Integer

Sight Reduction Tables

Latitude 70° to 76°

USE OF THE TABLES.

The Greenwich Hour Angle (GHA) and Declination of the SUN are taken from the current year's Sun Almanac for the precise date and time of the observation.
The GHA is combined with an Assumed Longitude, somewhere close to your actual position (obtained from your GPS or, if you are a traditionalist, your Dead Reckoning position) to give your Local Hour Angle (LHA).
The resulting LHA must be a whole degree of latitude.

If LHA and Declination = SAME
Start at the first page and work forward until you find the page with your LHA.
Enter the table with your Declination and Latitude, and read off Hc, d' and Z.
Take care to note whether d' is +ve or -ve.

If LHA and Declination = CONTRARY
Start at the last page and work backwards until you find the page with your LHA.
Enter the table with your Declination and Latitude, and read of Hc, d' and Z.
Take care to note whether d' is +ve or -ve.

NOTE: Values of Hc, d' and Z are always in **BOLD** text whenever LHA and Declination are contrary.

Hc, the computed Altitude, must now be corrected for minutes of Declination by means of the correction table at the end of the tables.
Enter the table with minutes of declination and d'. It doesn't matter which way round you use the table.
If d' is -ve, SUBTRACT the value obtained from the correction table from Hc to determine the corrected value of Hc.
If d' is +ve, ADD the value obtained from the correction table to HC to determine the corrected value of Hc.

Accuracy and Precision
This particular set of tables returns Hc, d' and Z as INTEGERS.
In the majority of situations this will give you satisfactory results as well as simplifying the entire sight reduction process.

These tables have been compared to the US National Imagery and Mapping Agency Sight Reduction Tables for Air Navigation Pub249 with the following results.

- No difference for Hc° has been identified by the author.
- No difference in D' has been identified by the author.
- 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

0° 360° LHA — Latitude SAME as Declination — 0° 360° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	20°00'	+60'	180°	19°00'	+60'	180°	18°00'	+60'	180°	17°00'	+60'	180°	16°00'	+60'	180°	15°00'	+60'	180°	14°00'	+60'	180°	0
1	21°00'	+60'	180°	20°00'	+60'	180°	19°00'	+60'	180°	18°00'	+60'	180°	17°00'	+60'	180°	16°00'	+60'	180°	15°00'	+60'	180°	1
2	22°00'	+60'	180°	21°00'	+60'	180°	20°00'	+60'	180°	19°00'	+60'	180°	18°00'	+60'	180°	17°00'	+60'	180°	16°00'	+60'	180°	2
3	23°00'	+60'	180°	22°00'	+60'	180°	21°00'	+60'	180°	20°00'	+60'	180°	19°00'	+60'	180°	18°00'	+60'	180°	17°00'	+60'	180°	3
4	24°00'	+60'	180°	23°00'	+60'	180°	22°00'	+60'	180°	21°00'	+60'	180°	20°00'	+60'	180°	19°00'	+60'	180°	18°00'	+60'	180°	4
5	25°00'	+60'	180°	24°00'	+60'	180°	23°00'	+60'	180°	22°00'	+60'	180°	21°00'	+60'	180°	20°00'	+60'	180°	19°00'	+60'	180°	5
6	26°00'	+60'	180°	25°00'	+60'	180°	24°00'	+60'	180°	23°00'	+60'	180°	22°00'	+60'	180°	21°00'	+60'	180°	20°00'	+60'	180°	6
7	27°00'	+60'	180°	26°00'	+60'	180°	25°00'	+60'	180°	24°00'	+60'	180°	23°00'	+60'	180°	22°00'	+60'	180°	21°00'	+60'	180°	7
8	28°00'	+60'	180°	27°00'	+60'	180°	26°00'	+60'	180°	25°00'	+60'	180°	24°00'	+60'	180°	23°00'	+60'	180°	22°00'	+60'	180°	8
9	29°00'	+60'	180°	28°00'	+60'	180°	27°00'	+60'	180°	26°00'	+60'	180°	25°00'	+60'	180°	24°00'	+60'	180°	23°00'	+60'	180°	9
10	30°00'	+60'	180°	29°00'	+60'	180°	28°00'	+60'	180°	27°00'	+60'	180°	26°00'	+60'	180°	25°00'	+60'	180°	24°00'	+60'	180°	10
11	31°00'	+60'	180°	30°00'	+60'	180°	29°00'	+60'	180°	28°00'	+60'	180°	27°00'	+60'	180°	26°00'	+60'	180°	25°00'	+60'	180°	11
12	32°00'	+60'	180°	31°00'	+60'	180°	30°00'	+60'	180°	29°00'	+60'	180°	28°00'	+60'	180°	27°00'	+60'	180°	26°00'	+60'	180°	12
13	33°00'	+60'	180°	32°00'	+60'	180°	31°00'	+60'	180°	30°00'	+60'	180°	29°00'	+60'	180°	28°00'	+60'	180°	27°00'	+60'	180°	13
14	34°00'	+60'	180°	33°00'	+60'	180°	32°00'	+60'	180°	31°00'	+60'	180°	30°00'	+60'	180°	29°00'	+60'	180°	28°00'	+60'	180°	14
15	35°00'	+60'	180°	34°00'	+60'	180°	33°00'	+60'	180°	32°00'	+60'	180°	31°00'	+60'	180°	30°00'	+60'	180°	29°00'	+60'	180°	15
16	36°00'	+60'	180°	35°00'	+60'	180°	34°00'	+60'	180°	33°00'	+60'	180°	32°00'	+60'	180°	31°00'	+60'	180°	30°00'	+60'	180°	16
17	37°00'	+60'	180°	36°00'	+60'	180°	35°00'	+60'	180°	34°00'	+60'	180°	33°00'	+60'	180°	32°00'	+60'	180°	31°00'	+60'	180°	17
18	38°00'	+60'	180°	37°00'	+60'	180°	36°00'	+60'	180°	35°00'	+60'	180°	34°00'	+60'	180°	33°00'	+60'	180°	32°00'	+60'	180°	18
19	39°00'	+60'	180°	38°00'	+60'	180°	37°00'	+60'	180°	36°00'	+60'	180°	35°00'	+60'	180°	34°00'	+60'	180°	33°00'	+60'	180°	19
20	40°00'	+60'	180°	39°00'	+60'	180°	38°00'	+60'	180°	37°00'	+60'	180°	36°00'	+60'	180°	35°00'	+60'	180°	34°00'	+60'	180°	20
21	41°00'	+60'	180°	40°00'	+60'	180°	39°00'	+60'	180°	38°00'	+60'	180°	37°00'	+60'	180°	36°00'	+60'	180°	35°00'	+60'	180°	21
22	42°00'	+60'	180°	41°00'	+60'	180°	40°00'	+60'	180°	39°00'	+60'	180°	38°00'	+60'	180°	37°00'	+60'	180°	36°00'	+60'	180°	22
23	43°00'	+60'	180°	42°00'	+60'	180°	41°00'	+60'	180°	40°00'	+60'	180°	39°00'	+60'	180°	38°00'	+60'	180°	37°00'	+60'	180°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

0° 360° LHA — Latitude SAME as Declination — 0° 360° LHA

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

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

1° 359° LHA — Latitude SAME as Declination — 1° 359° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	20°00'	+60'	179°	19°00'	+60'	179°	18°00'	+60'	179°	17°00'	+60'	179°	16°00'	+60'	179°	15°00'	+60'	179°	14°00'	+60'	179°	0
1	21°00'	+60'	179°	20°00'	+60'	179°	19°00'	+60'	179°	18°00'	+60'	179°	17°00'	+60'	179°	16°00'	+60'	179°	15°00'	+60'	179°	1
2	22°00'	+60'	179°	21°00'	+60'	179°	20°00'	+60'	179°	19°00'	+60'	179°	18°00'	+60'	179°	17°00'	+60'	179°	16°00'	+60'	179°	2
3	23°00'	+60'	179°	22°00'	+60'	179°	21°00'	+60'	179°	20°00'	+60'	179°	19°00'	+60'	179°	18°00'	+60'	179°	17°00'	+60'	179°	3
4	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	21°00'	+60'	179°	20°00'	+60'	179°	19°00'	+60'	179°	18°00'	+60'	179°	4
5	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	21°00'	+60'	179°	20°00'	+60'	179°	19°00'	+60'	179°	5
6	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	21°00'	+60'	179°	20°00'	+60'	179°	6
7	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	21°00'	+60'	179°	7
8	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	8
9	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	9
10	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	10
11	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	11
12	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	12
13	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	13
14	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	14
15	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	15
16	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	16
17	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	17
18	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	18
19	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	19
20	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	20
21	41°00'	+60'	179°	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	21
22	42°00'	+60'	179°	41°00'	+60'	179°	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	22
23	43°00'	+60'	179°	42°00'	+60'	179°	41°00'	+60'	179°	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

1° 359° LHA — Latitude SAME as Declination — 1° 359° LHA

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

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

2° 358° LHA — Latitude SAME as Declination — 2° 358° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°59'	+60'	178°	18°59'	+60'	178°	17°59'	+60'	178°	16°59'	+60'	178°	15°59'	+60'	178°	14°59'	+60'	178°	13°59'	+60'	178°	0
1	20°59'	+60'	178°	19°59'	+60'	178°	18°59'	+60'	178°	17°59'	+60'	178°	16°59'	+60'	178°	15°59'	+60'	178°	14°59'	+60'	178°	1
2	21°59'	+60'	178°	20°59'	+60'	178°	19°59'	+60'	178°	18°59'	+60'	178°	17°59'	+60'	178°	16°59'	+60'	178°	15°59'	+60'	178°	2
3	22°59'	+60'	178°	21°59'	+60'	178°	20°59'	+60'	178°	19°59'	+60'	178°	18°59'	+60'	178°	17°59'	+60'	178°	16°59'	+60'	178°	3
4	23°59'	+60'	178°	22°59'	+60'	178°	21°59'	+60'	178°	20°59'	+60'	178°	19°59'	+60'	178°	18°59'	+60'	178°	17°59'	+60'	178°	4
5	24°59'	+61'	178°	23°59'	+61'	178°	22°59'	+61'	178°	21°59'	+60'	178°	20°59'	+60'	178°	19°59'	+60'	178°	18°59'	+60'	178°	5
6	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	21°00'	+60'	179°	20°00'	+60'	179°	6
7	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	21°00'	+60'	179°	7
8	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	22°00'	+60'	179°	8
9	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	23°00'	+60'	179°	9
10	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	24°00'	+60'	179°	10
11	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	25°00'	+60'	179°	11
12	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	26°00'	+60'	179°	12
13	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	27°00'	+60'	179°	13
14	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	28°00'	+60'	179°	14
15	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	29°00'	+60'	179°	15
16	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	30°00'	+60'	179°	16
17	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	31°00'	+60'	179°	17
18	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	32°00'	+60'	179°	18
19	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	33°00'	+60'	179°	19
20	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	34°00'	+60'	179°	20
21	41°00'	+60'	179°	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	35°00'	+60'	179°	21
22	42°00'	+60'	179°	41°00'	+60'	179°	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	36°00'	+60'	179°	22
23	43°00'	+60'	179°	42°00'	+60'	179°	41°00'	+60'	179°	40°00'	+60'	179°	39°00'	+60'	179°	38°00'	+60'	179°	37°00'	+60'	179°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

2° 358° LHA — Latitude SAME as Declination — 2° 358° LHA

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

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

3° 357° LHA — Latitude SAME as Declination — 3° 357° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°58'	+60'	177°	18°58'	+60'	177°	17°58'	+60'	177°	16°59'	+60'	177°	15°59'	+60'	177°	14°59'	+60'	177°	13°59'	+60'	177°	0
1	20°58'	+60'	177°	19°58'	+60'	177°	18°58'	+60'	177°	17°59'	+60'	177°	16°59'	+60'	177°	15°59'	+60'	177°	14°59'	+60'	177°	1
2	21°58'	+60'	177°	20°58'	+60'	177°	19°58'	+60'	177°	18°59'	+60'	177°	17°59'	+60'	177°	16°59'	+60'	177°	15°59'	+60'	177°	2
3	22°58'	+60'	177°	21°58'	+60'	177°	20°58'	+60'	177°	19°59'	+60'	177°	18°59'	+60'	177°	17°59'	+60'	177°	16°59'	+60'	177°	3
4	23°58'	+60'	177°	22°58'	+60'	177°	21°58'	+60'	177°	20°59'	+60'	177°	19°59'	+60'	177°	18°59'	+60'	177°	17°59'	+60'	177°	4
5	24°58'	+60'	177°	23°58'	+60'	177°	22°58'	+60'	177°	21°59'	+60'	177°	20°59'	+60'	177°	19°59'	+60'	177°	18°59'	+60'	177°	5
6	25°58'	+60'	177°	24°58'	+60'	177°	23°58'	+60'	177°	22°59'	+60'	177°	21°59'	+60'	177°	20°59'	+60'	177°	19°59'	+60'	177°	6
7	26°58'	+60'	177°	25°58'	+60'	177°	24°58'	+60'	177°	23°59'	+60'	177°	22°59'	+60'	177°	21°59'	+60'	177°	20°59'	+60'	177°	7
8	27°58'	+60'	177°	26°58'	+60'	177°	25°58'	+60'	177°	24°58'	+60'	177°	23°59'	+60'	177°	22°59'	+60'	177°	21°59'	+60'	177°	8
9	28°58'	+60'	177°	27°58'	+60'	177°	26°58'	+60'	177°	25°58'	+60'	177°	24°59'	+60'	177°	23°59'	+60'	177°	22°59'	+60'	177°	9
10	29°58'	+60'	177°	28°58'	+60'	177°	27°58'	+60'	177°	26°58'	+60'	177°	25°59'	+60'	177°	24°59'	+60'	177°	23°59'	+60'	177°	10
11	30°58'	+60'	177°	29°58'	+60'	177°	28°58'	+60'	177°	27°58'	+60'	177°	26°59'	+60'	177°	25°59'	+60'	177°	24°59'	+60'	177°	11
12	31°58'	+60'	177°	30°58'	+60'	177°	29°58'	+60'	177°	28°58'	+60'	177°	27°59'	+60'	177°	26°59'	+60'	177°	25°59'	+60'	177°	12
13	32°58'	+60'	177°	31°58'	+60'	177°	30°58'	+60'	177°	29°58'	+60'	177°	28°59'	+60'	177°	27°59'	+60'	177°	26°59'	+60'	177°	13
14	33°58'	+60'	176°	32°58'	+60'	177°	31°58'	+60'	177°	30°58'	+60'	177°	29°59'	+60'	177°	28°59'	+60'	177°	27°59'	+60'	177°	14
15	34°58'	+60'	176°	33°58'	+60'	177°	32°58'	+60'	177°	31°58'	+60'	177°	30°59'	+60'	177°	29°59'	+60'	177°	28°59'	+60'	177°	15
16	35°58'	+60'	176°	34°58'	+60'	176°	33°58'	+60'	177°	32°58'	+60'	177°	31°59'	+60'	177°	30°59'	+60'	177°	29°59'	+60'	177°	16
17	36°58'	+60'	176°	35°58'	+60'	176°	34°58'	+60'	176°	33°58'	+60'	177°	32°59'	+60'	177°	31°59'	+60'	177°	30°59'	+60'	177°	17
18	37°58'	+60'	176°	36°58'	+60'	176°	35°58'	+60'	176°	34°58'	+60'	177°	33°59'	+60'	177°	32°59'	+60'	177°	31°59'	+60'	177°	18
19	38°58'	+60'	176°	37°58'	+60'	176°	36°58'	+60'	176°	35°58'	+60'	176°	34°59'	+60'	177°	33°59'	+60'	177°	32°59'	+60'	177°	19
20	39°58'	+60'	176°	38°58'	+60'	176°	37°58'	+60'	176°	36°58'	+60'	176°	35°58'	+60'	177°	34°59'	+60'	177°	33°59'	+60'	177°	20
21	40°58'	+60'	176°	39°58'	+60'	176°	38°58'	+60'	176°	37°58'	+60'	176°	36°58'	+60'	176°	35°59'	+60'	177°	34°59'	+60'	177°	21
22	41°58'	+60'	176°	40°58'	+60'	176°	39°58'	+60'	176°	38°58'	+60'	176°	37°58'	+60'	176°	36°59'	+60'	177°	35°59'	+60'	177°	22
23	42°58'	+60'	176°	41°58'	+60'	176°	40°58'	+60'	176°	39°58'	+60'	176°	38°58'	+60'	176°	37°59'	+60'	176°	36°59'	+60'	177°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

3° 357° LHA — Latitude SAME as Declination — 3° 357° LHA

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

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

4° 356° LHA — Latitude SAME as Declination — 4° 356° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°57'	+60'	176°	18°57'	+60'	176°	17°57'	+60'	176°	16°57'	+60'	176°	15°58'	+60'	176°	14°58'	+60'	176°	13°58'	+60'	176°	0
1	20°57'	+60'	176°	19°57'	+60'	176°	18°57'	+60'	176°	17°57'	+60'	176°	16°58'	+60'	176°	15°58'	+60'	176°	14°58'	+60'	176°	1
2	21°57'	+60'	176°	20°57'	+60'	176°	19°57'	+60'	176°	18°57'	+60'	176°	17°58'	+60'	176°	16°58'	+60'	176°	15°58'	+60'	176°	2
3	22°57'	+60'	176°	21°57'	+60'	176°	20°57'	+60'	176°	19°57'	+60'	176°	18°58'	+60'	176°	17°58'	+60'	176°	16°58'	+60'	176°	3
4	23°57'	+60'	176°	22°57'	+60'	176°	21°57'	+60'	176°	20°57'	+60'	176°	19°58'	+60'	176°	18°58'	+60'	176°	17°58'	+60'	176°	4
5	24°57'	+60'	176°	23°57'	+60'	176°	22°57'	+60'	176°	21°57'	+60'	176°	20°58'	+60'	176°	19°58'	+60'	176°	18°58'	+60'	176°	5
6	25°57'	+60'	176°	24°57'	+60'	176°	23°57'	+60'	176°	22°57'	+60'	176°	21°58'	+60'	176°	20°58'	+60'	176°	19°58'	+60'	176°	6
7	26°57'	+60'	176°	25°57'	+60'	176°	24°57'	+60'	176°	23°57'	+60'	176°	22°58'	+60'	176°	21°58'	+60'	176°	20°58'	+60'	176°	7
8	27°57'	+60'	176°	26°57'	+60'	176°	25°57'	+60'	176°	24°57'	+60'	176°	23°57'	+60'	176°	22°58'	+60'	176°	21°58'	+60'	176°	8
9	28°57'	+60'	175°	27°57'	+60'	176°	26°57'	+60'	176°	25°57'	+60'	176°	24°57'	+60'	176°	23°58'	+60'	176°	22°58'	+60'	176°	9
10	29°57'	+60'	175°	28°57'	+60'	175°	27°57'	+60'	176°	26°57'	+60'	176°	25°57'	+60'	176°	24°58'	+60'	176°	23°58'	+60'	176°	10
11	30°57'	+60'	175°	29°57'	+60'	175°	28°57'	+60'	176°	27°57'	+60'	176°	26°57'	+60'	176°	25°58'	+60'	176°	24°58'	+60'	176°	11
12	31°57'	+60'	175°	30°57'	+60'	175°	29°57'	+60'	175°	28°57'	+60'	176°	27°57'	+60'	176°	26°58'	+60'	176°	25°58'	+60'	176°	12
13	32°57'	+60'	175°	31°57'	+60'	175°	30°57'	+60'	175°	29°57'	+60'	176°	28°57'	+60'	176°	27°58'	+60'	176°	26°58'	+60'	176°	13
14	33°57'	+60'	175°	32°57'	+60'	175°	31°57'	+60'	175°	30°57'	+60'	175°	29°57'	+60'	176°	28°58'	+60'	176°	27°58'	+60'	176°	14
15	34°57'	+60'	175°	33°57'	+60'	175°	32°57'	+60'	175°	31°57'	+60'	175°	30°57'	+60'	175°	29°58'	+60'	176°	28°58'	+60'	176°	15
16	35°57'	+60'	175°	34°57'	+60'	175°	33°57'	+60'	175°	32°57'	+60'	175°	31°57'	+60'	175°	30°58'	+60'	176°	29°58'	+60'	176°	16
17	36°57'	+60'	175°	35°57'	+60'	175°	34°57'	+60'	175°	33°57'	+60'	175°	32°57'	+60'	175°	31°58'	+60'	175°	30°58'	+60'	176°	17
18	37°57'	+60'	175°	36°57'	+60'	175°	35°57'	+60'	175°	34°57'	+60'	175°	33°57'	+60'	175°	32°58'	+60'	175°	31°58'	+60'	176°	18
19	38°57'	+60'	175°	37°57'	+60'	175°	36°57'	+60'	175°	35°57'	+60'	175°	34°57'	+60'	175°	33°58'	+60'	175°	32°58'	+60'	175°	19
20	39°56'	+60'	175°	38°57'	+60'	175°	37°57'	+60'	175°	36°57'	+60'	175°	35°57'	+60'	175°	34°58'	+60'	175°	33°58'	+60'	175°	20
21	40°56'	+60'	175°	39°57'	+60'	175°	38°57'	+60'	175°	37°57'	+60'	175°	36°57'	+60'	175°	35°57'	+60'	175°	34°58'	+60'	175°	21
22	41°56'	+60'	175°	40°57'	+60'	175°	39°57'	+60'	175°	38°57'	+60'	175°	37°57'	+60'	175°	36°57'	+60'	175°	35°58'	+60'	175°	22
23	42°56'	+60'	175°	41°57'	+60'	175°	40°57'	+60'	175°	39°57'	+60'	175°	38°57'	+60'	175°	37°57'	+60'	175°	36°58'	+60'	175°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

4° 356° LHA — Latitude SAME as Declination — 4° 356° LHA

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

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

5° 355° LHA — Latitude SAME as Declination — 5° 355° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°55'	+60'	175°	18°55'	+60'	175°	17°56'	+60'	175°	16°56'	+60'	175°	15°56'	+60'	175°	14°56'	+60'	175°	13°57'	+60'	175°	0
1	20°55'	+60'	175°	19°55'	+60'	175°	18°56'	+60'	175°	17°56'	+60'	175°	16°56'	+60'	175°	15°56'	+60'	175°	14°57'	+60'	175°	1
2	21°55'	+60'	175°	20°55'	+60'	175°	19°56'	+60'	175°	18°56'	+60'	175°	17°56'	+60'	175°	16°56'	+60'	175°	15°57'	+60'	175°	2
3	22°55'	+60'	175°	21°55'	+60'	175°	20°56'	+60'	175°	19°56'	+60'	175°	18°56'	+60'	175°	17°56'	+60'	175°	16°57'	+60'	175°	3
4	23°55'	+60'	175°	22°55'	+60'	175°	21°56'	+60'	175°	20°56'	+60'	175°	19°56'	+60'	175°	18°56'	+60'	175°	17°57'	+60'	175°	4
5	24°55'	+60'	175°	23°55'	+60'	175°	22°56'	+60'	175°	21°56'	+60'	175°	20°56'	+60'	175°	19°56'	+60'	175°	18°57'	+60'	175°	5
6	25°55'	+60'	174°	24°55'	+60'	175°	23°56'	+60'	175°	22°56'	+60'	175°	21°56'	+60'	175°	20°56'	+60'	175°	19°57'	+60'	175°	6
7	26°55'	+60'	174°	25°55'	+60'	174°	24°56'	+60'	175°	23°56'	+60'	175°	22°56'	+60'	175°	21°56'	+60'	175°	20°57'	+60'	175°	7
8	27°55'	+60'	174°	26°55'	+60'	174°	25°56'	+60'	174°	24°56'	+60'	175°	23°56'	+60'	175°	22°56'	+60'	175°	21°57'	+60'	175°	8
9	28°55'	+60'	174°	27°55'	+60'	174°	26°56'	+60'	174°	25°56'	+60'	175°	24°56'	+60'	175°	23°56'	+60'	175°	22°57'	+60'	175°	9
10	29°55'	+60'	174°	28°55'	+60'	174°	27°55'	+60'	174°	26°56'	+60'	174°	25°56'	+60'	175°	24°56'	+60'	175°	23°57'	+60'	175°	10
11	30°55'	+60'	174°	29°55'	+60'	174°	28°55'	+60'	174°	27°56'	+60'	174°	26°56'	+60'	174°	25°56'	+60'	175°	24°57'	+60'	175°	11
12	31°55'	+60'	174°	30°55'	+60'	174°	29°55'	+60'	174°	28°56'	+60'	174°	27°56'	+60'	174°	26°56'	+60'	175°	25°57'	+60'	175°	12
13	32°55'	+60'	174°	31°55'	+60'	174°	30°55'	+60'	174°	29°56'	+60'	174°	28°56'	+60'	174°	27°56'	+60'	174°	26°57'	+60'	175°	13
14	33°55'	+60'	174°	32°55'	+60'	174°	31°55'	+60'	174°	30°56'	+60'	174°	29°56'	+60'	174°	28°56'	+60'	174°	27°57'	+60'	175°	14
15	34°55'	+60'	174°	33°55'	+60'	174°	32°55'	+60'	174°	31°56'	+60'	174°	30°56'	+60'	174°	29°56'	+60'	174°	28°57'	+60'	174°	15
16	35°55'	+60'	174°	34°55'	+60'	174°	33°55'	+60'	174°	32°56'	+60'	174°	31°56'	+60'	174°	30°56'	+60'	174°	29°56'	+60'	174°	16
17	36°55'	+60'	174°	35°55'	+60'	174°	34°55'	+60'	174°	33°56'	+60'	174°	32°56'	+60'	174°	31°56'	+60'	174°	30°56'	+60'	174°	17
18	37°55'	+60'	174°	36°55'	+60'	174°	35°55'	+60'	174°	34°56'	+60'	174°	33°56'	+60'	174°	32°56'	+60'	174°	31°56'	+60'	174°	18
19	38°55'	+60'	174°	37°55'	+60'	174°	36°55'	+60'	174°	35°56'	+60'	174°	34°56'	+60'	174°	33°56'	+60'	174°	32°56'	+60'	174°	19
20	39°55'	+60'	174°	38°55'	+60'	174°	37°55'	+60'	174°	36°56'	+60'	174°	35°56'	+60'	174°	34°56'	+60'	174°	33°56'	+60'	174°	20
21	40°54'	+60'	174°	39°55'	+60'	174°	38°55'	+60'	174°	37°55'	+60'	174°	36°56'	+60'	174°	35°56'	+60'	174°	34°56'	+60'	174°	21
22	41°54'	+60'	174°	40°55'	+60'	174°	39°55'	+60'	174°	38°55'	+60'	174°	37°56'	+60'	174°	36°56'	+60'	174°	35°56'	+60'	174°	22
23	42°54'	+60'	174°	41°55'	+60'	174°	40°55'	+60'	174°	39°55'	+60'	174°	38°56'	+60'	174°	37°56'	+60'	174°	36°56'	+60'	174°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

5° 355° LHA — Latitude SAME as Declination — 5° 355° LHA

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

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

6° 354° LHA — Latitude SAME as Declination — 6° 354° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	19°53'	+60'	174°	18°54'	+60'	174°	17°54'	+60'	174°	16°54'	+60'	174°	15°55'	+60'	174°	14°55'	+60'	174°	13°55'	+60'	174°	0
1	20°53'	+60'	174°	19°53'	+60'	174°	18°54'	+60'	174°	17°54'	+60'	174°	16°55'	+60'	174°	15°55'	+60'	174°	14°55'	+60'	174°	1
2	21°53'	+60'	174°	20°53'	+60'	174°	19°54'	+60'	174°	18°54'	+60'	174°	17°55'	+60'	174°	16°55'	+60'	174°	15°55'	+60'	174°	2
3	22°53'	+60'	173°	21°53'	+60'	174°	20°54'	+60'	174°	19°54'	+60'	174°	18°55'	+60'	174°	17°55'	+60'	174°	16°55'	+60'	174°	3
4	23°53'	+60'	173°	22°53'	+60'	174°	21°54'	+60'	174°	20°54'	+60'	174°	19°54'	+60'	174°	18°55'	+60'	174°	17°55'	+60'	174°	4
5	24°53'	+60'	173°	23°53'	+60'	173°	22°54'	+60'	174°	21°54'	+60'	174°	20°54'	+60'	174°	19°55'	+60'	174°	18°55'	+60'	174°	5
6	25°53'	+60'	173°	24°53'	+60'	173°	23°54'	+60'	173°	22°54'	+60'	174°	21°54'	+60'	174°	20°55'	+60'	174°	19°55'	+60'	174°	6
7	26°53'	+60'	173°	25°53'	+60'	173°	24°54'	+60'	173°	23°54'	+60'	173°	22°54'	+60'	174°	21°55'	+60'	174°	20°55'	+60'	174°	7
8	27°53'	+60'	173°	26°53'	+60'	173°	25°54'	+60'	173°	24°54'	+60'	173°	23°54'	+60'	173°	22°55'	+60'	174°	21°55'	+60'	174°	8
9	28°53'	+60'	173°	27°53'	+60'	173°	26°54'	+60'	173°	25°54'	+60'	173°	24°54'	+60'	173°	23°55'	+60'	174°	22°55'	+60'	174°	9
10	29°53'	+60'	173°	28°53'	+60'	173°	27°54'	+60'	173°	26°54'	+60'	173°	25°54'	+60'	173°	24°55'	+60'	173°	23°55'	+60'	174°	10
11	30°53'	+60'	173°	29°53'	+60'	173°	28°53'	+60'	173°	27°54'	+60'	173°	26°54'	+60'	173°	25°55'	+60'	173°	24°55'	+60'	174°	11
12	31°53'	+60'	173°	30°53'	+60'	173°	29°53'	+60'	173°	28°54'	+60'	173°	27°54'	+60'	173°	26°55'	+60'	173°	25°55'	+60'	173°	12
13	32°53'	+60'	173°	31°53'	+60'	173°	30°53'	+60'	173°	29°54'	+60'	173°	28°54'	+60'	173°	27°55'	+60'	173°	26°55'	+60'	173°	13
14	33°52'	+60'	173°	32°53'	+60'	173°	31°53'	+60'	173°	30°54'	+60'	173°	29°54'	+60'	173°	28°55'	+60'	173°	27°55'	+60'	173°	14
15	34°52'	+60'	173°	33°53'	+60'	173°	32°53'	+60'	173°	31°54'	+60'	173°	30°54'	+60'	173°	29°55'	+60'	173°	28°55'	+60'	173°	15
16	35°52'	+60'	173°	34°53'	+60'	173°	33°53'	+60'	173°	32°54'	+60'	173°	31°54'	+60'	173°	30°55'	+60'	173°	29°55'	+60'	173°	16
17	36°52'	+60'	173°	35°53'	+60'	173°	34°53'	+60'	173°	33°54'	+60'	173°	32°54'	+60'	173°	31°55'	+60'	173°	30°55'	+60'	173°	17
18	37°52'	+60'	173°	36°53'	+60'	173°	35°53'	+60'	173°	34°54'	+60'	173°	33°54'	+60'	173°	32°54'	+60'	173°	31°55'	+60'	173°	18
19	38°52'	+60'	173°	37°53'	+60'	173°	36°53'	+60'	173°	35°54'	+60'	173°	34°54'	+60'	173°	33°54'	+60'	173°	32°55'	+60'	173°	19
20	39°52'	+60'	173°	38°53'	+60'	173°	37°53'	+60'	173°	36°54'	+60'	173°	35°54'	+60'	173°	34°54'	+60'	173°	33°55'	+60'	173°	20
21	40°52'	+60'	173°	39°53'	+60'	173°	38°53'	+60'	173°	37°53'	+60'	173°	36°54'	+60'	173°	35°54'	+60'	173°	34°55'	+60'	173°	21
22	41°52'	+60'	173°	40°52'	+60'	173°	39°53'	+60'	173°	38°53'	+60'	173°	37°54'	+60'	173°	36°54'	+60'	173°	35°55'	+60'	173°	22
23	42°52'	+60'	172°	41°52'	+60'	173°	40°53'	+60'	173°	39°53'	+60'	173°	38°54'	+60'	173°	37°54'	+60'	173°	36°55'	+60'	173°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	19°51'	+60'	173°	18°51'	+60'	173°	17°52'	+60'	173°	16°52'	+60'	173°	15°53'	+60'	173°	14°53'	+60'	173°	13°54'	+60'	173°	0
1	20°51'	+60'	173°	19°51'	+60'	173°	18°52'	+60'	173°	17°52'	+60'	173°	16°53'	+60'	173°	15°53'	+60'	173°	14°54'	+60'	173°	1
2	21°51'	+60'	172°	20°51'	+60'	173°	19°52'	+60'	173°	18°52'	+60'	173°	17°53'	+60'	173°	16°53'	+60'	173°	15°54'	+60'	173°	2
3	22°50'	+60'	172°	21°51'	+60'	172°	20°52'	+60'	173°	19°52'	+60'	173°	18°53'	+60'	173°	17°53'	+60'	173°	16°54'	+60'	173°	3
4	23°50'	+60'	172°	22°51'	+60'	172°	21°51'	+60'	172°	20°52'	+60'	173°	19°53'	+60'	173°	18°53'	+60'	173°	17°53'	+60'	173°	4
5	24°50'	+60'	172°	23°51'	+60'	172°	22°51'	+60'	172°	21°52'	+60'	172°	20°52'	+60'	173°	19°53'	+60'	173°	18°53'	+60'	173°	5
6	25°50'	+60'	172°	24°51'	+60'	172°	23°51'	+60'	172°	22°52'	+60'	172°	21°52'	+60'	172°	20°53'	+60'	173°	19°53'	+60'	173°	6
7	26°50'	+60'	172°	25°51'	+60'	172°	24°51'	+60'	172°	23°52'	+60'	172°	22°52'	+60'	172°	21°53'	+60'	173°	20°53'	+60'	173°	7
8	27°50'	+60'	172°	26°51'	+60'	172°	25°51'	+60'	172°	24°52'	+60'	172°	23°52'	+60'	172°	22°53'	+60'	172°	21°53'	+60'	173°	8
9	28°50'	+60'	172°	27°51'	+60'	172°	26°51'	+60'	172°	25°52'	+60'	172°	24°52'	+60'	172°	23°53'	+60'	172°	22°53'	+60'	172°	9
10	29°50'	+60'	172°	28°51'	+60'	172°	27°51'	+60'	172°	26°52'	+60'	172°	25°52'	+60'	172°	24°53'	+60'	172°	23°53'	+60'	172°	10
11	30°50'	+60'	172°	29°51'	+60'	172°	28°51'	+60'	172°	27°52'	+60'	172°	26°52'	+60'	172°	25°53'	+60'	172°	24°53'	+60'	172°	11
12	31°50'	+60'	172°	30°50'	+60'	172°	29°51'	+60'	172°	28°52'	+60'	172°	27°52'	+60'	172°	26°53'	+60'	172°	25°53'	+60'	172°	12
13	32°50'	+60'	172°	31°50'	+60'	172°	30°51'	+60'	172°	29°52'	+60'	172°	28°52'	+60'	172°	27°53'	+60'	172°	26°53'	+60'	172°	13
14	33°50'	+60'	172°	32°50'	+60'	172°	31°51'	+60'	172°	30°52'	+60'	172°	29°52'	+60'	172°	28°53'	+60'	172°	27°53'	+60'	172°	14
15	34°50'	+60'	172°	33°50'	+60'	172°	32°51'	+60'	172°	31°51'	+60'	172°	30°52'	+60'	172°	29°53'	+60'	172°	28°53'	+60'	172°	15
16	35°50'	+60'	172°	34°50'	+60'	172°	33°51'	+60'	172°	32°51'	+60'	172°	31°52'	+60'	172°	30°53'	+60'	172°	29°53'	+60'	172°	16
17	36°50'	+60'	172°	35°50'	+60'	172°	34°51'	+60'	172°	33°51'	+60'	172°	32°52'	+60'	172°	31°53'	+60'	172°	30°53'	+60'	172°	17
18	37°49'	+60'	172°	36°50'	+60'	172°	35°51'	+60'	172°	34°51'	+60'	172°	33°52'	+60'	172°	32°52'	+60'	172°	31°53'	+60'	172°	18
19	38°49'	+60'	171°	37°50'	+60'	172°	36°51'	+60'	172°	35°51'	+60'	172°	34°52'	+60'	172°	33°52'	+60'	172°	32°53'	+60'	172°	19
20	39°49'	+60'	171°	38°50'	+60'	172°	37°51'	+60'	172°	36°51'	+60'	172°	35°52'	+60'	172°	34°52'	+60'	172°	33°53'	+60'	172°	20
21	40°49'	+60'	171°	39°50'	+60'	171°	38°50'	+60'	172°	37°51'	+60'	172°	36°52'	+60'	172°	35°52'	+60'	172°	34°53'	+60'	172°	21
22	41°49'	+60'	171°	40°50'	+60'	171°	39°50'	+60'	172°	38°51'	+60'	172°	37°52'	+60'	172°	36°52'	+60'	172°	35°53'	+60'	172°	22
23	42°49'	+60'	171°	41°50'	+60'	171°	40°50'	+60'	171°	39°51'	+60'	172°	38°52'	+60'	172°	37°52'	+60'	172°	36°53'	+60'	172°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°48'	+60'	171°	18°48'	+60'	172°	17°49'	+60'	172°	16°50'	+60'	172°	15°50'	+60'	172°	14°51'	+60'	172°	13°52'	+60'	172°	0
1	20°48'	+60'	171°	19°48'	+60'	171°	18°49'	+60'	172°	17°50'	+60'	172°	16°50'	+60'	172°	15°51'	+60'	172°	14°52'	+60'	172°	1
2	21°48'	+60'	171°	20°48'	+60'	171°	19°49'	+60'	171°	18°50'	+60'	172°	17°50'	+60'	172°	16°51'	+60'	172°	15°52'	+60'	172°	2
3	22°48'	+60'	171°	21°48'	+60'	171°	20°49'	+60'	171°	19°50'	+60'	172°	18°50'	+60'	172°	17°51'	+60'	172°	16°52'	+60'	172°	3
4	23°48'	+60'	171°	22°48'	+60'	171°	21°49'	+60'	171°	20°50'	+60'	171°	19°50'	+60'	172°	18°51'	+60'	172°	17°52'	+60'	172°	4
5	24°47'	+60'	171°	23°48'	+60'	171°	22°49'	+60'	171°	21°49'	+60'	171°	20°50'	+60'	171°	19°51'	+60'	172°	18°51'	+60'	172°	5
6	25°47'	+60'	171°	24°48'	+60'	171°	23°49'	+60'	171°	22°49'	+60'	171°	21°50'	+60'	171°	20°51'	+60'	171°	19°51'	+60'	172°	6
7	26°47'	+60'	171°	25°48'	+60'	171°	24°49'	+60'	171°	23°49'	+60'	171°	22°50'	+60'	171°	21°51'	+60'	171°	20°51'	+60'	171°	7
8	27°47'	+60'	171°	26°48'	+60'	171°	25°49'	+60'	171°	24°49'	+60'	171°	23°50'	+60'	171°	22°51'	+60'	171°	21°51'	+60'	171°	8
9	28°47'	+60'	171°	27°48'	+60'	171°	26°49'	+60'	171°	25°49'	+60'	171°	24°50'	+60'	171°	23°51'	+60'	171°	22°51'	+60'	171°	9
10	29°47'	+60'	171°	28°48'	+60'	171°	27°48'	+60'	171°	26°49'	+60'	171°	25°50'	+60'	171°	24°51'	+60'	171°	23°51'	+60'	171°	10
11	30°47'	+60'	171°	29°48'	+60'	171°	28°48'	+60'	171°	27°49'	+60'	171°	26°50'	+60'	171°	25°51'	+60'	171°	24°51'	+60'	171°	11
12	31°47'	+60'	171°	30°48'	+60'	171°	29°48'	+60'	171°	28°49'	+60'	171°	27°50'	+60'	171°	26°51'	+60'	171°	25°51'	+60'	171°	12
13	32°47'	+60'	171°	31°47'	+60'	171°	30°48'	+60'	171°	29°49'	+60'	171°	28°50'	+60'	171°	27°50'	+60'	171°	26°51'	+60'	171°	13
14	33°47'	+60'	171°	32°47'	+60'	171°	31°48'	+60'	171°	30°49'	+60'	171°	29°50'	+60'	171°	28°50'	+60'	171°	27°51'	+60'	171°	14
15	34°47'	+60'	171°	33°47'	+60'	171°	32°48'	+60'	171°	31°49'	+60'	171°	30°50'	+60'	171°	29°50'	+60'	171°	28°51'	+60'	171°	15
16	35°46'	+60'	171°	34°47'	+60'	171°	33°48'	+60'	171°	32°49'	+60'	171°	31°50'	+60'	171°	30°50'	+60'	171°	29°51'	+60'	171°	16
17	36°46'	+60'	170°	35°47'	+60'	171°	34°48'	+60'	171°	33°49'	+60'	171°	32°49'	+60'	171°	31°50'	+60'	171°	30°51'	+60'	171°	17
18	37°46'	+60'	170°	36°47'	+60'	170°	35°48'	+60'	171°	34°49'	+60'	171°	33°49'	+60'	171°	32°50'	+60'	171°	31°51'	+60'	171°	18
19	38°46'	+60'	170°	37°47'	+60'	170°	36°48'	+60'	171°	35°49'	+60'	171°	34°49'	+60'	171°	33°50'	+60'	171°	32°51'	+60'	171°	19
20	39°46'	+60'	170°	38°47'	+60'	170°	37°48'	+60'	170°	36°49'	+60'	171°	35°49'	+60'	171°	34°50'	+60'	171°	33°51'	+60'	171°	20
21	40°46'	+60'	170°	39°47'	+60'	170°	38°48'	+60'	170°	37°48'	+60'	171°	36°49'	+60'	171°	35°50'	+60'	171°	34°51'	+60'	171°	21
22	41°46'	+60'	170°	40°47'	+60'	170°	39°48'	+60'	170°	38°48'	+60'	170°	37°49'	+60'	171°	36°50'	+60'	171°	35°51'	+60'	171°	22
23	42°46'	+60'	170°	41°47'	+60'	170°	40°47'	+60'	170°	39°48'	+60'	170°	38°49'	+60'	171°	37°50'	+60'	171°	36°51'	+60'	171°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°45'	+60'	170°	18°45'	+60'	170°	17°46'	+60'	171°	16°47'	+60'	171°	15°48'	+60'	171°	14°49'	+60'	171°	13°49'	+60'	171°	0
1	20°45'	+60'	170°	19°45'	+60'	170°	18°46'	+60'	170°	17°47'	+60'	171°	16°48'	+60'	171°	15°49'	+60'	171°	14°49'	+60'	171°	1
2	21°44'	+60'	170°	20°45'	+60'	170°	19°46'	+60'	170°	18°47'	+60'	170°	17°48'	+60'	171°	16°49'	+60'	171°	15°49'	+60'	171°	2
3	22°44'	+60'	170°	21°45'	+60'	170°	20°46'	+60'	170°	19°47'	+60'	170°	18°48'	+60'	171°	17°49'	+60'	171°	16°49'	+60'	171°	3
4	23°44'	+60'	170°	22°45'	+60'	170°	21°46'	+60'	170°	20°47'	+60'	170°	19°48'	+60'	170°	18°48'	+60'	171°	17°49'	+60'	171°	4
5	24°44'	+60'	170°	23°45'	+60'	170°	22°46'	+60'	170°	21°47'	+60'	170°	20°48'	+60'	170°	19°48'	+60'	170°	18°49'	+60'	171°	5
6	25°44'	+60'	170°	24°45'	+60'	170°	23°46'	+60'	170°	22°47'	+60'	170°	21°47'	+60'	170°	20°48'	+60'	170°	19°49'	+60'	170°	6
7	26°44'	+60'	170°	25°45'	+60'	170°	24°46'	+60'	170°	23°47'	+60'	170°	22°47'	+60'	170°	21°48'	+60'	170°	20°49'	+60'	170°	7
8	27°44'	+60'	170°	26°45'	+60'	170°	25°46'	+60'	170°	24°46'	+60'	170°	23°47'	+60'	170°	22°48'	+60'	170°	21°49'	+60'	170°	8
9	28°44'	+60'	170°	27°45'	+60'	170°	26°46'	+60'	170°	25°46'	+60'	170°	24°47'	+60'	170°	23°48'	+60'	170°	22°49'	+60'	170°	9
10	29°44'	+60'	170°	28°45'	+60'	170°	27°45'	+60'	170°	26°46'	+60'	170°	25°47'	+60'	170°	24°48'	+60'	170°	23°49'	+60'	170°	10
11	30°43'	+60'	170°	29°44'	+60'	170°	28°45'	+60'	170°	27°46'	+60'	170°	26°47'	+60'	170°	25°48'	+60'	170°	24°49'	+60'	170°	11
12	31°43'	+60'	170°	30°44'	+60'	170°	29°45'	+60'	170°	28°46'	+60'	170°	27°47'	+60'	170°	26°48'	+60'	170°	25°49'	+60'	170°	12
13	32°43'	+60'	170°	31°44'	+60'	170°	30°45'	+60'	170°	29°46'	+60'	170°	28°47'	+60'	170°	27°48'	+60'	170°	26°49'	+60'	170°	13
14	33°43'	+60'	169°	32°44'	+60'	170°	31°45'	+60'	170°	30°46'	+60'	170°	29°47'	+60'	170°	28°48'	+60'	170°	27°49'	+60'	170°	14
15	34°43'	+60'	169°	33°44'	+60'	170°	32°45'	+60'	170°	31°46'	+60'	170°	30°47'	+60'	170°	29°48'	+60'	170°	28°49'	+60'	170°	15
16	35°43'	+60'	169°	34°44'	+60'	169°	33°45'	+60'	170°	32°46'	+60'	170°	31°47'	+60'	170°	30°48'	+60'	170°	29°49'	+60'	170°	16
17	36°43'	+60'	169°	35°44'	+60'	169°	34°45'	+60'	170°	33°46'	+60'	170°	32°47'	+60'	170°	31°48'	+60'	170°	30°49'	+60'	170°	17
18	37°43'	+60'	169°	36°44'	+60'	169°	35°45'	+60'	169°	34°46'	+60'	170°	33°47'	+60'	170°	32°48'	+60'	170°	31°49'	+60'	170°	18
19	38°42'	+60'	169°	37°43'	+60'	169°	36°45'	+60'	169°	35°46'	+60'	169°	34°47'	+60'	170°	33°48'	+60'	170°	32°48'	+60'	170°	19
20	39°42'	+60'	169°	38°43'	+60'	169°	37°44'	+60'	169°	36°45'	+60'	169°	35°46'	+60'	170°	34°47'	+60'	170°	33°48'	+60'	170°	20
21	40°42'	+60'	169°	39°43'	+60'	169°	38°44'	+60'	169°	37°45'	+60'	169°	36°46'	+60'	169°	35°47'	+60'	170°	34°48'	+60'	170°	21
22	41°42'	+60'	169°	40°43'	+60'	169°	39°44'	+60'	169°	38°45'	+60'	169°	37°46'	+60'	169°	36°47'	+60'	170°	35°48'	+60'	170°	22
23	42°42'	+60'	169°	41°43'	+60'	169°	40°44'	+60'	169°	39°45'	+60'	169°	38°46'	+60'	169°	37°47'	+60'	170°	36°48'	+60'	170°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

9° 351° LHA — Latitude SAME as Declination — 9° 351° LHA

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

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

10° 350° LHA — Latitude SAME as Declination — 10° 350° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°41'	+60'	169°	18°42'	+60'	169°	17°43'	+60'	169°	16°44'	+60'	170°	15°45'	+60'	170°	14°46'	+60'	170°	13°47'	+60'	170°	0
1	20°41'	+60'	169°	19°42'	+60'	169°	18°43'	+60'	169°	17°44'	+60'	169°	16°45'	+60'	170°	15°46'	+60'	170°	14°47'	+60'	170°	1
2	21°41'	+60'	169°	20°42'	+60'	169°	19°43'	+60'	169°	18°44'	+60'	169°	17°45'	+60'	170°	16°46'	+60'	170°	15°47'	+60'	170°	2
3	22°41'	+60'	169°	21°42'	+60'	169°	20°43'	+60'	169°	19°44'	+60'	169°	18°45'	+60'	169°	17°46'	+60'	170°	16°47'	+60'	170°	3
4	23°41'	+60'	169°	22°42'	+60'	169°	21°43'	+60'	169°	20°44'	+60'	169°	19°45'	+60'	169°	18°46'	+60'	169°	17°47'	+60'	170°	4
5	24°40'	+60'	169°	23°41'	+60'	169°	22°43'	+60'	169°	21°44'	+60'	169°	20°45'	+60'	169°	19°46'	+60'	169°	18°47'	+60'	169°	5
6	25°40'	+60'	169°	24°41'	+60'	169°	23°42'	+60'	169°	22°44'	+60'	169°	21°45'	+60'	169°	20°46'	+60'	169°	19°47'	+60'	169°	6
7	26°40'	+60'	169°	25°41'	+60'	169°	24°42'	+60'	169°	23°43'	+60'	169°	22°44'	+60'	169°	21°46'	+60'	169°	20°47'	+60'	169°	7
8	27°40'	+60'	169°	26°41'	+60'	169°	25°42'	+60'	169°	24°43'	+60'	169°	23°44'	+60'	169°	22°45'	+60'	169°	21°47'	+60'	169°	8
9	28°40'	+60'	169°	27°41'	+60'	169°	26°42'	+60'	169°	25°43'	+60'	169°	24°44'	+60'	169°	23°45'	+60'	169°	22°46'	+60'	169°	9
10	29°40'	+60'	169°	28°41'	+60'	169°	27°42'	+60'	169°	26°43'	+60'	169°	25°44'	+60'	169°	24°45'	+60'	169°	23°46'	+60'	169°	10
11	30°40'	+60'	169°	29°41'	+60'	169°	28°42'	+60'	169°	27°43'	+60'	169°	26°44'	+60'	169°	25°45'	+60'	169°	24°46'	+60'	169°	11
12	31°39'	+60'	168°	30°41'	+60'	169°	29°42'	+60'	169°	28°43'	+60'	169°	27°44'	+60'	169°	26°45'	+60'	169°	25°46'	+60'	169°	12
13	32°39'	+60'	168°	31°40'	+60'	169°	30°42'	+60'	169°	29°43'	+60'	169°	28°44'	+60'	169°	27°45'	+60'	169°	26°46'	+60'	169°	13
14	33°39'	+60'	168°	32°40'	+60'	168°	31°42'	+60'	169°	30°43'	+60'	169°	29°44'	+60'	169°	28°45'	+60'	169°	27°46'	+60'	169°	14
15	34°39'	+60'	168°	33°40'	+60'	168°	32°41'	+60'	169°	31°43'	+60'	169°	30°44'	+60'	169°	29°45'	+60'	169°	28°46'	+60'	169°	15
16	35°39'	+60'	168°	34°40'	+60'	168°	33°41'	+60'	168°	32°43'	+60'	169°	31°44'	+60'	169°	30°45'	+60'	169°	29°46'	+60'	169°	16
17	36°39'	+60'	168°	35°40'	+60'	168°	34°41'	+60'	168°	33°42'	+60'	168°	32°44'	+60'	169°	31°45'	+60'	169°	30°46'	+60'	169°	17
18	37°38'	+60'	168°	36°40'	+60'	168°	35°41'	+60'	168°	34°42'	+60'	168°	33°44'	+60'	169°	32°45'	+60'	169°	31°46'	+60'	169°	18
19	38°38'	+60'	168°	37°40'	+60'	168°	36°41'	+60'	168°	35°42'	+60'	168°	34°43'	+60'	168°	33°45'	+60'	169°	32°46'	+60'	169°	19
20	39°38'	+60'	168°	38°39'	+60'	168°	37°41'	+60'	168°	36°42'	+60'	168°	35°43'	+60'	168°	34°45'	+60'	169°	33°46'	+60'	169°	20
21	40°38'	+60'	168°	39°39'	+60'	168°	38°41'	+60'	168°	37°42'	+60'	168°	36°43'	+60'	168°	35°44'	+60'	168°	34°46'	+60'	169°	21
22	41°38'	+60'	168°	40°39'	+60'	168°	39°41'	+60'	168°	38°42'	+60'	168°	37°43'	+60'	168°	36°44'	+60'	168°	35°46'	+60'	169°	22
23	42°38'	+60'	167°	41°39'	+60'	168°	40°40'	+60'	168°	39°42'	+60'	168°	38°43'	+60'	168°	37°44'	+60'	168°	36°45'	+60'	168°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

10° 350° LHA — Latitude SAME as Declination — 10° 350° LHA

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

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

11° 349° LHA — Latitude SAME as Declination — 11° 349° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°37'	+60'	168°	18°38'	+60'	168°	17°39'	+60'	168°	16°41'	+60'	169°	15°42'	+60'	169°	14°43'	+60'	169°	13°44'	+60'	169°	0
1	20°37'	+60'	168°	19°38'	+60'	168°	18°39'	+60'	168°	17°41'	+60'	168°	16°42'	+60'	169°	15°43'	+60'	169°	14°44'	+60'	169°	1
2	21°37'	+60'	168°	20°38'	+60'	168°	19°39'	+60'	168°	18°41'	+60'	168°	17°42'	+60'	168°	16°43'	+60'	169°	15°44'	+60'	169°	2
3	22°37'	+60'	168°	21°38'	+60'	168°	20°39'	+60'	168°	19°40'	+60'	168°	18°42'	+60'	168°	17°43'	+60'	168°	16°44'	+60'	169°	3
4	23°36'	+60'	168°	22°38'	+60'	168°	21°39'	+60'	168°	20°40'	+60'	168°	19°42'	+60'	168°	18°43'	+60'	168°	17°44'	+60'	168°	4
5	24°36'	+60'	168°	23°38'	+60'	168°	22°39'	+60'	168°	21°40'	+60'	168°	20°41'	+60'	168°	19°43'	+60'	168°	18°44'	+60'	168°	5
6	25°36'	+60'	168°	24°37'	+60'	168°	23°39'	+60'	168°	22°40'	+60'	168°	21°41'	+60'	168°	20°43'	+60'	168°	19°44'	+60'	168°	6
7	26°36'	+60'	168°	25°37'	+60'	168°	24°39'	+60'	168°	23°40'	+60'	168°	22°41'	+60'	168°	21°43'	+60'	168°	20°44'	+60'	168°	7
8	27°36'	+60'	168°	26°37'	+60'	168°	25°39'	+60'	168°	24°40'	+60'	168°	23°41'	+60'	168°	22°42'	+60'	168°	21°44'	+60'	168°	8
9	28°36'	+60'	168°	27°37'	+60'	168°	26°38'	+60'	168°	25°40'	+60'	168°	24°41'	+60'	168°	23°42'	+60'	168°	22°44'	+60'	168°	9
10	29°35'	+60'	168°	28°37'	+60'	168°	27°38'	+60'	168°	26°40'	+60'	168°	25°41'	+60'	168°	24°42'	+60'	168°	23°44'	+60'	168°	10
11	30°35'	+60'	167°	29°37'	+60'	168°	28°38'	+60'	168°	27°40'	+60'	168°	26°41'	+60'	168°	25°42'	+60'	168°	24°43'	+60'	168°	11
12	31°35'	+60'	167°	30°37'	+60'	167°	29°38'	+60'	168°	28°39'	+60'	168°	27°41'	+60'	168°	26°42'	+60'	168°	25°43'	+60'	168°	12
13	32°35'	+60'	167°	31°36'	+60'	167°	30°38'	+60'	168°	29°39'	+60'	168°	28°41'	+60'	168°	27°42'	+60'	168°	26°43'	+60'	168°	13
14	33°35'	+60'	167°	32°36'	+60'	167°	31°38'	+60'	167°	30°39'	+60'	168°	29°41'	+60'	168°	28°42'	+60'	168°	27°43'	+60'	168°	14
15	34°35'	+60'	167°	33°36'	+60'	167°	32°38'	+60'	167°	31°39'	+60'	167°	30°40'	+60'	168°	29°42'	+60'	168°	28°43'	+60'	168°	15
16	35°34'	+60'	167°	34°36'	+60'	167°	33°37'	+60'	167°	32°39'	+60'	167°	31°40'	+60'	168°	30°42'	+60'	168°	29°43'	+60'	168°	16
17	36°34'	+60'	167°	35°36'	+60'	167°	34°37'	+60'	167°	33°39'	+60'	167°	32°40'	+60'	167°	31°42'	+60'	168°	30°43'	+60'	168°	17
18	37°34'	+60'	167°	36°36'	+60'	167°	35°37'	+60'	167°	34°39'	+60'	167°	33°40'	+60'	167°	32°41'	+60'	168°	31°43'	+60'	168°	18
19	38°34'	+60'	167°	37°35'	+60'	167°	36°37'	+60'	167°	35°38'	+60'	167°	34°40'	+60'	167°	33°41'	+60'	167°	32°43'	+60'	168°	19
20	39°34'	+60'	167°	38°35'	+60'	167°	37°37'	+60'	167°	36°38'	+60'	167°	35°40'	+60'	167°	34°41'	+60'	167°	33°43'	+60'	168°	20
21	40°33'	+60'	166°	39°35'	+60'	167°	38°37'	+60'	167°	37°38'	+60'	167°	36°40'	+60'	167°	35°41'	+60'	167°	34°43'	+60'	167°	21
22	41°33'	+60'	166°	40°35'	+60'	167°	39°36'	+60'	167°	38°38'	+60'	167°	37°40'	+60'	167°	36°41'	+60'	167°	35°43'	+60'	167°	22
23	42°33'	+60'	166°	41°35'	+60'	166°	40°36'	+60'	167°	39°38'	+60'	167°	38°39'	+60'	167°	37°41'	+60'	167°	36°42'	+60'	167°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

11° 349° LHA — Latitude SAME as Declination — 11° 349° LHA

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

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

12° 348° LHA — Latitude SAME as Declination — 12° 348° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°33'	+60'	167°	18°34'	+60'	167°	17°36'	+60'	167°	16°37'	+60'	167°	15°38'	+60'	168°	14°40'	+60'	168°	13°41'	+60'	168°	0
1	20°33'	+60'	167°	19°34'	+60'	167°	18°35'	+60'	167°	17°37'	+60'	167°	16°38'	+60'	167°	15°40'	+60'	168°	14°41'	+60'	168°	1
2	21°32'	+60'	167°	20°34'	+60'	167°	19°35'	+60'	167°	18°37'	+60'	167°	17°38'	+60'	167°	16°40'	+60'	167°	15°41'	+60'	168°	2
3	22°32'	+60'	167°	21°34'	+60'	167°	20°35'	+60'	167°	19°37'	+60'	167°	18°38'	+60'	167°	17°40'	+60'	167°	16°41'	+60'	167°	3
4	23°32'	+60'	167°	22°34'	+60'	167°	21°35'	+60'	167°	20°37'	+60'	167°	19°38'	+60'	167°	18°40'	+60'	167°	17°41'	+60'	167°	4
5	24°32'	+60'	167°	23°33'	+60'	167°	22°35'	+60'	167°	21°36'	+60'	167°	20°38'	+60'	167°	19°39'	+60'	167°	18°41'	+60'	167°	5
6	25°32'	+60'	167°	24°33'	+60'	167°	23°35'	+60'	167°	22°36'	+60'	167°	21°38'	+60'	167°	20°39'	+60'	167°	19°41'	+60'	167°	6
7	26°31'	+60'	167°	25°33'	+60'	167°	24°35'	+60'	167°	23°36'	+60'	167°	22°38'	+60'	167°	21°39'	+60'	167°	20°41'	+60'	167°	7
8	27°31'	+60'	167°	26°33'	+60'	167°	25°34'	+60'	167°	24°36'	+60'	167°	23°38'	+60'	167°	22°39'	+60'	167°	21°41'	+60'	167°	8
9	28°31'	+60'	166°	27°33'	+60'	167°	26°34'	+60'	167°	25°36'	+60'	167°	24°37'	+60'	167°	23°39'	+60'	167°	22°41'	+60'	167°	9
10	29°31'	+60'	166°	28°33'	+60'	167°	27°34'	+60'	167°	26°36'	+60'	167°	25°37'	+60'	167°	24°39'	+60'	167°	23°40'	+60'	167°	10
11	30°31'	+60'	166°	29°32'	+60'	166°	28°34'	+60'	167°	27°36'	+60'	167°	26°37'	+60'	167°	25°39'	+60'	167°	24°40'	+60'	167°	11
12	31°30'	+60'	166°	30°32'	+60'	166°	29°34'	+60'	166°	28°35'	+60'	167°	27°37'	+60'	167°	26°39'	+60'	167°	25°40'	+60'	167°	12
13	32°30'	+60'	166°	31°32'	+60'	166°	30°34'	+60'	166°	29°35'	+60'	167°	28°37'	+60'	167°	27°39'	+60'	167°	26°40'	+60'	167°	13
14	33°30'	+60'	166°	32°32'	+60'	166°	31°34'	+60'	166°	30°35'	+60'	166°	29°37'	+60'	167°	28°38'	+60'	167°	27°40'	+60'	167°	14
15	34°30'	+60'	166°	33°32'	+60'	166°	32°33'	+60'	166°	31°35'	+60'	166°	30°37'	+60'	167°	29°38'	+60'	167°	28°40'	+60'	167°	15
16	35°30'	+60'	166°	34°31'	+60'	166°	33°33'	+60'	166°	32°35'	+60'	166°	31°37'	+60'	166°	30°38'	+60'	167°	29°40'	+60'	167°	16
17	36°29'	+60'	166°	35°31'	+60'	166°	34°33'	+60'	166°	33°35'	+60'	166°	32°36'	+60'	166°	31°38'	+60'	166°	30°40'	+60'	167°	17
18	37°29'	+60'	166°	36°31'	+60'	166°	35°33'	+60'	166°	34°35'	+60'	166°	33°36'	+60'	166°	32°38'	+60'	166°	31°40'	+60'	167°	18
19	38°29'	+60'	165°	37°31'	+60'	166°	36°33'	+60'	166°	35°34'	+60'	166°	34°36'	+60'	166°	33°38'	+60'	166°	32°40'	+60'	166°	19
20	39°29'	+60'	165°	38°31'	+60'	166°	37°32'	+60'	166°	36°34'	+60'	166°	35°36'	+60'	166°	34°38'	+60'	166°	33°39'	+60'	166°	20
21	40°28'	+60'	165°	39°30'	+60'	165°	38°32'	+60'	166°	37°34'	+60'	166°	36°36'	+60'	166°	35°38'	+60'	166°	34°39'	+60'	166°	21
22	41°28'	+60'	165°	40°30'	+60'	165°	39°32'	+60'	166°	38°34'	+60'	166°	37°36'	+60'	166°	36°37'	+60'	166°	35°39'	+60'	166°	22
23	42°28'	+60'	165°	41°30'	+60'	165°	40°32'	+60'	165°	39°34'	+60'	166°	38°36'	+60'	166°	37°37'	+60'	166°	36°39'	+60'	166°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°28'	+60'	166°	18°30'	+60'	166°	17°31'	+60'	166°	16°33'	+60'	166°	15°35'	+60'	166°	14°36'	+60'	167°	13°38'	+60'	167°	0
1	20°28'	+60'	166°	19°30'	+60'	166°	18°31'	+60'	166°	17°33'	+60'	166°	16°35'	+60'	166°	15°36'	+60'	166°	14°38'	+60'	167°	1
2	21°28'	+60'	166°	20°29'	+60'	166°	19°31'	+60'	166°	18°33'	+60'	166°	17°35'	+60'	166°	16°36'	+60'	166°	15°38'	+60'	166°	2
3	22°27'	+60'	166°	21°29'	+60'	166°	20°31'	+60'	166°	19°33'	+60'	166°	18°34'	+60'	166°	17°36'	+60'	166°	16°38'	+60'	166°	3
4	23°27'	+60'	166°	22°29'	+60'	166°	21°31'	+60'	166°	20°33'	+60'	166°	19°34'	+60'	166°	18°36'	+60'	166°	17°38'	+60'	166°	4
5	24°27'	+60'	166°	23°29'	+60'	166°	22°31'	+60'	166°	21°32'	+60'	166°	20°34'	+60'	166°	19°36'	+60'	166°	18°38'	+60'	166°	5
6	25°27'	+60'	166°	24°29'	+60'	166°	23°30'	+60'	166°	22°32'	+60'	166°	21°34'	+60'	166°	20°36'	+60'	166°	19°37'	+60'	166°	6
7	26°27'	+60'	166°	25°28'	+60'	166°	24°30'	+60'	166°	23°32'	+60'	166°	22°34'	+60'	166°	21°36'	+60'	166°	20°37'	+60'	166°	7
8	27°26'	+60'	165°	26°28'	+60'	166°	25°30'	+60'	166°	24°32'	+60'	166°	23°34'	+60'	166°	22°36'	+60'	166°	21°37'	+60'	166°	8
9	28°26'	+60'	165°	27°28'	+60'	165°	26°30'	+60'	166°	25°32'	+60'	166°	24°34'	+60'	166°	23°35'	+60'	166°	22°37'	+60'	166°	9
10	29°26'	+60'	165°	28°28'	+60'	165°	27°30'	+60'	166°	26°32'	+60'	166°	25°33'	+60'	166°	24°35'	+60'	166°	23°37'	+60'	166°	10
11	30°26'	+60'	165°	29°28'	+60'	165°	28°30'	+60'	165°	27°31'	+60'	166°	26°33'	+60'	166°	25°35'	+60'	166°	24°37'	+60'	166°	11
12	31°25'	+60'	165°	30°27'	+60'	165°	29°29'	+60'	165°	28°31'	+60'	165°	27°33'	+60'	166°	26°35'	+60'	166°	25°37'	+60'	166°	12
13	32°25'	+60'	165°	31°27'	+60'	165°	30°29'	+60'	165°	29°31'	+60'	165°	28°33'	+60'	166°	27°35'	+60'	166°	26°37'	+60'	166°	13
14	33°25'	+60'	165°	32°27'	+60'	165°	31°29'	+60'	165°	30°31'	+60'	165°	29°33'	+60'	165°	28°35'	+60'	166°	27°37'	+60'	166°	14
15	34°25'	+60'	165°	33°27'	+60'	165°	32°29'	+60'	165°	31°31'	+60'	165°	30°33'	+60'	165°	29°35'	+60'	166°	28°37'	+60'	166°	15
16	35°24'	+60'	165°	34°26'	+60'	165°	33°29'	+60'	165°	32°31'	+60'	165°	31°33'	+60'	165°	30°34'	+60'	165°	29°36'	+60'	166°	16
17	36°24'	+60'	164°	35°26'	+60'	165°	34°28'	+60'	165°	33°30'	+60'	165°	32°32'	+60'	165°	31°34'	+60'	165°	30°36'	+60'	166°	17
18	37°24'	+60'	164°	36°26'	+60'	165°	35°28'	+60'	165°	34°30'	+60'	165°	33°32'	+60'	165°	32°34'	+60'	165°	31°36'	+60'	165°	18
19	38°23'	+60'	164°	37°26'	+60'	164°	36°28'	+60'	165°	35°30'	+60'	165°	34°32'	+60'	165°	33°34'	+60'	165°	32°36'	+60'	165°	19
20	39°23'	+60'	164°	38°25'	+60'	164°	37°28'	+60'	165°	36°30'	+60'	165°	35°32'	+60'	165°	34°34'	+60'	165°	33°36'	+60'	165°	20
21	40°23'	+60'	164°	39°25'	+60'	164°	38°27'	+60'	164°	37°30'	+60'	165°	36°32'	+60'	165°	35°34'	+60'	165°	34°36'	+60'	165°	21
22	41°23'	+60'	164°	40°25'	+60'	164°	39°27'	+60'	164°	38°29'	+60'	165°	37°32'	+60'	165°	36°34'	+60'	165°	35°36'	+60'	165°	22
23	42°22'	+60'	164°	41°25'	+60'	164°	40°27'	+60'	164°	39°29'	+60'	164°	38°31'	+60'	165°	37°33'	+60'	165°	36°35'	+60'	165°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

13° 347° LHA — Latitude SAME as Declination — 13° 347° LHA

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

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

14° 346° LHA — Latitude SAME as Declination — 14° 346° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	19°23'	+60'	165°	18°25'	+60'	165°	17°27'	+60'	165°	16°29'	+60'	165°	15°31'	+60'	165°	14°33'	+60'	166°	13°35'	+60'	166°	0
1	20°23'	+60'	165°	19°25'	+60'	165°	18°27'	+60'	165°	17°29'	+60'	165°	16°31'	+60'	165°	15°33'	+60'	165°	14°34'	+60'	166°	1
2	21°22'	+60'	165°	20°24'	+60'	165°	19°26'	+60'	165°	18°28'	+60'	165°	17°30'	+60'	165°	16°32'	+60'	165°	15°34'	+60'	165°	2
3	22°22'	+60'	165°	21°24'	+60'	165°	20°26'	+60'	165°	19°28'	+60'	165°	18°30'	+60'	165°	17°32'	+60'	165°	16°34'	+60'	165°	3
4	23°22'	+60'	165°	22°24'	+60'	165°	21°26'	+60'	165°	20°28'	+60'	165°	19°30'	+60'	165°	18°32'	+60'	165°	17°34'	+60'	165°	4
5	24°22'	+60'	165°	23°24'	+60'	165°	22°26'	+60'	165°	21°28'	+60'	165°	20°30'	+60'	165°	19°32'	+60'	165°	18°34'	+60'	165°	5
6	25°21'	+60'	165°	24°24'	+60'	165°	23°26'	+60'	165°	22°28'	+60'	165°	21°30'	+60'	165°	20°32'	+60'	165°	19°34'	+60'	165°	6
7	26°21'	+60'	164°	25°23'	+60'	165°	24°26'	+60'	165°	23°28'	+60'	165°	22°30'	+60'	165°	21°32'	+60'	165°	20°34'	+60'	165°	7
8	27°21'	+60'	164°	26°23'	+60'	164°	25°25'	+60'	165°	24°27'	+60'	165°	23°30'	+60'	165°	22°32'	+60'	165°	21°34'	+60'	165°	8
9	28°21'	+60'	164°	27°23'	+60'	164°	26°25'	+60'	165°	25°27'	+60'	165°	24°29'	+60'	165°	23°31'	+60'	165°	22°34'	+60'	165°	9
10	29°20'	+60'	164°	28°23'	+60'	164°	27°25'	+60'	164°	26°27'	+60'	165°	25°29'	+60'	165°	24°31'	+60'	165°	23°33'	+60'	165°	10
11	30°20'	+60'	164°	29°22'	+60'	164°	28°25'	+60'	164°	27°27'	+60'	164°	26°29'	+60'	165°	25°31'	+60'	165°	24°33'	+60'	165°	11
12	31°20'	+60'	164°	30°22'	+60'	164°	29°24'	+60'	164°	28°27'	+60'	164°	27°29'	+60'	165°	26°31'	+60'	165°	25°33'	+60'	165°	12
13	32°20'	+60'	164°	31°22'	+60'	164°	30°24'	+60'	164°	29°27'	+60'	164°	28°29'	+60'	164°	27°31'	+60'	165°	26°33'	+60'	165°	13
14	33°19'	+60'	164°	32°22'	+60'	164°	31°24'	+60'	164°	30°26'	+60'	164°	29°29'	+60'	164°	28°31'	+60'	165°	27°33'	+60'	165°	14
15	34°19'	+60'	164°	33°21'	+60'	164°	32°24'	+60'	164°	31°26'	+60'	164°	30°28'	+60'	164°	29°31'	+60'	164°	28°33'	+60'	165°	15
16	35°19'	+60'	163°	34°21'	+60'	164°	33°24'	+60'	164°	32°26'	+60'	164°	31°28'	+60'	164°	30°30'	+60'	164°	29°33'	+60'	164°	16
17	36°18'	+60'	163°	35°21'	+60'	164°	34°23'	+60'	164°	33°26'	+60'	164°	32°28'	+60'	164°	31°30'	+60'	164°	30°33'	+60'	164°	17
18	37°18'	+60'	163°	36°21'	+60'	163°	35°23'	+60'	164°	34°25'	+60'	164°	33°28'	+60'	164°	32°30'	+60'	164°	31°32'	+60'	164°	18
19	38°18'	+60'	163°	37°20'	+60'	163°	36°23'	+60'	163°	35°25'	+60'	164°	34°28'	+60'	164°	33°30'	+60'	164°	32°32'	+60'	164°	19
20	39°17'	+60'	163°	38°20'	+60'	163°	37°23'	+60'	163°	36°25'	+60'	164°	35°27'	+60'	164°	34°30'	+60'	164°	33°32'	+60'	164°	20
21	40°17'	+60'	163°	39°20'	+60'	163°	38°22'	+60'	163°	37°25'	+60'	163°	36°27'	+60'	164°	35°30'	+60'	164°	34°32'	+60'	164°	21
22	41°17'	+60'	163°	40°19'	+60'	163°	39°22'	+60'	163°	38°25'	+60'	163°	37°27'	+60'	164°	36°29'	+60'	164°	35°32'	+60'	164°	22
23	42°16'	+60'	162°	41°19'	+60'	163°	40°22'	+60'	163°	39°24'	+60'	163°	38°27'	+60'	163°	37°29'	+60'	164°	36°32'	+60'	164°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

14° 346° LHA — Latitude SAME as Declination — 14° 346° LHA

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

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

15° 345° LHA — Latitude SAME as Declination — 15° 345° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	19°17'	+60'	164°	18°20'	+60'	164°	17°22'	+60'	164°	16°24'	+60'	164°	15°26'	+60'	164°	14°29'	+60'	164°	13°31'	+60'	165°	0
1	20°17'	+60'	164°	19°20'	+60'	164°	18°22'	+60'	164°	17°24'	+60'	164°	16°26'	+60'	164°	15°29'	+60'	164°	14°31'	+60'	164°	1
2	21°17'	+60'	164°	20°19'	+60'	164°	19°22'	+60'	164°	18°24'	+60'	164°	17°26'	+60'	164°	16°28'	+60'	164°	15°31'	+60'	164°	2
3	22°17'	+60'	164°	21°19'	+60'	164°	20°21'	+60'	164°	19°24'	+60'	164°	18°26'	+60'	164°	17°28'	+60'	164°	16°30'	+60'	164°	3
4	23°16'	+60'	164°	22°19'	+60'	164°	21°21'	+60'	164°	20°23'	+60'	164°	19°26'	+60'	164°	18°28'	+60'	164°	17°30'	+60'	164°	4
5	24°16'	+60'	164°	23°19'	+60'	164°	22°21'	+60'	164°	21°23'	+60'	164°	20°26'	+60'	164°	19°28'	+60'	164°	18°30'	+60'	164°	5
6	25°16'	+60'	163°	24°18'	+60'	164°	23°21'	+60'	164°	22°23'	+60'	164°	21°25'	+60'	164°	20°28'	+60'	164°	19°30'	+60'	164°	6
7	26°16'	+60'	163°	25°18'	+60'	163°	24°20'	+60'	164°	23°23'	+60'	164°	22°25'	+60'	164°	21°28'	+60'	164°	20°30'	+60'	164°	7
8	27°15'	+60'	163°	26°18'	+60'	163°	25°20'	+60'	164°	24°23'	+60'	164°	23°25'	+60'	164°	22°27'	+60'	164°	21°30'	+60'	164°	8
9	28°15'	+60'	163°	27°17'	+60'	163°	26°20'	+60'	163°	25°22'	+60'	164°	24°25'	+60'	164°	23°27'	+60'	164°	22°30'	+60'	164°	9
10	29°15'	+60'	163°	28°17'	+60'	163°	27°20'	+60'	163°	26°22'	+60'	163°	25°25'	+60'	164°	24°27'	+60'	164°	23°30'	+60'	164°	10
11	30°14'	+60'	163°	29°17'	+60'	163°	28°20'	+60'	163°	27°22'	+60'	163°	26°25'	+60'	164°	25°27'	+60'	164°	24°29'	+60'	164°	11
12	31°14'	+60'	163°	30°17'	+60'	163°	29°19'	+60'	163°	28°22'	+60'	163°	27°24'	+60'	163°	26°27'	+60'	164°	25°29'	+60'	164°	12
13	32°14'	+60'	163°	31°16'	+60'	163°	30°19'	+60'	163°	29°22'	+60'	163°	28°24'	+60'	163°	27°27'	+60'	163°	26°29'	+60'	164°	13
14	33°13'	+60'	163°	32°16'	+60'	163°	31°19'	+60'	163°	30°21'	+60'	163°	29°24'	+60'	163°	28°26'	+60'	163°	27°29'	+60'	164°	14
15	34°13'	+60'	162°	33°16'	+60'	163°	32°18'	+60'	163°	31°21'	+60'	163°	30°24'	+60'	163°	29°26'	+60'	163°	28°29'	+60'	163°	15
16	35°13'	+60'	162°	34°15'	+60'	162°	33°18'	+60'	163°	32°21'	+60'	163°	31°24'	+60'	163°	30°26'	+60'	163°	29°29'	+60'	163°	16
17	36°12'	+60'	162°	35°15'	+60'	162°	34°18'	+60'	163°	33°21'	+60'	163°	32°23'	+60'	163°	31°26'	+60'	163°	30°28'	+60'	163°	17
18	37°12'	+60'	162°	36°15'	+60'	162°	35°18'	+60'	162°	34°20'	+60'	163°	33°23'	+60'	163°	32°26'	+60'	163°	31°28'	+60'	163°	18
19	38°12'	+60'	162°	37°14'	+60'	162°	36°17'	+60'	162°	35°20'	+60'	163°	34°23'	+60'	163°	33°26'	+60'	163°	32°28'	+60'	163°	19
20	39°11'	+60'	162°	38°14'	+60'	162°	37°17'	+60'	162°	36°20'	+60'	162°	35°23'	+60'	163°	34°25'	+60'	163°	33°28'	+60'	163°	20
21	40°11'	+60'	162°	39°14'	+60'	162°	38°17'	+60'	162°	37°20'	+60'	162°	36°22'	+60'	163°	35°25'	+60'	163°	34°28'	+60'	163°	21
22	41°10'	+60'	161°	40°13'	+60'	162°	39°16'	+60'	162°	38°19'	+60'	162°	37°22'	+60'	162°	36°25'	+60'	163°	35°28'	+60'	163°	22
23	42°10'	+60'	161°	41°13'	+60'	162°	40°16'	+60'	162°	39°19'	+60'	162°	38°22'	+60'	162°	37°25'	+60'	163°	36°27'	+60'	163°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

15° 345° LHA — Latitude SAME as Declination — 15° 345° LHA

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

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

16° 344° LHA — Latitude SAME as Declination — 16° 344° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°12'	+60'	163°	18°14'	+60'	163°	17°17'	+60'	163°	16°19'	+60'	163°	15°22'	+60'	163°	14°24'	+60'	163°	13°27'	+60'	164°	0
1	20°11'	+60'	163°	19°14'	+60'	163°	18°17'	+60'	163°	17°19'	+60'	163°	16°22'	+60'	163°	15°24'	+60'	163°	14°27'	+60'	163°	1
2	21°11'	+60'	163°	20°14'	+60'	163°	19°16'	+60'	163°	18°19'	+60'	163°	17°21'	+60'	163°	16°24'	+60'	163°	15°27'	+60'	163°	2
3	22°11'	+60'	163°	21°13'	+60'	163°	20°16'	+60'	163°	19°19'	+60'	163°	18°21'	+60'	163°	17°24'	+60'	163°	16°26'	+60'	163°	3
4	23°10'	+60'	163°	22°13'	+60'	163°	21°16'	+60'	163°	20°18'	+60'	163°	19°21'	+60'	163°	18°24'	+60'	163°	17°26'	+60'	163°	4
5	24°10'	+60'	162°	23°13'	+60'	163°	22°16'	+60'	163°	21°18'	+60'	163°	20°21'	+60'	163°	19°24'	+60'	163°	18°26'	+60'	163°	5
6	25°10'	+60'	162°	24°13'	+60'	163°	23°15'	+60'	163°	22°18'	+60'	163°	21°21'	+60'	163°	20°23'	+60'	163°	19°26'	+60'	163°	6
7	26°09'	+60'	162°	25°12'	+60'	162°	24°15'	+60'	163°	23°18'	+60'	163°	22°21'	+60'	163°	21°23'	+60'	163°	20°26'	+60'	163°	7
8	27°09'	+60'	162°	26°12'	+60'	162°	25°15'	+60'	162°	24°18'	+60'	163°	23°20'	+60'	163°	22°23'	+60'	163°	21°26'	+60'	163°	8
9	28°09'	+60'	162°	27°12'	+60'	162°	26°15'	+60'	162°	25°17'	+60'	162°	24°20'	+60'	163°	23°23'	+60'	163°	22°26'	+60'	163°	9
10	29°08'	+60'	162°	28°11'	+60'	162°	27°14'	+60'	162°	26°17'	+60'	162°	25°20'	+60'	163°	24°23'	+60'	163°	23°25'	+60'	163°	10
11	30°08'	+60'	162°	29°11'	+60'	162°	28°14'	+60'	162°	27°17'	+60'	162°	26°20'	+60'	162°	25°22'	+60'	163°	24°25'	+60'	163°	11
12	31°08'	+60'	162°	30°11'	+60'	162°	29°14'	+60'	162°	28°17'	+60'	162°	27°19'	+60'	162°	26°22'	+60'	162°	25°25'	+60'	163°	12
13	32°07'	+60'	162°	31°10'	+60'	162°	30°13'	+60'	162°	29°16'	+60'	162°	28°19'	+60'	162°	27°22'	+60'	162°	26°25'	+60'	163°	13
14	33°07'	+60'	161°	32°10'	+60'	162°	31°13'	+60'	162°	30°16'	+60'	162°	29°19'	+60'	162°	28°22'	+60'	162°	27°25'	+60'	162°	14
15	34°07'	+60'	161°	33°10'	+60'	161°	32°13'	+60'	162°	31°16'	+60'	162°	30°19'	+60'	162°	29°22'	+60'	162°	28°25'	+60'	162°	15
16	35°06'	+60'	161°	34°09'	+60'	161°	33°13'	+60'	162°	32°16'	+60'	162°	31°19'	+60'	162°	30°21'	+60'	162°	29°24'	+60'	162°	16
17	36°06'	+60'	161°	35°09'	+60'	161°	34°12'	+60'	161°	33°15'	+60'	162°	32°18'	+60'	162°	31°21'	+60'	162°	30°24'	+60'	162°	17
18	37°05'	+60'	161°	36°09'	+60'	161°	35°12'	+60'	161°	34°15'	+60'	162°	33°18'	+60'	162°	32°21'	+60'	162°	31°24'	+60'	162°	18
19	38°05'	+60'	161°	37°08'	+60'	161°	36°12'	+60'	161°	35°15'	+60'	161°	34°18'	+60'	162°	33°21'	+60'	162°	32°24'	+60'	162°	19
20	39°05'	+60'	161°	38°08'	+60'	161°	37°11'	+60'	161°	36°14'	+60'	161°	35°18'	+60'	161°	34°21'	+60'	162°	33°24'	+60'	162°	20
21	40°04'	+60'	160°	39°07'	+60'	161°	38°11'	+60'	161°	37°14'	+60'	161°	36°17'	+60'	161°	35°20'	+60'	162°	34°23'	+60'	162°	21
22	41°04'	+60'	160°	40°07'	+60'	160°	39°10'	+60'	161°	38°14'	+60'	161°	37°17'	+60'	161°	36°20'	+60'	162°	35°23'	+60'	162°	22
23	42°03'	+60'	160°	41°07'	+60'	160°	40°10'	+60'	161°	39°13'	+60'	161°	38°17'	+60'	161°	37°20'	+60'	161°	36°23'	+60'	162°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

16° 344° LHA — Latitude SAME as Declination — 16° 344° LHA

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

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

17° 343° LHA — Latitude SAME as Declination — 17° 343° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°05'	+60'	162°	18°08'	+60'	162°	17°11'	+60'	162°	16°14'	+60'	162°	15°17'	+60'	162°	14°20'	+60'	162°	13°23'	+60'	163°	0
1	20°05'	+60'	162°	19°08'	+60'	162°	18°11'	+60'	162°	17°14'	+60'	162°	16°17'	+60'	162°	15°20'	+60'	162°	14°22'	+60'	162°	1
2	21°05'	+60'	162°	20°08'	+60'	162°	19°11'	+60'	162°	18°14'	+60'	162°	17°17'	+60'	162°	16°19'	+60'	162°	15°22'	+60'	162°	2
3	22°04'	+60'	162°	21°07'	+60'	162°	20°10'	+60'	162°	19°13'	+60'	162°	18°16'	+60'	162°	17°19'	+60'	162°	16°22'	+60'	162°	3
4	23°04'	+60'	162°	22°07'	+60'	162°	21°10'	+60'	162°	20°13'	+60'	162°	19°16'	+60'	162°	18°19'	+60'	162°	17°22'	+60'	162°	4
5	24°04'	+60'	161°	23°07'	+60'	162°	22°10'	+60'	162°	21°13'	+60'	162°	20°16'	+60'	162°	19°19'	+60'	162°	18°22'	+60'	162°	5
6	25°03'	+60'	161°	24°07'	+60'	161°	23°10'	+60'	162°	22°13'	+60'	162°	21°16'	+60'	162°	20°19'	+60'	162°	19°22'	+60'	162°	6
7	26°03'	+60'	161°	25°06'	+60'	161°	24°09'	+60'	161°	23°12'	+60'	162°	22°15'	+60'	162°	21°18'	+60'	162°	20°21'	+60'	162°	7
8	27°03'	+60'	161°	26°06'	+60'	161°	25°09'	+60'	161°	24°12'	+60'	161°	23°15'	+60'	162°	22°18'	+60'	162°	21°21'	+60'	162°	8
9	28°02'	+60'	161°	27°06'	+60'	161°	26°09'	+60'	161°	25°12'	+60'	161°	24°15'	+60'	162°	23°18'	+60'	162°	22°21'	+60'	162°	9
10	29°02'	+60'	161°	28°05'	+60'	161°	27°08'	+60'	161°	26°12'	+60'	161°	25°15'	+60'	161°	24°18'	+60'	162°	23°21'	+60'	162°	10
11	30°01'	+60'	161°	29°05'	+60'	161°	28°08'	+60'	161°	27°11'	+60'	161°	26°15'	+60'	161°	25°18'	+60'	161°	24°21'	+60'	162°	11
12	31°01'	+60'	161°	30°04'	+60'	161°	29°08'	+60'	161°	28°11'	+60'	161°	27°14'	+60'	161°	26°17'	+60'	161°	25°21'	+60'	162°	12
13	32°01'	+60'	160°	31°04'	+60'	161°	30°07'	+60'	161°	29°11'	+60'	161°	28°14'	+60'	161°	27°17'	+60'	161°	26°20'	+60'	161°	13
14	33°00'	+60'	160°	32°04'	+60'	160°	31°07'	+60'	161°	30°10'	+60'	161°	29°14'	+60'	161°	28°17'	+60'	161°	27°20'	+60'	161°	14
15	34°00'	+60'	160°	33°03'	+60'	160°	32°07'	+60'	161°	31°10'	+60'	161°	30°14'	+60'	161°	29°17'	+60'	161°	28°20'	+60'	161°	15
16	34°59'	+60'	160°	34°03'	+60'	160°	33°06'	+60'	160°	32°10'	+60'	161°	31°13'	+60'	161°	30°17'	+60'	161°	29°20'	+60'	161°	16
17	35°59'	+60'	160°	35°03'	+60'	160°	34°06'	+60'	160°	33°10'	+60'	160°	32°13'	+60'	161°	31°16'	+60'	161°	30°20'	+60'	161°	17
18	36°58'	+60'	160°	36°02'	+60'	160°	35°06'	+60'	160°	34°09'	+60'	160°	33°13'	+60'	161°	32°16'	+60'	161°	31°19'	+60'	161°	18
19	37°58'	+60'	159°	37°02'	+60'	160°	36°05'	+60'	160°	35°09'	+60'	160°	34°12'	+60'	160°	33°16'	+60'	161°	32°19'	+60'	161°	19
20	38°57'	+59'	159°	38°01'	+60'	160°	37°05'	+60'	160°	36°09'	+60'	160°	35°12'	+60'	160°	34°16'	+60'	161°	33°19'	+60'	161°	20
21	39°57'	+59'	159°	39°01'	+60'	159°	38°05'	+60'	160°	37°08'	+60'	160°	36°12'	+60'	160°	35°15'	+60'	160°	34°19'	+60'	161°	21
22	40°56'	+59'	159°	40°00'	+60'	159°	39°04'	+60'	160°	38°08'	+60'	160°	37°12'	+60'	160°	36°15'	+60'	160°	35°19'	+60'	161°	22
23	41°56'	+59'	159°	41°00'	+60'	159°	40°04'	+60'	159°	39°08'	+60'	160°	38°11'	+60'	160°	37°15'	+60'	160°	36°18'	+60'	160°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

17° 343° LHA — Latitude SAME as Declination — 17° 343° LHA

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

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

18° 342° LHA — Latitude SAME as Declination — 18° 342° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	18°59'	+60'	161°	18°02'	+60'	161°	17°05'	+60'	161°	16°09'	+60'	161°	15°12'	+60'	161°	14°15'	+60'	161°	13°18'	+60'	161°	0
1	19°59'	+60'	161°	19°02'	+60'	161°	18°05'	+60'	161°	17°08'	+60'	161°	16°12'	+60'	161°	15°15'	+60'	161°	14°18'	+60'	161°	1
2	20°58'	+60'	161°	20°02'	+60'	161°	19°05'	+60'	161°	18°08'	+60'	161°	17°11'	+60'	161°	16°15'	+60'	161°	15°18'	+60'	161°	2
3	21°58'	+60'	161°	21°01'	+60'	161°	20°05'	+60'	161°	19°08'	+60'	161°	18°11'	+60'	161°	17°14'	+60'	161°	16°18'	+60'	161°	3
4	22°57'	+60'	160°	22°01'	+60'	161°	21°04'	+60'	161°	20°08'	+60'	161°	19°11'	+60'	161°	18°14'	+60'	161°	17°17'	+60'	161°	4
5	23°57'	+60'	160°	23°00'	+60'	160°	22°04'	+60'	161°	21°07'	+60'	161°	20°11'	+60'	161°	19°14'	+60'	161°	18°17'	+60'	161°	5
6	24°57'	+60'	160°	24°00'	+60'	160°	23°04'	+60'	160°	22°07'	+60'	161°	21°10'	+60'	161°	20°14'	+60'	161°	19°17'	+60'	161°	6
7	25°56'	+60'	160°	25°00'	+60'	160°	24°03'	+60'	160°	23°07'	+60'	161°	22°10'	+60'	161°	21°14'	+60'	161°	20°17'	+60'	161°	7
8	26°56'	+60'	160°	25°59'	+60'	160°	25°03'	+60'	160°	24°06'	+60'	160°	23°10'	+60'	161°	22°13'	+60'	161°	21°17'	+60'	161°	8
9	27°55'	+60'	160°	26°59'	+60'	160°	26°03'	+60'	160°	25°06'	+60'	160°	24°10'	+60'	160°	23°13'	+60'	161°	22°16'	+60'	161°	9
10	28°55'	+60'	160°	27°59'	+60'	160°	27°02'	+60'	160°	26°06'	+60'	160°	25°09'	+60'	160°	24°13'	+60'	161°	23°16'	+60'	161°	10
11	29°54'	+60'	160°	28°58'	+60'	160°	28°02'	+60'	160°	27°06'	+60'	160°	26°09'	+60'	160°	25°13'	+60'	160°	24°16'	+60'	161°	11
12	30°54'	+60'	159°	29°58'	+60'	160°	29°02'	+60'	160°	28°05'	+60'	160°	27°09'	+60'	160°	26°12'	+60'	160°	25°16'	+60'	160°	12
13	31°54'	+60'	159°	30°57'	+60'	159°	30°01'	+60'	160°	29°05'	+60'	160°	28°09'	+60'	160°	27°12'	+60'	160°	26°16'	+60'	160°	13
14	32°53'	+60'	159°	31°57'	+60'	159°	31°01'	+60'	160°	30°05'	+60'	160°	29°08'	+60'	160°	28°12'	+60'	160°	27°15'	+60'	160°	14
15	33°53'	+60'	159°	32°57'	+60'	159°	32°00'	+60'	159°	31°04'	+60'	160°	30°08'	+60'	160°	29°12'	+60'	160°	28°15'	+60'	160°	15
16	34°52'	+59'	159°	33°56'	+60'	159°	33°00'	+60'	159°	32°04'	+60'	159°	31°08'	+60'	160°	30°11'	+60'	160°	29°15'	+60'	160°	16
17	35°52'	+59'	159°	34°56'	+60'	159°	34°00'	+60'	159°	33°04'	+60'	159°	32°07'	+60'	160°	31°11'	+60'	160°	30°15'	+60'	160°	17
18	36°51'	+59'	158°	35°55'	+60'	159°	34°59'	+60'	159°	34°03'	+60'	159°	33°07'	+60'	159°	32°11'	+60'	160°	31°15'	+60'	160°	18
19	37°51'	+59'	158°	36°55'	+60'	159°	35°59'	+60'	159°	35°03'	+60'	159°	34°07'	+60'	159°	33°11'	+60'	160°	32°14'	+60'	160°	19
20	38°50'	+59'	158°	37°54'	+60'	158°	36°58'	+60'	159°	36°02'	+60'	159°	35°06'	+60'	159°	34°10'	+60'	159°	33°14'	+60'	160°	20
21	39°49'	+59'	158°	38°54'	+59'	158°	37°58'	+60'	159°	37°02'	+60'	159°	36°06'	+60'	159°	35°10'	+60'	159°	34°14'	+60'	160°	21
22	40°49'	+59'	158°	39°53'	+59'	158°	38°58'	+60'	158°	38°02'	+60'	159°	37°06'	+60'	159°	36°10'	+60'	159°	35°14'	+60'	159°	22
23	41°48'	+59'	158°	40°53'	+59'	158°	39°57'	+60'	158°	39°01'	+60'	159°	38°05'	+60'	159°	37°09'	+60'	159°	36°13'	+60'	159°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

18° 342° LHA — Latitude SAME as Declination — 18° 342° LHA

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

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

19° 341° LHA — Latitude SAME as Declination — 19° 341° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	18°52'	+60'	160°	17°56'	+60'	160°	16°59'	+60'	160°	16°03'	+60'	160°	15°06'	+60'	160°	14°10'	+60'	160°	13°13'	+60'	160°	0
1	19°52'	+60'	160°	18°55'	+60'	160°	17°59'	+60'	160°	17°03'	+60'	160°	16°06'	+60'	160°	15°10'	+60'	160°	14°13'	+60'	160°	1
2	20°51'	+60'	160°	19°55'	+60'	160°	18°59'	+60'	160°	18°02'	+60'	160°	17°06'	+60'	160°	16°09'	+60'	160°	15°13'	+60'	160°	2
3	21°51'	+60'	159°	20°55'	+60'	160°	19°58'	+60'	160°	19°02'	+60'	160°	18°06'	+60'	160°	17°09'	+60'	160°	16°13'	+60'	160°	3
4	22°50'	+60'	159°	21°54'	+60'	160°	20°58'	+60'	160°	20°02'	+60'	160°	19°05'	+60'	160°	18°09'	+60'	160°	17°13'	+60'	160°	4
5	23°50'	+60'	159°	22°54'	+60'	159°	21°58'	+60'	160°	21°01'	+60'	160°	20°05'	+60'	160°	19°09'	+60'	160°	18°12'	+60'	160°	5
6	24°49'	+60'	159°	23°53'	+60'	159°	22°57'	+60'	159°	22°01'	+60'	160°	21°05'	+60'	160°	20°09'	+60'	160°	19°12'	+60'	160°	6
7	25°49'	+60'	159°	24°53'	+60'	159°	23°57'	+60'	159°	23°01'	+60'	159°	22°05'	+60'	160°	21°08'	+60'	160°	20°12'	+60'	160°	7
8	26°49'	+60'	159°	25°53'	+60'	159°	24°57'	+60'	159°	24°00'	+60'	159°	23°04'	+60'	159°	22°08'	+60'	160°	21°12'	+60'	160°	8
9	27°48'	+60'	159°	26°52'	+60'	159°	25°56'	+60'	159°	25°00'	+60'	159°	24°04'	+60'	159°	23°08'	+60'	160°	22°12'	+60'	160°	9
10	28°48'	+60'	159°	27°52'	+60'	159°	26°56'	+60'	159°	26°00'	+60'	159°	25°04'	+60'	159°	24°08'	+60'	159°	23°11'	+60'	160°	10
11	29°47'	+59'	158°	28°51'	+60'	159°	27°55'	+60'	159°	26°59'	+60'	159°	26°03'	+60'	159°	25°07'	+60'	159°	24°11'	+60'	159°	11
12	30°47'	+59'	158°	29°51'	+60'	158°	28°55'	+60'	159°	27°59'	+60'	159°	27°03'	+60'	159°	26°07'	+60'	159°	25°11'	+60'	159°	12
13	31°46'	+59'	158°	30°50'	+60'	158°	29°55'	+60'	159°	28°59'	+60'	159°	28°03'	+60'	159°	27°07'	+60'	159°	26°11'	+60'	159°	13
14	32°46'	+59'	158°	31°50'	+60'	158°	30°54'	+60'	158°	29°58'	+60'	159°	29°02'	+60'	159°	28°06'	+60'	159°	27°10'	+60'	159°	14
15	33°45'	+59'	158°	32°49'	+60'	158°	31°54'	+60'	158°	30°58'	+60'	158°	30°02'	+60'	159°	29°06'	+60'	159°	28°10'	+60'	159°	15
16	34°44'	+59'	158°	33°49'	+60'	158°	32°53'	+60'	158°	31°58'	+60'	158°	31°02'	+60'	159°	30°06'	+60'	159°	29°10'	+60'	159°	16
17	35°44'	+59'	157°	34°48'	+59'	158°	33°53'	+60'	158°	32°57'	+60'	158°	32°01'	+60'	158°	31°06'	+60'	159°	30°10'	+60'	159°	17
18	36°43'	+59'	157°	35°48'	+59'	158°	34°52'	+60'	158°	33°57'	+60'	158°	33°01'	+60'	158°	32°05'	+60'	159°	31°09'	+60'	159°	18
19	37°43'	+59'	157°	36°47'	+59'	157°	35°52'	+60'	158°	34°56'	+60'	158°	34°01'	+60'	158°	33°05'	+60'	158°	32°09'	+60'	159°	19
20	38°42'	+59'	157°	37°47'	+59'	157°	36°52'	+60'	158°	35°56'	+60'	158°	35°00'	+60'	158°	34°05'	+60'	158°	33°09'	+60'	159°	20
21	39°42'	+59'	157°	38°46'	+59'	157°	37°51'	+60'	157°	36°56'	+60'	158°	36°00'	+60'	158°	35°04'	+60'	158°	34°09'	+60'	158°	21
22	40°41'	+59'	157°	39°46'	+59'	157°	38°51'	+59'	157°	37°55'	+60'	158°	37°00'	+60'	158°	36°04'	+60'	158°	35°08'	+60'	158°	22
23	41°40'	+59'	156°	40°45'	+59'	157°	39°50'	+59'	157°	38°55'	+60'	157°	37°59'	+60'	158°	37°04'	+60'	158°	36°08'	+60'	158°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

19° 341° LHA — Latitude SAME as Declination — 19° 341° LHA

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

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

20° 340° LHA — Latitude SAME as Declination — 20° 340° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	18°45'	+60'	159°	17°49'	+60'	159°	16°53'	+60'	159°	15°57'	+60'	159°	15°01'	+60'	159°	14°05'	+60'	159°	13°08'	+60'	159°	0
1	19°44'	+60'	159°	18°48'	+60'	159°	17°52'	+60'	159°	16°56'	+60'	159°	16°00'	+60'	159°	15°04'	+60'	159°	14°08'	+60'	159°	1
2	20°44'	+60'	159°	19°48'	+60'	159°	18°52'	+60'	159°	17°56'	+60'	159°	17°00'	+60'	159°	16°04'	+60'	159°	15°08'	+60'	159°	2
3	21°43'	+60'	158°	20°48'	+60'	159°	19°52'	+60'	159°	18°56'	+60'	159°	18°00'	+60'	159°	17°04'	+60'	159°	16°08'	+60'	159°	3
4	22°43'	+60'	158°	21°47'	+60'	158°	20°51'	+60'	159°	19°55'	+60'	159°	19°00'	+60'	159°	18°04'	+60'	159°	17°08'	+60'	159°	4
5	23°42'	+60'	158°	22°47'	+60'	158°	21°51'	+60'	158°	20°55'	+60'	159°	19°59'	+60'	159°	19°03'	+60'	159°	18°07'	+60'	159°	5
6	24°42'	+59'	158°	23°46'	+60'	158°	22°51'	+60'	158°	21°55'	+60'	158°	20°59'	+60'	159°	20°03'	+60'	159°	19°07'	+60'	159°	6
7	25°41'	+59'	158°	24°46'	+60'	158°	23°50'	+60'	158°	22°54'	+60'	158°	21°59'	+60'	159°	21°03'	+60'	159°	20°07'	+60'	159°	7
8	26°41'	+59'	158°	25°45'	+60'	158°	24°50'	+60'	158°	23°54'	+60'	158°	22°58'	+60'	158°	22°02'	+60'	159°	21°07'	+60'	159°	8
9	27°40'	+59'	158°	26°45'	+60'	158°	25°49'	+60'	158°	24°54'	+60'	158°	23°58'	+60'	158°	23°02'	+60'	158°	22°06'	+60'	159°	9
10	28°40'	+59'	157°	27°44'	+60'	158°	26°49'	+60'	158°	25°53'	+60'	158°	24°58'	+60'	158°	24°02'	+60'	158°	23°06'	+60'	159°	10
11	29°39'	+59'	157°	28°44'	+60'	157°	27°49'	+60'	158°	26°53'	+60'	158°	25°57'	+60'	158°	25°02'	+60'	158°	24°06'	+60'	158°	11
12	30°39'	+59'	157°	29°43'	+59'	157°	28°48'	+60'	158°	27°53'	+60'	158°	26°57'	+60'	158°	26°01'	+60'	158°	25°06'	+60'	158°	12
13	31°38'	+59'	157°	30°43'	+59'	157°	29°48'	+60'	157°	28°52'	+60'	158°	27°57'	+60'	158°	27°01'	+60'	158°	26°05'	+60'	158°	13
14	32°38'	+59'	157°	31°42'	+59'	157°	30°47'	+60'	157°	29°52'	+60'	158°	28°56'	+60'	158°	28°01'	+60'	158°	27°05'	+60'	158°	14
15	33°37'	+59'	157°	32°42'	+59'	157°	31°47'	+60'	157°	30°51'	+60'	157°	29°56'	+60'	158°	29°00'	+60'	158°	28°05'	+60'	158°	15
16	34°36'	+59'	156°	33°41'	+59'	157°	32°46'	+60'	157°	31°51'	+60'	157°	30°56'	+60'	157°	30°00'	+60'	158°	29°05'	+60'	158°	16
17	35°36'	+59'	156°	34°41'	+59'	157°	33°46'	+60'	157°	32°51'	+60'	157°	31°55'	+60'	157°	31°00'	+60'	158°	30°04'	+60'	158°	17
18	36°35'	+59'	156°	35°40'	+59'	156°	34°45'	+59'	157°	33°50'	+60'	157°	32°55'	+60'	157°	31°59'	+60'	157°	31°04'	+60'	158°	18
19	37°35'	+59'	156°	36°40'	+59'	156°	35°45'	+59'	157°	34°50'	+60'	157°	33°54'	+60'	157°	32°59'	+60'	157°	32°04'	+60'	158°	19
20	38°34'	+59'	156°	37°39'	+59'	156°	36°44'	+59'	156°	35°49'	+60'	157°	34°54'	+60'	157°	33°59'	+60'	157°	33°03'	+60'	157°	20
21	39°33'	+59'	156°	38°39'	+59'	156°	37°44'	+59'	156°	36°49'	+60'	156°	35°54'	+60'	157°	34°58'	+60'	157°	34°03'	+60'	157°	21
22	40°33'	+59'	155°	39°38'	+59'	156°	38°43'	+59'	156°	37°48'	+60'	156°	36°53'	+60'	157°	35°58'	+60'	157°	35°03'	+60'	157°	22
23	41°32'	+59'	155°	40°37'	+59'	155°	39°43'	+59'	156°	38°48'	+59'	156°	37°53'	+60'	156°	36°58'	+60'	157°	36°03'	+60'	157°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

20° 340° LHA — Latitude SAME as Declination — 20° 340° LHA

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

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

21° 339° LHA — Latitude SAME as Declination — 21° 339° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	18°37'	+59'	158°	17°42'	+60'	158°	16°46'	+60'	158°	15°50'	+60'	158°	14°55'	+60'	158°	13°59'	+60'	158°	13°03'	+60'	158°	0
1	19°37'	+59'	158°	18°41'	+60'	158°	17°46'	+60'	158°	16°50'	+60'	158°	15°54'	+60'	158°	14°59'	+60'	158°	14°03'	+60'	158°	1
2	20°36'	+59'	158°	19°41'	+60'	158°	18°45'	+60'	158°	17°50'	+60'	158°	16°54'	+60'	158°	15°58'	+60'	158°	15°03'	+60'	158°	2
3	21°36'	+59'	157°	20°40'	+60'	158°	19°45'	+60'	158°	18°49'	+60'	158°	17°54'	+60'	158°	16°58'	+60'	158°	16°02'	+60'	158°	3
4	22°35'	+59'	157°	21°40'	+60'	157°	20°44'	+60'	158°	19°49'	+60'	158°	18°53'	+60'	158°	17°58'	+60'	158°	17°02'	+60'	158°	4
5	23°35'	+59'	157°	22°39'	+60'	157°	21°44'	+60'	157°	20°49'	+60'	158°	19°53'	+60'	158°	18°58'	+60'	158°	18°02'	+60'	158°	5
6	24°34'	+59'	157°	23°39'	+60'	157°	22°44'	+60'	157°	21°48'	+60'	157°	20°53'	+60'	158°	19°57'	+60'	158°	19°02'	+60'	158°	6
7	25°34'	+59'	157°	24°38'	+59'	157°	23°43'	+60'	157°	22°48'	+60'	157°	21°52'	+60'	157°	20°57'	+60'	158°	20°01'	+60'	158°	7
8	26°33'	+59'	157°	25°38'	+59'	157°	24°43'	+60'	157°	23°47'	+60'	157°	22°52'	+60'	157°	21°57'	+60'	158°	21°01'	+60'	158°	8
9	27°32'	+59'	156°	26°37'	+59'	157°	25°42'	+60'	157°	24°47'	+60'	157°	23°52'	+60'	157°	22°56'	+60'	157°	22°01'	+60'	158°	9
10	28°32'	+59'	156°	27°37'	+59'	157°	26°42'	+60'	157°	25°47'	+60'	157°	24°51'	+60'	157°	23°56'	+60'	157°	23°01'	+60'	157°	10
11	29°31'	+59'	156°	28°36'	+59'	156°	27°41'	+60'	157°	26°46'	+60'	157°	25°51'	+60'	157°	24°56'	+60'	157°	24°00'	+60'	157°	11
12	30°31'	+59'	156°	29°36'	+59'	156°	28°41'	+60'	156°	27°46'	+60'	157°	26°51'	+60'	157°	25°55'	+60'	157°	25°00'	+60'	157°	12
13	31°30'	+59'	156°	30°35'	+59'	156°	29°40'	+60'	156°	28°45'	+60'	157°	27°50'	+60'	157°	26°55'	+60'	157°	26°00'	+60'	157°	13
14	32°29'	+59'	156°	31°35'	+59'	156°	30°40'	+59'	156°	29°45'	+60'	156°	28°50'	+60'	157°	27°55'	+60'	157°	27°00'	+60'	157°	14
15	33°29'	+59'	155°	32°34'	+59'	156°	31°39'	+59'	156°	30°44'	+60'	156°	29°50'	+60'	156°	28°54'	+60'	157°	27°59'	+60'	157°	15
16	34°28'	+59'	155°	33°34'	+59'	156°	32°39'	+59'	156°	31°44'	+60'	156°	30°49'	+60'	156°	29°54'	+60'	157°	28°59'	+60'	157°	16
17	35°27'	+59'	155°	34°33'	+59'	155°	33°38'	+59'	156°	32°44'	+60'	156°	31°49'	+60'	156°	30°54'	+60'	156°	29°59'	+60'	157°	17
18	36°27'	+59'	155°	35°32'	+59'	155°	34°38'	+59'	156°	33°43'	+60'	156°	32°48'	+60'	156°	31°53'	+60'	156°	30°58'	+60'	157°	18
19	37°26'	+59'	155°	36°32'	+59'	155°	35°37'	+59'	155°	34°43'	+60'	156°	33°48'	+60'	156°	32°53'	+60'	156°	31°58'	+60'	156°	19
20	38°25'	+59'	155°	37°31'	+59'	155°	36°37'	+59'	155°	35°42'	+59'	156°	34°47'	+60'	156°	33°53'	+60'	156°	32°58'	+60'	156°	20
21	39°25'	+59'	154°	38°30'	+59'	155°	37°36'	+59'	155°	36°42'	+59'	155°	35°47'	+60'	156°	34°52'	+60'	156°	33°57'	+60'	156°	21
22	40°24'	+59'	154°	39°30'	+59'	154°	38°35'	+59'	155°	37°41'	+59'	155°	36°47'	+60'	155°	35°52'	+60'	156°	34°57'	+60'	156°	22
23	41°23'	+59'	154°	40°29'	+59'	154°	39°35'	+59'	155°	38°41'	+59'	155°	37°46'	+60'	155°	36°51'	+60'	156°	35°57'	+60'	156°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

21° 339° LHA — Latitude SAME as Declination — 21° 339° 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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	18°29'	+59'	157°	17°34'	+60'	157°	16°39'	+60'	157°	15°44'	+60'	157°	14°48'	+60'	157°	13°53'	+60'	157°	12°58'	+60'	157°	0
1	19°29'	+59'	157°	18°34'	+59'	157°	17°39'	+60'	157°	16°43'	+60'	157°	15°48'	+60'	157°	14°53'	+60'	157°	13°57'	+60'	157°	1
2	20°28'	+59'	156°	19°33'	+59'	157°	18°38'	+60'	157°	17°43'	+60'	157°	16°48'	+60'	157°	15°52'	+60'	157°	14°57'	+60'	157°	2
3	21°28'	+59'	156°	20°33'	+59'	156°	19°38'	+60'	157°	18°43'	+60'	157°	17°47'	+60'	157°	16°52'	+60'	157°	15°57'	+60'	157°	3
4	22°27'	+59'	156°	21°32'	+59'	156°	20°37'	+60'	156°	19°42'	+60'	157°	18°47'	+60'	157°	17°52'	+60'	157°	16°57'	+60'	157°	4
5	23°26'	+59'	156°	22°32'	+59'	156°	21°37'	+60'	156°	20°42'	+60'	156°	19°47'	+60'	157°	18°52'	+60'	157°	17°56'	+60'	157°	5
6	24°26'	+59'	156°	23°31'	+59'	156°	22°36'	+60'	156°	21°41'	+60'	156°	20°46'	+60'	157°	19°51'	+60'	157°	18°56'	+60'	157°	6
7	25°25'	+59'	156°	24°31'	+59'	156°	23°36'	+60'	156°	22°41'	+60'	156°	21°46'	+60'	156°	20°51'	+60'	157°	19°56'	+60'	157°	7
8	26°25'	+59'	156°	25°30'	+59'	156°	24°35'	+60'	156°	23°40'	+60'	156°	22°46'	+60'	156°	21°51'	+60'	156°	20°56'	+60'	157°	8
9	27°24'	+59'	155°	26°29'	+59'	156°	25°35'	+59'	156°	24°40'	+60'	156°	23°45'	+60'	156°	22°50'	+60'	156°	21°55'	+60'	156°	9
10	28°23'	+59'	155°	27°29'	+59'	155°	26°34'	+59'	156°	25°40'	+60'	156°	24°45'	+60'	156°	23°50'	+60'	156°	22°55'	+60'	156°	10
11	29°23'	+59'	155°	28°28'	+59'	155°	27°34'	+59'	155°	26°39'	+60'	156°	25°44'	+60'	156°	24°50'	+60'	156°	23°55'	+60'	156°	11
12	30°22'	+59'	155°	29°28'	+59'	155°	28°33'	+59'	155°	27°39'	+60'	156°	26°44'	+60'	156°	25°49'	+60'	156°	24°54'	+60'	156°	12
13	31°21'	+59'	155°	30°27'	+59'	155°	29°33'	+59'	155°	28°38'	+60'	155°	27°44'	+60'	156°	26°49'	+60'	156°	25°54'	+60'	156°	13
14	32°21'	+59'	155°	31°27'	+59'	155°	30°32'	+59'	155°	29°38'	+60'	155°	28°43'	+60'	156°	27°49'	+60'	156°	26°54'	+60'	156°	14
15	33°20'	+59'	154°	32°26'	+59'	155°	31°32'	+59'	155°	30°37'	+60'	155°	29°43'	+60'	155°	28°48'	+60'	156°	27°53'	+60'	156°	15
16	34°19'	+59'	154°	33°25'	+59'	154°	32°31'	+59'	155°	31°37'	+59'	155°	30°42'	+60'	155°	29°48'	+60'	155°	28°53'	+60'	156°	16
17	35°19'	+59'	154°	34°25'	+59'	154°	33°30'	+59'	155°	32°36'	+59'	155°	31°42'	+60'	155°	30°47'	+60'	155°	29°53'	+60'	156°	17
18	36°18'	+59'	154°	35°24'	+59'	154°	34°30'	+59'	154°	33°36'	+59'	155°	32°41'	+60'	155°	31°47'	+60'	155°	30°52'	+60'	155°	18
19	37°17'	+59'	154°	36°23'	+59'	154°	35°29'	+59'	154°	34°35'	+59'	155°	33°41'	+60'	155°	32°47'	+60'	155°	31°52'	+60'	155°	19
20	38°16'	+59'	153°	37°23'	+59'	154°	36°29'	+59'	154°	35°35'	+59'	154°	34°41'	+60'	155°	33°46'	+60'	155°	32°52'	+60'	155°	20
21	39°15'	+59'	153°	38°22'	+59'	154°	37°28'	+59'	154°	36°34'	+59'	154°	35°40'	+60'	155°	34°46'	+60'	155°	33°51'	+60'	155°	21
22	40°15'	+59'	153°	39°21'	+59'	153°	38°27'	+59'	154°	37°34'	+59'	154°	36°40'	+59'	154°	35°45'	+60'	155°	34°51'	+60'	155°	22
23	41°14'	+59'	153°	40°20'	+59'	153°	39°27'	+59'	153°	38°33'	+59'	154°	37°39'	+59'	154°	36°45'	+60'	155°	35°51'	+60'	155°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	18°21'	+59'	156°	17°26'	+59'	156°	16°32'	+60'	156°	15°37'	+60'	156°	14°42'	+60'	156°	13°47'	+60'	156°	12°52'	+60'	156°	0
1	19°20'	+59'	156°	18°26'	+59'	156°	17°31'	+60'	156°	16°36'	+60'	156°	15°42'	+60'	156°	14°47'	+60'	156°	13°52'	+60'	156°	1
2	20°20'	+59'	155°	19°25'	+59'	156°	18°31'	+60'	156°	17°36'	+60'	156°	16°41'	+60'	156°	15°46'	+60'	156°	14°51'	+60'	156°	2
3	21°19'	+59'	155°	20°25'	+59'	155°	19°30'	+60'	156°	18°35'	+60'	156°	17°41'	+60'	156°	16°46'	+60'	156°	15°51'	+60'	156°	3
4	22°19'	+59'	155°	21°24'	+59'	155°	20°30'	+59'	155°	19°35'	+60'	156°	18°40'	+60'	156°	17°46'	+60'	156°	16°51'	+60'	156°	4
5	23°18'	+59'	155°	22°24'	+59'	155°	21°29'	+59'	155°	20°35'	+60'	155°	19°40'	+60'	156°	18°45'	+60'	156°	17°51'	+60'	156°	5
6	24°17'	+59'	155°	23°23'	+59'	155°	22°29'	+59'	155°	21°34'	+60'	155°	20°40'	+60'	155°	19°45'	+60'	156°	18°50'	+60'	156°	6
7	25°17'	+59'	155°	24°22'	+59'	155°	23°28'	+59'	155°	22°34'	+60'	155°	21°39'	+60'	155°	20°45'	+60'	155°	19°50'	+60'	156°	7
8	26°16'	+59'	154°	25°22'	+59'	155°	24°28'	+59'	155°	23°33'	+60'	155°	22°39'	+60'	155°	21°44'	+60'	155°	20°50'	+60'	156°	8
9	27°15'	+59'	154°	26°21'	+59'	154°	25°27'	+59'	155°	24°33'	+60'	155°	23°38'	+60'	155°	22°44'	+60'	155°	21°49'	+60'	155°	9
10	28°15'	+59'	154°	27°21'	+59'	154°	26°26'	+59'	155°	25°32'	+60'	155°	24°38'	+60'	155°	23°44'	+60'	155°	22°49'	+60'	155°	10
11	29°14'	+59'	154°	28°20'	+59'	154°	27°26'	+59'	154°	26°32'	+60'	155°	25°38'	+60'	155°	24°43'	+60'	155°	23°49'	+60'	155°	11
12	30°13'	+59'	154°	29°19'	+59'	154°	28°25'	+59'	154°	27°31'	+59'	154°	26°37'	+60'	155°	25°43'	+60'	155°	24°48'	+60'	155°	12
13	31°12'	+59'	154°	30°19'	+59'	154°	29°25'	+59'	154°	28°31'	+59'	154°	27°37'	+60'	155°	26°42'	+60'	155°	25°48'	+60'	155°	13
14	32°12'	+59'	153°	31°18'	+59'	154°	30°24'	+59'	154°	29°30'	+59'	154°	28°36'	+60'	154°	27°42'	+60'	155°	26°48'	+60'	155°	14
15	33°11'	+59'	153°	32°17'	+59'	153°	31°24'	+59'	154°	30°30'	+59'	154°	29°36'	+60'	154°	28°42'	+60'	155°	27°47'	+60'	155°	15
16	34°10'	+59'	153°	33°17'	+59'	153°	32°23'	+59'	154°	31°29'	+59'	154°	30°35'	+60'	154°	29°41'	+60'	154°	28°47'	+60'	155°	16
17	35°09'	+59'	153°	34°16'	+59'	153°	33°22'	+59'	153°	32°29'	+59'	154°	31°35'	+60'	154°	30°41'	+60'	154°	29°47'	+60'	155°	17
18	36°09'	+59'	153°	35°15'	+59'	153°	34°22'	+59'	153°	33°28'	+59'	154°	32°34'	+60'	154°	31°40'	+60'	154°	30°46'	+60'	154°	18
19	37°08'	+59'	152°	36°14'	+59'	153°	35°21'	+59'	153°	34°28'	+59'	153°	33°34'	+59'	154°	32°40'	+60'	154°	31°46'	+60'	154°	19
20	38°07'	+59'	152°	37°14'	+59'	153°	36°20'	+59'	153°	35°27'	+59'	153°	34°33'	+59'	154°	33°40'	+60'	154°	32°46'	+60'	154°	20
21	39°06'	+59'	152°	38°13'	+59'	152°	37°20'	+59'	153°	36°26'	+59'	153°	35°33'	+59'	153°	34°39'	+60'	154°	33°45'	+60'	154°	21
22	40°05'	+59'	152°	39°12'	+59'	152°	38°19'	+59'	153°	37°26'	+59'	153°	36°32'	+59'	153°	35°39'	+60'	154°	34°45'	+60'	154°	22
23	41°04'	+59'	152°	40°11'	+59'	152°	39°18'	+59'	152°	38°25'	+59'	153°	37°32'	+59'	153°	36°38'	+60'	153°	35°44'	+60'	154°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

23° 337° LHA — Latitude SAME as Declination — 23° 337° LHA

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

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

24° 336° LHA — Latitude SAME as Declination — 24° 336° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	18°12'	+59'	155°	17°18'	+59'	155°	16°24'	+59'	155°	15°29'	+60'	155°	14°35'	+60'	155°	13°41'	+60'	155°	12°46'	+60'	155°	0
1	19°12'	+59'	154°	18°18'	+59'	155°	17°23'	+59'	155°	16°29'	+60'	155°	15°35'	+60'	155°	14°40'	+60'	155°	13°46'	+60'	155°	1
2	20°11'	+59'	154°	19°17'	+59'	154°	18°23'	+59'	155°	17°29'	+60'	155°	16°34'	+60'	155°	15°40'	+60'	155°	14°45'	+60'	155°	2
3	21°10'	+59'	154°	20°16'	+59'	154°	19°22'	+59'	154°	18°28'	+60'	155°	17°34'	+60'	155°	16°40'	+60'	155°	15°45'	+60'	155°	3
4	22°10'	+59'	154°	21°16'	+59'	154°	20°22'	+59'	154°	19°28'	+60'	155°	18°33'	+60'	155°	17°39'	+60'	155°	16°45'	+60'	155°	4
5	23°09'	+59'	154°	22°15'	+59'	154°	21°21'	+59'	154°	20°27'	+60'	154°	19°33'	+60'	155°	18°39'	+60'	155°	17°45'	+60'	155°	5
6	24°08'	+59'	154°	23°15'	+59'	154°	22°21'	+59'	154°	21°27'	+60'	154°	20°33'	+60'	154°	19°38'	+60'	155°	18°44'	+60'	155°	6
7	25°08'	+59'	154°	24°14'	+59'	154°	23°20'	+59'	154°	22°26'	+59'	154°	21°32'	+60'	154°	20°38'	+60'	154°	19°44'	+60'	155°	7
8	26°07'	+59'	153°	25°13'	+59'	154°	24°20'	+59'	154°	23°26'	+59'	154°	22°32'	+60'	154°	21°38'	+60'	154°	20°44'	+60'	154°	8
9	27°06'	+59'	153°	26°13'	+59'	153°	25°19'	+59'	154°	24°25'	+59'	154°	23°31'	+60'	154°	22°37'	+60'	154°	21°43'	+60'	154°	9
10	28°05'	+59'	153°	27°12'	+59'	153°	26°18'	+59'	153°	25°25'	+59'	154°	24°31'	+60'	154°	23°37'	+60'	154°	22°43'	+60'	154°	10
11	29°05'	+59'	153°	28°11'	+59'	153°	27°18'	+59'	153°	26°24'	+59'	154°	25°30'	+60'	154°	24°36'	+60'	154°	23°43'	+60'	154°	11
12	30°04'	+59'	153°	29°11'	+59'	153°	28°17'	+59'	153°	27°24'	+59'	153°	26°30'	+60'	154°	25°36'	+60'	154°	24°42'	+60'	154°	12
13	31°03'	+59'	152°	30°10'	+59'	153°	29°17'	+59'	153°	28°23'	+59'	153°	27°29'	+60'	153°	26°36'	+60'	154°	25°42'	+60'	154°	13
14	32°02'	+59'	152°	31°09'	+59'	153°	30°16'	+59'	153°	29°22'	+59'	153°	28°29'	+60'	153°	27°35'	+60'	154°	26°41'	+60'	154°	14
15	33°02'	+59'	152°	32°08'	+59'	152°	31°15'	+59'	153°	30°22'	+59'	153°	29°28'	+59'	153°	28°35'	+60'	153°	27°41'	+60'	154°	15
16	34°01'	+59'	152°	33°08'	+59'	152°	32°15'	+59'	152°	31°21'	+59'	153°	30°28'	+59'	153°	29°34'	+60'	153°	28°41'	+60'	154°	16
17	35°00'	+59'	152°	34°07'	+59'	152°	33°14'	+59'	152°	32°21'	+59'	153°	31°27'	+59'	153°	30°34'	+60'	153°	29°40'	+60'	153°	17
18	35°59'	+59'	151°	35°06'	+59'	152°	34°13'	+59'	152°	33°20'	+59'	152°	32°27'	+59'	153°	31°33'	+60'	153°	30°40'	+60'	153°	18
19	36°58'	+59'	151°	36°05'	+59'	152°	35°13'	+59'	152°	34°19'	+59'	152°	33°26'	+59'	153°	32°33'	+60'	153°	31°40'	+60'	153°	19
20	37°57'	+59'	151°	37°05'	+59'	151°	36°12'	+59'	152°	35°19'	+59'	152°	34°26'	+59'	152°	33°33'	+60'	153°	32°39'	+60'	153°	20
21	38°56'	+59'	151°	38°04'	+59'	151°	37°11'	+59'	152°	36°18'	+59'	152°	35°25'	+59'	152°	34°32'	+60'	153°	33°39'	+60'	153°	21
22	39°55'	+59'	151°	39°03'	+59'	151°	38°10'	+59'	151°	37°18'	+59'	152°	36°25'	+59'	152°	35°32'	+59'	152°	34°38'	+60'	153°	22
23	40°54'	+59'	150°	40°02'	+59'	151°	39°10'	+59'	151°	38°17'	+59'	152°	37°24'	+59'	152°	36°31'	+59'	152°	35°38'	+60'	153°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

24° 336° LHA — Latitude SAME as Declination — 24° 336° LHA

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

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

25° 335° LHA — Latitude SAME as Declination — 25° 335° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	18°03'	+59'	154°	17°10'	+59'	154°	16°16'	+59'	154°	15°22'	+60'	154°	14°28'	+60'	154°	13°34'	+60'	154°	12°40'	+60'	154°	0
1	19°03'	+59'	153°	18°09'	+59'	154°	17°15'	+59'	154°	16°21'	+59'	154°	15°28'	+60'	154°	14°34'	+60'	154°	13°40'	+60'	154°	1
2	20°02'	+59'	153°	19°08'	+59'	153°	18°15'	+59'	154°	17°21'	+59'	154°	16°27'	+60'	154°	15°33'	+60'	154°	14°39'	+60'	154°	2
3	21°01'	+59'	153°	20°08'	+59'	153°	19°14'	+59'	153°	18°20'	+59'	154°	17°27'	+60'	154°	16°33'	+60'	154°	15°39'	+60'	154°	3
4	22°01'	+59'	153°	21°07'	+59'	153°	20°14'	+59'	153°	19°20'	+59'	153°	18°26'	+60'	154°	17°32'	+60'	154°	16°39'	+60'	154°	4
5	23°00'	+59'	153°	22°06'	+59'	153°	21°13'	+59'	153°	20°19'	+59'	153°	19°26'	+60'	153°	18°32'	+60'	154°	17°38'	+60'	154°	5
6	23°59'	+59'	153°	23°06'	+59'	153°	22°12'	+59'	153°	21°19'	+59'	153°	20°25'	+60'	153°	19°32'	+60'	154°	18°38'	+60'	154°	6
7	24°58'	+59'	152°	24°05'	+59'	153°	23°12'	+59'	153°	22°18'	+59'	153°	21°25'	+60'	153°	20°31'	+60'	153°	19°38'	+60'	154°	7
8	25°58'	+59'	152°	25°04'	+59'	152°	24°11'	+59'	153°	23°18'	+59'	153°	22°24'	+60'	153°	21°31'	+60'	153°	20°37'	+60'	153°	8
9	26°57'	+59'	152°	26°04'	+59'	152°	25°11'	+59'	153°	24°17'	+59'	153°	23°24'	+60'	153°	22°30'	+60'	153°	21°37'	+60'	153°	9
10	27°56'	+59'	152°	27°03'	+59'	152°	26°10'	+59'	152°	25°17'	+59'	153°	24°23'	+60'	153°	23°30'	+60'	153°	22°36'	+60'	153°	10
11	28°55'	+59'	152°	28°02'	+59'	152°	27°09'	+59'	152°	26°16'	+59'	152°	25°23'	+59'	153°	24°30'	+60'	153°	23°36'	+60'	153°	11
12	29°54'	+59'	152°	29°02'	+59'	152°	28°09'	+59'	152°	27°16'	+59'	152°	26°22'	+59'	153°	25°29'	+60'	153°	24°36'	+60'	153°	12
13	30°53'	+59'	151°	30°01'	+59'	152°	29°08'	+59'	152°	28°15'	+59'	152°	27°22'	+59'	152°	26°29'	+60'	153°	25°35'	+60'	153°	13
14	31°53'	+59'	151°	31°00'	+59'	151°	30°07'	+59'	152°	29°14'	+59'	152°	28°21'	+59'	152°	27°28'	+60'	152°	26°35'	+60'	153°	14
15	32°52'	+59'	151°	31°59'	+59'	151°	31°07'	+59'	152°	30°14'	+59'	152°	29°21'	+59'	152°	28°28'	+60'	152°	27°35'	+60'	153°	15
16	33°51'	+59'	151°	32°58'	+59'	151°	32°06'	+59'	151°	31°13'	+59'	152°	30°20'	+59'	152°	29°27'	+60'	152°	28°34'	+60'	152°	16
17	34°50'	+59'	151°	33°58'	+59'	151°	33°05'	+59'	151°	32°12'	+59'	151°	31°20'	+59'	152°	30°27'	+60'	152°	29°34'	+60'	152°	17
18	35°49'	+59'	150°	34°57'	+59'	151°	34°04'	+59'	151°	33°12'	+59'	151°	32°19'	+59'	152°	31°26'	+59'	152°	30°33'	+60'	152°	18
19	36°48'	+59'	150°	35°56'	+59'	150°	35°04'	+59'	151°	34°11'	+59'	151°	33°19'	+59'	151°	32°26'	+59'	152°	31°33'	+60'	152°	19
20	37°47'	+59'	150°	36°55'	+59'	150°	36°03'	+59'	151°	35°10'	+59'	151°	34°18'	+59'	151°	33°25'	+59'	152°	32°32'	+60'	152°	20
21	38°46'	+59'	150°	37°54'	+59'	150°	37°02'	+59'	150°	36°10'	+59'	151°	35°17'	+59'	151°	34°25'	+59'	151°	33°32'	+60'	152°	21
22	39°45'	+59'	149°	38°53'	+59'	150°	38°01'	+59'	150°	37°09'	+59'	151°	36°17'	+59'	151°	35°24'	+59'	151°	34°32'	+60'	152°	22
23	40°44'	+59'	149°	39°52'	+59'	150°	39°00'	+59'	150°	38°08'	+59'	150°	37°16'	+59'	151°	36°24'	+59'	151°	35°31'	+60'	151°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

25° 335° LHA — Latitude SAME as Declination — 25° 335° LHA

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

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

26° 334° LHA — Latitude SAME as Declination — 26° 334° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°54'	+59'	153°	17°01'	+59'	153°	16°08'	+59'	153°	15°14'	+59'	153°	14°21'	+60'	153°	13°27'	+60'	153°	12°34'	+60'	153°	0
1	18°53'	+59'	152°	18°00'	+59'	153°	17°07'	+59'	153°	16°14'	+59'	153°	15°20'	+60'	153°	14°27'	+60'	153°	13°33'	+60'	153°	1
2	19°53'	+59'	152°	19°00'	+59'	152°	18°06'	+59'	153°	17°13'	+59'	153°	16°20'	+60'	153°	15°26'	+60'	153°	14°33'	+60'	153°	2
3	20°52'	+59'	152°	19°59'	+59'	152°	19°06'	+59'	152°	18°12'	+59'	153°	17°19'	+60'	153°	16°26'	+60'	153°	15°32'	+60'	153°	3
4	21°51'	+59'	152°	20°58'	+59'	152°	20°05'	+59'	152°	19°12'	+59'	152°	18°19'	+60'	153°	17°25'	+60'	153°	16°32'	+60'	153°	4
5	22°50'	+59'	152°	21°57'	+59'	152°	21°04'	+59'	152°	20°11'	+59'	152°	19°18'	+60'	152°	18°25'	+60'	153°	17°32'	+60'	153°	5
6	23°50'	+59'	152°	22°57'	+59'	152°	22°04'	+59'	152°	21°11'	+59'	152°	20°18'	+59'	152°	19°25'	+60'	152°	18°31'	+60'	153°	6
7	24°49'	+59'	151°	23°56'	+59'	152°	23°03'	+59'	152°	22°10'	+59'	152°	21°17'	+59'	152°	20°24'	+60'	152°	19°31'	+60'	153°	7
8	25°48'	+59'	151°	24°55'	+59'	151°	24°03'	+59'	152°	23°10'	+59'	152°	22°17'	+59'	152°	21°24'	+60'	152°	20°31'	+60'	152°	8
9	26°47'	+59'	151°	25°54'	+59'	151°	25°02'	+59'	151°	24°09'	+59'	152°	23°16'	+59'	152°	22°23'	+60'	152°	21°30'	+60'	152°	9
10	27°46'	+59'	151°	26°54'	+59'	151°	26°01'	+59'	151°	25°08'	+59'	152°	24°16'	+59'	152°	23°23'	+60'	152°	22°30'	+60'	152°	10
11	28°45'	+59'	151°	27°53'	+59'	151°	27°00'	+59'	151°	26°08'	+59'	151°	25°15'	+59'	152°	24°22'	+60'	152°	23°29'	+60'	152°	11
12	29°44'	+59'	150°	28°52'	+59'	151°	28°00'	+59'	151°	27°07'	+59'	151°	26°15'	+59'	151°	25°22'	+60'	152°	24°29'	+60'	152°	12
13	30°43'	+59'	150°	29°51'	+59'	150°	28°59'	+59'	151°	28°07'	+59'	151°	27°14'	+59'	151°	26°21'	+60'	152°	25°29'	+60'	152°	13
14	31°43'	+59'	150°	30°51'	+59'	150°	29°58'	+59'	151°	29°06'	+59'	151°	28°13'	+59'	151°	27°21'	+60'	151°	26°28'	+60'	152°	14
15	32°42'	+59'	150°	31°50'	+59'	150°	30°58'	+59'	150°	30°05'	+59'	151°	29°13'	+59'	151°	28°20'	+59'	151°	27°28'	+60'	151°	15
16	33°41'	+59'	150°	32°49'	+59'	150°	31°57'	+59'	150°	31°05'	+59'	151°	30°12'	+59'	151°	29°20'	+59'	151°	28°27'	+60'	151°	16
17	34°40'	+59'	149°	33°48'	+59'	150°	32°56'	+59'	150°	32°04'	+59'	150°	31°12'	+59'	151°	30°19'	+59'	151°	29°27'	+60'	151°	17
18	35°39'	+59'	149°	34°47'	+59'	149°	33°55'	+59'	150°	33°03'	+59'	150°	32°11'	+59'	150°	31°19'	+59'	151°	30°26'	+60'	151°	18
19	36°38'	+59'	149°	35°46'	+59'	149°	34°54'	+59'	150°	34°03'	+59'	150°	33°11'	+59'	150°	32°18'	+59'	151°	31°26'	+60'	151°	19
20	37°37'	+59'	149°	36°45'	+59'	149°	35°54'	+59'	149°	35°02'	+59'	150°	34°10'	+59'	150°	33°18'	+59'	150°	32°25'	+60'	151°	20
21	38°35'	+59'	148°	37°44'	+59'	149°	36°53'	+59'	149°	36°01'	+59'	150°	35°09'	+59'	150°	34°17'	+59'	150°	33°25'	+60'	151°	21
22	39°34'	+59'	148°	38°43'	+59'	149°	37°52'	+59'	149°	37°00'	+59'	149°	36°09'	+59'	150°	35°17'	+59'	150°	34°24'	+59'	150°	22
23	40°33'	+59'	148°	39°42'	+59'	148°	38°51'	+59'	149°	38°00'	+59'	149°	37°08'	+59'	150°	36°16'	+59'	150°	35°24'	+59'	150°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

26° 334° LHA — Latitude SAME as Declination — 26° 334° LHA

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

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

27° 333° LHA — Latitude SAME as Declination — 27° 333° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°45'	+59'	152°	16°52'	+59'	152°	15°59'	+59'	152°	15°06'	+59'	152°	14°13'	+59'	152°	13°20'	+60'	152°	12°27'	+60'	152°	0
1	18°44'	+59'	151°	17°51'	+59'	152°	16°58'	+59'	152°	16°05'	+59'	152°	15°13'	+59'	152°	14°20'	+60'	152°	13°26'	+60'	152°	1
2	19°43'	+59'	151°	18°50'	+59'	151°	17°58'	+59'	152°	17°05'	+59'	152°	16°12'	+59'	152°	15°19'	+60'	152°	14°26'	+60'	152°	2
3	20°42'	+59'	151°	19°50'	+59'	151°	18°57'	+59'	151°	18°04'	+59'	152°	17°11'	+59'	152°	16°19'	+60'	152°	15°26'	+60'	152°	3
4	21°41'	+59'	151°	20°49'	+59'	151°	19°56'	+59'	151°	19°04'	+59'	151°	18°11'	+59'	152°	17°18'	+60'	152°	16°25'	+60'	152°	4
5	22°40'	+59'	151°	21°48'	+59'	151°	20°56'	+59'	151°	20°03'	+59'	151°	19°10'	+59'	151°	18°18'	+60'	152°	17°25'	+60'	152°	5
6	23°40'	+59'	150°	22°47'	+59'	151°	21°55'	+59'	151°	21°02'	+59'	151°	20°10'	+59'	151°	19°17'	+60'	151°	18°25'	+60'	152°	6
7	24°39'	+59'	150°	23°47'	+59'	151°	22°54'	+59'	151°	22°02'	+59'	151°	21°09'	+59'	151°	20°17'	+60'	151°	19°24'	+60'	151°	7
8	25°38'	+59'	150°	24°46'	+59'	150°	23°54'	+59'	151°	23°01'	+59'	151°	22°09'	+59'	151°	21°16'	+60'	151°	20°24'	+60'	151°	8
9	26°37'	+59'	150°	25°45'	+59'	150°	24°53'	+59'	150°	24°01'	+59'	151°	23°08'	+59'	151°	22°16'	+60'	151°	21°23'	+60'	151°	9
10	27°36'	+59'	150°	26°44'	+59'	150°	25°52'	+59'	150°	25°00'	+59'	150°	24°08'	+59'	151°	23°15'	+60'	151°	22°23'	+60'	151°	10
11	28°35'	+59'	150°	27°43'	+59'	150°	26°51'	+59'	150°	25°59'	+59'	150°	25°07'	+59'	151°	24°15'	+59'	151°	23°22'	+60'	151°	11
12	29°34'	+59'	149°	28°42'	+59'	150°	27°51'	+59'	150°	26°59'	+59'	150°	26°07'	+59'	150°	25°14'	+59'	151°	24°22'	+60'	151°	12
13	30°33'	+59'	149°	29°42'	+59'	149°	28°50'	+59'	150°	27°58'	+59'	150°	27°06'	+59'	150°	26°14'	+59'	150°	25°22'	+60'	151°	13
14	31°32'	+59'	149°	30°41'	+59'	149°	29°49'	+59'	149°	28°57'	+59'	150°	28°05'	+59'	150°	27°13'	+59'	150°	26°21'	+60'	151°	14
15	32°31'	+59'	149°	31°40'	+59'	149°	30°48'	+59'	149°	29°57'	+59'	150°	29°05'	+59'	150°	28°13'	+59'	150°	27°21'	+60'	150°	15
16	33°30'	+59'	148°	32°39'	+59'	149°	31°47'	+59'	149°	30°56'	+59'	149°	30°04'	+59'	150°	29°12'	+59'	150°	28°20'	+60'	150°	16
17	34°29'	+59'	148°	33°38'	+59'	149°	32°47'	+59'	149°	31°55'	+59'	149°	31°03'	+59'	150°	30°12'	+59'	150°	29°20'	+60'	150°	17
18	35°28'	+59'	148°	34°37'	+59'	148°	33°46'	+59'	149°	32°54'	+59'	149°	32°03'	+59'	149°	31°11'	+59'	150°	30°19'	+60'	150°	18
19	36°27'	+59'	148°	35°36'	+59'	148°	34°45'	+59'	149°	33°54'	+59'	149°	33°02'	+59'	149°	32°11'	+59'	150°	31°19'	+59'	150°	19
20	37°26'	+59'	148°	36°35'	+59'	148°	35°44'	+59'	148°	34°53'	+59'	149°	34°01'	+59'	149°	33°10'	+59'	149°	32°18'	+59'	150°	20
21	38°24'	+59'	147°	37°34'	+59'	148°	36°43'	+59'	148°	35°52'	+59'	148°	35°01'	+59'	149°	34°09'	+59'	149°	33°18'	+59'	150°	21
22	39°23'	+59'	147°	38°33'	+59'	147°	37°42'	+59'	148°	36°51'	+59'	148°	36°00'	+59'	149°	35°09'	+59'	149°	34°17'	+59'	149°	22
23	40°22'	+59'	147°	39°32'	+59'	147°	38°41'	+59'	148°	37°50'	+59'	148°	36°59'	+59'	148°	36°08'	+59'	149°	35°17'	+59'	149°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

27° 333° LHA — Latitude SAME as Declination — 27° 333° 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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°35'	+59'	150°	16°42'	+59'	151°	15°50'	+59'	151°	14°58'	+59'	151°	14°05'	+59'	151°	13°13'	+60'	151°	12°20'	+60'	151°	0
1	18°34'	+59'	150°	17°42'	+59'	150°	16°49'	+59'	151°	15°57'	+59'	151°	15°05'	+59'	151°	14°12'	+60'	151°	13°20'	+60'	151°	1
2	19°33'	+59'	150°	18°41'	+59'	150°	17°49'	+59'	150°	16°56'	+59'	151°	16°04'	+59'	151°	15°12'	+60'	151°	14°19'	+60'	151°	2
3	20°32'	+59'	150°	19°40'	+59'	150°	18°48'	+59'	150°	17°56'	+59'	150°	17°04'	+59'	151°	16°11'	+60'	151°	15°19'	+60'	151°	3
4	21°31'	+59'	150°	20°39'	+59'	150°	19°47'	+59'	150°	18°55'	+59'	150°	18°03'	+59'	150°	17°11'	+60'	151°	16°18'	+60'	151°	4
5	22°30'	+59'	150°	21°38'	+59'	150°	20°46'	+59'	150°	19°54'	+59'	150°	19°02'	+59'	150°	18°10'	+60'	151°	17°18'	+60'	151°	5
6	23°29'	+59'	149°	22°38'	+59'	150°	21°46'	+59'	150°	20°54'	+59'	150°	20°02'	+59'	150°	19°10'	+59'	150°	18°18'	+60'	151°	6
7	24°28'	+59'	149°	23°37'	+59'	149°	22°45'	+59'	150°	21°53'	+59'	150°	21°01'	+59'	150°	20°09'	+59'	150°	19°17'	+60'	150°	7
8	25°27'	+59'	149°	24°36'	+59'	149°	23°44'	+59'	149°	22°53'	+59'	150°	22°01'	+59'	150°	21°09'	+59'	150°	20°17'	+60'	150°	8
9	26°26'	+59'	149°	25°35'	+59'	149°	24°44'	+59'	149°	23°52'	+59'	150°	23°00'	+59'	150°	22°08'	+59'	150°	21°16'	+60'	150°	9
10	27°25'	+59'	149°	26°34'	+59'	149°	25°43'	+59'	149°	24°51'	+59'	149°	23°59'	+59'	150°	23°08'	+59'	150°	22°16'	+60'	150°	10
11	28°24'	+59'	148°	27°33'	+59'	149°	26°42'	+59'	149°	25°50'	+59'	149°	24°59'	+59'	149°	24°07'	+59'	150°	23°15'	+60'	150°	11
12	29°23'	+59'	148°	28°32'	+59'	148°	27°41'	+59'	149°	26°50'	+59'	149°	25°58'	+59'	149°	25°07'	+59'	150°	24°15'	+60'	150°	12
13	30°22'	+59'	148°	29°31'	+59'	148°	28°40'	+59'	149°	27°49'	+59'	149°	26°58'	+59'	149°	26°06'	+59'	149°	25°14'	+60'	150°	13
14	31°21'	+59'	148°	30°30'	+59'	148°	29°39'	+59'	148°	28°48'	+59'	149°	27°57'	+59'	149°	27°05'	+59'	149°	26°14'	+60'	149°	14
15	32°20'	+59'	148°	31°30'	+59'	148°	30°39'	+59'	148°	29°48'	+59'	148°	28°56'	+59'	149°	28°05'	+59'	149°	27°13'	+60'	149°	15
16	33°19'	+59'	147°	32°29'	+59'	148°	31°38'	+59'	148°	30°47'	+59'	148°	29°56'	+59'	149°	29°04'	+59'	149°	28°13'	+59'	149°	16
17	34°18'	+59'	147°	33°28'	+59'	147°	32°37'	+59'	148°	31°46'	+59'	148°	30°55'	+59'	148°	30°04'	+59'	149°	29°12'	+59'	149°	17
18	35°17'	+59'	147°	34°27'	+59'	147°	33°36'	+59'	148°	32°45'	+59'	148°	31°54'	+59'	148°	31°03'	+59'	149°	30°12'	+59'	149°	18
19	36°16'	+59'	147°	35°25'	+59'	147°	34°35'	+59'	147°	33°44'	+59'	148°	32°54'	+59'	148°	32°03'	+59'	148°	31°11'	+59'	149°	19
20	37°14'	+59'	146°	36°24'	+59'	147°	35°34'	+59'	147°	34°44'	+59'	148°	33°53'	+59'	148°	33°02'	+59'	148°	32°11'	+59'	149°	20
21	38°13'	+59'	146°	37°23'	+59'	147°	36°33'	+59'	147°	35°43'	+59'	147°	34°52'	+59'	148°	34°01'	+59'	148°	33°10'	+59'	148°	21
22	39°12'	+59'	146°	38°22'	+59'	146°	37°32'	+59'	147°	36°42'	+59'	147°	35°51'	+59'	148°	35°01'	+59'	148°	34°10'	+59'	148°	22
23	40°11'	+59'	146°	39°21'	+59'	146°	38°31'	+59'	146°	37°41'	+59'	147°	36°51'	+59'	147°	36°00'	+59'	148°	35°09'	+59'	148°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°24'	+59'	149°	16°33'	+59'	150°	15°41'	+59'	150°	14°49'	+59'	150°	13°57'	+59'	150°	13°05'	+59'	150°	12°13'	+60'	150°	0
1	18°23'	+59'	149°	17°32'	+59'	149°	16°40'	+59'	150°	15°48'	+59'	150°	14°56'	+59'	150°	14°04'	+59'	150°	13°12'	+60'	150°	1
2	19°23'	+59'	149°	18°31'	+59'	149°	17°39'	+59'	149°	16°48'	+59'	150°	15°56'	+59'	150°	15°04'	+59'	150°	14°12'	+60'	150°	2
3	20°22'	+59'	149°	19°30'	+59'	149°	18°39'	+59'	149°	17°47'	+59'	149°	16°55'	+59'	150°	16°03'	+59'	150°	15°12'	+60'	150°	3
4	21°21'	+59'	149°	20°29'	+59'	149°	19°38'	+59'	149°	18°46'	+59'	149°	17°55'	+59'	149°	17°03'	+59'	150°	16°11'	+60'	150°	4
5	22°20'	+59'	149°	21°28'	+59'	149°	20°37'	+59'	149°	19°46'	+59'	149°	18°54'	+59'	149°	18°02'	+59'	149°	17°11'	+60'	150°	5
6	23°19'	+59'	148°	22°28'	+59'	149°	21°36'	+59'	149°	20°45'	+59'	149°	19°53'	+59'	149°	19°02'	+59'	149°	18°10'	+60'	150°	6
7	24°18'	+59'	148°	23°27'	+59'	148°	22°36'	+59'	149°	21°44'	+59'	149°	20°53'	+59'	149°	20°01'	+59'	149°	19°10'	+60'	149°	7
8	25°17'	+59'	148°	24°26'	+59'	148°	23°35'	+59'	148°	22°44'	+59'	149°	21°52'	+59'	149°	21°01'	+59'	149°	20°09'	+60'	149°	8
9	26°16'	+59'	148°	25°25'	+59'	148°	24°34'	+59'	148°	23°43'	+59'	148°	22°52'	+59'	149°	22°00'	+59'	149°	21°09'	+60'	149°	9
10	27°15'	+59'	148°	26°24'	+59'	148°	25°33'	+59'	148°	24°42'	+59'	148°	23°51'	+59'	149°	23°00'	+59'	149°	22°08'	+60'	149°	10
11	28°14'	+59'	147°	27°23'	+59'	148°	26°32'	+59'	148°	25°41'	+59'	148°	24°50'	+59'	148°	23°59'	+59'	149°	23°08'	+60'	149°	11
12	29°12'	+59'	147°	28°22'	+59'	147°	27°31'	+59'	148°	26°41'	+59'	148°	25°50'	+59'	148°	24°59'	+59'	148°	24°07'	+59'	149°	12
13	30°11'	+59'	147°	29°21'	+59'	147°	28°30'	+59'	147°	27°40'	+59'	148°	26°49'	+59'	148°	25°58'	+59'	148°	25°07'	+59'	149°	13
14	31°10'	+59'	147°	30°20'	+59'	147°	29°30'	+59'	147°	28°39'	+59'	148°	27°48'	+59'	148°	26°57'	+59'	148°	26°06'	+59'	148°	14
15	32°09'	+59'	146°	31°19'	+59'	147°	30°29'	+59'	147°	29°38'	+59'	147°	28°48'	+59'	148°	27°57'	+59'	148°	27°06'	+59'	148°	15
16	33°08'	+59'	146°	32°18'	+59'	147°	31°28'	+59'	147°	30°37'	+59'	147°	29°47'	+59'	148°	28°56'	+59'	148°	28°05'	+59'	148°	16
17	34°07'	+59'	146°	33°17'	+59'	146°	32°27'	+59'	147°	31°37'	+59'	147°	30°46'	+59'	147°	29°56'	+59'	148°	29°05'	+59'	148°	17
18	35°05'	+59'	146°	34°16'	+59'	146°	33°26'	+59'	146°	32°36'	+59'	147°	31°45'	+59'	147°	30°55'	+59'	147°	30°04'	+59'	148°	18
19	36°04'	+59'	145°	35°15'	+59'	146°	34°25'	+59'	146°	33°35'	+59'	147°	32°45'	+59'	147°	31°54'	+59'	147°	31°04'	+59'	148°	19
20	37°03'	+59'	145°	36°14'	+59'	146°	35°24'	+59'	146°	34°34'	+59'	146°	33°44'	+59'	147°	32°54'	+59'	147°	32°03'	+59'	147°	20
21	38°02'	+59'	145°	37°12'	+59'	145°	36°23'	+59'	146°	35°33'	+59'	146°	34°43'	+59'	147°	33°53'	+59'	147°	33°03'	+59'	147°	21
22	39°00'	+59'	145°	38°11'	+59'	145°	37°22'	+59'	146°	36°32'	+59'	146°	35°42'	+59'	146°	34°52'	+59'	147°	34°02'	+59'	147°	22
23	39°59'	+59'	144°	39°10'	+59'	145°	38°21'	+59'	145°	37°31'	+59'	146°	36°41'	+59'	146°	35°52'	+59'	147°	35°01'	+59'	147°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

30° 330° LHA — Latitude SAME as Declination — 30° 330° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°14'	+59'	148°	16°23'	+59'	149°	15°31'	+59'	149°	14°40'	+59'	149°	13°49'	+59'	149°	12°57'	+59'	149°	12°06'	+60'	149°	0
1	18°13'	+59'	148°	17°22'	+59'	148°	16°31'	+59'	149°	15°39'	+59'	149°	14°48'	+59'	149°	13°57'	+59'	149°	13°05'	+60'	149°	1
2	19°12'	+59'	148°	18°21'	+59'	148°	17°30'	+59'	148°	16°39'	+59'	149°	15°47'	+59'	149°	14°56'	+59'	149°	14°05'	+60'	149°	2
3	20°11'	+59'	148°	19°20'	+59'	148°	18°29'	+59'	148°	17°38'	+59'	148°	16°47'	+59'	149°	15°56'	+59'	149°	15°04'	+60'	149°	3
4	21°10'	+59'	148°	20°19'	+59'	148°	19°28'	+59'	148°	18°37'	+59'	148°	17°46'	+59'	148°	16°55'	+59'	149°	16°04'	+60'	149°	4
5	22°09'	+59'	147°	21°18'	+59'	148°	20°27'	+59'	148°	19°36'	+59'	148°	18°46'	+59'	148°	17°54'	+59'	148°	17°03'	+60'	149°	5
6	23°08'	+59'	147°	22°17'	+59'	147°	21°27'	+59'	148°	20°36'	+59'	148°	19°45'	+59'	148°	18°54'	+59'	148°	18°03'	+60'	148°	6
7	24°07'	+59'	147°	23°16'	+59'	147°	22°26'	+59'	148°	21°35'	+59'	148°	20°44'	+59'	148°	19°53'	+59'	148°	19°02'	+60'	148°	7
8	25°06'	+59'	147°	24°15'	+59'	147°	23°25'	+59'	147°	22°34'	+59'	148°	21°44'	+59'	148°	20°53'	+59'	148°	20°02'	+59'	148°	8
9	26°05'	+59'	147°	25°14'	+59'	147°	24°24'	+59'	147°	23°34'	+59'	147°	22°43'	+59'	148°	21°52'	+59'	148°	21°01'	+59'	148°	9
10	27°03'	+59'	146°	26°13'	+59'	147°	25°23'	+59'	147°	24°33'	+59'	147°	23°42'	+59'	147°	22°52'	+59'	148°	22°01'	+59'	148°	10
11	28°02'	+59'	146°	27°12'	+59'	147°	26°22'	+59'	147°	25°32'	+59'	147°	24°42'	+59'	147°	23°51'	+59'	148°	23°00'	+59'	148°	11
12	29°01'	+59'	146°	28°11'	+59'	146°	27°21'	+59'	147°	26°31'	+59'	147°	25°41'	+59'	147°	24°50'	+59'	147°	24°00'	+59'	148°	12
13	30°00'	+59'	146°	29°10'	+59'	146°	28°20'	+59'	146°	27°30'	+59'	147°	26°40'	+59'	147°	25°50'	+59'	147°	24°59'	+59'	147°	13
14	30°59'	+59'	146°	30°09'	+59'	146°	29°19'	+59'	146°	28°30'	+59'	146°	27°39'	+59'	147°	26°49'	+59'	147°	25°59'	+59'	147°	14
15	31°58'	+59'	145°	31°08'	+59'	146°	30°18'	+59'	146°	29°29'	+59'	146°	28°39'	+59'	147°	27°48'	+59'	147°	26°58'	+59'	147°	15
16	32°56'	+59'	145°	32°07'	+59'	145°	31°18'	+59'	146°	30°28'	+59'	146°	29°38'	+59'	146°	28°48'	+59'	147°	27°58'	+59'	147°	16
17	33°55'	+59'	145°	33°06'	+59'	145°	32°17'	+59'	146°	31°27'	+59'	146°	30°37'	+59'	146°	29°47'	+59'	147°	28°57'	+59'	147°	17
18	34°54'	+59'	145°	34°05'	+59'	145°	33°15'	+59'	145°	32°26'	+59'	146°	31°36'	+59'	146°	30°46'	+59'	146°	29°56'	+59'	147°	18
19	35°52'	+59'	144°	35°04'	+59'	145°	34°14'	+59'	145°	33°25'	+59'	146°	32°36'	+59'	146°	31°46'	+59'	146°	30°56'	+59'	147°	19
20	36°51'	+59'	144°	36°02'	+59'	144°	35°13'	+59'	145°	34°24'	+59'	145°	33°35'	+59'	146°	32°45'	+59'	146°	31°55'	+59'	146°	20
21	37°50'	+59'	144°	37°01'	+59'	144°	36°12'	+59'	145°	35°23'	+59'	145°	34°34'	+59'	145°	33°44'	+59'	146°	32°55'	+59'	146°	21
22	38°48'	+59'	143°	38°00'	+59'	144°	37°11'	+59'	144°	36°22'	+59'	145°	35°33'	+59'	145°	34°44'	+59'	146°	33°54'	+59'	146°	22
23	39°47'	+58'	143°	38°58'	+59'	144°	38°10'	+59'	144°	37°21'	+59'	145°	36°32'	+59'	145°	35°43'	+59'	145°	34°53'	+59'	146°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

30° 330° LHA — Latitude SAME as Declination — 30° 330° LHA

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

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

31° 329° LHA — Latitude SAME as Declination — 31° 329° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°03'	+59'	147°	16°12'	+59'	148°	15°22'	+59'	148°	14°31'	+59'	148°	13°40'	+59'	148°	12°49'	+59'	148°	11°58'	+60'	148°	0
1	18°02'	+59'	147°	17°11'	+59'	147°	16°21'	+59'	148°	15°30'	+59'	148°	14°39'	+59'	148°	13°49'	+59'	148°	12°58'	+60'	148°	1
2	19°01'	+59'	147°	18°10'	+59'	147°	17°20'	+59'	147°	16°29'	+59'	148°	15°39'	+59'	148°	14°48'	+59'	148°	13°57'	+60'	148°	2
3	20°00'	+59'	147°	19°09'	+59'	147°	18°19'	+59'	147°	17°29'	+59'	147°	16°38'	+59'	148°	15°47'	+59'	148°	14°57'	+59'	148°	3
4	20°59'	+59'	147°	20°09'	+59'	147°	19°18'	+59'	147°	18°28'	+59'	147°	17°37'	+59'	147°	16°47'	+59'	148°	15°56'	+59'	148°	4
5	21°58'	+59'	146°	21°08'	+59'	147°	20°17'	+59'	147°	19°27'	+59'	147°	18°37'	+59'	147°	17°46'	+59'	147°	16°56'	+59'	148°	5
6	22°56'	+59'	146°	22°07'	+59'	146°	21°16'	+59'	147°	20°26'	+59'	147°	19°36'	+59'	147°	18°46'	+59'	147°	17°55'	+59'	147°	6
7	23°55'	+59'	146°	23°06'	+59'	146°	22°16'	+59'	146°	21°26'	+59'	147°	20°35'	+59'	147°	19°45'	+59'	147°	18°55'	+59'	147°	7
8	24°54'	+59'	146°	24°05'	+59'	146°	23°15'	+59'	146°	22°25'	+59'	147°	21°35'	+59'	147°	20°44'	+59'	147°	19°54'	+59'	147°	8
9	25°53'	+59'	146°	25°04'	+59'	146°	24°14'	+59'	146°	23°24'	+59'	146°	22°34'	+59'	147°	21°44'	+59'	147°	20°54'	+59'	147°	9
10	26°52'	+59'	145°	26°02'	+59'	146°	25°13'	+59'	146°	24°23'	+59'	146°	23°33'	+59'	146°	22°43'	+59'	147°	21°53'	+59'	147°	10
11	27°51'	+59'	145°	27°01'	+59'	145°	26°12'	+59'	146°	25°22'	+59'	146°	24°32'	+59'	146°	23°43'	+59'	146°	22°52'	+59'	147°	11
12	28°49'	+59'	145°	28°00'	+59'	145°	27°11'	+59'	146°	26°21'	+59'	146°	25°32'	+59'	146°	24°42'	+59'	146°	23°52'	+59'	147°	12
13	29°48'	+59'	145°	28°59'	+59'	145°	28°10'	+59'	145°	27°21'	+59'	146°	26°31'	+59'	146°	25°41'	+59'	146°	24°51'	+59'	146°	13
14	30°47'	+59'	144°	29°58'	+59'	145°	29°09'	+59'	145°	28°20'	+59'	145°	27°30'	+59'	146°	26°41'	+59'	146°	25°51'	+59'	146°	14
15	31°46'	+59'	144°	30°57'	+59'	145°	30°08'	+59'	145°	29°19'	+59'	145°	28°29'	+59'	146°	27°40'	+59'	146°	26°50'	+59'	146°	15
16	32°44'	+59'	144°	31°56'	+59'	144°	31°07'	+59'	145°	30°18'	+59'	145°	29°29'	+59'	145°	28°39'	+59'	146°	27°50'	+59'	146°	16
17	33°43'	+59'	144°	32°55'	+59'	144°	32°06'	+59'	144°	31°17'	+59'	145°	30°28'	+59'	145°	29°38'	+59'	145°	28°49'	+59'	146°	17
18	34°42'	+59'	143°	33°53'	+59'	144°	33°05'	+59'	144°	32°16'	+59'	145°	31°27'	+59'	145°	30°38'	+59'	145°	29°48'	+59'	146°	18
19	35°40'	+59'	143°	34°52'	+59'	144°	34°04'	+59'	144°	33°15'	+59'	144°	32°26'	+59'	145°	31°37'	+59'	145°	30°48'	+59'	145°	19
20	36°39'	+59'	143°	35°51'	+59'	143°	35°03'	+59'	144°	34°14'	+59'	144°	33°25'	+59'	145°	32°36'	+59'	145°	31°47'	+59'	145°	20
21	37°37'	+58'	143°	36°50'	+59'	143°	36°01'	+59'	144°	35°13'	+59'	144°	34°24'	+59'	144°	33°36'	+59'	145°	32°46'	+59'	145°	21
22	38°36'	+58'	142°	37°48'	+59'	143°	37°00'	+59'	143°	36°12'	+59'	144°	35°23'	+59'	144°	34°35'	+59'	145°	33°46'	+59'	145°	22
23	39°34'	+58'	142°	38°47'	+59'	143°	37°59'	+59'	143°	37°11'	+59'	143°	36°23'	+59'	144°	35°34'	+59'	144°	34°45'	+59'	145°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

31° 329° LHA — Latitude SAME as Declination — 31° 329° LHA

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

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

32° 328° LHA — Latitude SAME as Declination — 32° 328° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	16°52'	+59'	146°	16°02'	+59'	147°	15°12'	+59'	147°	14°21'	+59'	147°	13°31'	+59'	147°	12°41'	+59'	147°	11°50'	+59'	147°	0
1	17°51'	+59'	146°	17°01'	+59'	146°	16°11'	+59'	147°	15°21'	+59'	147°	14°30'	+59'	147°	13°40'	+59'	147°	12°50'	+59'	147°	1
2	18°49'	+59'	146°	18°00'	+59'	146°	17°10'	+59'	146°	16°20'	+59'	147°	15°30'	+59'	147°	14°40'	+59'	147°	13°49'	+59'	147°	2
3	19°48'	+59'	146°	18°59'	+59'	146°	18°09'	+59'	146°	17°19'	+59'	146°	16°29'	+59'	147°	15°39'	+59'	147°	14°49'	+59'	147°	3
4	20°47'	+59'	146°	19°58'	+59'	146°	19°08'	+59'	146°	18°18'	+59'	146°	17°28'	+59'	146°	16°38'	+59'	147°	15°48'	+59'	147°	4
5	21°46'	+59'	145°	20°57'	+59'	146°	20°07'	+59'	146°	19°17'	+59'	146°	18°28'	+59'	146°	17°38'	+59'	146°	16°48'	+59'	147°	5
6	22°45'	+59'	145°	21°56'	+59'	145°	21°06'	+59'	146°	20°17'	+59'	146°	19°27'	+59'	146°	18°37'	+59'	146°	17°47'	+59'	146°	6
7	23°44'	+59'	145°	22°55'	+59'	145°	22°05'	+59'	145°	21°16'	+59'	146°	20°26'	+59'	146°	19°36'	+59'	146°	18°47'	+59'	146°	7
8	24°43'	+59'	145°	23°53'	+59'	145°	23°04'	+59'	145°	22°15'	+59'	145°	21°25'	+59'	146°	20°36'	+59'	146°	19°46'	+59'	146°	8
9	25°41'	+59'	144°	24°52'	+59'	145°	24°03'	+59'	145°	23°14'	+59'	145°	22°25'	+59'	146°	21°35'	+59'	146°	20°45'	+59'	146°	9
10	26°40'	+59'	144°	25°51'	+59'	145°	25°02'	+59'	145°	24°13'	+59'	145°	23°24'	+59'	145°	22°34'	+59'	146°	21°45'	+59'	146°	10
11	27°39'	+59'	144°	26°50'	+59'	144°	26°01'	+59'	145°	25°12'	+59'	145°	24°23'	+59'	145°	23°34'	+59'	145°	22°44'	+59'	146°	11
12	28°38'	+59'	144°	27°49'	+59'	144°	27°00'	+59'	144°	26°11'	+59'	145°	25°22'	+59'	145°	24°33'	+59'	145°	23°44'	+59'	146°	12
13	29°36'	+59'	144°	28°48'	+59'	144°	27°59'	+59'	144°	27°11'	+59'	145°	26°22'	+59'	145°	25°32'	+59'	145°	24°43'	+59'	145°	13
14	30°35'	+59'	143°	29°47'	+59'	144°	28°58'	+59'	144°	28°10'	+59'	144°	27°21'	+59'	145°	26°32'	+59'	145°	25°43'	+59'	145°	14
15	31°34'	+59'	143°	30°45'	+59'	143°	29°57'	+59'	144°	29°09'	+59'	144°	28°20'	+59'	144°	27°31'	+59'	145°	26°42'	+59'	145°	15
16	32°32'	+59'	143°	31°44'	+59'	143°	30°56'	+59'	144°	30°08'	+59'	144°	29°19'	+59'	144°	28°30'	+59'	145°	27°41'	+59'	145°	16
17	33°31'	+59'	143°	32°43'	+59'	143°	31°55'	+59'	143°	31°07'	+59'	144°	30°18'	+59'	144°	29°30'	+59'	144°	28°41'	+59'	145°	17
18	34°29'	+59'	142°	33°42'	+59'	143°	32°54'	+59'	143°	32°06'	+59'	143°	31°17'	+59'	144°	30°29'	+59'	144°	29°40'	+59'	145°	18
19	35°28'	+58'	142°	34°40'	+59'	142°	33°53'	+59'	143°	33°05'	+59'	143°	32°16'	+59'	144°	31°28'	+59'	144°	30°39'	+59'	144°	19
20	36°26'	+58'	142°	35°39'	+59'	142°	34°51'	+59'	143°	34°04'	+59'	143°	33°16'	+59'	143°	32°27'	+59'	144°	31°39'	+59'	144°	20
21	37°25'	+58'	141°	36°38'	+59'	142°	35°50'	+59'	142°	35°03'	+59'	143°	34°15'	+59'	143°	33°26'	+59'	144°	32°38'	+59'	144°	21
22	38°23'	+58'	141°	37°36'	+59'	142°	36°49'	+59'	142°	36°01'	+59'	143°	35°14'	+59'	143°	34°26'	+59'	143°	33°37'	+59'	144°	22
23	39°21'	+58'	141°	38°35'	+58'	141°	37°48'	+59'	142°	37°00'	+59'	142°	36°13'	+59'	143°	35°25'	+59'	143°	34°37'	+59'	144°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

32° 328° LHA — Latitude SAME as Declination — 32° 328° LHA

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

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

33° 327° LHA — Latitude SAME as Declination — 33° 327° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	16°40'	+59'	145°	15°51'	+59'	146°	15°01'	+59'	146°	14°12'	+59'	146°	13°22'	+59'	146°	12°32'	+59'	146°	11°42'	+59'	146°	0
1	17°39'	+59'	145°	16°50'	+59'	145°	16°00'	+59'	145°	15°11'	+59'	146°	14°21'	+59'	146°	13°32'	+59'	146°	12°42'	+59'	146°	1
2	18°38'	+59'	145°	17°49'	+59'	145°	16°59'	+59'	145°	16°10'	+59'	145°	15°21'	+59'	146°	14°31'	+59'	146°	13°41'	+59'	146°	2
3	19°37'	+59'	145°	18°48'	+59'	145°	17°58'	+59'	145°	17°09'	+59'	145°	16°20'	+59'	145°	15°30'	+59'	146°	14°41'	+59'	146°	3
4	20°35'	+59'	145°	19°47'	+59'	145°	18°57'	+59'	145°	18°08'	+59'	145°	17°19'	+59'	145°	16°30'	+59'	145°	15°40'	+59'	146°	4
5	21°34'	+59'	144°	20°45'	+59'	145°	19°57'	+59'	145°	19°07'	+59'	145°	18°18'	+59'	145°	17°29'	+59'	145°	16°40'	+59'	146°	5
6	22°33'	+59'	144°	21°44'	+59'	144°	20°56'	+59'	145°	20°07'	+59'	145°	19°18'	+59'	145°	18°28'	+59'	145°	17°39'	+59'	145°	6
7	23°32'	+59'	144°	22°43'	+59'	144°	21°55'	+59'	144°	21°06'	+59'	145°	20°17'	+59'	145°	19°28'	+59'	145°	18°38'	+59'	145°	7
8	24°31'	+59'	144°	23°42'	+59'	144°	22°54'	+59'	144°	22°05'	+59'	144°	21°16'	+59'	145°	20°27'	+59'	145°	19°38'	+59'	145°	8
9	25°29'	+59'	143°	24°41'	+59'	144°	23°53'	+59'	144°	23°04'	+59'	144°	22°15'	+59'	144°	21°26'	+59'	145°	20°37'	+59'	145°	9
10	26°28'	+59'	143°	25°40'	+59'	143°	24°51'	+59'	144°	24°03'	+59'	144°	23°14'	+59'	144°	22°26'	+59'	145°	21°37'	+59'	145°	10
11	27°27'	+59'	143°	26°39'	+59'	143°	25°50'	+59'	144°	25°02'	+59'	144°	24°14'	+59'	144°	23°25'	+59'	144°	22°36'	+59'	145°	11
12	28°25'	+59'	143°	27°37'	+59'	143°	26°49'	+59'	143°	26°01'	+59'	144°	25°13'	+59'	144°	24°24'	+59'	144°	23°35'	+59'	144°	12
13	29°24'	+59'	142°	28°36'	+59'	143°	27°48'	+59'	143°	27°00'	+59'	143°	26°12'	+59'	144°	25°23'	+59'	144°	24°35'	+59'	144°	13
14	30°22'	+59'	142°	29°35'	+59'	143°	28°47'	+59'	143°	27°59'	+59'	143°	27°11'	+59'	144°	26°23'	+59'	144°	25°34'	+59'	144°	14
15	31°21'	+59'	142°	30°34'	+59'	142°	29°46'	+59'	143°	28°58'	+59'	143°	28°10'	+59'	143°	27°22'	+59'	144°	26°34'	+59'	144°	15
16	32°20'	+59'	142°	31°32'	+59'	142°	30°45'	+59'	142°	29°57'	+59'	143°	29°09'	+59'	143°	28°21'	+59'	143°	27°33'	+59'	144°	16
17	33°18'	+58'	141°	32°31'	+59'	142°	31°44'	+59'	142°	30°56'	+59'	143°	30°08'	+59'	143°	29°20'	+59'	143°	28°32'	+59'	144°	17
18	34°17'	+58'	141°	33°30'	+59'	142°	32°43'	+59'	142°	31°55'	+59'	142°	31°07'	+59'	143°	30°20'	+59'	143°	29°31'	+59'	143°	18
19	35°15'	+58'	141°	34°28'	+59'	141°	33°41'	+59'	142°	32°54'	+59'	142°	32°07'	+59'	143°	31°19'	+59'	143°	30°31'	+59'	143°	19
20	36°13'	+58'	141°	35°27'	+59'	141°	34°40'	+59'	142°	33°53'	+59'	142°	33°06'	+59'	142°	32°18'	+59'	143°	31°30'	+59'	143°	20
21	37°12'	+58'	140°	36°25'	+59'	141°	35°39'	+59'	141°	34°52'	+59'	142°	34°05'	+59'	142°	33°17'	+59'	143°	32°29'	+59'	143°	21
22	38°10'	+58'	140°	37°24'	+58'	141°	36°37'	+59'	141°	35°51'	+59'	141°	35°04'	+59'	142°	34°16'	+59'	142°	33°29'	+59'	143°	22
23	39°08'	+58'	140°	38°22'	+58'	140°	37°36'	+59'	141°	36°49'	+59'	141°	36°03'	+59'	142°	35°15'	+59'	142°	34°28'	+59'	143°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

33° 327° LHA — Latitude SAME as Declination — 33° 327° LHA

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

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

34° 326° LHA — Latitude SAME as Declination — 34° 326° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	16°28'	+59'	144°	15°40'	+59'	144°	14°51'	+59'	145°	14°02'	+59'	145°	13°13'	+59'	145°	12°23'	+59'	145°	11°34'	+59'	145°	0
1	17°27'	+59'	144°	16°38'	+59'	144°	15°50'	+59'	144°	15°01'	+59'	145°	14°12'	+59'	145°	13°23'	+59'	145°	12°34'	+59'	145°	1
2	18°26'	+59'	144°	17°37'	+59'	144°	16°49'	+59'	144°	16°00'	+59'	144°	15°11'	+59'	145°	14°22'	+59'	145°	13°33'	+59'	145°	2
3	19°25'	+59'	144°	18°36'	+59'	144°	17°48'	+59'	144°	16°59'	+59'	144°	16°10'	+59'	144°	15°21'	+59'	145°	14°32'	+59'	145°	3
4	20°23'	+59'	143°	19°35'	+59'	144°	18°47'	+59'	144°	17°58'	+59'	144°	17°09'	+59'	144°	16°21'	+59'	144°	15°32'	+59'	145°	4
5	21°22'	+59'	143°	20°34'	+59'	143°	19°46'	+59'	144°	18°57'	+59'	144°	18°09'	+59'	144°	17°20'	+59'	144°	16°31'	+59'	144°	5
6	22°21'	+59'	143°	21°33'	+59'	143°	20°45'	+59'	144°	19°56'	+59'	144°	19°08'	+59'	144°	18°19'	+59'	144°	17°31'	+59'	144°	6
7	23°20'	+59'	143°	22°32'	+59'	143°	21°44'	+59'	143°	20°55'	+59'	144°	20°07'	+59'	144°	19°19'	+59'	144°	18°30'	+59'	144°	7
8	24°18'	+59'	143°	23°30'	+59'	143°	22°43'	+59'	143°	21°54'	+59'	143°	21°06'	+59'	144°	20°18'	+59'	144°	19°29'	+59'	144°	8
9	25°17'	+59'	142°	24°29'	+59'	143°	23°41'	+59'	143°	22°54'	+59'	143°	22°05'	+59'	143°	21°17'	+59'	144°	20°29'	+59'	144°	9
10	26°15'	+59'	142°	25°28'	+59'	142°	24°40'	+59'	143°	23°53'	+59'	143°	23°05'	+59'	143°	22°16'	+59'	143°	21°28'	+59'	144°	10
11	27°14'	+59'	142°	26°27'	+59'	142°	25°39'	+59'	142°	24°52'	+59'	143°	24°04'	+59'	143°	23°16'	+59'	143°	22°28'	+59'	144°	11
12	28°13'	+59'	142°	27°26'	+59'	142°	26°38'	+59'	142°	25°51'	+59'	143°	25°03'	+59'	143°	24°15'	+59'	143°	23°27'	+59'	143°	12
13	29°11'	+59'	141°	28°24'	+59'	142°	27°37'	+59'	142°	26°50'	+59'	142°	26°02'	+59'	143°	25°14'	+59'	143°	24°26'	+59'	143°	13
14	30°10'	+58'	141°	29°23'	+59'	141°	28°36'	+59'	142°	27°49'	+59'	142°	27°01'	+59'	142°	26°13'	+59'	143°	25°26'	+59'	143°	14
15	31°08'	+58'	141°	30°22'	+59'	141°	29°35'	+59'	142°	28°48'	+59'	142°	28°00'	+59'	142°	27°13'	+59'	143°	26°25'	+59'	143°	15
16	32°07'	+58'	141°	31°20'	+59'	141°	30°33'	+59'	141°	29°46'	+59'	142°	28°59'	+59'	142°	28°12'	+59'	142°	27°24'	+59'	143°	16
17	33°05'	+58'	140°	32°19'	+59'	141°	31°32'	+59'	141°	30°45'	+59'	142°	29°58'	+59'	142°	29°11'	+59'	142°	28°23'	+59'	143°	17
18	34°04'	+58'	140°	33°17'	+59'	140°	32°31'	+59'	141°	31°44'	+59'	141°	30°57'	+59'	142°	30°10'	+59'	142°	29°23'	+59'	142°	18
19	35°02'	+58'	140°	34°16'	+59'	140°	33°30'	+59'	141°	32°43'	+59'	141°	31°56'	+59'	141°	31°09'	+59'	142°	30°22'	+59'	142°	19
20	36°00'	+58'	139°	35°14'	+58'	140°	34°28'	+59'	140°	33°42'	+59'	141°	32°55'	+59'	141°	32°08'	+59'	142°	31°21'	+59'	142°	20
21	36°59'	+58'	139°	36°13'	+58'	140°	35°27'	+59'	140°	34°41'	+59'	141°	33°54'	+59'	141°	33°08'	+59'	141°	32°20'	+59'	142°	21
22	37°57'	+58'	139°	37°11'	+58'	139°	36°26'	+59'	140°	35°40'	+59'	140°	34°53'	+59'	141°	34°07'	+59'	141°	33°20'	+59'	142°	22
23	38°55'	+58'	139°	38°10'	+58'	139°	37°24'	+59'	140°	36°38'	+59'	140°	35°52'	+59'	141°	35°06'	+59'	141°	34°19'	+59'	141°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	16°16'	+59'	143°	15°28'	+59'	143°	14°40'	+59'	144°	13°51'	+59'	144°	13°03'	+59'	144°	12°14'	+59'	144°	11°26'	+59'	144°	0
1	17°15'	+59'	143°	16°27'	+59'	143°	15°39'	+59'	143°	14°51'	+59'	144°	14°02'	+59'	144°	13°14'	+59'	144°	12°25'	+59'	144°	1
2	18°14'	+59'	143°	17°26'	+59'	143°	16°38'	+59'	143°	15°50'	+59'	143°	15°01'	+59'	144°	14°13'	+59'	144°	13°25'	+59'	144°	2
3	19°12'	+59'	143°	18°25'	+59'	143°	17°37'	+59'	143°	16°49'	+59'	143°	16°01'	+59'	143°	15°12'	+59'	144°	14°24'	+59'	144°	3
4	20°11'	+59'	142°	19°23'	+59'	143°	18°36'	+59'	143°	17°48'	+59'	143°	17°00'	+59'	143°	16°12'	+59'	143°	15°23'	+59'	144°	4
5	21°10'	+59'	142°	20°22'	+59'	142°	19°35'	+59'	143°	18°47'	+59'	143°	17°59'	+59'	143°	17°11'	+59'	143°	16°23'	+59'	143°	5
6	22°08'	+59'	142°	21°21'	+59'	142°	20°33'	+59'	142°	19°46'	+59'	143°	18°58'	+59'	143°	18°10'	+59'	143°	17°22'	+59'	143°	6
7	23°07'	+59'	142°	22°20'	+59'	142°	21°32'	+59'	142°	20°45'	+59'	142°	19°57'	+59'	143°	19°09'	+59'	143°	18°21'	+59'	143°	7
8	24°06'	+59'	142°	23°19'	+59'	142°	22°31'	+59'	142°	21°44'	+59'	142°	20°56'	+59'	143°	20°09'	+59'	143°	19°21'	+59'	143°	8
9	25°04'	+59'	141°	24°17'	+59'	142°	23°30'	+59'	142°	22°43'	+59'	142°	21°55'	+59'	142°	21°08'	+59'	143°	20°20'	+59'	143°	9
10	26°03'	+59'	141°	25°16'	+59'	141°	24°29'	+59'	142°	23°42'	+59'	142°	22°55'	+59'	142°	22°07'	+59'	142°	21°19'	+59'	143°	10
11	27°01'	+59'	141°	26°15'	+59'	141°	25°28'	+59'	141°	24°41'	+59'	142°	23°54'	+59'	142°	23°06'	+59'	142°	22°19'	+59'	143°	11
12	28°00'	+58'	141°	27°13'	+59'	141°	26°27'	+59'	141°	25°40'	+59'	142°	24°53'	+59'	142°	24°06'	+59'	142°	23°18'	+59'	142°	12
13	28°58'	+58'	140°	28°12'	+59'	141°	27°25'	+59'	141°	26°39'	+59'	141°	25°52'	+59'	142°	25°05'	+59'	142°	24°17'	+59'	142°	13
14	29°57'	+58'	140°	29°11'	+59'	140°	28°24'	+59'	141°	27°38'	+59'	141°	26°51'	+59'	141°	26°04'	+59'	142°	25°17'	+59'	142°	14
15	30°55'	+58'	140°	30°09'	+59'	140°	29°23'	+59'	141°	28°37'	+59'	141°	27°50'	+59'	141°	27°03'	+59'	142°	26°16'	+59'	142°	15
16	31°54'	+58'	140°	31°08'	+59'	140°	30°22'	+59'	140°	29°35'	+59'	141°	28°49'	+59'	141°	28°02'	+59'	141°	27°15'	+59'	142°	16
17	32°52'	+58'	139°	32°06'	+59'	140°	31°20'	+59'	140°	30°34'	+59'	140°	29°48'	+59'	141°	29°01'	+59'	141°	28°15'	+59'	141°	17
18	33°50'	+58'	139°	33°05'	+58'	139°	32°19'	+59'	140°	31°33'	+59'	140°	30°47'	+59'	141°	30°00'	+59'	141°	29°14'	+59'	141°	18
19	34°49'	+58'	139°	34°03'	+58'	139°	33°18'	+59'	140°	32°32'	+59'	140°	31°46'	+59'	140°	31°00'	+59'	141°	30°13'	+59'	141°	19
20	35°47'	+58'	138°	35°02'	+58'	139°	34°16'	+59'	139°	33°31'	+59'	140°	32°45'	+59'	140°	31°59'	+59'	141°	31°12'	+59'	141°	20
21	36°45'	+58'	138°	36°00'	+58'	139°	35°15'	+59'	139°	34°30'	+59'	139°	33°44'	+59'	140°	32°58'	+59'	140°	32°11'	+59'	141°	21
22	37°43'	+58'	138°	36°59'	+58'	138°	36°14'	+59'	139°	35°28'	+59'	139°	34°43'	+59'	140°	33°57'	+59'	140°	33°11'	+59'	141°	22
23	38°41'	+58'	137°	37°57'	+58'	138°	37°12'	+58'	138°	36°27'	+59'	139°	35°42'	+59'	139°	34°56'	+59'	140°	34°10'	+59'	140°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	16°04'	+59'	142°	15°16'	+59'	142°	14°29'	+59'	143°	13°41'	+59'	143°	12°53'	+59'	143°	12°05'	+59'	143°	11°17'	+59'	143°	0
1	17°02'	+59'	142°	16°15'	+59'	142°	15°28'	+59'	142°	14°40'	+59'	143°	13°52'	+59'	143°	13°04'	+59'	143°	12°17'	+59'	143°	1
2	18°01'	+59'	142°	17°14'	+59'	142°	16°27'	+59'	142°	15°39'	+59'	142°	14°51'	+59'	143°	14°04'	+59'	143°	13°16'	+59'	143°	2
3	19°00'	+59'	142°	18°13'	+59'	142°	17°25'	+59'	142°	16°38'	+59'	142°	15°51'	+59'	142°	15°03'	+59'	143°	14°15'	+59'	143°	3
4	19°58'	+59'	141°	19°11'	+59'	142°	18°24'	+59'	142°	17°37'	+59'	142°	16°50'	+59'	142°	16°02'	+59'	142°	15°15'	+59'	143°	4
5	20°57'	+59'	141°	20°10'	+59'	141°	19°23'	+59'	142°	18°36'	+59'	142°	17°49'	+59'	142°	17°01'	+59'	142°	16°14'	+59'	142°	5
6	21°56'	+59'	141°	21°09'	+59'	141°	20°22'	+59'	141°	19°35'	+59'	142°	18°48'	+59'	142°	18°01'	+59'	142°	17°13'	+59'	142°	6
7	22°54'	+59'	141°	22°08'	+59'	141°	21°21'	+59'	141°	20°34'	+59'	141°	19°47'	+59'	142°	19°00'	+59'	142°	18°13'	+59'	142°	7
8	23°53'	+59'	140°	23°06'	+59'	141°	22°20'	+59'	141°	21°33'	+59'	141°	20°46'	+59'	141°	19°59'	+59'	142°	19°12'	+59'	142°	8
9	24°51'	+58'	140°	24°05'	+59'	141°	23°19'	+59'	141°	22°32'	+59'	141°	21°45'	+59'	141°	20°58'	+59'	142°	20°11'	+59'	142°	9
10	25°50'	+58'	140°	25°04'	+59'	140°	24°17'	+59'	141°	23°31'	+59'	141°	22°44'	+59'	141°	21°58'	+59'	141°	21°11'	+59'	142°	10
11	26°48'	+58'	140°	26°02'	+59'	140°	25°16'	+59'	140°	24°30'	+59'	141°	23°43'	+59'	141°	22°57'	+59'	141°	22°10'	+59'	141°	11
12	27°47'	+58'	139°	27°01'	+59'	140°	26°15'	+59'	140°	25°29'	+59'	140°	24°42'	+59'	141°	23°56'	+59'	141°	23°09'	+59'	141°	12
13	28°45'	+58'	139°	27°59'	+59'	140°	27°14'	+59'	140°	26°28'	+59'	140°	25°41'	+59'	141°	24°55'	+59'	141°	24°08'	+59'	141°	13
14	29°43'	+58'	139°	28°58'	+59'	139°	28°12'	+59'	140°	27°27'	+59'	140°	26°40'	+59'	140°	25°54'	+59'	141°	25°08'	+59'	141°	14
15	30°42'	+58'	139°	29°57'	+59'	139°	29°11'	+59'	139°	28°25'	+59'	140°	27°39'	+59'	140°	26°53'	+59'	140°	26°07'	+59'	141°	15
16	31°40'	+58'	138°	30°55'	+58'	139°	30°10'	+59'	139°	29°24'	+59'	140°	28°38'	+59'	140°	27°52'	+59'	140°	27°06'	+59'	141°	16
17	32°38'	+58'	138°	31°54'	+58'	139°	31°08'	+59'	139°	30°23'	+59'	139°	29°37'	+59'	140°	28°52'	+59'	140°	28°05'	+59'	140°	17
18	33°37'	+58'	138°	32°52'	+58'	138°	32°07'	+59'	139°	31°22'	+59'	139°	30°36'	+59'	139°	29°51'	+59'	140°	29°05'	+59'	140°	18
19	34°35'	+58'	138°	33°50'	+58'	138°	33°06'	+59'	138°	32°21'	+59'	139°	31°35'	+59'	139°	30°50'	+59'	140°	30°04'	+59'	140°	19
20	35°33'	+58'	137°	34°49'	+58'	138°	34°04'	+59'	138°	33°19'	+59'	139°	32°34'	+59'	139°	31°49'	+59'	139°	31°03'	+59'	140°	20
21	36°31'	+58'	137°	35°47'	+58'	137°	35°03'	+58'	138°	34°18'	+59'	138°	33°33'	+59'	139°	32°48'	+59'	139°	32°02'	+59'	140°	21
22	37°29'	+58'	137°	36°45'	+58'	137°	36°01'	+58'	138°	35°17'	+59'	138°	34°32'	+59'	139°	33°47'	+59'	139°	33°01'	+59'	139°	22
23	38°27'	+58'	136°	37°44'	+58'	137°	37°00'	+58'	137°	36°15'	+59'	138°	35°31'	+59'	138°	34°46'	+59'	139°	34°00'	+59'	139°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°51'	+59'	141°	15°04'	+59'	141°	14°17'	+59'	142°	13°30'	+59'	142°	12°43'	+59'	142°	11°56'	+59'	142°	11°08'	+59'	142°	0
1	16°50'	+59'	141°	16°03'	+59'	141°	15°16'	+59'	141°	14°29'	+59'	142°	13°42'	+59'	142°	12°55'	+59'	142°	12°08'	+59'	142°	1
2	17°48'	+59'	141°	17°02'	+59'	141°	16°15'	+59'	141°	15°28'	+59'	141°	14°41'	+59'	142°	13°54'	+59'	142°	13°07'	+59'	142°	2
3	18°47'	+59'	141°	18°00'	+59'	141°	17°14'	+59'	141°	16°27'	+59'	141°	15°40'	+59'	141°	14°53'	+59'	142°	14°06'	+59'	142°	3
4	19°45'	+59'	140°	18°59'	+59'	141°	18°13'	+59'	141°	17°26'	+59'	141°	16°39'	+59'	141°	15°53'	+59'	141°	15°06'	+59'	142°	4
5	20°44'	+59'	140°	19°58'	+59'	140°	19°12'	+59'	141°	18°25'	+59'	141°	17°39'	+59'	141°	16°52'	+59'	141°	16°05'	+59'	141°	5
6	21°42'	+58'	140°	20°57'	+59'	140°	20°10'	+59'	140°	19°24'	+59'	141°	18°38'	+59'	141°	17°51'	+59'	141°	17°04'	+59'	141°	6
7	22°41'	+58'	140°	21°55'	+59'	140°	21°09'	+59'	140°	20°23'	+59'	140°	19°37'	+59'	141°	18°50'	+59'	141°	18°04'	+59'	141°	7
8	23°39'	+58'	139°	22°54'	+59'	140°	22°08'	+59'	140°	21°22'	+59'	140°	20°36'	+59'	140°	19°49'	+59'	141°	19°03'	+59'	141°	8
9	24°38'	+58'	139°	23°52'	+59'	139°	23°07'	+59'	140°	22°21'	+59'	140°	21°35'	+59'	140°	20°49'	+59'	141°	20°02'	+59'	141°	9
10	25°36'	+58'	139°	24°51'	+59'	139°	24°05'	+59'	140°	23°20'	+59'	140°	22°34'	+59'	140°	21°48'	+59'	140°	21°01'	+59'	141°	10
11	26°35'	+58'	139°	25°50'	+59'	139°	25°04'	+59'	139°	24°19'	+59'	140°	23°33'	+59'	140°	22°47'	+59'	140°	22°01'	+59'	140°	11
12	27°33'	+58'	138°	26°48'	+59'	139°	26°03'	+59'	139°	25°17'	+59'	139°	24°32'	+59'	140°	23°46'	+59'	140°	23°00'	+59'	140°	12
13	28°31'	+58'	138°	27°47'	+58'	138°	27°02'	+59'	139°	26°16'	+59'	139°	25°31'	+59'	139°	24°45'	+59'	140°	23°59'	+59'	140°	13
14	29°30'	+58'	138°	28°45'	+58'	138°	28°00'	+59'	139°	27°15'	+59'	139°	26°30'	+59'	139°	25°44'	+59'	140°	24°58'	+59'	140°	14
15	30°28'	+58'	138°	29°44'	+58'	138°	28°59'	+59'	138°	28°14'	+59'	139°	27°29'	+59'	139°	26°43'	+59'	139°	25°58'	+59'	140°	15
16	31°26'	+58'	137°	30°42'	+58'	138°	29°58'	+59'	138°	29°13'	+59'	138°	28°28'	+59'	139°	27°42'	+59'	139°	26°57'	+59'	140°	16
17	32°25'	+58'	137°	31°40'	+58'	137°	30°56'	+59'	138°	30°11'	+59'	138°	29°27'	+59'	139°	28°41'	+59'	139°	27°56'	+59'	139°	17
18	33°23'	+58'	137°	32°39'	+58'	137°	31°55'	+59'	138°	31°10'	+59'	138°	30°25'	+59'	138°	29°40'	+59'	139°	28°55'	+59'	139°	18
19	34°21'	+58'	136°	33°37'	+58'	137°	32°53'	+58'	137°	32°09'	+59'	138°	31°24'	+59'	138°	30°39'	+59'	139°	29°54'	+59'	139°	19
20	35°19'	+58'	136°	34°35'	+58'	137°	33°52'	+58'	137°	33°08'	+59'	138°	32°23'	+59'	138°	31°38'	+59'	138°	30°53'	+59'	139°	20
21	36°17'	+58'	136°	35°34'	+58'	136°	34°50'	+58'	137°	34°06'	+59'	137°	33°22'	+59'	138°	32°37'	+59'	138°	31°53'	+59'	139°	21
22	37°15'	+58'	135°	36°32'	+58'	136°	35°49'	+58'	137°	35°05'	+59'	137°	34°21'	+59'	137°	33°36'	+59'	138°	32°52'	+59'	138°	22
23	38°13'	+58'	135°	37°30'	+58'	136°	36°47'	+58'	136°	36°03'	+59'	137°	35°20'	+59'	137°	34°35'	+59'	138°	33°51'	+59'	138°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°38'	+59'	140°	14°52'	+59'	140°	14°06'	+59'	141°	13°19'	+59'	141°	12°33'	+59'	141°	11°46'	+59'	141°	10°59'	+59'	141°	0
1	16°37'	+59'	140°	15°51'	+59'	140°	15°04'	+59'	140°	14°18'	+59'	141°	13°32'	+59'	141°	12°45'	+59'	141°	11°59'	+59'	141°	1
2	17°35'	+59'	140°	16°49'	+59'	140°	16°03'	+59'	140°	15°17'	+59'	140°	14°31'	+59'	141°	13°44'	+59'	141°	12°58'	+59'	141°	2
3	18°34'	+58'	140°	17°48'	+59'	140°	17°02'	+59'	140°	16°16'	+59'	140°	15°30'	+59'	140°	14°44'	+59'	141°	13°57'	+59'	141°	3
4	19°32'	+58'	139°	18°47'	+59'	140°	18°01'	+59'	140°	17°15'	+59'	140°	16°29'	+59'	140°	15°43'	+59'	140°	14°57'	+59'	141°	4
5	20°31'	+58'	139°	19°45'	+59'	139°	19°00'	+59'	140°	18°14'	+59'	140°	17°28'	+59'	140°	16°42'	+59'	140°	15°56'	+59'	140°	5
6	21°29'	+58'	139°	20°44'	+59'	139°	19°58'	+59'	139°	19°13'	+59'	140°	18°27'	+59'	140°	17°41'	+59'	140°	16°55'	+59'	140°	6
7	22°28'	+58'	139°	21°42'	+59'	139°	20°57'	+59'	139°	20°12'	+59'	139°	19°26'	+59'	140°	18°40'	+59'	140°	17°54'	+59'	140°	7
8	23°26'	+58'	138°	22°41'	+59'	139°	21°56'	+59'	139°	21°11'	+59'	139°	20°25'	+59'	139°	19°39'	+59'	140°	18°54'	+59'	140°	8
9	24°24'	+58'	138°	23°40'	+59'	138°	22°55'	+59'	139°	22°09'	+59'	139°	21°24'	+59'	139°	20°39'	+59'	139°	19°53'	+59'	140°	9
10	25°23'	+58'	138°	24°38'	+59'	138°	23°53'	+59'	138°	23°08'	+59'	139°	22°23'	+59'	139°	21°38'	+59'	139°	20°52'	+59'	140°	10
11	26°21'	+58'	138°	25°37'	+58'	138°	24°52'	+59'	138°	24°07'	+59'	139°	23°22'	+59'	139°	22°37'	+59'	139°	21°51'	+59'	139°	11
12	27°19'	+58'	137°	26°35'	+58'	138°	25°51'	+59'	138°	25°06'	+59'	138°	24°21'	+59'	139°	23°36'	+59'	139°	22°51'	+59'	139°	12
13	28°18'	+58'	137°	27°34'	+58'	137°	26°49'	+59'	138°	26°05'	+59'	138°	25°20'	+59'	138°	24°35'	+59'	139°	23°50'	+59'	139°	13
14	29°16'	+58'	137°	28°32'	+58'	137°	27°48'	+59'	138°	27°04'	+59'	138°	26°19'	+59'	138°	25°34'	+59'	139°	24°49'	+59'	139°	14
15	30°14'	+58'	137°	29°30'	+58'	137°	28°46'	+59'	137°	28°02'	+59'	138°	27°18'	+59'	138°	26°33'	+59'	138°	25°48'	+59'	139°	15
16	31°12'	+58'	136°	30°29'	+58'	137°	29°45'	+59'	137°	29°01'	+59'	137°	28°17'	+59'	138°	27°32'	+59'	138°	26°47'	+59'	138°	16
17	32°10'	+58'	136°	31°27'	+58'	136°	30°44'	+58'	137°	30°00'	+59'	137°	29°16'	+59'	138°	28°31'	+59'	138°	27°46'	+59'	138°	17
18	33°08'	+58'	136°	32°25'	+58'	136°	31°42'	+58'	137°	30°58'	+59'	137°	30°14'	+59'	137°	29°30'	+59'	138°	28°46'	+59'	138°	18
19	34°07'	+58'	135°	33°24'	+58'	136°	32°41'	+58'	136°	31°57'	+59'	137°	31°13'	+59'	137°	30°29'	+59'	138°	29°45'	+59'	138°	19
20	35°05'	+58'	135°	34°22'	+58'	136°	33°39'	+58'	136°	32°56'	+59'	136°	32°12'	+59'	137°	31°28'	+59'	137°	30°44'	+59'	138°	20
21	36°02'	+58'	135°	35°20'	+58'	135°	34°37'	+58'	136°	33°54'	+59'	136°	33°11'	+59'	137°	32°27'	+59'	137°	31°43'	+59'	137°	21
22	37°00'	+58'	134°	36°18'	+58'	135°	35°36'	+58'	135°	34°53'	+59'	136°	34°10'	+59'	136°	33°26'	+59'	137°	32°42'	+59'	137°	22
23	37°58'	+58'	134°	37°16'	+58'	135°	36°34'	+58'	135°	35°51'	+58'	136°	35°08'	+59'	136°	34°25'	+59'	137°	33°41'	+59'	137°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°25'	+58'	139°	14°39'	+59'	139°	13°54'	+59'	140°	13°08'	+59'	140°	12°22'	+59'	140°	11°36'	+59'	140°	10°50'	+59'	140°	0
1	16°23'	+58'	139°	15°38'	+59'	139°	14°53'	+59'	139°	14°07'	+59'	140°	13°21'	+59'	140°	12°35'	+59'	140°	11°49'	+59'	140°	1
2	17°22'	+58'	139°	16°37'	+59'	139°	15°51'	+59'	139°	15°06'	+59'	139°	14°20'	+59'	140°	13°35'	+59'	140°	12°49'	+59'	140°	2
3	18°20'	+58'	139°	17°35'	+59'	139°	16°50'	+59'	139°	16°05'	+59'	139°	15°19'	+59'	139°	14°34'	+59'	140°	13°48'	+59'	140°	3
4	19°19'	+58'	138°	18°34'	+59'	139°	17°49'	+59'	139°	17°04'	+59'	139°	16°18'	+59'	139°	15°33'	+59'	139°	14°47'	+59'	140°	4
5	20°17'	+58'	138°	19°32'	+59'	138°	18°47'	+59'	139°	18°02'	+59'	139°	17°17'	+59'	139°	16°32'	+59'	139°	15°46'	+59'	139°	5
6	21°15'	+58'	138°	20°31'	+59'	138°	19°46'	+59'	138°	19°01'	+59'	139°	18°16'	+59'	139°	17°31'	+59'	139°	16°46'	+59'	139°	6
7	22°14'	+58'	138°	21°29'	+59'	138°	20°45'	+59'	138°	20°00'	+59'	138°	19°15'	+59'	139°	18°30'	+59'	139°	17°45'	+59'	139°	7
8	23°12'	+58'	137°	22°28'	+58'	138°	21°44'	+59'	138°	20°59'	+59'	138°	20°14'	+59'	138°	19°29'	+59'	139°	18°44'	+59'	139°	8
9	24°11'	+58'	137°	23°26'	+58'	137°	22°42'	+59'	138°	21°58'	+59'	138°	21°13'	+59'	138°	20°28'	+59'	138°	19°43'	+59'	139°	9
10	25°09'	+58'	137°	24°25'	+58'	137°	23°41'	+59'	137°	22°57'	+59'	138°	22°12'	+59'	138°	21°27'	+59'	138°	20°43'	+59'	139°	10
11	26°07'	+58'	137°	25°23'	+58'	137°	24°40'	+59'	137°	23°55'	+59'	137°	23°11'	+59'	138°	22°27'	+59'	138°	21°42'	+59'	138°	11
12	27°05'	+58'	136°	26°22'	+58'	137°	25°38'	+59'	137°	24°54'	+59'	137°	24°10'	+59'	138°	23°26'	+59'	138°	22°41'	+59'	138°	12
13	28°04'	+58'	136°	27°20'	+58'	136°	26°37'	+59'	137°	25°53'	+59'	137°	25°09'	+59'	137°	24°25'	+59'	138°	23°40'	+59'	138°	13
14	29°02'	+58'	136°	28°19'	+58'	136°	27°35'	+59'	136°	26°52'	+59'	137°	26°08'	+59'	137°	25°24'	+59'	137°	24°39'	+59'	138°	14
15	30°00'	+58'	135°	29°17'	+58'	136°	28°34'	+58'	136°	27°50'	+59'	137°	27°07'	+59'	137°	26°23'	+59'	137°	25°38'	+59'	138°	15
16	30°58'	+58'	135°	30°15'	+58'	136°	29°32'	+58'	136°	28°49'	+59'	136°	28°05'	+59'	137°	27°22'	+59'	137°	26°38'	+59'	137°	16
17	31°56'	+58'	135°	31°14'	+58'	135°	30°31'	+58'	136°	29°48'	+59'	136°	29°04'	+59'	136°	28°21'	+59'	137°	27°37'	+59'	137°	17
18	32°54'	+58'	135°	32°12'	+58'	135°	31°29'	+58'	135°	30°46'	+59'	136°	30°03'	+59'	136°	29°20'	+59'	137°	28°36'	+59'	137°	18
19	33°52'	+58'	134°	33°10'	+58'	135°	32°28'	+58'	135°	31°45'	+59'	136°	31°02'	+59'	136°	30°19'	+59'	136°	29°35'	+59'	137°	19
20	34°50'	+58'	134°	34°08'	+58'	134°	33°26'	+58'	135°	32°43'	+59'	135°	32°01'	+59'	136°	31°17'	+59'	136°	30°34'	+59'	137°	20
21	35°48'	+58'	134°	35°06'	+58'	134°	34°24'	+58'	135°	33°42'	+58'	135°	32°59'	+59'	136°	32°16'	+59'	136°	31°33'	+59'	136°	21
22	36°46'	+58'	133°	36°04'	+58'	134°	35°23'	+58'	134°	34°40'	+58'	135°	33°58'	+59'	135°	33°15'	+59'	136°	32°32'	+59'	136°	22
23	37°43'	+58'	133°	37°02'	+58'	133°	36°21'	+58'	134°	35°39'	+58'	135°	34°57'	+59'	135°	34°14'	+59'	136°	33°31'	+59'	136°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

39° 321° LHA — Latitude SAME as Declination — 39° 321° LHA

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

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

40° 320° LHA — Latitude SAME as Declination — 40° 320° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°11'	+58'	138°	14°27'	+59'	138°	13°42'	+59'	139°	12°57'	+59'	139°	12°11'	+59'	139°	11°26'	+59'	139°	10°41'	+59'	139°	0
1	16°10'	+58'	138°	15°25'	+59'	138°	14°40'	+59'	138°	13°55'	+59'	139°	13°10'	+59'	139°	12°25'	+59'	139°	11°40'	+59'	139°	1
2	17°08'	+58'	138°	16°24'	+59'	138°	15°39'	+59'	138°	14°54'	+59'	138°	14°09'	+59'	139°	13°24'	+59'	139°	12°39'	+59'	139°	2
3	18°07'	+58'	138°	17°22'	+59'	138°	16°38'	+59'	138°	15°53'	+59'	138°	15°08'	+59'	138°	14°23'	+59'	138°	13°39'	+59'	139°	3
4	19°05'	+58'	137°	18°21'	+59'	138°	17°36'	+59'	138°	16°52'	+59'	138°	16°07'	+59'	138°	15°23'	+59'	138°	14°38'	+59'	138°	4
5	20°03'	+58'	137°	19°19'	+58'	137°	18°35'	+59'	138°	17°51'	+59'	138°	17°06'	+59'	138°	16°22'	+59'	138°	15°37'	+59'	138°	5
6	21°02'	+58'	137°	20°18'	+58'	137°	19°34'	+59'	137°	18°50'	+59'	138°	18°05'	+59'	138°	17°21'	+59'	138°	16°36'	+59'	138°	6
7	22°00'	+58'	137°	21°16'	+58'	137°	20°32'	+59'	137°	19°48'	+59'	137°	19°04'	+59'	138°	18°20'	+59'	138°	17°35'	+59'	138°	7
8	22°58'	+58'	136°	22°15'	+58'	137°	21°31'	+59'	137°	20°47'	+59'	137°	20°03'	+59'	137°	19°19'	+59'	138°	18°35'	+59'	138°	8
9	23°56'	+58'	136°	23°13'	+58'	136°	22°30'	+59'	137°	21°46'	+59'	137°	21°02'	+59'	137°	20°18'	+59'	137°	19°34'	+59'	138°	9
10	24°55'	+58'	136°	24°12'	+58'	136°	23°28'	+59'	136°	22°45'	+59'	137°	22°01'	+59'	137°	21°17'	+59'	137°	20°33'	+59'	137°	10
11	25°53'	+58'	135°	25°10'	+58'	136°	24°27'	+59'	136°	23°43'	+59'	136°	23°00'	+59'	137°	22°16'	+59'	137°	21°32'	+59'	137°	11
12	26°51'	+58'	135°	26°08'	+58'	136°	25°25'	+59'	136°	24°42'	+59'	136°	23°59'	+59'	137°	23°15'	+59'	137°	22°31'	+59'	137°	12
13	27°49'	+58'	135°	27°07'	+58'	135°	26°24'	+58'	136°	25°41'	+59'	136°	24°58'	+59'	136°	24°14'	+59'	137°	23°30'	+59'	137°	13
14	28°47'	+58'	135°	28°05'	+58'	135°	27°22'	+58'	135°	26°39'	+59'	136°	25°56'	+59'	136°	25°13'	+59'	136°	24°29'	+59'	137°	14
15	29°45'	+58'	134°	29°03'	+58'	135°	28°21'	+58'	135°	27°38'	+59'	136°	26°55'	+59'	136°	26°12'	+59'	136°	25°29'	+59'	137°	15
16	30°43'	+58'	134°	30°01'	+58'	134°	29°19'	+58'	135°	28°37'	+59'	135°	27°54'	+59'	136°	27°11'	+59'	136°	26°28'	+59'	136°	16
17	31°41'	+58'	134°	31°00'	+58'	134°	30°18'	+58'	135°	29°35'	+59'	135°	28°53'	+59'	135°	28°10'	+59'	136°	27°27'	+59'	136°	17
18	32°39'	+58'	133°	31°58'	+58'	134°	31°16'	+58'	134°	30°34'	+59'	135°	29°52'	+59'	135°	29°09'	+59'	136°	28°26'	+59'	136°	18
19	33°37'	+58'	133°	32°56'	+58'	134°	32°14'	+58'	134°	31°32'	+59'	135°	30°50'	+59'	135°	30°08'	+59'	135°	29°25'	+59'	136°	19
20	34°35'	+58'	133°	33°54'	+58'	133°	33°13'	+58'	134°	32°31'	+58'	134°	31°49'	+59'	135°	31°07'	+59'	135°	30°24'	+59'	136°	20
21	35°33'	+58'	132°	34°52'	+58'	133°	34°11'	+58'	133°	33°29'	+58'	134°	32°48'	+59'	134°	32°05'	+59'	135°	31°23'	+59'	135°	21
22	36°30'	+58'	132°	35°50'	+58'	133°	35°09'	+58'	133°	34°28'	+58'	134°	33°46'	+59'	134°	33°04'	+59'	135°	32°22'	+59'	135°	22
23	37°28'	+58'	132°	36°48'	+58'	132°	36°07'	+58'	133°	35°26'	+58'	133°	34°45'	+59'	134°	34°03'	+59'	134°	33°21'	+59'	135°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

40° 320° LHA — Latitude SAME as Declination — 40° 320° LHA

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

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

41° 319° LHA — Latitude SAME as Declination — 41° 319° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	14°58'	+58'	137°	14°13'	+59'	137°	13°29'	+59'	138°	12°45'	+59'	138°	12°00'	+59'	138°	11°16'	+59'	138°	10°31'	+59'	138°	0
1	15°56'	+58'	137°	15°12'	+59'	137°	14°28'	+59'	137°	13°44'	+59'	138°	12°59'	+59'	138°	12°15'	+59'	138°	11°30'	+59'	138°	1
2	16°54'	+58'	137°	16°10'	+58'	137°	15°27'	+59'	137°	14°42'	+59'	137°	13°58'	+59'	137°	13°14'	+59'	138°	12°30'	+59'	138°	2
3	17°53'	+58'	136°	17°09'	+58'	137°	16°25'	+59'	137°	15°41'	+59'	137°	14°57'	+59'	137°	14°13'	+59'	137°	13°29'	+59'	138°	3
4	18°51'	+58'	136°	18°07'	+58'	136°	17°24'	+59'	137°	16°40'	+59'	137°	15°56'	+59'	137°	15°12'	+59'	137°	14°28'	+59'	137°	4
5	19°49'	+58'	136°	19°06'	+58'	136°	18°22'	+59'	136°	17°39'	+59'	137°	16°55'	+59'	137°	16°11'	+59'	137°	15°27'	+59'	137°	5
6	20°47'	+58'	136°	20°04'	+58'	136°	19°21'	+59'	136°	18°38'	+59'	136°	17°54'	+59'	137°	17°10'	+59'	137°	16°26'	+59'	137°	6
7	21°46'	+58'	135°	21°03'	+58'	136°	20°20'	+59'	136°	19°36'	+59'	136°	18°53'	+59'	137°	18°09'	+59'	137°	17°26'	+59'	137°	7
8	22°44'	+58'	135°	22°01'	+58'	136°	21°18'	+59'	136°	20°35'	+59'	136°	19°52'	+59'	136°	19°08'	+59'	137°	18°25'	+59'	137°	8
9	23°42'	+58'	135°	22°59'	+58'	135°	22°17'	+59'	136°	21°34'	+59'	136°	20°51'	+59'	136°	20°07'	+59'	136°	19°24'	+59'	137°	9
10	24°40'	+58'	135°	23°58'	+58'	135°	23°15'	+59'	135°	22°33'	+59'	136°	21°50'	+59'	136°	21°06'	+59'	136°	20°23'	+59'	136°	10
11	25°38'	+58'	134°	24°56'	+58'	135°	24°14'	+58'	135°	23°31'	+59'	135°	22°48'	+59'	136°	22°05'	+59'	136°	21°22'	+59'	136°	11
12	26°36'	+58'	134°	25°54'	+58'	134°	25°12'	+58'	135°	24°30'	+59'	135°	23°47'	+59'	135°	23°04'	+59'	136°	22°21'	+59'	136°	12
13	27°34'	+58'	134°	26°53'	+58'	134°	26°11'	+58'	135°	25°29'	+59'	135°	24°46'	+59'	135°	24°03'	+59'	136°	23°20'	+59'	136°	13
14	28°32'	+58'	134°	27°51'	+58'	134°	27°09'	+58'	134°	26°27'	+59'	135°	25°45'	+59'	135°	25°02'	+59'	135°	24°19'	+59'	136°	14
15	29°30'	+58'	133°	28°49'	+58'	134°	28°08'	+58'	134°	27°26'	+59'	134°	26°44'	+59'	135°	26°01'	+59'	135°	25°19'	+59'	135°	15
16	30°28'	+58'	133°	29°47'	+58'	133°	29°06'	+58'	134°	28°24'	+59'	134°	27°42'	+59'	135°	27°00'	+59'	135°	26°18'	+59'	135°	16
17	31°26'	+58'	133°	30°45'	+58'	133°	30°04'	+58'	134°	29°23'	+59'	134°	28°41'	+59'	134°	27°59'	+59'	135°	27°17'	+59'	135°	17
18	32°24'	+58'	132°	31°44'	+58'	133°	31°03'	+58'	133°	30°21'	+58'	134°	29°40'	+59'	134°	28°58'	+59'	135°	28°16'	+59'	135°	18
19	33°22'	+58'	132°	32°42'	+58'	133°	32°01'	+58'	133°	31°20'	+58'	133°	30°38'	+59'	134°	29°57'	+59'	134°	29°15'	+59'	135°	19
20	34°20'	+58'	132°	33°40'	+58'	132°	32°59'	+58'	133°	32°18'	+58'	133°	31°37'	+59'	134°	30°56'	+59'	134°	30°14'	+59'	134°	20
21	35°17'	+58'	131°	34°38'	+58'	132°	33°57'	+58'	132°	33°17'	+58'	133°	32°36'	+59'	133°	31°54'	+59'	134°	31°13'	+59'	134°	21
22	36°15'	+58'	131°	35°36'	+58'	132°	34°56'	+58'	132°	34°15'	+58'	133°	33°34'	+59'	133°	32°53'	+59'	134°	32°12'	+59'	134°	22
23	37°13'	+58'	131°	36°33'	+58'	131°	35°54'	+58'	132°	35°13'	+58'	132°	34°33'	+59'	133°	33°52'	+59'	133°	33°10'	+59'	134°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

41° 319° LHA — Latitude SAME as Declination — 41° 319° LHA

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

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

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	14°43'	+58'	136°	14°00'	+58'	136°	13°17'	+59'	137°	12°33'	+59'	137°	11°49'	+59'	137°	11°05'	+59'	137°	10°21'	+59'	137°	0
1	15°42'	+58'	136°	14°59'	+58'	136°	14°15'	+59'	136°	13°32'	+59'	137°	12°48'	+59'	137°	12°04'	+59'	137°	11°21'	+59'	137°	1
2	16°40'	+58'	136°	15°57'	+58'	136°	15°14'	+59'	136°	14°30'	+59'	136°	13°47'	+59'	136°	13°03'	+59'	137°	12°20'	+59'	137°	2
3	17°38'	+58'	135°	16°55'	+58'	136°	16°12'	+59'	136°	15°29'	+59'	136°	14°46'	+59'	136°	14°03'	+59'	136°	13°19'	+59'	137°	3
4	18°37'	+58'	135°	17°54'	+58'	135°	17°11'	+59'	136°	16°28'	+59'	136°	15°45'	+59'	136°	15°02'	+59'	136°	14°18'	+59'	136°	4
5	19°35'	+58'	135°	18°52'	+58'	135°	18°10'	+59'	135°	17°27'	+59'	136°	16°44'	+59'	136°	16°01'	+59'	136°	15°17'	+59'	136°	5
6	20°33'	+58'	135°	19°51'	+58'	135°	19°08'	+59'	135°	18°25'	+59'	135°	17°43'	+59'	136°	17°00'	+59'	136°	16°16'	+59'	136°	6
7	21°31'	+58'	134°	20°49'	+58'	135°	20°07'	+59'	135°	19°24'	+59'	135°	18°41'	+59'	135°	17°59'	+59'	136°	17°16'	+59'	136°	7
8	22°29'	+58'	134°	21°47'	+58'	134°	21°05'	+58'	135°	20°23'	+59'	135°	19°40'	+59'	135°	18°58'	+59'	136°	18°15'	+59'	136°	8
9	23°27'	+58'	134°	22°46'	+58'	134°	22°04'	+58'	135°	21°21'	+59'	135°	20°39'	+59'	135°	19°57'	+59'	135°	19°14'	+59'	136°	9
10	24°25'	+58'	134°	23°44'	+58'	134°	23°02'	+58'	134°	22°20'	+59'	135°	21°38'	+59'	135°	20°56'	+59'	135°	20°13'	+59'	135°	10
11	25°23'	+58'	133°	24°42'	+58'	134°	24°01'	+58'	134°	23°19'	+59'	134°	22°37'	+59'	135°	21°54'	+59'	135°	21°12'	+59'	135°	11
12	26°22'	+58'	133°	25°40'	+58'	133°	24°59'	+58'	134°	24°17'	+59'	134°	23°36'	+59'	134°	22°53'	+59'	135°	22°11'	+59'	135°	12
13	27°20'	+58'	133°	26°39'	+58'	133°	25°57'	+58'	134°	25°16'	+59'	134°	24°34'	+59'	134°	23°52'	+59'	135°	23°10'	+59'	135°	13
14	28°17'	+58'	132°	27°37'	+58'	133°	26°56'	+58'	133°	26°15'	+59'	134°	25°33'	+59'	134°	24°51'	+59'	134°	24°09'	+59'	135°	14
15	29°15'	+58'	132°	28°35'	+58'	133°	27°54'	+58'	133°	27°13'	+59'	133°	26°32'	+59'	134°	25°50'	+59'	134°	25°08'	+59'	134°	15
16	30°13'	+58'	132°	29°33'	+58'	132°	28°52'	+58'	133°	28°12'	+58'	133°	27°30'	+59'	134°	26°49'	+59'	134°	26°07'	+59'	134°	16
17	31°11'	+58'	132°	30°31'	+58'	132°	29°51'	+58'	132°	29°10'	+58'	133°	28°29'	+59'	133°	27°48'	+59'	134°	27°06'	+59'	134°	17
18	32°09'	+58'	131°	31°29'	+58'	132°	30°49'	+58'	132°	30°09'	+58'	133°	29°28'	+59'	133°	28°47'	+59'	133°	28°05'	+59'	134°	18
19	33°07'	+58'	131°	32°27'	+58'	131°	31°47'	+58'	132°	31°07'	+58'	132°	30°26'	+59'	133°	29°45'	+59'	133°	29°04'	+59'	134°	19
20	34°04'	+58'	131°	33°25'	+58'	131°	32°45'	+58'	132°	32°05'	+58'	132°	31°25'	+59'	133°	30°44'	+59'	133°	30°03'	+59'	133°	20
21	35°02'	+58'	130°	34°23'	+58'	131°	33°44'	+58'	131°	33°04'	+58'	132°	32°24'	+59'	132°	31°43'	+59'	133°	31°02'	+59'	133°	21
22	36°00'	+58'	130°	35°21'	+58'	130°	34°42'	+58'	131°	34°02'	+58'	132°	33°22'	+59'	132°	32°42'	+59'	133°	32°01'	+59'	133°	22
23	36°57'	+57'	130°	36°19'	+58'	130°	35°40'	+58'	131°	35°00'	+58'	131°	34°21'	+58'	132°	33°40'	+59'	132°	33°00'	+59'	133°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

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

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

43° 317° LHA — Latitude SAME as Declination — 43° 317° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	14°29'	+58'	135°	13°46'	+58'	135°	13°04'	+59'	136°	12°21'	+59'	136°	11°38'	+59'	136°	10°55'	+59'	136°	10°11'	+59'	136°	0
1	15°27'	+58'	135°	14°45'	+58'	135°	14°02'	+59'	135°	13°20'	+59'	136°	12°37'	+59'	136°	11°54'	+59'	136°	11°11'	+59'	136°	1
2	16°26'	+58'	135°	15°43'	+58'	135°	15°01'	+59'	135°	14°18'	+59'	135°	13°36'	+59'	135°	12°53'	+59'	136°	12°10'	+59'	136°	2
3	17°24'	+58'	134°	16°42'	+58'	135°	15°59'	+59'	135°	15°17'	+59'	135°	14°34'	+59'	135°	13°52'	+59'	135°	13°09'	+59'	136°	3
4	18°22'	+58'	134°	17°40'	+58'	134°	16°58'	+59'	135°	16°16'	+59'	135°	15°33'	+59'	135°	14°51'	+59'	135°	14°08'	+59'	135°	4
5	19°20'	+58'	134°	18°38'	+58'	134°	17°56'	+59'	134°	17°14'	+59'	135°	16°32'	+59'	135°	15°50'	+59'	135°	15°07'	+59'	135°	5
6	20°18'	+58'	134°	19°37'	+58'	134°	18°55'	+58'	134°	18°13'	+59'	134°	17°31'	+59'	135°	16°49'	+59'	135°	16°06'	+59'	135°	6
7	21°16'	+58'	133°	20°35'	+58'	134°	19°53'	+58'	134°	19°12'	+59'	134°	18°30'	+59'	134°	17°48'	+59'	135°	17°05'	+59'	135°	7
8	22°14'	+58'	133°	21°33'	+58'	133°	20°52'	+58'	134°	20°10'	+59'	134°	19°29'	+59'	134°	18°47'	+59'	134°	18°04'	+59'	135°	8
9	23°12'	+58'	133°	22°31'	+58'	133°	21°50'	+58'	133°	21°09'	+59'	134°	20°27'	+59'	134°	19°46'	+59'	134°	19°04'	+59'	135°	9
10	24°10'	+58'	133°	23°30'	+58'	133°	22°49'	+58'	133°	22°08'	+59'	134°	21°26'	+59'	134°	20°44'	+59'	134°	20°03'	+59'	134°	10
11	25°08'	+58'	132°	24°28'	+58'	133°	23°47'	+58'	133°	23°06'	+59'	133°	22°25'	+59'	134°	21°43'	+59'	134°	21°02'	+59'	134°	11
12	26°06'	+58'	132°	25°26'	+58'	132°	24°46'	+58'	133°	24°05'	+59'	133°	23°24'	+59'	133°	22°42'	+59'	134°	22°01'	+59'	134°	12
13	27°04'	+58'	132°	26°24'	+58'	132°	25°44'	+58'	132°	25°03'	+59'	133°	24°22'	+59'	133°	23°41'	+59'	133°	23°00'	+59'	134°	13
14	28°02'	+58'	131°	27°22'	+58'	132°	26°42'	+58'	132°	26°02'	+58'	133°	25°21'	+59'	133°	24°40'	+59'	133°	23°59'	+59'	134°	14
15	29°00'	+58'	131°	28°20'	+58'	132°	27°40'	+58'	132°	27°00'	+58'	132°	26°20'	+59'	133°	25°39'	+59'	133°	24°58'	+59'	133°	15
16	29°58'	+58'	131°	29°18'	+58'	131°	28°39'	+58'	132°	27°59'	+58'	132°	27°18'	+59'	132°	26°38'	+59'	133°	25°57'	+59'	133°	16
17	30°56'	+58'	131°	30°16'	+58'	131°	29°37'	+58'	131°	28°57'	+58'	132°	28°17'	+59'	132°	27°37'	+59'	133°	26°56'	+59'	133°	17
18	31°53'	+58'	130°	31°14'	+58'	131°	30°35'	+58'	131°	29°56'	+58'	132°	29°16'	+59'	132°	28°35'	+59'	132°	27°55'	+59'	133°	18
19	32°51'	+58'	130°	32°12'	+58'	130°	31°33'	+58'	131°	30°54'	+58'	131°	30°14'	+59'	132°	29°34'	+59'	132°	28°54'	+59'	133°	19
20	33°49'	+58'	130°	33°10'	+58'	130°	32°31'	+58'	131°	31°52'	+58'	131°	31°13'	+59'	131°	30°33'	+59'	132°	29°53'	+59'	132°	20
21	34°46'	+58'	129°	34°08'	+58'	130°	33°30'	+58'	130°	32°51'	+58'	131°	32°11'	+58'	131°	31°32'	+59'	132°	30°51'	+59'	132°	21
22	35°44'	+57'	129°	35°06'	+58'	129°	34°28'	+58'	130°	33°49'	+58'	130°	33°10'	+58'	131°	32°30'	+59'	131°	31°50'	+59'	132°	22
23	36°41'	+57'	128°	36°04'	+58'	129°	35°26'	+58'	130°	34°47'	+58'	130°	34°08'	+58'	131°	33°29'	+59'	131°	32°49'	+59'	132°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

43° 317° LHA — Latitude SAME as Declination — 43° 317° 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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	14°15'	+58'	134°	13°33'	+58'	134°	12°51'	+59'	135°	12°08'	+59'	135°	11°26'	+59'	135°	10°44'	+59'	135°	10°01'	+59'	135°	0
1	15°13'	+58'	134°	14°31'	+58'	134°	13°49'	+59'	134°	13°07'	+59'	135°	12°25'	+59'	135°	11°43'	+59'	135°	11°00'	+59'	135°	1
2	16°11'	+58'	134°	15°29'	+58'	134°	14°48'	+58'	134°	14°06'	+59'	134°	13°24'	+59'	134°	12°42'	+59'	135°	12°00'	+59'	135°	2
3	17°09'	+58'	133°	16°28'	+58'	134°	15°46'	+58'	134°	15°04'	+59'	134°	14°23'	+59'	134°	13°41'	+59'	134°	12°59'	+59'	135°	3
4	18°07'	+58'	133°	17°26'	+58'	133°	16°45'	+58'	134°	16°03'	+59'	134°	15°21'	+59'	134°	14°40'	+59'	134°	13°58'	+59'	134°	4
5	19°05'	+58'	133°	18°24'	+58'	133°	17°43'	+58'	133°	17°02'	+59'	134°	16°20'	+59'	134°	15°39'	+59'	134°	14°57'	+59'	134°	5
6	20°03'	+58'	133°	19°22'	+58'	133°	18°42'	+58'	133°	18°00'	+59'	133°	17°19'	+59'	134°	16°38'	+59'	134°	15°56'	+59'	134°	6
7	21°01'	+58'	132°	20°21'	+58'	133°	19°40'	+58'	133°	18°59'	+59'	133°	18°18'	+59'	133°	17°36'	+59'	134°	16°55'	+59'	134°	7
8	21°59'	+58'	132°	21°19'	+58'	132°	20°38'	+58'	133°	19°58'	+59'	133°	19°17'	+59'	133°	18°35'	+59'	133°	17°54'	+59'	134°	8
9	22°57'	+58'	132°	22°17'	+58'	132°	21°37'	+58'	132°	20°56'	+59'	133°	20°15'	+59'	133°	19°34'	+59'	133°	18°53'	+59'	134°	9
10	23°55'	+58'	132°	23°15'	+58'	132°	22°35'	+58'	132°	21°55'	+59'	132°	21°14'	+59'	133°	20°33'	+59'	133°	19°52'	+59'	133°	10
11	24°53'	+58'	131°	24°13'	+58'	132°	23°33'	+58'	132°	22°53'	+59'	132°	22°13'	+59'	133°	21°32'	+59'	133°	20°51'	+59'	133°	11
12	25°51'	+58'	131°	25°12'	+58'	131°	24°32'	+58'	132°	23°52'	+58'	132°	23°11'	+59'	132°	22°31'	+59'	133°	21°50'	+59'	133°	12
13	26°49'	+58'	131°	26°10'	+58'	131°	25°30'	+58'	131°	24°50'	+58'	132°	24°10'	+59'	132°	23°30'	+59'	132°	22°49'	+59'	133°	13
14	27°47'	+58'	130°	27°08'	+58'	131°	26°28'	+58'	131°	25°49'	+58'	132°	25°09'	+59'	132°	24°29'	+59'	132°	23°48'	+59'	133°	14
15	28°44'	+58'	130°	28°06'	+58'	130°	27°27'	+58'	131°	26°47'	+58'	131°	26°07'	+59'	132°	25°27'	+59'	132°	24°47'	+59'	132°	15
16	29°42'	+58'	130°	29°04'	+58'	130°	28°25'	+58'	131°	27°46'	+58'	131°	27°06'	+59'	131°	26°26'	+59'	132°	25°46'	+59'	132°	16
17	30°40'	+58'	129°	30°02'	+58'	130°	29°23'	+58'	130°	28°44'	+58'	131°	28°05'	+59'	131°	27°25'	+59'	132°	26°45'	+59'	132°	17
18	31°38'	+58'	129°	30°59'	+58'	130°	30°21'	+58'	130°	29°42'	+58'	130°	29°03'	+59'	131°	28°24'	+59'	131°	27°44'	+59'	132°	18
19	32°35'	+58'	129°	31°57'	+58'	129°	31°19'	+58'	130°	30°41'	+58'	130°	30°02'	+58'	131°	29°22'	+59'	131°	28°43'	+59'	132°	19
20	33°33'	+57'	128°	32°55'	+58'	129°	32°17'	+58'	129°	31°39'	+58'	130°	31°00'	+58'	130°	30°21'	+59'	131°	29°42'	+59'	131°	20
21	34°30'	+57'	128°	33°53'	+58'	129°	33°15'	+58'	129°	32°37'	+58'	130°	31°59'	+58'	130°	31°20'	+59'	131°	30°41'	+59'	131°	21
22	35°28'	+57'	128°	34°51'	+58'	128°	34°13'	+58'	129°	33°35'	+58'	129°	32°57'	+58'	130°	32°18'	+59'	130°	31°39'	+59'	131°	22
23	36°25'	+57'	127°	35°48'	+58'	128°	35°11'	+58'	129°	34°34'	+58'	129°	33°56'	+58'	130°	33°17'	+59'	130°	32°38'	+59'	131°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

44° 316° LHA — Latitude SAME as Declination — 44° 316° LHA

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

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

45° 315° LHA — Latitude SAME as Declination — 45° 315° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	14°00'	+58'	133°	13°19'	+58'	133°	12°37'	+58'	134°	11°56'	+59'	134°	11°14'	+59'	134°	10°33'	+59'	134°	9°51'	+59'	134°	0
1	14°58'	+58'	133°	14°17'	+58'	133°	13°36'	+58'	133°	12°55'	+59'	134°	12°13'	+59'	134°	11°32'	+59'	134°	10°50'	+59'	134°	1
2	15°56'	+58'	133°	15°15'	+58'	133°	14°34'	+58'	133°	13°53'	+59'	133°	13°12'	+59'	133°	12°31'	+59'	134°	11°49'	+59'	134°	2
3	16°54'	+58'	132°	16°13'	+58'	133°	15°33'	+58'	133°	14°52'	+59'	133°	14°11'	+59'	133°	13°30'	+59'	133°	12°48'	+59'	134°	3
4	17°52'	+58'	132°	17°12'	+58'	132°	16°31'	+58'	133°	15°50'	+59'	133°	15°09'	+59'	133°	14°28'	+59'	133°	13°47'	+59'	133°	4
5	18°50'	+58'	132°	18°10'	+58'	132°	17°29'	+58'	132°	16°49'	+59'	133°	16°08'	+59'	133°	15°27'	+59'	133°	14°46'	+59'	133°	5
6	19°48'	+58'	132°	19°08'	+58'	132°	18°28'	+58'	132°	17°48'	+59'	132°	17°07'	+59'	133°	16°26'	+59'	133°	15°45'	+59'	133°	6
7	20°46'	+58'	131°	20°06'	+58'	132°	19°26'	+58'	132°	18°46'	+59'	132°	18°06'	+59'	132°	17°25'	+59'	133°	16°44'	+59'	133°	7
8	21°44'	+58'	131°	21°04'	+58'	131°	20°25'	+58'	132°	19°45'	+59'	132°	19°04'	+59'	132°	18°24'	+59'	132°	17°43'	+59'	133°	8
9	22°42'	+58'	131°	22°03'	+58'	131°	21°23'	+58'	131°	20°43'	+59'	132°	20°03'	+59'	132°	19°23'	+59'	132°	18°42'	+59'	132°	9
10	23°40'	+58'	131°	23°01'	+58'	131°	22°21'	+58'	131°	21°42'	+58'	131°	21°02'	+59'	132°	20°22'	+59'	132°	19°41'	+59'	132°	10
11	24°38'	+58'	130°	23°59'	+58'	131°	23°20'	+58'	131°	22°40'	+58'	131°	22°01'	+59'	132°	21°21'	+59'	132°	20°40'	+59'	132°	11
12	25°35'	+58'	130°	24°57'	+58'	130°	24°18'	+58'	131°	23°39'	+58'	131°	22°59'	+59'	131°	22°19'	+59'	132°	21°39'	+59'	132°	12
13	26°33'	+58'	130°	25°55'	+58'	130°	25°16'	+58'	130°	24°37'	+58'	131°	23°58'	+59'	131°	23°18'	+59'	131°	22°38'	+59'	132°	13
14	27°31'	+58'	129°	26°53'	+58'	130°	26°14'	+58'	130°	25°35'	+58'	130°	24°56'	+59'	131°	24°17'	+59'	131°	23°37'	+59'	132°	14
15	28°29'	+58'	129°	27°51'	+58'	129°	27°12'	+58'	130°	26°34'	+58'	130°	25°55'	+59'	131°	25°16'	+59'	131°	24°36'	+59'	131°	15
16	29°26'	+58'	129°	28°49'	+58'	129°	28°11'	+58'	130°	27°32'	+58'	130°	26°54'	+59'	130°	26°15'	+59'	131°	25°35'	+59'	131°	16
17	30°24'	+58'	128°	29°46'	+58'	129°	29°09'	+58'	129°	28°31'	+58'	130°	27°52'	+59'	130°	27°13'	+59'	130°	26°34'	+59'	131°	17
18	31°22'	+58'	128°	30°44'	+58'	129°	30°07'	+58'	129°	29°29'	+58'	129°	28°51'	+58'	130°	28°12'	+59'	130°	27°33'	+59'	131°	18
19	32°19'	+57'	128°	31°42'	+58'	128°	31°05'	+58'	129°	30°27'	+58'	129°	29°49'	+58'	130°	29°11'	+59'	130°	28°32'	+59'	130°	19
20	33°16'	+57'	127°	32°40'	+58'	128°	32°03'	+58'	128°	31°25'	+58'	129°	30°48'	+58'	129°	30°09'	+59'	130°	29°31'	+59'	130°	20
21	34°14'	+57'	127°	33°38'	+58'	128°	33°01'	+58'	128°	32°24'	+58'	129°	31°46'	+58'	129°	31°08'	+59'	130°	30°30'	+59'	130°	21
22	35°11'	+57'	127°	34°35'	+58'	127°	33°59'	+58'	128°	33°22'	+58'	128°	32°44'	+58'	129°	32°07'	+59'	129°	31°28'	+59'	130°	22
23	36°09'	+57'	126°	35°33'	+58'	127°	34°57'	+58'	127°	34°20'	+58'	128°	33°43'	+58'	129°	33°05'	+59'	129°	32°27'	+59'	130°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	13°45'	+58'	132°	13°04'	+58'	132°	12°24'	+58'	133°	11°43'	+59'	133°	11°02'	+59'	133°	10°21'	+59'	133°	9°40'	+59'	133°	0
1	14°43'	+58'	132°	14°02'	+58'	132°	13°22'	+58'	132°	12°42'	+59'	133°	12°01'	+59'	133°	11°20'	+59'	133°	10°40'	+59'	133°	1
2	15°41'	+58'	132°	15°01'	+58'	132°	14°21'	+58'	132°	13°40'	+59'	132°	13°00'	+59'	132°	12°19'	+59'	133°	11°39'	+59'	133°	2
3	16°39'	+58'	131°	15°59'	+58'	132°	15°19'	+58'	132°	14°39'	+59'	132°	13°59'	+59'	132°	13°18'	+59'	132°	12°38'	+59'	133°	3
4	17°37'	+58'	131°	16°57'	+58'	131°	16°17'	+58'	132°	15°37'	+59'	132°	14°57'	+59'	132°	14°17'	+59'	132°	13°37'	+59'	132°	4
5	18°35'	+58'	131°	17°55'	+58'	131°	17°16'	+58'	131°	16°36'	+59'	132°	15°56'	+59'	132°	15°16'	+59'	132°	14°36'	+59'	132°	5
6	19°33'	+58'	131°	18°53'	+58'	131°	18°14'	+58'	131°	17°34'	+59'	131°	16°55'	+59'	132°	16°15'	+59'	132°	15°35'	+59'	132°	6
7	20°30'	+58'	130°	19°52'	+58'	131°	19°12'	+58'	131°	18°33'	+58'	131°	17°53'	+59'	131°	17°14'	+59'	132°	16°34'	+59'	132°	7
8	21°28'	+58'	130°	20°50'	+58'	130°	20°11'	+58'	131°	19°31'	+58'	131°	18°52'	+59'	131°	18°12'	+59'	131°	17°33'	+59'	132°	8
9	22°26'	+58'	130°	21°48'	+58'	130°	21°09'	+58'	130°	20°30'	+58'	131°	19°51'	+59'	131°	19°11'	+59'	131°	18°32'	+59'	131°	9
10	23°24'	+58'	129°	22°46'	+58'	130°	22°07'	+58'	130°	21°28'	+58'	130°	20°49'	+59'	131°	20°10'	+59'	131°	19°31'	+59'	131°	10
11	24°22'	+58'	129°	23°44'	+58'	130°	23°05'	+58'	130°	22°27'	+58'	130°	21°48'	+59'	130°	21°09'	+59'	131°	20°30'	+59'	131°	11
12	25°20'	+58'	129°	24°42'	+58'	129°	24°04'	+58'	130°	23°25'	+58'	130°	22°47'	+59'	130°	22°08'	+59'	131°	21°29'	+59'	131°	12
13	26°17'	+58'	129°	25°40'	+58'	129°	25°02'	+58'	129°	24°24'	+58'	130°	23°45'	+59'	130°	23°06'	+59'	130°	22°28'	+59'	131°	13
14	27°15'	+58'	128°	26°38'	+58'	129°	26°00'	+58'	129°	25°22'	+58'	129°	24°44'	+59'	130°	24°05'	+59'	130°	23°26'	+59'	130°	14
15	28°13'	+58'	128°	27°36'	+58'	128°	26°58'	+58'	129°	26°20'	+58'	129°	25°42'	+59'	130°	25°04'	+59'	130°	24°25'	+59'	130°	15
16	29°10'	+58'	128°	28°33'	+58'	128°	27°56'	+58'	128°	27°19'	+58'	129°	26°41'	+58'	129°	26°03'	+59'	130°	25°24'	+59'	130°	16
17	30°08'	+57'	127°	29°31'	+58'	128°	28°54'	+58'	128°	28°17'	+58'	129°	27°39'	+58'	129°	27°01'	+59'	129°	26°23'	+59'	130°	17
18	31°05'	+57'	127°	30°29'	+58'	127°	29°52'	+58'	128°	29°15'	+58'	128°	28°38'	+58'	129°	28°00'	+59'	129°	27°22'	+59'	130°	18
19	32°03'	+57'	127°	31°27'	+58'	127°	30°50'	+58'	128°	30°13'	+58'	128°	29°36'	+58'	129°	28°59'	+59'	129°	28°21'	+59'	129°	19
20	33°00'	+57'	126°	32°24'	+58'	127°	31°48'	+58'	127°	31°12'	+58'	128°	30°35'	+58'	128°	29°57'	+59'	129°	29°20'	+59'	129°	20
21	33°57'	+57'	126°	33°22'	+58'	126°	32°46'	+58'	127°	32°10'	+58'	128°	31°33'	+58'	128°	30°56'	+59'	128°	30°18'	+59'	129°	21
22	34°55'	+57'	126°	34°20'	+58'	126°	33°44'	+58'	127°	33°08'	+58'	127°	32°31'	+58'	128°	31°54'	+59'	128°	31°17'	+59'	129°	22
23	35°52'	+57'	125°	35°17'	+57'	126°	34°42'	+58'	126°	34°06'	+58'	127°	33°30'	+58'	127°	32°53'	+58'	128°	32°16'	+59'	128°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	13°29'	+58'	131°	12°50'	+58'	131°	12°10'	+58'	132°	11°30'	+59'	132°	10°50'	+59'	132°	10°10'	+59'	132°	9°30'	+59'	132°	0
1	14°27'	+58'	131°	13°48'	+58'	131°	13°08'	+58'	131°	12°29'	+59'	132°	11°49'	+59'	132°	11°09'	+59'	132°	10°29'	+59'	132°	1
2	15°25'	+58'	131°	14°46'	+58'	131°	14°07'	+58'	131°	13°27'	+59'	131°	12°48'	+59'	131°	12°08'	+59'	132°	11°28'	+59'	132°	2
3	16°23'	+58'	130°	15°44'	+58'	131°	15°05'	+58'	131°	14°26'	+59'	131°	13°46'	+59'	131°	13°07'	+59'	131°	12°27'	+59'	132°	3
4	17°21'	+58'	130°	16°42'	+58'	130°	16°03'	+58'	131°	15°24'	+58'	131°	14°45'	+59'	131°	14°05'	+59'	131°	13°26'	+59'	131°	4
5	18°19'	+58'	130°	17°40'	+58'	130°	17°02'	+58'	130°	16°23'	+58'	131°	15°44'	+59'	131°	15°04'	+59'	131°	14°25'	+59'	131°	5
6	19°17'	+58'	130°	18°39'	+58'	130°	18°00'	+58'	130°	17°21'	+58'	130°	16°42'	+59'	131°	16°03'	+59'	131°	15°24'	+59'	131°	6
7	20°15'	+58'	129°	19°37'	+58'	130°	18°58'	+58'	130°	18°20'	+58'	130°	17°41'	+59'	130°	17°02'	+59'	131°	16°23'	+59'	131°	7
8	21°13'	+58'	129°	20°35'	+58'	129°	19°56'	+58'	130°	19°18'	+58'	130°	18°40'	+59'	130°	18°01'	+59'	130°	17°22'	+59'	131°	8
9	22°10'	+58'	129°	21°33'	+58'	129°	20°55'	+58'	129°	20°17'	+58'	130°	19°38'	+59'	130°	19°00'	+59'	130°	18°21'	+59'	130°	9
10	23°08'	+58'	128°	22°31'	+58'	129°	21°53'	+58'	129°	21°15'	+58'	129°	20°37'	+59'	130°	19°58'	+59'	130°	19°20'	+59'	130°	10
11	24°06'	+58'	128°	23°29'	+58'	128°	22°51'	+58'	129°	22°13'	+58'	129°	21°35'	+59'	129°	20°57'	+59'	130°	20°19'	+59'	130°	11
12	25°03'	+58'	128°	24°27'	+58'	128°	23°49'	+58'	129°	23°12'	+58'	129°	22°34'	+59'	129°	21°56'	+59'	130°	21°18'	+59'	130°	12
13	26°01'	+58'	128°	25°24'	+58'	128°	24°47'	+58'	128°	24°10'	+58'	129°	23°32'	+59'	129°	22°55'	+59'	129°	22°16'	+59'	130°	13
14	26°59'	+58'	127°	26°22'	+58'	128°	25°45'	+58'	128°	25°08'	+58'	128°	24°31'	+58'	129°	23°53'	+59'	129°	23°15'	+59'	129°	14
15	27°56'	+58'	127°	27°20'	+58'	127°	26°44'	+58'	128°	26°07'	+58'	128°	25°29'	+58'	128°	24°52'	+59'	129°	24°14'	+59'	129°	15
16	28°54'	+57'	127°	28°18'	+58'	127°	27°42'	+58'	127°	27°05'	+58'	128°	26°28'	+58'	128°	25°51'	+59'	129°	25°13'	+59'	129°	16
17	29°51'	+57'	126°	29°16'	+58'	127°	28°40'	+58'	127°	28°03'	+58'	128°	27°26'	+58'	128°	26°49'	+59'	128°	26°12'	+59'	129°	17
18	30°49'	+57'	126°	30°13'	+58'	126°	29°38'	+58'	127°	29°01'	+58'	127°	28°25'	+58'	128°	27°48'	+59'	128°	27°11'	+59'	129°	18
19	31°46'	+57'	126°	31°11'	+58'	126°	30°35'	+58'	127°	30°00'	+58'	127°	29°23'	+58'	127°	28°47'	+59'	128°	28°09'	+59'	128°	19
20	32°43'	+57'	125°	32°09'	+58'	126°	31°33'	+58'	126°	30°58'	+58'	127°	30°22'	+58'	127°	29°45'	+59'	128°	29°08'	+59'	128°	20
21	33°41'	+57'	125°	33°06'	+57'	125°	32°31'	+58'	126°	31°56'	+58'	126°	31°20'	+58'	127°	30°44'	+59'	127°	30°07'	+59'	128°	21
22	34°38'	+57'	125°	34°04'	+57'	125°	33°29'	+58'	126°	32°54'	+58'	126°	32°18'	+58'	127°	31°42'	+58'	127°	31°06'	+59'	128°	22
23	35°35'	+57'	124°	35°01'	+57'	125°	34°27'	+58'	125°	33°52'	+58'	126°	33°16'	+58'	126°	32°41'	+58'	127°	32°04'	+59'	127°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	13°14'	+58'	130°	12°35'	+58'	130°	11°56'	+58'	131°	11°17'	+59'	131°	10°38'	+59'	131°	9°58'	+59'	131°	9°19'	+59'	131°	0
1	14°12'	+58'	130°	13°33'	+58'	130°	12°54'	+58'	130°	12°15'	+58'	131°	11°36'	+59'	131°	10°57'	+59'	131°	10°18'	+59'	131°	1
2	15°10'	+58'	130°	14°31'	+58'	130°	13°53'	+58'	130°	13°14'	+58'	130°	12°35'	+59'	130°	11°56'	+59'	131°	11°17'	+59'	131°	2
3	16°07'	+58'	129°	15°29'	+58'	130°	14°51'	+58'	130°	14°12'	+58'	130°	13°34'	+59'	130°	12°55'	+59'	130°	12°16'	+59'	131°	3
4	17°05'	+58'	129°	16°27'	+58'	129°	15°49'	+58'	130°	15°11'	+58'	130°	14°32'	+59'	130°	13°54'	+59'	130°	13°15'	+59'	130°	4
5	18°03'	+58'	129°	17°25'	+58'	129°	16°47'	+58'	129°	16°09'	+58'	130°	15°31'	+59'	130°	14°52'	+59'	130°	14°14'	+59'	130°	5
6	19°01'	+58'	129°	18°23'	+58'	129°	17°46'	+58'	129°	17°08'	+58'	129°	16°30'	+59'	130°	15°51'	+59'	130°	15°13'	+59'	130°	6
7	19°59'	+58'	128°	19°21'	+58'	129°	18°44'	+58'	129°	18°06'	+58'	129°	17°28'	+59'	129°	16°50'	+59'	130°	16°12'	+59'	130°	7
8	20°56'	+58'	128°	20°19'	+58'	128°	19°42'	+58'	129°	19°05'	+58'	129°	18°27'	+59'	129°	17°49'	+59'	129°	17°11'	+59'	130°	8
9	21°54'	+58'	128°	21°17'	+58'	128°	20°40'	+58'	128°	20°03'	+58'	129°	19°25'	+59'	129°	18°48'	+59'	129°	18°10'	+59'	129°	9
10	22°52'	+58'	127°	22°15'	+58'	128°	21°38'	+58'	128°	21°01'	+58'	128°	20°24'	+59'	129°	19°46'	+59'	129°	19°09'	+59'	129°	10
11	23°50'	+58'	127°	23°13'	+58'	127°	22°37'	+58'	128°	22°00'	+58'	128°	21°22'	+59'	128°	20°45'	+59'	129°	20°07'	+59'	129°	11
12	24°47'	+58'	127°	24°11'	+58'	127°	23°35'	+58'	128°	22°58'	+58'	128°	22°21'	+58'	128°	21°44'	+59'	129°	21°06'	+59'	129°	12
13	25°45'	+58'	126°	25°09'	+58'	127°	24°33'	+58'	127°	23°56'	+58'	128°	23°20'	+58'	128°	22°42'	+59'	128°	22°05'	+59'	129°	13
14	26°42'	+57'	126°	26°07'	+58'	127°	25°31'	+58'	127°	24°55'	+58'	127°	24°18'	+58'	128°	23°41'	+59'	128°	23°04'	+59'	128°	14
15	27°40'	+57'	126°	27°04'	+58'	126°	26°29'	+58'	127°	25°53'	+58'	127°	25°16'	+58'	127°	24°40'	+59'	128°	24°03'	+59'	128°	15
16	28°37'	+57'	126°	28°02'	+58'	126°	27°27'	+58'	126°	26°51'	+58'	127°	26°15'	+58'	127°	25°38'	+59'	128°	25°02'	+59'	128°	16
17	29°35'	+57'	125°	29°00'	+58'	126°	28°25'	+58'	126°	27°49'	+58'	127°	27°13'	+58'	127°	26°37'	+59'	127°	26°00'	+59'	128°	17
18	30°32'	+57'	125°	29°57'	+58'	125°	29°23'	+58'	126°	28°47'	+58'	126°	28°12'	+58'	127°	27°36'	+59'	127°	26°59'	+59'	128°	18
19	31°29'	+57'	125°	30°55'	+58'	125°	30°20'	+58'	125°	29°45'	+58'	126°	29°10'	+58'	126°	28°34'	+59'	127°	27°58'	+59'	127°	19
20	32°27'	+57'	124°	31°53'	+57'	125°	31°18'	+58'	125°	30°43'	+58'	126°	30°08'	+58'	126°	29°33'	+59'	127°	28°57'	+59'	127°	20
21	33°24'	+57'	124°	32°50'	+57'	124°	32°16'	+58'	125°	31°42'	+58'	125°	31°07'	+58'	126°	30°31'	+58'	126°	29°55'	+59'	127°	21
22	34°21'	+57'	123°	33°48'	+57'	124°	33°14'	+58'	125°	32°39'	+58'	125°	32°05'	+58'	126°	31°30'	+58'	126°	30°54'	+59'	127°	22
23	35°18'	+57'	123°	34°45'	+57'	124°	34°11'	+58'	124°	33°37'	+58'	125°	33°03'	+58'	125°	32°28'	+58'	126°	31°53'	+59'	126°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	12°58'	+58'	129°	12°20'	+58'	129°	11°42'	+58'	130°	11°04'	+58'	130°	10°25'	+59'	130°	9°47'	+59'	130°	9°08'	+59'	130°	0
1	13°56'	+58'	129°	13°18'	+58'	129°	12°40'	+58'	129°	12°02'	+58'	130°	11°24'	+59'	130°	10°45'	+59'	130°	10°07'	+59'	130°	1
2	14°54'	+58'	129°	14°16'	+58'	129°	13°38'	+58'	129°	13°00'	+58'	129°	12°22'	+59'	129°	11°44'	+59'	130°	11°06'	+59'	130°	2
3	15°51'	+58'	128°	15°14'	+58'	129°	14°37'	+58'	129°	13°59'	+58'	129°	13°21'	+59'	129°	12°43'	+59'	129°	12°05'	+59'	130°	3
4	16°49'	+58'	128°	16°12'	+58'	128°	15°35'	+58'	129°	14°57'	+58'	129°	14°20'	+59'	129°	13°42'	+59'	129°	13°04'	+59'	129°	4
5	17°47'	+58'	128°	17°10'	+58'	128°	16°33'	+58'	128°	15°56'	+58'	129°	15°18'	+59'	129°	14°41'	+59'	129°	14°03'	+59'	129°	5
6	18°45'	+58'	128°	18°08'	+58'	128°	17°31'	+58'	128°	16°54'	+58'	128°	16°17'	+59'	129°	15°39'	+59'	129°	15°02'	+59'	129°	6
7	19°43'	+58'	127°	19°06'	+58'	128°	18°29'	+58'	128°	17°52'	+58'	128°	17°15'	+59'	128°	16°38'	+59'	129°	16°01'	+59'	129°	7
8	20°40'	+58'	127°	20°04'	+58'	127°	19°28'	+58'	128°	18°51'	+58'	128°	18°14'	+59'	128°	17°37'	+59'	128°	16°59'	+59'	129°	8
9	21°38'	+58'	127°	21°02'	+58'	127°	20°26'	+58'	127°	19°49'	+58'	128°	19°12'	+59'	128°	18°35'	+59'	128°	17°58'	+59'	128°	9
10	22°35'	+58'	126°	22°00'	+58'	127°	21°24'	+58'	127°	20°47'	+58'	127°	20°11'	+58'	128°	19°34'	+59'	128°	18°57'	+59'	128°	10
11	23°33'	+58'	126°	22°58'	+58'	126°	22°22'	+58'	127°	21°46'	+58'	127°	21°09'	+58'	127°	20°33'	+59'	128°	19°56'	+59'	128°	11
12	24°31'	+58'	126°	23°55'	+58'	126°	23°20'	+58'	126°	22°44'	+58'	127°	22°08'	+58'	127°	21°32'	+59'	127°	20°55'	+59'	128°	12
13	25°28'	+57'	125°	24°53'	+58'	126°	24°18'	+58'	126°	23°42'	+58'	127°	23°06'	+58'	127°	22°30'	+59'	127°	21°54'	+59'	128°	13
14	26°26'	+57'	125°	25°51'	+58'	126°	25°16'	+58'	126°	24°40'	+58'	126°	24°05'	+58'	127°	23°29'	+59'	127°	22°53'	+59'	127°	14
15	27°23'	+57'	125°	26°49'	+58'	125°	26°14'	+58'	126°	25°39'	+58'	126°	25°03'	+58'	126°	24°27'	+59'	127°	23°51'	+59'	127°	15
16	28°20'	+57'	124°	27°46'	+58'	125°	27°12'	+58'	125°	26°37'	+58'	126°	26°02'	+58'	126°	25°26'	+59'	127°	24°50'	+59'	127°	16
17	29°18'	+57'	124°	28°44'	+58'	125°	28°10'	+58'	125°	27°35'	+58'	125°	27°00'	+58'	126°	26°25'	+59'	126°	25°49'	+59'	127°	17
18	30°15'	+57'	124°	29°41'	+58'	124°	29°07'	+58'	125°	28°33'	+58'	125°	27°58'	+58'	126°	27°23'	+59'	126°	26°48'	+59'	126°	18
19	31°12'	+57'	123°	30°39'	+57'	124°	30°05'	+58'	124°	29°31'	+58'	125°	28°57'	+58'	125°	28°22'	+58'	126°	27°46'	+59'	126°	19
20	32°09'	+57'	123°	31°36'	+57'	124°	31°03'	+58'	124°	30°29'	+58'	125°	29°55'	+58'	125°	29°20'	+58'	126°	28°45'	+59'	126°	20
21	33°07'	+57'	123°	32°34'	+57'	123°	32°01'	+58'	124°	31°27'	+58'	124°	30°53'	+58'	125°	30°19'	+58'	125°	29°44'	+59'	126°	21
22	34°04'	+57'	122°	33°31'	+57'	123°	32°58'	+58'	123°	32°25'	+58'	124°	31°51'	+58'	125°	31°17'	+58'	125°	30°42'	+59'	126°	22
23	35°01'	+57'	122°	34°29'	+57'	123°	33°56'	+58'	123°	33°23'	+58'	124°	32°49'	+58'	124°	32°15'	+58'	125°	31°41'	+59'	125°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

49° 311° LHA — Latitude SAME as Declination — 49° 311° LHA

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

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

50° 310° LHA — Latitude SAME as Declination — 50° 310° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	12°42'	+58'	128°	12°05'	+58'	128°	11°27'	+58'	129°	10°50'	+58'	129°	10°12'	+59'	129°	9°35'	+59'	129°	8°57'	+59'	129°	0
1	13°40'	+58'	128°	13°03'	+58'	128°	12°26'	+58'	128°	11°48'	+58'	129°	11°11'	+59'	129°	10°33'	+59'	129°	9°56'	+59'	129°	1
2	14°38'	+58'	128°	14°01'	+58'	128°	13°24'	+58'	128°	12°47'	+58'	128°	12°10'	+59'	128°	11°32'	+59'	129°	10°55'	+59'	129°	2
3	15°35'	+58'	127°	14°59'	+58'	128°	14°22'	+58'	128°	13°45'	+58'	128°	13°08'	+59'	128°	12°31'	+59'	128°	11°54'	+59'	129°	3
4	16°33'	+58'	127°	15°57'	+58'	127°	15°20'	+58'	128°	14°44'	+58'	128°	14°07'	+59'	128°	13°30'	+59'	128°	12°52'	+59'	128°	4
5	17°31'	+58'	127°	16°55'	+58'	127°	16°18'	+58'	127°	15°42'	+58'	128°	15°05'	+59'	128°	14°28'	+59'	128°	13°51'	+59'	128°	5
6	18°28'	+58'	127°	17°53'	+58'	127°	17°16'	+58'	127°	16°40'	+58'	127°	16°04'	+59'	128°	15°27'	+59'	128°	14°50'	+59'	128°	6
7	19°26'	+58'	126°	18°50'	+58'	127°	18°15'	+58'	127°	17°39'	+58'	127°	17°02'	+59'	127°	16°26'	+59'	128°	15°49'	+59'	128°	7
8	20°24'	+58'	126°	19°48'	+58'	126°	19°13'	+58'	127°	18°37'	+58'	127°	18°01'	+58'	127°	17°24'	+59'	127°	16°48'	+59'	128°	8
9	21°21'	+58'	126°	20°46'	+58'	126°	20°11'	+58'	126°	19°35'	+58'	127°	18°59'	+58'	127°	18°23'	+59'	127°	17°47'	+59'	127°	9
10	22°19'	+58'	125°	21°44'	+58'	126°	21°09'	+58'	126°	20°33'	+58'	126°	19°58'	+58'	127°	19°22'	+59'	127°	18°46'	+59'	127°	10
11	23°16'	+57'	125°	22°42'	+58'	125°	22°07'	+58'	126°	21°32'	+58'	126°	20°56'	+58'	126°	20°20'	+59'	127°	19°45'	+59'	127°	11
12	24°14'	+57'	125°	23°40'	+58'	125°	23°05'	+58'	125°	22°30'	+58'	126°	21°55'	+58'	126°	21°19'	+59'	126°	20°43'	+59'	127°	12
13	25°11'	+57'	124°	24°37'	+58'	125°	24°03'	+58'	125°	23°28'	+58'	126°	22°53'	+58'	126°	22°18'	+59'	126°	21°42'	+59'	127°	13
14	26°09'	+57'	124°	25°35'	+58'	125°	25°01'	+58'	125°	24°26'	+58'	125°	23°51'	+58'	126°	23°16'	+59'	126°	22°41'	+59'	126°	14
15	27°06'	+57'	124°	26°33'	+58'	124°	25°59'	+58'	125°	25°24'	+58'	125°	24°50'	+58'	125°	24°15'	+59'	126°	23°40'	+59'	126°	15
16	28°03'	+57'	123°	27°30'	+58'	124°	26°57'	+58'	124°	26°23'	+58'	125°	25°48'	+58'	125°	25°13'	+59'	126°	24°38'	+59'	126°	16
17	29°01'	+57'	123°	28°28'	+58'	124°	27°54'	+58'	124°	27°21'	+58'	124°	26°46'	+58'	125°	26°12'	+59'	125°	25°37'	+59'	126°	17
18	29°58'	+57'	123°	29°25'	+57'	123°	28°52'	+58'	124°	28°19'	+58'	124°	27°45'	+58'	125°	27°11'	+58'	125°	26°36'	+59'	125°	18
19	30°55'	+57'	122°	30°23'	+57'	123°	29°50'	+58'	123°	29°17'	+58'	124°	28°43'	+58'	124°	28°09'	+58'	125°	27°35'	+59'	125°	19
20	31°52'	+57'	122°	31°20'	+57'	123°	30°48'	+58'	123°	30°15'	+58'	124°	29°41'	+58'	124°	29°07'	+58'	125°	28°33'	+59'	125°	20
21	32°49'	+57'	122°	32°17'	+57'	122°	31°45'	+58'	123°	31°13'	+58'	123°	30°39'	+58'	124°	30°06'	+58'	124°	29°32'	+59'	125°	21
22	33°46'	+57'	121°	33°15'	+57'	122°	32°43'	+58'	122°	32°10'	+58'	123°	31°38'	+58'	123°	31°04'	+58'	124°	30°30'	+59'	124°	22
23	34°43'	+57'	121°	34°12'	+57'	122°	33°40'	+57'	122°	33°08'	+58'	123°	32°36'	+58'	123°	32°03'	+58'	124°	31°29'	+59'	124°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

50° 310° LHA — Latitude SAME as Declination — 50° 310° LHA

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

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

51° 309° LHA — Latitude SAME as Declination — 51° 309° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	12°26'	+58'	127°	11°49'	+58'	127°	11°13'	+58'	128°	10°36'	+58'	128°	9°59'	+59'	128°	9°22'	+59'	128°	8°45'	+59'	128°	0
1	13°24'	+58'	127°	12°47'	+58'	127°	12°11'	+58'	127°	11°35'	+58'	128°	10°58'	+59'	128°	10°21'	+59'	128°	9°44'	+59'	128°	1
2	14°21'	+58'	127°	13°45'	+58'	127°	13°09'	+58'	127°	12°33'	+58'	127°	11°56'	+59'	127°	11°20'	+59'	128°	10°43'	+59'	128°	2
3	15°19'	+58'	126°	14°43'	+58'	127°	14°07'	+58'	127°	13°31'	+58'	127°	12°55'	+59'	127°	12°19'	+59'	127°	11°42'	+59'	128°	3
4	16°17'	+58'	126°	15°41'	+58'	126°	15°05'	+58'	127°	14°30'	+58'	127°	13°54'	+59'	127°	13°17'	+59'	127°	12°41'	+59'	127°	4
5	17°14'	+58'	126°	16°39'	+58'	126°	16°04'	+58'	126°	15°28'	+58'	127°	14°52'	+59'	127°	14°16'	+59'	127°	13°40'	+59'	127°	5
6	18°12'	+58'	126°	17°37'	+58'	126°	17°02'	+58'	126°	16°26'	+58'	126°	15°51'	+58'	127°	15°15'	+59'	127°	14°39'	+59'	127°	6
7	19°09'	+58'	125°	18°35'	+58'	126°	18°00'	+58'	126°	17°24'	+58'	126°	16°49'	+58'	126°	16°13'	+59'	127°	15°38'	+59'	127°	7
8	20°07'	+58'	125°	19°32'	+58'	125°	18°58'	+58'	126°	18°23'	+58'	126°	17°48'	+58'	126°	17°12'	+59'	126°	16°36'	+59'	127°	8
9	21°05'	+57'	125°	20°30'	+58'	125°	19°56'	+58'	125°	19°21'	+58'	126°	18°46'	+58'	126°	18°11'	+59'	126°	17°35'	+59'	126°	9
10	22°02'	+57'	124°	21°28'	+58'	125°	20°54'	+58'	125°	20°19'	+58'	125°	19°44'	+58'	126°	19°09'	+59'	126°	18°34'	+59'	126°	10
11	22°59'	+57'	124°	22°26'	+58'	124°	21°52'	+58'	125°	21°17'	+58'	125°	20°43'	+58'	125°	20°08'	+59'	126°	19°33'	+59'	126°	11
12	23°57'	+57'	124°	23°23'	+58'	124°	22°50'	+58'	124°	22°16'	+58'	125°	21°41'	+58'	125°	21°07'	+59'	125°	20°32'	+59'	126°	12
13	24°54'	+57'	123°	24°21'	+58'	124°	23°48'	+58'	124°	23°14'	+58'	125°	22°40'	+58'	125°	22°05'	+59'	125°	21°30'	+59'	126°	13
14	25°52'	+57'	123°	25°19'	+58'	123°	24°45'	+58'	124°	24°12'	+58'	124°	23°38'	+58'	125°	23°04'	+59'	125°	22°29'	+59'	125°	14
15	26°49'	+57'	123°	26°16'	+58'	123°	25°43'	+58'	124°	25°10'	+58'	124°	24°36'	+58'	124°	24°02'	+59'	125°	23°28'	+59'	125°	15
16	27°46'	+57'	122°	27°14'	+57'	123°	26°41'	+58'	123°	26°08'	+58'	124°	25°35'	+58'	124°	25°01'	+58'	124°	24°27'	+59'	125°	16
17	28°43'	+57'	122°	28°11'	+57'	123°	27°39'	+58'	123°	27°06'	+58'	123°	26°33'	+58'	124°	25°59'	+58'	124°	25°25'	+59'	125°	17
18	29°41'	+57'	122°	29°09'	+57'	122°	28°37'	+58'	123°	28°04'	+58'	123°	27°31'	+58'	124°	26°58'	+58'	124°	26°24'	+59'	124°	18
19	30°38'	+57'	121°	30°06'	+57'	122°	29°34'	+58'	122°	29°02'	+58'	123°	28°29'	+58'	123°	27°56'	+58'	124°	27°23'	+59'	124°	19
20	31°35'	+57'	121°	31°04'	+57'	122°	30°32'	+58'	122°	30°00'	+58'	123°	29°27'	+58'	123°	28°55'	+58'	123°	28°21'	+59'	124°	20
21	32°32'	+57'	121°	32°01'	+57'	121°	31°30'	+58'	122°	30°58'	+58'	122°	30°26'	+58'	123°	29°53'	+58'	123°	29°20'	+59'	124°	21
22	33°29'	+57'	120°	32°58'	+57'	121°	32°27'	+57'	121°	31°56'	+58'	122°	31°24'	+58'	122°	30°51'	+58'	123°	30°18'	+59'	123°	22
23	34°25'	+57'	120°	33°55'	+57'	120°	33°25'	+57'	121°	32°53'	+58'	122°	32°22'	+58'	122°	31°50'	+58'	123°	31°17'	+59'	123°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

52° 308° LHA — Latitude SAME as Declination — 52° 308° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	12°09'	+58'	126°	11°34'	+58'	126°	10°58'	+58'	127°	10°22'	+58'	127°	9°46'	+59'	127°	9°10'	+59'	127°	8°34'	+59'	127°	0
1	13°07'	+58'	126°	12°32'	+58'	126°	11°56'	+58'	126°	11°21'	+58'	127°	10°45'	+59'	127°	10°09'	+59'	127°	9°33'	+59'	127°	1
2	14°05'	+58'	126°	13°30'	+58'	126°	12°54'	+58'	126°	12°19'	+58'	126°	11°43'	+58'	126°	11°08'	+59'	127°	10°32'	+59'	127°	2
3	15°02'	+58'	125°	14°27'	+58'	126°	13°52'	+58'	126°	13°17'	+58'	126°	12°42'	+58'	126°	12°06'	+59'	126°	11°31'	+59'	127°	3
4	16°00'	+58'	125°	15°25'	+58'	125°	14°50'	+58'	126°	14°15'	+58'	126°	13°40'	+58'	126°	13°05'	+59'	126°	12°29'	+59'	126°	4
5	16°57'	+58'	125°	16°23'	+58'	125°	15°48'	+58'	125°	15°14'	+58'	126°	14°39'	+58'	126°	14°04'	+59'	126°	13°28'	+59'	126°	5
6	17°55'	+58'	125°	17°21'	+58'	125°	16°47'	+58'	125°	16°12'	+58'	125°	15°37'	+58'	126°	15°02'	+59'	126°	14°27'	+59'	126°	6
7	18°53'	+57'	124°	18°19'	+58'	125°	17°45'	+58'	125°	17°10'	+58'	125°	16°36'	+58'	125°	16°01'	+59'	126°	15°26'	+59'	126°	7
8	19°50'	+57'	124°	19°16'	+58'	124°	18°43'	+58'	125°	18°08'	+58'	125°	17°34'	+58'	125°	16°59'	+59'	125°	16°25'	+59'	126°	8
9	20°48'	+57'	124°	20°14'	+58'	124°	19°41'	+58'	124°	19°07'	+58'	125°	18°32'	+58'	125°	17°58'	+59'	125°	17°23'	+59'	125°	9
10	21°45'	+57'	123°	21°12'	+58'	124°	20°38'	+58'	124°	20°05'	+58'	124°	19°31'	+58'	125°	18°57'	+59'	125°	18°22'	+59'	125°	10
11	22°42'	+57'	123°	22°10'	+58'	123°	21°36'	+58'	124°	21°03'	+58'	124°	20°29'	+58'	124°	19°55'	+59'	125°	19°21'	+59'	125°	11
12	23°40'	+57'	123°	23°07'	+58'	123°	22°34'	+58'	123°	22°01'	+58'	124°	21°28'	+58'	124°	20°54'	+59'	124°	20°20'	+59'	125°	12
13	24°37'	+57'	122°	24°05'	+58'	123°	23°32'	+58'	123°	22°59'	+58'	123°	22°26'	+58'	124°	21°52'	+59'	124°	21°19'	+59'	124°	13
14	25°34'	+57'	122°	25°02'	+58'	122°	24°30'	+58'	123°	23°57'	+58'	123°	23°24'	+58'	124°	22°51'	+59'	124°	22°17'	+59'	124°	14
15	26°32'	+57'	122°	26°00'	+57'	122°	25°28'	+58'	123°	24°55'	+58'	123°	24°23'	+58'	123°	23°49'	+58'	124°	23°16'	+59'	124°	15
16	27°29'	+57'	121°	26°57'	+57'	122°	26°26'	+58'	122°	25°53'	+58'	123°	25°21'	+58'	123°	24°48'	+58'	123°	24°15'	+59'	124°	16
17	28°26'	+57'	121°	27°55'	+57'	121°	27°23'	+58'	122°	26°51'	+58'	122°	26°19'	+58'	123°	25°46'	+58'	123°	25°13'	+59'	124°	17
18	29°23'	+57'	121°	28°52'	+57'	121°	28°21'	+58'	122°	27°49'	+58'	122°	27°17'	+58'	123°	26°45'	+58'	123°	26°12'	+59'	123°	18
19	30°20'	+57'	120°	29°49'	+57'	121°	29°19'	+58'	121°	28°47'	+58'	122°	28°15'	+58'	122°	27°43'	+58'	123°	27°11'	+59'	123°	19
20	31°17'	+57'	120°	30°47'	+57'	120°	30°16'	+58'	121°	29°45'	+58'	121°	29°13'	+58'	122°	28°42'	+58'	122°	28°09'	+59'	123°	20
21	32°14'	+57'	120°	31°44'	+57'	120°	31°14'	+57'	121°	30°43'	+58'	121°	30°12'	+58'	122°	29°40'	+58'	122°	29°08'	+59'	123°	21
22	33°11'	+57'	119°	32°41'	+57'	120°	32°11'	+57'	120°	31°41'	+58'	121°	31°10'	+58'	121°	30°38'	+58'	122°	30°06'	+59'	122°	22
23	34°07'	+57'	119°	33°38'	+57'	119°	33°09'	+57'	120°	32°38'	+58'	121°	32°08'	+58'	121°	31°36'	+58'	122°	31°05'	+58'	122°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

52° 308° LHA — Latitude SAME as Declination — 52° 308° LHA

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

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

53° 307° LHA — Latitude SAME as Declination — 53° 307° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	11°53'	+58'	125°	11°18'	+58'	125°	10°43'	+58'	126°	10°08'	+58'	126°	9°33'	+58'	126°	8°58'	+59'	126°	8°22'	+59'	126°	0
1	12°50'	+58'	125°	12°16'	+58'	125°	11°41'	+58'	125°	11°06'	+58'	126°	10°31'	+58'	126°	9°56'	+59'	126°	9°21'	+59'	126°	1
2	13°48'	+58'	125°	13°14'	+58'	125°	12°39'	+58'	125°	12°05'	+58'	125°	11°30'	+58'	125°	10°55'	+59'	126°	10°20'	+59'	126°	2
3	14°45'	+58'	124°	14°11'	+58'	125°	13°37'	+58'	125°	13°03'	+58'	125°	12°28'	+58'	125°	11°54'	+59'	125°	11°19'	+59'	126°	3
4	15°43'	+58'	124°	15°09'	+58'	124°	14°35'	+58'	125°	14°01'	+58'	125°	13°27'	+58'	125°	12°52'	+59'	125°	12°18'	+59'	125°	4
5	16°41'	+57'	124°	16°07'	+58'	124°	15°33'	+58'	124°	14°59'	+58'	125°	14°25'	+58'	125°	13°51'	+59'	125°	13°16'	+59'	125°	5
6	17°38'	+57'	124°	17°05'	+58'	124°	16°31'	+58'	124°	15°58'	+58'	124°	15°24'	+58'	125°	14°50'	+59'	125°	14°15'	+59'	125°	6
7	18°35'	+57'	123°	18°02'	+58'	124°	17°29'	+58'	124°	16°56'	+58'	124°	16°22'	+58'	124°	15°48'	+59'	125°	15°14'	+59'	125°	7
8	19°33'	+57'	123°	19°00'	+58'	123°	18°27'	+58'	124°	17°54'	+58'	124°	17°20'	+58'	124°	16°47'	+59'	124°	16°13'	+59'	125°	8
9	20°30'	+57'	123°	19°58'	+58'	123°	19°25'	+58'	123°	18°52'	+58'	124°	18°19'	+58'	124°	17°45'	+59'	124°	17°12'	+59'	124°	9
10	21°28'	+57'	122°	20°55'	+58'	123°	20°23'	+58'	123°	19°50'	+58'	123°	19°17'	+58'	124°	18°44'	+59'	124°	18°10'	+59'	124°	10
11	22°25'	+57'	122°	21°53'	+58'	122°	21°21'	+58'	123°	20°48'	+58'	123°	20°15'	+58'	123°	19°42'	+59'	124°	19°09'	+59'	124°	11
12	23°22'	+57'	122°	22°51'	+58'	122°	22°19'	+58'	122°	21°46'	+58'	123°	21°14'	+58'	123°	20°41'	+59'	123°	20°08'	+59'	124°	12
13	24°20'	+57'	121°	23°48'	+58'	122°	23°17'	+58'	122°	22°44'	+58'	122°	22°12'	+58'	123°	21°39'	+58'	123°	21°06'	+59'	123°	13
14	25°17'	+57'	121°	24°46'	+57'	121°	24°14'	+58'	122°	23°42'	+58'	122°	23°10'	+58'	123°	22°38'	+58'	123°	22°05'	+59'	123°	14
15	26°14'	+57'	121°	25°43'	+57'	121°	25°12'	+58'	122°	24°40'	+58'	122°	24°09'	+58'	122°	23°36'	+58'	123°	23°04'	+59'	123°	15
16	27°11'	+57'	120°	26°41'	+57'	121°	26°10'	+58'	121°	25°38'	+58'	122°	25°07'	+58'	122°	24°35'	+58'	122°	24°03'	+59'	123°	16
17	28°08'	+57'	120°	27°38'	+57'	120°	27°07'	+58'	121°	26°36'	+58'	121°	26°05'	+58'	122°	25°33'	+58'	122°	25°01'	+59'	123°	17
18	29°05'	+57'	120°	28°35'	+57'	120°	28°05'	+58'	121°	27°34'	+58'	121°	27°03'	+58'	121°	26°32'	+58'	122°	26°00'	+59'	122°	18
19	30°02'	+57'	119°	29°33'	+57'	120°	29°03'	+58'	120°	28°32'	+58'	121°	28°01'	+58'	121°	27°30'	+58'	122°	26°58'	+59'	122°	19
20	30°59'	+57'	119°	30°30'	+57'	119°	30°00'	+57'	120°	29°30'	+58'	120°	28°59'	+58'	121°	28°28'	+58'	121°	27°57'	+59'	122°	20
21	31°56'	+57'	119°	31°27'	+57'	119°	30°58'	+57'	120°	30°28'	+58'	120°	29°57'	+58'	121°	29°27'	+58'	121°	28°55'	+59'	122°	21
22	32°53'	+57'	118°	32°24'	+57'	119°	31°55'	+57'	119°	31°25'	+58'	120°	30°55'	+58'	120°	30°25'	+58'	121°	29°54'	+58'	121°	22
23	33°49'	+57'	118°	33°21'	+57'	118°	32°52'	+57'	119°	32°23'	+58'	119°	31°53'	+58'	120°	31°23'	+58'	121°	30°52'	+58'	121°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

53° 307° LHA — Latitude SAME as Declination — 53° 307° LHA

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

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

54° 306° LHA — Latitude SAME as Declination — 54° 306° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	11°36'	+58'	124°	11°02'	+58'	124°	10°28'	+58'	125°	9°54'	+58'	125°	9°19'	+58'	125°	8°45'	+59'	125°	8°11'	+59'	125°	0
1	12°33'	+58'	124°	12°00'	+58'	124°	11°26'	+58'	124°	10°52'	+58'	125°	10°18'	+58'	125°	9°44'	+59'	125°	9°09'	+59'	125°	1
2	13°31'	+58'	124°	12°58'	+58'	124°	12°24'	+58'	124°	11°50'	+58'	124°	11°16'	+58'	124°	10°42'	+59'	125°	10°08'	+59'	125°	2
3	14°28'	+57'	123°	13°55'	+58'	124°	13°22'	+58'	124°	12°48'	+58'	124°	12°15'	+58'	124°	11°41'	+59'	124°	11°07'	+59'	125°	3
4	15°26'	+57'	123°	14°53'	+58'	123°	14°20'	+58'	124°	13°47'	+58'	124°	13°13'	+58'	124°	12°40'	+59'	124°	12°06'	+59'	124°	4
5	16°23'	+57'	123°	15°51'	+58'	123°	15°18'	+58'	123°	14°45'	+58'	124°	14°12'	+58'	124°	13°38'	+59'	124°	13°04'	+59'	124°	5
6	17°21'	+57'	123°	16°48'	+58'	123°	16°16'	+58'	123°	15°43'	+58'	123°	15°10'	+58'	124°	14°37'	+59'	124°	14°03'	+59'	124°	6
7	18°18'	+57'	122°	17°46'	+58'	123°	17°14'	+58'	123°	16°41'	+58'	123°	16°08'	+58'	123°	15°35'	+59'	124°	15°02'	+59'	124°	7
8	19°16'	+57'	122°	18°44'	+58'	122°	18°12'	+58'	123°	17°39'	+58'	123°	17°07'	+58'	123°	16°34'	+59'	123°	16°01'	+59'	124°	8
9	20°13'	+57'	122°	19°41'	+58'	122°	19°09'	+58'	122°	18°37'	+58'	123°	18°05'	+58'	123°	17°32'	+59'	123°	17°00'	+59'	123°	9
10	21°10'	+57'	121°	20°39'	+58'	122°	20°07'	+58'	122°	19°35'	+58'	122°	19°03'	+58'	123°	18°31'	+59'	123°	17°58'	+59'	123°	10
11	22°08'	+57'	121°	21°37'	+58'	121°	21°05'	+58'	122°	20°34'	+58'	122°	20°02'	+58'	122°	19°29'	+58'	123°	18°57'	+59'	123°	11
12	23°05'	+57'	121°	22°34'	+57'	121°	22°03'	+58'	121°	21°32'	+58'	122°	21°00'	+58'	122°	20°28'	+58'	122°	19°56'	+59'	123°	12
13	24°02'	+57'	120°	23°32'	+57'	121°	23°01'	+58'	121°	22°30'	+58'	121°	21°58'	+58'	122°	21°26'	+58'	122°	20°54'	+59'	122°	13
14	24°59'	+57'	120°	24°29'	+57'	120°	23°58'	+58'	121°	23°28'	+58'	121°	22°56'	+58'	122°	22°25'	+58'	122°	21°53'	+59'	122°	14
15	25°56'	+57'	120°	25°26'	+57'	120°	24°56'	+58'	120°	24°26'	+58'	121°	23°55'	+58'	121°	23°23'	+58'	122°	22°52'	+59'	122°	15
16	26°53'	+57'	119°	26°24'	+57'	120°	25°54'	+58'	120°	25°23'	+58'	121°	24°53'	+58'	121°	24°22'	+58'	121°	23°50'	+59'	122°	16
17	27°50'	+57'	119°	27°21'	+57'	119°	26°51'	+58'	120°	26°21'	+58'	120°	25°51'	+58'	121°	25°20'	+58'	121°	24°49'	+59'	122°	17
18	28°47'	+57'	119°	28°18'	+57'	119°	27°49'	+58'	120°	27°19'	+58'	120°	26°49'	+58'	120°	26°18'	+58'	121°	25°47'	+59'	121°	18
19	29°44'	+57'	118°	29°16'	+57'	119°	28°47'	+57'	119°	28°17'	+58'	120°	27°47'	+58'	120°	27°17'	+58'	121°	26°46'	+59'	121°	19
20	30°41'	+57'	118°	30°13'	+57'	118°	29°44'	+57'	119°	29°15'	+58'	119°	28°45'	+58'	120°	28°15'	+58'	120°	27°44'	+59'	121°	20
21	31°38'	+57'	117°	31°10'	+57'	118°	30°41'	+57'	119°	30°13'	+58'	119°	29°43'	+58'	120°	29°13'	+58'	120°	28°43'	+58'	121°	21
22	32°35'	+57'	117°	32°07'	+57'	118°	31°39'	+57'	118°	31°10'	+58'	119°	30°41'	+58'	119°	30°12'	+58'	120°	29°41'	+58'	120°	22
23	33°31'	+57'	117°	33°04'	+57'	117°	32°36'	+57'	118°	32°08'	+58'	118°	31°39'	+58'	119°	31°10'	+58'	120°	30°40'	+58'	120°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

54° 306° LHA — Latitude SAME as Declination — 54° 306° LHA

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

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

55° 305° LHA — Latitude SAME as Declination — 55° 305° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	11°19'	+57'	123°	10°46'	+58'	124°	10°13'	+58'	124°	9°39'	+58'	124°	9°06'	+58'	124°	8°32'	+59'	124°	7°59'	+59'	124°	0
1	12°16'	+57'	123°	11°43'	+58'	123°	11°11'	+58'	123°	10°37'	+58'	124°	10°04'	+58'	124°	9°31'	+59'	124°	8°57'	+59'	124°	1
2	13°14'	+57'	123°	12°41'	+58'	123°	12°08'	+58'	123°	11°36'	+58'	123°	11°03'	+58'	123°	10°29'	+59'	124°	9°56'	+59'	124°	2
3	14°11'	+57'	122°	13°39'	+58'	123°	13°06'	+58'	123°	12°34'	+58'	123°	12°01'	+58'	123°	11°28'	+59'	123°	10°55'	+59'	124°	3
4	15°09'	+57'	122°	14°37'	+58'	122°	14°04'	+58'	123°	13°32'	+58'	123°	12°59'	+58'	123°	12°27'	+59'	123°	11°54'	+59'	123°	4
5	16°06'	+57'	122°	15°34'	+58'	122°	15°02'	+58'	122°	14°30'	+58'	123°	13°58'	+58'	123°	13°25'	+59'	123°	12°52'	+59'	123°	5
6	17°03'	+57'	122°	16°32'	+58'	122°	16°00'	+58'	122°	15°28'	+58'	122°	14°56'	+58'	123°	14°24'	+59'	123°	13°51'	+59'	123°	6
7	18°01'	+57'	121°	17°30'	+58'	122°	16°58'	+58'	122°	16°26'	+58'	122°	15°54'	+58'	122°	15°22'	+59'	123°	14°50'	+59'	123°	7
8	18°58'	+57'	121°	18°27'	+58'	121°	17°56'	+58'	122°	17°24'	+58'	122°	16°53'	+58'	122°	16°21'	+59'	122°	15°49'	+59'	123°	8
9	19°55'	+57'	121°	19°25'	+58'	121°	18°54'	+58'	121°	18°22'	+58'	122°	17°51'	+58'	122°	17°19'	+58'	122°	16°47'	+59'	122°	9
10	20°53'	+57'	120°	20°22'	+58'	121°	19°52'	+58'	121°	19°21'	+58'	121°	18°49'	+58'	122°	18°18'	+58'	122°	17°46'	+59'	122°	10
11	21°50'	+57'	120°	21°20'	+57'	120°	20°49'	+58'	121°	20°19'	+58'	121°	19°48'	+58'	121°	19°16'	+58'	122°	18°45'	+59'	122°	11
12	22°47'	+57'	120°	22°17'	+57'	120°	21°47'	+58'	120°	21°17'	+58'	121°	20°46'	+58'	121°	20°15'	+58'	121°	19°43'	+59'	122°	12
13	23°44'	+57'	119°	23°15'	+57'	120°	22°45'	+58'	120°	22°15'	+58'	120°	21°44'	+58'	121°	21°13'	+58'	121°	20°42'	+59'	121°	13
14	24°41'	+57'	119°	24°12'	+57'	119°	23°42'	+58'	120°	23°12'	+58'	120°	22°42'	+58'	121°	22°12'	+58'	121°	21°41'	+59'	121°	14
15	25°38'	+57'	119°	25°09'	+57'	119°	24°40'	+58'	119°	24°10'	+58'	120°	23°40'	+58'	120°	23°10'	+58'	121°	22°39'	+59'	121°	15
16	26°35'	+57'	118°	26°07'	+57'	119°	25°38'	+58'	119°	25°08'	+58'	120°	24°38'	+58'	120°	24°08'	+58'	120°	23°38'	+59'	121°	16
17	27°32'	+57'	118°	27°04'	+57'	118°	26°35'	+58'	119°	26°06'	+58'	119°	25°37'	+58'	120°	25°07'	+58'	120°	24°36'	+59'	121°	17
18	28°29'	+57'	118°	28°01'	+57'	118°	27°33'	+57'	119°	27°04'	+58'	119°	26°35'	+58'	119°	26°05'	+58'	120°	25°35'	+59'	120°	18
19	29°26'	+57'	117°	28°58'	+57'	118°	28°30'	+57'	118°	28°02'	+58'	119°	27°33'	+58'	119°	27°03'	+58'	120°	26°33'	+58'	120°	19
20	30°23'	+57'	117°	29°55'	+57'	117°	29°28'	+57'	118°	28°59'	+58'	118°	28°31'	+58'	119°	28°02'	+58'	119°	27°32'	+58'	120°	20
21	31°20'	+57'	116°	30°53'	+57'	117°	30°25'	+57'	118°	29°57'	+58'	118°	29°29'	+58'	119°	29°00'	+58'	119°	28°30'	+58'	120°	21
22	32°16'	+57'	116°	31°50'	+57'	117°	31°22'	+57'	117°	30°55'	+58'	118°	30°27'	+58'	118°	29°58'	+58'	119°	29°29'	+58'	119°	22
23	33°13'	+56'	116°	32°46'	+57'	116°	32°20'	+57'	117°	31°52'	+58'	117°	31°24'	+58'	118°	30°56'	+58'	118°	30°27'	+58'	119°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

55° 305° LHA — Latitude SAME as Declination — 55° 305° 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 SAME as Declination — 56° 304° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	11°02'	+57'	122°	10°29'	+58'	123°	9°57'	+58'	123°	9°25'	+58'	123°	8°52'	+58'	123°	8°19'	+59'	123°	7°46'	+59'	123°	0
1	11°59'	+57'	122°	11°27'	+58'	122°	10°55'	+58'	122°	10°23'	+58'	123°	9°50'	+58'	123°	9°18'	+59'	123°	8°45'	+59'	123°	1
2	12°56'	+57'	122°	12°25'	+58'	122°	11°53'	+58'	122°	11°21'	+58'	122°	10°49'	+58'	122°	10°16'	+59'	123°	9°44'	+59'	123°	2
3	13°54'	+57'	121°	13°22'	+58'	122°	12°51'	+58'	122°	12°19'	+58'	122°	11°47'	+58'	122°	11°15'	+59'	122°	10°43'	+59'	123°	3
4	14°51'	+57'	121°	14°20'	+58'	121°	13°49'	+58'	122°	13°17'	+58'	122°	12°45'	+58'	122°	12°14'	+59'	122°	11°41'	+59'	122°	4
5	15°49'	+57'	121°	15°18'	+58'	121°	14°47'	+58'	121°	14°15'	+58'	122°	13°44'	+58'	122°	13°12'	+59'	122°	12°40'	+59'	122°	5
6	16°46'	+57'	121°	16°15'	+58'	121°	15°44'	+58'	121°	15°13'	+58'	121°	14°42'	+58'	122°	14°11'	+59'	122°	13°39'	+59'	122°	6
7	17°43'	+57'	120°	17°13'	+58'	121°	16°42'	+58'	121°	16°11'	+58'	121°	15°40'	+58'	121°	15°09'	+58'	122°	14°38'	+59'	122°	7
8	18°40'	+57'	120°	18°10'	+58'	120°	17°40'	+58'	121°	17°09'	+58'	121°	16°39'	+58'	121°	16°08'	+58'	121°	15°36'	+59'	122°	8
9	19°38'	+57'	120°	19°08'	+57'	120°	18°38'	+58'	120°	18°07'	+58'	121°	17°37'	+58'	121°	17°06'	+58'	121°	16°35'	+59'	121°	9
10	20°35'	+57'	119°	20°05'	+57'	120°	19°36'	+58'	120°	19°05'	+58'	120°	18°35'	+58'	121°	18°05'	+58'	121°	17°34'	+59'	121°	10
11	21°32'	+57'	119°	21°03'	+57'	119°	20°33'	+58'	120°	20°03'	+58'	120°	19°33'	+58'	120°	19°03'	+58'	121°	18°32'	+59'	121°	11
12	22°29'	+57'	119°	22°00'	+57'	119°	21°31'	+58'	119°	21°01'	+58'	120°	20°32'	+58'	120°	20°01'	+58'	120°	19°31'	+59'	121°	12
13	23°26'	+57'	118°	22°58'	+57'	119°	22°29'	+58'	119°	21°59'	+58'	119°	21°30'	+58'	120°	21°00'	+58'	120°	20°30'	+59'	120°	13
14	24°23'	+57'	118°	23°55'	+57'	118°	23°26'	+58'	119°	22°57'	+58'	119°	22°28'	+58'	119°	21°58'	+58'	120°	21°28'	+59'	120°	14
15	25°20'	+57'	118°	24°52'	+57'	118°	24°24'	+58'	118°	23°55'	+58'	119°	23°26'	+58'	119°	22°57'	+58'	120°	22°27'	+59'	120°	15
16	26°17'	+57'	117°	25°49'	+57'	118°	25°21'	+58'	118°	24°53'	+58'	119°	24°24'	+58'	119°	23°55'	+58'	119°	23°25'	+59'	120°	16
17	27°14'	+57'	117°	26°47'	+57'	117°	26°19'	+57'	118°	25°51'	+58'	118°	25°22'	+58'	119°	24°53'	+58'	119°	24°24'	+59'	119°	17
18	28°11'	+57'	117°	27°44'	+57'	117°	27°16'	+57'	117°	26°48'	+58'	118°	26°20'	+58'	118°	25°51'	+58'	119°	25°22'	+58'	119°	18
19	29°08'	+57'	116°	28°41'	+57'	117°	28°14'	+57'	117°	27°46'	+58'	118°	27°18'	+58'	118°	26°50'	+58'	119°	26°21'	+58'	119°	19
20	30°04'	+57'	116°	29°38'	+57'	116°	29°11'	+57'	117°	28°44'	+58'	117°	28°16'	+58'	118°	27°48'	+58'	118°	27°19'	+58'	119°	20
21	31°01'	+57'	115°	30°35'	+57'	116°	30°09'	+57'	116°	29°42'	+58'	117°	29°14'	+58'	118°	28°46'	+58'	118°	28°18'	+58'	118°	21
22	31°58'	+57'	115°	31°32'	+57'	116°	31°06'	+57'	116°	30°39'	+58'	117°	30°12'	+58'	117°	29°44'	+58'	118°	29°16'	+58'	118°	22
23	32°54'	+56'	115°	32°29'	+57'	115°	32°03'	+57'	116°	31°37'	+57'	116°	31°10'	+58'	117°	30°42'	+58'	117°	30°15'	+58'	118°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

56° 304° LHA — Latitude SAME as Declination — 56° 304° LHA

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

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

57° 303° LHA — Latitude SAME as Declination — 57° 303° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	10°44'	+57'	121°	10°13'	+58'	122°	9°41'	+58'	122°	9°10'	+58'	122°	8°38'	+58'	122°	8°06'	+59'	122°	7°34'	+59'	122°	0
1	11°42'	+57'	121°	11°10'	+58'	121°	10°39'	+58'	121°	10°08'	+58'	122°	9°36'	+58'	122°	9°05'	+59'	122°	8°33'	+59'	122°	1
2	12°39'	+57'	121°	12°08'	+58'	121°	11°37'	+58'	121°	11°06'	+58'	121°	10°35'	+58'	121°	10°03'	+59'	122°	9°32'	+59'	122°	2
3	13°36'	+57'	120°	13°06'	+58'	121°	12°35'	+58'	121°	12°04'	+58'	121°	11°33'	+58'	121°	11°02'	+59'	121°	10°30'	+59'	122°	3
4	14°34'	+57'	120°	14°03'	+58'	120°	13°33'	+58'	121°	13°02'	+58'	121°	12°31'	+58'	121°	12°00'	+58'	121°	11°29'	+59'	121°	4
5	15°31'	+57'	120°	15°01'	+58'	120°	14°31'	+58'	120°	14°00'	+58'	121°	13°30'	+58'	121°	12°59'	+58'	121°	12°28'	+59'	121°	5
6	16°28'	+57'	120°	15°58'	+58'	120°	15°28'	+58'	120°	14°58'	+58'	120°	14°28'	+58'	121°	13°57'	+58'	121°	13°27'	+59'	121°	6
7	17°25'	+57'	119°	16°56'	+57'	120°	16°26'	+58'	120°	15°56'	+58'	120°	15°26'	+58'	120°	14°56'	+58'	121°	14°25'	+59'	121°	7
8	18°23'	+57'	119°	17°53'	+57'	119°	17°24'	+58'	120°	16°54'	+58'	120°	16°24'	+58'	120°	15°54'	+58'	120°	15°24'	+59'	121°	8
9	19°20'	+57'	119°	18°51'	+57'	119°	18°22'	+58'	119°	17°52'	+58'	120°	17°23'	+58'	120°	16°53'	+58'	120°	16°23'	+59'	120°	9
10	20°17'	+57'	118°	19°48'	+57'	119°	19°19'	+58'	119°	18°50'	+58'	119°	18°21'	+58'	120°	17°51'	+58'	120°	17°21'	+59'	120°	10
11	21°14'	+57'	118°	20°46'	+57'	118°	20°17'	+58'	119°	19°48'	+58'	119°	19°19'	+58'	119°	18°50'	+58'	120°	18°20'	+59'	120°	11
12	22°11'	+57'	118°	21°43'	+57'	118°	21°15'	+58'	118°	20°46'	+58'	119°	20°17'	+58'	119°	19°48'	+58'	119°	19°18'	+59'	120°	12
13	23°08'	+57'	117°	22°40'	+57'	118°	22°12'	+58'	118°	21°44'	+58'	118°	21°15'	+58'	119°	20°46'	+58'	119°	20°17'	+59'	119°	13
14	24°05'	+57'	117°	23°38'	+57'	117°	23°10'	+58'	118°	22°42'	+58'	118°	22°13'	+58'	118°	21°45'	+58'	119°	21°16'	+59'	119°	14
15	25°02'	+57'	117°	24°35'	+57'	117°	24°07'	+58'	117°	23°40'	+58'	118°	23°11'	+58'	118°	22°43'	+58'	119°	22°14'	+59'	119°	15
16	25°59'	+57'	116°	25°32'	+57'	117°	25°05'	+57'	117°	24°37'	+58'	118°	24°10'	+58'	118°	23°41'	+58'	118°	23°13'	+59'	119°	16
17	26°56'	+57'	116°	26°29'	+57'	116°	26°02'	+57'	117°	25°35'	+58'	117°	25°08'	+58'	118°	24°40'	+58'	118°	24°11'	+58'	118°	17
18	27°52'	+57'	116°	27°26'	+57'	116°	27°00'	+57'	116°	26°33'	+58'	117°	26°06'	+58'	117°	25°38'	+58'	118°	25°10'	+58'	118°	18
19	28°49'	+57'	115°	28°23'	+57'	116°	27°57'	+57'	116°	27°31'	+58'	117°	27°04'	+58'	117°	26°36'	+58'	118°	26°08'	+58'	118°	19
20	29°46'	+57'	115°	29°20'	+57'	115°	28°55'	+57'	116°	28°28'	+58'	116°	28°01'	+58'	117°	27°34'	+58'	117°	27°07'	+58'	118°	20
21	30°42'	+57'	114°	30°17'	+57'	115°	29°52'	+57'	115°	29°26'	+58'	116°	28°59'	+58'	116°	28°32'	+58'	117°	28°05'	+58'	117°	21
22	31°39'	+56'	114°	31°14'	+57'	115°	30°49'	+57'	115°	30°23'	+57'	116°	29°57'	+58'	116°	29°30'	+58'	117°	29°03'	+58'	117°	22
23	32°35'	+56'	114°	32°11'	+57'	114°	31°46'	+57'	115°	31°21'	+57'	115°	30°55'	+58'	116°	30°29'	+58'	116°	30°02'	+58'	117°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

57° 303° LHA — Latitude SAME as Declination — 57° 303° LHA

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

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

58° 302° LHA — Latitude SAME as Declination — 58° 302° LHA

Dec°	70			71			72			73			74			75			76			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	10°27'	+57'	120°	9°56'	+58'	121°	9°25'	+58'	121°	8°55'	+58'	121°	8°24'	+58'	121°	7°53'	+59'	121°	7°22'	+59'	121°	0
1	11°24'	+57'	120°	10°54'	+58'	120°	10°23'	+58'	120°	9°53'	+58'	121°	9°22'	+58'	121°	8°51'	+58'	121°	8°21'	+59'	121°	1
2	12°21'	+57'	120°	11°51'	+58'	120°	11°21'	+58'	120°	10°51'	+58'	120°	10°21'	+58'	121°	9°50'	+58'	121°	9°19'	+59'	121°	2
3	13°18'	+57'	120°	12°49'	+58'	120°	12°19'	+58'	120°	11°49'	+58'	120°	11°19'	+58'	120°	10°48'	+58'	120°	10°18'	+59'	121°	3
4	14°16'	+57'	119°	13°46'	+58'	119°	13°17'	+58'	120°	12°47'	+58'	120°	12°17'	+58'	120°	11°47'	+58'	120°	11°17'	+59'	120°	4
5	15°13'	+57'	119°	14°44'	+57'	119°	14°15'	+58'	119°	13°45'	+58'	120°	13°15'	+58'	120°	12°45'	+58'	120°	12°15'	+59'	120°	5
6	16°10'	+57'	119°	15°41'	+57'	119°	15°12'	+58'	119°	14°43'	+58'	119°	14°14'	+58'	120°	13°44'	+58'	120°	13°14'	+59'	120°	6
7	17°07'	+57'	118°	16°39'	+57'	119°	16°10'	+58'	119°	15°41'	+58'	119°	15°12'	+58'	119°	14°42'	+58'	120°	14°13'	+59'	120°	7
8	18°04'	+57'	118°	17°36'	+57'	118°	17°08'	+58'	119°	16°39'	+58'	119°	16°10'	+58'	119°	15°41'	+58'	119°	15°11'	+59'	120°	8
9	19°02'	+57'	118°	18°34'	+57'	118°	18°05'	+58'	118°	17°37'	+58'	119°	17°08'	+58'	119°	16°39'	+58'	119°	16°10'	+59'	119°	9
10	19°59'	+57'	117°	19°31'	+57'	118°	19°03'	+58'	118°	18°35'	+58'	118°	18°06'	+58'	119°	17°38'	+58'	119°	17°09'	+59'	119°	10
11	20°56'	+57'	117°	20°28'	+57'	117°	20°01'	+58'	118°	19°33'	+58'	118°	19°04'	+58'	118°	18°36'	+58'	119°	18°07'	+59'	119°	11
12	21°53'	+57'	117°	21°26'	+57'	117°	20°58'	+58'	117°	20°31'	+58'	118°	20°03'	+58'	118°	19°34'	+58'	118°	19°06'	+59'	119°	12
13	22°50'	+57'	116°	22°23'	+57'	117°	21°56'	+58'	117°	21°28'	+58'	117°	21°01'	+58'	118°	20°33'	+58'	118°	20°04'	+59'	118°	13
14	23°47'	+57'	116°	23°20'	+57'	116°	22°53'	+58'	117°	22°26'	+58'	117°	21°59'	+58'	117°	21°31'	+58'	118°	21°03'	+59'	118°	14
15	24°44'	+57'	116°	24°17'	+57'	116°	23°51'	+57'	116°	23°24'	+58'	117°	22°57'	+58'	117°	22°29'	+58'	118°	22°01'	+59'	118°	15
16	25°40'	+57'	115°	25°15'	+57'	116°	24°48'	+57'	116°	24°22'	+58'	117°	23°55'	+58'	117°	23°28'	+58'	117°	23°00'	+58'	118°	16
17	26°37'	+57'	115°	26°12'	+57'	115°	25°46'	+57'	116°	25°20'	+58'	116°	24°53'	+58'	117°	24°26'	+58'	117°	23°58'	+58'	117°	17
18	27°34'	+57'	115°	27°09'	+57'	115°	26°43'	+57'	115°	26°17'	+58'	116°	25°51'	+58'	116°	25°24'	+58'	117°	24°57'	+58'	117°	18
19	28°31'	+57'	114°	28°06'	+57'	115°	27°41'	+57'	115°	27°15'	+58'	116°	26°49'	+58'	116°	26°22'	+58'	116°	25°55'	+58'	117°	19
20	29°27'	+57'	114°	29°03'	+57'	114°	28°38'	+57'	115°	28°12'	+58'	115°	27°47'	+58'	116°	27°20'	+58'	116°	26°54'	+58'	117°	20
21	30°24'	+56'	113°	30°00'	+57'	114°	29°35'	+57'	114°	29°10'	+58'	115°	28°44'	+58'	115°	28°18'	+58'	116°	27°52'	+58'	116°	21
22	31°20'	+56'	113°	30°56'	+57'	114°	30°32'	+57'	114°	30°08'	+57'	115°	29°42'	+58'	115°	29°17'	+58'	116°	28°50'	+58'	116°	22
23	32°17'	+56'	113°	31°53'	+57'	113°	31°29'	+57'	114°	31°05'	+57'	114°	30°40'	+58'	115°	30°15'	+58'	115°	29°49'	+58'	116°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

58° 302° LHA — Latitude SAME as Declination — 58° 302° LHA

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

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

59° 301° LHA — Latitude SAME as Declination — 59° 301° LHA

Dec°	70			71			72			73			74			75			76			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	10°09'	+57'	119°	9°39'	+58'	120°	9°09'	+58'	120°	8°40'	+58'	120°	8°10'	+58'	120°	7°40'	+58'	120°	7°09'	+59'	120°	0
1	11°06'	+57'	119°	10°37'	+58'	119°	10°07'	+58'	119°	9°38'	+58'	120°	9°08'	+58'	120°	8°38'	+58'	120°	8°08'	+59'	120°	1
2	12°03'	+57'	119°	11°34'	+58'	119°	11°05'	+58'	119°	10°36'	+58'	119°	10°06'	+58'	120°	9°37'	+58'	120°	9°07'	+59'	120°	2
3	13°00'	+57'	119°	12°32'	+57'	119°	12°03'	+58'	119°	11°34'	+58'	119°	11°04'	+58'	119°	10°35'	+58'	119°	10°05'	+59'	120°	3
4	13°58'	+57'	118°	13°29'	+57'	118°	13°01'	+58'	119°	12°32'	+58'	119°	12°03'	+58'	119°	11°33'	+58'	119°	11°04'	+59'	119°	4
5	14°55'	+57'	118°	14°27'	+57'	118°	13°58'	+58'	118°	13°30'	+58'	119°	13°01'	+58'	119°	12°32'	+58'	119°	12°03'	+59'	119°	5
6	15°52'	+57'	118°	15°24'	+57'	118°	14°56'	+58'	118°	14°28'	+58'	118°	13°59'	+58'	119°	13°30'	+58'	119°	13°01'	+59'	119°	6
7	16°49'	+57'	117°	16°22'	+57'	118°	15°54'	+58'	118°	15°26'	+58'	118°	14°57'	+58'	118°	14°29'	+58'	119°	14°00'	+59'	119°	7
8	17°46'	+57'	117°	17°19'	+57'	117°	16°51'	+58'	118°	16°24'	+58'	118°	15°55'	+58'	118°	15°27'	+58'	118°	14°59'	+59'	119°	8
9	18°43'	+57'	117°	18°16'	+57'	117°	17°49'	+58'	117°	17°21'	+58'	118°	16°54'	+58'	118°	16°26'	+58'	118°	15°57'	+59'	118°	9
10	19°40'	+57'	116°	19°14'	+57'	117°	18°47'	+58'	117°	18°19'	+58'	117°	17°52'	+58'	118°	17°24'	+58'	118°	16°56'	+59'	118°	10
11	20°37'	+57'	116°	20°11'	+57'	116°	19°44'	+58'	117°	19°17'	+58'	117°	18°50'	+58'	117°	18°22'	+58'	118°	17°54'	+59'	118°	11
12	21°34'	+57'	116°	21°08'	+57'	116°	20°42'	+58'	116°	20°15'	+58'	117°	19°48'	+58'	117°	19°21'	+58'	117°	18°53'	+59'	118°	12
13	22°31'	+57'	115°	22°05'	+57'	116°	21°39'	+57'	116°	21°13'	+58'	116°	20°46'	+58'	117°	20°19'	+58'	117°	19°51'	+59'	117°	13
14	23°28'	+57'	115°	23°03'	+57'	115°	22°37'	+57'	116°	22°11'	+58'	116°	21°44'	+58'	116°	21°17'	+58'	117°	20°50'	+58'	117°	14
15	24°25'	+57'	115°	24°00'	+57'	115°	23°34'	+57'	115°	23°08'	+58'	116°	22°42'	+58'	116°	22°15'	+58'	117°	21°48'	+58'	117°	15
16	25°22'	+57'	114°	24°57'	+57'	115°	24°32'	+57'	115°	24°06'	+58'	115°	23°40'	+58'	116°	23°14'	+58'	116°	22°47'	+58'	117°	16
17	26°18'	+57'	114°	25°54'	+57'	114°	25°29'	+57'	115°	25°04'	+58'	115°	24°38'	+58'	116°	24°12'	+58'	116°	23°45'	+58'	116°	17
18	27°15'	+57'	114°	26°51'	+57'	114°	26°26'	+57'	114°	26°01'	+58'	115°	25°36'	+58'	115°	25°10'	+58'	116°	24°44'	+58'	116°	18
19	28°12'	+57'	113°	27°48'	+57'	114°	27°24'	+57'	114°	26°59'	+58'	115°	26°34'	+58'	115°	26°08'	+58'	115°	25°42'	+58'	116°	19
20	29°08'	+56'	113°	28°45'	+57'	113°	28°21'	+57'	114°	27°57'	+58'	114°	27°32'	+58'	115°	27°06'	+58'	115°	26°41'	+58'	116°	20
21	30°05'	+56'	112°	29°42'	+57'	113°	29°18'	+57'	113°	28°54'	+57'	114°	28°29'	+58'	114°	28°04'	+58'	115°	27°39'	+58'	115°	21
22	31°01'	+56'	112°	30°39'	+57'	113°	30°15'	+57'	113°	29°51'	+57'	114°	29°27'	+58'	114°	29°02'	+58'	115°	28°37'	+58'	115°	22
23	31°58'	+56'	112°	31°35'	+57'	112°	31°12'	+57'	113°	30°49'	+57'	113°	30°25'	+58'	114°	30°00'	+58'	114°	29°36'	+58'	115°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

59° 301° LHA — Latitude SAME as Declination — 59° 301° 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 SAME as Declination — 60° 300° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	9°51'	+57'	118°	9°22'	+57'	119°	8°53'	+58'	119°	8°24'	+58'	119°	7°55'	+58'	119°	7°26'	+58'	119°	6°57'	+59'	119°	0
1	10°48'	+57'	118°	10°20'	+57'	118°	9°51'	+58'	118°	9°22'	+58'	119°	8°54'	+58'	119°	8°25'	+58'	119°	7°55'	+59'	119°	1
2	11°45'	+57'	118°	11°17'	+57'	118°	10°49'	+58'	118°	10°20'	+58'	118°	9°52'	+58'	119°	9°23'	+58'	119°	8°54'	+59'	119°	2
3	12°42'	+57'	118°	12°15'	+57'	118°	11°47'	+58'	118°	11°18'	+58'	118°	10°50'	+58'	118°	10°21'	+58'	118°	9°53'	+59'	119°	3
4	13°40'	+57'	117°	13°12'	+57'	117°	12°44'	+58'	118°	12°16'	+58'	118°	11°48'	+58'	118°	11°20'	+58'	118°	10°51'	+59'	118°	4
5	14°37'	+57'	117°	14°09'	+57'	117°	13°42'	+58'	117°	13°14'	+58'	118°	12°46'	+58'	118°	12°18'	+58'	118°	11°50'	+59'	118°	5
6	15°34'	+57'	117°	15°07'	+57'	117°	14°40'	+58'	117°	14°12'	+58'	117°	13°44'	+58'	118°	13°17'	+58'	118°	12°49'	+59'	118°	6
7	16°31'	+57'	116°	16°04'	+57'	117°	15°37'	+58'	117°	15°10'	+58'	117°	14°43'	+58'	117°	14°15'	+58'	118°	13°47'	+59'	118°	7
8	17°28'	+57'	116°	17°02'	+57'	116°	16°35'	+58'	117°	16°08'	+58'	117°	15°41'	+58'	117°	15°13'	+58'	117°	14°46'	+59'	118°	8
9	18°25'	+57'	116°	17°59'	+57'	116°	17°32'	+58'	116°	17°06'	+58'	117°	16°39'	+58'	117°	16°12'	+58'	117°	15°44'	+59'	117°	9
10	19°22'	+57'	115°	18°56'	+57'	116°	18°30'	+58'	116°	18°04'	+58'	116°	17°37'	+58'	117°	17°10'	+58'	117°	16°43'	+59'	117°	10
11	20°19'	+57'	115°	19°53'	+57'	115°	19°28'	+58'	116°	19°01'	+58'	116°	18°35'	+58'	116°	18°08'	+58'	117°	17°41'	+59'	117°	11
12	21°16'	+57'	115°	20°51'	+57'	115°	20°25'	+57'	115°	19°59'	+58'	116°	19°33'	+58'	116°	19°07'	+58'	116°	18°40'	+59'	117°	12
13	22°13'	+57'	114°	21°48'	+57'	115°	21°23'	+57'	115°	20°57'	+58'	115°	20°31'	+58'	116°	20°05'	+58'	116°	19°38'	+58'	116°	13
14	23°09'	+57'	114°	22°45'	+57'	114°	22°20'	+57'	115°	21°55'	+58'	115°	21°29'	+58'	115°	21°03'	+58'	116°	20°37'	+58'	116°	14
15	24°06'	+57'	114°	23°42'	+57'	114°	23°17'	+57'	114°	22°52'	+58'	115°	22°27'	+58'	115°	22°01'	+58'	116°	21°35'	+58'	116°	15
16	25°03'	+57'	113°	24°39'	+57'	114°	24°15'	+57'	114°	23°50'	+58'	114°	23°25'	+58'	115°	23°00'	+58'	115°	22°34'	+58'	116°	16
17	26°00'	+57'	113°	25°36'	+57'	113°	25°12'	+57'	114°	24°48'	+58'	114°	24°23'	+58'	115°	23°58'	+58'	115°	23°32'	+58'	115°	17
18	26°56'	+57'	112°	26°33'	+57'	113°	26°09'	+57'	113°	25°45'	+58'	114°	25°21'	+58'	114°	24°56'	+58'	115°	24°31'	+58'	115°	18
19	27°53'	+56'	112°	27°30'	+57'	113°	27°07'	+57'	113°	26°43'	+58'	114°	26°19'	+58'	114°	25°54'	+58'	114°	25°29'	+58'	115°	19
20	28°49'	+56'	112°	28°27'	+57'	112°	28°04'	+57'	113°	27°40'	+57'	113°	27°17'	+58'	114°	26°52'	+58'	114°	26°27'	+58'	115°	20
21	29°46'	+56'	111°	29°24'	+57'	112°	29°01'	+57'	112°	28°38'	+57'	113°	28°14'	+58'	113°	27°50'	+58'	114°	27°26'	+58'	114°	21
22	30°42'	+56'	111°	30°20'	+57'	112°	29°58'	+57'	112°	29°35'	+57'	113°	29°12'	+58'	113°	28°48'	+58'	114°	28°24'	+58'	114°	22
23	31°38'	+56'	111°	31°17'	+57'	111°	30°55'	+57'	112°	30°33'	+57'	112°	30°10'	+58'	113°	29°46'	+58'	113°	29°22'	+58'	114°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

60° 300° LHA — Latitude SAME as Declination — 60° 300° 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 SAME as Declination — 61° 299° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	9°33'	+57'	118°	9°05'	+57'	118°	8°37'	+58'	118°	8°09'	+58'	118°	7°41'	+58'	118°	7°13'	+58'	118°	6°44'	+59'	118°	0
1	10°30'	+57'	117°	10°02'	+57'	117°	9°35'	+58'	118°	9°07'	+58'	118°	8°39'	+58'	118°	8°11'	+58'	118°	7°43'	+59'	118°	1
2	11°27'	+57'	117°	11°00'	+57'	117°	10°32'	+58'	117°	10°05'	+58'	117°	9°37'	+58'	118°	9°09'	+58'	118°	8°41'	+59'	118°	2
3	12°24'	+57'	117°	11°57'	+57'	117°	11°30'	+58'	117°	11°03'	+58'	117°	10°35'	+58'	117°	10°08'	+58'	117°	9°40'	+59'	118°	3
4	13°21'	+57'	116°	12°55'	+57'	116°	12°28'	+58'	117°	12°01'	+58'	117°	11°33'	+58'	117°	11°06'	+58'	117°	10°39'	+59'	117°	4
5	14°18'	+57'	116°	13°52'	+57'	116°	13°25'	+58'	116°	12°59'	+58'	117°	12°32'	+58'	117°	12°04'	+58'	117°	11°37'	+59'	117°	5
6	15°15'	+57'	116°	14°49'	+57'	116°	14°23'	+58'	116°	13°56'	+58'	116°	13°30'	+58'	117°	13°03'	+58'	117°	12°36'	+59'	117°	6
7	16°12'	+57'	115°	15°47'	+57'	116°	15°21'	+58'	116°	14°54'	+58'	116°	14°28'	+58'	116°	14°01'	+58'	117°	13°34'	+59'	117°	7
8	17°09'	+57'	115°	16°44'	+57'	115°	16°18'	+58'	116°	15°52'	+58'	116°	15°26'	+58'	116°	15°00'	+58'	116°	14°33'	+59'	117°	8
9	18°06'	+57'	115°	17°41'	+57'	115°	17°16'	+58'	115°	16°50'	+58'	116°	16°24'	+58'	116°	15°58'	+58'	116°	15°31'	+59'	116°	9
10	19°03'	+57'	114°	18°38'	+57'	115°	18°13'	+58'	115°	17°48'	+58'	115°	17°22'	+58'	116°	16°56'	+58'	116°	16°30'	+59'	116°	10
11	20°00'	+57'	114°	19°36'	+57'	114°	19°11'	+57'	115°	18°46'	+58'	115°	18°20'	+58'	115°	17°54'	+58'	116°	17°28'	+58'	116°	11
12	20°57'	+57'	114°	20°33'	+57'	114°	20°08'	+57'	114°	19°43'	+58'	115°	19°18'	+58'	115°	18°53'	+58'	115°	18°27'	+58'	116°	12
13	21°54'	+57'	113°	21°30'	+57'	114°	21°06'	+57'	114°	20°41'	+58'	114°	20°16'	+58'	115°	19°51'	+58'	115°	19°25'	+58'	115°	13
14	22°51'	+57'	113°	22°27'	+57'	113°	22°03'	+57'	114°	21°39'	+58'	114°	21°14'	+58'	114°	20°49'	+58'	115°	20°24'	+58'	115°	14
15	23°47'	+57'	113°	23°24'	+57'	113°	23°00'	+57'	113°	22°36'	+58'	114°	22°12'	+58'	114°	21°47'	+58'	115°	21°22'	+58'	115°	15
16	24°44'	+57'	112°	24°21'	+57'	113°	23°58'	+57'	113°	23°34'	+58'	113°	23°10'	+58'	114°	22°46'	+58'	114°	22°21'	+58'	115°	16
17	25°41'	+57'	112°	25°18'	+57'	112°	24°55'	+57'	113°	24°32'	+58'	113°	24°08'	+58'	114°	23°44'	+58'	114°	23°19'	+58'	114°	17
18	26°37'	+57'	111°	26°15'	+57'	112°	25°52'	+57'	112°	25°29'	+58'	113°	25°06'	+58'	113°	24°42'	+58'	114°	24°18'	+58'	114°	18
19	27°34'	+56'	111°	27°12'	+57'	112°	26°50'	+57'	112°	26°27'	+57'	113°	26°04'	+58'	113°	25°40'	+58'	113°	25°16'	+58'	114°	19
20	28°30'	+56'	111°	28°09'	+57'	111°	27°47'	+57'	112°	27°24'	+57'	112°	27°01'	+58'	113°	26°38'	+58'	113°	26°14'	+58'	114°	20
21	29°27'	+56'	110°	29°05'	+57'	111°	28°44'	+57'	111°	28°22'	+57'	112°	27°59'	+58'	112°	27°36'	+58'	113°	27°12'	+58'	113°	21
22	30°23'	+56'	110°	30°02'	+57'	110°	29°41'	+57'	111°	29°19'	+57'	112°	28°57'	+58'	112°	28°34'	+58'	113°	28°11'	+58'	113°	22
23	31°19'	+56'	110°	30°59'	+57'	110°	30°38'	+57'	111°	30°16'	+57'	111°	29°54'	+58'	112°	29°32'	+58'	112°	29°09'	+58'	113°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

61° 299° LHA — Latitude SAME as Declination — 61° 299° 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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	9°14'	+57'	117°	8°48'	+57'	117°	8°20'	+58'	117°	7°53'	+58'	117°	7°26'	+58'	117°	6°59'	+58'	117°	6°31'	+59'	117°	0
1	10°12'	+57'	116°	9°45'	+57'	116°	9°18'	+58'	117°	8°51'	+58'	117°	8°24'	+58'	117°	7°57'	+58'	117°	7°30'	+59'	117°	1
2	11°09'	+57'	116°	10°42'	+57'	116°	10°16'	+58'	116°	9°49'	+58'	116°	9°22'	+58'	117°	8°56'	+58'	117°	8°28'	+59'	117°	2
3	12°06'	+57'	116°	11°40'	+57'	116°	11°13'	+58'	116°	10°47'	+58'	116°	10°21'	+58'	116°	9°54'	+58'	116°	9°27'	+59'	117°	3
4	13°03'	+57'	115°	12°37'	+57'	115°	12°11'	+58'	116°	11°45'	+58'	116°	11°19'	+58'	116°	10°52'	+58'	116°	10°26'	+59'	116°	4
5	14°00'	+57'	115°	13°34'	+57'	115°	13°09'	+58'	115°	12°43'	+58'	116°	12°17'	+58'	116°	11°51'	+58'	116°	11°24'	+59'	116°	5
6	14°57'	+57'	115°	14°32'	+57'	115°	14°06'	+58'	115°	13°41'	+58'	115°	13°15'	+58'	116°	12°49'	+58'	116°	12°23'	+59'	116°	6
7	15°54'	+57'	114°	15°29'	+57'	115°	15°04'	+58'	115°	14°39'	+58'	115°	14°13'	+58'	115°	13°47'	+58'	116°	13°21'	+59'	116°	7
8	16°51'	+57'	114°	16°26'	+57'	114°	16°01'	+58'	115°	15°36'	+58'	115°	15°11'	+58'	115°	14°46'	+58'	115°	14°20'	+59'	116°	8
9	17°48'	+57'	114°	17°23'	+57'	114°	16°59'	+57'	114°	16°34'	+58'	115°	16°09'	+58'	115°	15°44'	+58'	115°	15°18'	+59'	115°	9
10	18°45'	+57'	113°	18°21'	+57'	114°	17°56'	+57'	114°	17°32'	+58'	114°	17°07'	+58'	115°	16°42'	+58'	115°	16°17'	+58'	115°	10
11	19°41'	+57'	113°	19°18'	+57'	113°	18°54'	+57'	114°	18°30'	+58'	114°	18°05'	+58'	114°	17°40'	+58'	115°	17°15'	+58'	115°	11
12	20°38'	+57'	113°	20°15'	+57'	113°	19°51'	+57'	113°	19°27'	+58'	114°	19°03'	+58'	114°	18°39'	+58'	114°	18°14'	+58'	115°	12
13	21°35'	+57'	112°	21°12'	+57'	113°	20°49'	+57'	113°	20°25'	+58'	113°	20°01'	+58'	114°	19°37'	+58'	114°	19°12'	+58'	114°	13
14	22°32'	+57'	112°	22°09'	+57'	112°	21°46'	+57'	113°	21°23'	+58'	113°	20°59'	+58'	113°	20°35'	+58'	114°	20°11'	+58'	114°	14
15	23°28'	+57'	112°	23°06'	+57'	112°	22°43'	+57'	112°	22°20'	+58'	113°	21°57'	+58'	113°	21°33'	+58'	114°	21°09'	+58'	114°	15
16	24°25'	+57'	111°	24°03'	+57'	112°	23°41'	+57'	112°	23°18'	+58'	112°	22°55'	+58'	113°	22°31'	+58'	113°	22°07'	+58'	114°	16
17	25°22'	+57'	111°	25°00'	+57'	111°	24°38'	+57'	112°	24°16'	+58'	112°	23°53'	+58'	113°	23°29'	+58'	113°	23°06'	+58'	113°	17
18	26°18'	+56'	110°	25°57'	+57'	111°	25°35'	+57'	111°	25°13'	+57'	112°	24°51'	+58'	112°	24°28'	+58'	113°	24°04'	+58'	113°	18
19	27°15'	+56'	110°	26°54'	+57'	111°	26°32'	+57'	111°	26°11'	+57'	112°	25°48'	+58'	112°	25°26'	+58'	112°	25°03'	+58'	113°	19
20	28°11'	+56'	110°	27°50'	+57'	110°	27°29'	+57'	111°	27°08'	+57'	111°	26°46'	+58'	112°	26°24'	+58'	112°	26°01'	+58'	113°	20
21	29°07'	+56'	109°	28°47'	+57'	110°	28°27'	+57'	110°	28°05'	+57'	111°	27°44'	+58'	111°	27°22'	+58'	112°	26°59'	+58'	112°	21
22	30°04'	+56'	109°	29°44'	+57'	109°	29°24'	+57'	110°	29°03'	+57'	111°	28°41'	+58'	111°	28°20'	+58'	112°	27°57'	+58'	112°	22
23	31°00'	+56'	109°	30°40'	+57'	109°	30°20'	+57'	110°	30°00'	+57'	110°	29°39'	+58'	111°	29°18'	+58'	111°	28°56'	+58'	112°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°56'	+57'	116°	8°30'	+57'	116°	8°04'	+58'	116°	7°38'	+58'	116°	7°11'	+58'	116°	6°45'	+58'	116°	6°18'	+59'	116°	0
1	9°53'	+57'	115°	9°27'	+57'	115°	9°02'	+58'	116°	8°36'	+58'	116°	8°09'	+58'	116°	7°43'	+58'	116°	7°17'	+59'	116°	1
2	10°50'	+57'	115°	10°25'	+57'	115°	9°59'	+58'	115°	9°33'	+58'	115°	9°08'	+58'	116°	8°42'	+58'	116°	8°15'	+59'	116°	2
3	11°47'	+57'	115°	11°22'	+57'	115°	10°57'	+58'	115°	10°31'	+58'	115°	10°06'	+58'	115°	9°40'	+58'	115°	9°14'	+59'	116°	3
4	12°44'	+57'	114°	12°19'	+57'	115°	11°54'	+58'	115°	11°29'	+58'	115°	11°04'	+58'	115°	10°38'	+58'	115°	10°13'	+59'	115°	4
5	13°41'	+57'	114°	13°17'	+57'	114°	12°52'	+58'	114°	12°27'	+58'	115°	12°02'	+58'	115°	11°37'	+58'	115°	11°11'	+59'	115°	5
6	14°38'	+57'	114°	14°14'	+57'	114°	13°49'	+58'	114°	13°25'	+58'	114°	13°00'	+58'	115°	12°35'	+58'	115°	12°10'	+59'	115°	6
7	15°35'	+57'	113°	15°11'	+57'	114°	14°47'	+58'	114°	14°23'	+58'	114°	13°58'	+58'	114°	13°33'	+58'	115°	13°08'	+59'	115°	7
8	16°32'	+57'	113°	16°08'	+57'	113°	15°44'	+57'	114°	15°20'	+58'	114°	14°56'	+58'	114°	14°31'	+58'	114°	14°07'	+58'	115°	8
9	17°29'	+57'	113°	17°05'	+57'	113°	16°42'	+57'	113°	16°18'	+58'	114°	15°54'	+58'	114°	15°30'	+58'	114°	15°05'	+58'	114°	9
10	18°26'	+57'	112°	18°03'	+57'	113°	17°39'	+57'	113°	17°16'	+58'	113°	16°52'	+58'	114°	16°28'	+58'	114°	16°04'	+58'	114°	10
11	19°22'	+57'	112°	19°00'	+57'	112°	18°37'	+57'	113°	18°14'	+58'	113°	17°50'	+58'	113°	17°26'	+58'	114°	17°02'	+58'	114°	11
12	20°19'	+57'	112°	19°57'	+57'	112°	19°34'	+57'	112°	19°11'	+58'	113°	18°48'	+58'	113°	18°24'	+58'	113°	18°01'	+58'	114°	12
13	21°16'	+57'	111°	20°54'	+57'	112°	20°32'	+57'	112°	20°09'	+58'	112°	19°46'	+58'	113°	19°23'	+58'	113°	18°59'	+58'	113°	13
14	22°13'	+57'	111°	21°51'	+57'	111°	21°29'	+57'	112°	21°07'	+58'	112°	20°44'	+58'	112°	20°21'	+58'	113°	19°57'	+58'	113°	14
15	23°09'	+57'	111°	22°48'	+57'	111°	22°26'	+57'	111°	22°04'	+58'	112°	21°42'	+58'	112°	21°19'	+58'	113°	20°56'	+58'	113°	15
16	24°06'	+57'	110°	23°45'	+57'	111°	23°23'	+57'	111°	23°02'	+58'	111°	22°40'	+58'	112°	22°17'	+58'	112°	21°54'	+58'	113°	16
17	25°02'	+56'	110°	24°42'	+57'	110°	24°21'	+57'	111°	23°59'	+57'	111°	23°37'	+58'	112°	23°15'	+58'	112°	22°52'	+58'	112°	17
18	25°59'	+56'	109°	25°39'	+57'	110°	25°18'	+57'	110°	24°57'	+57'	111°	24°35'	+58'	111°	24°13'	+58'	112°	23°51'	+58'	112°	18
19	26°55'	+56'	109°	26°35'	+57'	110°	26°15'	+57'	110°	25°54'	+57'	111°	25°33'	+58'	111°	25°11'	+58'	111°	24°49'	+58'	112°	19
20	27°52'	+56'	109°	27°32'	+57'	109°	27°12'	+57'	110°	26°52'	+57'	110°	26°31'	+58'	111°	26°09'	+58'	111°	25°47'	+58'	112°	20
21	28°48'	+56'	108°	28°29'	+57'	109°	28°09'	+57'	109°	27°49'	+57'	110°	27°28'	+58'	110°	27°07'	+58'	111°	26°46'	+58'	111°	21
22	29°44'	+56'	108°	29°25'	+57'	108°	29°06'	+57'	109°	28°46'	+57'	110°	28°26'	+58'	110°	28°05'	+58'	111°	27°44'	+58'	111°	22
23	30°40'	+56'	108°	30°22'	+56'	108°	30°03'	+57'	109°	29°44'	+57'	109°	29°24'	+58'	110°	29°03'	+58'	110°	28°42'	+58'	111°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

64° 296° LHA — Latitude SAME as Declination — 64° 296° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°37'	+57'	115°	8°12'	+57'	115°	7°47'	+58'	115°	7°22'	+58'	115°	6°56'	+58'	115°	6°31'	+58'	115°	6°05'	+59'	115°	0
1	9°34'	+57'	114°	9°10'	+57'	114°	8°45'	+58'	115°	8°20'	+58'	115°	7°55'	+58'	115°	7°29'	+58'	115°	7°04'	+59'	115°	1
2	10°31'	+57'	114°	10°07'	+57'	114°	9°42'	+58'	114°	9°18'	+58'	114°	8°53'	+58'	115°	8°28'	+58'	115°	8°02'	+59'	115°	2
3	11°28'	+57'	114°	11°04'	+57'	114°	10°40'	+58'	114°	10°15'	+58'	114°	9°51'	+58'	114°	9°26'	+58'	115°	9°01'	+59'	115°	3
4	12°25'	+57'	113°	12°01'	+57'	114°	11°37'	+58'	114°	11°13'	+58'	114°	10°49'	+58'	114°	10°24'	+58'	114°	9°59'	+59'	114°	4
5	13°22'	+57'	113°	12°59'	+57'	113°	12°35'	+58'	113°	12°11'	+58'	114°	11°47'	+58'	114°	11°22'	+58'	114°	10°58'	+59'	114°	5
6	14°19'	+57'	113°	13°56'	+57'	113°	13°32'	+57'	113°	13°09'	+58'	113°	12°45'	+58'	114°	12°21'	+58'	114°	11°56'	+58'	114°	6
7	15°16'	+57'	112°	14°53'	+57'	113°	14°30'	+57'	113°	14°07'	+58'	113°	13°43'	+58'	113°	13°19'	+58'	114°	12°55'	+58'	114°	7
8	16°13'	+57'	112°	15°50'	+57'	112°	15°27'	+57'	113°	15°04'	+58'	113°	14°41'	+58'	113°	14°17'	+58'	113°	13°53'	+58'	114°	8
9	17°10'	+57'	112°	16°47'	+57'	112°	16°25'	+57'	112°	16°02'	+58'	113°	15°39'	+58'	113°	15°15'	+58'	113°	14°52'	+58'	113°	9
10	18°07'	+57'	111°	17°45'	+57'	112°	17°22'	+57'	112°	17°00'	+58'	112°	16°37'	+58'	113°	16°14'	+58'	113°	15°50'	+58'	113°	10
11	19°03'	+57'	111°	18°42'	+57'	111°	18°20'	+57'	112°	17°57'	+58'	112°	17°35'	+58'	112°	17°12'	+58'	113°	16°49'	+58'	113°	11
12	20°00'	+57'	111°	19°39'	+57'	111°	19°17'	+57'	111°	18°55'	+58'	112°	18°33'	+58'	112°	18°10'	+58'	112°	17°47'	+58'	113°	12
13	20°57'	+57'	110°	20°36'	+57'	111°	20°14'	+57'	111°	19°53'	+58'	111°	19°31'	+58'	112°	19°08'	+58'	112°	18°46'	+58'	112°	13
14	21°53'	+57'	110°	21°33'	+57'	110°	21°12'	+57'	111°	20°50'	+58'	111°	20°28'	+58'	111°	20°06'	+58'	112°	19°44'	+58'	112°	14
15	22°50'	+57'	110°	22°30'	+57'	110°	22°09'	+57'	110°	21°48'	+58'	111°	21°26'	+58'	111°	21°05'	+58'	112°	20°42'	+58'	112°	15
16	23°46'	+56'	109°	23°26'	+57'	110°	23°06'	+57'	110°	22°45'	+57'	110°	22°24'	+58'	111°	22°03'	+58'	111°	21°41'	+58'	112°	16
17	24°43'	+56'	109°	24°23'	+57'	109°	24°03'	+57'	110°	23°43'	+57'	110°	23°22'	+58'	111°	23°01'	+58'	111°	22°39'	+58'	111°	17
18	25°39'	+56'	109°	25°20'	+57'	109°	25°00'	+57'	109°	24°40'	+57'	110°	24°20'	+58'	110°	23°59'	+58'	111°	23°37'	+58'	111°	18
19	26°36'	+56'	108°	26°17'	+57'	109°	25°58'	+57'	109°	25°38'	+57'	110°	25°17'	+58'	110°	24°57'	+58'	110°	24°36'	+58'	111°	19
20	27°32'	+56'	108°	27°14'	+57'	108°	26°55'	+57'	109°	26°35'	+57'	109°	26°15'	+58'	110°	25°55'	+58'	110°	25°34'	+58'	111°	20
21	28°28'	+56'	107°	28°10'	+57'	108°	27°52'	+57'	108°	27°32'	+57'	109°	27°13'	+58'	109°	26°53'	+58'	110°	26°32'	+58'	110°	21
22	29°24'	+56'	107°	29°07'	+57'	107°	28°48'	+57'	108°	28°30'	+57'	109°	28°10'	+58'	109°	27°51'	+58'	110°	27°30'	+58'	110°	22
23	30°21'	+56'	107°	30°03'	+56'	107°	29°45'	+57'	108°	29°27'	+57'	108°	29°08'	+58'	109°	28°48'	+58'	109°	28°28'	+58'	110°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

64° 296° LHA — Latitude SAME as Declination — 64° 296° 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 SAME as Declination — 65° 295° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°19'	+57'	114°	7°55'	+57'	114°	7°30'	+58'	114°	7°06'	+58'	114°	6°41'	+58'	114°	6°17'	+58'	114°	5°52'	+59'	114°	0
1	9°16'	+57'	113°	8°52'	+57'	113°	8°28'	+58'	114°	8°04'	+58'	114°	7°39'	+58'	114°	7°15'	+58'	114°	6°51'	+59'	114°	1
2	10°13'	+57'	113°	9°49'	+57'	113°	9°25'	+58'	113°	9°01'	+58'	113°	8°37'	+58'	114°	8°13'	+58'	114°	7°49'	+59'	114°	2
3	11°10'	+57'	113°	10°46'	+57'	113°	10°23'	+58'	113°	9°59'	+58'	113°	9°36'	+58'	113°	9°12'	+58'	114°	8°48'	+59'	114°	3
4	12°06'	+57'	112°	11°43'	+57'	113°	11°20'	+57'	113°	10°57'	+58'	113°	10°34'	+58'	113°	10°10'	+58'	113°	9°46'	+58'	113°	4
5	13°03'	+57'	112°	12°41'	+57'	112°	12°18'	+57'	112°	11°55'	+58'	113°	11°32'	+58'	113°	11°08'	+58'	113°	10°45'	+58'	113°	5
6	14°00'	+57'	112°	13°38'	+57'	112°	13°15'	+57'	112°	12°53'	+58'	112°	12°30'	+58'	113°	12°06'	+58'	113°	11°43'	+58'	113°	6
7	14°57'	+57'	111°	14°35'	+57'	112°	14°13'	+57'	112°	13°50'	+58'	112°	13°28'	+58'	112°	13°05'	+58'	113°	12°42'	+58'	113°	7
8	15°54'	+57'	111°	15°32'	+57'	111°	15°10'	+57'	112°	14°48'	+58'	112°	14°26'	+58'	112°	14°03'	+58'	112°	13°40'	+58'	113°	8
9	16°51'	+57'	111°	16°29'	+57'	111°	16°08'	+57'	111°	15°46'	+58'	112°	15°24'	+58'	112°	15°01'	+58'	112°	14°38'	+58'	112°	9
10	17°47'	+57'	110°	17°26'	+57'	111°	17°05'	+57'	111°	16°43'	+58'	111°	16°21'	+58'	112°	15°59'	+58'	112°	15°37'	+58'	112°	10
11	18°44'	+57'	110°	18°23'	+57'	110°	18°02'	+57'	111°	17°41'	+58'	111°	17°19'	+58'	111°	16°58'	+58'	112°	16°35'	+58'	112°	11
12	19°41'	+57'	110°	19°20'	+57'	110°	19°00'	+57'	110°	18°39'	+58'	111°	18°17'	+58'	111°	17°56'	+58'	111°	17°34'	+58'	112°	12
13	20°37'	+57'	109°	20°17'	+57'	110°	19°57'	+57'	110°	19°36'	+58'	110°	19°15'	+58'	111°	18°54'	+58'	111°	18°32'	+58'	111°	13
14	21°34'	+57'	109°	21°14'	+57'	109°	20°54'	+57'	110°	20°34'	+58'	110°	20°13'	+58'	110°	19°52'	+58'	111°	19°30'	+58'	111°	14
15	22°31'	+56'	109°	22°11'	+57'	109°	21°51'	+57'	109°	21°31'	+57'	110°	21°11'	+58'	110°	20°50'	+58'	111°	20°29'	+58'	111°	15
16	23°27'	+56'	108°	23°08'	+57'	109°	22°49'	+57'	109°	22°29'	+57'	109°	22°09'	+58'	110°	21°48'	+58'	110°	21°27'	+58'	111°	16
17	24°23'	+56'	108°	24°05'	+57'	108°	23°46'	+57'	109°	23°26'	+57'	109°	23°06'	+58'	110°	22°46'	+58'	110°	22°25'	+58'	110°	17
18	25°20'	+56'	108°	25°02'	+57'	108°	24°43'	+57'	108°	24°24'	+57'	109°	24°04'	+58'	109°	23°44'	+58'	110°	23°24'	+58'	110°	18
19	26°16'	+56'	107°	25°58'	+57'	108°	25°40'	+57'	108°	25°21'	+57'	109°	25°02'	+58'	109°	24°42'	+58'	109°	24°22'	+58'	110°	19
20	27°12'	+56'	107°	26°55'	+57'	107°	26°37'	+57'	108°	26°18'	+57'	108°	25°59'	+58'	109°	25°40'	+58'	109°	25°20'	+58'	110°	20
21	28°09'	+56'	106°	27°52'	+57'	107°	27°34'	+57'	107°	27°16'	+57'	108°	26°57'	+58'	108°	26°38'	+58'	109°	26°18'	+58'	109°	21
22	29°05'	+56'	106°	28°48'	+56'	106°	28°31'	+57'	107°	28°13'	+57'	108°	27°55'	+58'	108°	27°36'	+58'	109°	27°17'	+58'	109°	22
23	30°01'	+56'	106°	29°45'	+56'	106°	29°28'	+57'	107°	29°10'	+57'	107°	28°52'	+57'	108°	28°34'	+58'	108°	28°15'	+58'	109°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

65° 295° LHA — Latitude SAME as Declination — 65° 295° 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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°00'	+57'	113°	7°37'	+57'	113°	7°13'	+58'	113°	6°50'	+58'	113°	6°26'	+58'	113°	6°03'	+58'	113°	5°39'	+58'	113°	0
1	8°57'	+57'	112°	8°34'	+57'	113°	8°11'	+58'	113°	7°48'	+58'	113°	7°24'	+58'	113°	7°01'	+58'	113°	6°37'	+58'	113°	1
2	9°54'	+57'	112°	9°31'	+57'	112°	9°08'	+57'	112°	8°45'	+58'	113°	8°22'	+58'	113°	7°59'	+58'	113°	7°36'	+58'	113°	2
3	10°51'	+57'	112°	10°28'	+57'	112°	10°06'	+57'	112°	9°43'	+58'	112°	9°20'	+58'	112°	8°57'	+58'	113°	8°34'	+58'	113°	3
4	11°47'	+57'	111°	11°25'	+57'	112°	11°03'	+57'	112°	10°41'	+58'	112°	10°18'	+58'	112°	9°56'	+58'	112°	9°33'	+58'	112°	4
5	12°44'	+57'	111°	12°23'	+57'	111°	12°01'	+57'	111°	11°39'	+58'	112°	11°16'	+58'	112°	10°54'	+58'	112°	10°31'	+58'	112°	5
6	13°41'	+57'	111°	13°20'	+57'	111°	12°58'	+57'	111°	12°36'	+58'	111°	12°14'	+58'	112°	11°52'	+58'	112°	11°30'	+58'	112°	6
7	14°38'	+57'	110°	14°17'	+57'	111°	13°56'	+57'	111°	13°34'	+58'	111°	13°12'	+58'	111°	12°50'	+58'	112°	12°28'	+58'	112°	7
8	15°35'	+57'	110°	15°14'	+57'	110°	14°53'	+57'	111°	14°32'	+58'	111°	14°10'	+58'	111°	13°49'	+58'	111°	13°27'	+58'	112°	8
9	16°31'	+57'	110°	16°11'	+57'	110°	15°50'	+57'	110°	15°29'	+58'	111°	15°08'	+58'	111°	14°47'	+58'	111°	14°25'	+58'	111°	9
10	17°28'	+57'	109°	17°08'	+57'	110°	16°48'	+57'	110°	16°27'	+58'	110°	16°06'	+58'	111°	15°45'	+58'	111°	15°23'	+58'	111°	10
11	18°25'	+57'	109°	18°05'	+57'	109°	17°45'	+57'	110°	17°25'	+58'	110°	17°04'	+58'	110°	16°43'	+58'	111°	16°22'	+58'	111°	11
12	19°21'	+57'	109°	19°02'	+57'	109°	18°42'	+57'	109°	18°22'	+58'	110°	18°02'	+58'	110°	17°41'	+58'	110°	17°20'	+58'	111°	12
13	20°18'	+57'	108°	19°59'	+57'	109°	19°39'	+57'	109°	19°20'	+58'	109°	19°00'	+58'	110°	18°39'	+58'	110°	18°19'	+58'	110°	13
14	21°15'	+57'	108°	20°56'	+57'	108°	20°37'	+57'	109°	20°17'	+57'	109°	19°57'	+58'	109°	19°37'	+58'	110°	19°17'	+58'	110°	14
15	22°11'	+56'	108°	21°53'	+57'	108°	21°34'	+57'	108°	21°15'	+57'	109°	20°55'	+58'	109°	20°35'	+58'	110°	20°15'	+58'	110°	15
16	23°07'	+56'	107°	22°49'	+57'	108°	22°31'	+57'	108°	22°12'	+57'	108°	21°53'	+58'	109°	21°33'	+58'	109°	21°14'	+58'	110°	16
17	24°04'	+56'	107°	23°46'	+57'	107°	23°28'	+57'	108°	23°10'	+57'	108°	22°51'	+58'	109°	22°31'	+58'	109°	22°12'	+58'	109°	17
18	25°00'	+56'	107°	24°43'	+57'	107°	24°25'	+57'	107°	24°07'	+57'	108°	23°48'	+58'	108°	23°29'	+58'	109°	23°10'	+58'	109°	18
19	25°57'	+56'	106°	25°40'	+57'	107°	25°22'	+57'	107°	25°04'	+57'	108°	24°46'	+58'	108°	24°27'	+58'	108°	24°08'	+58'	109°	19
20	26°53'	+56'	106°	26°36'	+57'	106°	26°19'	+57'	107°	26°02'	+57'	107°	25°44'	+58'	108°	25°25'	+58'	108°	25°06'	+58'	109°	20
21	27°49'	+56'	105°	27°33'	+56'	106°	27°16'	+57'	106°	26°59'	+57'	107°	26°41'	+58'	107°	26°23'	+58'	108°	26°05'	+58'	108°	21
22	28°45'	+56'	105°	28°29'	+56'	105°	28°13'	+57'	106°	27°56'	+57'	107°	27°39'	+58'	107°	27°21'	+58'	108°	27°03'	+58'	108°	22
23	29°41'	+56'	105°	29°26'	+56'	105°	29°10'	+57'	106°	28°53'	+57'	106°	28°36'	+57'	107°	28°19'	+58'	107°	28°01'	+58'	108°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	7°41'	+57'	112°	7°19'	+57'	112°	6°56'	+57'	112°	6°34'	+58'	112°	6°11'	+58'	112°	5°48'	+58'	112°	5°25'	+58'	112°	0
1	8°38'	+57'	111°	8°16'	+57'	112°	7°54'	+57'	112°	7°31'	+58'	112°	7°09'	+58'	112°	6°47'	+58'	112°	6°24'	+58'	112°	1
2	9°35'	+57'	111°	9°13'	+57'	111°	8°51'	+57'	111°	8°29'	+58'	112°	8°07'	+58'	112°	7°45'	+58'	112°	7°22'	+58'	112°	2
3	10°31'	+57'	111°	10°10'	+57'	111°	9°48'	+57'	111°	9°27'	+58'	111°	9°05'	+58'	111°	8°43'	+58'	112°	8°21'	+58'	112°	3
4	11°28'	+57'	110°	11°07'	+57'	111°	10°46'	+57'	111°	10°25'	+58'	111°	10°03'	+58'	111°	9°41'	+58'	111°	9°19'	+58'	111°	4
5	12°25'	+57'	110°	12°04'	+57'	110°	11°43'	+57'	111°	11°22'	+58'	111°	11°01'	+58'	111°	10°39'	+58'	111°	10°18'	+58'	111°	5
6	13°22'	+57'	110°	13°01'	+57'	110°	12°41'	+57'	110°	12°20'	+58'	110°	11°59'	+58'	111°	11°38'	+58'	111°	11°16'	+58'	111°	6
7	14°19'	+57'	109°	13°58'	+57'	110°	13°38'	+57'	110°	13°18'	+58'	110°	12°57'	+58'	110°	12°36'	+58'	111°	12°15'	+58'	111°	7
8	15°15'	+57'	109°	14°56'	+57'	109°	14°36'	+57'	110°	14°15'	+58'	110°	13°55'	+58'	110°	13°34'	+58'	110°	13°13'	+58'	111°	8
9	16°12'	+57'	109°	15°53'	+57'	109°	15°33'	+57'	109°	15°13'	+58'	110°	14°53'	+58'	110°	14°32'	+58'	110°	14°11'	+58'	110°	9
10	17°09'	+57'	108°	16°50'	+57'	109°	16°30'	+57'	109°	16°10'	+58'	109°	15°51'	+58'	110°	15°30'	+58'	110°	15°10'	+58'	110°	10
11	18°05'	+57'	108°	17°47'	+57'	108°	17°27'	+57'	109°	17°08'	+58'	109°	16°48'	+58'	109°	16°28'	+58'	110°	16°08'	+58'	110°	11
12	19°02'	+57'	108°	18°43'	+57'	108°	18°25'	+57'	108°	18°06'	+58'	109°	17°46'	+58'	109°	17°27'	+58'	109°	17°07'	+58'	110°	12
13	19°58'	+57'	107°	19°40'	+57'	108°	19°22'	+57'	108°	19°03'	+58'	108°	18°44'	+58'	109°	18°25'	+58'	109°	18°05'	+58'	109°	13
14	20°55'	+56'	107°	20°37'	+57'	107°	20°19'	+57'	108°	20°01'	+57'	108°	19°42'	+58'	108°	19°23'	+58'	109°	19°03'	+58'	109°	14
15	21°51'	+56'	107°	21°34'	+57'	107°	21°16'	+57'	107°	20°58'	+57'	108°	20°40'	+58'	108°	20°21'	+58'	109°	20°02'	+58'	109°	15
16	22°48'	+56'	106°	22°31'	+57'	107°	22°13'	+57'	107°	21°56'	+57'	107°	21°37'	+58'	108°	21°19'	+58'	108°	21°00'	+58'	109°	16
17	23°44'	+56'	106°	23°28'	+57'	106°	23°10'	+57'	107°	22°53'	+57'	107°	22°35'	+58'	108°	22°17'	+58'	108°	21°58'	+58'	108°	17
18	24°41'	+56'	106°	24°24'	+57'	106°	24°07'	+57'	106°	23°50'	+57'	107°	23°33'	+58'	107°	23°15'	+58'	108°	22°56'	+58'	108°	18
19	25°37'	+56'	105°	25°21'	+57'	106°	25°04'	+57'	106°	24°48'	+57'	107°	24°30'	+58'	107°	24°13'	+58'	107°	23°54'	+58'	108°	19
20	26°33'	+56'	105°	26°17'	+57'	105°	26°01'	+57'	106°	25°45'	+57'	106°	25°28'	+58'	107°	25°11'	+58'	107°	24°53'	+58'	108°	20
21	27°29'	+56'	104°	27°14'	+56'	105°	26°58'	+57'	105°	26°42'	+57'	106°	26°26'	+58'	106°	26°08'	+58'	107°	25°51'	+58'	107°	21
22	28°25'	+56'	104°	28°10'	+56'	104°	27°55'	+57'	105°	27°39'	+57'	106°	27°23'	+57'	106°	27°06'	+58'	107°	26°49'	+58'	107°	22
23	29°21'	+56'	104°	29°07'	+56'	104°	28°52'	+57'	105°	28°36'	+57'	105°	28°21'	+57'	106°	28°04'	+58'	106°	27°47'	+58'	107°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

68° 292° LHA — Latitude SAME as Declination — 68° 292° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	7°22'	+57'	111°	7°00'	+57'	111°	6°39'	+57'	111°	6°17'	+58'	111°	5°56'	+58'	111°	5°34'	+58'	111°	5°12'	+58'	111°	0
1	8°19'	+57'	110°	7°57'	+57'	111°	7°36'	+57'	111°	7°15'	+58'	111°	6°54'	+58'	111°	6°32'	+58'	111°	6°10'	+58'	111°	1
2	9°15'	+57'	110°	8°55'	+57'	110°	8°34'	+57'	110°	8°13'	+58'	111°	7°52'	+58'	111°	7°30'	+58'	111°	7°09'	+58'	111°	2
3	10°12'	+57'	110°	9°52'	+57'	110°	9°31'	+57'	110°	9°10'	+58'	110°	8°50'	+58'	110°	8°28'	+58'	111°	8°07'	+58'	111°	3
4	11°09'	+57'	109°	10°49'	+57'	110°	10°29'	+57'	110°	10°08'	+58'	110°	9°47'	+58'	110°	9°27'	+58'	110°	9°06'	+58'	110°	4
5	12°06'	+57'	109°	11°46'	+57'	109°	11°26'	+57'	110°	11°06'	+58'	110°	10°45'	+58'	110°	10°25'	+58'	110°	10°04'	+58'	110°	5
6	13°02'	+57'	109°	12°43'	+57'	109°	12°23'	+57'	109°	12°03'	+58'	109°	11°43'	+58'	110°	11°23'	+58'	110°	11°03'	+58'	110°	6
7	13°59'	+57'	108°	13°40'	+57'	109°	13°21'	+57'	109°	13°01'	+58'	109°	12°41'	+58'	109°	12°21'	+58'	110°	12°01'	+58'	110°	7
8	14°56'	+57'	108°	14°37'	+57'	108°	14°18'	+57'	109°	13°59'	+58'	109°	13°39'	+58'	109°	13°19'	+58'	109°	12°59'	+58'	110°	8
9	15°53'	+57'	108°	15°34'	+57'	108°	15°15'	+57'	108°	14°56'	+58'	109°	14°37'	+58'	109°	14°18'	+58'	109°	13°58'	+58'	109°	9
10	16°49'	+57'	107°	16°31'	+57'	108°	16°13'	+57'	108°	15°54'	+58'	108°	15°35'	+58'	109°	15°16'	+58'	109°	14°56'	+58'	109°	10
11	17°46'	+57'	107°	17°28'	+57'	107°	17°10'	+57'	108°	16°51'	+58'	108°	16°33'	+58'	108°	16°14'	+58'	109°	15°55'	+58'	109°	11
12	18°42'	+57'	107°	18°25'	+57'	107°	18°07'	+57'	107°	17°49'	+58'	108°	17°31'	+58'	108°	17°12'	+58'	108°	16°53'	+58'	109°	12
13	19°39'	+56'	106°	19°22'	+57'	107°	19°04'	+57'	107°	18°46'	+57'	107°	18°28'	+58'	108°	18°10'	+58'	108°	17°51'	+58'	108°	13
14	20°35'	+56'	106°	20°19'	+57'	106°	20°01'	+57'	107°	19°44'	+57'	107°	19°26'	+58'	107°	19°08'	+58'	108°	18°49'	+58'	108°	14
15	21°32'	+56'	106°	21°15'	+57'	106°	20°59'	+57'	106°	20°41'	+57'	107°	20°24'	+58'	107°	20°06'	+58'	108°	19°48'	+58'	108°	15
16	22°28'	+56'	105°	22°12'	+57'	106°	21°56'	+57'	106°	21°39'	+57'	106°	21°22'	+58'	107°	21°04'	+58'	107°	20°46'	+58'	108°	16
17	23°24'	+56'	105°	23°09'	+57'	105°	22°53'	+57'	106°	22°36'	+57'	106°	22°19'	+58'	107°	22°02'	+58'	107°	21°44'	+58'	107°	17
18	24°21'	+56'	105°	24°05'	+57'	105°	23°50'	+57'	105°	23°33'	+57'	106°	23°17'	+58'	106°	23°00'	+58'	107°	22°42'	+58'	107°	18
19	25°17'	+56'	104°	25°02'	+57'	105°	24°47'	+57'	105°	24°31'	+57'	106°	24°15'	+58'	106°	23°58'	+58'	106°	23°41'	+58'	107°	19
20	26°13'	+56'	104°	25°59'	+56'	104°	25°44'	+57'	105°	25°28'	+57'	105°	25°12'	+58'	106°	24°56'	+58'	106°	24°39'	+58'	107°	20
21	27°09'	+56'	103°	26°55'	+56'	104°	26°40'	+57'	104°	26°25'	+57'	105°	26°10'	+57'	105°	25°54'	+58'	106°	25°37'	+58'	106°	21
22	28°05'	+56'	103°	27°51'	+56'	104°	27°37'	+57'	104°	27°22'	+57'	105°	27°07'	+57'	105°	26°51'	+58'	106°	26°35'	+58'	106°	22
23	29°01'	+56'	103°	28°48'	+56'	103°	28°34'	+57'	104°	28°20'	+57'	104°	28°05'	+57'	105°	27°49'	+58'	105°	27°33'	+58'	106°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

68° 292° LHA — Latitude SAME as Declination — 68° 292° 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 SAME as Declination — 69° 291° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	7°02'	+57'	110°	6°42'	+57'	110°	6°21'	+57'	110°	6°01'	+58'	110°	5°40'	+58'	110°	5°19'	+58'	110°	4°58'	+58'	110°	0
1	7°59'	+57'	110°	7°39'	+57'	110°	7°19'	+57'	110°	6°59'	+58'	110°	6°38'	+58'	110°	6°18'	+58'	110°	5°57'	+58'	110°	1
2	8°56'	+57'	109°	8°36'	+57'	109°	8°16'	+57'	109°	7°56'	+58'	110°	7°36'	+58'	110°	7°16'	+58'	110°	6°55'	+58'	110°	2
3	9°53'	+57'	109°	9°33'	+57'	109°	9°14'	+57'	109°	8°54'	+58'	109°	8°34'	+58'	109°	8°14'	+58'	110°	7°54'	+58'	110°	3
4	10°50'	+57'	109°	10°30'	+57'	109°	10°11'	+57'	109°	9°52'	+58'	109°	9°32'	+58'	109°	9°12'	+58'	109°	8°52'	+58'	110°	4
5	11°46'	+57'	108°	11°27'	+57'	108°	11°08'	+57'	109°	10°49'	+58'	109°	10°30'	+58'	109°	10°10'	+58'	109°	9°51'	+58'	109°	5
6	12°43'	+57'	108°	12°24'	+57'	108°	12°06'	+57'	108°	11°47'	+58'	108°	11°28'	+58'	109°	11°08'	+58'	109°	10°49'	+58'	109°	6
7	13°40'	+57'	108°	13°21'	+57'	108°	13°03'	+57'	108°	12°44'	+58'	108°	12°26'	+58'	108°	12°07'	+58'	109°	11°47'	+58'	109°	7
8	14°36'	+57'	107°	14°18'	+57'	107°	14°00'	+57'	108°	13°42'	+58'	108°	13°23'	+58'	108°	13°05'	+58'	108°	12°46'	+58'	109°	8
9	15°33'	+57'	107°	15°15'	+57'	107°	14°58'	+57'	107°	14°40'	+58'	108°	14°21'	+58'	108°	14°03'	+58'	108°	13°44'	+58'	108°	9
10	16°30'	+57'	106°	16°12'	+57'	107°	15°55'	+57'	107°	15°37'	+58'	107°	15°19'	+58'	108°	15°01'	+58'	108°	14°42'	+58'	108°	10
11	17°26'	+57'	106°	17°09'	+57'	106°	16°52'	+57'	107°	16°35'	+58'	107°	16°17'	+58'	107°	15°59'	+58'	108°	15°41'	+58'	108°	11
12	18°23'	+56'	106°	18°06'	+57'	106°	17°49'	+57'	106°	17°32'	+57'	107°	17°15'	+58'	107°	16°57'	+58'	107°	16°39'	+58'	108°	12
13	19°19'	+56'	105°	19°03'	+57'	106°	18°46'	+57'	106°	18°30'	+57'	106°	18°13'	+58'	107°	17°55'	+58'	107°	17°37'	+58'	107°	13
14	20°16'	+56'	105°	20°00'	+57'	105°	19°44'	+57'	106°	19°27'	+57'	106°	19°10'	+58'	106°	18°53'	+58'	107°	18°36'	+58'	107°	14
15	21°12'	+56'	105°	20°56'	+57'	105°	20°41'	+57'	105°	20°25'	+57'	106°	20°08'	+58'	106°	19°51'	+58'	107°	19°34'	+58'	107°	15
16	22°08'	+56'	104°	21°53'	+57'	105°	21°38'	+57'	105°	21°22'	+57'	105°	21°06'	+58'	106°	20°49'	+58'	106°	20°32'	+58'	107°	16
17	23°05'	+56'	104°	22°50'	+57'	104°	22°35'	+57'	105°	22°19'	+57'	105°	22°03'	+58'	106°	21°47'	+58'	106°	21°30'	+58'	106°	17
18	24°01'	+56'	104°	23°46'	+57'	104°	23°32'	+57'	104°	23°17'	+57'	105°	23°01'	+58'	105°	22°45'	+58'	106°	22°29'	+58'	106°	18
19	24°57'	+56'	103°	24°43'	+57'	104°	24°29'	+57'	104°	24°14'	+57'	105°	23°59'	+58'	105°	23°43'	+58'	105°	23°27'	+58'	106°	19
20	25°53'	+56'	103°	25°40'	+56'	103°	25°26'	+57'	104°	25°11'	+57'	104°	24°56'	+58'	105°	24°41'	+58'	105°	24°25'	+58'	106°	20
21	26°49'	+56'	102°	26°36'	+56'	103°	26°22'	+57'	103°	26°08'	+57'	104°	25°54'	+57'	104°	25°39'	+58'	105°	25°23'	+58'	105°	21
22	27°45'	+56'	102°	27°32'	+56'	103°	27°19'	+57'	103°	27°05'	+57'	104°	26°51'	+57'	104°	26°36'	+58'	105°	26°21'	+58'	105°	22
23	28°41'	+56'	102°	28°29'	+56'	102°	28°16'	+57'	103°	28°02'	+57'	103°	27°49'	+57'	104°	27°34'	+58'	104°	27°19'	+58'	105°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

69° 291° LHA — Latitude SAME as Declination — 69° 291° 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 SAME as Declination — 70° 290° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	6°43'	+57'	109°	6°24'	+57'	109°	6°04'	+57'	109°	5°44'	+58'	109°	5°25'	+58'	109°	5°05'	+58'	109°	4°45'	+58'	109°	0
1	7°40'	+57'	109°	7°21'	+57'	109°	7°01'	+57'	109°	6°42'	+58'	109°	6°23'	+58'	109°	6°03'	+58'	109°	5°43'	+58'	109°	1
2	8°37'	+57'	108°	8°18'	+57'	108°	7°59'	+57'	109°	7°40'	+58'	109°	7°20'	+58'	109°	7°01'	+58'	109°	6°42'	+58'	109°	2
3	9°33'	+57'	108°	9°15'	+57'	108°	8°56'	+57'	108°	8°37'	+58'	108°	8°18'	+58'	108°	7°59'	+58'	109°	7°40'	+58'	109°	3
4	10°30'	+57'	108°	10°12'	+57'	108°	9°53'	+57'	108°	9°35'	+58'	108°	9°16'	+58'	108°	8°57'	+58'	108°	8°38'	+58'	109°	4
5	11°27'	+57'	107°	11°09'	+57'	107°	10°51'	+57'	108°	10°33'	+58'	108°	10°14'	+58'	108°	9°56'	+58'	108°	9°37'	+58'	108°	5
6	12°23'	+57'	107°	12°06'	+57'	107°	11°48'	+57'	107°	11°30'	+58'	108°	11°12'	+58'	108°	10°54'	+58'	108°	10°35'	+58'	108°	6
7	13°20'	+57'	107°	13°03'	+57'	107°	12°45'	+57'	107°	12°28'	+58'	107°	12°10'	+58'	107°	11°52'	+58'	108°	11°34'	+58'	108°	7
8	14°17'	+57'	106°	14°00'	+57'	106°	13°43'	+57'	107°	13°25'	+58'	107°	13°08'	+58'	107°	12°50'	+58'	107°	12°32'	+58'	108°	8
9	15°13'	+57'	106°	14°57'	+57'	106°	14°40'	+57'	106°	14°23'	+58'	107°	14°06'	+58'	107°	13°48'	+58'	107°	13°30'	+58'	107°	9
10	16°10'	+57'	106°	15°54'	+57'	106°	15°37'	+57'	106°	15°20'	+58'	106°	15°03'	+58'	107°	14°46'	+58'	107°	14°29'	+58'	107°	10
11	17°06'	+56'	105°	16°50'	+57'	105°	16°34'	+57'	106°	16°18'	+57'	106°	16°01'	+58'	106°	15°44'	+58'	107°	15°27'	+58'	107°	11
12	18°03'	+56'	105°	17°47'	+57'	105°	17°31'	+57'	105°	17°15'	+57'	106°	16°59'	+58'	106°	16°42'	+58'	106°	16°25'	+58'	107°	12
13	18°59'	+56'	104°	18°44'	+57'	105°	18°29'	+57'	105°	18°13'	+57'	105°	17°57'	+58'	106°	17°40'	+58'	106°	17°23'	+58'	106°	13
14	19°56'	+56'	104°	19°41'	+57'	104°	19°26'	+57'	105°	19°10'	+57'	105°	18°54'	+58'	105°	18°38'	+58'	106°	18°22'	+58'	106°	14
15	20°52'	+56'	104°	20°38'	+57'	104°	20°23'	+57'	104°	20°08'	+57'	105°	19°52'	+58'	105°	19°36'	+58'	106°	19°20'	+58'	106°	15
16	21°48'	+56'	103°	21°34'	+57'	104°	21°20'	+57'	104°	21°05'	+57'	105°	20°50'	+58'	105°	20°34'	+58'	105°	20°18'	+58'	106°	16
17	22°45'	+56'	103°	22°31'	+57'	103°	22°17'	+57'	104°	22°02'	+57'	104°	21°47'	+58'	105°	21°32'	+58'	105°	21°16'	+58'	105°	17
18	23°41'	+56'	103°	23°28'	+57'	103°	23°14'	+57'	103°	23°00'	+57'	104°	22°45'	+58'	104°	22°30'	+58'	105°	22°15'	+58'	105°	18
19	24°37'	+56'	102°	24°24'	+56'	103°	24°11'	+57'	103°	23°57'	+57'	104°	23°43'	+58'	104°	23°28'	+58'	104°	23°13'	+58'	105°	19
20	25°33'	+56'	102°	25°21'	+56'	102°	25°08'	+57'	103°	24°54'	+57'	103°	24°40'	+57'	104°	24°26'	+58'	104°	24°11'	+58'	105°	20
21	26°29'	+56'	101°	26°17'	+56'	102°	26°04'	+57'	102°	25°51'	+57'	103°	25°38'	+57'	103°	25°23'	+58'	104°	25°09'	+58'	104°	21
22	27°25'	+56'	101°	27°13'	+56'	102°	27°01'	+57'	102°	26°48'	+57'	103°	26°35'	+57'	103°	26°21'	+58'	104°	26°07'	+58'	104°	22
23	28°21'	+56'	101°	28°10'	+56'	101°	27°58'	+57'	102°	27°45'	+57'	102°	27°32'	+57'	103°	27°19'	+58'	103°	27°05'	+58'	104°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

70° 290° LHA — Latitude SAME as Declination — 70° 290° 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 SAME as Declination — 71° 289° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	6°24'	+57'	108°	6°05'	+57'	108°	5°46'	+57'	108°	5°28'	+58'	108°	5°09'	+58'	108°	4°50'	+58'	108°	4°31'	+58'	108°	0
1	7°20'	+57'	108°	7°02'	+57'	108°	6°44'	+57'	108°	6°25'	+58'	108°	6°07'	+58'	108°	5°48'	+58'	108°	5°29'	+58'	108°	1
2	8°17'	+57'	107°	7°59'	+57'	107°	7°41'	+57'	108°	7°23'	+58'	108°	7°05'	+58'	108°	6°46'	+58'	108°	6°28'	+58'	108°	2
3	9°14'	+57'	107°	8°56'	+57'	107°	8°38'	+57'	107°	8°21'	+58'	107°	8°03'	+58'	108°	7°44'	+58'	108°	7°26'	+58'	108°	3
4	10°10'	+57'	107°	9°53'	+57'	107°	9°36'	+57'	107°	9°18'	+58'	107°	9°00'	+58'	107°	8°43'	+58'	107°	8°25'	+58'	108°	4
5	11°07'	+57'	106°	10°50'	+57'	106°	10°33'	+57'	107°	10°16'	+58'	107°	9°58'	+58'	107°	9°41'	+58'	107°	9°23'	+58'	107°	5
6	12°04'	+57'	106°	11°47'	+57'	106°	11°30'	+57'	106°	11°13'	+58'	107°	10°56'	+58'	107°	10°39'	+58'	107°	10°21'	+58'	107°	6
7	13°00'	+57'	106°	12°44'	+57'	106°	12°28'	+57'	106°	12°11'	+58'	106°	11°54'	+58'	106°	11°37'	+58'	107°	11°20'	+58'	107°	7
8	13°57'	+57'	105°	13°41'	+57'	105°	13°25'	+57'	106°	13°08'	+58'	106°	12°52'	+58'	106°	12°35'	+58'	106°	12°18'	+58'	107°	8
9	14°53'	+57'	105°	14°38'	+57'	105°	14°22'	+57'	105°	14°06'	+58'	106°	13°50'	+58'	106°	13°33'	+58'	106°	13°16'	+58'	106°	9
10	15°50'	+56'	105°	15°35'	+57'	105°	15°19'	+57'	105°	15°03'	+57'	105°	14°47'	+58'	106°	14°31'	+58'	106°	14°15'	+58'	106°	10
11	16°46'	+56'	104°	16°32'	+57'	105°	16°16'	+57'	105°	16°01'	+57'	105°	15°45'	+58'	105°	15°29'	+58'	106°	15°13'	+58'	106°	11
12	17°43'	+56'	104°	17°28'	+57'	104°	17°14'	+57'	104°	16°58'	+57'	105°	16°43'	+58'	105°	16°27'	+58'	105°	16°11'	+58'	106°	12
13	18°39'	+56'	103°	18°25'	+57'	104°	18°11'	+57'	104°	17°56'	+57'	104°	17°41'	+58'	105°	17°25'	+58'	105°	17°09'	+58'	105°	13
14	19°36'	+56'	103°	19°22'	+57'	103°	19°08'	+57'	104°	18°53'	+57'	104°	18°38'	+58'	104°	18°23'	+58'	105°	18°08'	+58'	105°	14
15	20°32'	+56'	103°	20°19'	+57'	103°	20°05'	+57'	103°	19°51'	+57'	104°	19°36'	+58'	104°	19°21'	+58'	105°	19°06'	+58'	105°	15
16	21°28'	+56'	102°	21°15'	+57'	103°	21°02'	+57'	103°	20°48'	+57'	104°	20°34'	+58'	104°	20°19'	+58'	104°	20°04'	+58'	105°	16
17	22°25'	+56'	102°	22°12'	+57'	102°	21°59'	+57'	103°	21°45'	+57'	103°	21°31'	+58'	104°	21°17'	+58'	104°	21°02'	+58'	104°	17
18	23°21'	+56'	102°	23°08'	+57'	102°	22°56'	+57'	102°	22°43'	+57'	103°	22°29'	+58'	103°	22°15'	+58'	104°	22°01'	+58'	104°	18
19	24°17'	+56'	101°	24°05'	+56'	102°	23°53'	+57'	102°	23°40'	+57'	103°	23°26'	+58'	103°	23°13'	+58'	103°	22°59'	+58'	104°	19
20	25°13'	+56'	101°	25°01'	+56'	101°	24°49'	+57'	102°	24°37'	+57'	102°	24°24'	+57'	103°	24°11'	+58'	103°	23°57'	+58'	104°	20
21	26°09'	+56'	100°	25°58'	+56'	101°	25°46'	+57'	101°	25°34'	+57'	102°	25°21'	+57'	102°	25°08'	+58'	103°	24°55'	+58'	103°	21
22	27°05'	+56'	100°	26°54'	+56'	101°	26°43'	+57'	101°	26°31'	+57'	102°	26°19'	+57'	102°	26°06'	+58'	103°	25°53'	+58'	103°	22
23	28°01'	+56'	100°	27°50'	+56'	100°	27°40'	+57'	101°	27°28'	+57'	101°	27°16'	+57'	102°	27°04'	+58'	102°	26°51'	+58'	103°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

71° 289° LHA — Latitude SAME as Declination — 71° 289° LHA

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

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

72° 288° LHA — Latitude SAME as Declination — 72° 288° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	6°04'	+57'	107°	5°46'	+57'	107°	5°29'	+57'	107°	5°11'	+58'	107°	4°53'	+58'	107°	4°35'	+58'	107°	4°17'	+58'	107°	0
1	7°01'	+57'	107°	6°43'	+57'	107°	6°26'	+57'	107°	6°09'	+58'	107°	5°51'	+58'	107°	5°33'	+58'	107°	5°16'	+58'	107°	1
2	7°57'	+57'	106°	7°40'	+57'	106°	7°23'	+57'	107°	7°06'	+58'	107°	6°49'	+58'	107°	6°32'	+58'	107°	6°14'	+58'	107°	2
3	8°54'	+57'	106°	8°37'	+57'	106°	8°21'	+57'	106°	8°04'	+58'	106°	7°47'	+58'	107°	7°30'	+58'	107°	7°12'	+58'	107°	3
4	9°51'	+57'	106°	9°34'	+57'	106°	9°18'	+57'	106°	9°01'	+58'	106°	8°45'	+58'	106°	8°28'	+58'	106°	8°11'	+58'	107°	4
5	10°47'	+57'	105°	10°31'	+57'	105°	10°15'	+57'	106°	9°59'	+58'	106°	9°42'	+58'	106°	9°26'	+58'	106°	9°09'	+58'	106°	5
6	11°44'	+57'	105°	11°28'	+57'	105°	11°13'	+57'	105°	10°57'	+58'	106°	10°40'	+58'	106°	10°24'	+58'	106°	10°07'	+58'	106°	6
7	12°41'	+57'	105°	12°25'	+57'	105°	12°10'	+57'	105°	11°54'	+58'	105°	11°38'	+58'	105°	11°22'	+58'	106°	11°06'	+58'	106°	7
8	13°37'	+57'	104°	13°22'	+57'	105°	13°07'	+57'	105°	12°52'	+57'	105°	12°36'	+58'	105°	12°20'	+58'	105°	12°04'	+58'	106°	8
9	14°34'	+56'	104°	14°19'	+57'	104°	14°04'	+57'	104°	13°49'	+57'	105°	13°34'	+58'	105°	13°18'	+58'	105°	13°02'	+58'	105°	9
10	15°30'	+56'	104°	15°16'	+57'	104°	15°01'	+57'	104°	14°47'	+57'	104°	14°32'	+58'	105°	14°16'	+58'	105°	14°01'	+58'	105°	10
11	16°27'	+56'	103°	16°13'	+57'	104°	15°58'	+57'	104°	15°44'	+57'	104°	15°29'	+58'	104°	15°14'	+58'	105°	14°59'	+58'	105°	11
12	17°23'	+56'	103°	17°09'	+57'	103°	16°56'	+57'	103°	16°41'	+57'	104°	16°27'	+58'	104°	16°12'	+58'	104°	15°57'	+58'	105°	12
13	18°19'	+56'	103°	18°06'	+57'	103°	17°53'	+57'	103°	17°39'	+57'	103°	17°25'	+58'	104°	17°10'	+58'	104°	16°55'	+58'	104°	13
14	19°16'	+56'	102°	19°03'	+57'	103°	18°50'	+57'	103°	18°36'	+57'	103°	18°22'	+58'	103°	18°08'	+58'	104°	17°54'	+58'	104°	14
15	20°12'	+56'	102°	20°00'	+57'	102°	19°47'	+57'	103°	19°34'	+57'	103°	19°20'	+58'	103°	19°06'	+58'	104°	18°52'	+58'	104°	15
16	21°08'	+56'	101°	20°56'	+57'	102°	20°44'	+57'	102°	20°31'	+57'	103°	20°18'	+58'	103°	20°04'	+58'	103°	19°50'	+58'	104°	16
17	22°04'	+56'	101°	21°53'	+57'	101°	21°41'	+57'	102°	21°28'	+57'	102°	21°15'	+58'	103°	21°02'	+58'	103°	20°48'	+58'	103°	17
18	23°01'	+56'	101°	22°49'	+56'	101°	22°38'	+57'	101°	22°25'	+57'	102°	22°13'	+58'	102°	22°00'	+58'	103°	21°46'	+58'	103°	18
19	23°57'	+56'	100°	23°46'	+56'	101°	23°34'	+57'	101°	23°23'	+57'	102°	23°10'	+57'	102°	22°58'	+58'	102°	22°45'	+58'	103°	19
20	24°53'	+56'	100°	24°42'	+56'	100°	24°31'	+57'	101°	24°20'	+57'	101°	24°08'	+57'	102°	23°55'	+58'	102°	23°43'	+58'	103°	20
21	25°49'	+56'	99°	25°39'	+56'	100°	25°28'	+57'	100°	25°17'	+57'	101°	25°05'	+57'	101°	24°53'	+58'	102°	24°41'	+58'	102°	21
22	26°45'	+56'	99°	26°35'	+56'	100°	26°25'	+57'	100°	26°14'	+57'	101°	26°03'	+57'	101°	25°51'	+58'	102°	25°39'	+58'	102°	22
23	27°40'	+56'	99°	27°31'	+56'	99°	27°21'	+57'	100°	27°11'	+57'	100°	27°00'	+57'	101°	26°49'	+58'	101°	26°37'	+58'	102°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

72° 288° LHA — Latitude SAME as Declination — 72° 288° LHA

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

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

73° 287° LHA — Latitude SAME as Declination — 73° 287° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	5°44'	+57'	106°	5°28'	+57'	106°	5°11'	+57'	106°	4°54'	+58'	106°	4°37'	+58'	106°	4°20'	+58'	106°	4°03'	+58'	107°	0
1	6°41'	+57'	106°	6°25'	+57'	106°	6°08'	+57'	106°	5°52'	+58'	106°	5°35'	+58'	106°	5°19'	+58'	106°	5°02'	+58'	106°	1
2	7°38'	+57'	105°	7°22'	+57'	105°	7°06'	+57'	106°	6°49'	+58'	106°	6°33'	+58'	106°	6°17'	+58'	106°	6°00'	+58'	106°	2
3	8°34'	+57'	105°	8°19'	+57'	105°	8°03'	+57'	105°	7°47'	+58'	105°	7°31'	+58'	106°	7°15'	+58'	106°	6°58'	+58'	106°	3
4	9°31'	+57'	105°	9°16'	+57'	105°	9°00'	+57'	105°	8°45'	+58'	105°	8°29'	+58'	105°	8°13'	+58'	105°	7°57'	+58'	106°	4
5	10°27'	+57'	104°	10°13'	+57'	105°	9°57'	+57'	105°	9°42'	+58'	105°	9°27'	+58'	105°	9°11'	+58'	105°	8°55'	+58'	105°	5
6	11°24'	+57'	104°	11°09'	+57'	104°	10°55'	+57'	104°	10°40'	+58'	105°	10°24'	+58'	105°	10°09'	+58'	105°	9°53'	+58'	105°	6
7	12°21'	+57'	104°	12°06'	+57'	104°	11°52'	+57'	104°	11°37'	+57'	104°	11°22'	+58'	104°	11°07'	+58'	105°	10°52'	+58'	105°	7
8	13°17'	+56'	103°	13°03'	+57'	104°	12°49'	+57'	104°	12°35'	+57'	104°	12°20'	+58'	104°	12°05'	+58'	104°	11°50'	+58'	105°	8
9	14°14'	+56'	103°	14°00'	+57'	103°	13°46'	+57'	103°	13°32'	+57'	104°	13°18'	+58'	104°	13°03'	+58'	104°	12°48'	+58'	104°	9
10	15°10'	+56'	103°	14°57'	+57'	103°	14°43'	+57'	103°	14°30'	+57'	103°	14°15'	+58'	104°	14°01'	+58'	104°	13°47'	+58'	104°	10
11	16°07'	+56'	102°	15°54'	+57'	103°	15°40'	+57'	103°	15°27'	+57'	103°	15°13'	+58'	103°	14°59'	+58'	104°	14°45'	+58'	104°	11
12	17°03'	+56'	102°	16°50'	+57'	102°	16°38'	+57'	103°	16°24'	+57'	103°	16°11'	+58'	103°	15°57'	+58'	103°	15°43'	+58'	104°	12
13	17°59'	+56'	102°	17°47'	+57'	102°	17°35'	+57'	102°	17°22'	+57'	103°	17°09'	+58'	103°	16°55'	+58'	103°	16°41'	+58'	103°	13
14	18°56'	+56'	101°	18°44'	+57'	102°	18°32'	+57'	102°	18°19'	+57'	102°	18°06'	+58'	103°	17°53'	+58'	103°	17°40'	+58'	103°	14
15	19°52'	+56'	101°	19°40'	+57'	101°	19°29'	+57'	102°	19°16'	+57'	102°	19°04'	+58'	102°	18°51'	+58'	103°	18°38'	+58'	103°	15
16	20°48'	+56'	100°	20°37'	+57'	101°	20°26'	+57'	101°	20°14'	+57'	102°	20°01'	+58'	102°	19°49'	+58'	102°	19°36'	+58'	103°	16
17	21°44'	+56'	100°	21°34'	+57'	100°	21°22'	+57'	101°	21°11'	+57'	101°	20°59'	+58'	102°	20°47'	+58'	102°	20°34'	+58'	102°	17
18	22°40'	+56'	100°	22°30'	+56'	100°	22°19'	+57'	101°	22°08'	+57'	101°	21°57'	+58'	101°	21°45'	+58'	102°	21°32'	+58'	102°	18
19	23°37'	+56'	99°	23°27'	+56'	100°	23°16'	+57'	100°	23°05'	+57'	101°	22°54'	+57'	101°	22°42'	+58'	101°	22°30'	+58'	102°	19
20	24°33'	+56'	99°	24°23'	+56'	99°	24°13'	+57'	100°	24°03'	+57'	100°	23°52'	+57'	101°	23°40'	+58'	101°	23°28'	+58'	102°	20
21	25°28'	+56'	99°	25°19'	+56'	99°	25°10'	+57'	99°	25°00'	+57'	100°	24°49'	+57'	100°	24°38'	+58'	101°	24°26'	+58'	101°	21
22	26°24'	+56'	98°	26°16'	+56'	99°	26°06'	+57'	99°	25°57'	+57'	100°	25°46'	+57'	100°	25°36'	+58'	101°	25°24'	+58'	101°	22
23	27°20'	+56'	98°	27°12'	+56'	98°	27°03'	+57'	99°	26°54'	+57'	99°	26°44'	+57'	100°	26°33'	+58'	100°	26°22'	+58'	101°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

73° 287° LHA — Latitude SAME as Declination — 73° 287° LHA

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

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

74° 286° LHA — Latitude SAME as Declination — 74° 286° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	5°25'	+57'	105°	5°09'	+57'	105°	4°53'	+57'	105°	4°37'	+58'	105°	4°21'	+58'	105°	4°05'	+58'	105°	3°49'	+58'	106°	0
1	6°21'	+57'	105°	6°06'	+57'	105°	5°50'	+57'	105°	5°35'	+58'	105°	5°19'	+58'	105°	5°04'	+58'	105°	4°48'	+58'	105°	1
2	7°18'	+57'	104°	7°03'	+57'	105°	6°48'	+57'	105°	6°32'	+58'	105°	6°17'	+58'	105°	6°02'	+58'	105°	5°46'	+58'	105°	2
3	8°14'	+57'	104°	8°00'	+57'	104°	7°45'	+57'	104°	7°30'	+58'	104°	7°15'	+58'	105°	7°00'	+58'	105°	6°44'	+58'	105°	3
4	9°11'	+57'	104°	8°57'	+57'	104°	8°42'	+57'	104°	8°28'	+58'	104°	8°13'	+58'	104°	7°58'	+58'	104°	7°43'	+58'	105°	4
5	10°08'	+57'	103°	9°54'	+57'	104°	9°39'	+57'	104°	9°25'	+58'	104°	9°11'	+58'	104°	8°56'	+58'	104°	8°41'	+58'	104°	5
6	11°04'	+57'	103°	10°50'	+57'	103°	10°37'	+57'	103°	10°23'	+57'	104°	10°08'	+58'	104°	9°54'	+58'	104°	9°39'	+58'	104°	6
7	12°01'	+56'	103°	11°47'	+57'	103°	11°34'	+57'	103°	11°20'	+57'	103°	11°06'	+58'	104°	10°52'	+58'	104°	10°38'	+58'	104°	7
8	12°57'	+56'	102°	12°44'	+57'	103°	12°31'	+57'	103°	12°18'	+57'	103°	12°04'	+58'	103°	11°50'	+58'	103°	11°36'	+58'	104°	8
9	13°54'	+56'	102°	13°41'	+57'	102°	13°28'	+57'	103°	13°15'	+57'	103°	13°02'	+58'	103°	12°48'	+58'	103°	12°34'	+58'	103°	9
10	14°50'	+56'	102°	14°38'	+57'	102°	14°25'	+57'	102°	14°12'	+57'	102°	13°59'	+58'	103°	13°46'	+58'	103°	13°33'	+58'	103°	10
11	15°46'	+56'	101°	15°35'	+57'	102°	15°22'	+57'	102°	15°10'	+57'	102°	14°57'	+58'	102°	14°44'	+58'	103°	14°31'	+58'	103°	11
12	16°43'	+56'	101°	16°31'	+57'	101°	16°19'	+57'	102°	16°07'	+57'	102°	15°55'	+58'	102°	15°42'	+58'	102°	15°29'	+58'	103°	12
13	17°39'	+56'	101°	17°28'	+57'	101°	17°16'	+57'	101°	17°05'	+57'	102°	16°52'	+58'	102°	16°40'	+58'	102°	16°27'	+58'	102°	13
14	18°35'	+56'	100°	18°25'	+57'	101°	18°13'	+57'	101°	18°02'	+57'	101°	17°50'	+58'	102°	17°38'	+58'	102°	17°25'	+58'	102°	14
15	19°32'	+56'	100°	19°21'	+57'	100°	19°10'	+57'	101°	18°59'	+57'	101°	18°48'	+58'	101°	18°36'	+58'	102°	18°24'	+58'	102°	15
16	20°28'	+56'	100°	20°18'	+57'	100°	20°07'	+57'	100°	19°56'	+57'	101°	19°45'	+58'	101°	19°34'	+58'	101°	19°22'	+58'	102°	16
17	21°24'	+56'	99°	21°14'	+56'	100°	21°04'	+57'	100°	20°54'	+57'	100°	20°43'	+58'	101°	20°32'	+58'	101°	20°20'	+58'	101°	17
18	22°20'	+56'	99°	22°11'	+56'	99°	22°01'	+57'	100°	21°51'	+57'	100°	21°40'	+57'	100°	21°29'	+58'	101°	21°18'	+58'	101°	18
19	23°16'	+56'	98°	23°07'	+56'	99°	22°58'	+57'	99°	22°48'	+57'	100°	22°38'	+57'	100°	22°27'	+58'	100°	22°16'	+58'	101°	19
20	24°12'	+56'	98°	24°04'	+56'	98°	23°55'	+57'	99°	23°45'	+57'	99°	23°35'	+57'	100°	23°25'	+58'	100°	23°14'	+58'	101°	20
21	25°08'	+56'	98°	25°00'	+56'	98°	24°51'	+57'	98°	24°42'	+57'	99°	24°33'	+57'	99°	24°23'	+58'	100°	24°12'	+58'	100°	21
22	26°04'	+56'	97°	25°56'	+56'	98°	25°48'	+57'	98°	25°39'	+57'	99°	25°30'	+57'	99°	25°20'	+58'	100°	25°10'	+58'	100°	22
23	27°00'	+56'	97°	26°53'	+56'	97°	26°45'	+57'	98°	26°36'	+57'	98°	26°27'	+57'	99°	26°18'	+58'	99°	26°08'	+58'	100°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

74° 286° LHA — Latitude SAME as Declination — 74° 286° LHA

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

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

75° 285° LHA — Latitude SAME as Declination — 75° 285° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	5°05'	+57'	104°	4°50'	+57'	104°	4°35'	+57'	104°	4°20'	+58'	104°	4°05'	+58'	104°	3°50'	+58'	105°	3°35'	+58'	105°	0
1	6°01'	+57'	104°	5°47'	+57'	104°	5°32'	+57'	104°	5°18'	+58'	104°	5°03'	+58'	104°	4°49'	+58'	104°	4°34'	+58'	104°	1
2	6°58'	+57'	103°	6°44'	+57'	104°	6°30'	+57'	104°	6°15'	+58'	104°	6°01'	+58'	104°	5°47'	+58'	104°	5°32'	+58'	104°	2
3	7°54'	+57'	103°	7°41'	+57'	103°	7°27'	+57'	103°	7°13'	+58'	104°	6°59'	+58'	104°	6°45'	+58'	104°	6°30'	+58'	104°	3
4	8°51'	+57'	103°	8°38'	+57'	103°	8°24'	+57'	103°	8°10'	+57'	103°	7°57'	+58'	103°	7°43'	+58'	104°	7°29'	+58'	104°	4
5	9°48'	+57'	102°	9°35'	+57'	103°	9°21'	+57'	103°	9°08'	+57'	103°	8°54'	+58'	103°	8°41'	+58'	103°	8°27'	+58'	103°	5
6	10°44'	+56'	102°	10°31'	+57'	102°	10°19'	+57'	102°	10°05'	+57'	103°	9°52'	+58'	103°	9°39'	+58'	103°	9°25'	+58'	103°	6
7	11°41'	+56'	102°	11°28'	+57'	102°	11°16'	+57'	102°	11°03'	+57'	102°	10°50'	+58'	103°	10°37'	+58'	103°	10°24'	+58'	103°	7
8	12°37'	+56'	101°	12°25'	+57'	102°	12°13'	+57'	102°	12°00'	+57'	102°	11°48'	+58'	102°	11°35'	+58'	102°	11°22'	+58'	103°	8
9	13°33'	+56'	101°	13°22'	+57'	101°	13°10'	+57'	102°	12°58'	+57'	102°	12°45'	+58'	102°	12°33'	+58'	102°	12°20'	+58'	102°	9
10	14°30'	+56'	101°	14°19'	+57'	101°	14°07'	+57'	101°	13°55'	+57'	101°	13°43'	+58'	102°	13°31'	+58'	102°	13°18'	+58'	102°	10
11	15°26'	+56'	100°	15°15'	+57'	101°	15°04'	+57'	101°	14°53'	+57'	101°	14°41'	+58'	101°	14°29'	+58'	102°	14°17'	+58'	102°	11
12	16°23'	+56'	100°	16°12'	+57'	100°	16°01'	+57'	101°	15°50'	+57'	101°	15°39'	+58'	101°	15°27'	+58'	101°	15°15'	+58'	102°	12
13	17°19'	+56'	100°	17°09'	+57'	100°	16°58'	+57'	100°	16°47'	+57'	101°	16°36'	+58'	101°	16°25'	+58'	101°	16°13'	+58'	101°	13
14	18°15'	+56'	99°	18°05'	+57'	100°	17°55'	+57'	100°	17°45'	+57'	100°	17°34'	+58'	101°	17°23'	+58'	101°	17°11'	+58'	101°	14
15	19°11'	+56'	99°	19°02'	+57'	99°	18°52'	+57'	100°	18°42'	+57'	100°	18°31'	+58'	100°	18°21'	+58'	101°	18°09'	+58'	101°	15
16	20°08'	+56'	99°	19°59'	+57'	99°	19°49'	+57'	99°	19°39'	+57'	100°	19°29'	+58'	100°	19°18'	+58'	100°	19°08'	+58'	101°	16
17	21°04'	+56'	98°	20°55'	+56'	99°	20°46'	+57'	99°	20°36'	+57'	99°	20°27'	+58'	100°	20°16'	+58'	100°	20°06'	+58'	100°	17
18	22°00'	+56'	98°	21°52'	+56'	98°	21°43'	+57'	99°	21°34'	+57'	99°	21°24'	+57'	99°	21°14'	+58'	100°	21°04'	+58'	100°	18
19	22°56'	+56'	97°	22°48'	+56'	98°	22°40'	+57'	98°	22°31'	+57'	99°	22°22'	+57'	99°	22°12'	+58'	99°	22°02'	+58'	100°	19
20	23°52'	+56'	97°	23°44'	+56'	97°	23°36'	+57'	98°	23°28'	+57'	98°	23°19'	+57'	99°	23°10'	+58'	99°	23°00'	+58'	100°	20
21	24°48'	+56'	97°	24°41'	+56'	97°	24°33'	+57'	98°	24°25'	+57'	98°	24°16'	+57'	98°	24°07'	+58'	99°	23°58'	+58'	99°	21
22	25°44'	+56'	96°	25°37'	+56'	97°	25°30'	+57'	97°	25°22'	+57'	98°	25°14'	+57'	98°	25°05'	+58'	99°	24°56'	+58'	99°	22
23	26°39'	+56'	96°	26°33'	+56'	96°	26°26'	+57'	97°	26°19'	+57'	97°	26°11'	+57'	98°	26°03'	+58'	98°	25°54'	+58'	99°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

75° 285° LHA — Latitude SAME as Declination — 75° 285° LHA

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

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

76° 284° LHA — Latitude SAME as Declination — 76° 284° LHA

Dec°	70			71			72			73			74			75			76			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	4°45'	+57'	103°	4°31'	+57'	103°	4°17'	+57'	103°	4°03'	+58'	103°	3°49'	+58'	103°	3°35'	+58'	104°	3°21'	+58'	104°	0
1	5°41'	+57'	103°	5°28'	+57'	103°	5°14'	+57'	103°	5°01'	+58'	103°	4°47'	+58'	103°	4°33'	+58'	103°	4°20'	+58'	103°	1
2	6°38'	+57'	103°	6°25'	+57'	103°	6°12'	+57'	103°	5°58'	+58'	103°	5°45'	+58'	103°	5°32'	+58'	103°	5°18'	+58'	103°	2
3	7°34'	+57'	102°	7°22'	+57'	102°	7°09'	+57'	102°	6°56'	+57'	103°	6°43'	+58'	103°	6°30'	+58'	103°	6°16'	+58'	103°	3
4	8°31'	+57'	102°	8°19'	+57'	102°	8°06'	+57'	102°	7°53'	+57'	102°	7°41'	+58'	102°	7°28'	+58'	103°	7°15'	+58'	103°	4
5	9°27'	+56'	102°	9°15'	+57'	102°	9°03'	+57'	102°	8°51'	+57'	102°	8°38'	+58'	102°	8°26'	+58'	102°	8°13'	+58'	102°	5
6	10°24'	+56'	101°	10°12'	+57'	101°	10°00'	+57'	102°	9°48'	+57'	102°	9°36'	+58'	102°	9°24'	+58'	102°	9°11'	+58'	102°	6
7	11°20'	+56'	101°	11°09'	+57'	101°	10°58'	+57'	101°	10°46'	+57'	101°	10°34'	+58'	102°	10°22'	+58'	102°	10°09'	+58'	102°	7
8	12°17'	+56'	100°	12°06'	+57'	101°	11°55'	+57'	101°	11°43'	+57'	101°	11°32'	+58'	101°	11°20'	+58'	101°	11°08'	+58'	102°	8
9	13°13'	+56'	100°	13°03'	+57'	100°	12°52'	+57'	101°	12°41'	+57'	101°	12°29'	+58'	101°	12°18'	+58'	101°	12°06'	+58'	101°	9
10	14°10'	+56'	100°	13°59'	+57'	100°	13°49'	+57'	100°	13°38'	+57'	100°	13°27'	+58'	101°	13°16'	+58'	101°	13°04'	+58'	101°	10
11	15°06'	+56'	99°	14°56'	+57'	100°	14°46'	+57'	100°	14°35'	+57'	100°	14°25'	+58'	100°	14°14'	+58'	101°	14°02'	+58'	101°	11
12	16°02'	+56'	99°	15°53'	+57'	99°	15°43'	+57'	100°	15°33'	+57'	100°	15°22'	+58'	100°	15°12'	+58'	100°	15°01'	+58'	101°	12
13	16°59'	+56'	99°	16°49'	+57'	99°	16°40'	+57'	99°	16°30'	+57'	100°	16°20'	+58'	100°	16°10'	+58'	100°	15°59'	+58'	100°	13
14	17°55'	+56'	98°	17°46'	+57'	99°	17°37'	+57'	99°	17°27'	+57'	99°	17°18'	+58'	100°	17°07'	+58'	100°	16°57'	+58'	100°	14
15	18°51'	+56'	98°	18°43'	+57'	98°	18°34'	+57'	99°	18°25'	+57'	99°	18°15'	+58'	99°	18°05'	+58'	100°	17°55'	+58'	100°	15
16	19°47'	+56'	98°	19°39'	+57'	98°	19°31'	+57'	98°	19°22'	+57'	99°	19°13'	+58'	99°	19°03'	+58'	99°	18°53'	+58'	100°	16
17	20°43'	+56'	97°	20°36'	+56'	98°	20°28'	+57'	98°	20°19'	+57'	98°	20°10'	+57'	99°	20°01'	+58'	99°	19°51'	+58'	99°	17
18	21°40'	+56'	97°	21°32'	+56'	97°	21°24'	+57'	98°	21°16'	+57'	98°	21°08'	+57'	98°	20°59'	+58'	99°	20°49'	+58'	99°	18
19	22°36'	+56'	96°	22°29'	+56'	97°	22°21'	+57'	97°	22°13'	+57'	98°	22°05'	+57'	98°	21°57'	+58'	98°	21°48'	+58'	99°	19
20	23°31'	+56'	96°	23°25'	+56'	96°	23°18'	+57'	97°	23°11'	+57'	97°	23°03'	+57'	98°	22°54'	+58'	98°	22°46'	+58'	99°	20
21	24°27'	+56'	96°	24°21'	+56'	96°	24°15'	+57'	97°	24°08'	+57'	97°	24°00'	+57'	97°	23°52'	+58'	98°	23°44'	+58'	98°	21
22	25°23'	+56'	95°	25°17'	+56'	96°	25°11'	+57'	96°	25°05'	+57'	97°	24°57'	+57'	97°	24°50'	+58'	98°	24°42'	+58'	98°	22
23	26°19'	+56'	95°	26°14'	+56'	95°	26°08'	+57'	96°	26°02'	+57'	96°	25°55'	+57'	97°	25°47'	+58'	97°	25°39'	+58'	98°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70			71			72			73			74			75			76			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	4°25'	+57'	102°	4°12'	+57'	102°	3°59'	+57'	102°	3°46'	+57'	102°	3°33'	+58'	103°	3°20'	+58'	103°	3°07'	+58'	103°	0
1	5°21'	+57'	102°	5°09'	+57'	102°	4°56'	+57'	102°	4°44'	+57'	102°	4°31'	+58'	102°	4°18'	+58'	102°	4°05'	+58'	102°	1
2	6°18'	+57'	102°	6°06'	+57'	102°	5°54'	+57'	102°	5°41'	+57'	102°	5°29'	+58'	102°	5°16'	+58'	102°	5°04'	+58'	102°	2
3	7°14'	+57'	101°	7°03'	+57'	101°	6°51'	+57'	101°	6°39'	+57'	102°	6°27'	+58'	102°	6°14'	+58'	102°	6°02'	+58'	102°	3
4	8°11'	+56'	101°	7°59'	+57'	101°	7°48'	+57'	101°	7°36'	+57'	101°	7°24'	+58'	101°	7°12'	+58'	102°	7°00'	+58'	102°	4
5	9°07'	+56'	101°	8°56'	+57'	101°	8°45'	+57'	101°	8°34'	+57'	101°	8°22'	+58'	101°	8°10'	+58'	101°	7°59'	+58'	101°	5
6	10°04'	+56'	100°	9°53'	+57'	100°	9°42'	+57'	101°	9°31'	+57'	101°	9°20'	+58'	101°	9°08'	+58'	101°	8°57'	+58'	101°	6
7	11°00'	+56'	100°	10°50'	+57'	100°	10°39'	+57'	100°	10°29'	+57'	100°	10°18'	+58'	101°	10°06'	+58'	101°	9°55'	+58'	101°	7
8	11°57'	+56'	100°	11°47'	+57'	100°	11°36'	+57'	100°	11°26'	+57'	100°	11°15'	+58'	100°	11°04'	+58'	101°	10°53'	+58'	101°	8
9	12°53'	+56'	99°	12°43'	+57'	99°	12°34'	+57'	100°	12°23'	+57'	100°	12°13'	+58'	100°	12°02'	+58'	100°	11°52'	+58'	100°	9
10	13°49'	+56'	99°	13°40'	+57'	99°	13°31'	+57'	99°	13°21'	+57'	100°	13°11'	+58'	100°	13°00'	+58'	100°	12°50'	+58'	100°	10
11	14°46'	+56'	98°	14°37'	+57'	99°	14°28'	+57'	99°	14°18'	+57'	99°	14°08'	+58'	99°	13°58'	+58'	100°	13°48'	+58'	100°	11
12	15°42'	+56'	98°	15°34'	+57'	98°	15°25'	+57'	99°	15°15'	+57'	99°	15°06'	+58'	99°	14°56'	+58'	99°	14°46'	+58'	100°	12
13	16°38'	+56'	98°	16°30'	+57'	98°	16°22'	+57'	98°	16°13'	+57'	99°	16°04'	+58'	99°	15°54'	+58'	99°	15°44'	+58'	99°	13
14	17°35'	+56'	97°	17°27'	+57'	98°	17°19'	+57'	98°	17°10'	+57'	98°	17°01'	+58'	99°	16°52'	+58'	99°	16°43'	+58'	99°	14
15	18°31'	+56'	97°	18°23'	+57'	97°	18°15'	+57'	98°	18°07'	+57'	98°	17°59'	+58'	98°	17°50'	+58'	99°	17°41'	+58'	99°	15
16	19°27'	+56'	97°	19°20'	+56'	97°	19°12'	+57'	97°	19°05'	+57'	98°	18°56'	+58'	98°	18°48'	+58'	98°	18°39'	+58'	99°	16
17	20°23'	+56'	96°	20°16'	+56'	97°	20°09'	+57'	97°	20°02'	+57'	97°	19°54'	+57'	98°	19°46'	+58'	98°	19°37'	+58'	98°	17
18	21°19'	+56'	96°	21°13'	+56'	96°	21°06'	+57'	97°	20°59'	+57'	97°	20°51'	+57'	97°	20°43'	+58'	98°	20°35'	+58'	98°	18
19	22°15'	+56'	95°	22°09'	+56'	96°	22°03'	+57'	96°	21°56'	+57'	97°	21°49'	+57'	97°	21°41'	+58'	97°	21°33'	+58'	98°	19
20	23°11'	+56'	95°	23°06'	+56'	96°	23°00'	+57'	96°	22°53'	+57'	96°	22°46'	+57'	97°	22°39'	+58'	97°	22°31'	+58'	98°	20
21	24°07'	+56'	95°	24°02'	+56'	95°	23°56'	+57'	96°	23°50'	+57'	96°	23°44'	+57'	96°	23°37'	+58'	97°	23°29'	+58'	97°	21
22	25°03'	+56'	94°	24°58'	+56'	95°	24°53'	+57'	95°	24°47'	+57'	96°	24°41'	+57'	96°	24°34'	+58'	97°	24°27'	+58'	97°	22
23	25°59'	+56'	94°	25°54'	+56'	94°	25°49'	+57'	95°	25°44'	+57'	95°	25°38'	+57'	96°	25°32'	+58'	96°	25°25'	+58'	97°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

77° 283° LHA — Latitude SAME as Declination — 77° 283° LHA

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

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

78° 282° LHA — Latitude SAME as Declination — 78° 282° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	4°05'	+57'	101°	3°53'	+57'	101°	3°41'	+57'	101°	3°29'	+57'	101°	3°17'	+58'	102°	3°05'	+58'	102°	2°53'	+58'	102°	0
1	5°01'	+57'	101°	4°50'	+57'	101°	4°38'	+57'	101°	4°27'	+57'	101°	4°15'	+58'	101°	4°03'	+58'	101°	3°51'	+58'	101°	1
2	5°58'	+56'	101°	5°47'	+57'	101°	5°35'	+57'	101°	5°24'	+57'	101°	5°13'	+58'	101°	5°01'	+58'	101°	4°50'	+58'	101°	2
3	6°54'	+56'	100°	6°43'	+57'	100°	6°33'	+57'	101°	6°22'	+57'	101°	6°10'	+58'	101°	5°59'	+58'	101°	5°48'	+58'	101°	3
4	7°51'	+56'	100°	7°40'	+57'	100°	7°30'	+57'	100°	7°19'	+57'	100°	7°08'	+58'	100°	6°57'	+58'	101°	6°46'	+58'	101°	4
5	8°47'	+56'	100°	8°37'	+57'	100°	8°27'	+57'	100°	8°16'	+57'	100°	8°06'	+58'	100°	7°55'	+58'	100°	7°44'	+58'	100°	5
6	9°44'	+56'	99°	9°34'	+57'	99°	9°24'	+57'	100°	9°14'	+57'	100°	9°04'	+58'	100°	8°53'	+58'	100°	8°43'	+58'	100°	6
7	10°40'	+56'	99°	10°31'	+57'	99°	10°21'	+57'	99°	10°11'	+57'	99°	10°01'	+58'	100°	9°51'	+58'	100°	9°41'	+58'	100°	7
8	11°36'	+56'	99°	11°27'	+57'	99°	11°18'	+57'	99°	11°09'	+57'	99°	10°59'	+58'	99°	10°49'	+58'	100°	10°39'	+58'	100°	8
9	12°33'	+56'	98°	12°24'	+57'	98°	12°15'	+57'	99°	12°06'	+57'	99°	11°57'	+58'	99°	11°47'	+58'	99°	11°37'	+58'	99°	9
10	13°29'	+56'	98°	13°21'	+57'	98°	13°12'	+57'	98°	13°03'	+57'	99°	12°54'	+58'	99°	12°45'	+58'	99°	12°36'	+58'	99°	10
11	14°25'	+56'	98°	14°18'	+57'	98°	14°09'	+57'	98°	14°01'	+57'	98°	13°52'	+58'	99°	13°43'	+58'	99°	13°34'	+58'	99°	11
12	15°22'	+56'	97°	15°14'	+57'	97°	15°06'	+57'	98°	14°58'	+57'	98°	14°50'	+58'	98°	14°41'	+58'	98°	14°32'	+58'	99°	12
13	16°18'	+56'	97°	16°11'	+57'	97°	16°03'	+57'	97°	15°55'	+57'	98°	15°47'	+58'	98°	15°39'	+58'	98°	15°30'	+58'	98°	13
14	17°14'	+56'	96°	17°07'	+57'	97°	17°00'	+57'	97°	16°53'	+57'	97°	16°45'	+58'	98°	16°37'	+58'	98°	16°28'	+58'	98°	14
15	18°10'	+56'	96°	18°04'	+57'	96°	17°57'	+57'	97°	17°50'	+57'	97°	17°42'	+58'	97°	17°35'	+58'	98°	17°26'	+58'	98°	15
16	19°07'	+56'	96°	19°00'	+56'	96°	18°54'	+57'	96°	18°47'	+57'	97°	18°40'	+58'	97°	18°32'	+58'	97°	18°25'	+58'	98°	16
17	20°03'	+56'	95°	19°57'	+56'	96°	19°51'	+57'	96°	19°44'	+57'	96°	19°37'	+57'	97°	19°30'	+58'	97°	19°23'	+58'	97°	17
18	20°59'	+56'	95°	20°53'	+56'	95°	20°48'	+57'	96°	20°41'	+57'	96°	20°35'	+57'	96°	20°28'	+58'	97°	20°21'	+58'	97°	18
19	21°55'	+56'	95°	21°50'	+56'	95°	21°44'	+57'	95°	21°39'	+57'	96°	21°32'	+57'	96°	21°26'	+58'	97°	21°19'	+58'	97°	19
20	22°51'	+56'	94°	22°46'	+56'	95°	22°41'	+57'	95°	22°36'	+57'	95°	22°30'	+57'	96°	22°23'	+58'	96°	22°17'	+58'	97°	20
21	23°46'	+56'	94°	23°42'	+56'	94°	23°38'	+57'	95°	23°33'	+57'	95°	23°27'	+57'	95°	23°21'	+58'	96°	23°15'	+58'	96°	21
22	24°42'	+56'	93°	24°39'	+56'	94°	24°34'	+57'	94°	24°30'	+57'	95°	24°24'	+57'	95°	24°19'	+58'	96°	24°13'	+58'	96°	22
23	25°38'	+56'	93°	25°35'	+56'	93°	25°31'	+57'	94°	25°27'	+57'	94°	25°22'	+57'	95°	25°16'	+58'	95°	25°11'	+58'	96°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	3°45'	+56'	100°	3°34'	+57'	100°	3°23'	+57'	100°	3°12'	+57'	101°	3°01'	+58'	101°	2°50'	+58'	101°	2°39'	+58'	101°	0
1	4°41'	+56'	100°	4°31'	+57'	100°	4°20'	+57'	100°	4°09'	+57'	100°	3°59'	+58'	100°	3°48'	+58'	100°	3°37'	+58'	100°	1
2	5°37'	+56'	100°	5°27'	+57'	100°	5°17'	+57'	100°	5°07'	+57'	100°	4°56'	+58'	100°	4°46'	+58'	100°	4°35'	+58'	100°	2
3	6°34'	+56'	99°	6°24'	+57'	99°	6°14'	+57'	100°	6°04'	+57'	100°	5°54'	+58'	100°	5°44'	+58'	100°	5°34'	+58'	100°	3
4	7°30'	+56'	99°	7°21'	+57'	99°	7°11'	+57'	99°	7°02'	+57'	99°	6°52'	+58'	99°	6°42'	+58'	100°	6°32'	+58'	100°	4
5	8°27'	+56'	99°	8°18'	+57'	99°	8°09'	+57'	99°	7°59'	+57'	99°	7°50'	+58'	99°	7°40'	+58'	99°	7°30'	+58'	99°	5
6	9°23'	+56'	98°	9°15'	+57'	98°	9°06'	+57'	99°	8°57'	+57'	99°	8°47'	+58'	99°	8°38'	+58'	99°	8°28'	+58'	99°	6
7	10°20'	+56'	98°	10°11'	+57'	98°	10°03'	+57'	98°	9°54'	+57'	98°	9°45'	+58'	99°	9°36'	+58'	99°	9°27'	+58'	99°	7
8	11°16'	+56'	98°	11°08'	+57'	98°	11°00'	+57'	98°	10°51'	+57'	98°	10°43'	+58'	98°	10°34'	+58'	99°	10°25'	+58'	99°	8
9	12°12'	+56'	97°	12°05'	+57'	97°	11°57'	+57'	98°	11°49'	+57'	98°	11°40'	+58'	98°	11°32'	+58'	98°	11°23'	+58'	99°	9
10	13°09'	+56'	97°	13°01'	+57'	97°	12°54'	+57'	97°	12°46'	+57'	98°	12°38'	+58'	98°	12°30'	+58'	98°	12°21'	+58'	98°	10
11	14°05'	+56'	97°	13°58'	+57'	97°	13°51'	+57'	97°	13°43'	+57'	97°	13°36'	+58'	98°	13°28'	+58'	98°	13°19'	+58'	98°	11
12	15°01'	+56'	96°	14°55'	+57'	96°	14°48'	+57'	97°	14°41'	+57'	97°	14°33'	+58'	97°	14°26'	+58'	98°	14°18'	+58'	98°	12
13	15°58'	+56'	96°	15°51'	+57'	96°	15°45'	+57'	96°	15°38'	+57'	97°	15°31'	+58'	97°	15°23'	+58'	97°	15°16'	+58'	98°	13
14	16°54'	+56'	95°	16°48'	+57'	96°	16°42'	+57'	96°	16°35'	+57'	96°	16°28'	+58'	97°	16°21'	+58'	97°	16°14'	+58'	97°	14
15	17°50'	+56'	95°	17°44'	+57'	95°	17°39'	+57'	96°	17°32'	+57'	96°	17°26'	+58'	96°	17°19'	+58'	97°	17°12'	+58'	97°	15
16	18°46'	+56'	95°	18°41'	+56'	95°	18°36'	+57'	95°	18°30'	+57'	96°	18°24'	+57'	96°	18°17'	+58'	96°	18°10'	+58'	97°	16
17	19°42'	+56'	94°	19°37'	+56'	95°	19°32'	+57'	95°	19°27'	+57'	95°	19°21'	+57'	96°	19°15'	+58'	96°	19°08'	+58'	96°	17
18	20°38'	+56'	94°	20°34'	+56'	94°	20°29'	+57'	95°	20°24'	+57'	95°	20°18'	+57'	95°	20°13'	+58'	96°	20°06'	+58'	96°	18
19	21°34'	+56'	94°	21°30'	+56'	94°	21°26'	+57'	94°	21°21'	+57'	95°	21°16'	+57'	95°	21°10'	+58'	96°	21°04'	+58'	96°	19
20	22°30'	+56'	93°	22°27'	+56'	94°	22°23'	+57'	94°	22°18'	+57'	94°	22°13'	+57'	95°	22°08'	+58'	95°	22°02'	+58'	96°	20
21	23°26'	+56'	93°	23°23'	+56'	93°	23°19'	+57'	94°	23°15'	+57'	94°	23°11'	+57'	95°	23°06'	+58'	95°	23°00'	+58'	95°	21
22	24°22'	+56'	92°	24°19'	+56'	93°	24°16'	+57'	93°	24°12'	+57'	94°	24°08'	+57'	94°	24°03'	+58'	95°	23°58'	+58'	95°	22
23	25°18'	+56'	92°	25°15'	+56'	92°	25°12'	+56'	93°	25°09'	+57'	93°	25°05'	+57'	94°	25°01'	+58'	94°	24°56'	+58'	95°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	3°24'	+56'	99°	3°14'	+57'	99°	3°05'	+57'	100°	2°55'	+57'	100°	2°45'	+58'	100°	2°35'	+58'	100°	2°24'	+58'	100°	0
1	4°21'	+56'	99°	4°11'	+57'	99°	4°02'	+57'	99°	3°52'	+57'	99°	3°42'	+58'	99°	3°33'	+58'	99°	3°23'	+58'	99°	1
2	5°17'	+56'	99°	5°08'	+57'	99°	4°59'	+57'	99°	4°50'	+57'	99°	4°40'	+58'	99°	4°31'	+58'	99°	4°21'	+58'	99°	2
3	6°14'	+56'	98°	6°05'	+57'	98°	5°56'	+57'	99°	5°47'	+57'	99°	5°38'	+58'	99°	5°29'	+58'	99°	5°19'	+58'	99°	3
4	7°10'	+56'	98°	7°02'	+57'	98°	6°53'	+57'	98°	6°44'	+57'	98°	6°36'	+58'	99°	6°27'	+58'	99°	6°18'	+58'	99°	4
5	8°07'	+56'	98°	7°58'	+57'	98°	7°50'	+57'	98°	7°42'	+57'	98°	7°33'	+58'	98°	7°25'	+58'	98°	7°16'	+58'	99°	5
6	9°03'	+56'	97°	8°55'	+57'	98°	8°47'	+57'	98°	8°39'	+57'	98°	8°31'	+58'	98°	8°23'	+58'	98°	8°14'	+58'	98°	6
7	9°59'	+56'	97°	9°52'	+57'	97°	9°44'	+57'	97°	9°37'	+57'	98°	9°29'	+58'	98°	9°21'	+58'	98°	9°12'	+58'	98°	7
8	10°56'	+56'	97°	10°49'	+57'	97°	10°41'	+57'	97°	10°34'	+57'	97°	10°26'	+58'	97°	10°18'	+58'	98°	10°10'	+58'	98°	8
9	11°52'	+56'	96°	11°45'	+57'	97°	11°38'	+57'	97°	11°31'	+57'	97°	11°24'	+58'	97°	11°16'	+58'	97°	11°09'	+58'	98°	9
10	12°48'	+56'	96°	12°42'	+57'	96°	12°35'	+57'	96°	12°29'	+57'	97°	12°22'	+58'	97°	12°14'	+58'	97°	12°07'	+58'	97°	10
11	13°45'	+56'	96°	13°39'	+57'	96°	13°32'	+57'	96°	13°26'	+57'	96°	13°19'	+58'	97°	13°12'	+58'	97°	13°05'	+58'	97°	11
12	14°41'	+56'	95°	14°35'	+57'	96°	14°29'	+57'	96°	14°23'	+57'	96°	14°17'	+58'	96°	14°10'	+58'	97°	14°03'	+58'	97°	12
13	15°37'	+56'	95°	15°32'	+57'	95°	15°26'	+57'	95°	15°21'	+57'	96°	15°14'	+58'	96°	15°08'	+58'	96°	15°01'	+58'	97°	13
14	16°33'	+56'	95°	16°28'	+57'	95°	16°23'	+57'	95°	16°18'	+57'	95°	16°12'	+58'	96°	16°06'	+58'	96°	15°59'	+58'	96°	14
15	17°30'	+56'	94°	17°25'	+56'	94°	17°20'	+57'	95°	17°15'	+57'	95°	17°10'	+58'	95°	17°04'	+58'	96°	16°58'	+58'	96°	15
16	18°26'	+56'	94°	18°22'	+56'	94°	18°17'	+57'	94°	18°12'	+57'	95°	18°07'	+57'	95°	18°02'	+58'	95°	17°56'	+58'	96°	16
17	19°22'	+56'	93°	19°18'	+56'	94°	19°14'	+57'	94°	19°09'	+57'	94°	19°05'	+57'	95°	18°59'	+58'	95°	18°54'	+58'	95°	17
18	20°18'	+56'	93°	20°14'	+56'	93°	20°11'	+57'	94°	20°07'	+57'	94°	20°02'	+57'	94°	19°57'	+58'	95°	19°52'	+58'	95°	18
19	21°14'	+56'	93°	21°11'	+56'	93°	21°07'	+57'	93°	21°04'	+57'	94°	20°59'	+57'	94°	20°55'	+58'	95°	20°50'	+58'	95°	19
20	22°10'	+56'	92°	22°07'	+56'	93°	22°04'	+57'	93°	22°01'	+57'	93°	21°57'	+57'	94°	21°53'	+58'	94°	21°48'	+58'	95°	20
21	23°05'	+56'	92°	23°03'	+56'	92°	23°01'	+57'	93°	22°58'	+57'	93°	22°54'	+57'	94°	22°50'	+58'	94°	22°46'	+58'	94°	21
22	24°01'	+56'	91°	24°00'	+56'	92°	23°57'	+57'	92°	23°55'	+57'	93°	23°51'	+57'	93°	23°48'	+58'	94°	23°44'	+58'	94°	22
23	24°57'	+56'	91°	24°56'	+56'	92°	24°54'	+56'	92°	24°52'	+57'	92°	24°49'	+57'	93°	24°45'	+58'	93°	24°42'	+58'	94°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	3°04'	+56'	98°	2°55'	+57'	99°	2°46'	+57'	99°	2°37'	+57'	99°	2°28'	+58'	99°	2°19'	+58'	99°	2°10'	+58'	99°	0
1	4°00'	+56'	98°	3°52'	+57'	98°	3°43'	+57'	98°	3°35'	+57'	98°	3°26'	+58'	98°	3°17'	+58'	98°	3°08'	+58'	98°	1
2	4°57'	+56'	98°	4°49'	+57'	98°	4°40'	+57'	98°	4°32'	+57'	98°	4°24'	+58'	98°	4°15'	+58'	98°	4°07'	+58'	98°	2
3	5°53'	+56'	97°	5°46'	+57'	98°	5°38'	+57'	98°	5°30'	+57'	98°	5°21'	+58'	98°	5°13'	+58'	98°	5°05'	+58'	98°	3
4	6°50'	+56'	97°	6°42'	+57'	97°	6°35'	+57'	97°	6°27'	+57'	97°	6°19'	+58'	98°	6°11'	+58'	98°	6°03'	+58'	98°	4
5	7°46'	+56'	97°	7°39'	+57'	97°	7°32'	+57'	97°	7°24'	+57'	97°	7°17'	+58'	97°	7°09'	+58'	97°	7°01'	+58'	98°	5
6	8°43'	+56'	96°	8°36'	+57'	97°	8°29'	+57'	97°	8°22'	+57'	97°	8°15'	+58'	97°	8°07'	+58'	97°	8°00'	+58'	97°	6
7	9°39'	+56'	96°	9°33'	+57'	96°	9°26'	+57'	96°	9°19'	+57'	97°	9°12'	+58'	97°	9°05'	+58'	97°	8°58'	+58'	97°	7
8	10°35'	+56'	96°	10°29'	+57'	96°	10°23'	+57'	96°	10°17'	+57'	96°	10°10'	+58'	96°	10°03'	+58'	97°	9°56'	+58'	97°	8
9	11°32'	+56'	95°	11°26'	+57'	96°	11°20'	+57'	96°	11°14'	+57'	96°	11°08'	+58'	96°	11°01'	+58'	96°	10°54'	+58'	97°	9
10	12°28'	+56'	95°	12°23'	+57'	95°	12°17'	+57'	95°	12°11'	+57'	96°	12°05'	+58'	96°	11°59'	+58'	96°	11°52'	+58'	96°	10
11	13°24'	+56'	95°	13°19'	+57'	95°	13°14'	+57'	95°	13°09'	+57'	95°	13°03'	+58'	96°	12°57'	+58'	96°	12°51'	+58'	96°	11
12	14°21'	+56'	94°	14°16'	+57'	95°	14°11'	+57'	95°	14°06'	+57'	95°	14°00'	+58'	95°	13°55'	+58'	96°	13°49'	+58'	96°	12
13	15°17'	+56'	94°	15°12'	+57'	94°	15°08'	+57'	94°	15°03'	+57'	95°	14°58'	+58'	95°	14°53'	+58'	95°	14°47'	+58'	96°	13
14	16°13'	+56'	94°	16°09'	+57'	94°	16°05'	+57'	94°	16°00'	+57'	94°	15°56'	+58'	95°	15°50'	+58'	95°	15°45'	+58'	95°	14
15	17°09'	+56'	93°	17°06'	+56'	94°	17°02'	+57'	94°	16°58'	+57'	94°	16°53'	+58'	94°	16°48'	+58'	95°	16°43'	+58'	95°	15
16	18°05'	+56'	93°	18°02'	+56'	93°	17°59'	+57'	93°	17°55'	+57'	94°	17°51'	+57'	94°	17°46'	+58'	94°	17°41'	+58'	95°	16
17	19°01'	+56'	92°	18°58'	+56'	93°	18°55'	+57'	93°	18°52'	+57'	93°	18°48'	+57'	94°	18°44'	+58'	94°	18°39'	+58'	95°	17
18	19°57'	+56'	92°	19°55'	+56'	92°	19°52'	+57'	93°	19°49'	+57'	93°	19°46'	+57'	94°	19°42'	+58'	94°	19°37'	+58'	94°	18
19	20°53'	+56'	92°	20°51'	+56'	92°	20°49'	+57'	92°	20°46'	+57'	93°	20°43'	+57'	93°	20°39'	+58'	94°	20°35'	+58'	94°	19
20	21°49'	+56'	91°	21°48'	+56'	92°	21°46'	+57'	92°	21°43'	+57'	93°	21°40'	+57'	93°	21°37'	+58'	93°	21°33'	+58'	94°	20
21	22°45'	+56'	91°	22°44'	+56'	91°	22°42'	+57'	92°	22°40'	+57'	92°	22°38'	+57'	93°	22°35'	+58'	93°	22°31'	+58'	93°	21
22	23°41'	+56'	91°	23°40'	+56'	91°	23°39'	+57'	91°	23°37'	+57'	92°	23°35'	+57'	92°	23°32'	+58'	93°	23°29'	+58'	93°	22
23	24°37'	+56'	90°	24°36'	+56'	91°	24°35'	+56'	91°	24°34'	+57'	91°	24°32'	+57'	92°	24°30'	+58'	92°	24°27'	+58'	93°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

81° 279° LHA — Latitude SAME as Declination — 81° 279° LHA

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

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

82° 278° LHA — Latitude SAME as Declination — 82° 278° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	2°44'	+56'	98°	2°36'	+57'	98°	2°28'	+57'	98°	2°20'	+57'	98°	2°12'	+58'	98°	2°04'	+58'	98°	1°56'	+58'	98°	0
1	3°40'	+56'	97°	3°33'	+57'	97°	3°25'	+57'	97°	3°17'	+57'	97°	3°10'	+58'	97°	3°02'	+58'	97°	2°54'	+58'	98°	1
2	4°37'	+56'	97°	4°29'	+57'	97°	4°22'	+57'	97°	4°15'	+57'	97°	4°07'	+58'	97°	4°00'	+58'	97°	3°52'	+58'	97°	2
3	5°33'	+56'	97°	5°26'	+57'	97°	5°19'	+57'	97°	5°12'	+57'	97°	5°05'	+58'	97°	4°58'	+58'	97°	4°51'	+58'	97°	3
4	6°29'	+56'	96°	6°23'	+57'	96°	6°16'	+57'	96°	6°10'	+57'	96°	6°03'	+58'	97°	5°56'	+58'	97°	5°49'	+58'	97°	4
5	7°26'	+56'	96°	7°20'	+57'	96°	7°13'	+57'	96°	7°07'	+57'	96°	7°00'	+58'	96°	6°54'	+58'	96°	6°47'	+58'	97°	5
6	8°22'	+56'	95°	8°16'	+57'	96°	8°10'	+57'	96°	8°04'	+57'	96°	7°58'	+58'	96°	7°52'	+58'	96°	7°45'	+58'	96°	6
7	9°19'	+56'	95°	9°13'	+57'	95°	9°08'	+57'	95°	9°02'	+57'	96°	8°56'	+58'	96°	8°50'	+58'	96°	8°43'	+58'	96°	7
8	10°15'	+56'	95°	10°10'	+57'	95°	10°05'	+57'	95°	9°59'	+57'	95°	9°53'	+58'	95°	9°48'	+58'	96°	9°42'	+58'	96°	8
9	11°11'	+56'	94°	11°06'	+57'	95°	11°02'	+57'	95°	10°56'	+57'	95°	10°51'	+58'	95°	10°46'	+58'	95°	10°40'	+58'	96°	9
10	12°08'	+56'	94°	12°03'	+57'	94°	11°59'	+57'	94°	11°54'	+57'	95°	11°49'	+58'	95°	11°43'	+58'	95°	11°38'	+58'	95°	10
11	13°04'	+56'	94°	13°00'	+57'	94°	12°56'	+57'	94°	12°51'	+57'	94°	12°46'	+58'	95°	12°41'	+58'	95°	12°36'	+58'	95°	11
12	14°00'	+56'	93°	13°56'	+57'	94°	13°52'	+57'	94°	13°48'	+57'	94°	13°44'	+58'	94°	13°39'	+58'	95°	13°34'	+58'	95°	12
13	14°56'	+56'	93°	14°53'	+57'	93°	14°49'	+57'	94°	14°46'	+57'	94°	14°41'	+58'	94°	14°37'	+58'	94°	14°32'	+58'	95°	13
14	15°52'	+56'	93°	15°50'	+57'	93°	15°46'	+57'	93°	15°43'	+57'	93°	15°39'	+58'	94°	15°35'	+58'	94°	15°31'	+58'	94°	14
15	16°49'	+56'	92°	16°46'	+56'	93°	16°43'	+57'	93°	16°40'	+57'	93°	16°37'	+58'	93°	16°33'	+58'	94°	16°29'	+58'	94°	15
16	17°45'	+56'	92°	17°43'	+56'	92°	17°40'	+57'	93°	17°37'	+57'	93°	17°34'	+57'	93°	17°31'	+58'	93°	17°27'	+58'	94°	16
17	18°41'	+56'	92°	18°39'	+56'	92°	18°37'	+57'	92°	18°34'	+57'	93°	18°32'	+57'	93°	18°28'	+58'	93°	18°25'	+58'	94°	17
18	19°37'	+56'	91°	19°35'	+56'	91°	19°34'	+57'	92°	19°31'	+57'	92°	19°29'	+57'	93°	19°26'	+58'	93°	19°23'	+58'	93°	18
19	20°33'	+56'	91°	20°32'	+56'	91°	20°30'	+57'	92°	20°29'	+57'	92°	20°26'	+57'	92°	20°24'	+58'	93°	20°21'	+58'	93°	19
20	21°29'	+56'	90°	21°28'	+56'	91°	21°27'	+57'	91°	21°26'	+57'	92°	21°24'	+57'	92°	21°22'	+58'	92°	21°19'	+58'	93°	20
21	22°24'	+56'	90°	22°24'	+56'	90°	22°24'	+57'	91°	22°23'	+57'	91°	22°21'	+57'	92°	22°19'	+58'	92°	22°17'	+58'	92°	21
22	23°20'	+56'	90°	23°20'	+56'	90°	23°20'	+57'	90°	23°20'	+57'	91°	23°18'	+57'	91°	23°17'	+58'	92°	23°15'	+58'	92°	22
23	24°16'	+56'	89°	24°17'	+56'	90°	24°17'	+56'	90°	24°16'	+57'	91°	24°16'	+57'	91°	24°14'	+58'	91°	24°13'	+58'	92°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	2°23'	+56'	97°	2°16'	+57'	97°	2°09'	+57'	97°	2°03'	+57'	97°	1°56'	+58'	97°	1°48'	+58'	97°	1°41'	+58'	97°	0
1	3°20'	+56'	96°	3°13'	+57'	96°	3°07'	+57'	96°	3°00'	+57'	96°	2°53'	+58'	96°	2°46'	+58'	97°	2°40'	+58'	97°	1
2	4°16'	+56'	96°	4°10'	+57'	96°	4°04'	+57'	96°	3°57'	+57'	96°	3°51'	+58'	96°	3°44'	+58'	96°	3°38'	+58'	96°	2
3	5°13'	+56'	96°	5°07'	+57'	96°	5°01'	+57'	96°	4°55'	+57'	96°	4°49'	+58'	96°	4°42'	+58'	96°	4°36'	+58'	96°	3
4	6°09'	+56'	95°	6°03'	+57'	95°	5°58'	+57'	95°	5°52'	+57'	96°	5°46'	+58'	96°	5°40'	+58'	96°	5°34'	+58'	96°	4
5	7°05'	+56'	95°	7°00'	+57'	95°	6°55'	+57'	95°	6°50'	+57'	95°	6°44'	+58'	95°	6°38'	+58'	95°	6°33'	+58'	96°	5
6	8°02'	+56'	95°	7°57'	+57'	95°	7°52'	+57'	95°	7°47'	+57'	95°	7°42'	+58'	95°	7°36'	+58'	95°	7°31'	+58'	95°	6
7	8°58'	+56'	94°	8°54'	+57'	94°	8°49'	+57'	94°	8°44'	+57'	95°	8°39'	+58'	95°	8°34'	+58'	95°	8°29'	+58'	95°	7
8	9°54'	+56'	94°	9°50'	+57'	94°	9°46'	+57'	94°	9°42'	+57'	94°	9°37'	+58'	95°	9°32'	+58'	95°	9°27'	+58'	95°	8
9	10°51'	+56'	93°	10°47'	+57'	94°	10°43'	+57'	94°	10°39'	+57'	94°	10°35'	+58'	94°	10°30'	+58'	94°	10°25'	+58'	95°	9
10	11°47'	+56'	93°	11°44'	+57'	93°	11°40'	+57'	94°	11°36'	+57'	94°	11°32'	+58'	94°	11°28'	+58'	94°	11°24'	+58'	94°	10
11	12°43'	+56'	93°	12°40'	+57'	93°	12°37'	+57'	93°	12°34'	+57'	93°	12°30'	+58'	94°	12°26'	+58'	94°	12°22'	+58'	94°	11
12	13°40'	+56'	92°	13°37'	+57'	93°	13°34'	+57'	93°	13°31'	+57'	93°	13°27'	+58'	93°	13°24'	+58'	94°	13°20'	+58'	94°	12
13	14°36'	+56'	92°	14°33'	+57'	92°	14°31'	+57'	93°	14°28'	+57'	93°	14°25'	+58'	93°	14°22'	+58'	93°	14°18'	+58'	94°	13
14	15°32'	+56'	92°	15°30'	+57'	92°	15°28'	+57'	92°	15°25'	+57'	93°	15°23'	+58'	93°	15°19'	+58'	93°	15°16'	+58'	93°	14
15	16°28'	+56'	91°	16°27'	+56'	92°	16°25'	+57'	92°	16°23'	+57'	92°	16°20'	+57'	92°	16°17'	+58'	93°	16°14'	+58'	93°	15
16	17°24'	+56'	91°	17°23'	+56'	91°	17°22'	+57'	92°	17°20'	+57'	92°	17°18'	+57'	92°	17°15'	+58'	93°	17°12'	+58'	93°	16
17	18°20'	+56'	91°	18°19'	+56'	91°	18°18'	+57'	91°	18°17'	+57'	92°	18°15'	+57'	92°	18°13'	+58'	92°	18°10'	+58'	93°	17
18	19°16'	+56'	90°	19°16'	+56'	91°	19°15'	+57'	91°	19°14'	+57'	91°	19°12'	+57'	92°	19°11'	+58'	92°	19°08'	+58'	92°	18
19	20°12'	+56'	90°	20°12'	+56'	90°	20°12'	+57'	91°	20°11'	+57'	91°	20°10'	+57'	91°	20°08'	+58'	92°	20°06'	+58'	92°	19
20	21°08'	+56'	89°	21°08'	+56'	90°	21°08'	+57'	90°	21°08'	+57'	91°	21°07'	+57'	91°	21°06'	+58'	91°	21°04'	+58'	92°	20
21	22°04'	+56'	89°	22°05'	+56'	89°	22°05'	+57'	90°	22°05'	+57'	90°	22°05'	+57'	91°	22°04'	+58'	91°	22°02'	+58'	91°	21
22	23°00'	+56'	89°	23°01'	+56'	89°	23°02'	+57'	89°	23°02'	+57'	90°	23°02'	+57'	90°	23°01'	+58'	91°	23°00'	+58'	91°	22
23	23°55'	+56'	88°	23°57'	+56'	89°	23°58'	+56'	89°	23°59'	+57'	90°	23°59'	+57'	90°	23°59'	+58'	90°	23°58'	+58'	91°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

83° 277° LHA — Latitude SAME as Declination — 83° 277° LHA

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

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

84° 276° LHA — Latitude SAME as Declination — 84° 276° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	2°03'	+56'	96°	1°57'	+57'	96°	1°51'	+57'	96°	1°45'	+57'	96°	1°39'	+58'	96°	1°33'	+58'	96°	1°27'	+58'	96°	0
1	2°59'	+56'	95°	2°54'	+57'	95°	2°48'	+57'	95°	2°42'	+57'	95°	2°37'	+58'	95°	2°31'	+58'	96°	2°25'	+58'	96°	1
2	3°56'	+56'	95°	3°51'	+57'	95°	3°45'	+57'	95°	3°40'	+57'	95°	3°34'	+58'	95°	3°29'	+58'	95°	3°23'	+58'	95°	2
3	4°52'	+56'	95°	4°47'	+57'	95°	4°42'	+57'	95°	4°37'	+57'	95°	4°32'	+58'	95°	4°27'	+58'	95°	4°22'	+58'	95°	3
4	5°49'	+56'	94°	5°44'	+57'	94°	5°39'	+57'	94°	5°35'	+57'	95°	5°30'	+58'	95°	5°25'	+58'	95°	5°20'	+58'	95°	4
5	6°45'	+56'	94°	6°41'	+57'	94°	6°36'	+57'	94°	6°32'	+57'	94°	6°28'	+58'	94°	6°23'	+58'	95°	6°18'	+58'	95°	5
6	7°41'	+56'	94°	7°37'	+57'	94°	7°34'	+57'	94°	7°29'	+57'	94°	7°25'	+58'	94°	7°21'	+58'	94°	7°16'	+58'	94°	6
7	8°38'	+56'	93°	8°34'	+57'	93°	8°31'	+57'	94°	8°27'	+57'	94°	8°23'	+58'	94°	8°19'	+58'	94°	8°14'	+58'	94°	7
8	9°34'	+56'	93°	9°31'	+57'	93°	9°28'	+57'	93°	9°24'	+57'	93°	9°20'	+58'	94°	9°17'	+58'	94°	9°13'	+58'	94°	8
9	10°30'	+56'	93°	10°28'	+57'	93°	10°25'	+57'	93°	10°21'	+57'	93°	10°18'	+58'	93°	10°15'	+58'	93°	10°11'	+58'	94°	9
10	11°27'	+56'	92°	11°24'	+57'	92°	11°22'	+57'	93°	11°19'	+57'	93°	11°16'	+58'	93°	11°12'	+58'	93°	11°09'	+58'	93°	10
11	12°23'	+56'	92°	12°21'	+57'	92°	12°19'	+57'	92°	12°16'	+57'	92°	12°13'	+58'	93°	12°10'	+58'	93°	12°07'	+58'	93°	11
12	13°19'	+56'	91°	13°17'	+57'	92°	13°15'	+57'	92°	13°13'	+57'	92°	13°11'	+58'	92°	13°08'	+58'	93°	13°05'	+58'	93°	12
13	14°15'	+56'	91°	14°14'	+57'	91°	14°12'	+57'	92°	14°11'	+57'	92°	14°08'	+58'	92°	14°06'	+58'	92°	14°03'	+58'	93°	13
14	15°11'	+56'	91°	15°10'	+57'	91°	15°09'	+57'	91°	15°08'	+57'	92°	15°06'	+58'	92°	15°04'	+58'	92°	15°02'	+58'	92°	14
15	16°08'	+56'	90°	16°07'	+56'	91°	16°06'	+57'	91°	16°05'	+57'	91°	16°04'	+57'	92°	16°02'	+58'	92°	16°00'	+58'	92°	15
16	17°04'	+56'	90°	17°03'	+56'	90°	17°03'	+57'	91°	17°02'	+57'	91°	17°01'	+57'	91°	17°00'	+58'	92°	16°58'	+58'	92°	16
17	18°00'	+56'	90°	18°00'	+56'	90°	18°00'	+57'	90°	17°59'	+57'	91°	17°58'	+57'	91°	17°57'	+58'	91°	17°56'	+58'	92°	17
18	18°56'	+56'	89°	18°56'	+56'	90°	18°57'	+57'	90°	18°56'	+57'	90°	18°56'	+57'	91°	18°55'	+58'	91°	18°54'	+58'	91°	18
19	19°52'	+56'	89°	19°53'	+56'	89°	19°53'	+57'	90°	19°53'	+57'	90°	19°53'	+57'	90°	19°53'	+58'	91°	19°52'	+58'	91°	19
20	20°48'	+56'	88°	20°49'	+56'	89°	20°50'	+57'	89°	20°51'	+57'	90°	20°51'	+57'	90°	20°51'	+58'	90°	20°50'	+58'	91°	20
21	21°43'	+56'	88°	21°45'	+56'	88°	21°47'	+57'	89°	21°48'	+57'	89°	21°48'	+57'	90°	21°48'	+58'	90°	21°48'	+58'	90°	21
22	22°39'	+56'	88°	22°41'	+56'	88°	22°43'	+57'	89°	22°44'	+57'	89°	22°45'	+57'	89°	22°46'	+58'	90°	22°46'	+58'	90°	22
23	23°35'	+56'	87°	23°38'	+56'	88°	23°40'	+56'	88°	23°41'	+57'	89°	23°43'	+57'	89°	23°43'	+58'	89°	23°44'	+58'	90°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

84° 276° LHA — Latitude SAME as Declination — 84° 276° LHA

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

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

85° 275° LHA — Latitude SAME as Declination — 85° 275° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	1°42'	+56'	95°	1°38'	+57'	95°	1°33'	+57'	95°	1°28'	+57'	95°	1°23'	+58'	95°	1°18'	+58'	95°	1°12'	+58'	95°	0
1	2°39'	+56'	94°	2°34'	+57'	94°	2°30'	+57'	94°	2°25'	+57'	94°	2°20'	+58'	95°	2°16'	+58'	95°	2°11'	+58'	95°	1
2	3°35'	+56'	94°	3°31'	+57'	94°	3°27'	+57'	94°	3°22'	+57'	94°	3°18'	+58'	94°	3°13'	+58'	94°	3°09'	+58'	94°	2
3	4°32'	+56'	94°	4°28'	+57'	94°	4°24'	+57'	94°	4°20'	+57'	94°	4°16'	+58'	94°	4°11'	+58'	94°	4°07'	+58'	94°	3
4	5°28'	+56'	93°	5°25'	+57'	93°	5°21'	+57'	94°	5°17'	+57'	94°	5°13'	+58'	94°	5°09'	+58'	94°	5°05'	+58'	94°	4
5	6°24'	+56'	93°	6°21'	+57'	93°	6°18'	+57'	93°	6°15'	+57'	93°	6°11'	+58'	93°	6°07'	+58'	94°	6°04'	+58'	94°	5
6	7°21'	+56'	93°	7°18'	+57'	93°	7°15'	+57'	93°	7°12'	+57'	93°	7°09'	+58'	93°	7°05'	+58'	93°	7°02'	+58'	93°	6
7	8°17'	+56'	92°	8°15'	+57'	92°	8°12'	+57'	93°	8°09'	+57'	93°	8°06'	+58'	93°	8°03'	+58'	93°	8°00'	+58'	93°	7
8	9°13'	+56'	92°	9°11'	+57'	92°	9°09'	+57'	92°	9°07'	+57'	92°	9°04'	+58'	93°	9°01'	+58'	93°	8°58'	+58'	93°	8
9	10°10'	+56'	92°	10°08'	+57'	92°	10°06'	+57'	92°	10°04'	+57'	92°	10°02'	+58'	92°	9°59'	+58'	92°	9°56'	+58'	93°	9
10	11°06'	+56'	91°	11°05'	+57'	91°	11°03'	+57'	92°	11°01'	+57'	92°	10°59'	+58'	92°	10°57'	+58'	92°	10°55'	+58'	92°	10
11	12°02'	+56'	91°	12°01'	+57'	91°	12°00'	+57'	91°	11°59'	+57'	92°	11°57'	+58'	92°	11°55'	+58'	92°	11°53'	+58'	92°	11
12	12°59'	+56'	91°	12°58'	+57'	91°	12°57'	+57'	91°	12°56'	+57'	91°	12°54'	+58'	91°	12°53'	+58'	92°	12°51'	+58'	92°	12
13	13°55'	+56'	90°	13°54'	+57'	90°	13°54'	+57'	91°	13°53'	+57'	91°	13°52'	+58'	91°	13°51'	+58'	91°	13°49'	+58'	92°	13
14	14°51'	+56'	90°	14°51'	+57'	90°	14°51'	+57'	90°	14°50'	+57'	91°	14°49'	+58'	91°	14°48'	+58'	91°	14°47'	+58'	91°	14
15	15°47'	+56'	89°	15°47'	+56'	90°	15°48'	+57'	90°	15°47'	+57'	90°	15°47'	+57'	91°	15°46'	+58'	91°	15°45'	+58'	91°	15
16	16°43'	+56'	89°	16°44'	+56'	89°	16°44'	+57'	90°	16°45'	+57'	90°	16°44'	+57'	90°	16°44'	+58'	91°	16°43'	+58'	91°	16
17	17°39'	+56'	89°	17°40'	+56'	89°	17°41'	+57'	89°	17°42'	+57'	90°	17°42'	+57'	90°	17°42'	+58'	90°	17°41'	+58'	91°	17
18	18°35'	+56'	88°	18°37'	+56'	89°	18°38'	+57'	89°	18°39'	+57'	89°	18°39'	+57'	90°	18°40'	+58'	90°	18°39'	+58'	90°	18
19	19°31'	+56'	88°	19°33'	+56'	88°	19°35'	+57'	89°	19°36'	+57'	89°	19°37'	+57'	89°	19°37'	+58'	90°	19°37'	+58'	90°	19
20	20°27'	+56'	88°	20°29'	+56'	88°	20°31'	+57'	88°	20°33'	+57'	89°	20°34'	+57'	89°	20°35'	+58'	89°	20°35'	+58'	90°	20
21	21°23'	+56'	87°	21°26'	+56'	88°	21°28'	+57'	88°	21°30'	+57'	88°	21°32'	+57'	89°	21°33'	+58'	89°	21°33'	+58'	90°	21
22	22°19'	+56'	87°	22°22'	+56'	87°	22°25'	+57'	88°	22°27'	+57'	88°	22°29'	+57'	88°	22°30'	+58'	89°	22°31'	+58'	89°	22
23	23°14'	+56'	86°	23°18'	+56'	87°	23°21'	+57'	87°	23°24'	+57'	88°	23°26'	+57'	88°	23°28'	+58'	89°	23°29'	+58'	89°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	1°22'	+56'	94°	1°18'	+57'	94°	1°14'	+57'	94°	1°10'	+57'	94°	1°06'	+58'	94°	1°02'	+58'	94°	0°58'	+58'	94°	0
1	2°18'	+56'	93°	2°15'	+57'	93°	2°11'	+57'	93°	2°08'	+57'	94°	2°04'	+58'	94°	2°00'	+58'	94°	1°56'	+58'	94°	1
2	3°15'	+56'	93°	3°12'	+57'	93°	3°08'	+57'	93°	3°05'	+57'	93°	3°01'	+58'	93°	2°58'	+58'	93°	2°54'	+58'	93°	2
3	4°11'	+56'	93°	4°08'	+57'	93°	4°05'	+57'	93°	4°02'	+57'	93°	3°59'	+58'	93°	3°56'	+58'	93°	3°53'	+58'	93°	3
4	5°08'	+56'	92°	5°05'	+57'	92°	5°02'	+57'	93°	5°00'	+57'	93°	4°57'	+58'	93°	4°54'	+58'	93°	4°51'	+58'	93°	4
5	6°04'	+56'	92°	6°02'	+57'	92°	5°59'	+57'	92°	5°57'	+57'	92°	5°54'	+58'	92°	5°52'	+58'	93°	5°49'	+58'	93°	5
6	7°00'	+56'	92°	6°58'	+57'	92°	6°56'	+57'	92°	6°54'	+57'	92°	6°52'	+58'	92°	6°50'	+58'	92°	6°47'	+58'	92°	6
7	7°57'	+56'	91°	7°55'	+57'	91°	7°53'	+57'	92°	7°52'	+57'	92°	7°50'	+58'	92°	7°48'	+58'	92°	7°46'	+58'	92°	7
8	8°53'	+56'	91°	8°52'	+57'	91°	8°51'	+57'	91°	8°49'	+57'	91°	8°47'	+58'	92°	8°46'	+58'	92°	8°44'	+58'	92°	8
9	9°49'	+56'	91°	9°48'	+57'	91°	9°48'	+57'	91°	9°46'	+57'	91°	9°45'	+58'	91°	9°44'	+58'	92°	9°42'	+58'	92°	9
10	10°46'	+56'	90°	10°45'	+57'	90°	10°44'	+57'	91°	10°44'	+57'	91°	10°43'	+58'	91°	10°41'	+58'	91°	10°40'	+58'	91°	10
11	11°42'	+56'	90°	11°42'	+57'	90°	11°41'	+57'	90°	11°41'	+57'	91°	11°40'	+58'	91°	11°39'	+58'	91°	11°38'	+58'	91°	11
12	12°38'	+56'	90°	12°38'	+57'	90°	12°38'	+57'	90°	12°38'	+57'	90°	12°38'	+58'	90°	12°37'	+58'	91°	12°36'	+58'	91°	12
13	13°34'	+56'	89°	13°35'	+57'	89°	13°35'	+57'	90°	13°35'	+57'	90°	13°35'	+58'	90°	13°35'	+58'	90°	13°34'	+58'	91°	13
14	14°30'	+56'	89°	14°31'	+57'	89°	14°32'	+57'	89°	14°33'	+57'	90°	14°33'	+58'	90°	14°33'	+58'	90°	14°33'	+58'	90°	14
15	15°26'	+56'	89°	15°28'	+56'	89°	15°29'	+57'	89°	15°30'	+57'	89°	15°30'	+57'	90°	15°31'	+58'	90°	15°31'	+58'	90°	15
16	16°23'	+56'	88°	16°24'	+56'	88°	16°26'	+57'	89°	16°27'	+57'	89°	16°28'	+57'	89°	16°29'	+58'	90°	16°29'	+58'	90°	16
17	17°19'	+56'	88°	17°21'	+56'	88°	17°23'	+57'	88°	17°24'	+57'	89°	17°25'	+57'	89°	17°26'	+58'	89°	17°27'	+58'	90°	17
18	18°15'	+56'	87°	18°17'	+56'	88°	18°19'	+57'	88°	18°21'	+57'	88°	18°23'	+57'	89°	18°24'	+58'	89°	18°25'	+58'	89°	18
19	19°11'	+56'	87°	19°14'	+56'	87°	19°16'	+57'	88°	19°18'	+57'	88°	19°20'	+57'	88°	19°22'	+58'	89°	19°23'	+58'	89°	19
20	20°07'	+56'	87°	20°10'	+56'	87°	20°13'	+57'	87°	20°15'	+57'	88°	20°18'	+57'	88°	20°19'	+58'	88°	20°21'	+58'	89°	20
21	21°02'	+56'	86°	21°06'	+56'	87°	21°10'	+57'	87°	21°12'	+57'	87°	21°15'	+57'	88°	21°17'	+58'	88°	21°19'	+58'	89°	21
22	21°58'	+56'	86°	22°02'	+56'	86°	22°06'	+57'	87°	22°09'	+57'	87°	22°12'	+57'	87°	22°15'	+58'	88°	22°17'	+58'	88°	22
23	22°54'	+56'	85°	22°59'	+56'	86°	23°03'	+57'	86°	23°06'	+57'	87°	23°10'	+57'	87°	23°12'	+58'	88°	23°15'	+58'	88°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	1°02'	+56'	93°	0°59'	+57'	93°	0°56'	+57'	93°	0°53'	+57'	93°	0°50'	+58'	93°	0°47'	+58'	93°	0°44'	+58'	93°	0
1	1°58'	+56'	92°	1°55'	+57'	93°	1°53'	+57'	93°	1°50'	+57'	93°	1°47'	+58'	93°	1°45'	+58'	93°	1°42'	+58'	93°	1
2	2°54'	+56'	92°	2°52'	+57'	92°	2°50'	+57'	92°	2°47'	+57'	92°	2°45'	+58'	92°	2°42'	+58'	92°	2°40'	+58'	92°	2
3	3°51'	+56'	92°	3°49'	+57'	92°	3°47'	+57'	92°	3°45'	+57'	92°	3°43'	+58'	92°	3°40'	+58'	92°	3°38'	+58'	92°	3
4	4°47'	+56'	91°	4°46'	+57'	92°	4°44'	+57'	92°	4°42'	+57'	92°	4°40'	+58'	92°	4°38'	+58'	92°	4°36'	+58'	92°	4
5	5°43'	+56'	91°	5°42'	+57'	91°	5°41'	+57'	91°	5°39'	+57'	91°	5°38'	+58'	92°	5°36'	+58'	92°	5°35'	+58'	92°	5
6	6°40'	+56'	91°	6°39'	+57'	91°	6°38'	+57'	91°	6°37'	+57'	91°	6°36'	+58'	91°	6°34'	+58'	91°	6°33'	+58'	91°	6
7	7°36'	+56'	90°	7°36'	+57'	91°	7°35'	+57'	91°	7°34'	+57'	91°	7°33'	+58'	91°	7°32'	+58'	91°	7°31'	+58'	91°	7
8	8°32'	+56'	90°	8°32'	+57'	90°	8°32'	+57'	90°	8°32'	+57'	91°	8°31'	+58'	91°	8°30'	+58'	91°	8°29'	+58'	91°	8
9	9°29'	+56'	90°	9°29'	+57'	90°	9°29'	+57'	90°	9°29'	+57'	90°	9°29'	+58'	90°	9°28'	+58'	91°	9°27'	+58'	91°	9
10	10°25'	+56'	89°	10°26'	+57'	90°	10°26'	+57'	90°	10°26'	+57'	90°	10°26'	+58'	90°	10°26'	+58'	90°	10°26'	+58'	90°	10
11	11°21'	+56'	89°	11°22'	+57'	89°	11°23'	+57'	89°	11°23'	+57'	90°	11°24'	+58'	90°	11°24'	+58'	90°	11°24'	+58'	90°	11
12	12°17'	+56'	89°	12°19'	+57'	89°	12°20'	+57'	89°	12°21'	+57'	89°	12°21'	+58'	90°	12°22'	+58'	90°	12°22'	+58'	90°	12
13	13°14'	+56'	88°	13°15'	+57'	89°	13°17'	+57'	89°	13°18'	+57'	89°	13°19'	+58'	89°	13°20'	+58'	89°	13°20'	+58'	90°	13
14	14°10'	+56'	88°	14°12'	+57'	88°	14°14'	+57'	88°	14°15'	+57'	89°	14°16'	+58'	89°	14°17'	+58'	89°	14°18'	+58'	89°	14
15	15°06'	+56'	88°	15°08'	+56'	88°	15°11'	+57'	88°	15°12'	+57'	88°	15°14'	+57'	89°	15°15'	+58'	89°	15°16'	+58'	89°	15
16	16°02'	+56'	87°	16°05'	+56'	87°	16°07'	+57'	88°	16°10'	+57'	88°	16°11'	+57'	88°	16°13'	+58'	89°	16°14'	+58'	89°	16
17	16°58'	+56'	87°	17°01'	+56'	87°	17°04'	+57'	87°	17°07'	+57'	88°	17°09'	+57'	88°	17°11'	+58'	88°	17°12'	+58'	89°	17
18	17°54'	+56'	86°	17°58'	+56'	87°	18°01'	+57'	87°	18°04'	+57'	87°	18°06'	+57'	88°	18°09'	+58'	88°	18°10'	+58'	88°	18
19	18°50'	+56'	86°	18°54'	+56'	86°	18°58'	+57'	87°	19°01'	+57'	87°	19°04'	+57'	87°	19°06'	+58'	88°	19°08'	+58'	88°	19
20	19°46'	+56'	86°	19°50'	+56'	86°	19°54'	+57'	86°	19°58'	+57'	87°	20°01'	+57'	87°	20°04'	+58'	87°	20°06'	+58'	88°	20
21	20°42'	+56'	85°	20°47'	+56'	86°	20°51'	+57'	86°	20°55'	+57'	86°	20°58'	+57'	87°	21°02'	+58'	87°	21°04'	+58'	88°	21
22	21°38'	+56'	85°	21°43'	+56'	85°	21°48'	+57'	86°	21°52'	+57'	86°	21°56'	+57'	87°	21°59'	+58'	87°	22°02'	+58'	87°	22
23	22°34'	+56'	85°	22°39'	+56'	85°	22°44'	+57'	85°	22°49'	+57'	86°	22°53'	+57'	86°	22°57'	+58'	87°	23°00'	+58'	87°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	0°41'	+56'	92°	0°39'	+57'	92°	0°37'	+57'	92°	0°35'	+57'	92°	0°33'	+58'	92°	0°31'	+58'	92°	0°29'	+58'	92°	0
1	1°37'	+56'	92°	1°36'	+57'	92°	1°34'	+57'	92°	1°32'	+57'	92°	1°31'	+58'	92°	1°29'	+58'	92°	1°27'	+58'	92°	1
2	2°34'	+56'	91°	2°33'	+57'	91°	2°31'	+57'	91°	2°30'	+57'	91°	2°28'	+58'	91°	2°27'	+58'	91°	2°25'	+58'	91°	2
3	3°30'	+56'	91°	3°29'	+57'	91°	3°28'	+57'	91°	3°27'	+57'	91°	3°26'	+58'	91°	3°25'	+58'	91°	3°24'	+58'	91°	3
4	4°27'	+56'	91°	4°26'	+57'	91°	4°25'	+57'	91°	4°25'	+57'	91°	4°24'	+58'	91°	4°23'	+58'	91°	4°22'	+58'	91°	4
5	5°23'	+56'	90°	5°23'	+57'	90°	5°22'	+57'	90°	5°22'	+57'	90°	5°21'	+58'	91°	5°21'	+58'	91°	5°20'	+58'	91°	5
6	6°19'	+56'	90°	6°19'	+57'	90°	6°19'	+57'	90°	6°19'	+57'	90°	6°19'	+58'	90°	6°19'	+58'	90°	6°18'	+58'	90°	6
7	7°16'	+56'	89°	7°16'	+57'	90°	7°16'	+57'	90°	7°17'	+57'	90°	7°17'	+58'	90°	7°17'	+58'	90°	7°16'	+58'	90°	7
8	8°12'	+56'	89°	8°13'	+57'	89°	8°13'	+57'	89°	8°14'	+57'	90°	8°14'	+58'	90°	8°15'	+58'	90°	8°15'	+58'	90°	8
9	9°08'	+56'	89°	9°09'	+57'	89°	9°10'	+57'	89°	9°11'	+57'	89°	9°12'	+58'	89°	9°13'	+58'	90°	9°13'	+58'	90°	9
10	10°04'	+56'	88°	10°06'	+57'	89°	10°07'	+57'	89°	10°09'	+57'	89°	10°10'	+58'	89°	10°10'	+58'	89°	10°11'	+58'	89°	10
11	11°01'	+56'	88°	11°03'	+57'	88°	11°04'	+57'	88°	11°06'	+57'	89°	11°07'	+58'	89°	11°08'	+58'	89°	11°09'	+58'	89°	11
12	11°57'	+56'	88°	11°59'	+57'	88°	12°01'	+57'	88°	12°03'	+57'	88°	12°05'	+58'	89°	12°06'	+58'	89°	12°07'	+58'	89°	12
13	12°53'	+56'	87°	12°56'	+57'	88°	12°58'	+57'	88°	13°00'	+57'	88°	13°02'	+58'	88°	13°04'	+58'	89°	13°05'	+58'	89°	13
14	13°49'	+56'	87°	13°52'	+57'	87°	13°55'	+57'	87°	13°58'	+57'	88°	14°00'	+58'	88°	14°02'	+58'	88°	14°04'	+58'	88°	14
15	14°45'	+56'	87°	14°49'	+56'	87°	14°52'	+57'	87°	14°55'	+57'	87°	14°57'	+57'	88°	15°00'	+58'	88°	15°02'	+58'	88°	15
16	15°42'	+56'	86°	15°45'	+56'	87°	15°49'	+57'	87°	15°52'	+57'	87°	15°55'	+57'	87°	15°57'	+58'	88°	16°00'	+58'	88°	16
17	16°38'	+56'	86°	16°42'	+56'	86°	16°46'	+57'	86°	16°49'	+57'	87°	16°52'	+57'	87°	16°55'	+58'	87°	16°58'	+58'	88°	17
18	17°34'	+56'	86°	17°38'	+56'	86°	17°42'	+57'	86°	17°46'	+57'	86°	17°50'	+57'	87°	17°53'	+58'	87°	17°56'	+58'	87°	18
19	18°30'	+56'	85°	18°35'	+56'	85°	18°39'	+57'	86°	18°43'	+57'	86°	18°47'	+57'	86°	18°51'	+58'	87°	18°54'	+58'	87°	19
20	19°26'	+56'	85°	19°31'	+56'	85°	19°36'	+57'	85°	19°40'	+57'	86°	19°45'	+57'	86°	19°48'	+58'	87°	19°52'	+58'	87°	20
21	20°22'	+56'	84°	20°27'	+56'	85°	20°33'	+57'	85°	20°37'	+57'	85°	20°42'	+57'	86°	20°46'	+58'	86°	20°50'	+58'	87°	21
22	21°17'	+56'	84°	21°23'	+56'	84°	21°29'	+57'	85°	21°34'	+57'	85°	21°39'	+57'	86°	21°44'	+58'	86°	21°48'	+58'	86°	22
23	22°13'	+56'	84°	22°20'	+56'	84°	22°26'	+57'	84°	22°31'	+57'	85°	22°37'	+57'	85°	22°41'	+58'	86°	22°46'	+58'	86°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	0°21'	+56'	91°	0°20'	+57'	91°	0°19'	+57'	91°	0°18'	+57'	91°	0°17'	+58'	91°	0°16'	+58'	91°	0°15'	+58'	91°	0
1	1°17'	+56'	91°	1°16'	+57'	91°	1°16'	+57'	91°	1°15'	+57'	91°	1°14'	+58'	91°	1°13'	+58'	91°	1°13'	+58'	91°	1
2	2°13'	+56'	90°	2°13'	+57'	90°	2°13'	+57'	90°	2°12'	+57'	90°	2°12'	+58'	90°	2°11'	+58'	90°	2°11'	+58'	90°	2
3	3°10'	+56'	90°	3°10'	+57'	90°	3°10'	+57'	90°	3°10'	+57'	90°	3°10'	+58'	90°	3°09'	+58'	90°	3°09'	+58'	90°	3
4	4°06'	+56'	90°	4°06'	+57'	90°	4°07'	+57'	90°	4°07'	+57'	90°	4°07'	+58'	90°	4°07'	+58'	90°	4°07'	+58'	90°	4
5	5°02'	+56'	89°	5°03'	+57'	89°	5°04'	+57'	89°	5°04'	+57'	89°	5°05'	+58'	90°	5°05'	+58'	90°	5°06'	+58'	90°	5
6	5°59'	+56'	89°	6°00'	+57'	89°	6°01'	+57'	89°	6°02'	+57'	89°	6°03'	+58'	89°	6°03'	+58'	89°	6°04'	+58'	90°	6
7	6°55'	+56'	89°	6°57'	+57'	89°	6°58'	+57'	89°	6°59'	+57'	89°	7°00'	+58'	89°	7°01'	+58'	89°	7°02'	+58'	89°	7
8	7°51'	+56'	88°	7°53'	+57'	88°	7°55'	+57'	88°	7°56'	+57'	89°	7°58'	+58'	89°	7°59'	+58'	89°	8°00'	+58'	89°	8
9	8°48'	+56'	88°	8°50'	+57'	88°	8°52'	+57'	88°	8°54'	+57'	88°	8°55'	+58'	88°	8°57'	+58'	89°	8°58'	+58'	89°	9
10	9°44'	+56'	87°	9°47'	+57'	88°	9°49'	+57'	88°	9°51'	+57'	88°	9°53'	+58'	88°	9°55'	+58'	88°	9°57'	+58'	89°	10
11	10°40'	+56'	87°	10°43'	+57'	87°	10°46'	+57'	88°	10°48'	+57'	88°	10°51'	+58'	88°	10°53'	+58'	88°	10°55'	+58'	88°	11
12	11°36'	+56'	87°	11°40'	+57'	87°	11°43'	+57'	87°	11°46'	+57'	87°	11°48'	+58'	88°	11°51'	+58'	88°	11°53'	+58'	88°	12
13	12°33'	+56'	86°	12°36'	+57'	87°	12°40'	+57'	87°	12°43'	+57'	87°	12°46'	+58'	87°	12°48'	+58'	88°	12°51'	+58'	88°	13
14	13°29'	+56'	86°	13°33'	+57'	86°	13°37'	+57'	87°	13°40'	+57'	87°	13°43'	+58'	87°	13°46'	+58'	87°	13°49'	+58'	88°	14
15	14°25'	+56'	86°	14°29'	+56'	86°	14°33'	+57'	86°	14°37'	+57'	86°	14°41'	+58'	87°	14°44'	+58'	87°	14°47'	+58'	87°	15
16	15°21'	+56'	85°	15°26'	+56'	86°	15°30'	+57'	86°	15°34'	+57'	86°	15°38'	+57'	86°	15°42'	+58'	87°	15°45'	+58'	87°	16
17	16°17'	+56'	85°	16°22'	+56'	85°	16°27'	+57'	86°	16°32'	+57'	86°	16°36'	+57'	86°	16°40'	+58'	86°	16°43'	+58'	87°	17
18	17°13'	+56'	85°	17°19'	+56'	85°	17°24'	+57'	85°	17°29'	+57'	86°	17°33'	+57'	86°	17°37'	+58'	86°	17°41'	+58'	86°	18
19	18°09'	+56'	84°	18°15'	+56'	85°	18°21'	+57'	85°	18°26'	+57'	85°	18°31'	+57'	86°	18°35'	+58'	86°	18°39'	+58'	86°	19
20	19°05'	+56'	84°	19°11'	+56'	84°	19°17'	+57'	85°	19°23'	+57'	85°	19°28'	+57'	85°	19°33'	+58'	86°	19°37'	+58'	86°	20
21	20°01'	+56'	83°	20°08'	+56'	84°	20°14'	+57'	84°	20°20'	+57'	85°	20°25'	+57'	85°	20°31'	+58'	85°	20°35'	+58'	86°	21
22	20°57'	+56'	83°	21°04'	+56'	83°	21°11'	+57'	84°	21°17'	+57'	84°	21°23'	+57'	85°	21°28'	+58'	85°	21°33'	+58'	85°	22
23	21°53'	+56'	83°	22°00'	+56'	83°	22°07'	+57'	83°	22°14'	+57'	84°	22°20'	+57'	84°	22°26'	+58'	85°	22°31'	+58'	85°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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 SAME or CONTRARY as Declination — 90° 270° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	0°00'	+56'	90°	0°00'	+57'	90°	0°00'	+57'	90°	0°00'	+57'	90°	0°00'	+58'	90°	0°00'	+58'	90°	0°00'	+58'	90°	0
1	0°56'	+56'	90°	0°57'	+57'	90°	0°57'	+57'	90°	0°57'	+57'	90°	0°58'	+58'	90°	0°58'	+58'	90°	0°58'	+58'	90°	1
2	1°53'	+56'	89°	1°53'	+57'	89°	1°54'	+57'	89°	1°55'	+57'	89°	1°55'	+58'	89°	1°56'	+58'	89°	1°56'	+58'	90°	2
3	2°49'	+56'	89°	2°50'	+57'	89°	2°51'	+57'	89°	2°52'	+57'	89°	2°53'	+58'	89°	2°54'	+58'	89°	2°55'	+58'	89°	3
4	3°46'	+56'	89°	3°47'	+57'	89°	3°48'	+57'	89°	3°49'	+57'	89°	3°51'	+58'	89°	3°52'	+58'	89°	3°53'	+58'	89°	4
5	4°42'	+56'	88°	4°44'	+57'	88°	4°45'	+57'	88°	4°47'	+57'	89°	4°48'	+58'	89°	4°50'	+58'	89°	4°51'	+58'	89°	5
6	5°38'	+56'	88°	5°40'	+57'	88°	5°42'	+57'	88°	5°44'	+57'	88°	5°46'	+58'	88°	5°48'	+58'	88°	5°49'	+58'	89°	6
7	6°35'	+56'	88°	6°37'	+57'	88°	6°39'	+57'	88°	6°42'	+57'	88°	6°44'	+58'	88°	6°46'	+58'	88°	6°47'	+58'	88°	7
8	7°31'	+56'	87°	7°34'	+57'	87°	7°36'	+57'	88°	7°39'	+57'	88°	7°41'	+58'	88°	7°44'	+58'	88°	7°46'	+58'	88°	8
9	8°27'	+56'	87°	8°30'	+57'	87°	8°33'	+57'	87°	8°36'	+57'	87°	8°39'	+58'	88°	8°41'	+58'	88°	8°44'	+58'	88°	9
10	9°23'	+56'	87°	9°27'	+57'	87°	9°30'	+57'	87°	9°34'	+57'	87°	9°37'	+58'	87°	9°39'	+58'	87°	9°42'	+58'	88°	10
11	10°20'	+56'	86°	10°24'	+57'	86°	10°27'	+57'	87°	10°31'	+57'	87°	10°34'	+58'	87°	10°37'	+58'	87°	10°40'	+58'	87°	11
12	11°16'	+56'	86°	11°20'	+57'	86°	11°24'	+57'	86°	11°28'	+57'	86°	11°32'	+58'	87°	11°35'	+58'	87°	11°38'	+58'	87°	12
13	12°12'	+56'	85°	12°17'	+57'	86°	12°21'	+57'	86°	12°25'	+57'	86°	12°29'	+58'	86°	12°33'	+58'	87°	12°36'	+58'	87°	13
14	13°08'	+56'	85°	13°13'	+57'	85°	13°18'	+57'	86°	13°23'	+57'	86°	13°27'	+58'	86°	13°31'	+58'	86°	13°35'	+58'	87°	14
15	14°05'	+56'	85°	14°10'	+57'	85°	14°15'	+57'	85°	14°20'	+57'	86°	14°24'	+58'	86°	14°29'	+58'	86°	14°33'	+58'	86°	15
16	15°01'	+56'	84°	15°06'	+56'	85°	15°12'	+57'	85°	15°17'	+57'	85°	15°22'	+57'	85°	15°26'	+58'	86°	15°31'	+58'	86°	16
17	15°57'	+56'	84°	16°03'	+56'	84°	16°09'	+57'	85°	16°14'	+57'	85°	16°19'	+57'	85°	16°24'	+58'	85°	16°29'	+58'	86°	17
18	16°53'	+56'	84°	16°59'	+56'	84°	17°05'	+57'	84°	17°11'	+57'	85°	17°17'	+57'	85°	17°22'	+58'	85°	17°27'	+58'	86°	18
19	17°49'	+56'	83°	17°56'	+56'	84°	18°02'	+57'	84°	18°08'	+57'	84°	18°14'	+57'	85°	18°20'	+58'	85°	18°25'	+58'	85°	19
20	18°45'	+56'	83°	18°52'	+56'	83°	18°59'	+57'	84°	19°05'	+57'	84°	19°12'	+57'	84°	19°17'	+58'	85°	19°23'	+58'	85°	20
21	19°41'	+56'	83°	19°48'	+56'	83°	19°56'	+57'	83°	20°03'	+57'	84°	20°09'	+57'	84°	20°15'	+58'	84°	20°21'	+58'	85°	21
22	20°37'	+56'	82°	20°45'	+56'	83°	20°52'	+57'	83°	21°00'	+57'	83°	21°06'	+57'	84°	21°13'	+58'	84°	21°19'	+58'	84°	22
23	21°32'	+56'	82°	21°41'	+56'	82°	21°49'	+57'	83°	21°56'	+57'	83°	22°04'	+57'	83°	22°10'	+58'	84°	22°17'	+58'	84°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	0°21'	-56'	91°	0°20'	-57'	91°	0°19'	-57'	91°	0°18'	-57'	91°	0°17'	-58'	91°	0°16'	-58'	91°	0°15'	-58'	91°	0
1	0°36'	+56'	89°	0°37'	+57'	89°	0°39'	+57'	89°	0°40'	+57'	89°	0°41'	+58'	89°	0°42'	+58'	89°	0°44'	+58'	89°	1
2	1°32'	+56'	88°	1°34'	+57'	88°	1°36'	+57'	88°	1°37'	+57'	88°	1°39'	+58'	88°	1°40'	+58'	89°	1°42'	+58'	89°	2
3	2°29'	+56'	88°	2°31'	+57'	88°	2°33'	+57'	88°	2°35'	+57'	88°	2°36'	+58'	88°	2°38'	+58'	88°	2°40'	+58'	88°	3
4	3°25'	+56'	88°	3°27'	+57'	88°	3°30'	+57'	88°	3°32'	+57'	88°	3°34'	+58'	88°	3°36'	+58'	88°	3°38'	+58'	88°	4
5	4°21'	+56'	87°	4°24'	+57'	87°	4°27'	+57'	88°	4°29'	+57'	88°	4°32'	+58'	88°	4°34'	+58'	88°	4°37'	+58'	88°	5
6	5°18'	+56'	87°	5°21'	+57'	87°	5°24'	+57'	87°	5°27'	+57'	87°	5°29'	+58'	87°	5°32'	+58'	87°	5°35'	+58'	88°	6
7	6°14'	+56'	87°	6°18'	+57'	87°	6°21'	+57'	87°	6°24'	+57'	87°	6°27'	+58'	87°	6°30'	+58'	87°	6°33'	+58'	87°	7
8	7°10'	+56'	86°	7°14'	+57'	86°	7°18'	+57'	87°	7°21'	+57'	87°	7°25'	+58'	87°	7°28'	+58'	87°	7°31'	+58'	87°	8
9	8°07'	+56'	86°	8°11'	+57'	86°	8°15'	+57'	86°	8°19'	+57'	86°	8°22'	+58'	87°	8°26'	+58'	87°	8°29'	+58'	87°	9
10	9°03'	+56'	86°	9°08'	+57'	86°	9°12'	+57'	86°	9°16'	+57'	86°	9°20'	+58'	86°	9°24'	+58'	86°	9°28'	+58'	87°	10
11	9°59'	+56'	85°	10°04'	+57'	85°	10°09'	+57'	86°	10°13'	+57'	86°	10°18'	+58'	86°	10°22'	+58'	86°	10°26'	+58'	86°	11
12	10°56'	+56'	85°	11°01'	+57'	85°	11°06'	+57'	85°	11°11'	+57'	85°	11°15'	+58'	86°	11°20'	+58'	86°	11°24'	+58'	86°	12
13	11°52'	+56'	85°	11°57'	+57'	85°	12°03'	+57'	85°	12°08'	+57'	85°	12°13'	+58'	85°	12°17'	+58'	86°	12°22'	+58'	86°	13
14	12°48'	+56'	84°	12°54'	+57'	84°	13°00'	+57'	85°	13°05'	+57'	85°	13°10'	+58'	85°	13°15'	+58'	85°	13°20'	+58'	86°	14
15	13°44'	+56'	84°	13°50'	+57'	84°	13°57'	+57'	84°	14°02'	+57'	85°	14°08'	+58'	85°	14°13'	+58'	85°	14°18'	+58'	85°	15
16	14°40'	+56'	83°	14°47'	+56'	84°	14°53'	+57'	84°	15°00'	+57'	84°	15°05'	+57'	85°	15°11'	+58'	85°	15°16'	+58'	85°	16
17	15°36'	+56'	83°	15°43'	+56'	83°	15°50'	+57'	84°	15°57'	+57'	84°	16°03'	+57'	84°	16°09'	+58'	85°	16°14'	+58'	85°	17
18	16°32'	+56'	83°	16°40'	+56'	83°	16°47'	+57'	83°	16°54'	+57'	84°	17°00'	+57'	84°	17°07'	+58'	84°	17°12'	+58'	85°	18
19	17°29'	+56'	82°	17°36'	+56'	83°	17°44'	+57'	83°	17°51'	+57'	83°	17°58'	+57'	84°	18°04'	+58'	84°	18°10'	+58'	84°	19
20	18°24'	+56'	82°	18°33'	+56'	82°	18°41'	+57'	83°	18°48'	+57'	83°	18°55'	+57'	83°	19°02'	+58'	84°	19°08'	+58'	84°	20
21	19°20'	+56'	82°	19°29'	+56'	82°	19°37'	+57'	82°	19°45'	+57'	83°	19°53'	+57'	83°	20°00'	+58'	83°	20°06'	+58'	84°	21
22	20°16'	+56'	81°	20°25'	+56'	82°	20°34'	+57'	82°	20°42'	+57'	82°	20°50'	+57'	83°	20°57'	+58'	83°	21°04'	+58'	83°	22
23	21°12'	+56'	81°	21°22'	+56'	81°	21°31'	+57'	82°	21°39'	+57'	82°	21°47'	+57'	82°	21°55'	+58'	83°	22°02'	+58'	83°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

91° 269° LHA — Latitude SAME as DECLINATION — 91° 269° 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 CONTRARY to Declination — 88° 272° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	0°41'	-56'	92°	0°39'	-57'	92°	0°37'	-57'	92°	0°35'	-57'	92°	0°33'	-58'	92°	0°31'	-58'	92°	0°29'	-58'	92°	0
1	0°15'	+56'	88°	0°18'	+57'	88°	0°20'	+57'	88°	0°22'	+57'	88°	0°25'	+58'	88°	0°27'	+58'	88°	0°29'	+58'	88°	1
2	1°12'	+56'	87°	1°14'	+57'	87°	1°17'	+57'	87°	1°20'	+57'	88°	1°22'	+58'	88°	1°25'	+58'	88°	1°27'	+58'	88°	2
3	2°08'	+56'	87°	2°11'	+57'	87°	2°14'	+57'	87°	2°17'	+57'	87°	2°20'	+58'	87°	2°23'	+58'	87°	2°26'	+58'	87°	3
4	3°04'	+56'	87°	3°08'	+57'	87°	3°11'	+57'	87°	3°14'	+57'	87°	3°18'	+58'	87°	3°21'	+58'	87°	3°24'	+58'	87°	4
5	4°01'	+56'	86°	4°05'	+57'	86°	4°08'	+57'	87°	4°12'	+57'	87°	4°15'	+58'	87°	4°19'	+58'	87°	4°22'	+58'	87°	5
6	4°57'	+56'	86°	5°01'	+57'	86°	5°05'	+57'	86°	5°09'	+57'	86°	5°13'	+58'	86°	5°17'	+58'	87°	5°20'	+58'	87°	6
7	5°54'	+56'	86°	5°58'	+57'	86°	6°02'	+57'	86°	6°07'	+57'	86°	6°11'	+58'	86°	6°15'	+58'	86°	6°18'	+58'	86°	7
8	6°50'	+56'	85°	6°55'	+57'	85°	6°59'	+57'	86°	7°04'	+57'	86°	7°08'	+58'	86°	7°13'	+58'	86°	7°17'	+58'	86°	8
9	7°46'	+56'	85°	7°51'	+57'	85°	7°56'	+57'	85°	8°01'	+57'	85°	8°06'	+58'	86°	8°10'	+58'	86°	8°15'	+58'	86°	9
10	8°43'	+56'	85°	8°48'	+57'	85°	8°53'	+57'	85°	8°59'	+57'	85°	9°04'	+58'	85°	9°08'	+58'	85°	9°13'	+58'	86°	10
11	9°39'	+56'	84°	9°45'	+57'	84°	9°50'	+57'	85°	9°56'	+57'	85°	10°01'	+58'	85°	10°06'	+58'	85°	10°11'	+58'	85°	11
12	10°35'	+56'	84°	10°41'	+57'	84°	10°47'	+57'	84°	10°53'	+57'	85°	10°59'	+58'	85°	11°04'	+58'	85°	11°09'	+58'	85°	12
13	11°31'	+56'	84°	11°38'	+57'	84°	11°44'	+57'	84°	11°50'	+57'	84°	11°56'	+58'	84°	12°02'	+58'	85°	12°07'	+58'	85°	13
14	12°28'	+56'	83°	12°34'	+57'	83°	12°41'	+57'	84°	12°48'	+57'	84°	12°54'	+58'	84°	13°00'	+58'	84°	13°06'	+58'	85°	14
15	13°24'	+56'	83°	13°31'	+57'	83°	13°38'	+57'	83°	13°45'	+57'	84°	13°51'	+58'	84°	13°58'	+58'	84°	14°04'	+58'	84°	15
16	14°20'	+56'	83°	14°28'	+56'	83°	14°35'	+57'	83°	14°42'	+57'	83°	14°49'	+58'	84°	14°56'	+58'	84°	15°02'	+58'	84°	16
17	15°16'	+56'	82°	15°24'	+56'	82°	15°32'	+57'	83°	15°39'	+57'	83°	15°46'	+57'	83°	15°53'	+58'	84°	16°00'	+58'	84°	17
18	16°12'	+56'	82°	16°21'	+56'	82°	16°29'	+57'	82°	16°36'	+57'	83°	16°44'	+57'	83°	16°51'	+58'	83°	16°58'	+58'	84°	18
19	17°08'	+56'	81°	17°17'	+56'	82°	17°25'	+57'	82°	17°34'	+57'	82°	17°41'	+57'	83°	17°49'	+58'	83°	17°56'	+58'	83°	19
20	18°04'	+56'	81°	18°13'	+56'	81°	18°22'	+57'	82°	18°31'	+57'	82°	18°39'	+57'	82°	18°47'	+58'	83°	18°54'	+58'	83°	20
21	19°00'	+56'	81°	19°10'	+56'	81°	19°19'	+57'	81°	19°28'	+57'	82°	19°36'	+57'	82°	19°44'	+58'	82°	19°52'	+58'	83°	21
22	19°56'	+56'	80°	20°06'	+56'	81°	20°16'	+57'	81°	20°25'	+57'	81°	20°34'	+57'	82°	20°42'	+58'	82°	20°50'	+58'	82°	22
23	20°52'	+56'	80°	21°02'	+56'	80°	21°12'	+57'	81°	21°22'	+57'	81°	21°31'	+57'	81°	21°40'	+58'	82°	21°48'	+58'	82°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	1°02'	-56'	93°	0°59'	-57'	93°	0°56'	-57'	93°	0°53'	-57'	93°	0°50'	-58'	93°	0°47'	-58'	93°	0°44'	-58'	93°	0
1	0°05'	-56'	93°	0°02'	-57'	93°	0°01'	+57'	87°	0°05'	+57'	87°	0°08'	+58'	87°	0°11'	+58'	87°	0°15'	+58'	87°	1
2	0°51'	+56'	86°	0°55'	+57'	87°	0°59'	+57'	87°	1°02'	+57'	87°	1°06'	+58'	87°	1°09'	+58'	87°	1°13'	+58'	87°	2
3	1°48'	+56'	86°	1°52'	+57'	86°	1°56'	+57'	86°	2°00'	+57'	86°	2°03'	+58'	86°	2°07'	+58'	86°	2°11'	+58'	86°	3
4	2°44'	+56'	86°	2°48'	+57'	86°	2°53'	+57'	86°	2°57'	+57'	86°	3°01'	+58'	86°	3°05'	+58'	86°	3°09'	+58'	86°	4
5	3°40'	+56'	85°	3°45'	+57'	86°	3°50'	+57'	86°	3°54'	+57'	86°	3°59'	+58'	86°	4°03'	+58'	86°	4°08'	+58'	86°	5
6	4°37'	+56'	85°	4°42'	+57'	85°	4°47'	+57'	85°	4°52'	+57'	85°	4°56'	+58'	85°	5°01'	+58'	86°	5°06'	+58'	86°	6
7	5°33'	+56'	85°	5°39'	+57'	85°	5°44'	+57'	85°	5°49'	+57'	85°	5°54'	+58'	85°	5°59'	+58'	85°	6°04'	+58'	85°	7
8	6°29'	+56'	84°	6°35'	+57'	85°	6°41'	+57'	85°	6°46'	+57'	85°	6°52'	+58'	85°	6°57'	+58'	85°	7°02'	+58'	85°	8
9	7°26'	+56'	84°	7°32'	+57'	84°	7°38'	+57'	84°	7°44'	+57'	84°	7°49'	+58'	85°	7°55'	+58'	85°	8°00'	+58'	85°	9
10	8°22'	+56'	84°	8°29'	+57'	84°	8°35'	+57'	84°	8°41'	+57'	84°	8°47'	+58'	84°	8°53'	+58'	84°	8°59'	+58'	85°	10
11	9°18'	+56'	83°	9°25'	+57'	84°	9°32'	+57'	84°	9°38'	+57'	84°	9°45'	+58'	84°	9°51'	+58'	84°	9°57'	+58'	84°	11
12	10°15'	+56'	83°	10°22'	+57'	83°	10°29'	+57'	83°	10°36'	+57'	84°	10°42'	+58'	84°	10°49'	+58'	84°	10°55'	+58'	84°	12
13	11°11'	+56'	83°	11°19'	+57'	83°	11°26'	+57'	83°	11°33'	+57'	83°	11°40'	+58'	83°	11°47'	+58'	84°	11°53'	+58'	84°	13
14	12°07'	+56'	82°	12°15'	+57'	83°	12°23'	+57'	83°	12°30'	+57'	83°	12°37'	+58'	83°	12°44'	+58'	83°	12°51'	+58'	84°	14
15	13°03'	+56'	82°	13°12'	+57'	82°	13°20'	+57'	82°	13°27'	+57'	83°	13°35'	+58'	83°	13°42'	+58'	83°	13°49'	+58'	83°	15
16	14°00'	+56'	82°	14°08'	+57'	82°	14°17'	+57'	82°	14°25'	+57'	82°	14°33'	+58'	83°	14°40'	+58'	83°	14°47'	+58'	83°	16
17	14°56'	+56'	81°	15°05'	+56'	82°	15°13'	+57'	82°	15°22'	+57'	82°	15°30'	+57'	82°	15°38'	+58'	83°	15°45'	+58'	83°	17
18	15°52'	+56'	81°	16°01'	+56'	81°	16°10'	+57'	81°	16°19'	+57'	82°	16°28'	+57'	82°	16°36'	+58'	82°	16°44'	+58'	83°	18
19	16°48'	+56'	81°	16°58'	+56'	81°	17°07'	+57'	81°	17°16'	+57'	81°	17°25'	+57'	82°	17°33'	+58'	82°	17°42'	+58'	82°	19
20	17°44'	+56'	80°	17°54'	+56'	80°	18°04'	+57'	81°	18°13'	+57'	81°	18°22'	+57'	81°	18°31'	+58'	82°	18°40'	+58'	82°	20
21	18°40'	+56'	80°	18°50'	+56'	80°	19°01'	+57'	80°	19°10'	+57'	81°	19°20'	+57'	81°	19°29'	+58'	81°	19°38'	+58'	82°	21
22	19°36'	+56'	79°	19°47'	+56'	80°	19°57'	+57'	80°	20°07'	+57'	80°	20°17'	+57'	81°	20°27'	+58'	81°	20°36'	+58'	82°	22
23	20°32'	+56'	79°	20°43'	+56'	79°	20°54'	+57'	80°	21°04'	+57'	80°	21°15'	+57'	80°	21°24'	+58'	81°	21°34'	+58'	81°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

93° 267° LHA — Latitude SAME as DECLINATION — 93° 267° 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 CONTRARY to Declination — 86° 274° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	1°22'	-56'	94°	1°18'	-57'	94°	1°14'	-57'	94°	1°10'	-57'	94°	1°06'	-58'	94°	1°02'	-58'	94°	0°58'	-58'	94°	0
1	0°26'	-56'	94°	0°21'	-57'	94°	0°17'	-57'	94°	0°13'	-57'	94°	0°08'	-58'	94°	0°04'	-58'	94°	0°00'	+58'	86°	1
2	0°31'	+56'	86°	0°35'	+57'	86°	0°40'	+57'	86°	0°45'	+57'	86°	0°49'	+58'	86°	0°54'	+58'	86°	0°58'	+58'	86°	2
3	1°27'	+56'	85°	1°32'	+57'	85°	1°37'	+57'	85°	1°42'	+57'	85°	1°47'	+58'	85°	1°52'	+58'	85°	1°57'	+58'	85°	3
4	2°24'	+56'	85°	2°29'	+57'	85°	2°34'	+57'	85°	2°39'	+57'	85°	2°45'	+58'	85°	2°50'	+58'	85°	2°55'	+58'	85°	4
5	3°20'	+56'	85°	3°26'	+57'	85°	3°31'	+57'	85°	3°37'	+57'	85°	3°42'	+58'	85°	3°48'	+58'	85°	3°53'	+58'	85°	5
6	4°16'	+56'	84°	4°22'	+57'	84°	4°28'	+57'	84°	4°34'	+57'	84°	4°40'	+58'	85°	4°46'	+58'	85°	4°51'	+58'	85°	6
7	5°13'	+56'	84°	5°19'	+57'	84°	5°25'	+57'	84°	5°32'	+57'	84°	5°38'	+58'	84°	5°44'	+58'	84°	5°50'	+58'	84°	7
8	6°09'	+56'	84°	6°16'	+57'	84°	6°22'	+57'	84°	6°29'	+57'	84°	6°35'	+58'	84°	6°42'	+58'	84°	6°48'	+58'	84°	8
9	7°05'	+56'	83°	7°13'	+57'	83°	7°19'	+57'	83°	7°26'	+57'	84°	7°33'	+58'	84°	7°40'	+58'	84°	7°46'	+58'	84°	9
10	8°02'	+56'	83°	8°09'	+57'	83°	8°16'	+57'	83°	8°24'	+57'	83°	8°31'	+58'	83°	8°37'	+58'	84°	8°44'	+58'	84°	10
11	8°58'	+56'	82°	9°06'	+57'	83°	9°13'	+57'	83°	9°21'	+57'	83°	9°28'	+58'	83°	9°35'	+58'	83°	9°42'	+58'	83°	11
12	9°54'	+56'	82°	10°03'	+57'	82°	10°10'	+57'	82°	10°18'	+57'	83°	10°26'	+58'	83°	10°33'	+58'	83°	10°40'	+58'	83°	12
13	10°51'	+56'	82°	10°59'	+57'	82°	11°07'	+57'	82°	11°16'	+57'	82°	11°23'	+58'	83°	11°31'	+58'	83°	11°39'	+58'	83°	13
14	11°47'	+56'	81°	11°56'	+57'	82°	12°04'	+57'	82°	12°13'	+57'	82°	12°21'	+58'	82°	12°29'	+58'	82°	12°37'	+58'	83°	14
15	12°43'	+56'	81°	12°52'	+57'	81°	13°01'	+57'	81°	13°10'	+57'	82°	13°19'	+58'	82°	13°27'	+58'	82°	13°35'	+58'	82°	15
16	13°39'	+56'	81°	13°49'	+57'	81°	13°58'	+57'	81°	14°07'	+57'	81°	14°16'	+58'	82°	14°25'	+58'	82°	14°33'	+58'	82°	16
17	14°35'	+56'	80°	14°45'	+56'	81°	14°55'	+57'	81°	15°05'	+57'	81°	15°14'	+58'	81°	15°23'	+58'	82°	15°31'	+58'	82°	17
18	15°32'	+56'	80°	15°42'	+56'	80°	15°52'	+57'	81°	16°02'	+57'	81°	16°11'	+57'	81°	16°20'	+58'	81°	16°29'	+58'	82°	18
19	16°28'	+56'	80°	16°38'	+56'	80°	16°49'	+57'	80°	16°59'	+57'	80°	17°09'	+57'	81°	17°18'	+58'	81°	17°27'	+58'	81°	19
20	17°24'	+56'	79°	17°35'	+56'	80°	17°46'	+57'	80°	17°56'	+57'	80°	18°06'	+57'	80°	18°16'	+58'	81°	18°25'	+58'	81°	20
21	18°20'	+56'	79°	18°31'	+56'	79°	18°42'	+57'	79°	18°53'	+57'	80°	19°04'	+57'	80°	19°14'	+58'	81°	19°23'	+58'	81°	21
22	19°16'	+56'	78°	19°28'	+56'	79°	19°39'	+57'	79°	19°50'	+57'	80°	20°01'	+57'	80°	20°11'	+58'	80°	20°21'	+58'	81°	22
23	20°12'	+56'	78°	20°24'	+56'	78°	20°36'	+57'	79°	20°47'	+57'	79°	20°58'	+57'	80°	21°09'	+58'	80°	21°19'	+58'	80°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	1°42'	-56'	95°	1°38'	-57'	95°	1°33'	-57'	95°	1°28'	-57'	95°	1°23'	-58'	95°	1°18'	-58'	95°	1°12'	-58'	95°	0
1	0°46'	-56'	95°	0°41'	-57'	95°	0°36'	-57'	95°	0°30'	-57'	95°	0°25'	-58'	95°	0°20'	-58'	95°	0°14'	-58'	95°	1
2	0°10'	+56'	85°	0°16'	+57'	85°	0°22'	+57'	85°	0°27'	+57'	85°	0°33'	+58'	85°	0°38'	+58'	85°	0°44'	+58'	85°	2
3	1°07'	+56'	84°	1°13'	+57'	84°	1°19'	+57'	84°	1°25'	+57'	84°	1°30'	+58'	84°	1°36'	+58'	84°	1°42'	+58'	84°	3
4	2°03'	+56'	84°	2°09'	+57'	84°	2°16'	+57'	84°	2°22'	+57'	84°	2°28'	+58'	84°	2°34'	+58'	84°	2°40'	+58'	84°	4
5	3°00'	+56'	84°	3°06'	+57'	84°	3°13'	+57'	84°	3°19'	+57'	84°	3°26'	+58'	84°	3°32'	+58'	84°	3°39'	+58'	84°	5
6	3°56'	+56'	83°	4°03'	+57'	83°	4°10'	+57'	83°	4°17'	+57'	83°	4°24'	+58'	84°	4°30'	+58'	84°	4°37'	+58'	84°	6
7	4°52'	+56'	83°	5°00'	+57'	83°	5°07'	+57'	83°	5°14'	+57'	83°	5°21'	+58'	83°	5°28'	+58'	83°	5°35'	+58'	83°	7
8	5°49'	+56'	83°	5°56'	+57'	83°	6°04'	+57'	83°	6°12'	+57'	83°	6°19'	+58'	83°	6°26'	+58'	83°	6°33'	+58'	83°	8
9	6°45'	+56'	82°	6°53'	+57'	82°	7°01'	+57'	82°	7°09'	+57'	83°	7°17'	+58'	83°	7°24'	+58'	83°	7°32'	+58'	83°	9
10	7°41'	+56'	82°	7°50'	+57'	82°	7°58'	+57'	82°	8°06'	+57'	82°	8°14'	+58'	82°	8°22'	+58'	83°	8°30'	+58'	83°	10
11	8°38'	+56'	82°	8°47'	+57'	82°	8°55'	+57'	82°	9°04'	+57'	82°	9°12'	+58'	82°	9°20'	+58'	82°	9°28'	+58'	82°	11
12	9°34'	+56'	81°	9°43'	+57'	81°	9°52'	+57'	82°	10°01'	+57'	82°	10°09'	+58'	82°	10°18'	+58'	82°	10°26'	+58'	82°	12
13	10°30'	+56'	81°	10°40'	+57'	81°	10°49'	+57'	81°	10°58'	+57'	81°	11°07'	+58'	82°	11°16'	+58'	82°	11°24'	+58'	82°	13
14	11°27'	+56'	80°	11°36'	+57'	81°	11°46'	+57'	81°	11°55'	+57'	81°	12°05'	+58'	81°	12°14'	+58'	82°	12°22'	+58'	82°	14
15	12°23'	+56'	80°	12°33'	+57'	80°	12°43'	+57'	81°	12°53'	+57'	81°	13°02'	+58'	81°	13°12'	+58'	81°	13°21'	+58'	81°	15
16	13°19'	+56'	80°	13°30'	+57'	80°	13°40'	+57'	80°	13°50'	+57'	80°	14°00'	+58'	81°	14°09'	+58'	81°	14°19'	+58'	81°	16
17	14°15'	+56'	79°	14°26'	+57'	80°	14°37'	+57'	80°	14°47'	+57'	80°	14°57'	+58'	80°	15°07'	+58'	81°	15°17'	+58'	81°	17
18	15°11'	+56'	79°	15°23'	+56'	79°	15°34'	+57'	80°	15°44'	+57'	80°	15°55'	+57'	80°	16°05'	+58'	80°	16°15'	+58'	81°	18
19	16°08'	+56'	79°	16°19'	+56'	79°	16°31'	+57'	79°	16°42'	+57'	80°	16°52'	+57'	80°	17°03'	+58'	80°	17°13'	+58'	80°	19
20	17°04'	+56'	78°	17°16'	+56'	79°	17°27'	+57'	79°	17°39'	+57'	79°	17°50'	+57'	80°	18°01'	+58'	80°	18°11'	+58'	80°	20
21	18°00'	+56'	78°	18°12'	+56'	78°	18°24'	+57'	79°	18°36'	+57'	79°	18°47'	+57'	79°	18°58'	+58'	80°	19°09'	+58'	80°	21
22	18°56'	+56'	78°	19°08'	+56'	78°	19°21'	+57'	78°	19°33'	+57'	79°	19°45'	+57'	79°	19°56'	+58'	79°	20°07'	+58'	80°	22
23	19°52'	+56'	77°	20°05'	+56'	78°	20°18'	+57'	78°	20°30'	+57'	78°	20°42'	+57'	79°	20°54'	+58'	79°	21°05'	+58'	79°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

95° 265° LHA — Latitude SAME as DECLINATION — 95° 265° LHA

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

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

84° 276° LHA — Latitude CONTRARY to Declination — 84° 276° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	2°03'	-56'	96°	1°57'	-57'	96°	1°51'	-57'	96°	1°45'	-57'	96°	1°39'	-58'	96°	1°33'	-58'	96°	1°27'	-58'	96°	0
1	1°07'	-56'	96°	1°00'	-57'	96°	0°54'	-57'	96°	0°48'	-57'	96°	0°41'	-58'	96°	0°35'	-58'	96°	0°29'	-58'	96°	1
2	0°10'	-56'	96°	0°03'	-57'	96°	0°03'	+57'	84°	0°10'	+57'	84°	0°16'	+58'	84°	0°23'	+58'	84°	0°30'	+58'	84°	2
3	0°46'	+56'	83°	0°53'	+57'	83°	1°00'	+57'	83°	1°07'	+57'	83°	1°14'	+58'	83°	1°21'	+58'	83°	1°28'	+58'	83°	3
4	1°43'	+56'	83°	1°50'	+57'	83°	1°57'	+57'	83°	2°05'	+57'	83°	2°12'	+58'	83°	2°19'	+58'	83°	2°26'	+58'	83°	4
5	2°39'	+56'	83°	2°47'	+57'	83°	2°54'	+57'	83°	3°02'	+57'	83°	3°09'	+58'	83°	3°17'	+58'	83°	3°24'	+58'	83°	5
6	3°36'	+56'	82°	3°44'	+57'	82°	3°51'	+57'	82°	3°59'	+57'	83°	4°07'	+58'	83°	4°15'	+58'	83°	4°22'	+58'	83°	6
7	4°32'	+56'	82°	4°40'	+57'	82°	4°49'	+57'	82°	4°57'	+57'	82°	5°05'	+58'	82°	5°13'	+58'	82°	5°21'	+58'	82°	7
8	5°28'	+56'	82°	5°37'	+57'	82°	5°46'	+57'	82°	5°54'	+57'	82°	6°02'	+58'	82°	6°11'	+58'	82°	6°19'	+58'	82°	8
9	6°25'	+56'	81°	6°34'	+57'	81°	6°43'	+57'	82°	6°51'	+57'	82°	7°00'	+58'	82°	7°09'	+58'	82°	7°17'	+58'	82°	9
10	7°21'	+56'	81°	7°31'	+57'	81°	7°40'	+57'	81°	7°49'	+57'	81°	7°58'	+58'	81°	8°07'	+58'	82°	8°15'	+58'	82°	10
11	8°17'	+56'	81°	8°27'	+57'	81°	8°37'	+57'	81°	8°46'	+57'	81°	8°55'	+58'	81°	9°05'	+58'	81°	9°14'	+58'	82°	11
12	9°14'	+56'	80°	9°24'	+57'	80°	9°34'	+57'	81°	9°44'	+57'	81°	9°53'	+58'	81°	10°03'	+58'	81°	10°12'	+58'	81°	12
13	10°10'	+56'	80°	10°21'	+57'	80°	10°31'	+57'	80°	10°41'	+57'	80°	10°51'	+58'	81°	11°00'	+58'	81°	11°10'	+58'	81°	13
14	11°06'	+56'	80°	11°17'	+57'	80°	11°28'	+57'	80°	11°38'	+57'	80°	11°48'	+58'	80°	11°58'	+58'	81°	12°08'	+58'	81°	14
15	12°03'	+56'	79°	12°14'	+57'	79°	12°25'	+57'	80°	12°35'	+57'	80°	12°46'	+58'	80°	12°56'	+58'	80°	13°06'	+58'	81°	15
16	12°59'	+56'	79°	13°10'	+57'	79°	13°22'	+57'	79°	13°33'	+57'	80°	13°44'	+58'	80°	13°54'	+58'	80°	14°04'	+58'	80°	16
17	13°55'	+56'	78°	14°07'	+57'	79°	14°19'	+57'	79°	14°30'	+57'	79°	14°41'	+58'	79°	14°52'	+58'	80°	15°02'	+58'	80°	17
18	14°51'	+56'	78°	15°04'	+57'	78°	15°16'	+57'	79°	15°27'	+57'	79°	15°39'	+58'	79°	15°50'	+58'	79°	16°01'	+58'	80°	18
19	15°47'	+56'	78°	16°00'	+56'	78°	16°12'	+57'	78°	16°24'	+57'	79°	16°36'	+57'	79°	16°48'	+58'	79°	16°59'	+58'	79°	19
20	16°44'	+56'	77°	16°57'	+56'	78°	17°09'	+57'	78°	17°22'	+57'	78°	17°34'	+57'	79°	17°45'	+58'	79°	17°57'	+58'	79°	20
21	17°40'	+56'	77°	17°53'	+56'	77°	18°06'	+57'	78°	18°19'	+57'	78°	18°31'	+57'	78°	18°43'	+58'	79°	18°55'	+58'	79°	21
22	18°36'	+56'	77°	18°49'	+56'	77°	19°03'	+57'	77°	19°16'	+57'	78°	19°28'	+57'	78°	19°41'	+58'	78°	19°53'	+58'	79°	22
23	19°32'	+56'	76°	19°46'	+56'	77°	19°59'	+57'	77°	20°13'	+57'	77°	20°26'	+57'	78°	20°38'	+58'	78°	20°51'	+58'	78°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

96° 264° LHA — Latitude SAME as DECLINATION — 96° 264° LHA

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

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

83° 277° LHA — Latitude CONTRARY to Declination — 83° 277° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	2°23'	-56'	97°	2°16'	-57'	97°	2°09'	-57'	97°	2°03'	-57'	97°	1°56'	-58'	97°	1°48'	-58'	97°	1°41'	-58'	97°	0
1	1°27'	-56'	97°	1°20'	-57'	97°	1°12'	-57'	97°	1°05'	-57'	97°	0°58'	-58'	97°	0°50'	-58'	97°	0°43'	-58'	97°	1
2	0°30'	-56'	97°	0°23'	-57'	97°	0°15'	-57'	97°	0°08'	-57'	97°	0°00'	-58'	97°	0°08'	+58'	83°	0°15'	+58'	83°	2
3	0°26'	+56'	82°	0°34'	+57'	82°	0°42'	+57'	82°	0°50'	+57'	82°	0°58'	+58'	82°	1°06'	+58'	82°	1°13'	+58'	82°	3
4	1°22'	+56'	82°	1°31'	+57'	82°	1°39'	+57'	82°	1°47'	+57'	82°	1°55'	+58'	82°	2°03'	+58'	82°	2°12'	+58'	82°	4
5	2°19'	+56'	82°	2°27'	+57'	82°	2°36'	+57'	82°	2°45'	+57'	82°	2°53'	+58'	82°	3°01'	+58'	82°	3°10'	+58'	82°	5
6	3°15'	+56'	81°	3°24'	+57'	81°	3°33'	+57'	81°	3°42'	+57'	82°	3°51'	+58'	82°	3°59'	+58'	82°	4°08'	+58'	82°	6
7	4°12'	+56'	81°	4°21'	+57'	81°	4°30'	+57'	81°	4°39'	+57'	81°	4°48'	+58'	81°	4°57'	+58'	81°	5°06'	+58'	82°	7
8	5°08'	+56'	81°	5°18'	+57'	81°	5°27'	+57'	81°	5°37'	+57'	81°	5°46'	+58'	81°	5°55'	+58'	81°	6°05'	+58'	81°	8
9	6°05'	+56'	80°	6°15'	+57'	80°	6°24'	+57'	81°	6°34'	+57'	81°	6°44'	+58'	81°	6°53'	+58'	81°	7°03'	+58'	81°	9
10	7°01'	+56'	80°	7°11'	+57'	80°	7°21'	+57'	80°	7°32'	+57'	80°	7°41'	+58'	81°	7°51'	+58'	81°	8°01'	+58'	81°	10
11	7°57'	+56'	80°	8°08'	+57'	80°	8°19'	+57'	80°	8°29'	+57'	80°	8°39'	+58'	80°	8°49'	+58'	80°	8°59'	+58'	81°	11
12	8°54'	+56'	79°	9°05'	+57'	79°	9°16'	+57'	80°	9°26'	+57'	80°	9°37'	+58'	80°	9°47'	+58'	80°	9°57'	+58'	80°	12
13	9°50'	+56'	79°	10°01'	+57'	79°	10°13'	+57'	79°	10°24'	+57'	79°	10°34'	+58'	80°	10°45'	+58'	80°	10°56'	+58'	80°	13
14	10°46'	+56'	79°	10°58'	+57'	79°	11°10'	+57'	79°	11°21'	+57'	79°	11°32'	+58'	79°	11°43'	+58'	80°	11°54'	+58'	80°	14
15	11°43'	+56'	78°	11°55'	+57'	78°	12°07'	+57'	79°	12°18'	+57'	79°	12°30'	+58'	79°	12°41'	+58'	79°	12°52'	+58'	80°	15
16	12°39'	+56'	78°	12°51'	+57'	78°	13°04'	+57'	78°	13°16'	+57'	79°	13°27'	+58'	79°	13°39'	+58'	79°	13°50'	+58'	79°	16
17	13°35'	+56'	78°	13°48'	+57'	78°	14°00'	+57'	78°	14°13'	+57'	78°	14°25'	+58'	79°	14°37'	+58'	79°	14°48'	+58'	79°	17
18	14°31'	+56'	77°	14°44'	+57'	77°	14°57'	+57'	78°	15°10'	+57'	78°	15°22'	+58'	78°	15°34'	+58'	79°	15°46'	+58'	79°	18
19	15°27'	+56'	77°	15°41'	+57'	77°	15°54'	+57'	77°	16°07'	+57'	78°	16°20'	+57'	78°	16°32'	+58'	78°	16°44'	+58'	79°	19
20	16°24'	+56'	76°	16°37'	+56'	77°	16°51'	+57'	77°	17°04'	+57'	77°	17°17'	+57'	78°	17°30'	+58'	78°	17°42'	+58'	78°	20
21	17°20'	+56'	76°	17°34'	+56'	76°	17°48'	+57'	77°	18°02'	+57'	77°	18°15'	+57'	77°	18°28'	+58'	78°	18°40'	+58'	78°	21
22	18°16'	+56'	76°	18°30'	+56'	76°	18°45'	+57'	76°	18°59'	+57'	77°	19°12'	+57'	77°	19°26'	+58'	77°	19°39'	+58'	78°	22
23	19°12'	+56'	75°	19°27'	+56'	76°	19°41'	+57'	76°	19°56'	+57'	76°	20°10'	+57'	77°	20°23'	+58'	77°	20°37'	+58'	77°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	2°44'	-56'	98°	2°36'	-57'	98°	2°28'	-57'	98°	2°20'	-57'	98°	2°12'	-58'	98°	2°04'	-58'	98°	1°56'	-58'	98°	0
1	1°47'	-56'	98°	1°39'	-57'	98°	1°31'	-57'	98°	1°22'	-57'	98°	1°14'	-58'	98°	1°06'	-58'	98°	0°58'	-58'	98°	1
2	0°51'	-56'	98°	0°42'	-57'	98°	0°34'	-57'	98°	0°25'	-57'	98°	0°16'	-58'	98°	0°08'	-58'	98°	0°01'	+58'	82°	2
3	0°06'	+56'	81°	0°15'	+57'	81°	0°23'	+57'	81°	0°32'	+57'	81°	0°41'	+58'	81°	0°50'	+58'	82°	0°59'	+58'	82°	3
4	1°02'	+56'	81°	1°11'	+57'	81°	1°21'	+57'	81°	1°30'	+57'	81°	1°39'	+58'	81°	1°48'	+58'	81°	1°57'	+58'	81°	4
5	1°59'	+56'	81°	2°08'	+57'	81°	2°18'	+57'	81°	2°27'	+57'	81°	2°37'	+58'	81°	2°46'	+58'	81°	2°55'	+58'	81°	5
6	2°55'	+56'	80°	3°05'	+57'	80°	3°15'	+57'	81°	3°25'	+57'	81°	3°34'	+58'	81°	3°44'	+58'	81°	3°54'	+58'	81°	6
7	3°51'	+56'	80°	4°02'	+57'	80°	4°12'	+57'	80°	4°22'	+57'	80°	4°32'	+58'	80°	4°42'	+58'	80°	4°52'	+58'	81°	7
8	4°48'	+56'	80°	4°59'	+57'	80°	5°09'	+57'	80°	5°19'	+57'	80°	5°30'	+58'	80°	5°40'	+58'	80°	5°50'	+58'	80°	8
9	5°44'	+56'	79°	5°55'	+57'	80°	6°06'	+57'	80°	6°17'	+57'	80°	6°28'	+58'	80°	6°38'	+58'	80°	6°48'	+58'	80°	9
10	6°41'	+56'	79°	6°52'	+57'	79°	7°03'	+57'	79°	7°14'	+57'	79°	7°25'	+58'	80°	7°36'	+58'	80°	7°47'	+58'	80°	10
11	7°37'	+56'	79°	7°49'	+57'	79°	8°00'	+57'	79°	8°12'	+57'	79°	8°23'	+58'	79°	8°34'	+58'	79°	8°45'	+58'	80°	11
12	8°33'	+56'	78°	8°45'	+57'	79°	8°57'	+57'	79°	9°09'	+57'	79°	9°21'	+58'	79°	9°32'	+58'	79°	9°43'	+58'	79°	12
13	9°30'	+56'	78°	9°42'	+57'	78°	9°54'	+57'	78°	10°06'	+57'	79°	10°18'	+58'	79°	10°30'	+58'	79°	10°41'	+58'	79°	13
14	10°26'	+56'	78°	10°39'	+57'	78°	10°51'	+57'	78°	11°04'	+57'	78°	11°16'	+58'	78°	11°28'	+58'	79°	11°39'	+58'	79°	14
15	11°23'	+56'	77°	11°36'	+57'	78°	11°48'	+57'	78°	12°01'	+57'	78°	12°13'	+58'	78°	12°26'	+58'	78°	12°38'	+58'	79°	15
16	12°19'	+56'	77°	12°32'	+57'	77°	12°45'	+57'	77°	12°58'	+57'	78°	13°11'	+58'	78°	13°24'	+58'	78°	13°36'	+58'	78°	16
17	13°15'	+56'	77°	13°29'	+57'	77°	13°42'	+57'	77°	13°56'	+57'	77°	14°09'	+58'	78°	14°21'	+58'	78°	14°34'	+58'	78°	17
18	14°11'	+56'	76°	14°25'	+57'	77°	14°39'	+57'	77°	14°53'	+57'	77°	15°06'	+58'	77°	15°19'	+58'	78°	15°32'	+58'	78°	18
19	15°08'	+56'	76°	15°22'	+57'	76°	15°36'	+57'	76°	15°50'	+57'	77°	16°04'	+58'	77°	16°17'	+58'	77°	16°30'	+58'	78°	19
20	16°04'	+56'	76°	16°19'	+56'	76°	16°33'	+57'	76°	16°47'	+57'	76°	17°01'	+57'	77°	17°15'	+58'	77°	17°28'	+58'	77°	20
21	17°00'	+56'	75°	17°15'	+56'	75°	17°30'	+57'	76°	17°44'	+57'	76°	17°59'	+57'	76°	18°13'	+58'	77°	18°26'	+58'	77°	21
22	17°56'	+56'	75°	18°11'	+56'	75°	18°27'	+57'	75°	18°42'	+57'	76°	18°56'	+57'	76°	19°10'	+58'	76°	19°24'	+58'	77°	22
23	18°52'	+56'	74°	19°08'	+56'	75°	19°23'	+57'	75°	19°39'	+57'	75°	19°54'	+57'	76°	20°08'	+58'	76°	20°22'	+58'	77°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	3°04'	-56'	98°	2°55'	-57'	99°	2°46'	-57'	99°	2°37'	-57'	99°	2°28'	-58'	99°	2°19'	-58'	99°	2°10'	-58'	99°	0
1	2°08'	-56'	99°	1°58'	-57'	99°	1°49'	-57'	99°	1°40'	-57'	99°	1°31'	-58'	99°	1°21'	-58'	99°	1°12'	-58'	99°	1
2	1°11'	-56'	99°	1°02'	-57'	99°	0°52'	-57'	99°	0°42'	-57'	99°	0°33'	-58'	99°	0°23'	-58'	99°	0°14'	-58'	99°	2
3	0°15'	-56'	99°	0°05'	-57'	99°	0°05'	+57'	81°	0°15'	+57'	81°	0°25'	+58'	81°	0°35'	+58'	81°	0°45'	+58'	81°	3
4	0°42'	+56'	80°	0°52'	+57'	80°	1°02'	+57'	80°	1°12'	+57'	80°	1°23'	+58'	80°	1°33'	+58'	80°	1°43'	+58'	80°	4
5	1°38'	+56'	80°	1°49'	+57'	80°	1°59'	+57'	80°	2°10'	+57'	80°	2°20'	+58'	80°	2°31'	+58'	80°	2°41'	+58'	80°	5
6	2°35'	+56'	80°	2°46'	+57'	80°	2°57'	+57'	80°	3°07'	+57'	80°	3°18'	+58'	80°	3°29'	+58'	80°	3°39'	+58'	80°	6
7	3°31'	+56'	79°	3°43'	+57'	79°	3°54'	+57'	79°	4°05'	+57'	79°	4°16'	+58'	79°	4°27'	+58'	80°	4°38'	+58'	80°	7
8	4°28'	+56'	79°	4°39'	+57'	79°	4°51'	+57'	79°	5°02'	+57'	79°	5°14'	+58'	79°	5°25'	+58'	79°	5°36'	+58'	79°	8
9	5°24'	+56'	78°	5°36'	+57'	79°	5°48'	+57'	79°	6°00'	+57'	79°	6°11'	+58'	79°	6°23'	+58'	79°	6°34'	+58'	79°	9
10	6°21'	+56'	78°	6°33'	+57'	78°	6°45'	+57'	78°	6°57'	+57'	78°	7°09'	+58'	79°	7°21'	+58'	79°	7°32'	+58'	79°	10
11	7°17'	+56'	78°	7°30'	+57'	78°	7°42'	+57'	78°	7°54'	+57'	78°	8°07'	+58'	78°	8°19'	+58'	78°	8°31'	+58'	79°	11
12	8°13'	+56'	77°	8°26'	+57'	78°	8°39'	+57'	78°	8°52'	+57'	78°	9°04'	+58'	78°	9°17'	+58'	78°	9°29'	+58'	78°	12
13	9°10'	+56'	77°	9°23'	+57'	77°	9°36'	+57'	77°	9°49'	+57'	78°	10°02'	+58'	78°	10°15'	+58'	78°	10°27'	+58'	78°	13
14	10°06'	+56'	77°	10°20'	+57'	77°	10°33'	+57'	77°	10°47'	+57'	77°	11°00'	+58'	77°	11°13'	+58'	78°	11°25'	+58'	78°	14
15	11°03'	+56'	76°	11°17'	+57'	77°	11°30'	+57'	77°	11°44'	+57'	77°	11°57'	+58'	77°	12°10'	+58'	77°	12°23'	+58'	78°	15
16	11°59'	+56'	76°	12°13'	+57'	76°	12°27'	+57'	76°	12°41'	+57'	77°	12°55'	+58'	77°	13°08'	+58'	77°	13°22'	+58'	77°	16
17	12°55'	+56'	76°	13°10'	+57'	76°	13°24'	+57'	76°	13°39'	+57'	76°	13°53'	+58'	77°	14°06'	+58'	77°	14°20'	+58'	77°	17
18	13°51'	+56'	75°	14°06'	+57'	76°	14°21'	+57'	76°	14°36'	+57'	76°	14°50'	+58'	76°	15°04'	+58'	77°	15°18'	+58'	77°	18
19	14°48'	+56'	75°	15°03'	+57'	75°	15°18'	+57'	76°	15°33'	+57'	76°	15°48'	+58'	76°	16°02'	+58'	76°	16°16'	+58'	77°	19
20	15°44'	+56'	75°	16°00'	+57'	75°	16°15'	+57'	75°	16°30'	+57'	75°	16°45'	+58'	76°	17°00'	+58'	76°	17°14'	+58'	76°	20
21	16°40'	+56'	74°	16°56'	+56'	75°	17°12'	+57'	75°	17°27'	+57'	75°	17°43'	+57'	75°	17°58'	+58'	76°	18°12'	+58'	76°	21
22	17°36'	+56'	74°	17°53'	+56'	74°	18°09'	+57'	75°	18°25'	+57'	75°	18°40'	+57'	75°	18°55'	+58'	75°	19°10'	+58'	76°	22
23	18°32'	+56'	74°	18°49'	+56'	74°	19°06'	+57'	74°	19°22'	+57'	75°	19°38'	+57'	75°	19°53'	+58'	75°	20°08'	+58'	76°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	3°24'	-56'	99°	3°14'	-57'	99°	3°05'	-57'	100°	2°55'	-57'	100°	2°45'	-58'	100°	2°35'	-58'	100°	2°24'	-58'	100°	0
1	2°28'	-56'	100°	2°18'	-57'	100°	2°07'	-57'	100°	1°57'	-57'	100°	1°47'	-58'	100°	1°37'	-58'	100°	1°26'	-58'	100°	1
2	1°31'	-56'	100°	1°21'	-57'	100°	1°10'	-57'	100°	1°00'	-57'	100°	0°49'	-58'	100°	0°39'	-58'	100°	0°28'	-58'	100°	2
3	0°35'	-56'	100°	0°24'	-57'	100°	0°13'	-57'	100°	0°02'	-57'	100°	0°09'	+58'	80°	0°19'	+58'	80°	0°30'	+58'	80°	3
4	0°22'	+56'	79°	0°33'	+57'	79°	0°44'	+57'	79°	0°55'	+57'	79°	1°06'	+58'	79°	1°18'	+58'	79°	1°29'	+58'	79°	4
5	1°18'	+56'	79°	1°30'	+57'	79°	1°41'	+57'	79°	1°53'	+57'	79°	2°04'	+58'	79°	2°16'	+58'	79°	2°27'	+58'	79°	5
6	2°15'	+56'	79°	2°27'	+57'	79°	2°38'	+57'	79°	2°50'	+57'	79°	3°02'	+58'	79°	3°14'	+58'	79°	3°25'	+58'	79°	6
7	3°11'	+56'	78°	3°23'	+57'	78°	3°35'	+57'	78°	3°48'	+57'	78°	4°00'	+58'	78°	4°12'	+58'	79°	4°23'	+58'	79°	7
8	4°08'	+56'	78°	4°20'	+57'	78°	4°33'	+57'	78°	4°45'	+57'	78°	4°57'	+58'	78°	5°10'	+58'	78°	5°22'	+58'	78°	8
9	5°04'	+56'	78°	5°17'	+57'	78°	5°30'	+57'	78°	5°42'	+57'	78°	5°55'	+58'	78°	6°08'	+58'	78°	6°20'	+58'	78°	9
10	6°01'	+56'	77°	6°14'	+57'	77°	6°27'	+57'	77°	6°40'	+57'	78°	6°53'	+58'	78°	7°06'	+58'	78°	7°18'	+58'	78°	10
11	6°57'	+56'	77°	7°11'	+57'	77°	7°24'	+57'	77°	7°37'	+57'	77°	7°50'	+58'	77°	8°04'	+58'	78°	8°16'	+58'	78°	11
12	7°53'	+56'	77°	8°07'	+57'	77°	8°21'	+57'	77°	8°35'	+57'	77°	8°48'	+58'	77°	9°02'	+58'	77°	9°15'	+58'	77°	12
13	8°50'	+56'	76°	9°04'	+57'	76°	9°18'	+57'	76°	9°32'	+57'	77°	9°46'	+58'	77°	9°59'	+58'	77°	10°13'	+58'	77°	13
14	9°46'	+56'	76°	10°01'	+57'	76°	10°15'	+57'	76°	10°29'	+57'	76°	10°44'	+58'	77°	10°57'	+58'	77°	11°11'	+58'	77°	14
15	10°43'	+56'	75°	10°58'	+57'	76°	11°12'	+57'	76°	11°27'	+57'	76°	11°41'	+58'	76°	11°55'	+58'	76°	12°09'	+58'	77°	15
16	11°39'	+56'	75°	11°54'	+57'	75°	12°09'	+57'	76°	12°24'	+57'	76°	12°39'	+58'	76°	12°53'	+58'	76°	13°07'	+58'	76°	16
17	12°35'	+56'	75°	12°51'	+57'	75°	13°06'	+57'	75°	13°22'	+57'	75°	13°36'	+58'	76°	13°51'	+58'	76°	14°06'	+58'	76°	17
18	13°32'	+56'	74°	13°48'	+57'	75°	14°03'	+57'	75°	14°19'	+57'	75°	14°34'	+58'	75°	14°49'	+58'	76°	15°04'	+58'	76°	18
19	14°28'	+56'	74°	14°44'	+57'	74°	15°00'	+57'	75°	15°16'	+57'	75°	15°32'	+58'	75°	15°47'	+58'	75°	16°02'	+58'	76°	19
20	15°24'	+56'	74°	15°41'	+57'	74°	15°57'	+57'	74°	16°13'	+57'	75°	16°29'	+58'	75°	16°45'	+58'	75°	17°00'	+58'	75°	20
21	16°20'	+56'	73°	16°37'	+57'	74°	16°54'	+57'	74°	17°11'	+57'	74°	17°27'	+58'	75°	17°43'	+58'	75°	17°58'	+58'	75°	21
22	17°16'	+56'	73°	17°34'	+56'	73°	17°51'	+57'	74°	18°08'	+57'	74°	18°24'	+57'	74°	18°40'	+58'	75°	18°56'	+58'	75°	22
23	18°13'	+56'	73°	18°30'	+56'	73°	18°48'	+57'	73°	19°05'	+57'	74°	19°22'	+57'	74°	19°38'	+58'	74°	19°54'	+58'	75°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	3°45'	-57'	100°	3°34'	-57'	100°	3°23'	-57'	100°	3°12'	-57'	101°	3°01'	-58'	101°	2°50'	-58'	101°	2°39'	-58'	101°	0
1	2°48'	-57'	101°	2°37'	-57'	101°	2°26'	-57'	101°	2°14'	-57'	101°	2°03'	-58'	101°	1°52'	-58'	101°	1°40'	-58'	101°	1
2	1°51'	-57'	101°	1°40'	-57'	101°	1°28'	-57'	101°	1°17'	-57'	101°	1°05'	-58'	101°	0°54'	-58'	101°	0°42'	-58'	101°	2
3	0°55'	-57'	101°	0°43'	-57'	101°	0°31'	-57'	101°	0°19'	-57'	101°	0°08'	-58'	101°	0°04'	+58'	79°	0°16'	+58'	79°	3
4	0°02'	+57'	78°	0°14'	+57'	78°	0°26'	+57'	78°	0°38'	+57'	78°	0°50'	+58'	78°	1°02'	+58'	78°	1°14'	+58'	78°	4
5	0°58'	+57'	78°	1°11'	+57'	78°	1°23'	+57'	78°	1°35'	+57'	78°	1°48'	+58'	78°	2°00'	+58'	78°	2°13'	+58'	78°	5
6	1°55'	+57'	78°	2°07'	+57'	78°	2°20'	+57'	78°	2°33'	+57'	78°	2°46'	+58'	78°	2°58'	+58'	78°	3°11'	+58'	78°	6
7	2°51'	+57'	77°	3°04'	+57'	77°	3°17'	+57'	77°	3°30'	+57'	77°	3°43'	+58'	78°	3°56'	+58'	78°	4°09'	+58'	78°	7
8	3°48'	+56'	77°	4°01'	+57'	77°	4°15'	+57'	77°	4°28'	+57'	77°	4°41'	+58'	77°	4°54'	+58'	77°	5°07'	+58'	77°	8
9	4°44'	+56'	77°	4°58'	+57'	77°	5°12'	+57'	77°	5°25'	+57'	77°	5°39'	+58'	77°	5°52'	+58'	77°	6°06'	+58'	77°	9
10	5°41'	+56'	76°	5°55'	+57'	76°	6°09'	+57'	76°	6°23'	+57'	77°	6°37'	+58'	77°	6°50'	+58'	77°	7°04'	+58'	77°	10
11	6°37'	+56'	76°	6°52'	+57'	76°	7°06'	+57'	76°	7°20'	+57'	76°	7°34'	+58'	76°	7°48'	+58'	77°	8°02'	+58'	77°	11
12	7°34'	+56'	76°	7°48'	+57'	76°	8°03'	+57'	76°	8°18'	+57'	76°	8°32'	+58'	76°	8°46'	+58'	76°	9°01'	+58'	76°	12
13	8°30'	+56'	75°	8°45'	+57'	75°	9°00'	+57'	76°	9°15'	+57'	76°	9°30'	+58'	76°	9°44'	+58'	76°	9°59'	+58'	76°	13
14	9°26'	+56'	75°	9°42'	+57'	75°	9°57'	+57'	75°	10°12'	+57'	75°	10°27'	+58'	76°	10°42'	+58'	76°	10°57'	+58'	76°	14
15	10°23'	+56'	75°	10°39'	+57'	75°	10°54'	+57'	75°	11°10'	+57'	75°	11°25'	+58'	75°	11°40'	+58'	76°	11°55'	+58'	76°	15
16	11°19'	+56'	74°	11°35'	+57'	74°	11°51'	+57'	75°	12°07'	+57'	75°	12°23'	+58'	75°	12°38'	+58'	75°	12°53'	+58'	75°	16
17	12°16'	+56'	74°	12°32'	+57'	74°	12°48'	+57'	74°	13°05'	+57'	75°	13°20'	+58'	75°	13°36'	+58'	75°	13°52'	+58'	75°	17
18	13°12'	+56'	74°	13°29'	+57'	74°	13°45'	+57'	74°	14°02'	+57'	74°	14°18'	+58'	74°	14°34'	+58'	75°	14°50'	+58'	75°	18
19	14°08'	+56'	73°	14°25'	+57'	73°	14°42'	+57'	74°	14°59'	+57'	74°	15°16'	+58'	74°	15°32'	+58'	74°	15°48'	+58'	75°	19
20	15°04'	+56'	73°	15°22'	+57'	73°	15°39'	+57'	73°	15°56'	+57'	74°	16°13'	+58'	74°	16°30'	+58'	74°	16°46'	+58'	74°	20
21	16°01'	+56'	72°	16°19'	+57'	73°	16°36'	+57'	73°	16°54'	+57'	73°	17°11'	+58'	74°	17°28'	+58'	74°	17°44'	+58'	74°	21
22	16°57'	+56'	72°	17°15'	+57'	72°	17°33'	+57'	73°	17°51'	+57'	73°	18°08'	+58'	73°	18°25'	+58'	74°	18°42'	+58'	74°	22
23	17°53'	+56'	72°	18°12'	+56'	72°	18°30'	+57'	72°	18°48'	+57'	73°	19°06'	+57'	73°	19°23'	+58'	73°	19°40'	+58'	74°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

101° 259° LHA — Latitude SAME as DECLINATION — 101° 259° LHA

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

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

78° 282° LHA — Latitude CONTRARY to Declination — 78° 282° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	4°05'	-57'	101°	3°53'	-57'	101°	3°41'	-57'	101°	3°29'	-57'	101°	3°17'	-58'	102°	3°05'	-58'	102°	2°53'	-58'	102°	0
1	3°08'	-57'	102°	2°56'	-57'	102°	2°44'	-57'	102°	2°32'	-57'	102°	2°19'	-58'	102°	2°07'	-58'	102°	1°55'	-58'	102°	1
2	2°12'	-57'	102°	1°59'	-57'	102°	1°47'	-57'	102°	1°34'	-57'	102°	1°22'	-58'	102°	1°09'	-58'	102°	0°56'	-58'	102°	2
3	1°15'	-57'	102°	1°02'	-57'	102°	0°49'	-57'	102°	0°37'	-57'	102°	0°24'	-58'	102°	0°11'	-58'	102°	0°02'	+58'	78°	3
4	0°19'	-57'	103°	0°05'	-57'	103°	0°08'	+57'	77°	0°21'	+57'	77°	0°34'	+58'	77°	0°47'	+58'	77°	1°00'	+58'	77°	4
5	0°38'	+57'	77°	0°51'	+57'	77°	1°05'	+57'	77°	1°18'	+57'	77°	1°32'	+58'	77°	1°45'	+58'	77°	1°58'	+58'	77°	5
6	1°35'	+57'	77°	1°48'	+57'	77°	2°02'	+57'	77°	2°16'	+57'	77°	2°30'	+58'	77°	2°43'	+58'	77°	2°57'	+58'	77°	6
7	2°31'	+57'	76°	2°45'	+57'	76°	2°59'	+57'	76°	3°13'	+57'	77°	3°27'	+58'	77°	3°41'	+58'	77°	3°55'	+58'	77°	7
8	3°28'	+57'	76°	3°42'	+57'	76°	3°56'	+57'	76°	4°11'	+57'	76°	4°25'	+58'	76°	4°39'	+58'	76°	4°53'	+58'	76°	8
9	4°24'	+57'	76°	4°39'	+57'	76°	4°54'	+57'	76°	5°08'	+57'	76°	5°23'	+58'	76°	5°37'	+58'	76°	5°52'	+58'	76°	9
10	5°21'	+57'	75°	5°36'	+57'	75°	5°51'	+57'	76°	6°06'	+57'	76°	6°21'	+58'	76°	6°35'	+58'	76°	6°50'	+58'	76°	10
11	6°17'	+56'	75°	6°33'	+57'	75°	6°48'	+57'	75°	7°03'	+57'	75°	7°18'	+58'	75°	7°33'	+58'	76°	7°48'	+58'	76°	11
12	7°14'	+56'	75°	7°29'	+57'	75°	7°45'	+57'	75°	8°01'	+57'	75°	8°16'	+58'	75°	8°31'	+58'	75°	8°46'	+58'	75°	12
13	8°10'	+56'	74°	8°26'	+57'	74°	8°42'	+57'	75°	8°58'	+57'	75°	9°14'	+58'	75°	9°29'	+58'	75°	9°45'	+58'	75°	13
14	9°07'	+56'	74°	9°23'	+57'	74°	9°39'	+57'	74°	9°56'	+57'	74°	10°12'	+58'	75°	10°27'	+58'	75°	10°43'	+58'	75°	14
15	10°03'	+56'	74°	10°20'	+57'	74°	10°36'	+57'	74°	10°53'	+57'	74°	11°09'	+58'	74°	11°25'	+58'	75°	11°41'	+58'	75°	15
16	10°59'	+56'	73°	11°17'	+57'	73°	11°34'	+57'	74°	11°50'	+57'	74°	12°07'	+58'	74°	12°23'	+58'	74°	12°39'	+58'	75°	16
17	11°56'	+56'	73°	12°13'	+57'	73°	12°31'	+57'	73°	12°48'	+57'	74°	13°05'	+58'	74°	13°21'	+58'	74°	13°38'	+58'	74°	17
18	12°52'	+56'	73°	13°10'	+57'	73°	13°28'	+57'	73°	13°45'	+57'	73°	14°02'	+58'	74°	14°19'	+58'	74°	14°36'	+58'	74°	18
19	13°49'	+56'	72°	14°07'	+57'	72°	14°25'	+57'	73°	14°42'	+57'	73°	15°00'	+58'	73°	15°17'	+58'	73°	15°34'	+58'	74°	19
20	14°45'	+56'	72°	15°03'	+57'	72°	15°22'	+57'	72°	15°40'	+57'	73°	15°57'	+58'	73°	16°15'	+58'	73°	16°32'	+58'	73°	20
21	15°41'	+56'	72°	16°00'	+57'	72°	16°19'	+57'	72°	16°37'	+57'	72°	16°55'	+58'	73°	17°13'	+58'	73°	17°30'	+58'	73°	21
22	16°37'	+56'	71°	16°57'	+57'	71°	17°16'	+57'	72°	17°34'	+57'	72°	17°53'	+58'	72°	18°11'	+58'	73°	18°28'	+58'	73°	22
23	17°34'	+56'	71°	17°53'	+57'	71°	18°12'	+57'	71°	18°31'	+57'	72°	18°50'	+57'	72°	19°08'	+58'	72°	19°26'	+58'	73°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	4°25'	-57'	102°	4°12'	-57'	102°	3°59'	-57'	102°	3°46'	-58'	102°	3°33'	-58'	103°	3°20'	-58'	103°	3°07'	-58'	103°	0
1	3°28'	-57'	103°	3°15'	-57'	103°	3°02'	-57'	103°	2°49'	-58'	103°	2°36'	-58'	103°	2°22'	-58'	103°	2°09'	-58'	103°	1
2	2°32'	-57'	103°	2°18'	-57'	103°	2°05'	-57'	103°	1°51'	-58'	103°	1°38'	-58'	103°	1°24'	-58'	103°	1°11'	-58'	103°	2
3	1°35'	-57'	103°	1°21'	-57'	103°	1°08'	-57'	103°	0°54'	-58'	103°	0°40'	-58'	103°	0°26'	-58'	103°	0°12'	-58'	103°	3
4	0°39'	-57'	104°	0°24'	-57'	104°	0°10'	-57'	104°	0°04'	+58'	76°	0°18'	+58'	76°	0°32'	+58'	76°	0°46'	+58'	76°	4
5	0°18'	+57'	76°	0°32'	+57'	76°	0°47'	+57'	76°	1°01'	+58'	76°	1°16'	+58'	76°	1°30'	+58'	76°	1°44'	+58'	76°	5
6	1°15'	+57'	76°	1°29'	+57'	76°	1°44'	+57'	76°	1°59'	+58'	76°	2°13'	+58'	76°	2°28'	+58'	76°	2°43'	+58'	76°	6
7	2°11'	+57'	75°	2°26'	+57'	75°	2°41'	+57'	76°	2°56'	+58'	76°	3°11'	+58'	76°	3°26'	+58'	76°	3°41'	+58'	76°	7
8	3°08'	+57'	75°	3°23'	+57'	75°	3°39'	+57'	75°	3°54'	+57'	75°	4°09'	+58'	75°	4°24'	+58'	75°	4°39'	+58'	75°	8
9	4°04'	+57'	75°	4°20'	+57'	75°	4°36'	+57'	75°	4°51'	+57'	75°	5°07'	+58'	75°	5°22'	+58'	75°	5°38'	+58'	75°	9
10	5°01'	+57'	74°	5°17'	+57'	75°	5°33'	+57'	75°	5°49'	+57'	75°	6°05'	+58'	75°	6°20'	+58'	75°	6°36'	+58'	75°	10
11	5°57'	+57'	74°	6°14'	+57'	74°	6°30'	+57'	74°	6°46'	+57'	74°	7°02'	+58'	75°	7°18'	+58'	75°	7°34'	+58'	75°	11
12	6°54'	+57'	74°	7°11'	+57'	74°	7°27'	+57'	74°	7°44'	+57'	74°	8°00'	+58'	74°	8°16'	+58'	74°	8°32'	+58'	75°	12
13	7°50'	+56'	73°	8°08'	+57'	74°	8°24'	+57'	74°	8°41'	+57'	74°	8°58'	+58'	74°	9°14'	+58'	74°	9°31'	+58'	74°	13
14	8°47'	+56'	73°	9°04'	+57'	73°	9°22'	+57'	73°	9°39'	+57'	74°	9°56'	+58'	74°	10°12'	+58'	74°	10°29'	+58'	74°	14
15	9°43'	+56'	73°	10°01'	+57'	73°	10°19'	+57'	73°	10°36'	+57'	73°	10°53'	+58'	73°	11°10'	+58'	74°	11°27'	+58'	74°	15
16	10°40'	+56'	72°	10°58'	+57'	73°	11°16'	+57'	73°	11°34'	+57'	73°	11°51'	+58'	73°	12°08'	+58'	73°	12°25'	+58'	74°	16
17	11°36'	+56'	72°	11°55'	+57'	72°	12°13'	+57'	72°	12°31'	+57'	73°	12°49'	+58'	73°	13°06'	+58'	73°	13°24'	+58'	73°	17
18	12°33'	+56'	72°	12°51'	+57'	72°	13°10'	+57'	72°	13°28'	+57'	72°	13°46'	+58'	73°	14°04'	+58'	73°	14°22'	+58'	73°	18
19	13°29'	+56'	71°	13°48'	+57'	72°	14°07'	+57'	72°	14°26'	+57'	72°	14°44'	+58'	72°	15°02'	+58'	73°	15°20'	+58'	73°	19
20	14°25'	+56'	71°	14°45'	+57'	71°	15°04'	+57'	71°	15°23'	+57'	72°	15°42'	+58'	72°	16°00'	+58'	72°	16°18'	+58'	73°	20
21	15°22'	+56'	71°	15°42'	+57'	71°	16°01'	+57'	71°	16°20'	+57'	71°	16°39'	+58'	72°	16°58'	+58'	72°	17°16'	+58'	72°	21
22	16°18'	+56'	70°	16°38'	+57'	71°	16°58'	+57'	71°	17°18'	+57'	71°	17°37'	+58'	71°	17°56'	+58'	72°	18°14'	+58'	72°	22
23	17°14'	+56'	70°	17°35'	+57'	70°	17°55'	+57'	70°	18°15'	+57'	71°	18°34'	+58'	71°	18°54'	+58'	71°	19°13'	+58'	72°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

103° 257° LHA — Latitude SAME as DECLINATION — 103° 257° LHA

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

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

76° 284° LHA — Latitude CONTRARY to Declination — 76° 284° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	4°45'	-57'	103°	4°31'	-57'	103°	4°17'	-57'	103°	4°03'	-58'	103°	3°49'	-58'	103°	3°35'	-58'	104°	3°21'	-58'	104°	0
1	3°48'	-57'	104°	3°34'	-57'	104°	3°20'	-57'	104°	3°06'	-58'	104°	2°52'	-58'	104°	2°37'	-58'	104°	2°23'	-58'	104°	1
2	2°52'	-57'	104°	2°37'	-57'	104°	2°23'	-57'	104°	2°08'	-58'	104°	1°54'	-58'	104°	1°39'	-58'	104°	1°25'	-58'	104°	2
3	1°55'	-57'	104°	1°40'	-57'	104°	1°26'	-57'	104°	1°11'	-58'	104°	0°56'	-58'	104°	0°41'	-58'	104°	0°26'	-58'	104°	3
4	0°58'	-57'	105°	0°43'	-57'	105°	0°28'	-57'	105°	0°13'	-58'	105°	0°02'	+58'	75°	0°17'	+58'	75°	0°32'	+58'	75°	4
5	0°02'	-57'	105°	0°14'	+57'	75°	0°29'	+57'	75°	0°44'	+58'	75°	1°00'	+58'	75°	1°15'	+58'	75°	1°30'	+58'	75°	5
6	0°55'	+57'	75°	1°10'	+57'	75°	1°26'	+57'	75°	1°42'	+58'	75°	1°57'	+58'	75°	2°13'	+58'	75°	2°29'	+58'	75°	6
7	1°51'	+57'	74°	2°07'	+57'	75°	2°23'	+57'	75°	2°39'	+58'	75°	2°55'	+58'	75°	3°11'	+58'	75°	3°27'	+58'	75°	7
8	2°48'	+57'	74°	3°04'	+57'	74°	3°21'	+57'	74°	3°37'	+58'	74°	3°53'	+58'	74°	4°09'	+58'	74°	4°25'	+58'	75°	8
9	3°45'	+57'	74°	4°01'	+57'	74°	4°18'	+57'	74°	4°34'	+58'	74°	4°51'	+58'	74°	5°07'	+58'	74°	5°24'	+58'	74°	9
10	4°41'	+57'	73°	4°58'	+57'	74°	5°15'	+57'	74°	5°32'	+58'	74°	5°49'	+58'	74°	6°05'	+58'	74°	6°22'	+58'	74°	10
11	5°38'	+57'	73°	5°55'	+57'	73°	6°12'	+57'	73°	6°29'	+57'	73°	6°46'	+58'	74°	7°03'	+58'	74°	7°20'	+58'	74°	11
12	6°34'	+57'	73°	6°52'	+57'	73°	7°09'	+57'	73°	7°27'	+57'	73°	7°44'	+58'	73°	8°01'	+58'	73°	8°18'	+58'	74°	12
13	7°31'	+57'	72°	7°49'	+57'	73°	8°07'	+57'	73°	8°24'	+57'	73°	8°42'	+58'	73°	8°59'	+58'	73°	9°17'	+58'	73°	13
14	8°27'	+57'	72°	8°46'	+57'	72°	9°04'	+57'	72°	9°22'	+57'	73°	9°40'	+58'	73°	9°57'	+58'	73°	10°15'	+58'	73°	14
15	9°24'	+56'	72°	9°43'	+57'	72°	10°01'	+57'	72°	10°19'	+57'	72°	10°38'	+58'	72°	10°55'	+58'	73°	11°13'	+58'	73°	15
16	10°20'	+56'	71°	10°39'	+57'	72°	10°58'	+57'	72°	11°17'	+57'	72°	11°35'	+58'	72°	11°53'	+58'	72°	12°12'	+58'	73°	16
17	11°17'	+56'	71°	11°36'	+57'	71°	11°55'	+57'	72°	12°14'	+57'	72°	12°33'	+58'	72°	12°51'	+58'	72°	13°10'	+58'	72°	17
18	12°13'	+56'	71°	12°33'	+57'	71°	12°52'	+57'	71°	13°12'	+57'	71°	13°31'	+58'	72°	13°49'	+58'	72°	14°08'	+58'	72°	18
19	13°10'	+56'	70°	13°30'	+57'	71°	13°49'	+57'	71°	14°09'	+57'	71°	14°28'	+58'	71°	14°47'	+58'	72°	15°06'	+58'	72°	19
20	14°06'	+56'	70°	14°26'	+57'	70°	14°47'	+57'	71°	15°06'	+57'	71°	15°26'	+58'	71°	15°45'	+58'	71°	16°04'	+58'	72°	20
21	15°02'	+56'	70°	15°23'	+57'	70°	15°44'	+57'	70°	16°04'	+57'	71°	16°24'	+58'	71°	16°43'	+58'	71°	17°03'	+58'	71°	21
22	15°59'	+56'	69°	16°20'	+57'	70°	16°41'	+57'	70°	17°01'	+57'	70°	17°21'	+58'	70°	17°41'	+58'	71°	18°01'	+58'	71°	22
23	16°55'	+56'	69°	17°16'	+57'	69°	17°38'	+57'	70°	17°58'	+57'	70°	18°19'	+58'	70°	18°39'	+58'	71°	18°59'	+58'	71°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

104° 256° LHA — Latitude SAME as DECLINATION — 104° 256° LHA

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

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

75° 285° LHA — Latitude CONTRARY to Declination — 75° 285° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	5°05'	-57'	104°	4°50'	-57'	104°	4°35'	-57'	104°	4°20'	-58'	104°	4°05'	-58'	104°	3°50'	-58'	105°	3°35'	-58'	105°	0
1	4°08'	-57'	104°	3°53'	-57'	105°	3°38'	-57'	105°	3°23'	-58'	105°	3°08'	-58'	105°	2°52'	-58'	105°	2°37'	-58'	105°	1
2	3°11'	-57'	105°	2°56'	-57'	105°	2°41'	-57'	105°	2°25'	-58'	105°	2°10'	-58'	105°	1°54'	-58'	105°	1°39'	-58'	105°	2
3	2°15'	-57'	105°	1°59'	-57'	105°	1°43'	-57'	105°	1°28'	-58'	105°	1°12'	-58'	105°	0°56'	-58'	105°	0°40'	-58'	105°	3
4	1°18'	-57'	105°	1°02'	-57'	105°	0°46'	-57'	105°	0°30'	-58'	106°	0°14'	-58'	106°	0°02'	+58'	74°	0°18'	+58'	74°	4
5	0°22'	-57'	106°	0°05'	-57'	106°	0°11'	+57'	74°	0°27'	+58'	74°	0°44'	+58'	74°	1°00'	+58'	74°	1°16'	+58'	74°	5
6	0°35'	+57'	74°	0°52'	+57'	74°	1°08'	+57'	74°	1°25'	+58'	74°	1°42'	+58'	74°	1°58'	+58'	74°	2°15'	+58'	74°	6
7	1°32'	+57'	74°	1°49'	+57'	74°	2°06'	+57'	74°	2°22'	+58'	74°	2°39'	+58'	74°	2°56'	+58'	74°	3°13'	+58'	74°	7
8	2°28'	+57'	73°	2°46'	+57'	73°	3°03'	+57'	73°	3°20'	+58'	73°	3°37'	+58'	73°	3°54'	+58'	73°	4°11'	+58'	74°	8
9	3°25'	+57'	73°	3°43'	+57'	73°	4°00'	+57'	73°	4°18'	+58'	73°	4°35'	+58'	73°	4°52'	+58'	73°	5°10'	+58'	73°	9
10	4°22'	+57'	73°	4°39'	+57'	73°	4°57'	+57'	73°	5°15'	+58'	73°	5°33'	+58'	73°	5°50'	+58'	73°	6°08'	+58'	73°	10
11	5°18'	+57'	72°	5°36'	+57'	72°	5°55'	+57'	72°	6°13'	+58'	73°	6°31'	+58'	73°	6°49'	+58'	73°	7°06'	+58'	73°	11
12	6°15'	+57'	72°	6°33'	+57'	72°	6°52'	+57'	72°	7°10'	+58'	72°	7°28'	+58'	72°	7°47'	+58'	72°	8°05'	+58'	73°	12
13	7°11'	+57'	72°	7°30'	+57'	72°	7°49'	+57'	72°	8°08'	+58'	72°	8°26'	+58'	72°	8°45'	+58'	72°	9°03'	+58'	72°	13
14	8°08'	+57'	71°	8°27'	+57'	71°	8°46'	+57'	71°	9°05'	+57'	72°	9°24'	+58'	72°	9°43'	+58'	72°	10°01'	+58'	72°	14
15	9°04'	+57'	71°	9°24'	+57'	71°	9°43'	+57'	71°	10°03'	+57'	71°	10°22'	+58'	72°	10°41'	+58'	72°	10°59'	+58'	72°	15
16	10°01'	+57'	71°	10°21'	+57'	71°	10°41'	+57'	71°	11°00'	+57'	71°	11°20'	+58'	71°	11°39'	+58'	71°	11°58'	+58'	72°	16
17	10°57'	+56'	70°	11°18'	+57'	70°	11°38'	+57'	71°	11°58'	+57'	71°	12°17'	+58'	71°	12°37'	+58'	71°	12°56'	+58'	71°	17
18	11°54'	+56'	70°	12°15'	+57'	70°	12°35'	+57'	70°	12°55'	+57'	70°	13°15'	+58'	71°	13°35'	+58'	71°	13°54'	+58'	71°	18
19	12°50'	+56'	70°	13°11'	+57'	70°	13°32'	+57'	70°	13°52'	+57'	70°	14°13'	+58'	70°	14°33'	+58'	71°	14°52'	+58'	71°	19
20	13°47'	+56'	69°	14°08'	+57'	69°	14°29'	+57'	70°	14°50'	+57'	70°	15°10'	+58'	70°	15°31'	+58'	70°	15°51'	+58'	71°	20
21	14°43'	+56'	69°	15°05'	+57'	69°	15°26'	+57'	69°	15°47'	+57'	70°	16°08'	+58'	70°	16°29'	+58'	70°	16°49'	+58'	70°	21
22	15°40'	+56'	68°	16°02'	+57'	69°	16°23'	+57'	69°	16°45'	+57'	69°	17°06'	+58'	70°	17°26'	+58'	70°	17°47'	+58'	70°	22
23	16°36'	+56'	68°	16°58'	+57'	68°	17°20'	+57'	69°	17°42'	+57'	69°	18°03'	+58'	69°	18°24'	+58'	70°	18°45'	+58'	70°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	5°25'	-57'	105°	5°09'	-57'	105°	4°53'	-57'	105°	4°37'	-58'	105°	4°21'	-58'	105°	4°05'	-58'	105°	3°49'	-58'	106°	0
1	4°28'	-57'	105°	4°12'	-57'	105°	3°56'	-57'	106°	3°40'	-58'	106°	3°24'	-58'	106°	3°07'	-58'	106°	2°51'	-58'	106°	1
2	3°31'	-57'	106°	3°15'	-57'	106°	2°59'	-57'	106°	2°42'	-58'	106°	2°26'	-58'	106°	2°09'	-58'	106°	1°53'	-58'	106°	2
3	2°35'	-57'	106°	2°18'	-57'	106°	2°01'	-57'	106°	1°45'	-58'	106°	1°28'	-58'	106°	1°11'	-58'	106°	0°54'	-58'	106°	3
4	1°38'	-57'	106°	1°21'	-57'	106°	1°04'	-57'	106°	0°47'	-58'	106°	0°30'	-58'	106°	0°13'	-58'	106°	0°04'	+58'	74°	4
5	0°41'	-57'	107°	0°24'	-57'	107°	0°07'	-57'	107°	0°11'	+58'	73°	0°28'	+58'	73°	0°45'	+58'	73°	1°02'	+58'	73°	5
6	0°15'	+57'	73°	0°33'	+57'	73°	0°51'	+57'	73°	1°08'	+58'	73°	1°26'	+58'	73°	1°43'	+58'	73°	2°01'	+58'	73°	6
7	1°12'	+57'	73°	1°30'	+57'	73°	1°48'	+57'	73°	2°06'	+58'	73°	2°24'	+58'	73°	2°41'	+58'	73°	2°59'	+58'	73°	7
8	2°09'	+57'	72°	2°27'	+57'	72°	2°45'	+57'	72°	3°03'	+58'	72°	3°21'	+58'	72°	3°39'	+58'	73°	3°57'	+58'	73°	8
9	3°05'	+57'	72°	3°24'	+57'	72°	3°42'	+57'	72°	4°01'	+58'	72°	4°19'	+58'	72°	4°38'	+58'	72°	4°56'	+58'	72°	9
10	4°02'	+57'	72°	4°21'	+57'	72°	4°40'	+57'	72°	4°58'	+58'	72°	5°17'	+58'	72°	5°36'	+58'	72°	5°54'	+58'	72°	10
11	4°59'	+57'	71°	5°18'	+57'	71°	5°37'	+57'	71°	5°56'	+58'	72°	6°15'	+58'	72°	6°34'	+58'	72°	6°52'	+58'	72°	11
12	5°55'	+57'	71°	6°15'	+57'	71°	6°34'	+57'	71°	6°54'	+58'	71°	7°13'	+58'	71°	7°32'	+58'	72°	7°51'	+58'	72°	12
13	6°52'	+57'	71°	7°12'	+57'	71°	7°31'	+57'	71°	7°51'	+58'	71°	8°11'	+58'	71°	8°30'	+58'	71°	8°49'	+58'	71°	13
14	7°48'	+57'	70°	8°09'	+57'	70°	8°29'	+57'	71°	8°49'	+58'	71°	9°08'	+58'	71°	9°28'	+58'	71°	9°47'	+58'	71°	14
15	8°45'	+57'	70°	9°06'	+57'	70°	9°26'	+57'	70°	9°46'	+58'	70°	10°06'	+58'	71°	10°26'	+58'	71°	10°46'	+58'	71°	15
16	9°42'	+57'	70°	10°02'	+57'	70°	10°23'	+57'	70°	10°44'	+57'	70°	11°04'	+58'	70°	11°24'	+58'	70°	11°44'	+58'	71°	16
17	10°38'	+57'	69°	10°59'	+57'	69°	11°20'	+57'	70°	11°41'	+57'	70°	12°02'	+58'	70°	12°22'	+58'	70°	12°42'	+58'	70°	17
18	11°35'	+57'	69°	11°56'	+57'	69°	12°17'	+57'	69°	12°39'	+57'	70°	12°59'	+58'	70°	13°20'	+58'	70°	13°41'	+58'	70°	18
19	12°31'	+56'	69°	12°53'	+57'	69°	13°15'	+57'	69°	13°36'	+57'	69°	13°57'	+58'	69°	14°18'	+58'	70°	14°39'	+58'	70°	19
20	13°28'	+56'	68°	13°50'	+57'	68°	14°12'	+57'	69°	14°33'	+57'	69°	14°55'	+58'	69°	15°16'	+58'	69°	15°37'	+58'	70°	20
21	14°24'	+56'	68°	14°47'	+57'	68°	15°09'	+57'	68°	15°31'	+57'	69°	15°53'	+58'	69°	16°14'	+58'	69°	16°35'	+58'	69°	21
22	15°21'	+56'	68°	15°43'	+57'	68°	16°06'	+57'	68°	16°28'	+57'	68°	16°50'	+58'	69°	17°12'	+58'	69°	17°33'	+58'	69°	22
23	16°17'	+56'	67°	16°40'	+57'	67°	17°03'	+57'	68°	17°26'	+57'	68°	17°48'	+58'	68°	18°10'	+58'	69°	18°32'	+58'	69°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	5°44'	-57'	106°	5°28'	-57'	106°	5°11'	-57'	106°	4°54'	-58'	106°	4°37'	-58'	106°	4°20'	-58'	106°	4°03'	-58'	107°	0
1	4°48'	-57'	106°	4°31'	-57'	106°	4°14'	-57'	107°	3°57'	-58'	107°	3°39'	-58'	107°	3°22'	-58'	107°	3°05'	-58'	107°	1
2	3°51'	-57'	107°	3°34'	-57'	107°	3°16'	-57'	107°	2°59'	-58'	107°	2°42'	-58'	107°	2°24'	-58'	107°	2°07'	-58'	107°	2
3	2°54'	-57'	107°	2°37'	-57'	107°	2°19'	-57'	107°	2°01'	-58'	107°	1°44'	-58'	107°	1°26'	-58'	107°	1°08'	-58'	107°	3
4	1°58'	-57'	107°	1°40'	-57'	107°	1°22'	-57'	107°	1°04'	-58'	107°	0°46'	-58'	107°	0°28'	-58'	107°	0°10'	-58'	107°	4
5	1°01'	-57'	108°	0°43'	-57'	108°	0°24'	-57'	108°	0°06'	-58'	108°	0°12'	+58'	72°	0°30'	+58'	72°	0°48'	+58'	72°	5
6	0°04'	-57'	108°	0°14'	+57'	72°	0°33'	+57'	72°	0°51'	+58'	72°	1°10'	+58'	72°	1°28'	+58'	72°	1°47'	+58'	72°	6
7	0°52'	+57'	72°	1°11'	+57'	72°	1°30'	+57'	72°	1°49'	+58'	72°	2°08'	+58'	72°	2°27'	+58'	72°	2°45'	+58'	72°	7
8	1°49'	+57'	71°	2°08'	+57'	71°	2°28'	+57'	71°	2°47'	+58'	71°	3°06'	+58'	72°	3°25'	+58'	72°	3°44'	+58'	72°	8
9	2°46'	+57'	71°	3°05'	+57'	71°	3°25'	+57'	71°	3°44'	+58'	71°	4°04'	+58'	71°	4°23'	+58'	71°	4°42'	+58'	71°	9
10	3°43'	+57'	71°	4°02'	+57'	71°	4°22'	+57'	71°	4°42'	+58'	71°	5°01'	+58'	71°	5°21'	+58'	71°	5°40'	+58'	71°	10
11	4°39'	+57'	70°	4°59'	+57'	70°	5°19'	+57'	71°	5°39'	+58'	71°	5°59'	+58'	71°	6°19'	+58'	71°	6°39'	+58'	71°	11
12	5°36'	+57'	70°	5°56'	+57'	70°	6°17'	+57'	70°	6°37'	+58'	70°	6°57'	+58'	70°	7°17'	+58'	71°	7°37'	+58'	71°	12
13	6°33'	+57'	70°	6°53'	+57'	70°	7°14'	+57'	70°	7°35'	+58'	70°	7°55'	+58'	70°	8°15'	+58'	70°	8°35'	+58'	70°	13
14	7°29'	+57'	69°	7°50'	+57'	69°	8°11'	+57'	70°	8°32'	+58'	70°	8°53'	+58'	70°	9°13'	+58'	70°	9°34'	+58'	70°	14
15	8°26'	+57'	69°	8°47'	+57'	69°	9°09'	+57'	69°	9°30'	+58'	69°	9°51'	+58'	70°	10°11'	+58'	70°	10°32'	+58'	70°	15
16	9°22'	+57'	69°	9°44'	+57'	69°	10°06'	+57'	69°	10°27'	+58'	69°	10°48'	+58'	69°	11°09'	+58'	70°	11°30'	+58'	70°	16
17	10°19'	+57'	68°	10°41'	+57'	69°	11°03'	+57'	69°	11°25'	+57'	69°	11°46'	+58'	69°	12°07'	+58'	69°	12°29'	+58'	69°	17
18	11°16'	+57'	68°	11°38'	+57'	68°	12°00'	+57'	68°	12°22'	+57'	69°	12°44'	+58'	69°	13°06'	+58'	69°	13°27'	+58'	69°	18
19	12°12'	+57'	68°	12°35'	+57'	68°	12°57'	+57'	68°	13°20'	+57'	68°	13°42'	+58'	69°	14°04'	+58'	69°	14°25'	+58'	69°	19
20	13°09'	+57'	67°	13°32'	+57'	68°	13°55'	+57'	68°	14°17'	+57'	68°	14°39'	+58'	68°	15°02'	+58'	69°	15°23'	+58'	69°	20
21	14°05'	+56'	67°	14°29'	+57'	67°	14°52'	+57'	67°	15°15'	+57'	68°	15°37'	+58'	68°	16°00'	+58'	68°	16°22'	+58'	69°	21
22	15°02'	+56'	67°	15°25'	+57'	67°	15°49'	+57'	67°	16°12'	+57'	67°	16°35'	+58'	68°	16°58'	+58'	68°	17°20'	+58'	68°	22
23	15°58'	+56'	66°	16°22'	+57'	67°	16°46'	+57'	67°	17°09'	+57'	67°	17°33'	+58'	67°	17°55'	+58'	68°	18°18'	+58'	68°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	6°04'	-57'	107°	5°46'	-57'	107°	5°29'	-57'	107°	5°11'	-58'	107°	4°53'	-58'	107°	4°35'	-58'	107°	4°17'	-58'	107°	0
1	5°07'	-57'	107°	4°49'	-57'	107°	4°31'	-57'	107°	4°13'	-58'	108°	3°55'	-58'	108°	3°37'	-58'	108°	3°19'	-58'	108°	1
2	4°11'	-57'	108°	3°52'	-57'	108°	3°34'	-57'	108°	3°16'	-58'	108°	2°57'	-58'	108°	2°39'	-58'	108°	2°20'	-58'	108°	2
3	3°14'	-57'	108°	2°55'	-57'	108°	2°37'	-57'	108°	2°18'	-58'	108°	1°59'	-58'	108°	1°41'	-58'	108°	1°22'	-58'	108°	3
4	2°17'	-57'	108°	1°58'	-57'	108°	1°39'	-57'	108°	1°21'	-58'	108°	1°02'	-58'	108°	0°43'	-58'	108°	0°24'	-58'	108°	4
5	1°20'	-57'	109°	1°01'	-57'	109°	0°42'	-57'	109°	0°23'	-58'	109°	0°04'	-58'	109°	0°16'	+58'	71°	0°35'	+58'	71°	5
6	0°24'	-57'	109°	0°04'	-57'	109°	0°15'	+57'	71°	0°35'	+58'	71°	0°54'	+58'	71°	1°14'	+58'	71°	1°33'	+58'	71°	6
7	0°33'	+57'	71°	0°53'	+57'	71°	1°13'	+57'	71°	1°32'	+58'	71°	1°52'	+58'	71°	2°12'	+58'	71°	2°31'	+58'	71°	7
8	1°30'	+57'	70°	1°50'	+57'	70°	2°10'	+57'	70°	2°30'	+58'	71°	2°50'	+58'	71°	3°10'	+58'	71°	3°30'	+58'	71°	8
9	2°27'	+57'	70°	2°47'	+57'	70°	3°07'	+57'	70°	3°28'	+58'	70°	3°48'	+58'	70°	4°08'	+58'	70°	4°28'	+58'	70°	9
10	3°23'	+57'	70°	3°44'	+57'	70°	4°05'	+57'	70°	4°25'	+58'	70°	4°46'	+58'	70°	5°06'	+58'	70°	5°27'	+58'	70°	10
11	4°20'	+57'	69°	4°41'	+57'	70°	5°02'	+57'	70°	5°23'	+58'	70°	5°44'	+58'	70°	6°04'	+58'	70°	6°25'	+58'	70°	11
12	5°17'	+57'	69°	5°38'	+57'	69°	5°59'	+57'	69°	6°20'	+58'	69°	6°42'	+58'	69°	7°03'	+58'	70°	7°23'	+58'	70°	12
13	6°13'	+57'	69°	6°35'	+57'	69°	6°57'	+57'	69°	7°18'	+58'	69°	7°39'	+58'	69°	8°01'	+58'	69°	8°22'	+58'	69°	13
14	7°10'	+57'	68°	7°32'	+57'	69°	7°54'	+57'	69°	8°16'	+58'	69°	8°37'	+58'	69°	8°59'	+58'	69°	9°20'	+58'	69°	14
15	8°07'	+57'	68°	8°29'	+57'	68°	8°51'	+57'	68°	9°13'	+58'	69°	9°35'	+58'	69°	9°57'	+58'	69°	10°18'	+58'	69°	15
16	9°03'	+57'	68°	9°26'	+57'	68°	9°49'	+57'	68°	10°11'	+58'	68°	10°33'	+58'	68°	10°55'	+58'	69°	11°17'	+58'	69°	16
17	10°00'	+57'	67°	10°23'	+57'	68°	10°46'	+57'	68°	11°08'	+58'	68°	11°31'	+58'	68°	11°53'	+58'	68°	12°15'	+58'	69°	17
18	10°57'	+57'	67°	11°20'	+57'	67°	11°43'	+57'	67°	12°06'	+58'	68°	12°29'	+58'	68°	12°51'	+58'	68°	13°13'	+58'	68°	18
19	11°53'	+57'	67°	12°17'	+57'	67°	12°40'	+57'	67°	13°03'	+57'	67°	13°26'	+58'	68°	13°49'	+58'	68°	14°12'	+58'	68°	19
20	12°50'	+57'	66°	13°14'	+57'	67°	13°37'	+57'	67°	14°01'	+57'	67°	14°24'	+58'	67°	14°47'	+58'	68°	15°10'	+58'	68°	20
21	13°46'	+57'	66°	14°11'	+57'	66°	14°35'	+57'	67°	14°58'	+57'	67°	15°22'	+58'	67°	15°45'	+58'	67°	16°08'	+58'	68°	21
22	14°43'	+56'	66°	15°07'	+57'	66°	15°32'	+57'	66°	15°56'	+57'	66°	16°20'	+58'	67°	16°43'	+58'	67°	17°06'	+58'	67°	22
23	15°39'	+56'	65°	16°04'	+57'	66°	16°29'	+57'	66°	16°53'	+57'	66°	17°17'	+58'	66°	17°41'	+58'	67°	18°05'	+58'	67°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	6°24'	-57'	108°	6°05'	-57'	108°	5°46'	-57'	108°	5°28'	-58'	108°	5°09'	-58'	108°	4°50'	-58'	108°	4°31'	-58'	108°	0
1	5°27'	-57'	108°	5°08'	-57'	108°	4°49'	-57'	108°	4°30'	-58'	109°	4°11'	-58'	109°	3°52'	-58'	109°	3°33'	-58'	109°	1
2	4°30'	-57'	109°	4°11'	-57'	109°	3°52'	-57'	109°	3°32'	-58'	109°	3°13'	-58'	109°	2°54'	-58'	109°	2°34'	-58'	109°	2
3	3°33'	-57'	109°	3°14'	-57'	109°	2°54'	-57'	109°	2°35'	-58'	109°	2°15'	-58'	109°	1°56'	-58'	109°	1°36'	-58'	109°	3
4	2°37'	-57'	109°	2°17'	-57'	109°	1°57'	-57'	109°	1°37'	-58'	109°	1°17'	-58'	109°	0°57'	-58'	109°	0°37'	-58'	109°	4
5	1°40'	-57'	110°	1°20'	-57'	110°	1°00'	-57'	110°	0°39'	-58'	110°	0°19'	-58'	110°	0°01'	+58'	70°	0°21'	+58'	70°	5
6	0°43'	-57'	110°	0°23'	-57'	110°	0°02'	-57'	110°	0°18'	+58'	70°	0°39'	+58'	70°	0°59'	+58'	70°	1°19'	+58'	70°	6
7	0°14'	+57'	70°	0°34'	+57'	70°	0°55'	+57'	70°	1°16'	+58'	70°	1°37'	+58'	70°	1°57'	+58'	70°	2°18'	+58'	70°	7
8	1°11'	+57'	69°	1°32'	+57'	69°	1°53'	+57'	70°	2°14'	+58'	70°	2°34'	+58'	70°	2°55'	+58'	70°	3°16'	+58'	70°	8
9	2°07'	+57'	69°	2°29'	+57'	69°	2°50'	+57'	69°	3°11'	+58'	69°	3°32'	+58'	69°	3°54'	+58'	69°	4°15'	+58'	69°	9
10	3°04'	+57'	69°	3°26'	+57'	69°	3°47'	+57'	69°	4°09'	+58'	69°	4°30'	+58'	69°	4°52'	+58'	69°	5°13'	+58'	69°	10
11	4°01'	+57'	69°	4°23'	+57'	69°	4°45'	+57'	69°	5°06'	+58'	69°	5°28'	+58'	69°	5°50'	+58'	69°	6°11'	+58'	69°	11
12	4°58'	+57'	68°	5°20'	+57'	68°	5°42'	+57'	68°	6°04'	+58'	68°	6°26'	+58'	69°	6°48'	+58'	69°	7°10'	+58'	69°	12
13	5°54'	+57'	68°	6°17'	+57'	68°	6°39'	+57'	68°	7°02'	+58'	68°	7°24'	+58'	68°	7°46'	+58'	68°	8°08'	+58'	69°	13
14	6°51'	+57'	68°	7°14'	+57'	68°	7°37'	+57'	68°	7°59'	+58'	68°	8°22'	+58'	68°	8°44'	+58'	68°	9°07'	+58'	68°	14
15	7°48'	+57'	67°	8°11'	+57'	67°	8°34'	+57'	67°	8°57'	+58'	68°	9°20'	+58'	68°	9°42'	+58'	68°	10°05'	+58'	68°	15
16	8°44'	+57'	67°	9°08'	+57'	67°	9°31'	+57'	67°	9°55'	+58'	67°	10°18'	+58'	67°	10°41'	+58'	68°	11°03'	+58'	68°	16
17	9°41'	+57'	67°	10°05'	+57'	67°	10°29'	+57'	67°	10°52'	+58'	67°	11°15'	+58'	67°	11°39'	+58'	67°	12°02'	+58'	68°	17
18	10°38'	+57'	66°	11°02'	+57'	66°	11°26'	+57'	67°	11°50'	+58'	67°	12°13'	+58'	67°	12°37'	+58'	67°	13°00'	+58'	67°	18
19	11°34'	+57'	66°	11°59'	+57'	66°	12°23'	+57'	66°	12°47'	+58'	66°	13°11'	+58'	67°	13°35'	+58'	67°	13°58'	+58'	67°	19
20	12°31'	+57'	66°	12°56'	+57'	66°	13°20'	+57'	66°	13°45'	+58'	66°	14°09'	+58'	66°	14°33'	+58'	67°	14°57'	+58'	67°	20
21	13°28'	+57'	65°	13°53'	+57'	65°	14°18'	+57'	66°	14°42'	+57'	66°	15°07'	+58'	66°	15°31'	+58'	66°	15°55'	+58'	67°	21
22	14°24'	+57'	65°	14°50'	+57'	65°	15°15'	+57'	65°	15°40'	+57'	66°	16°04'	+58'	66°	16°29'	+58'	66°	16°53'	+58'	66°	22
23	15°21'	+57'	64°	15°47'	+57'	65°	16°12'	+57'	65°	16°37'	+57'	65°	17°02'	+58'	66°	17°27'	+58'	66°	17°51'	+58'	66°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	6°43' -57' 109°	6°24' -57' 109°	6°04' -57' 109°	5°44' -58' 109°	5°25' -58' 109°	5°05' -58' 109°	4°45' -58' 109°	0
1	5°46' -57' 109°	5°27' -57' 109°	5°07' -57' 109°	4°47' -58' 109°	4°27' -58' 110°	4°07' -58' 110°	3°46' -58' 110°	1
2	4°49' -57' 110°	4°29' -57' 110°	4°09' -57' 110°	3°49' -58' 110°	3°29' -58' 110°	3°08' -58' 110°	2°48' -58' 110°	2
3	3°53' -57' 110°	3°32' -57' 110°	3°12' -57' 110°	2°51' -58' 110°	2°31' -58' 110°	2°10' -58' 110°	1°50' -58' 110°	3
4	2°56' -57' 110°	2°35' -57' 110°	2°14' -57' 110°	1°54' -58' 110°	1°33' -58' 110°	1°12' -58' 110°	0°51' -58' 110°	4
5	1°59' -57' 110°	1°38' -57' 111°	1°17' -57' 111°	0°56' -58' 111°	0°35' -58' 111°	0°14' -58' 111°	0°07' +58' 69°	5
6	1°02' -57' 111°	0°41' -57' 111°	0°20' -57' 111°	0°02' +58' 69°	0°23' +58' 69°	0°44' +58' 69°	1°06' +58' 69°	6
7	0°05' -57' 111°	0°16' +57' 69°	0°38' +57' 69°	0°59' +58' 69°	1°21' +58' 69°	1°43' +58' 69°	2°04' +58' 69°	7
8	0°51' +57' 69°	1°13' +57' 69°	1°35' +57' 69°	1°57' +58' 69°	2°19' +58' 69°	2°41' +58' 69°	3°03' +58' 69°	8
9	1°48' +57' 68°	2°10' +57' 68°	2°33' +57' 68°	2°55' +58' 68°	3°17' +58' 68°	3°39' +58' 68°	4°01' +58' 68°	9
10	2°45' +57' 68°	3°08' +57' 68°	3°30' +57' 68°	3°53' +58' 68°	4°15' +58' 68°	4°37' +58' 68°	4°59' +58' 68°	10
11	3°42' +57' 68°	4°05' +57' 68°	4°27' +57' 68°	4°50' +58' 68°	5°13' +58' 68°	5°35' +58' 68°	5°58' +58' 68°	11
12	4°39' +57' 67°	5°02' +57' 67°	5°25' +57' 67°	5°48' +58' 68°	6°11' +58' 68°	6°34' +58' 68°	6°56' +58' 68°	12
13	5°35' +57' 67°	5°59' +57' 67°	6°22' +57' 67°	6°46' +58' 67°	7°09' +58' 67°	7°32' +58' 67°	7°55' +58' 68°	13
14	6°32' +57' 67°	6°56' +57' 67°	7°20' +57' 67°	7°43' +58' 67°	8°07' +58' 67°	8°30' +58' 67°	8°53' +58' 67°	14
15	7°29' +57' 66°	7°53' +57' 66°	8°17' +57' 67°	8°41' +58' 67°	9°05' +58' 67°	9°28' +58' 67°	9°51' +58' 67°	15
16	8°26' +57' 66°	8°50' +57' 66°	9°14' +57' 66°	9°38' +58' 66°	10°02' +58' 67°	10°26' +58' 67°	10°50' +58' 67°	16
17	9°22' +57' 66°	9°47' +57' 66°	10°12' +57' 66°	10°36' +58' 66°	11°00' +58' 66°	11°24' +58' 66°	11°48' +58' 67°	17
18	10°19' +57' 65°	10°44' +57' 65°	11°09' +57' 66°	11°34' +58' 66°	11°58' +58' 66°	12°22' +58' 66°	12°47' +58' 66°	18
19	11°16' +57' 65°	11°41' +57' 65°	12°06' +57' 65°	12°31' +58' 66°	12°56' +58' 66°	13°21' +58' 66°	13°45' +58' 66°	19
20	12°13' +57' 65°	12°38' +57' 65°	13°04' +57' 65°	13°29' +58' 65°	13°54' +58' 65°	14°19' +58' 66°	14°43' +58' 66°	20
21	13°09' +57' 64°	13°35' +57' 64°	14°01' +57' 65°	14°26' +58' 65°	14°52' +58' 65°	15°17' +58' 65°	15°42' +58' 66°	21
22	14°06' +57' 64°	14°32' +57' 64°	14°58' +57' 64°	15°24' +58' 65°	15°49' +58' 65°	16°15' +58' 65°	16°40' +58' 65°	22
23	15°02' +57' 64°	15°29' +57' 64°	15°55' +57' 64°	16°21' +57' 64°	16°47' +58' 65°	17°13' +58' 65°	17°38' +58' 65°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	7°02' -57' 110°	6°42' -57' 110°	6°21' -57' 110°	6°01' -58' 110°	5°40' -58' 110°	5°19' -58' 110°	4°58' -58' 110°	0
1	6°06' -57' 110°	5°45' -57' 110°	5°24' -57' 110°	5°03' -58' 110°	4°42' -58' 111°	4°21' -58' 111°	4°00' -58' 111°	1
2	5°09' -57' 110°	4°48' -57' 111°	4°27' -57' 111°	4°05' -58' 111°	3°44' -58' 111°	3°23' -58' 111°	3°02' -58' 111°	2
3	4°12' -57' 111°	3°51' -57' 111°	3°29' -57' 111°	3°08' -58' 111°	2°46' -58' 111°	2°25' -58' 111°	2°03' -58' 111°	3
4	3°15' -57' 111°	2°53' -57' 111°	2°32' -57' 111°	2°10' -58' 111°	1°48' -58' 111°	1°26' -58' 111°	1°05' -58' 111°	4
5	2°18' -57' 111°	1°56' -57' 111°	1°34' -57' 112°	1°12' -58' 112°	0°50' -58' 112°	0°28' -58' 112°	0°06' -58' 112°	5
6	1°21' -57' 112°	0°59' -57' 112°	0°37' -57' 112°	0°15' -58' 112°	0°08' +58' 68°	0°30' +58' 68°	0°52' +58' 68°	6
7	0°25' -57' 112°	0°02' -57' 112°	0°21' +57' 68°	0°43' +58' 68°	1°06' +58' 68°	1°28' +58' 68°	1°51' +58' 68°	7
8	0°32' +57' 68°	0°55' +57' 68°	1°18' +57' 68°	1°41' +58' 68°	2°04' +58' 68°	2°26' +58' 68°	2°49' +58' 68°	8
9	1°29' +57' 67°	1°52' +57' 67°	2°15' +57' 67°	2°39' +58' 67°	3°02' +58' 67°	3°25' +58' 67°	3°48' +58' 68°	9
10	2°26' +57' 67°	2°50' +57' 67°	3°13' +57' 67°	3°36' +58' 67°	4°00' +58' 67°	4°23' +58' 67°	4°46' +58' 67°	10
11	3°23' +57' 67°	3°47' +57' 67°	4°10' +57' 67°	4°34' +58' 67°	4°58' +58' 67°	5°21' +58' 67°	5°44' +58' 67°	11
12	4°20' +57' 66°	4°44' +57' 66°	5°08' +57' 66°	5°32' +58' 67°	5°56' +58' 67°	6°19' +58' 67°	6°43' +58' 67°	12
13	5°17' +57' 66°	5°41' +57' 66°	6°05' +57' 66°	6°29' +58' 66°	6°53' +58' 66°	7°17' +58' 67°	7°41' +58' 67°	13
14	6°13' +57' 66°	6°38' +57' 66°	7°03' +57' 66°	7°27' +58' 66°	7°51' +58' 66°	8°16' +58' 66°	8°40' +58' 66°	14
15	7°10' +57' 65°	7°35' +57' 65°	8°00' +57' 66°	8°25' +58' 66°	8°49' +58' 66°	9°14' +58' 66°	9°38' +58' 66°	15
16	8°07' +57' 65°	8°32' +57' 65°	8°57' +57' 65°	9°22' +58' 65°	9°47' +58' 66°	10°12' +58' 66°	10°37' +58' 66°	16
17	9°04' +57' 65°	9°29' +57' 65°	9°55' +57' 65°	10°20' +58' 65°	10°45' +58' 65°	11°10' +58' 66°	11°35' +58' 66°	17
18	10°01' +57' 64°	10°26' +57' 65°	10°52' +57' 65°	11°18' +58' 65°	11°43' +58' 65°	12°08' +58' 65°	12°33' +58' 65°	18
19	10°57' +57' 64°	11°23' +57' 64°	11°50' +57' 64°	12°15' +58' 65°	12°41' +58' 65°	13°06' +58' 65°	13°32' +58' 65°	19
20	11°54' +57' 64°	12°21' +57' 64°	12°47' +57' 64°	13°13' +58' 64°	13°39' +58' 65°	14°05' +58' 65°	14°30' +58' 65°	20
21	12°51' +57' 63°	13°18' +57' 64°	13°44' +57' 64°	14°11' +58' 64°	14°37' +58' 64°	15°03' +58' 64°	15°28' +58' 65°	21
22	13°47' +57' 63°	14°15' +57' 63°	14°41' +57' 63°	15°08' +58' 64°	15°35' +58' 64°	16°01' +58' 64°	16°27' +58' 64°	22
23	14°44' +57' 63°	15°11' +57' 63°	15°39' +57' 63°	16°06' +58' 63°	16°32' +58' 64°	16°59' +58' 64°	17°25' +58' 64°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

111° 249° LHA — Latitude SAME as DECLINATION — 111° 249° LHA

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

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

68° 292° LHA — Latitude CONTRARY to Declination — 68° 292° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	7°22'	-57'	111°	7°00'	-57'	111°	6°39'	-57'	111°	6°17'	-58'	111°	5°56'	-58'	111°	5°34'	-58'	111°	5°12'	-58'	111°	0
1	6°25'	-57'	111°	6°03'	-57'	111°	5°41'	-57'	111°	5°20'	-58'	111°	4°58'	-58'	111°	4°36'	-58'	112°	4°14'	-58'	112°	1
2	5°28'	-57'	111°	5°06'	-57'	112°	4°44'	-57'	112°	4°22'	-58'	112°	4°00'	-58'	112°	3°37'	-58'	112°	3°15'	-58'	112°	2
3	4°31'	-57'	112°	4°09'	-57'	112°	3°46'	-57'	112°	3°24'	-58'	112°	3°02'	-58'	112°	2°39'	-58'	112°	2°17'	-58'	112°	3
4	3°34'	-57'	112°	3°12'	-57'	112°	2°49'	-57'	112°	2°26'	-58'	112°	2°04'	-58'	112°	1°41'	-58'	112°	1°18'	-58'	112°	4
5	2°37'	-57'	112°	2°14'	-57'	112°	1°52'	-57'	112°	1°29'	-58'	112°	1°06'	-58'	113°	0°43'	-58'	113°	0°20'	-58'	113°	5
6	1°40'	-57'	113°	1°17'	-57'	113°	0°54'	-57'	113°	0°31'	-58'	113°	0°08'	-58'	113°	0°16'	+58'	67°	0°39'	+58'	67°	6
7	0°43'	-57'	113°	0°20'	-57'	113°	0°03'	+57'	67°	0°27'	+58'	67°	0°50'	+58'	67°	1°14'	+58'	67°	1°37'	+58'	67°	7
8	0°13'	+57'	67°	0°37'	+57'	67°	1°01'	+57'	67°	1°25'	+58'	67°	1°48'	+58'	67°	2°12'	+58'	67°	2°36'	+58'	67°	8
9	1°10'	+57'	66°	1°34'	+57'	66°	1°58'	+57'	66°	2°22'	+58'	66°	2°46'	+58'	66°	3°10'	+58'	67°	3°34'	+58'	67°	9
10	2°07'	+57'	66°	2°32'	+57'	66°	2°56'	+57'	66°	3°20'	+58'	66°	3°44'	+58'	66°	4°09'	+58'	66°	4°33'	+58'	66°	10
11	3°04'	+57'	66°	3°29'	+57'	66°	3°53'	+57'	66°	4°18'	+58'	66°	4°42'	+58'	66°	5°07'	+58'	66°	5°31'	+58'	66°	11
12	4°01'	+57'	65°	4°26'	+57'	65°	4°51'	+57'	66°	5°16'	+58'	66°	5°40'	+58'	66°	6°05'	+58'	66°	6°30'	+58'	66°	12
13	4°58'	+57'	65°	5°23'	+57'	65°	5°48'	+57'	65°	6°13'	+58'	65°	6°38'	+58'	65°	7°03'	+58'	66°	7°28'	+58'	66°	13
14	5°55'	+57'	65°	6°20'	+57'	65°	6°46'	+57'	65°	7°11'	+58'	65°	7°36'	+58'	65°	8°01'	+58'	65°	8°26'	+58'	65°	14
15	6°52'	+57'	64°	7°17'	+57'	65°	7°43'	+57'	65°	8°09'	+58'	65°	8°34'	+58'	65°	9°00'	+58'	65°	9°25'	+58'	65°	15
16	7°48'	+57'	64°	8°15'	+57'	64°	8°41'	+57'	64°	9°07'	+58'	65°	9°32'	+58'	65°	9°58'	+58'	65°	10°23'	+58'	65°	16
17	8°45'	+57'	64°	9°12'	+57'	64°	9°38'	+57'	64°	10°04'	+58'	64°	10°30'	+58'	64°	10°56'	+58'	65°	11°22'	+58'	65°	17
18	9°42'	+57'	63°	10°09'	+57'	64°	10°35'	+57'	64°	11°02'	+58'	64°	11°28'	+58'	64°	11°54'	+58'	64°	12°20'	+58'	65°	18
19	10°39'	+57'	63°	11°06'	+57'	63°	11°33'	+57'	63°	12°00'	+58'	64°	12°26'	+58'	64°	12°52'	+58'	64°	13°19'	+58'	64°	19
20	11°36'	+57'	63°	12°03'	+57'	63°	12°30'	+57'	63°	12°57'	+58'	63°	13°24'	+58'	64°	13°51'	+58'	64°	14°17'	+58'	64°	20
21	12°32'	+57'	62°	13°00'	+57'	63°	13°28'	+57'	63°	13°55'	+58'	63°	14°22'	+58'	63°	14°49'	+58'	64°	15°15'	+58'	64°	21
22	13°29'	+57'	62°	13°57'	+57'	62°	14°25'	+57'	63°	14°52'	+58'	63°	15°20'	+58'	63°	15°47'	+58'	63°	16°14'	+58'	64°	22
23	14°26'	+57'	62°	14°54'	+57'	62°	15°22'	+57'	62°	15°50'	+58'	63°	16°18'	+58'	63°	16°45'	+58'	63°	17°12'	+58'	63°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

112° 248° LHA — Latitude SAME as DECLINATION — 112° 248° LHA

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

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

67° 293° LHA — Latitude CONTRARY to Declination — 67° 293° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	7°41'	-57'	112°	7°19'	-57'	112°	6°56'	-57'	112°	6°34'	-58'	112°	6°11'	-58'	112°	5°48'	-58'	112°	5°25'	-58'	112°	0
1	6°44'	-57'	112°	6°21'	-57'	112°	5°59'	-57'	112°	5°36'	-58'	112°	5°13'	-58'	112°	4°50'	-58'	113°	4°27'	-58'	113°	1
2	5°47'	-57'	112°	5°24'	-57'	112°	5°01'	-58'	113°	4°38'	-58'	113°	4°15'	-58'	113°	3°52'	-58'	113°	3°28'	-58'	113°	2
3	4°50'	-57'	113°	4°27'	-57'	113°	4°04'	-58'	113°	3°40'	-58'	113°	3°17'	-58'	113°	2°53'	-58'	113°	2°30'	-58'	113°	3
4	3°53'	-57'	113°	3°30'	-57'	113°	3°06'	-58'	113°	2°43'	-58'	113°	2°19'	-58'	113°	1°55'	-58'	113°	1°31'	-58'	113°	4
5	2°56'	-57'	113°	2°32'	-57'	113°	2°09'	-58'	113°	1°45'	-58'	113°	1°21'	-58'	113°	0°57'	-58'	113°	0°33'	-58'	114°	5
6	1°59'	-57'	114°	1°35'	-57'	114°	1°11'	-58'	114°	0°47'	-58'	114°	0°23'	-58'	114°	0°01'	+58'	66°	0°25'	+58'	66°	6
7	1°02'	-57'	114°	0°38'	-57'	114°	0°14'	-58'	114°	0°11'	+58'	66°	0°35'	+58'	66°	1°00'	+58'	66°	1°24'	+58'	66°	7
8	0°05'	-57'	114°	0°19'	+57'	66°	0°44'	+58'	66°	1°09'	+58'	66°	1°33'	+58'	66°	1°58'	+58'	66°	2°22'	+58'	66°	8
9	0°52'	+57'	65°	1°17'	+57'	65°	1°42'	+58'	65°	2°06'	+58'	65°	2°31'	+58'	66°	2°56'	+58'	66°	3°21'	+58'	66°	9
10	1°49'	+57'	65°	2°14'	+57'	65°	2°39'	+58'	65°	3°04'	+58'	65°	3°29'	+58'	65°	3°54'	+58'	65°	4°19'	+58'	65°	10
11	2°45'	+57'	65°	3°11'	+57'	65°	3°37'	+58'	65°	4°02'	+58'	65°	4°27'	+58'	65°	4°53'	+58'	65°	5°18'	+58'	65°	11
12	3°42'	+57'	64°	4°08'	+57'	65°	4°34'	+58'	65°	5°00'	+58'	65°	5°25'	+58'	65°	5°51'	+58'	65°	6°16'	+58'	65°	12
13	4°39'	+57'	64°	5°05'	+57'	64°	5°32'	+57'	64°	5°58'	+58'	64°	6°23'	+58'	64°	6°49'	+58'	65°	7°15'	+58'	65°	13
14	5°36'	+57'	64°	6°03'	+57'	64°	6°29'	+57'	64°	6°55'	+58'	64°	7°21'	+58'	64°	7°47'	+58'	64°	8°13'	+58'	64°	14
15	6°33'	+57'	64°	7°00'	+57'	64°	7°27'	+57'	64°	7°53'	+58'	64°	8°19'	+58'	64°	8°46'	+58'	64°	9°12'	+58'	64°	15
16	7°30'	+57'	63°	7°57'	+57'	63°	8°24'	+57'	63°	8°51'	+58'	64°	9°17'	+58'	64°	9°44'	+58'	64°	10°10'	+58'	64°	16
17	8°27'	+57'	63°	8°54'	+57'	63°	9°21'	+57'	63°	9°48'	+58'	63°	10°15'	+58'	63°	10°42'	+58'	64°	11°09'	+58'	64°	17
18	9°24'	+57'	63°	9°51'	+57'	63°	10°19'	+57'	63°	10°46'	+58'	63°	11°13'	+58'	63°	11°40'	+58'	63°	12°07'	+58'	64°	18
19	10°21'	+57'	62°	10°49'	+57'	62°	11°16'	+57'	63°	11°44'	+58'	63°	12°11'	+58'	63°	12°39'	+58'	63°	13°06'	+58'	63°	19
20	11°18'	+57'	62°	11°46'	+57'	62°	12°14'	+57'	62°	12°42'	+58'	62°	13°09'	+58'	63°	13°37'	+58'	63°	14°04'	+58'	63°	20
21	12°14'	+57'	62°	12°43'	+57'	62°	13°11'	+57'	62°	13°39'	+58'	62°	14°07'	+58'	62°	14°35'	+58'	63°	15°02'	+58'	63°	21
22	13°11'	+57'	61°	13°40'	+57'	61°	14°09'	+57'	62°	14°37'	+58'	62°	15°05'	+58'	62°	15°33'	+58'	62°	16°01'	+58'	63°	22
23	14°08'	+57'	61°	14°37'	+57'	61°	15°06'	+57'	61°	15°35'	+58'	62°	16°03'	+58'	62°	16°31'	+58'	62°	16°59'	+58'	62°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°00'	-57'	113°	7°37'	-57'	113°	7°13'	-58'	113°	6°50'	-58'	113°	6°26'	-58'	113°	6°03'	-58'	113°	5°39'	-59'	113°	0
1	7°03'	-57'	113°	6°39'	-57'	113°	6°16'	-58'	113°	5°52'	-58'	113°	5°28'	-58'	113°	5°04'	-58'	114°	4°40'	-59'	114°	1
2	6°06'	-57'	113°	5°42'	-57'	113°	5°18'	-58'	114°	4°54'	-58'	114°	4°30'	-58'	114°	4°06'	-58'	114°	3°42'	-59'	114°	2
3	5°09'	-57'	114°	4°45'	-57'	114°	4°21'	-58'	114°	3°56'	-58'	114°	3°32'	-58'	114°	3°08'	-58'	114°	2°43'	-59'	114°	3
4	4°12'	-57'	114°	3°48'	-57'	114°	3°23'	-58'	114°	2°59'	-58'	114°	2°34'	-58'	114°	2°09'	-58'	114°	1°45'	-59'	114°	4
5	3°15'	-57'	114°	2°50'	-57'	114°	2°26'	-58'	114°	2°01'	-58'	114°	1°36'	-58'	114°	1°11'	-58'	114°	0°46'	-59'	114°	5
6	2°18'	-57'	115°	1°53'	-57'	115°	1°28'	-58'	115°	1°03'	-58'	115°	0°38'	-58'	115°	0°13'	-58'	115°	0°12'	+59'	65°	6
7	1°21'	-57'	115°	0°56'	-57'	115°	0°30'	-58'	115°	0°05'	-58'	115°	0°20'	+58'	65°	0°45'	+58'	65°	1°11'	+59'	65°	7
8	0°24'	-57'	115°	0°02'	+57'	65°	0°27'	+58'	65°	0°53'	+58'	65°	1°18'	+58'	65°	1°44'	+58'	65°	2°09'	+59'	65°	8
9	0°33'	+57'	64°	0°59'	+57'	64°	1°25'	+58'	64°	1°51'	+58'	65°	2°16'	+58'	65°	2°42'	+58'	65°	3°08'	+59'	65°	9
10	1°30'	+57'	64°	1°56'	+57'	64°	2°22'	+58'	64°	2°48'	+58'	64°	3°14'	+58'	64°	3°40'	+58'	64°	4°06'	+59'	64°	10
11	2°27'	+57'	64°	2°53'	+57'	64°	3°20'	+58'	64°	3°46'	+58'	64°	4°12'	+58'	64°	4°39'	+58'	64°	5°05'	+59'	64°	11
12	3°24'	+57'	64°	3°51'	+57'	64°	4°17'	+58'	64°	4°44'	+58'	64°	5°10'	+58'	64°	5°37'	+58'	64°	6°03'	+58'	64°	12
13	4°21'	+57'	63°	4°48'	+57'	63°	5°15'	+58'	63°	5°42'	+58'	63°	6°09'	+58'	64°	6°35'	+58'	64°	7°02'	+58'	64°	13
14	5°18'	+57'	63°	5°45'	+57'	63°	6°12'	+58'	63°	6°40'	+58'	63°	7°07'	+58'	63°	7°33'	+58'	63°	8°00'	+58'	64°	14
15	6°15'	+57'	63°	6°42'	+57'	63°	7°10'	+58'	63°	7°37'	+58'	63°	8°05'	+58'	63°	8°32'	+58'	63°	8°59'	+58'	63°	15
16	7°12'	+57'	62°	7°40'	+57'	62°	8°07'	+58'	63°	8°35'	+58'	63°	9°03'	+58'	63°	9°30'	+58'	63°	9°57'	+58'	63°	16
17	8°09'	+57'	62°	8°37'	+57'	62°	9°05'	+57'	62°	9°33'	+58'	62°	10°01'	+58'	63°	10°28'	+58'	63°	10°56'	+58'	63°	17
18	9°06'	+57'	62°	9°34'	+57'	62°	10°02'	+57'	62°	10°31'	+58'	62°	10°59'	+58'	62°	11°26'	+58'	62°	11°54'	+58'	63°	18
19	10°03'	+57'	61°	10°31'	+57'	61°	11°00'	+57'	62°	11°28'	+58'	62°	11°57'	+58'	62°	12°25'	+58'	62°	12°53'	+58'	62°	19
20	11°00'	+57'	61°	11°29'	+57'	61°	11°57'	+57'	61°	12°26'	+58'	62°	12°55'	+58'	62°	13°23'	+58'	62°	13°51'	+58'	62°	20
21	11°56'	+57'	61°	12°26'	+57'	61°	12°55'	+57'	61°	13°24'	+58'	61°	13°53'	+58'	61°	14°21'	+58'	62°	14°49'	+58'	62°	21
22	12°53'	+57'	60°	13°23'	+57'	61°	13°52'	+57'	61°	14°21'	+58'	61°	14°50'	+58'	61°	15°19'	+58'	61°	15°48'	+58'	62°	22
23	13°50'	+57'	60°	14°20'	+57'	60°	14°50'	+57'	60°	15°19'	+58'	61°	15°48'	+58'	61°	16°17'	+58'	61°	16°46'	+58'	61°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

114° 246° LHA — Latitude SAME as DECLINATION — 114° 246° LHA

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

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

65° 295° LHA — Latitude CONTRARY to Declination — 65° 295° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°19'	-57'	114°	7°55'	-57'	114°	7°30'	-58'	114°	7°06'	-58'	114°	6°41'	-58'	114°	6°17'	-58'	114°	5°52'	-59'	114°	0
1	7°22'	-57'	114°	6°57'	-57'	114°	6°33'	-58'	114°	6°08'	-58'	114°	5°43'	-58'	114°	5°18'	-58'	114°	4°54'	-59'	115°	1
2	6°25'	-57'	114°	6°00'	-57'	114°	5°35'	-58'	114°	5°10'	-58'	115°	4°45'	-58'	115°	4°20'	-58'	115°	3°55'	-59'	115°	2
3	5°28'	-57'	115°	5°03'	-57'	115°	4°38'	-58'	115°	4°12'	-58'	115°	3°47'	-58'	115°	3°22'	-58'	115°	2°56'	-59'	115°	3
4	4°31'	-57'	115°	4°05'	-57'	115°	3°40'	-58'	115°	3°15'	-58'	115°	2°49'	-58'	115°	2°24'	-58'	115°	1°58'	-59'	115°	4
5	3°34'	-57'	115°	3°08'	-57'	115°	2°42'	-58'	115°	2°17'	-58'	115°	1°51'	-58'	115°	1°25'	-58'	115°	0°59'	-59'	115°	5
6	2°37'	-57'	116°	2°11'	-57'	116°	1°45'	-58'	116°	1°19'	-58'	116°	0°53'	-58'	116°	0°27'	-58'	116°	0°01'	-59'	116°	6
7	1°40'	-57'	116°	1°13'	-57'	116°	0°47'	-58'	116°	0°21'	-58'	116°	0°05'	+58'	64°	0°31'	+58'	64°	0°58'	+59'	64°	7
8	0°42'	-57'	116°	0°16'	-57'	116°	0°10'	+58'	64°	0°37'	+58'	64°	1°03'	+58'	64°	1°30'	+58'	64°	1°56'	+59'	64°	8
9	0°15'	+57'	64°	0°41'	+57'	64°	1°08'	+58'	64°	1°35'	+58'	64°	2°01'	+58'	64°	2°28'	+58'	64°	2°55'	+59'	64°	9
10	1°12'	+57'	63°	1°39'	+57'	63°	2°06'	+58'	63°	2°33'	+58'	63°	3°00'	+58'	63°	3°26'	+58'	63°	3°53'	+59'	63°	10
11	2°09'	+57'	63°	2°36'	+57'	63°	3°03'	+58'	63°	3°30'	+58'	63°	3°58'	+58'	63°	4°25'	+58'	63°	4°52'	+59'	63°	11
12	3°06'	+57'	63°	3°33'	+57'	63°	4°01'	+58'	63°	4°28'	+58'	63°	4°56'	+58'	63°	5°23'	+58'	63°	5°50'	+59'	63°	12
13	4°03'	+57'	62°	4°31'	+57'	62°	4°58'	+58'	62°	5°26'	+58'	63°	5°54'	+58'	63°	6°21'	+58'	63°	6°49'	+59'	63°	13
14	5°00'	+57'	62°	5°28'	+57'	62°	5°56'	+58'	62°	6°24'	+58'	62°	6°52'	+58'	62°	7°20'	+58'	62°	7°47'	+59'	63°	14
15	5°57'	+57'	62°	6°25'	+57'	62°	6°54'	+58'	62°	7°22'	+58'	62°	7°50'	+58'	62°	8°18'	+58'	62°	8°46'	+59'	62°	15
16	6°54'	+57'	61°	7°22'	+57'	61°	7°51'	+58'	62°	8°20'	+58'	62°	8°48'	+58'	62°	9°16'	+58'	62°	9°44'	+58'	62°	16
17	7°51'	+57'	61°	8°20'	+57'	61°	8°49'	+58'	61°	9°17'	+58'	61°	9°46'	+58'	62°	10°15'	+58'	62°	10°43'	+58'	62°	17
18	8°48'	+57'	61°	9°17'	+57'	61°	9°46'	+58'	61°	10°15'	+58'	61°	10°44'	+58'	61°	11°13'	+58'	61°	11°41'	+58'	62°	18
19	9°45'	+57'	60°	10°14'	+57'	61°	10°44'	+58'	61°	11°13'	+58'	61°	11°42'	+58'	61°	12°11'	+58'	61°	12°40'	+58'	61°	19
20	10°42'	+57'	60°	11°12'	+57'	60°	11°41'	+57'	60°	12°11'	+58'	61°	12°40'	+58'	61°	13°09'	+58'	61°	13°38'	+58'	61°	20
21	11°39'	+57'	60°	12°09'	+57'	60°	12°39'	+57'	60°	13°08'	+58'	60°	13°38'	+58'	61°	14°08'	+58'	61°	14°37'	+58'	61°	21
22	12°35'	+57'	59°	13°06'	+57'	60°	13°36'	+57'	60°	14°06'	+58'	60°	14°36'	+58'	60°	15°06'	+58'	60°	15°35'	+58'	61°	22
23	13°32'	+57'	59°	14°03'	+57'	59°	14°34'	+57'	60°	15°04'	+58'	60°	15°34'	+58'	60°	16°04'	+58'	60°	16°34'	+58'	61°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°37'	-57'	115°	8°12'	-57'	115°	7°47'	-58'	115°	7°22'	-58'	115°	6°56'	-58'	115°	6°31'	-58'	115°	6°05'	-59'	115°	0
1	7°40'	-57'	115°	7°15'	-57'	115°	6°50'	-58'	115°	6°24'	-58'	115°	5°58'	-58'	115°	5°33'	-58'	115°	5°07'	-59'	116°	1
2	6°43'	-57'	115°	6°18'	-57'	115°	5°52'	-58'	115°	5°26'	-58'	116°	5°00'	-58'	116°	4°34'	-58'	116°	4°08'	-59'	116°	2
3	5°46'	-57'	116°	5°20'	-57'	116°	4°54'	-58'	116°	4°28'	-58'	116°	4°02'	-58'	116°	3°36'	-58'	116°	3°10'	-59'	116°	3
4	4°49'	-57'	116°	4°23'	-57'	116°	3°57'	-58'	116°	3°30'	-58'	116°	3°04'	-58'	116°	2°38'	-58'	116°	2°11'	-59'	116°	4
5	3°52'	-57'	116°	3°26'	-57'	116°	2°59'	-58'	116°	2°32'	-58'	116°	2°06'	-58'	116°	1°39'	-58'	116°	1°12'	-59'	116°	5
6	2°55'	-57'	116°	2°28'	-57'	117°	2°01'	-58'	117°	1°35'	-58'	117°	1°08'	-58'	117°	0°41'	-58'	117°	0°14'	-59'	117°	6
7	1°58'	-57'	117°	1°31'	-57'	117°	1°04'	-58'	117°	0°37'	-58'	117°	0°10'	-58'	117°	0°18'	+58'	63°	0°45'	+59'	63°	7
8	1°01'	-57'	117°	0°33'	-57'	117°	0°06'	-58'	117°	0°21'	+58'	63°	0°49'	+58'	63°	1°16'	+58'	63°	1°43'	+59'	63°	8
9	0°04'	-57'	117°	0°24'	+57'	63°	0°52'	+58'	63°	1°19'	+58'	63°	1°47'	+58'	63°	2°14'	+58'	63°	2°42'	+59'	63°	9
10	0°53'	+57'	62°	1°21'	+57'	62°	1°49'	+58'	62°	2°17'	+58'	62°	2°45'	+58'	62°	3°13'	+58'	62°	3°40'	+59'	62°	10
11	1°50'	+57'	62°	2°19'	+57'	62°	2°47'	+58'	62°	3°15'	+58'	62°	3°43'	+58'	62°	4°11'	+58'	62°	4°39'	+59'	62°	11
12	2°48'	+57'	62°	3°16'	+57'	62°	3°44'	+58'	62°	4°13'	+58'	62°	4°41'	+58'	62°	5°09'	+58'	62°	5°37'	+59'	62°	12
13	3°45'	+57'	61°	4°13'	+57'	61°	4°42'	+58'	61°	5°11'	+58'	62°	5°39'	+58'	62°	6°08'	+58'	62°	6°36'	+59'	62°	13
14	4°42'	+57'	61°	5°11'	+57'	61°	5°40'	+58'	61°	6°09'	+58'	61°	6°37'	+58'	61°	7°06'	+58'	62°	7°35'	+59'	62°	14
15	5°39'	+57'	61°	6°08'	+57'	61°	6°37'	+58'	61°	7°06'	+58'	61°	7°35'	+58'	61°	8°04'	+58'	61°	8°33'	+59'	61°	15
16	6°36'	+57'	60°	7°05'	+57'	61°	7°35'	+58'	61°	8°04'	+58'	61°	8°33'	+58'	61°	9°03'	+58'	61°	9°32'	+59'	61°	16
17	7°33'	+57'	60°	8°03'	+57'	60°	8°32'	+58'	60°	9°02'	+58'	60°	9°32'	+58'	61°	10°01'	+58'	61°	10°30'	+59'	61°	17
18	8°30'	+57'	60°	9°00'	+57'	60°	9°30'	+58'	60°	10°00'	+58'	60°	10°30'	+58'	60°	10°59'	+58'	61°	11°29'	+58'	61°	18
19	9°27'	+57'	59°	9°57'	+57'	60°	10°28'	+58'	60°	10°58'	+58'	60°	11°28'	+58'	60°	11°57'	+58'	60°	12°27'	+58'	60°	19
20	10°24'	+57'	59°	10°55'	+57'	59°	11°25'	+58'	60°	11°56'	+58'	60°	12°26'	+58'	60°	12°56'	+58'	60°	13°26'	+58'	60°	20
21	11°21'	+57'	59°	11°52'	+57'	59°	12°23'	+58'	59°	12°53'	+58'	59°	13°24'	+58'	60°	13°54'	+58'	60°	14°24'	+58'	60°	21
22	12°18'	+57'	59°	12°49'	+57'	59°	13°20'	+57'	59°	13°51'	+58'	59°	14°22'	+58'	59°	14°52'	+58'	60°	15°23'	+58'	60°	22
23	13°15'	+57'	58°	13°46'	+57'	58°	14°18'	+57'	59°	14°49'	+58'	59°	15°20'	+58'	59°	15°50'	+58'	59°	16°21'	+58'	60°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	8°56'	-57'	116°	8°30'	-57'	116°	8°04'	-58'	116°	7°38'	-58'	116°	7°11'	-58'	116°	6°45'	-58'	116°	6°18'	-59'	116°	0
1	7°59'	-57'	116°	7°33'	-57'	116°	7°06'	-58'	116°	6°40'	-58'	116°	6°13'	-58'	116°	5°47'	-58'	116°	5°20'	-59'	117°	1
2	7°02'	-57'	116°	6°35'	-57'	116°	6°09'	-58'	116°	5°42'	-58'	117°	5°15'	-58'	117°	4°48'	-58'	117°	4°21'	-59'	117°	2
3	6°05'	-57'	117°	5°38'	-57'	117°	5°11'	-58'	117°	4°44'	-58'	117°	4°17'	-58'	117°	3°50'	-58'	117°	3°23'	-59'	117°	3
4	5°08'	-57'	117°	4°40'	-57'	117°	4°13'	-58'	117°	3°46'	-58'	117°	3°19'	-58'	117°	2°51'	-58'	117°	2°24'	-59'	117°	4
5	4°10'	-57'	117°	3°43'	-57'	117°	3°16'	-58'	117°	2°48'	-58'	117°	2°21'	-58'	117°	1°53'	-58'	117°	1°25'	-59'	117°	5
6	3°13'	-57'	117°	2°46'	-57'	117°	2°18'	-58'	118°	1°50'	-58'	118°	1°22'	-58'	118°	0°55'	-58'	118°	0°27'	-59'	118°	6
7	2°16'	-57'	118°	1°48'	-57'	118°	1°20'	-58'	118°	0°52'	-58'	118°	0°24'	-58'	118°	0°04'	+58'	62°	0°32'	+59'	62°	7
8	1°19'	-57'	118°	0°51'	-57'	118°	0°23'	-58'	118°	0°06'	+58'	62°	0°34'	+58'	62°	1°02'	+58'	62°	1°30'	+59'	62°	8
9	0°22'	-57'	118°	0°07'	+57'	62°	0°35'	+58'	62°	1°04'	+58'	62°	1°32'	+58'	62°	2°01'	+58'	62°	2°29'	+59'	62°	9
10	0°35'	+57'	61°	1°04'	+57'	61°	1°33'	+58'	61°	2°02'	+58'	61°	2°30'	+58'	61°	2°59'	+58'	61°	3°28'	+59'	62°	10
11	1°32'	+57'	61°	2°01'	+57'	61°	2°30'	+58'	61°	2°59'	+58'	61°	3°28'	+58'	61°	3°57'	+58'	61°	4°26'	+59'	61°	11
12	2°30'	+57'	61°	2°59'	+57'	61°	3°28'	+58'	61°	3°57'	+58'	61°	4°27'	+58'	61°	4°56'	+58'	61°	5°25'	+59'	61°	12
13	3°27'	+57'	60°	3°56'	+57'	60°	4°26'	+58'	61°	4°55'	+58'	61°	5°25'	+58'	61°	5°54'	+58'	61°	6°23'	+59'	61°	13
14	4°24'	+57'	60°	4°54'	+57'	60°	5°23'	+58'	60°	5°53'	+58'	60°	6°23'	+58'	60°	6°52'	+58'	61°	7°22'	+59'	61°	14
15	5°21'	+57'	60°	5°51'	+57'	60°	6°21'	+58'	60°	6°51'	+58'	60°	7°21'	+58'	60°	7°51'	+58'	60°	8°20'	+59'	60°	15
16	6°18'	+57'	60°	6°48'	+57'	60°	7°19'	+58'	60°	7°49'	+58'	60°	8°19'	+58'	60°	8°49'	+58'	60°	9°19'	+59'	60°	16
17	7°15'	+57'	59°	7°46'	+57'	59°	8°16'	+58'	59°	8°47'	+58'	60°	9°17'	+58'	60°	9°47'	+58'	60°	10°17'	+59'	60°	17
18	8°12'	+57'	59°	8°43'	+57'	59°	9°14'	+58'	59°	9°45'	+58'	59°	10°15'	+58'	59°	10°46'	+58'	60°	11°16'	+59'	60°	18
19	9°09'	+57'	59°	9°41'	+57'	59°	10°12'	+58'	59°	10°43'	+58'	59°	11°13'	+58'	59°	11°44'	+58'	59°	12°15'	+59'	60°	19
20	10°06'	+57'	58°	10°38'	+57'	58°	11°09'	+58'	59°	11°40'	+58'	59°	12°11'	+58'	59°	12°42'	+58'	59°	13°13'	+59'	59°	20
21	11°03'	+57'	58°	11°35'	+57'	58°	12°07'	+58'	58°	12°38'	+58'	58°	13°10'	+58'	59°	13°41'	+58'	59°	14°12'	+58'	59°	21
22	12°00'	+57'	58°	12°33'	+57'	58°	13°04'	+58'	58°	13°36'	+58'	58°	14°08'	+58'	58°	14°39'	+58'	59°	15°10'	+58'	59°	22
23	12°57'	+57'	57°	13°30'	+57'	58°	14°02'	+58'	58°	14°34'	+58'	58°	15°06'	+58'	58°	15°37'	+58'	58°	16°09'	+58'	59°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

117° 243° LHA — Latitude SAME as DECLINATION — 117° 243° 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 CONTRARY to Declination — 62° 298° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	9°14'	-57'	117°	8°48'	-57'	117°	8°20'	-58'	117°	7°53'	-58'	117°	7°26'	-58'	117°	6°59'	-58'	117°	6°31'	-59'	117°	0
1	8°17'	-57'	117°	7°50'	-57'	117°	7°23'	-58'	117°	6°55'	-58'	117°	6°28'	-58'	117°	6°00'	-58'	117°	5°33'	-59'	118°	1
2	7°20'	-57'	117°	6°53'	-57'	117°	6°25'	-58'	117°	5°57'	-58'	117°	5°30'	-58'	118°	5°02'	-58'	118°	4°34'	-59'	118°	2
3	6°23'	-57'	117°	5°55'	-57'	118°	5°27'	-58'	118°	5°00'	-58'	118°	4°32'	-58'	118°	4°04'	-58'	118°	3°35'	-59'	118°	3
4	5°26'	-57'	118°	4°58'	-57'	118°	4°30'	-58'	118°	4°02'	-58'	118°	3°33'	-58'	118°	3°05'	-58'	118°	2°37'	-59'	118°	4
5	4°29'	-57'	118°	4°00'	-57'	118°	3°32'	-58'	118°	3°04'	-58'	118°	2°35'	-58'	118°	2°07'	-58'	118°	1°38'	-59'	118°	5
6	3°31'	-57'	118°	3°03'	-57'	118°	2°34'	-58'	118°	2°06'	-58'	119°	1°37'	-58'	119°	1°08'	-58'	119°	0°40'	-59'	119°	6
7	2°34'	-57'	119°	2°05'	-57'	119°	1°37'	-58'	119°	1°08'	-58'	119°	0°39'	-58'	119°	0°10'	-58'	119°	0°19'	+59'	61°	7
8	1°37'	-57'	119°	1°08'	-57'	119°	0°39'	-58'	119°	0°10'	-58'	119°	0°19'	+58'	61°	0°48'	+58'	61°	1°18'	+59'	61°	8
9	0°40'	-57'	119°	0°10'	-57'	119°	0°19'	+58'	61°	0°48'	+58'	61°	1°18'	+58'	61°	1°47'	+58'	61°	2°16'	+59'	61°	9
10	0°17'	+57'	60°	0°47'	+57'	60°	1°17'	+58'	60°	1°46'	+58'	60°	2°16'	+58'	60°	2°45'	+58'	61°	3°15'	+59'	61°	10
11	1°15'	+57'	60°	1°44'	+57'	60°	2°14'	+58'	60°	2°44'	+58'	60°	3°14'	+58'	60°	3°44'	+58'	60°	4°13'	+59'	60°	11
12	2°12'	+57'	60°	2°42'	+57'	60°	3°12'	+58'	60°	3°42'	+58'	60°	4°12'	+58'	60°	4°42'	+58'	60°	5°12'	+59'	60°	12
13	3°09'	+57'	59°	3°39'	+57'	60°	4°10'	+58'	60°	4°40'	+58'	60°	5°10'	+58'	60°	5°41'	+58'	60°	6°11'	+59'	60°	13
14	4°06'	+57'	59°	4°37'	+57'	59°	5°07'	+58'	59°	5°38'	+58'	59°	6°09'	+58'	60°	6°39'	+58'	60°	7°09'	+59'	60°	14
15	5°03'	+57'	59°	5°34'	+57'	59°	6°05'	+58'	59°	6°36'	+58'	59°	7°07'	+58'	59°	7°37'	+58'	59°	8°08'	+59'	59°	15
16	6°00'	+57'	59°	6°32'	+57'	59°	7°03'	+58'	59°	7°34'	+58'	59°	8°05'	+58'	59°	8°36'	+58'	59°	9°06'	+59'	59°	16
17	6°58'	+57'	58°	7°29'	+57'	58°	8°01'	+58'	59°	8°32'	+58'	59°	9°03'	+58'	59°	9°34'	+58'	59°	10°05'	+59'	59°	17
18	7°55'	+57'	58°	8°27'	+57'	58°	8°58'	+58'	58°	9°30'	+58'	58°	10°01'	+58'	59°	10°32'	+58'	59°	11°04'	+59'	59°	18
19	8°52'	+57'	58°	9°24'	+57'	58°	9°56'	+58'	58°	10°28'	+58'	58°	10°59'	+58'	58°	11°31'	+58'	58°	12°02'	+59'	59°	19
20	9°49'	+57'	57°	10°21'	+57'	58°	10°54'	+58'	58°	11°26'	+58'	58°	11°57'	+58'	58°	12°29'	+58'	58°	13°01'	+59'	58°	20
21	10°46'	+57'	57°	11°19'	+57'	57°	11°51'	+58'	57°	12°23'	+58'	58°	12°56'	+58'	58°	13°27'	+58'	58°	13°59'	+59'	58°	21
22	11°43'	+57'	57°	12°16'	+57'	57°	12°49'	+58'	57°	13°21'	+58'	57°	13°54'	+58'	57°	14°26'	+58'	58°	14°58'	+59'	58°	22
23	12°40'	+57'	56°	13°13'	+57'	57°	13°46'	+58'	57°	14°19'	+58'	57°	14°52'	+58'	57°	15°24'	+58'	57°	15°56'	+58'	58°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	9°33'	-57'	118°	9°05'	-57'	118°	8°37'	-58'	118°	8°09'	-58'	118°	7°41'	-58'	118°	7°13'	-58'	118°	6°44'	-59'	118°	0
1	8°35'	-57'	118°	8°07'	-57'	118°	7°39'	-58'	118°	7°11'	-58'	118°	6°43'	-58'	118°	6°14'	-58'	118°	5°46'	-59'	118°	1
2	7°38'	-57'	118°	7°10'	-57'	118°	6°42'	-58'	118°	6°13'	-58'	118°	5°44'	-58'	119°	5°16'	-58'	119°	4°47'	-59'	119°	2
3	6°41'	-57'	118°	6°12'	-57'	119°	5°44'	-58'	119°	5°15'	-58'	119°	4°46'	-58'	119°	4°17'	-58'	119°	3°48'	-59'	119°	3
4	5°44'	-57'	119°	5°15'	-57'	119°	4°46'	-58'	119°	4°17'	-58'	119°	3°48'	-58'	119°	3°19'	-58'	119°	2°50'	-59'	119°	4
5	4°47'	-57'	119°	4°17'	-58'	119°	3°48'	-58'	119°	3°19'	-58'	119°	2°50'	-58'	119°	2°20'	-58'	119°	1°51'	-59'	119°	5
6	3°49'	-57'	119°	3°20'	-58'	119°	2°51'	-58'	119°	2°21'	-58'	119°	1°51'	-58'	120°	1°22'	-58'	120°	0°52'	-59'	120°	6
7	2°52'	-57'	120°	2°22'	-58'	120°	1°53'	-58'	120°	1°23'	-58'	120°	0°53'	-58'	120°	0°23'	-58'	120°	0°06'	+59'	60°	7
8	1°55'	-57'	120°	1°25'	-58'	120°	0°55'	-58'	120°	0°25'	-58'	120°	0°05'	+58'	60°	0°35'	+58'	60°	1°05'	+59'	60°	8
9	0°58'	-57'	120°	0°27'	-58'	120°	0°03'	+58'	60°	0°33'	+58'	60°	1°03'	+58'	60°	1°33'	+58'	60°	2°04'	+59'	60°	9
10	0°00'	-57'	121°	0°30'	+58'	59°	1°01'	+58'	59°	1°31'	+58'	60°	2°01'	+58'	60°	2°32'	+58'	60°	3°02'	+59'	60°	10
11	0°57'	+57'	59°	1°28'	+58'	59°	1°58'	+58'	59°	2°29'	+58'	59°	3°00'	+58'	59°	3°30'	+58'	59°	4°01'	+59'	59°	11
12	1°54'	+57'	59°	2°25'	+58'	59°	2°56'	+58'	59°	3°27'	+58'	59°	3°58'	+58'	59°	4°29'	+58'	59°	5°00'	+59'	59°	12
13	2°51'	+57'	59°	3°23'	+58'	59°	3°54'	+58'	59°	4°25'	+58'	59°	4°56'	+58'	59°	5°27'	+58'	59°	5°58'	+59'	59°	13
14	3°49'	+57'	58°	4°20'	+57'	58°	4°52'	+58'	58°	5°23'	+58'	58°	5°54'	+58'	59°	6°26'	+58'	59°	6°57'	+59'	59°	14
15	4°46'	+57'	58°	5°18'	+57'	58°	5°49'	+58'	58°	6°21'	+58'	58°	6°53'	+58'	58°	7°24'	+58'	58°	7°55'	+59'	59°	15
16	5°43'	+57'	58°	6°15'	+57'	58°	6°47'	+58'	58°	7°19'	+58'	58°	7°51'	+58'	58°	8°22'	+58'	58°	8°54'	+59'	58°	16
17	6°40'	+57'	57°	7°13'	+57'	57°	7°45'	+58'	58°	8°17'	+58'	58°	8°49'	+58'	58°	9°21'	+58'	58°	9°53'	+59'	58°	17
18	7°37'	+57'	57°	8°10'	+57'	57°	8°43'	+58'	57°	9°15'	+58'	57°	9°47'	+58'	58°	10°19'	+58'	58°	10°51'	+59'	58°	18
19	8°35'	+57'	57°	9°08'	+57'	57°	9°40'	+58'	57°	10°13'	+58'	57°	10°45'	+58'	57°	11°18'	+58'	57°	11°50'	+59'	58°	19
20	9°32'	+57'	56°	10°05'	+57'	57°	10°38'	+58'	57°	11°11'	+58'	57°	11°43'	+58'	57°	12°16'	+58'	57°	12°48'	+59'	57°	20
21	10°29'	+57'	56°	11°02'	+57'	56°	11°36'	+58'	56°	12°09'	+58'	57°	12°42'	+58'	57°	13°14'	+58'	57°	13°47'	+59'	57°	21
22	11°26'	+57'	56°	12°00'	+57'	56°	12°33'	+58'	56°	13°07'	+58'	56°	13°40'	+58'	57°	14°13'	+58'	57°	14°45'	+59'	57°	22
23	12°23'	+57'	56°	12°57'	+57'	56°	13°31'	+58'	56°	14°04'	+58'	56°	14°38'	+58'	56°	15°11'	+58'	57°	15°44'	+59'	57°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	9°51'	-57'	118°	9°22'	-58'	119°	8°53'	-58'	119°	8°24'	-58'	119°	7°55'	-58'	119°	7°26'	-58'	119°	6°57'	-59'	119°	0
1	8°54'	-57'	119°	8°25'	-58'	119°	7°56'	-58'	119°	7°26'	-58'	119°	6°57'	-58'	119°	6°28'	-58'	119°	5°58'	-59'	119°	1
2	7°56'	-57'	119°	7°27'	-58'	119°	6°58'	-58'	119°	6°28'	-58'	119°	5°59'	-58'	120°	5°29'	-58'	120°	5°00'	-59'	120°	2
3	6°59'	-57'	119°	6°30'	-58'	119°	6°00'	-58'	120°	5°30'	-58'	120°	5°01'	-58'	120°	4°31'	-58'	120°	4°01'	-59'	120°	3
4	6°02'	-57'	120°	5°32'	-58'	120°	5°02'	-58'	120°	4°32'	-58'	120°	4°02'	-58'	120°	3°32'	-58'	120°	3°02'	-59'	120°	4
5	5°05'	-57'	120°	4°34'	-58'	120°	4°04'	-58'	120°	3°34'	-58'	120°	3°04'	-58'	120°	2°34'	-58'	120°	2°04'	-59'	120°	5
6	4°07'	-57'	120°	3°37'	-58'	120°	3°07'	-58'	120°	2°36'	-58'	120°	2°06'	-58'	120°	1°35'	-58'	121°	1°05'	-59'	121°	6
7	3°10'	-57'	121°	2°39'	-58'	121°	2°09'	-58'	121°	1°38'	-58'	121°	1°08'	-58'	121°	0°37'	-58'	121°	0°06'	-59'	121°	7
8	2°13'	-57'	121°	1°42'	-58'	121°	1°11'	-58'	121°	0°40'	-58'	121°	0°09'	-58'	121°	0°22'	+58'	59°	0°52'	+59'	59°	8
9	1°15'	-57'	121°	0°44'	-58'	121°	0°13'	-58'	121°	0°18'	+58'	59°	0°49'	+58'	59°	1°20'	+58'	59°	1°51'	+59'	59°	9
10	0°18'	-57'	121°	0°13'	+58'	59°	0°45'	+58'	59°	1°16'	+58'	59°	1°47'	+58'	59°	2°19'	+58'	59°	2°50'	+59'	59°	10
11	0°39'	+57'	58°	1°11'	+58'	58°	1°42'	+58'	58°	2°14'	+58'	58°	2°46'	+58'	58°	3°17'	+58'	58°	3°48'	+59'	58°	11
12	1°37'	+57'	58°	2°08'	+58'	58°	2°40'	+58'	58°	3°12'	+58'	58°	3°44'	+58'	58°	4°15'	+58'	58°	4°47'	+59'	58°	12
13	2°34'	+57'	58°	3°06'	+58'	58°	3°38'	+58'	58°	4°10'	+58'	58°	4°42'	+58'	58°	5°14'	+58'	58°	5°46'	+59'	58°	13
14	3°31'	+57'	57°	4°04'	+58'	57°	4°36'	+58'	57°	5°08'	+58'	58°	5°40'	+58'	58°	6°12'	+58'	58°	6°44'	+59'	58°	14
15	4°29'	+57'	57°	5°01'	+58'	57°	5°34'	+58'	57°	6°06'	+58'	57°	6°39'	+58'	57°	7°11'	+58'	57°	7°43'	+59'	58°	15
16	5°26'	+57'	57°	5°59'	+58'	57°	6°31'	+58'	57°	7°04'	+58'	57°	7°37'	+58'	57°	8°09'	+58'	57°	8°42'	+59'	57°	16
17	6°23'	+57'	56°	6°56'	+58'	57°	7°29'	+58'	57°	8°02'	+58'	57°	8°35'	+58'	57°	9°08'	+58'	57°	9°40'	+59'	57°	17
18	7°20'	+57'	56°	7°54'	+58'	56°	8°27'	+58'	56°	9°00'	+58'	57°	9°33'	+58'	57°	10°06'	+58'	57°	10°39'	+59'	57°	18
19	8°18'	+57'	56°	8°51'	+57'	56°	9°25'	+58'	56°	9°58'	+58'	56°	10°31'	+58'	56°	11°05'	+58'	57°	11°38'	+59'	57°	19
20	9°15'	+57'	56°	9°49'	+57'	56°	10°23'	+58'	56°	10°56'	+58'	56°	11°30'	+58'	56°	12°03'	+58'	56°	12°36'	+59'	57°	20
21	10°12'	+57'	55°	10°46'	+57'	55°	11°20'	+58'	56°	11°54'	+58'	56°	12°28'	+58'	56°	13°01'	+58'	56°	13°35'	+59'	56°	21
22	11°09'	+57'	55°	11°44'	+57'	55°	12°18'	+58'	55°	12°52'	+58'	55°	13°26'	+58'	56°	14°00'	+58'	56°	14°33'	+59'	56°	22
23	12°06'	+57'	55°	12°41'	+57'	55°	13°16'	+58'	55°	13°50'	+58'	55°	14°24'	+58'	55°	14°58'	+58'	56°	15°32'	+59'	56°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	10°09'	-57'	119°	9°39'	-58'	120°	9°09'	-58'	120°	8°40'	-58'	120°	8°10'	-58'	120°	7°40'	-58'	120°	7°09'	-59'	120°	0
1	9°11'	-57'	120°	8°42'	-58'	120°	8°12'	-58'	120°	7°42'	-58'	120°	7°11'	-58'	120°	6°41'	-58'	120°	6°11'	-59'	120°	1
2	8°14'	-57'	120°	7°44'	-58'	120°	7°14'	-58'	120°	6°44'	-58'	120°	6°13'	-58'	120°	5°43'	-58'	121°	5°12'	-59'	121°	2
3	7°17'	-57'	120°	6°46'	-58'	120°	6°16'	-58'	121°	5°45'	-58'	121°	5°15'	-58'	121°	4°44'	-58'	121°	4°13'	-59'	121°	3
4	6°20'	-57'	121°	5°49'	-58'	121°	5°18'	-58'	121°	4°47'	-58'	121°	4°17'	-58'	121°	3°46'	-58'	121°	3°15'	-59'	121°	4
5	5°22'	-57'	121°	4°51'	-58'	121°	4°20'	-58'	121°	3°49'	-58'	121°	3°18'	-58'	121°	2°47'	-59'	121°	2°16'	-59'	121°	5
6	4°25'	-57'	121°	3°54'	-58'	121°	3°23'	-58'	121°	2°51'	-58'	121°	2°20'	-58'	121°	1°49'	-59'	121°	1°17'	-59'	121°	6
7	3°27'	-57'	122°	2°56'	-58'	122°	2°25'	-58'	122°	1°53'	-58'	122°	1°22'	-58'	122°	0°50'	-59'	122°	0°19'	-59'	122°	7
8	2°30'	-57'	122°	1°58'	-58'	122°	1°27'	-58'	122°	0°55'	-58'	122°	0°23'	-58'	122°	0°08'	+59'	58°	0°40'	+59'	58°	8
9	1°33'	-57'	122°	1°01'	-58'	122°	0°29'	-58'	122°	0°03'	+58'	58°	0°35'	+58'	58°	1°07'	+59'	58°	1°39'	+59'	58°	9
10	0°35'	-57'	122°	0°03'	-58'	122°	0°29'	+58'	58°	1°01'	+58'	58°	1°33'	+58'	58°	2°05'	+59'	58°	2°37'	+59'	58°	10
11	0°22'	+57'	57°	0°54'	+58'	57°	1°27'	+58'	57°	1°59'	+58'	57°	2°32'	+58'	57°	3°04'	+58'	57°	3°36'	+59'	57°	11
12	1°19'	+57'	57°	1°52'	+58'	57°	2°25'	+58'	57°	2°57'	+58'	57°	3°30'	+58'	57°	4°02'	+58'	57°	4°35'	+59'	57°	12
13	2°17'	+57'	57°	2°50'	+58'	57°	3°22'	+58'	57°	3°55'	+58'	57°	4°28'	+58'	57°	5°01'	+58'	57°	5°34'	+59'	57°	13
14	3°14'	+57'	56°	3°47'	+58'	56°	4°20'	+58'	57°	4°53'	+58'	57°	5°26'	+58'	57°	5°59'	+58'	57°	6°32'	+59'	57°	14
15	4°11'	+57'	56°	4°45'	+58'	56°	5°18'	+58'	56°	5°51'	+58'	56°	6°25'	+58'	56°	6°58'	+58'	57°	7°31'	+59'	57°	15
16	5°09'	+57'	56°	5°42'	+58'	56°	6°16'	+58'	56°	6°50'	+58'	56°	7°23'	+58'	56°	7°56'	+58'	56°	8°30'	+59'	56°	16
17	6°06'	+57'	56°	6°40'	+58'	56°	7°14'	+58'	56°	7°48'	+58'	56°	8°21'	+58'	56°	8°55'	+58'	56°	9°28'	+59'	56°	17
18	7°03'	+57'	55°	7°38'	+58'	55°	8°12'	+58'	55°	8°46'	+58'	56°	9°19'	+58'	56°	9°53'	+58'	56°	10°27'	+59'	56°	18
19	8°01'	+57'	55°	8°35'	+58'	55°	9°09'	+58'	55°	9°44'	+58'	55°	10°18'	+58'	55°	10°52'	+58'	56°	11°26'	+59'	56°	19
20	8°58'	+57'	55°	9°33'	+58'	55°	10°07'	+58'	55°	10°42'	+58'	55°	11°16'	+58'	55°	11°50'	+58'	55°	12°24'	+59'	56°	20
21	9°55'	+57'	54°	10°30'	+58'	54°	11°05'	+58'	55°	11°40'	+58'	55°	12°14'	+58'	55°	12°49'	+58'	55°	13°23'	+59'	55°	21
22	10°53'	+57'	54°	11°28'	+58'	54°	12°03'	+58'	54°	12°38'	+58'	55°	13°12'	+58'	55°	13°47'	+58'	55°	14°21'	+59'	55°	22
23	11°50'	+57'	54°	12°25'	+57'	54°	13°01'	+58'	54°	13°36'	+58'	54°	14°11'	+58'	54°	14°45'	+58'	55°	15°20'	+59'	55°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

121° 239° LHA — Latitude SAME as DECLINATION — 121° 239° LHA

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

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

58° 302° LHA — Latitude CONTRARY to Declination — 58° 302° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	10°27' -57' 120°	9°56' -58' 121°	9°25' -58' 121°	8°55' -58' 121°	8°24' -58' 121°	7°53' -59' 121°	7°22' -59' 121°	0
1	9°29' -57' 121°	8°58' -58' 121°	8°28' -58' 121°	7°57' -58' 121°	7°26' -58' 121°	6°54' -59' 121°	6°23' -59' 121°	1
2	8°32' -57' 121°	8°01' -58' 121°	7°30' -58' 121°	6°59' -58' 121°	6°27' -58' 121°	5°56' -59' 122°	5°25' -59' 122°	2
3	7°34' -57' 121°	7°03' -58' 121°	6°32' -58' 122°	6°00' -58' 122°	5°29' -58' 122°	4°57' -59' 122°	4°26' -59' 122°	3
4	6°37' -57' 122°	6°06' -58' 122°	5°34' -58' 122°	5°02' -58' 122°	4°31' -58' 122°	3°59' -59' 122°	3°27' -59' 122°	4
5	5°40' -57' 122°	5°08' -58' 122°	4°36' -58' 122°	4°04' -58' 122°	3°32' -58' 122°	3°00' -59' 122°	2°28' -59' 122°	5
6	4°42' -57' 122°	4°10' -58' 122°	3°38' -58' 122°	3°06' -58' 122°	2°34' -58' 122°	2°02' -59' 122°	1°30' -59' 122°	6
7	3°45' -57' 122°	3°13' -58' 123°	2°40' -58' 123°	2°08' -58' 123°	1°36' -58' 123°	1°03' -59' 123°	0°31' -59' 123°	7
8	2°47' -57' 123°	2°15' -58' 123°	1°42' -58' 123°	1°10' -58' 123°	0°37' -58' 123°	0°05' -59' 123°	0°28' +59' 57°	8
9	1°50' -57' 123°	1°17' -58' 123°	0°45' -58' 123°	0°12' -58' 123°	0°21' +58' 57°	0°54' +59' 57°	1°27' +59' 57°	9
10	0°53' -57' 123°	0°20' -58' 123°	0°13' +58' 57°	0°46' +58' 57°	1°19' +58' 57°	1°52' +59' 57°	2°25' +59' 57°	10
11	0°05' +57' 56°	0°38' +58' 56°	1°11' +58' 56°	1°44' +58' 56°	2°18' +58' 56°	2°51' +59' 56°	3°24' +59' 57°	11
12	1°02' +57' 56°	1°36' +58' 56°	2°09' +58' 56°	2°43' +58' 56°	3°16' +58' 56°	3°49' +59' 56°	4°23' +59' 56°	12
13	2°00' +57' 56°	2°33' +58' 56°	3°07' +58' 56°	3°41' +58' 56°	4°14' +58' 56°	4°48' +59' 56°	5°21' +59' 56°	13
14	2°57' +57' 55°	3°31' +58' 56°	4°05' +58' 56°	4°39' +58' 56°	5°13' +58' 56°	5°46' +59' 56°	6°20' +59' 56°	14
15	3°54' +57' 55°	4°29' +58' 55°	5°03' +58' 55°	5°37' +58' 55°	6°11' +58' 55°	6°45' +59' 56°	7°19' +59' 56°	15
16	4°52' +57' 55°	5°26' +58' 55°	6°01' +58' 55°	6°35' +58' 55°	7°09' +58' 55°	7°43' +59' 55°	8°18' +59' 55°	16
17	5°49' +57' 55°	6°24' +58' 55°	6°59' +58' 55°	7°33' +58' 55°	8°08' +58' 55°	8°42' +58' 55°	9°16' +59' 55°	17
18	6°47' +57' 54°	7°22' +58' 54°	7°56' +58' 55°	8°31' +58' 55°	9°06' +58' 55°	9°40' +58' 55°	10°15' +59' 55°	18
19	7°44' +57' 54°	8°19' +58' 54°	8°54' +58' 54°	9°29' +58' 54°	10°04' +58' 55°	10°39' +58' 55°	11°14' +59' 55°	19
20	8°41' +57' 54°	9°17' +58' 54°	9°52' +58' 54°	10°27' +58' 54°	11°02' +58' 54°	11°37' +58' 54°	12°12' +59' 55°	20
21	9°39' +57' 53°	10°14' +58' 54°	10°50' +58' 54°	11°25' +58' 54°	12°01' +58' 54°	12°36' +58' 54°	13°11' +59' 54°	21
22	10°36' +57' 53°	11°12' +58' 53°	11°48' +58' 53°	12°23' +58' 54°	12°59' +58' 54°	13°34' +58' 54°	14°10' +59' 54°	22
23	11°33' +57' 53°	12°10' +58' 53°	12°46' +58' 53°	13°22' +58' 53°	13°57' +58' 54°	14°33' +58' 54°	15°08' +59' 54°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

122° 238° LHA — Latitude SAME as DECLINATION — 122° 238° LHA

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

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

57° 303° LHA — Latitude CONTRARY to Declination — 57° 303° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	10°44' -57' 121°	10°13' -58' 122°	9°41' -58' 122°	9°10' -58' 122°	8°38' -58' 122°	8°06' -59' 122°	7°34' -59' 122°	0
1	1°14' -57' 122°	1°12' -58' 122°	1°11' -58' 122°	1°09' -58' 122°	1°07' -58' 122°	1°05' -59' 122°	1°04' -59' 122°	1
2	8°49' -57' 122°	8°17' -58' 122°	7°46' -58' 122°	7°13' -58' 122°	6°41' -58' 122°	6°09' -59' 123°	5°37' -59' 123°	2
3	7°52' -57' 122°	7°20' -58' 122°	6°48' -58' 122°	6°15' -58' 123°	5°43' -58' 123°	5°11' -59' 123°	4°38' -59' 123°	3
4	6°54' -57' 123°	6°22' -58' 123°	5°50' -58' 123°	5°17' -58' 123°	4°45' -58' 123°	4°12' -59' 123°	3°39' -59' 123°	4
5	5°57' -57' 123°	5°24' -58' 123°	4°52' -58' 123°	4°19' -58' 123°	3°46' -58' 123°	3°13' -59' 123°	2°41' -59' 123°	5
6	5°00' -57' 123°	4°27' -58' 123°	3°54' -58' 123°	3°21' -58' 123°	2°48' -58' 123°	2°15' -59' 123°	1°42' -59' 123°	6
7	4°02' -57' 123°	3°29' -58' 123°	2°56' -58' 124°	2°23' -58' 124°	1°50' -58' 124°	1°16' -59' 124°	0°43' -59' 124°	7
8	3°05' -57' 124°	2°31' -58' 124°	1°58' -58' 124°	1°25' -58' 124°	0°51' -58' 124°	0°18' -59' 124°	0°16' +59' 56°	8
9	2°07' -57' 124°	1°34' -58' 124°	1°00' -58' 124°	0°26' -58' 124°	0°07' +58' 56°	0°41' +59' 56°	1°14' +59' 56°	9
10	1°10' -57' 124°	0°36' -58' 124°	0°02' -58' 124°	0°32' +58' 56°	1°06' +58' 56°	1°39' +59' 56°	2°13' +59' 56°	10
11	0°12' -57' 125°	0°22' +58' 55°	0°56' +58' 55°	1°30' +58' 55°	2°04' +58' 55°	2°38' +59' 56°	3°12' +59' 56°	11
12	0°45' +57' 55°	1°20' +58' 55°	1°54' +58' 55°	2°28' +58' 55°	3°02' +58' 55°	3°37' +59' 55°	4°11' +59' 55°	12
13	1°43' +57' 55°	2°17' +58' 55°	2°52' +58' 55°	3°26' +58' 55°	4°01' +58' 55°	4°35' +59' 55°	5°09' +59' 55°	13
14	2°40' +57' 55°	3°15' +58' 55°	3°50' +58' 55°	4°24' +58' 55°	4°59' +58' 55°	5°34' +59' 55°	6°08' +59' 55°	14
15	3°38' +57' 54°	4°13' +58' 54°	4°48' +58' 54°	5°23' +58' 54°	5°57' +58' 55°	6°32' +59' 55°	7°07' +59' 55°	15
16	4°35' +57' 54°	5°10' +58' 54°	5°46' +58' 54°	6°21' +58' 54°	6°56' +58' 54°	7°31' +59' 54°	8°06' +59' 55°	16
17	5°33' +57' 54°	6°08' +58' 54°	6°44' +58' 54°	7°19' +58' 54°	7°54' +58' 54°	8°29' +59' 54°	9°04' +59' 54°	17
18	6°30' +57' 53°	7°06' +58' 53°	7°41' +58' 54°	8°17' +58' 54°	8°52' +58' 54°	9°28' +59' 54°	10°03' +59' 54°	18
19	7°27' +57' 53°	8°03' +58' 53°	8°39' +58' 53°	9°15' +58' 53°	9°51' +58' 54°	10°26' +59' 54°	11°02' +59' 54°	19
20	8°25' +57' 53°	9°01' +58' 53°	9°37' +58' 53°	10°13' +58' 53°	10°49' +58' 53°	11°25' +59' 54°	12°00' +59' 54°	20
21	9°22' +57' 53°	9°59' +58' 53°	10°35' +58' 53°	11°11' +58' 53°	11°47' +58' 53°	12°23' +58' 53°	12°59' +59' 53°	21
22	10°20' +57' 52°	10°56' +58' 52°	11°33' +58' 53°	12°09' +58' 53°	12°46' +58' 53°	13°22' +58' 53°	13°58' +59' 53°	22
23	11°17' +57' 52°	11°54' +58' 52°	12°31' +58' 52°	13°08' +58' 52°	13°44' +58' 53°	14°20' +58' 53°	14°57' +59' 53°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	11°02'	-57'	122°	10°29'	-58'	123°	9°57'	-58'	123°	9°25'	-58'	123°	8°52'	-58'	123°	8°19'	-59'	123°	7°46'	-59'	123°	0
1	10°04'	-57'	123°	9°32'	-58'	123°	8°59'	-58'	123°	8°26'	-58'	123°	7°54'	-58'	123°	7°21'	-59'	123°	6°48'	-59'	123°	1
2	9°07'	-57'	123°	8°34'	-58'	123°	8°01'	-58'	123°	7°28'	-58'	123°	6°55'	-58'	123°	6°22'	-59'	124°	5°49'	-59'	124°	2
3	8°09'	-57'	123°	7°36'	-58'	123°	7°03'	-58'	123°	6°30'	-58'	124°	5°57'	-58'	124°	5°24'	-59'	124°	4°50'	-59'	124°	3
4	7°12'	-58'	124°	6°38'	-58'	124°	6°05'	-58'	124°	5°32'	-58'	124°	4°58'	-58'	124°	4°25'	-59'	124°	3°51'	-59'	124°	4
5	6°14'	-58'	124°	5°41'	-58'	124°	5°07'	-58'	124°	4°34'	-58'	124°	4°00'	-58'	124°	3°26'	-59'	124°	2°53'	-59'	124°	5
6	5°17'	-58'	124°	4°43'	-58'	124°	4°09'	-58'	124°	3°35'	-58'	124°	3°02'	-58'	124°	2°28'	-59'	124°	1°54'	-59'	124°	6
7	4°19'	-58'	124°	3°45'	-58'	124°	3°11'	-58'	124°	2°37'	-58'	125°	2°03'	-58'	125°	1°29'	-59'	125°	0°55'	-59'	125°	7
8	3°22'	-58'	125°	2°47'	-58'	125°	2°13'	-58'	125°	1°39'	-58'	125°	1°05'	-58'	125°	0°31'	-59'	125°	0°04'	+59'	55°	8
9	2°24'	-58'	125°	1°50'	-58'	125°	1°15'	-58'	125°	0°41'	-58'	125°	0°06'	-58'	125°	0°28'	+59'	55°	1°02'	+59'	55°	9
10	1°27'	-58'	125°	0°52'	-58'	125°	0°17'	-58'	125°	0°17'	+58'	55°	0°52'	+58'	55°	1°27'	+59'	55°	2°01'	+59'	55°	10
11	0°29'	-58'	126°	0°06'	+58'	54°	0°41'	+58'	54°	1°16'	+58'	54°	1°50'	+58'	55°	2°25'	+59'	55°	3°00'	+59'	55°	11
12	0°29'	+58'	54°	1°04'	+58'	54°	1°39'	+58'	54°	2°14'	+58'	54°	2°49'	+58'	54°	3°24'	+59'	54°	3°59'	+59'	54°	12
13	1°26'	+58'	54°	2°01'	+58'	54°	2°37'	+58'	54°	3°12'	+58'	54°	3°47'	+58'	54°	4°22'	+59'	54°	4°58'	+59'	54°	13
14	2°24'	+58'	54°	2°59'	+58'	54°	3°35'	+58'	54°	4°10'	+58'	54°	4°46'	+58'	54°	5°21'	+59'	54°	5°56'	+59'	54°	14
15	3°21'	+58'	53°	3°57'	+58'	53°	4°33'	+58'	53°	5°08'	+58'	54°	5°44'	+58'	54°	6°20'	+59'	54°	6°55'	+59'	54°	15
16	4°19'	+58'	53°	4°55'	+58'	53°	5°31'	+58'	53°	6°07'	+58'	53°	6°42'	+58'	53°	7°18'	+59'	53°	7°54'	+59'	54°	16
17	5°16'	+58'	53°	5°52'	+58'	53°	6°29'	+58'	53°	7°05'	+58'	53°	7°41'	+58'	53°	8°17'	+59'	53°	8°53'	+59'	53°	17
18	6°14'	+58'	52°	6°50'	+58'	53°	7°27'	+58'	53°	8°03'	+58'	53°	8°39'	+58'	53°	9°15'	+59'	53°	9°51'	+59'	53°	18
19	7°11'	+57'	52°	7°48'	+58'	52°	8°25'	+58'	52°	9°01'	+58'	53°	9°38'	+58'	53°	10°14'	+59'	53°	10°50'	+59'	53°	19
20	8°09'	+57'	52°	8°46'	+58'	52°	9°23'	+58'	52°	9°59'	+58'	52°	10°36'	+58'	52°	11°12'	+59'	53°	11°49'	+59'	53°	20
21	9°06'	+57'	52°	9°43'	+58'	52°	10°20'	+58'	52°	10°57'	+58'	52°	11°34'	+58'	52°	12°11'	+59'	52°	12°48'	+59'	53°	21
22	10°04'	+57'	51°	10°41'	+58'	51°	11°18'	+58'	52°	11°56'	+58'	52°	12°33'	+58'	52°	13°10'	+59'	52°	13°46'	+59'	52°	22
23	11°01'	+57'	51°	11°39'	+58'	51°	12°16'	+58'	51°	12°54'	+58'	52°	13°31'	+58'	52°	14°08'	+59'	52°	14°45'	+59'	52°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	11°19'	-58'	123°	10°46'	-58'	124°	10°13'	-58'	124°	9°39'	-58'	124°	9°06'	-58'	124°	8°32'	-59'	124°	7°59'	-59'	124°	0
1	10°21'	-58'	124°	9°48'	-58'	124°	9°15'	-58'	124°	8°41'	-58'	124°	8°07'	-58'	124°	7°34'	-59'	124°	7°00'	-59'	124°	1
2	9°24'	-58'	124°	8°50'	-58'	124°	8°17'	-58'	124°	7°43'	-58'	124°	7°09'	-58'	124°	6°35'	-59'	125°	6°01'	-59'	125°	2
3	8°26'	-58'	124°	7°52'	-58'	124°	7°19'	-58'	124°	6°45'	-58'	125°	6°11'	-58'	125°	5°36'	-59'	125°	5°02'	-59'	125°	3
4	7°29'	-58'	124°	6°55'	-58'	125°	6°21'	-58'	125°	5°46'	-58'	125°	5°12'	-58'	125°	4°38'	-59'	125°	4°03'	-59'	125°	4
5	6°31'	-58'	125°	5°57'	-58'	125°	5°23'	-58'	125°	4°48'	-58'	125°	4°14'	-58'	125°	3°39'	-59'	125°	3°05'	-59'	125°	5
6	5°34'	-58'	125°	4°59'	-58'	125°	4°24'	-58'	125°	3°50'	-58'	125°	3°15'	-58'	125°	2°41'	-59'	125°	2°06'	-59'	125°	6
7	4°36'	-58'	125°	4°01'	-58'	125°	3°26'	-58'	125°	2°52'	-58'	126°	2°17'	-58'	126°	1°42'	-59'	126°	1°07'	-59'	126°	7
8	3°38'	-58'	126°	3°03'	-58'	126°	2°28'	-58'	126°	1°53'	-58'	126°	1°18'	-58'	126°	0°43'	-59'	126°	0°08'	-59'	126°	8
9	2°41'	-58'	126°	2°06'	-58'	126°	1°30'	-58'	126°	0°55'	-58'	126°	0°20'	-58'	126°	0°15'	+59'	54°	0°51'	+59'	54°	9
10	1°43'	-58'	126°	1°08'	-58'	126°	0°32'	-58'	126°	0°03'	+58'	54°	0°39'	+58'	54°	1°14'	+59'	54°	1°49'	+59'	54°	10
11	0°46'	-58'	126°	0°10'	-58'	126°	0°26'	+58'	54°	1°01'	+58'	54°	1°37'	+58'	54°	2°13'	+59'	54°	2°48'	+59'	54°	11
12	0°12'	+58'	53°	0°48'	+58'	53°	1°24'	+58'	53°	2°00'	+58'	53°	2°35'	+58'	53°	3°11'	+59'	53°	3°47'	+59'	53°	12
13	1°10'	+58'	53°	1°46'	+58'	53°	2°22'	+58'	53°	2°58'	+58'	53°	3°34'	+58'	53°	4°10'	+59'	53°	4°46'	+59'	53°	13
14	2°07'	+58'	53°	2°44'	+58'	53°	3°20'	+58'	53°	3°56'	+58'	53°	4°32'	+58'	53°	5°09'	+59'	53°	5°45'	+59'	53°	14
15	3°05'	+58'	52°	3°41'	+58'	52°	4°18'	+58'	53°	4°54'	+58'	53°	5°31'	+58'	53°	6°07'	+59'	53°	6°43'	+59'	53°	15
16	4°02'	+58'	52°	4°39'	+58'	52°	5°16'	+58'	52°	5°53'	+58'	52°	6°29'	+58'	52°	7°06'	+59'	53°	7°42'	+59'	53°	16
17	5°00'	+58'	52°	5°37'	+58'	52°	6°14'	+58'	52°	6°51'	+58'	52°	7°28'	+58'	52°	8°04'	+59'	52°	8°41'	+59'	52°	17
18	5°58'	+58'	52°	6°35'	+58'	52°	7°12'	+58'	52°	7°49'	+58'	52°	8°26'	+58'	52°	9°03'	+59'	52°	9°40'	+59'	52°	18
19	6°55'	+58'	51°	7°33'	+58'	51°	8°10'	+58'	51°	8°47'	+58'	52°	9°25'	+58'	52°	10°02'	+59'	52°	10°39'	+59'	52°	19
20	7°53'	+58'	51°	8°30'	+58'	51°	9°08'	+58'	51°	9°45'	+58'	51°	10°23'	+58'	51°	11°00'	+59'	52°	11°37'	+59'	52°	20
21	8°50'	+58'	51°	9°28'	+58'	51°	10°06'	+58'	51°	10°44'	+58'	51°	11°21'	+58'	51°	11°59'	+59'	51°	12°36'	+59'	52°	21
22	9°48'	+58'	50°	10°26'	+58'	51°	11°04'	+58'	51°	11°42'	+58'	51°	12°20'	+58'	51°	12°57'	+59'	51°	13°35'	+59'	51°	22
23	10°45'	+58'	50°	11°24'	+58'	50°	12°02'	+58'	50°	12°40'	+58'	51°	13°18'	+58'	51°	13°56'	+59'	51°	14°34'	+59'	51°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

125° 235° LHA — Latitude SAME as DECLINATION — 125° 235° LHA

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

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

54° 306° LHA — Latitude CONTRARY to Declination — 54° 306° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	11°36' -58' 124°	11°02' -58' 124°	10°28' -58' 125°	9°54' -58' 125°	9°19' -58' 125°	8°45' -59' 125°	8°11' -59' 125°	0
1	10°38' -58' 125°	10°04' -58' 125°	9°30' -58' 125°	8°55' -58' 125°	8°21' -58' 125°	7°46' -59' 125°	7°12' -59' 125°	1
2	9°41' -58' 125°	9°06' -58' 125°	8°32' -58' 125°	7°57' -58' 125°	7°23' -58' 125°	6°48' -59' 125°	6°13' -59' 126°	2
3	8°43' -58' 125°	8°08' -58' 125°	7°34' -58' 125°	6°59' -58' 126°	6°24' -58' 126°	5°49' -59' 126°	5°14' -59' 126°	3
4	7°45' -58' 125°	7°11' -58' 126°	6°36' -58' 126°	6°01' -58' 126°	5°26' -58' 126°	4°50' -59' 126°	4°15' -59' 126°	4
5	6°48' -58' 126°	6°13' -58' 126°	5°38' -58' 126°	5°02' -58' 126°	4°27' -58' 126°	3°52' -59' 126°	3°16' -59' 126°	5
6	5°50' -58' 126°	5°15' -58' 126°	4°40' -58' 126°	4°04' -58' 126°	3°29' -58' 126°	2°53' -59' 126°	2°18' -59' 126°	6
7	4°53' -58' 126°	4°17' -58' 126°	3°41' -58' 126°	3°06' -58' 126°	2°30' -58' 127°	1°54' -59' 127°	1°19' -59' 127°	7
8	3°55' -58' 127°	3°19' -58' 127°	2°43' -58' 127°	2°08' -58' 127°	1°32' -58' 127°	0°56' -59' 127°	0°20' -59' 127°	8
9	2°57' -58' 127°	2°21' -58' 127°	1°45' -58' 127°	1°09' -58' 127°	0°33' -58' 127°	0°03' +59' 53°	0°39' +59' 53°	9
10	2°00' -58' 127°	1°23' -58' 127°	0°47' -58' 127°	0°11' -58' 127°	0°25' +58' 53°	1°02' +59' 53°	1°38' +59' 53°	10
11	1°02' -58' 127°	0°26' -58' 127°	0°11' +58' 53°	0°47' +58' 53°	1°24' +58' 53°	2°00' +59' 53°	2°37' +59' 53°	11
12	0°04' -58' 128°	0°32' +58' 52°	1°09' +58' 52°	1°46' +58' 52°	2°22' +58' 52°	2°59' +59' 52°	3°35' +59' 52°	12
13	0°53' +58' 52°	1°30' +58' 52°	2°07' +58' 52°	2°44' +58' 52°	3°21' +58' 52°	3°58' +59' 52°	4°34' +59' 52°	13
14	1°51' +58' 52°	2°28' +58' 52°	3°05' +58' 52°	3°42' +58' 52°	4°19' +58' 52°	4°56' +59' 52°	5°33' +59' 52°	14
15	2°49' +58' 51°	3°26' +58' 52°	4°03' +58' 52°	4°41' +58' 52°	5°18' +58' 52°	5°55' +59' 52°	6°32' +59' 52°	15
16	3°46' +58' 51°	4°24' +58' 51°	5°01' +58' 51°	5°39' +58' 51°	6°16' +58' 51°	6°54' +59' 52°	7°31' +59' 52°	16
17	4°44' +58' 51°	5°22' +58' 51°	5°59' +58' 51°	6°37' +58' 51°	7°15' +58' 51°	7°52' +59' 51°	8°30' +59' 51°	17
18	5°42' +58' 51°	6°20' +58' 51°	6°57' +58' 51°	7°35' +58' 51°	8°13' +58' 51°	8°51' +59' 51°	9°28' +59' 51°	18
19	6°39' +58' 50°	7°17' +58' 50°	7°56' +58' 51°	8°34' +58' 51°	9°12' +58' 51°	9°49' +59' 51°	10°27' +59' 51°	19
20	7°37' +58' 50°	8°15' +58' 50°	8°54' +58' 50°	9°32' +58' 50°	10°10' +58' 51°	10°48' +59' 51°	11°26' +59' 51°	20
21	8°34' +58' 50°	9°13' +58' 50°	9°52' +58' 50°	10°30' +58' 50°	11°08' +58' 50°	11°47' +59' 50°	12°25' +59' 51°	21
22	9°32' +58' 50°	10°11' +58' 50°	10°50' +58' 50°	11°28' +58' 50°	12°07' +58' 50°	12°45' +59' 50°	13°24' +59' 50°	22
23	10°30' +58' 49°	11°09' +58' 49°	11°48' +58' 50°	12°27' +58' 50°	13°05' +58' 50°	13°44' +59' 50°	14°22' +59' 50°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	11°53' -58' 125°	11°18' -58' 125°	10°43' -58' 126°	10°08' -58' 126°	9°33' -58' 126°	8°58' -59' 126°	8°22' -59' 126°	0
1	10°55' -58' 126°	10°20' -58' 126°	9°45' -58' 126°	9°10' -58' 126°	8°34' -58' 126°	7°59' -59' 126°	7°23' -59' 126°	1
2	9°57' -58' 126°	9°22' -58' 126°	8°47' -58' 126°	8°11' -58' 126°	7°36' -59' 126°	7°00' -59' 126°	6°25' -59' 127°	2
3	9°00' -58' 126°	8°24' -58' 126°	7°49' -58' 126°	7°13' -58' 126°	6°37' -59' 127°	6°02' -59' 127°	5°26' -59' 127°	3
4	8°02' -58' 126°	7°26' -58' 127°	6°51' -58' 127°	6°15' -58' 127°	5°39' -59' 127°	5°03' -59' 127°	4°27' -59' 127°	4
5	7°04' -58' 127°	6°29' -58' 127°	5°53' -58' 127°	5°17' -58' 127°	4°40' -59' 127°	4°04' -59' 127°	3°28' -59' 127°	5
6	6°07' -58' 127°	5°31' -58' 127°	4°54' -58' 127°	4°18' -58' 127°	3°42' -59' 127°	3°06' -59' 127°	2°29' -59' 127°	6
7	5°09' -58' 127°	4°33' -58' 127°	3°56' -58' 127°	3°20' -58' 127°	2°43' -59' 127°	2°07' -59' 128°	1°30' -59' 128°	7
8	4°11' -58' 128°	3°35' -58' 128°	2°58' -58' 128°	2°22' -58' 128°	1°45' -59' 128°	1°08' -59' 128°	0°31' -59' 128°	8
9	3°14' -58' 128°	2°37' -58' 128°	2°00' -58' 128°	1°23' -58' 128°	0°46' -59' 128°	0°09' -59' 128°	0°27' +59' 52°	9
10	2°16' -58' 128°	1°39' -58' 128°	1°02' -58' 128°	0°25' -58' 128°	0°12' +59' 52°	0°49' +59' 52°	1°26' +59' 52°	10
11	1°18' -58' 128°	0°41' -58' 128°	0°04' -58' 128°	0°34' +58' 52°	1°11' +59' 52°	1°48' +59' 52°	2°25' +59' 52°	11
12	0°20' -58' 129°	0°17' +58' 51°	0°54' +58' 51°	1°32' +58' 51°	2°09' +59' 51°	2°47' +59' 51°	3°24' +59' 51°	12
13	0°37' +58' 51°	1°15' +58' 51°	1°53' +58' 51°	2°30' +58' 51°	3°08' +59' 51°	3°45' +59' 51°	4°23' +59' 51°	13
14	1°35' +58' 51°	2°13' +58' 51°	2°51' +58' 51°	3°29' +58' 51°	4°06' +59' 51°	4°44' +59' 51°	5°22' +59' 51°	14
15	2°33' +58' 51°	3°11' +58' 51°	3°49' +58' 51°	4°27' +58' 51°	5°05' +59' 51°	5°43' +59' 51°	6°21' +59' 51°	15
16	3°30' +58' 50°	4°09' +58' 50°	4°47' +58' 50°	5°25' +58' 50°	6°03' +59' 51°	6°41' +59' 51°	7°20' +59' 51°	16
17	4°28' +58' 50°	5°07' +58' 50°	5°45' +58' 50°	6°24' +58' 50°	7°02' +59' 50°	7°40' +59' 50°	8°18' +59' 51°	17
18	5°26' +58' 50°	6°05' +58' 50°	6°43' +58' 50°	7°22' +58' 50°	8°00' +58' 50°	8°39' +59' 50°	9°17' +59' 50°	18
19	6°23' +58' 49°	7°02' +58' 50°	7°41' +58' 50°	8°20' +58' 50°	8°59' +58' 50°	9°38' +59' 50°	10°16' +59' 50°	19
20	7°21' +58' 49°	8°00' +58' 49°	8°39' +58' 49°	9°18' +58' 50°	9°57' +58' 50°	10°36' +59' 50°	11°15' +59' 50°	20
21	8°19' +58' 49°	8°58' +58' 49°	9°38' +58' 49°	10°17' +58' 49°	10°56' +58' 49°	11°35' +59' 50°	12°14' +59' 50°	21
22	9°16' +58' 49°	9°56' +58' 49°	10°36' +58' 49°	11°15' +58' 49°	11°54' +58' 49°	12°33' +59' 49°	13°12' +59' 50°	22
23	10°14' +58' 48°	10°54' +58' 48°	11°34' +58' 49°	12°13' +58' 49°	12°53' +58' 49°	13°32' +59' 49°	14°11' +59' 49°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

127° 233° LHA — Latitude SAME as DECLINATION — 127° 233° LHA

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

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

52° 308° LHA — Latitude CONTRARY to Declination — 52° 308° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	12°09'	-58'	126°	11°34'	-58'	126°	10°58'	-58'	127°	10°22'	-58'	127°	9°46'	-59'	127°	9°10'	-59'	127°	8°34'	-59'	127°	0
1	11°12'	-58'	127°	10°36'	-58'	127°	10°00'	-58'	127°	9°24'	-58'	127°	8°48'	-59'	127°	8°11'	-59'	127°	7°35'	-59'	127°	1
2	10°14'	-58'	127°	9°38'	-58'	127°	9°02'	-58'	127°	8°26'	-58'	127°	7°49'	-59'	127°	7°13'	-59'	127°	6°36'	-59'	128°	2
3	9°16'	-58'	127°	8°40'	-58'	127°	8°04'	-58'	127°	7°27'	-58'	127°	6°51'	-59'	128°	6°14'	-59'	128°	5°37'	-59'	128°	3
4	8°19'	-58'	127°	7°42'	-58'	128°	7°05'	-58'	128°	6°29'	-58'	128°	5°52'	-59'	128°	5°15'	-59'	128°	4°38'	-59'	128°	4
5	7°21'	-58'	128°	6°44'	-58'	128°	6°07'	-58'	128°	5°30'	-58'	128°	4°54'	-59'	128°	4°17'	-59'	128°	3°40'	-59'	128°	5
6	6°23'	-58'	128°	5°46'	-58'	128°	5°09'	-58'	128°	4°32'	-58'	128°	3°55'	-59'	128°	3°18'	-59'	128°	2°41'	-59'	128°	6
7	5°25'	-58'	128°	4°48'	-58'	128°	4°11'	-58'	128°	3°34'	-58'	128°	2°56'	-59'	128°	2°19'	-59'	128°	1°42'	-59'	129°	7
8	4°28'	-58'	128°	3°50'	-58'	129°	3°13'	-58'	129°	2°35'	-58'	129°	1°58'	-59'	129°	1°20'	-59'	129°	0°43'	-59'	129°	8
9	3°30'	-58'	129°	2°52'	-58'	129°	2°15'	-58'	129°	1°37'	-58'	129°	0°59'	-59'	129°	0°22'	-59'	129°	0°16'	+59'	51°	9
10	2°32'	-58'	129°	1°54'	-58'	129°	1°16'	-58'	129°	0°39'	-58'	129°	0°01'	-59'	129°	0°37'	+59'	51°	1°15'	+59'	51°	10
11	1°34'	-58'	129°	0°56'	-58'	129°	0°18'	-58'	129°	0°20'	+58'	51°	0°58'	+59'	51°	1°36'	+59'	51°	2°14'	+59'	51°	11
12	0°36'	-58'	130°	0°02'	+58'	50°	0°40'	+58'	50°	1°18'	+58'	50°	1°56'	+59'	50°	2°35'	+59'	50°	3°13'	+59'	51°	12
13	0°21'	+58'	50°	1°00'	+58'	50°	1°38'	+58'	50°	2°17'	+58'	50°	2°55'	+59'	50°	3°33'	+59'	50°	4°12'	+59'	50°	13
14	1°19'	+58'	50°	1°58'	+58'	50°	2°36'	+58'	50°	3°15'	+58'	50°	3°54'	+59'	50°	4°32'	+59'	50°	5°11'	+59'	50°	14
15	2°17'	+58'	50°	2°56'	+58'	50°	3°35'	+58'	50°	4°13'	+58'	50°	4°52'	+59'	50°	5°31'	+59'	50°	6°09'	+59'	50°	15
16	3°15'	+58'	49°	3°54'	+58'	49°	4°33'	+58'	49°	5°12'	+58'	50°	5°51'	+59'	50°	6°30'	+59'	50°	7°08'	+59'	50°	16
17	4°12'	+58'	49°	4°52'	+58'	49°	5°31'	+58'	49°	6°10'	+58'	49°	6°49'	+59'	49°	7°28'	+59'	49°	8°07'	+59'	50°	17
18	5°10'	+58'	49°	5°50'	+58'	49°	6°29'	+58'	49°	7°08'	+58'	49°	7°48'	+59'	49°	8°27'	+59'	49°	9°06'	+59'	49°	18
19	6°08'	+58'	49°	6°48'	+58'	49°	7°27'	+58'	49°	8°07'	+58'	49°	8°46'	+59'	49°	9°26'	+59'	49°	10°05'	+59'	49°	19
20	7°06'	+58'	48°	7°46'	+58'	48°	8°25'	+58'	48°	9°05'	+58'	49°	9°45'	+59'	49°	10°24'	+59'	49°	11°04'	+59'	49°	20
21	8°03'	+58'	48°	8°44'	+58'	48°	9°24'	+58'	48°	10°04'	+58'	48°	10°43'	+59'	48°	11°23'	+59'	49°	12°03'	+59'	49°	21
22	9°01'	+58'	48°	9°42'	+58'	48°	10°22'	+58'	48°	11°02'	+58'	48°	11°42'	+58'	48°	12°22'	+59'	48°	13°02'	+59'	49°	22
23	9°59'	+58'	47°	10°39'	+58'	48°	11°20'	+58'	48°	12°00'	+58'	48°	12°40'	+58'	48°	13°20'	+59'	48°	14°00'	+59'	48°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	12°26'	-58'	127°	11°49'	-58'	127°	11°13'	-58'	128°	10°36'	-58'	128°	9°59'	-59'	128°	9°22'	-59'	128°	8°45'	-59'	128°	0
1	11°28'	-58'	128°	10°51'	-58'	128°	10°15'	-58'	128°	9°38'	-58'	128°	9°01'	-59'	128°	8°24'	-59'	128°	7°47'	-59'	128°	1
2	10°30'	-58'	128°	9°53'	-58'	128°	9°16'	-58'	128°	8°39'	-58'	128°	8°02'	-59'	128°	7°25'	-59'	128°	6°48'	-59'	129°	2
3	9°33'	-58'	128°	8°55'	-58'	128°	8°18'	-58'	128°	7°41'	-58'	128°	7°04'	-59'	129°	6°26'	-59'	129°	5°49'	-59'	129°	3
4	8°35'	-58'	128°	7°57'	-58'	128°	7°20'	-58'	129°	6°43'	-58'	129°	6°05'	-59'	129°	5°27'	-59'	129°	4°50'	-59'	129°	4
5	7°37'	-58'	129°	6°59'	-58'	129°	6°22'	-58'	129°	5°44'	-58'	129°	5°06'	-59'	129°	4°29'	-59'	129°	3°51'	-59'	129°	5
6	6°39'	-58'	129°	6°01'	-58'	129°	5°24'	-58'	129°	4°46'	-58'	129°	4°08'	-59'	129°	3°30'	-59'	129°	2°52'	-59'	129°	6
7	5°41'	-58'	129°	5°03'	-58'	129°	4°25'	-58'	129°	3°47'	-58'	129°	3°09'	-59'	129°	2°31'	-59'	129°	1°53'	-59'	129°	7
8	4°43'	-58'	129°	4°05'	-58'	130°	3°27'	-58'	130°	2°49'	-58'	130°	2°11'	-59'	130°	1°32'	-59'	130°	0°54'	-59'	130°	8
9	3°46'	-58'	130°	3°07'	-58'	130°	2°29'	-58'	130°	1°50'	-58'	130°	1°12'	-59'	130°	0°34'	-59'	130°	0°05'	+59'	50°	9
10	2°48'	-58'	130°	2°09'	-58'	130°	1°31'	-58'	130°	0°52'	-58'	130°	0°13'	-59'	130°	0°25'	+59'	50°	1°04'	+59'	50°	10
11	1°50'	-58'	130°	1°11'	-58'	130°	0°32'	-58'	130°	0°06'	+58'	50°	0°45'	+59'	50°	1°24'	+59'	50°	2°03'	+59'	50°	11
12	0°52'	-58'	131°	0°13'	-58'	131°	0°26'	+58'	49°	1°05'	+58'	49°	1°44'	+59'	50°	2°23'	+59'	50°	3°02'	+59'	50°	12
13	0°06'	+58'	49°	0°45'	+58'	49°	1°24'	+58'	49°	2°03'	+58'	49°	2°42'	+59'	49°	3°22'	+59'	49°	4°01'	+59'	49°	13
14	1°04'	+58'	49°	1°43'	+58'	49°	2°22'	+58'	49°	3°02'	+58'	49°	3°41'	+59'	49°	4°20'	+59'	49°	5°00'	+59'	49°	14
15	2°01'	+58'	49°	2°41'	+58'	49°	3°21'	+58'	49°	4°00'	+58'	49°	4°40'	+59'	49°	5°19'	+59'	49°	5°58'	+59'	49°	15
16	2°59'	+58'	48°	3°39'	+58'	48°	4°19'	+58'	49°	4°59'	+58'	49°	5°38'	+59'	49°	6°18'	+59'	49°	6°57'	+59'	49°	16
17	3°57'	+58'	48°	4°37'	+58'	48°	5°17'	+58'	48°	5°57'	+58'	48°	6°37'	+59'	48°	7°17'	+59'	49°	7°56'	+59'	49°	17
18	4°55'	+58'	48°	5°35'	+58'	48°	6°15'	+58'	48°	6°55'	+58'	48°	7°35'	+59'	48°	8°15'	+59'	48°	8°55'	+59'	48°	18
19	5°53'	+58'	48°	6°33'	+58'	48°	7°13'	+58'	48°	7°54'	+58'	48°	8°34'	+59'	48°	9°14'	+59'	48°	9°54'	+59'	48°	19
20	6°51'	+58'	47°	7°31'	+58'	47°	8°12'	+58'	48°	8°52'	+58'	48°	9°33'	+59'	48°	10°13'	+59'	48°	10°53'	+59'	48°	20
21	7°48'	+58'	47°	8°29'	+58'	47°	9°10'	+58'	47°	9°51'	+58'	47°	10°31'	+59'	48°	11°12'	+59'	48°	11°52'	+59'	48°	21
22	8°46'	+58'	47°	9°27'	+58'	47°	10°08'	+58'	47°	10°49'	+58'	47°	11°30'	+59'	47°	12°10'	+59'	47°	12°51'	+59'	48°	22
23	9°44'	+58'	47°	10°25'	+58'	47°	11°06'	+58'	47°	11°47'	+58'	47°	12°28'	+59'	47°	13°09'	+59'	47°	13°50'	+59'	47°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

129° 231° LHA — Latitude SAME as DECLINATION — 129° 231° 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 CONTRARY to Declination — 50° 310° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	12°42' -58' 128°	12°05' -58' 128°	11°27' -58' 129°	10°50' -58' 129°	10°12' -59' 129°	9°35' -59' 129°	8°57' -59' 129°	0
1	11°44' -58' 129°	11°07' -58' 129°	10°29' -58' 129°	9°52' -58' 129°	9°14' -59' 129°	8°36' -59' 129°	7°58' -59' 129°	1
2	10°46' -58' 129°	10°09' -58' 129°	9°31' -58' 129°	8°53' -58' 129°	8°15' -59' 129°	7°37' -59' 129°	6°59' -59' 130°	2
3	9°49' -58' 129°	9°11' -58' 129°	8°33' -58' 129°	7°55' -58' 129°	7°16' -59' 130°	6°38' -59' 130°	6°00' -59' 130°	3
4	8°51' -58' 129°	8°13' -58' 129°	7°34' -58' 130°	6°56' -58' 130°	6°18' -59' 130°	5°39' -59' 130°	5°01' -59' 130°	4
5	7°53' -58' 130°	7°15' -58' 130°	6°36' -58' 130°	5°58' -58' 130°	5°19' -59' 130°	4°41' -59' 130°	4°02' -59' 130°	5
6	6°55' -58' 130°	6°16' -58' 130°	5°38' -58' 130°	4°59' -58' 130°	4°21' -59' 130°	3°42' -59' 130°	3°03' -59' 130°	6
7	5°57' -58' 130°	5°18' -58' 130°	4°40' -58' 130°	4°01' -58' 130°	3°22' -59' 130°	2°43' -59' 130°	2°04' -59' 130°	7
8	4°59' -58' 130°	4°20' -58' 130°	3°41' -58' 131°	3°02' -58' 131°	2°23' -59' 131°	1°44' -59' 131°	1°05' -59' 131°	8
9	4°01' -58' 131°	3°22' -58' 131°	2°43' -58' 131°	2°04' -58' 131°	1°25' -59' 131°	0°45' -59' 131°	0°06' -59' 131°	9
10	3°03' -58' 131°	2°24' -58' 131°	1°45' -58' 131°	1°05' -58' 131°	0°26' -59' 131°	0°13' +59' 49°	0°53' +59' 49°	10
11	2°06' -58' 131°	1°26' -58' 131°	0°46' -58' 131°	0°07' -58' 131°	0°33' +59' 49°	1°12' +59' 49°	1°52' +59' 49°	11
12	1°08' -58' 131°	0°28' -58' 131°	0°12' +58' 49°	0°52' +58' 49°	1°31' +59' 49°	2°11' +59' 49°	2°51' +59' 49°	12
13	0°10' -58' 132°	0°30' +58' 48°	1°10' +58' 48°	1°50' +58' 48°	2°30' +59' 48°	3°10' +59' 48°	3°50' +59' 48°	13
14	0°48' +58' 48°	1°28' +58' 48°	2°08' +58' 48°	2°49' +58' 48°	3°29' +59' 48°	4°09' +59' 48°	4°49' +59' 48°	14
15	1°46' +58' 48°	2°26' +58' 48°	3°07' +58' 48°	3°47' +58' 48°	4°27' +59' 48°	5°07' +59' 48°	5°48' +59' 48°	15
16	2°44' +58' 47°	3°25' +58' 48°	4°05' +58' 48°	4°45' +58' 48°	5°26' +59' 48°	6°06' +59' 48°	6°46' +59' 48°	16
17	3°42' +58' 47°	4°23' +58' 47°	5°03' +58' 47°	5°44' +58' 47°	6°24' +59' 47°	7°05' +59' 48°	7°45' +59' 48°	17
18	4°40' +58' 47°	5°21' +58' 47°	6°02' +58' 47°	6°42' +58' 47°	7°23' +59' 47°	8°04' +59' 47°	8°44' +59' 47°	18
19	5°38' +58' 47°	6°19' +58' 47°	7°00' +58' 47°	7°41' +58' 47°	8°22' +59' 47°	9°03' +59' 47°	9°43' +59' 47°	19
20	6°36' +58' 46°	7°17' +58' 47°	7°58' +58' 47°	8°39' +58' 47°	9°20' +59' 47°	10°01' +59' 47°	10°42' +59' 47°	20
21	7°33' +58' 46°	8°15' +58' 46°	8°56' +58' 46°	9°38' +58' 47°	10°19' +59' 47°	11°00' +59' 47°	11°41' +59' 47°	21
22	8°31' +58' 46°	9°13' +58' 46°	9°55' +58' 46°	10°36' +58' 46°	11°18' +59' 46°	11°59' +59' 47°	12°40' +59' 47°	22
23	9°29' +58' 46°	10°11' +58' 46°	10°53' +58' 46°	11°35' +58' 46°	12°16' +59' 46°	12°58' +59' 46°	13°39' +59' 47°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	12°58' -58' 129°	12°20' -58' 129°	11°42' -58' 130°	11°04' -58' 130°	10°25' -59' 130°	9°47' -59' 130°	9°08' -59' 130°	0
1	12°00' -58' 130°	11°22' -58' 130°	10°44' -58' 130°	10°05' -58' 130°	9°26' -59' 130°	8°48' -59' 130°	8°09' -59' 130°	1
2	11°02' -58' 130°	10°24' -58' 130°	9°45' -58' 130°	9°07' -58' 130°	8°28' -59' 130°	7°49' -59' 130°	7°10' -59' 131°	2
3	10°04' -58' 130°	9°26' -58' 130°	8°47' -58' 130°	8°08' -58' 130°	7°29' -59' 131°	6°50' -59' 131°	6°11' -59' 131°	3
4	9°06' -58' 130°	8°28' -58' 130°	7°49' -58' 131°	7°10' -59' 131°	6°30' -59' 131°	5°51' -59' 131°	5°12' -59' 131°	4
5	8°09' -58' 131°	7°29' -58' 131°	6°50' -58' 131°	6°11' -59' 131°	5°32' -59' 131°	4°52' -59' 131°	4°13' -59' 131°	5
6	7°11' -58' 131°	6°31' -58' 131°	5°52' -58' 131°	5°13' -59' 131°	4°33' -59' 131°	3°54' -59' 131°	3°14' -59' 131°	6
7	6°13' -58' 131°	5°33' -58' 131°	4°54' -58' 131°	4°14' -59' 131°	3°34' -59' 131°	2°55' -59' 131°	2°15' -59' 131°	7
8	5°15' -58' 131°	4°35' -58' 131°	3°55' -58' 131°	3°16' -59' 132°	2°36' -59' 132°	1°56' -59' 132°	1°16' -59' 132°	8
9	4°17' -58' 132°	3°37' -58' 132°	2°57' -58' 132°	2°17' -59' 132°	1°37' -59' 132°	0°57' -59' 132°	0°17' -59' 132°	9
10	3°19' -58' 132°	2°39' -58' 132°	1°59' -58' 132°	1°19' -59' 132°	0°38' -59' 132°	0°02' +59' 48°	0°42' +59' 48°	10
11	2°21' -58' 132°	1°41' -58' 132°	1°00' -58' 132°	0°20' -59' 132°	0°20' +59' 48°	1°01' +59' 48°	1°41' +59' 48°	11
12	1°23' -58' 132°	0°42' -58' 132°	0°02' -58' 132°	0°39' +59' 48°	1°19' +59' 48°	1°59' +59' 48°	2°40' +59' 48°	12
13	0°25' -58' 133°	0°16' +58' 47°	0°56' +58' 47°	1°37' +59' 47°	2°18' +59' 47°	2°58' +59' 47°	3°39' +59' 47°	13
14	0°33' +58' 47°	1°14' +58' 47°	1°55' +58' 47°	2°36' +59' 47°	3°16' +59' 47°	3°57' +59' 47°	4°38' +59' 47°	14
15	1°31' +58' 47°	2°12' +58' 47°	2°53' +58' 47°	3°34' +59' 47°	4°15' +59' 47°	4°56' +59' 47°	5°37' +59' 47°	15
16	2°29' +58' 47°	3°10' +58' 47°	3°51' +58' 47°	4°33' +59' 47°	5°14' +59' 47°	5°55' +59' 47°	6°36' +59' 47°	16
17	3°27' +58' 46°	4°08' +58' 46°	4°50' +58' 46°	5°31' +59' 46°	6°12' +59' 47°	6°54' +59' 47°	7°35' +59' 47°	17
18	4°25' +58' 46°	5°07' +58' 46°	5°48' +58' 46°	6°30' +58' 46°	7°11' +59' 46°	7°52' +59' 46°	8°34' +59' 47°	18
19	5°23' +58' 46°	6°05' +58' 46°	6°46' +58' 46°	7°28' +58' 46°	8°10' +59' 46°	8°51' +59' 46°	9°33' +59' 46°	19
20	6°21' +58' 46°	7°03' +58' 46°	7°45' +58' 46°	8°27' +58' 46°	9°08' +59' 46°	9°50' +59' 46°	10°32' +59' 46°	20
21	7°19' +58' 45°	8°01' +58' 45°	8°43' +58' 45°	9°25' +58' 46°	10°07' +59' 46°	10°49' +59' 46°	11°31' +59' 46°	21
22	8°17' +58' 45°	8°59' +58' 45°	9°41' +58' 45°	10°24' +58' 45°	11°06' +59' 45°	11°48' +59' 46°	12°30' +59' 46°	22
23	9°15' +58' 45°	9°57' +58' 45°	10°40' +58' 45°	11°22' +58' 45°	12°04' +59' 45°	12°46' +59' 45°	13°29' +59' 46°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

131° 229° LHA — Latitude SAME as DECLINATION — 131° 229° 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 CONTRARY to Declination — 48° 312° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	13°14'	-58'	130°	12°35'	-58'	130°	11°56'	-58'	131°	11°17'	-59'	131°	10°38'	-59'	131°	9°58'	-59'	131°	9°19'	-59'	131°	0
1	12°16'	-58'	131°	11°37'	-58'	131°	10°58'	-58'	131°	10°18'	-59'	131°	9°39'	-59'	131°	9°00'	-59'	131°	8°20'	-59'	131°	1
2	11°18'	-58'	131°	10°39'	-58'	131°	9°59'	-58'	131°	9°20'	-59'	131°	8°40'	-59'	131°	8°01'	-59'	131°	7°21'	-59'	132°	2
3	10°20'	-58'	131°	9°41'	-58'	131°	9°01'	-58'	131°	8°21'	-59'	131°	7°42'	-59'	132°	7°02'	-59'	132°	6°22'	-59'	132°	3
4	9°22'	-58'	131°	8°42'	-58'	131°	8°03'	-58'	132°	7°23'	-59'	132°	6°43'	-59'	132°	6°03'	-59'	132°	5°23'	-59'	132°	4
5	8°24'	-58'	132°	7°44'	-58'	132°	7°04'	-58'	132°	6°24'	-59'	132°	5°44'	-59'	132°	5°04'	-59'	132°	4°24'	-59'	132°	5
6	7°26'	-58'	132°	6°46'	-58'	132°	6°06'	-58'	132°	5°26'	-59'	132°	4°45'	-59'	132°	4°05'	-59'	132°	3°25'	-59'	132°	6
7	6°28'	-58'	132°	5°48'	-58'	132°	5°07'	-58'	132°	4°27'	-59'	132°	3°47'	-59'	132°	3°06'	-59'	132°	2°26'	-59'	132°	7
8	5°30'	-58'	132°	4°50'	-58'	132°	4°09'	-58'	132°	3°29'	-59'	133°	2°48'	-59'	133°	2°07'	-59'	133°	1°27'	-59'	133°	8
9	4°32'	-58'	133°	3°51'	-58'	133°	3°11'	-58'	133°	2°30'	-59'	133°	1°49'	-59'	133°	1°09'	-59'	133°	0°28'	-59'	133°	9
10	3°34'	-58'	133°	2°53'	-58'	133°	2°12'	-58'	133°	1°31'	-59'	133°	0°51'	-59'	133°	0°10'	-59'	133°	0°31'	+59'	47°	10
11	2°36'	-58'	133°	1°55'	-58'	133°	1°14'	-58'	133°	0°33'	-59'	133°	0°08'	+59'	47°	0°49'	+59'	47°	1°30'	+59'	47°	11
12	1°38'	-58'	133°	0°57'	-58'	133°	0°16'	-58'	133°	0°26'	+59'	47°	1°07'	+59'	47°	1°48'	+59'	47°	2°29'	+59'	47°	12
13	0°40'	-58'	134°	0°01'	+58'	46°	0°43'	+58'	46°	1°24'	+59'	46°	2°06'	+59'	46°	2°47'	+59'	46°	3°28'	+59'	47°	13
14	0°18'	+58'	46°	1°00'	+58'	46°	1°41'	+58'	46°	2°23'	+59'	46°	3°04'	+59'	46°	3°46'	+59'	46°	4°27'	+59'	46°	14
15	1°16'	+58'	46°	1°58'	+58'	46°	2°40'	+58'	46°	3°21'	+59'	46°	4°03'	+59'	46°	4°45'	+59'	46°	5°26'	+59'	46°	15
16	2°14'	+58'	46°	2°56'	+58'	46°	3°38'	+58'	46°	4°20'	+59'	46°	5°02'	+59'	46°	5°44'	+59'	46°	6°25'	+59'	46°	16
17	3°12'	+58'	45°	3°54'	+58'	45°	4°36'	+58'	45°	5°18'	+59'	46°	6°00'	+59'	46°	6°42'	+59'	46°	7°24'	+59'	46°	17
18	4°10'	+58'	45°	4°53'	+58'	45°	5°35'	+58'	45°	6°17'	+59'	45°	6°59'	+59'	45°	7°41'	+59'	45°	8°23'	+59'	46°	18
19	5°08'	+58'	45°	5°51'	+58'	45°	6°33'	+58'	45°	7°16'	+59'	45°	7°58'	+59'	45°	8°40'	+59'	45°	9°22'	+59'	45°	19
20	6°06'	+58'	45°	6°49'	+58'	45°	7°32'	+58'	45°	8°14'	+59'	45°	8°57'	+59'	45°	9°39'	+59'	45°	10°21'	+59'	45°	20
21	7°04'	+58'	44°	7°47'	+58'	44°	8°30'	+58'	45°	9°13'	+59'	45°	9°55'	+59'	45°	10°38'	+59'	45°	11°20'	+59'	45°	21
22	8°02'	+58'	44°	8°45'	+58'	44°	9°28'	+58'	44°	10°11'	+59'	44°	10°54'	+59'	45°	11°37'	+59'	45°	12°19'	+59'	45°	22
23	9°00'	+58'	44°	9°43'	+58'	44°	10°27'	+58'	44°	11°10'	+59'	44°	11°53'	+59'	44°	12°35'	+59'	45°	13°18'	+59'	45°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	13°29'	-58'	131°	12°50'	-58'	131°	12°10'	-58'	132°	11°30'	-59'	132°	10°50'	-59'	132°	10°10'	-59'	132°	9°30'	-59'	132°	0
1	12°31'	-58'	131°	11°52'	-58'	132°	11°12'	-58'	132°	10°32'	-59'	132°	9°51'	-59'	132°	9°11'	-59'	132°	8°31'	-59'	132°	1
2	11°33'	-58'	132°	10°53'	-58'	132°	10°13'	-58'	132°	9°33'	-59'	132°	8°53'	-59'	132°	8°12'	-59'	132°	7°32'	-59'	133°	2
3	10°35'	-58'	132°	9°55'	-58'	132°	9°15'	-58'	132°	8°34'	-59'	132°	7°54'	-59'	132°	7°13'	-59'	133°	6°33'	-59'	133°	3
4	9°37'	-58'	132°	8°57'	-58'	132°	8°16'	-58'	133°	7°36'	-59'	133°	6°55'	-59'	133°	6°14'	-59'	133°	5°34'	-59'	133°	4
5	8°39'	-58'	133°	7°59'	-58'	133°	7°18'	-58'	133°	6°37'	-59'	133°	5°56'	-59'	133°	5°16'	-59'	133°	4°35'	-59'	133°	5
6	7°41'	-58'	133°	7°00'	-58'	133°	6°20'	-58'	133°	5°39'	-59'	133°	4°58'	-59'	133°	4°17'	-59'	133°	3°36'	-59'	133°	6
7	6°43'	-58'	133°	6°02'	-58'	133°	5°21'	-58'	133°	4°40'	-59'	133°	3°59'	-59'	133°	3°18'	-59'	133°	2°37'	-59'	133°	7
8	5°45'	-58'	133°	5°04'	-58'	133°	4°23'	-58'	133°	3°41'	-59'	133°	3°00'	-59'	134°	2°19'	-59'	134°	1°37'	-59'	134°	8
9	4°47'	-58'	134°	4°06'	-58'	134°	3°24'	-58'	134°	2°43'	-59'	134°	2°01'	-59'	134°	1°20'	-59'	134°	0°38'	-59'	134°	9
10	3°49'	-58'	134°	3°07'	-58'	134°	2°26'	-58'	134°	1°44'	-59'	134°	1°03'	-59'	134°	0°21'	-59'	134°	0°21'	+59'	46°	10
11	2°51'	-58'	134°	2°09'	-58'	134°	1°27'	-58'	134°	0°46'	-59'	134°	0°04'	-59'	134°	0°38'	+59'	46°	1°20'	+59'	46°	11
12	1°53'	-58'	134°	1°11'	-58'	134°	0°29'	-58'	134°	0°13'	+59'	46°	0°55'	+59'	46°	1°37'	+59'	46°	2°19'	+59'	46°	12
13	0°55'	-58'	135°	0°13'	-58'	135°	0°30'	+58'	45°	1°12'	+59'	45°	1°54'	+59'	45°	2°36'	+59'	46°	3°18'	+59'	46°	13
14	0°03'	+58'	45°	0°46'	+58'	45°	1°28'	+58'	45°	2°10'	+59'	45°	2°52'	+59'	45°	3°35'	+59'	45°	4°17'	+59'	45°	14
15	1°02'	+58'	45°	1°44'	+58'	45°	2°26'	+58'	45°	3°09'	+59'	45°	3°51'	+59'	45°	4°34'	+59'	45°	5°16'	+59'	45°	15
16	2°00'	+58'	45°	2°42'	+58'	45°	3°25'	+58'	45°	4°07'	+59'	45°	4°50'	+59'	45°	5°32'	+59'	45°	6°15'	+59'	45°	16
17	2°58'	+58'	44°	3°41'	+58'	44°	4°23'	+58'	45°	5°06'	+59'	45°	5°49'	+59'	45°	6°31'	+59'	45°	7°14'	+59'	45°	17
18	3°56'	+58'	44°	4°39'	+58'	44°	5°22'	+58'	44°	6°05'	+59'	44°	6°48'	+59'	44°	7°30'	+59'	45°	8°13'	+59'	45°	18
19	4°54'	+58'	44°	5°37'	+58'	44°	6°20'	+58'	44°	7°03'	+59'	44°	7°46'	+59'	44°	8°29'	+59'	44°	9°12'	+59'	44°	19
20	5°52'	+58'	44°	6°35'	+58'	44°	7°19'	+58'	44°	8°02'	+59'	44°	8°45'	+59'	44°	9°28'	+59'	44°	10°11'	+59'	44°	20
21	6°50'	+58'	43°	7°34'	+58'	44°	8°17'	+58'	44°	9°00'	+59'	44°	9°44'	+59'	44°	10°27'	+59'	44°	11°10'	+59'	44°	21
22	7°48'	+58'	43°	8°32'	+58'	43°	9°15'	+58'	43°	9°59'	+59'	44°	10°42'	+59'	44°	11°26'	+59'	44°	12°09'	+59'	44°	22
23	8°46'	+58'	43°	9°30'	+58'	43°	10°14'	+58'	43°	10°58'	+59'	43°	11°41'	+59'	43°	12°25'	+59'	44°	13°08'	+59'	44°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	13°45' -58' 132°	13°04' -58' 132°	12°24' -58' 133°	11°43' -59' 133°	11°02' -59' 133°	10°21' -59' 133°	9°40' -59' 133°	0
1	12°47' -58' 132°	12°06' -58' 133°	11°25' -58' 133°	10°44' -59' 133°	10°04' -59' 133°	9°23' -59' 133°	8°41' -59' 133°	1
2	11°49' -58' 133°	11°08' -58' 133°	10°27' -58' 133°	9°46' -59' 133°	9°05' -59' 133°	8°24' -59' 133°	7°42' -59' 133°	2
3	10°50' -58' 133°	10°09' -58' 133°	9°28' -58' 133°	8°47' -59' 133°	8°06' -59' 133°	7°25' -59' 134°	6°43' -59' 134°	3
4	9°52' -58' 133°	9°11' -58' 133°	8°30' -58' 133°	7°49' -59' 134°	7°07' -59' 134°	6°26' -59' 134°	5°44' -59' 134°	4
5	8°54' -58' 134°	8°13' -58' 134°	7°31' -58' 134°	6°50' -59' 134°	6°08' -59' 134°	5°27' -59' 134°	4°45' -59' 134°	5
6	7°56' -58' 134°	7°15' -58' 134°	6°33' -58' 134°	5°51' -59' 134°	5°10' -59' 134°	4°28' -59' 134°	3°46' -59' 134°	6
7	6°58' -58' 134°	6°16' -58' 134°	5°35' -58' 134°	4°53' -59' 134°	4°11' -59' 134°	3°29' -59' 134°	2°47' -59' 134°	7
8	6°00' -58' 134°	5°18' -58' 134°	4°36' -58' 134°	3°54' -59' 134°	3°12' -59' 134°	2°30' -59' 135°	1°48' -59' 135°	8
9	5°02' -58' 135°	4°20' -58' 135°	3°38' -58' 135°	2°55' -59' 135°	2°13' -59' 135°	1°31' -59' 135°	0°49' -59' 135°	9
10	4°04' -58' 135°	3°21' -58' 135°	2°39' -58' 135°	1°57' -59' 135°	1°14' -59' 135°	0°32' -59' 135°	0°10' +59' 45°	10
11	3°05' -58' 135°	2°23' -58' 135°	1°41' -58' 135°	0°58' -59' 135°	0°16' -59' 135°	0°27' +59' 45°	1°09' +59' 45°	11
12	2°07' -58' 135°	1°25' -58' 135°	0°42' -58' 135°	0°01' +59' 45°	0°43' +59' 45°	1°26' +59' 45°	2°08' +59' 45°	12
13	1°09' -58' 135°	0°26' -58' 135°	0°16' +58' 45°	0°59' +59' 45°	1°42' +59' 45°	2°25' +59' 45°	3°08' +59' 45°	13
14	0°11' -58' 136°	0°32' +58' 44°	1°15' +58' 44°	1°58' +59' 44°	2°41' +59' 44°	3°24' +59' 44°	4°07' +59' 44°	14
15	0°47' +58' 44°	1°30' +58' 44°	2°13' +58' 44°	2°57' +59' 44°	3°40' +59' 44°	4°23' +59' 44°	5°06' +59' 44°	15
16	1°45' +58' 44°	2°29' +58' 44°	3°12' +58' 44°	3°55' +59' 44°	4°38' +59' 44°	5°22' +59' 44°	6°05' +59' 44°	16
17	2°43' +58' 44°	3°27' +58' 44°	4°10' +58' 44°	4°54' +59' 44°	5°37' +59' 44°	6°21' +59' 44°	7°04' +59' 44°	17
18	3°42' +58' 43°	4°25' +58' 43°	5°09' +58' 43°	5°52' +59' 43°	6°36' +59' 44°	7°19' +59' 44°	8°03' +59' 44°	18
19	4°40' +58' 43°	5°24' +58' 43°	6°07' +58' 43°	6°51' +59' 43°	7°35' +59' 43°	8°18' +59' 43°	9°02' +59' 44°	19
20	5°38' +58' 43°	6°22' +58' 43°	7°06' +58' 43°	7°50' +59' 43°	8°34' +59' 43°	9°17' +59' 43°	10°01' +59' 43°	20
21	6°36' +58' 43°	7°20' +58' 43°	8°04' +58' 43°	8°48' +59' 43°	9°32' +59' 43°	10°16' +59' 43°	11°00' +59' 43°	21
22	7°34' +58' 42°	8°19' +58' 42°	9°03' +58' 42°	9°47' +59' 43°	10°31' +59' 43°	11°15' +59' 43°	11°59' +59' 43°	22
23	8°32' +58' 42°	9°17' +58' 42°	10°01' +58' 42°	10°46' +59' 42°	11°30' +59' 43°	12°14' +59' 43°	12°58' +59' 43°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	14°00' -58' 133°	13°19' -58' 133°	12°37' -58' 134°	11°56' -59' 134°	11°14' -59' 134°	10°33' -59' 134°	9°51' -59' 134°	0
1	13°02' -58' 133°	12°20' -58' 134°	11°39' -58' 134°	10°57' -59' 134°	10°16' -59' 134°	9°34' -59' 134°	8°52' -59' 134°	1
2	12°03' -58' 134°	11°22' -58' 134°	10°40' -59' 134°	9°59' -59' 134°	9°17' -59' 134°	8°35' -59' 134°	7°53' -59' 134°	2
3	11°05' -58' 134°	10°24' -58' 134°	9°42' -59' 134°	9°00' -59' 134°	8°18' -59' 134°	7°36' -59' 135°	6°54' -59' 135°	3
4	10°07' -58' 134°	9°25' -58' 134°	8°43' -59' 134°	8°01' -59' 135°	7°19' -59' 135°	6°37' -59' 135°	5°55' -59' 135°	4
5	9°09' -58' 134°	8°27' -58' 135°	7°45' -59' 135°	7°03' -59' 135°	6°20' -59' 135°	5°38' -59' 135°	4°55' -59' 135°	5
6	8°11' -58' 135°	7°29' -58' 135°	6°46' -59' 135°	6°04' -59' 135°	5°21' -59' 135°	4°39' -59' 135°	3°56' -59' 135°	6
7	7°13' -58' 135°	6°30' -58' 135°	5°48' -59' 135°	5°05' -59' 135°	4°23' -59' 135°	3°40' -59' 135°	2°57' -59' 135°	7
8	6°14' -58' 135°	5°32' -58' 135°	4°49' -59' 135°	4°06' -59' 135°	3°24' -59' 135°	2°41' -59' 135°	1°58' -59' 136°	8
9	5°16' -58' 135°	4°33' -58' 136°	3°51' -59' 136°	3°08' -59' 136°	2°25' -59' 136°	1°42' -59' 136°	0°59' -59' 136°	9
10	4°18' -58' 136°	3°35' -58' 136°	2°52' -59' 136°	2°09' -59' 136°	1°26' -59' 136°	0°43' -59' 136°	0°00' +59' 44°	10
11	3°20' -58' 136°	2°37' -58' 136°	1°54' -59' 136°	1°10' -59' 136°	0°27' -59' 136°	0°16' +59' 44°	0°59' +59' 44°	11
12	2°22' -58' 136°	1°38' -58' 136°	0°55' -59' 136°	0°12' -59' 136°	0°32' +59' 44°	1°15' +59' 44°	1°58' +59' 44°	12
13	1°23' -58' 136°	0°40' -58' 136°	0°04' +59' 44°	0°47' +59' 44°	1°31' +59' 44°	2°14' +59' 44°	2°57' +59' 44°	13
14	0°25' -58' 137°	0°18' +58' 43°	1°02' +59' 43°	1°46' +59' 43°	2°29' +59' 43°	3°13' +59' 43°	3°57' +59' 43°	14
15	0°33' +58' 43°	1°17' +58' 43°	2°01' +59' 43°	2°44' +59' 43°	3°28' +59' 43°	4°12' +59' 43°	4°56' +59' 43°	15
16	1°31' +58' 43°	2°15' +58' 43°	2°59' +59' 43°	3°43' +59' 43°	4°27' +59' 43°	5°11' +59' 43°	5°55' +59' 43°	16
17	2°29' +58' 43°	3°14' +58' 43°	3°58' +59' 43°	4°42' +59' 43°	5°26' +59' 43°	6°10' +59' 43°	6°54' +59' 43°	17
18	3°28' +58' 42°	4°12' +58' 42°	4°56' +59' 42°	5°41' +59' 43°	6°25' +59' 43°	7°09' +59' 43°	7°53' +59' 43°	18
19	4°26' +58' 42°	5°10' +58' 42°	5°55' +59' 42°	6°39' +59' 42°	7°24' +59' 42°	8°08' +59' 42°	8°52' +59' 43°	19
20	5°24' +58' 42°	6°09' +58' 42°	6°53' +59' 42°	7°38' +59' 42°	8°22' +59' 42°	9°07' +59' 42°	9°51' +59' 42°	20
21	6°22' +58' 42°	7°07' +58' 42°	7°52' +59' 42°	8°37' +59' 42°	9°21' +59' 42°	10°06' +59' 42°	10°50' +59' 42°	21
22	7°20' +58' 41°	8°05' +58' 41°	8°50' +59' 42°	9°35' +59' 42°	10°20' +59' 42°	11°05' +59' 42°	11°49' +59' 42°	22
23	8°19' +58' 41°	9°04' +58' 41°	9°49' +59' 41°	10°34' +59' 41°	11°19' +59' 42°	12°04' +59' 42°	12°48' +59' 42°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

135° 225° LHA — Latitude SAME as DECLINATION — 135° 225° LHA

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

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

44° 316° LHA — Latitude CONTRARY to Declination — 44° 316° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	14°15'	-58'	134°	13°33'	-58'	134°	12°51'	-59'	135°	12°08'	-59'	135°	11°26'	-59'	135°	10°44'	-59'	135°	10°01'	-59'	135°	0
1	13°16'	-58'	134°	12°34'	-58'	135°	11°52'	-59'	135°	11°10'	-59'	135°	10°27'	-59'	135°	9°45'	-59'	135°	9°02'	-59'	135°	1
2	12°18'	-58'	135°	11°36'	-58'	135°	10°54'	-59'	135°	10°11'	-59'	135°	9°28'	-59'	135°	8°46'	-59'	135°	8°03'	-59'	135°	2
3	11°20'	-58'	135°	10°38'	-58'	135°	9°55'	-59'	135°	9°12'	-59'	135°	8°30'	-59'	135°	7°47'	-59'	136°	7°04'	-59'	136°	3
4	10°22'	-58'	135°	9°39'	-58'	135°	8°56'	-59'	135°	8°14'	-59'	136°	7°31'	-59'	136°	6°48'	-59'	136°	6°05'	-59'	136°	4
5	9°24'	-58'	135°	8°41'	-58'	136°	7°58'	-59'	136°	7°15'	-59'	136°	6°32'	-59'	136°	5°49'	-59'	136°	5°06'	-59'	136°	5
6	8°25'	-58'	136°	7°42'	-58'	136°	6°59'	-59'	136°	6°16'	-59'	136°	5°33'	-59'	136°	4°50'	-59'	136°	4°07'	-59'	136°	6
7	7°27'	-58'	136°	6°44'	-58'	136°	6°01'	-59'	136°	5°17'	-59'	136°	4°34'	-59'	136°	3°51'	-59'	136°	3°07'	-59'	136°	7
8	6°29'	-58'	136°	5°45'	-58'	136°	5°02'	-59'	136°	4°19'	-59'	136°	3°35'	-59'	136°	2°52'	-59'	136°	2°08'	-59'	136°	8
9	5°31'	-58'	136°	4°47'	-58'	136°	4°04'	-59'	137°	3°20'	-59'	137°	2°36'	-59'	137°	1°53'	-59'	137°	1°09'	-59'	137°	9
10	4°32'	-58'	137°	3°49'	-58'	137°	3°05'	-59'	137°	2°21'	-59'	137°	1°37'	-59'	137°	0°54'	-59'	137°	0°10'	-59'	137°	10
11	3°34'	-58'	137°	2°50'	-58'	137°	2°06'	-59'	137°	1°22'	-59'	137°	0°39'	-59'	137°	0°05'	+59'	43°	0°49'	+59'	43°	11
12	2°36'	-58'	137°	1°52'	-58'	137°	1°08'	-59'	137°	0°24'	-59'	137°	0°20'	+59'	43°	1°04'	+59'	43°	1°48'	+59'	43°	12
13	1°37'	-58'	137°	0°53'	-58'	137°	0°09'	-59'	137°	0°35'	+59'	43°	1°19'	+59'	43°	2°03'	+59'	43°	2°48'	+59'	43°	13
14	0°39'	-58'	138°	0°05'	+58'	42°	0°49'	+59'	42°	1°34'	+59'	42°	2°18'	+59'	42°	3°02'	+59'	42°	3°47'	+59'	42°	14
15	0°19'	+58'	42°	1°04'	+58'	42°	1°48'	+59'	42°	2°33'	+59'	42°	3°17'	+59'	42°	4°01'	+59'	42°	4°46'	+59'	42°	15
16	1°17'	+58'	42°	2°02'	+58'	42°	2°47'	+59'	42°	3°31'	+59'	42°	4°16'	+59'	42°	5°00'	+59'	42°	5°45'	+59'	42°	16
17	2°16'	+58'	42°	3°01'	+58'	42°	3°45'	+59'	42°	4°30'	+59'	42°	5°15'	+59'	42°	5°59'	+59'	42°	6°44'	+59'	42°	17
18	3°14'	+58'	41°	3°59'	+58'	41°	4°44'	+59'	42°	5°29'	+59'	42°	6°14'	+59'	42°	6°58'	+59'	42°	7°43'	+59'	42°	18
19	4°12'	+58'	41°	4°57'	+58'	41°	5°42'	+59'	41°	6°28'	+59'	41°	7°13'	+59'	41°	7°57'	+59'	42°	8°42'	+59'	42°	19
20	5°11'	+58'	41°	5°56'	+58'	41°	6°41'	+59'	41°	7°26'	+59'	41°	8°11'	+59'	41°	8°56'	+59'	41°	9°41'	+59'	41°	20
21	6°09'	+58'	41°	6°54'	+58'	41°	7°40'	+59'	41°	8°25'	+59'	41°	9°10'	+59'	41°	9°55'	+59'	41°	10°41'	+59'	41°	21
22	7°07'	+58'	40°	7°53'	+58'	41°	8°38'	+59'	41°	9°24'	+59'	41°	10°09'	+59'	41°	10°54'	+59'	41°	11°40'	+59'	41°	22
23	8°05'	+58'	40°	8°51'	+58'	40°	9°37'	+59'	40°	10°22'	+59'	41°	11°08'	+59'	41°	11°53'	+59'	41°	12°39'	+59'	41°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	14°29'	-58'	135°	13°46'	-58'	135°	13°04'	-59'	136°	12°21'	-59'	136°	11°38'	-59'	136°	10°55'	-59'	136°	10°11'	-59'	136°	0
1	13°31'	-58'	135°	12°48'	-58'	136°	12°05'	-59'	136°	11°22'	-59'	136°	10°39'	-59'	136°	9°56'	-59'	136°	9°12'	-59'	136°	1
2	12°33'	-58'	136°	11°50'	-58'	136°	11°07'	-59'	136°	10°23'	-59'	136°	9°40'	-59'	136°	8°57'	-59'	136°	8°13'	-59'	136°	2
3	11°34'	-58'	136°	10°51'	-58'	136°	10°08'	-59'	136°	9°25'	-59'	136°	8°41'	-59'	136°	7°58'	-59'	137°	7°14'	-59'	137°	3
4	10°36'	-58'	136°	9°53'	-58'	136°	9°09'	-59'	136°	8°26'	-59'	137°	7°42'	-59'	137°	6°59'	-59'	137°	6°15'	-59'	137°	4
5	9°38'	-58'	136°	8°54'	-58'	137°	8°11'	-59'	137°	7°27'	-59'	137°	6°43'	-59'	137°	5°59'	-59'	137°	5°16'	-59'	137°	5
6	8°40'	-58'	137°	7°56'	-58'	137°	7°12'	-59'	137°	6°28'	-59'	137°	5°44'	-59'	137°	5°00'	-59'	137°	4°16'	-59'	137°	6
7	7°41'	-58'	137°	6°57'	-58'	137°	6°13'	-59'	137°	5°29'	-59'	137°	4°45'	-59'	137°	4°01'	-59'	137°	3°17'	-59'	137°	7
8	6°43'	-58'	137°	5°59'	-58'	137°	5°15'	-59'	137°	4°31'	-59'	137°	3°47'	-59'	137°	3°02'	-59'	137°	2°18'	-59'	137°	8
9	5°45'	-58'	137°	5°00'	-58'	137°	4°16'	-59'	138°	3°32'	-59'	138°	2°48'	-59'	138°	2°03'	-59'	138°	1°19'	-59'	138°	9
10	4°46'	-58'	138°	4°02'	-58'	138°	3°17'	-59'	138°	2°33'	-59'	138°	1°49'	-59'	138°	1°04'	-59'	138°	0°20'	-59'	138°	10
11	3°48'	-58'	138°	3°03'	-58'	138°	2°19'	-59'	138°	1°34'	-59'	138°	0°50'	-59'	138°	0°05'	-59'	138°	0°39'	+59'	42°	11
12	2°50'	-58'	138°	2°05'	-59'	138°	1°20'	-59'	138°	0°36'	-59'	138°	0°09'	+59'	42°	0°54'	+59'	42°	1°39'	+59'	42°	12
13	1°51'	-58'	138°	1°06'	-59'	138°	0°22'	-59'	138°	0°23'	+59'	42°	1°08'	+59'	42°	1°53'	+59'	42°	2°38'	+59'	42°	13
14	0°53'	-58'	139°	0°08'	-59'	139°	0°37'	+59'	41°	1°22'	+59'	41°	2°07'	+59'	41°	2°52'	+59'	41°	3°37'	+59'	42°	14
15	0°05'	+58'	41°	0°51'	+59'	41°	1°36'	+59'	41°	2°21'	+59'	41°	3°06'	+59'	41°	3°51'	+59'	41°	4°36'	+59'	41°	15
16	1°04'	+58'	41°	1°49'	+58'	41°	2°34'	+59'	41°	3°20'	+59'	41°	4°05'	+59'	41°	4°50'	+59'	41°	5°35'	+59'	41°	16
17	2°02'	+58'	41°	2°48'	+58'	41°	3°33'	+59'	41°	4°18'	+59'	41°	5°04'	+59'	41°	5°49'	+59'	41°	6°34'	+59'	41°	17
18	3°01'	+58'	41°	3°46'	+58'	41°	4°32'	+59'	41°	5°17'	+59'	41°	6°03'	+59'	41°	6°48'	+59'	41°	7°34'	+59'	41°	18
19	3°59'	+58'	40°	4°45'	+58'	40°	5°30'	+59'	40°	6°16'	+59'	40°	7°02'	+59'	41°	7°47'	+59'	41°	8°33'	+59'	41°	19
20	4°57'	+58'	40°	5°43'	+58'	40°	6°29'	+59'	40°	7°15'	+59'	40°	8°01'	+59'	40°	8°46'	+59'	40°	9°32'	+59'	41°	20
21	5°56'	+58'	40°	6°42'	+58'	40°	7°28'	+59'	40°	8°14'	+59'	40°	8°59'	+59'	40°	9°45'	+59'	40°	10°31'	+59'	40°	21
22	6°54'	+58'	40°	7°40'	+58'	40°	8°26'	+59'	40°	9°12'	+59'	40°	9°58'	+59'	40°	10°44'	+59'	40°	11°30'	+59'	40°	22
23	7°52'	+58'	39°	8°39'	+58'	39°	9°25'	+59'	40°	10°11'	+59'	40°	10°57'	+59'	40°	11°43'	+59'	40°	12°29'	+59'	40°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

137° 223° LHA — Latitude SAME as DECLINATION — 137° 223° LHA

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

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

42° 318° LHA — Latitude CONTRARY to Declination — 42° 318° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	14°43' -58' 136°	14°00' -58' 136°	13°17' -59' 137°	12°33' -59' 137°	11°49' -59' 137°	11°05' -59' 137°	10°21' -59' 137°	0
1	13°45' -58' 136°	13°02' -58' 137°	12°18' -59' 137°	11°34' -59' 137°	10°50' -59' 137°	10°06' -59' 137°	9°22' -59' 137°	1
2	12°47' -58' 137°	12°03' -58' 137°	11°19' -59' 137°	10°35' -59' 137°	9°51' -59' 137°	9°07' -59' 137°	8°23' -59' 137°	2
3	11°49' -58' 137°	11°05' -59' 137°	10°21' -59' 137°	9°37' -59' 137°	8°52' -59' 137°	8°08' -59' 138°	7°24' -59' 138°	3
4	10°50' -58' 137°	10°06' -59' 137°	9°22' -59' 137°	8°38' -59' 138°	7°53' -59' 138°	7°09' -59' 138°	6°25' -59' 138°	4
5	9°52' -58' 137°	9°08' -59' 138°	8°23' -59' 138°	7°39' -59' 138°	6°54' -59' 138°	6°10' -59' 138°	5°25' -59' 138°	5
6	8°53' -58' 138°	8°09' -59' 138°	7°25' -59' 138°	6°40' -59' 138°	5°56' -59' 138°	5°11' -59' 138°	4°26' -59' 138°	6
7	7°55' -58' 138°	7°11' -59' 138°	6°26' -59' 138°	5°41' -59' 138°	4°57' -59' 138°	4°12' -59' 138°	3°27' -59' 138°	7
8	6°57' -58' 138°	6°12' -59' 138°	5°27' -59' 138°	4°42' -59' 138°	3°58' -59' 138°	3°13' -59' 138°	2°28' -59' 138°	8
9	5°58' -58' 138°	5°13' -59' 138°	4°29' -59' 138°	3°44' -59' 139°	2°59' -59' 139°	2°14' -59' 139°	1°29' -59' 139°	9
10	5°00' -58' 139°	4°15' -59' 139°	3°30' -59' 139°	2°45' -59' 139°	2°00' -59' 139°	1°15' -59' 139°	0°29' -59' 139°	10
11	4°02' -58' 139°	3°16' -59' 139°	2°31' -59' 139°	1°46' -59' 139°	1°01' -59' 139°	0°15' -59' 139°	0°30' +59' 41°	11
12	3°03' -58' 139°	2°18' -59' 139°	1°32' -59' 139°	0°47' -59' 139°	0°02' -59' 139°	0°44' +59' 41°	1°29' +59' 41°	12
13	2°05' -58' 139°	1°19' -59' 139°	0°34' -59' 139°	0°12' +59' 41°	0°57' +59' 41°	1°43' +59' 41°	2°28' +59' 41°	13
14	1°06' -58' 140°	0°21' -59' 140°	0°25' +59' 40°	1°11' +59' 40°	1°56' +59' 41°	2°42' +59' 41°	3°27' +59' 41°	14
15	0°08' -58' 140°	0°38' +59' 40°	1°24' +59' 40°	2°09' +59' 40°	2°55' +59' 40°	3°41' +59' 40°	4°27' +59' 40°	15
16	0°51' +58' 40°	1°36' +59' 40°	2°22' +59' 40°	3°08' +59' 40°	3°54' +59' 40°	4°40' +59' 40°	5°26' +59' 40°	16
17	1°49' +58' 40°	2°35' +59' 40°	3°21' +59' 40°	4°07' +59' 40°	4°53' +59' 40°	5°39' +59' 40°	6°25' +59' 40°	17
18	2°47' +58' 40°	3°34' +59' 40°	4°20' +59' 40°	5°06' +59' 40°	5°52' +59' 40°	6°38' +59' 40°	7°24' +59' 40°	18
19	3°46' +58' 39°	4°32' +59' 39°	5°18' +59' 39°	6°05' +59' 40°	6°51' +59' 40°	7°37' +59' 40°	8°23' +59' 40°	19
20	4°44' +58' 39°	5°31' +59' 39°	6°17' +59' 39°	7°04' +59' 39°	7°50' +59' 39°	8°36' +59' 39°	9°23' +59' 40°	20
21	5°43' +58' 39°	6°29' +59' 39°	7°16' +59' 39°	8°02' +59' 39°	8°49' +59' 39°	9°35' +59' 39°	10°22' +59' 39°	21
22	6°41' +58' 39°	7°28' +59' 39°	8°15' +59' 39°	9°01' +59' 39°	9°48' +59' 39°	10°34' +59' 39°	11°21' +59' 39°	22
23	7°39' +58' 38°	8°26' +59' 39°	9°13' +59' 39°	10°00' +59' 39°	10°47' +59' 39°	11°34' +59' 39°	12°20' +59' 39°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	14°58' -58' 137°	14°13' -59' 137°	13°29' -59' 138°	12°45' -59' 138°	12°00' -59' 138°	11°16' -59' 138°	10°31' -59' 138°	0
1	13°59' -58' 137°	13°15' -59' 138°	12°31' -59' 138°	11°46' -59' 138°	11°01' -59' 138°	10°17' -59' 138°	9°32' -59' 138°	1
2	13°01' -58' 138°	12°16' -59' 138°	11°32' -59' 138°	10°47' -59' 138°	10°02' -59' 138°	9°18' -59' 138°	8°33' -59' 138°	2
3	12°02' -58' 138°	11°18' -59' 138°	10°33' -59' 138°	9°48' -59' 138°	9°03' -59' 138°	8°19' -59' 139°	7°34' -59' 139°	3
4	11°04' -58' 138°	10°19' -59' 138°	9°34' -59' 138°	8°49' -59' 139°	8°04' -59' 139°	7°19' -59' 139°	6°34' -59' 139°	4
5	10°06' -58' 138°	9°21' -59' 139°	8°36' -59' 139°	7°51' -59' 139°	7°05' -59' 139°	6°20' -59' 139°	5°35' -59' 139°	5
6	9°07' -58' 139°	8°22' -59' 139°	7°37' -59' 139°	6°52' -59' 139°	6°06' -59' 139°	5°21' -59' 139°	4°36' -59' 139°	6
7	8°09' -58' 139°	7°23' -59' 139°	6°38' -59' 139°	5°53' -59' 139°	5°07' -59' 139°	4°22' -59' 139°	3°37' -59' 139°	7
8	7°10' -58' 139°	6°25' -59' 139°	5°39' -59' 139°	4°54' -59' 139°	4°08' -59' 139°	3°23' -59' 139°	2°37' -59' 139°	8
9	6°12' -58' 139°	5°26' -59' 139°	4°41' -59' 139°	3°55' -59' 139°	3°09' -59' 140°	2°24' -59' 140°	1°38' -59' 140°	9
10	5°13' -58' 140°	4°28' -59' 140°	3°42' -59' 140°	2°56' -59' 140°	2°10' -59' 140°	1°25' -59' 140°	0°39' -59' 140°	10
11	4°15' -58' 140°	3°29' -59' 140°	2°43' -59' 140°	1°57' -59' 140°	1°11' -59' 140°	0°26' -59' 140°	0°20' +59' 40°	11
12	3°16' -58' 140°	2°30' -59' 140°	1°44' -59' 140°	0°58' -59' 140°	0°12' -59' 140°	0°34' +59' 40°	1°20' +59' 40°	12
13	2°18' -58' 140°	1°32' -59' 140°	0°46' -59' 140°	0°00' +59' 40°	0°47' +59' 40°	1°33' +59' 40°	2°19' +59' 40°	13
14	1°20' -58' 140°	0°33' -59' 140°	0°13' +59' 40°	0°59' +59' 40°	1°46' +59' 40°	2°32' +59' 40°	3°18' +59' 40°	14
15	0°21' -58' 141°	0°25' +59' 39°	1°12' +59' 39°	1°58' +59' 39°	2°45' +59' 39°	3°31' +59' 39°	4°17' +59' 39°	15
16	0°37' +58' 39°	1°24' +59' 39°	2°11' +59' 39°	2°57' +59' 39°	3°44' +59' 39°	4°30' +59' 39°	5°17' +59' 39°	16
17	1°36' +58' 39°	2°23' +59' 39°	3°09' +59' 39°	3°56' +59' 39°	4°43' +59' 39°	5°29' +59' 39°	6°16' +59' 39°	17
18	2°34' +58' 39°	3°21' +59' 39°	4°08' +59' 39°	4°55' +59' 39°	5°42' +59' 39°	6°28' +59' 39°	7°15' +59' 39°	18
19	3°33' +58' 38°	4°20' +59' 38°	5°07' +59' 39°	5°54' +59' 39°	6°41' +59' 39°	7°27' +59' 39°	8°14' +59' 39°	19
20	4°31' +58' 38°	5°18' +59' 38°	6°06' +59' 38°	6°53' +59' 38°	7°40' +59' 38°	8°27' +59' 39°	9°13' +59' 39°	20
21	5°30' +58' 38°	6°17' +59' 38°	7°04' +59' 38°	7°51' +59' 38°	8°39' +59' 38°	9°26' +59' 38°	10°13' +59' 38°	21
22	6°28' +58' 38°	7°16' +59' 38°	8°03' +59' 38°	8°50' +59' 38°	9°38' +59' 38°	10°25' +59' 38°	11°12' +59' 38°	22
23	7°27' +58' 38°	8°14' +59' 38°	9°02' +59' 38°	9°49' +59' 38°	10°37' +59' 38°	11°24' +59' 38°	12°11' +59' 38°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

139° 221° LHA — Latitude SAME as DECLINATION — 139° 221° LHA

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

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

40° 320° LHA — Latitude CONTRARY to Declination — 40° 320° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°11'	-58'	138°	14°27'	-59'	138°	13°42'	-59'	139°	12°57'	-59'	139°	12°11'	-59'	139°	11°26'	-59'	139°	10°41'	-59'	139°	0
1	14°13'	-58'	138°	13°28'	-59'	139°	12°43'	-59'	139°	11°58'	-59'	139°	11°12'	-59'	139°	10°27'	-59'	139°	9°42'	-59'	139°	1
2	13°14'	-58'	139°	12°29'	-59'	139°	11°44'	-59'	139°	10°59'	-59'	139°	10°13'	-59'	139°	9°28'	-59'	139°	8°42'	-59'	139°	2
3	12°16'	-58'	139°	11°31'	-59'	139°	10°45'	-59'	139°	10°00'	-59'	139°	9°14'	-59'	139°	8°29'	-59'	140°	7°43'	-59'	140°	3
4	11°18'	-58'	139°	10°32'	-59'	139°	9°47'	-59'	139°	9°01'	-59'	140°	8°15'	-59'	140°	7°30'	-59'	140°	6°44'	-59'	140°	4
5	10°19'	-58'	139°	9°33'	-59'	140°	8°48'	-59'	140°	8°02'	-59'	140°	7°16'	-59'	140°	6°30'	-59'	140°	5°45'	-59'	140°	5
6	9°21'	-58'	140°	8°35'	-59'	140°	7°49'	-59'	140°	7°03'	-59'	140°	6°17'	-59'	140°	5°31'	-59'	140°	4°45'	-59'	140°	6
7	8°22'	-59'	140°	7°36'	-59'	140°	6°50'	-59'	140°	6°04'	-59'	140°	5°18'	-59'	140°	4°32'	-59'	140°	3°46'	-59'	140°	7
8	7°24'	-59'	140°	6°38'	-59'	140°	5°51'	-59'	140°	5°05'	-59'	140°	4°19'	-59'	140°	3°33'	-59'	140°	2°47'	-59'	140°	8
9	6°25'	-59'	140°	5°39'	-59'	140°	4°53'	-59'	140°	4°06'	-59'	140°	3°20'	-59'	141°	2°34'	-59'	141°	1°47'	-59'	141°	9
10	5°27'	-59'	141°	4°40'	-59'	141°	3°54'	-59'	141°	3°07'	-59'	141°	2°21'	-59'	141°	1°35'	-59'	141°	0°48'	-59'	141°	10
11	4°28'	-59'	141°	3°42'	-59'	141°	2°55'	-59'	141°	2°09'	-59'	141°	1°22'	-59'	141°	0°35'	-59'	141°	0°11'	+59'	39°	11
12	3°30'	-59'	141°	2°43'	-59'	141°	1°56'	-59'	141°	1°10'	-59'	141°	0°23'	-59'	141°	0°24'	+59'	39°	1°10'	+59'	39°	12
13	2°31'	-59'	141°	1°44'	-59'	141°	0°57'	-59'	141°	0°11'	-59'	141°	0°36'	+59'	39°	1°23'	+59'	39°	2°10'	+59'	39°	13
14	1°32'	-59'	141°	0°46'	-59'	141°	0°01'	+59'	39°	0°48'	+59'	39°	1°35'	+59'	39°	2°22'	+59'	39°	3°09'	+59'	39°	14
15	0°34'	-59'	142°	0°13'	+59'	38°	1°00'	+59'	38°	1°47'	+59'	38°	2°34'	+59'	38°	3°21'	+59'	38°	4°08'	+59'	38°	15
16	0°25'	+59'	38°	1°12'	+59'	38°	1°59'	+59'	38°	2°46'	+59'	38°	3°33'	+59'	38°	4°20'	+59'	38°	5°07'	+59'	38°	16
17	1°23'	+59'	38°	2°10'	+59'	38°	2°58'	+59'	38°	3°45'	+59'	38°	4°32'	+59'	38°	5°20'	+59'	38°	6°07'	+59'	38°	17
18	2°22'	+59'	38°	3°09'	+59'	38°	3°57'	+59'	38°	4°44'	+59'	38°	5°31'	+59'	38°	6°19'	+59'	38°	7°06'	+59'	38°	18
19	3°20'	+59'	38°	4°08'	+59'	38°	4°55'	+59'	38°	5°43'	+59'	38°	6°30'	+59'	38°	7°18'	+59'	38°	8°05'	+59'	38°	19
20	4°19'	+59'	37°	5°06'	+59'	37°	5°54'	+59'	37°	6°42'	+59'	37°	7°29'	+59'	38°	8°17'	+59'	38°	9°04'	+59'	38°	20
21	5°17'	+59'	37°	6°05'	+59'	37°	6°53'	+59'	37°	7°41'	+59'	37°	8°28'	+59'	37°	9°16'	+59'	37°	10°04'	+59'	38°	21
22	6°16'	+59'	37°	7°04'	+59'	37°	7°52'	+59'	37°	8°40'	+59'	37°	9°27'	+59'	37°	10°15'	+59'	37°	11°03'	+59'	37°	22
23	7°14'	+59'	37°	8°02'	+59'	37°	8°51'	+59'	37°	9°39'	+59'	37°	10°26'	+59'	37°	11°14'	+59'	37°	12°02'	+59'	37°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°25'	-58'	139°	14°39'	-59'	139°	13°54'	-59'	140°	13°08'	-59'	140°	12°22'	-59'	140°	11°36'	-59'	140°	10°50'	-59'	140°	0
1	14°26'	-59'	139°	13°41'	-59'	140°	12°55'	-59'	140°	12°09'	-59'	140°	11°23'	-59'	140°	10°37'	-59'	140°	9°51'	-59'	140°	1
2	13°28'	-59'	140°	12°42'	-59'	140°	11°56'	-59'	140°	11°10'	-59'	140°	10°24'	-59'	140°	9°38'	-59'	140°	8°52'	-59'	140°	2
3	12°29'	-59'	140°	11°43'	-59'	140°	10°57'	-59'	140°	10°11'	-59'	140°	9°25'	-59'	140°	8°39'	-59'	141°	7°52'	-59'	141°	3
4	11°31'	-59'	140°	10°45'	-59'	140°	9°59'	-59'	140°	9°12'	-59'	141°	8°26'	-59'	141°	7°40'	-59'	141°	6°53'	-59'	141°	4
5	10°32'	-59'	140°	9°46'	-59'	140°	9°00'	-59'	141°	8°13'	-59'	141°	7°27'	-59'	141°	6°40'	-59'	141°	5°54'	-59'	141°	5
6	9°34'	-59'	141°	8°47'	-59'	141°	8°01'	-59'	141°	7°14'	-59'	141°	6°28'	-59'	141°	5°41'	-59'	141°	4°54'	-59'	141°	6
7	8°35'	-59'	141°	7°49'	-59'	141°	7°02'	-59'	141°	6°15'	-59'	141°	5°29'	-59'	141°	4°42'	-59'	141°	3°55'	-59'	141°	7
8	7°37'	-59'	141°	6°50'	-59'	141°	6°03'	-59'	141°	5°16'	-59'	141°	4°30'	-59'	141°	3°43'	-59'	141°	2°56'	-59'	141°	8
9	6°38'	-59'	141°	5°51'	-59'	141°	5°04'	-59'	141°	4°17'	-59'	141°	3°31'	-59'	141°	2°44'	-59'	142°	1°57'	-59'	142°	9
10	5°39'	-59'	141°	4°53'	-59'	142°	4°06'	-59'	142°	3°18'	-59'	142°	2°31'	-59'	142°	1°44'	-59'	142°	0°57'	-59'	142°	10
11	4°41'	-59'	142°	3°54'	-59'	142°	3°07'	-59'	142°	2°20'	-59'	142°	1°32'	-59'	142°	0°45'	-59'	142°	0°02'	+59'	38°	11
12	3°42'	-59'	142°	2°55'	-59'	142°	2°08'	-59'	142°	1°21'	-59'	142°	0°33'	-59'	142°	0°14'	+59'	38°	1°01'	+59'	38°	12
13	2°44'	-59'	142°	1°56'	-59'	142°	1°09'	-59'	142°	0°22'	-59'	142°	0°26'	+59'	38°	1°13'	+59'	38°	2°01'	+59'	38°	13
14	1°45'	-59'	142°	0°58'	-59'	142°	0°10'	-59'	142°	0°37'	+59'	38°	1°25'	+59'	38°	2°12'	+59'	38°	3°00'	+59'	38°	14
15	0°47'	-59'	143°	0°01'	+59'	37°	0°49'	+59'	37°	1°36'	+59'	37°	2°24'	+59'	37°	3°12'	+59'	38°	3°59'	+59'	38°	15
16	0°12'	+59'	37°	1°00'	+59'	37°	1°48'	+59'	37°	2°35'	+59'	37°	3°23'	+59'	37°	4°11'	+59'	37°	4°59'	+59'	37°	16
17	1°11'	+59'	37°	1°59'	+59'	37°	2°46'	+59'	37°	3°34'	+59'	37°	4°22'	+59'	37°	5°10'	+59'	37°	5°58'	+59'	37°	17
18	2°09'	+59'	37°	2°57'	+59'	37°	3°45'	+59'	37°	4°33'	+59'	37°	5°21'	+59'	37°	6°09'	+59'	37°	6°57'	+59'	37°	18
19	3°08'	+59'	37°	3°56'	+59'	37°	4°44'	+59'	37°	5°32'	+59'	37°	6°20'	+59'	37°	7°08'	+59'	37°	7°56'	+59'	37°	19
20	4°06'	+59'	36°	4°55'	+59'	36°	5°43'	+59'	36°	6°31'	+59'	37°	7°19'	+59'	37°	8°08'	+59'	37°	8°56'	+59'	37°	20
21	5°05'	+59'	36°	5°53'	+59'	36°	6°42'	+59'	36°	7°30'	+59'	36°	8°19'	+59'	36°	9°07'	+59'	37°	9°55'	+59'	37°	21
22	6°04'	+59'	36°	6°52'	+59'	36°	7°41'	+59'	36°	8°29'	+59'	36°	9°18'	+59'	36°	10°06'	+59'	36°	10°54'	+59'	36°	22
23	7°02'	+59'	36°	7°51'	+59'	36°	8°40'	+59'	36°	9°28'	+59'	36°	10°17'	+59'	36°	11°05'	+59'	36°	11°54'	+59'	36°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

141° 219° LHA — Latitude SAME as DECLINATION — 141° 219° 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 CONTRARY to Declination — 38° 322° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°38'	-59'	140°	14°52'	-59'	140°	14°06'	-59'	141°	13°19'	-59'	141°	12°33'	-59'	141°	11°46'	-59'	141°	10°59'	-59'	141°	0
1	14°40'	-59'	140°	13°53'	-59'	141°	13°07'	-59'	141°	12°20'	-59'	141°	11°34'	-59'	141°	10°47'	-59'	141°	10°00'	-59'	141°	1
2	13°41'	-59'	141°	12°55'	-59'	141°	12°08'	-59'	141°	11°21'	-59'	141°	10°35'	-59'	141°	9°48'	-59'	141°	9°01'	-59'	141°	2
3	12°42'	-59'	141°	11°56'	-59'	141°	11°09'	-59'	141°	10°22'	-59'	141°	9°35'	-59'	141°	8°48'	-59'	142°	8°01'	-59'	142°	3
4	11°44'	-59'	141°	10°57'	-59'	141°	10°10'	-59'	141°	9°23'	-59'	142°	8°36'	-59'	142°	7°49'	-59'	142°	7°02'	-59'	142°	4
5	10°45'	-59'	141°	9°58'	-59'	141°	9°11'	-59'	142°	8°24'	-59'	142°	7°37'	-59'	142°	6°50'	-59'	142°	6°03'	-59'	142°	5
6	9°47'	-59'	142°	9°00'	-59'	142°	8°12'	-59'	142°	7°25'	-59'	142°	6°38'	-59'	142°	5°51'	-59'	142°	5°03'	-59'	142°	6
7	8°48'	-59'	142°	8°01'	-59'	142°	7°14'	-59'	142°	6°26'	-59'	142°	5°39'	-59'	142°	4°52'	-59'	142°	4°04'	-59'	142°	7
8	7°49'	-59'	142°	7°02'	-59'	142°	6°15'	-59'	142°	5°27'	-59'	142°	4°40'	-59'	142°	3°52'	-59'	142°	3°05'	-59'	142°	8
9	6°51'	-59'	142°	6°03'	-59'	142°	5°16'	-59'	142°	4°28'	-59'	142°	3°41'	-59'	142°	2°53'	-59'	142°	2°06'	-59'	143°	9
10	5°52'	-59'	142°	5°05'	-59'	143°	4°17'	-59'	143°	3°29'	-59'	143°	2°42'	-59'	143°	1°54'	-59'	143°	1°06'	-59'	143°	10
11	4°53'	-59'	143°	4°06'	-59'	143°	3°18'	-59'	143°	2°30'	-59'	143°	1°42'	-59'	143°	0°55'	-59'	143°	0°07'	-59'	143°	11
12	3°55'	-59'	143°	3°07'	-59'	143°	2°19'	-59'	143°	1°31'	-59'	143°	0°43'	-59'	143°	0°05'	+59'	37°	0°52'	+59'	37°	12
13	2°56'	-59'	143°	2°08'	-59'	143°	1°20'	-59'	143°	0°32'	-59'	143°	0°16'	+59'	37°	1°04'	+59'	37°	1°52'	+59'	37°	13
14	1°58'	-59'	143°	1°09'	-59'	143°	0°21'	-59'	143°	0°27'	+59'	37°	1°15'	+59'	37°	2°03'	+59'	37°	2°51'	+59'	37°	14
15	0°59'	-59'	144°	0°11'	-59'	144°	0°38'	+59'	36°	1°26'	+59'	37°	2°14'	+59'	37°	3°02'	+59'	37°	3°50'	+59'	37°	15
16	0°00'	-59'	144°	0°48'	+59'	36°	1°37'	+59'	36°	2°25'	+59'	36°	3°13'	+59'	36°	4°02'	+59'	36°	4°50'	+59'	36°	16
17	0°58'	+59'	36°	1°47'	+59'	36°	2°35'	+59'	36°	3°24'	+59'	36°	4°12'	+59'	36°	5°01'	+59'	36°	5°49'	+59'	36°	17
18	1°57'	+59'	36°	2°46'	+59'	36°	3°34'	+59'	36°	4°23'	+59'	36°	5°11'	+59'	36°	6°00'	+59'	36°	6°48'	+59'	36°	18
19	2°56'	+59'	36°	3°44'	+59'	36°	4°33'	+59'	36°	5°22'	+59'	36°	6°11'	+59'	36°	6°59'	+59'	36°	7°48'	+59'	36°	19
20	3°54'	+59'	35°	4°43'	+59'	35°	5°32'	+59'	36°	6°21'	+59'	36°	7°10'	+59'	36°	7°58'	+59'	36°	8°47'	+59'	36°	20
21	4°53'	+59'	35°	5°42'	+59'	35°	6°31'	+59'	35°	7°20'	+59'	35°	8°09'	+59'	35°	8°58'	+59'	36°	9°46'	+59'	36°	21
22	5°52'	+59'	35°	6°41'	+59'	35°	7°30'	+59'	35°	8°19'	+59'	35°	9°08'	+59'	35°	9°57'	+59'	35°	10°46'	+59'	36°	22
23	6°50'	+59'	35°	7°40'	+59'	35°	8°29'	+59'	35°	9°18'	+59'	35°	10°07'	+59'	35°	10°56'	+59'	35°	11°45'	+59'	35°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	15°51'	-59'	141°	15°04'	-59'	141°	14°17'	-59'	142°	13°30'	-59'	142°	12°43'	-59'	142°	11°56'	-59'	142°	11°08'	-59'	142°	0
1	14°52'	-59'	141°	14°05'	-59'	142°	13°18'	-59'	142°	12°31'	-59'	142°	11°44'	-59'	142°	10°57'	-59'	142°	10°09'	-59'	142°	1
2	13°54'	-59'	142°	13°07'	-59'	142°	12°19'	-59'	142°	11°32'	-59'	142°	10°45'	-59'	142°	9°57'	-59'	142°	9°10'	-59'	142°	2
3	12°55'	-59'	142°	12°08'	-59'	142°	11°21'	-59'	142°	10°33'	-59'	142°	9°46'	-59'	142°	8°58'	-59'	143°	8°10'	-59'	143°	3
4	11°57'	-59'	142°	11°09'	-59'	142°	10°22'	-59'	142°	9°34'	-59'	142°	8°46'	-59'	143°	7°59'	-59'	143°	7°11'	-59'	143°	4
5	10°58'	-59'	142°	10°10'	-59'	142°	9°23'	-59'	143°	8°35'	-59'	143°	7°47'	-59'	143°	7°00'	-59'	143°	6°12'	-59'	143°	5
6	9°59'	-59'	143°	9°12'	-59'	143°	8°24'	-59'	143°	7°36'	-59'	143°	6°48'	-59'	143°	6°00'	-59'	143°	5°12'	-59'	143°	6
7	9°01'	-59'	143°	8°13'	-59'	143°	7°25'	-59'	143°	6°37'	-59'	143°	5°49'	-59'	143°	5°01'	-59'	143°	4°13'	-59'	143°	7
8	8°02'	-59'	143°	7°14'	-59'	143°	6°26'	-59'	143°	5°38'	-59'	143°	4°50'	-59'	143°	4°02'	-59'	143°	3°14'	-59'	143°	8
9	7°03'	-59'	143°	6°15'	-59'	143°	5°27'	-59'	143°	4°39'	-59'	143°	3°51'	-59'	143°	3°02'	-59'	143°	2°14'	-59'	143°	9
10	6°04'	-59'	143°	5°16'	-59'	143°	4°28'	-59'	144°	3°40'	-59'	144°	2°52'	-59'	144°	2°03'	-59'	144°	1°15'	-59'	144°	10
11	5°06'	-59'	144°	4°17'	-59'	144°	3°29'	-59'	144°	2°41'	-59'	144°	1°52'	-59'	144°	1°04'	-59'	144°	0°16'	-59'	144°	11
12	4°07'	-59'	144°	3°19'	-59'	144°	2°30'	-59'	144°	1°42'	-59'	144°	0°53'	-59'	144°	0°05'	-59'	144°	0°44'	+59'	36°	12
13	3°08'	-59'	144°	2°20'	-59'	144°	1°31'	-59'	144°	0°43'	-59'	144°	0°06'	+59'	36°	0°55'	+59'	36°	1°43'	+59'	36°	13
14	2°10'	-59'	144°	1°21'	-59'	144°	0°32'	-59'	144°	0°16'	+59'	36°	1°05'	+59'	36°	1°54'	+59'	36°	2°43'	+59'	36°	14
15	1°11'	-59'	144°	0°22'	-59'	144°	0°27'	+59'	36°	1°16'	+59'	36°	2°04'	+59'	36°	2°53'	+59'	36°	3°42'	+59'	36°	15
16	0°12'	-59'	145°	0°37'	+59'	35°	1°26'	+59'	35°	2°15'	+59'	35°	3°04'	+59'	35°	3°52'	+59'	35°	4°41'	+59'	35°	16
17	0°46'	+59'	35°	1°36'	+59'	35°	2°25'	+59'	35°	3°14'	+59'	35°	4°03'	+59'	35°	4°52'	+59'	35°	5°41'	+59'	35°	17
18	1°45'	+59'	35°	2°34'	+59'	35°	3°24'	+59'	35°	4°13'	+59'	35°	5°02'	+59'	35°	5°51'	+59'	35°	6°40'	+59'	35°	18
19	2°44'	+59'	35°	3°33'	+59'	35°	4°23'	+59'	35°	5°12'	+59'	35°	6°01'	+59'	35°	6°50'	+59'	35°	7°39'	+59'	35°	19
20	3°43'	+59'	35°	4°32'	+59'	35°	5°21'	+59'	35°	6°11'	+59'	35°	7°00'	+59'	35°	7°49'	+59'	35°	8°39'	+59'	35°	20
21	4°41'	+59'	34°	5°31'	+59'	34°	6°20'	+59'	34°	7°10'	+59'	34°	7°59'	+59'	35°	8°49'	+59'	35°	9°38'	+59'	35°	21
22	5°40'	+59'	34°	6°30'	+59'	34°	7°19'	+59'	34°	8°09'	+59'	34°	8°58'	+59'	34°	9°48'	+59'	34°	10°37'	+59'	35°	22
23	6°39'	+59'	34°	7°29'	+59'	34°	8°18'	+59'	34°	9°08'	+59'	34°	9°58'	+59'	34°	10°47'	+59'	34°	11°37'	+59'	34°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

143° 217° LHA — Latitude SAME as DECLINATION — 143° 217° 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 CONTRARY to Declination — 36° 324° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	16°04'	-59'	142°	15°16'	-59'	142°	14°29'	-59'	143°	13°41'	-59'	143°	12°53'	-59'	143°	12°05'	-59'	143°	11°17'	-59'	143°	0
1	15°05'	-59'	143°	14°17'	-59'	143°	13°30'	-59'	143°	12°42'	-59'	143°	11°54'	-59'	143°	11°06'	-59'	143°	10°18'	-59'	143°	1
2	14°06'	-59'	143°	13°19'	-59'	143°	12°31'	-59'	143°	11°43'	-59'	143°	10°55'	-59'	143°	10°07'	-59'	143°	9°18'	-59'	143°	2
3	13°08'	-59'	143°	12°20'	-59'	143°	11°32'	-59'	143°	10°44'	-59'	143°	9°56'	-59'	143°	9°07'	-59'	144°	8°19'	-59'	144°	3
4	12°09'	-59'	143°	11°21'	-59'	143°	10°33'	-59'	143°	9°45'	-59'	143°	8°56'	-59'	144°	8°08'	-59'	144°	7°20'	-59'	144°	4
5	11°10'	-59'	143°	10°22'	-59'	143°	9°34'	-59'	144°	8°46'	-59'	144°	7°57'	-59'	144°	7°09'	-59'	144°	6°20'	-59'	144°	5
6	10°12'	-59'	144°	9°23'	-59'	144°	8°35'	-59'	144°	7°46'	-59'	144°	6°58'	-59'	144°	6°09'	-59'	144°	5°21'	-59'	144°	6
7	9°13'	-59'	144°	8°24'	-59'	144°	7°36'	-59'	144°	6°47'	-59'	144°	5°59'	-59'	144°	5°10'	-59'	144°	4°22'	-59'	144°	7
8	8°14'	-59'	144°	7°26'	-59'	144°	6°37'	-59'	144°	5°48'	-59'	144°	5°00'	-59'	144°	4°11'	-59'	144°	3°22'	-59'	144°	8
9	7°15'	-59'	144°	6°27'	-59'	144°	5°38'	-59'	144°	4°49'	-59'	144°	4°00'	-59'	144°	3°12'	-59'	144°	2°23'	-59'	144°	9
10	6°17'	-59'	144°	5°28'	-59'	144°	4°39'	-59'	144°	3°50'	-59'	145°	3°01'	-59'	145°	2°12'	-59'	145°	1°23'	-59'	145°	10
11	5°18'	-59'	145°	4°29'	-59'	145°	3°40'	-59'	145°	2°51'	-59'	145°	2°02'	-59'	145°	1°13'	-59'	145°	0°24'	-59'	145°	11
12	4°19'	-59'	145°	3°30'	-59'	145°	2°41'	-59'	145°	1°52'	-59'	145°	1°03'	-59'	145°	0°14'	-59'	145°	0°35'	+59'	35°	12
13	3°20'	-59'	145°	2°31'	-59'	145°	1°42'	-59'	145°	0°53'	-59'	145°	0°04'	-59'	145°	0°46'	+59'	35°	1°35'	+59'	35°	13
14	2°21'	-59'	145°	1°32'	-59'	145°	0°43'	-59'	145°	0°06'	+59'	35°	0°56'	+59'	35°	1°45'	+59'	35°	2°34'	+59'	35°	14
15	1°23'	-59'	145°	0°33'	-59'	145°	0°16'	+59'	35°	1°05'	+59'	35°	1°55'	+59'	35°	2°44'	+59'	35°	3°34'	+59'	35°	15
16	0°24'	-59'	146°	0°26'	+59'	34°	1°15'	+59'	34°	2°05'	+59'	34°	2°54'	+59'	34°	3°43'	+59'	34°	4°33'	+59'	35°	16
17	0°35'	+59'	34°	1°24'	+59'	34°	2°14'	+59'	34°	3°04'	+59'	34°	3°53'	+59'	34°	4°43'	+59'	34°	5°32'	+59'	34°	17
18	1°34'	+59'	34°	2°23'	+59'	34°	3°13'	+59'	34°	4°03'	+59'	34°	4°52'	+59'	34°	5°42'	+59'	34°	6°32'	+59'	34°	18
19	2°32'	+59'	34°	3°22'	+59'	34°	4°12'	+59'	34°	5°02'	+59'	34°	5°52'	+59'	34°	6°41'	+59'	34°	7°31'	+59'	34°	19
20	3°31'	+59'	34°	4°21'	+59'	34°	5°11'	+59'	34°	6°01'	+59'	34°	6°51'	+59'	34°	7°41'	+59'	34°	8°30'	+59'	34°	20
21	4°30'	+59'	33°	5°20'	+59'	33°	6°10'	+59'	34°	7°00'	+59'	34°	7°50'	+59'	34°	8°40'	+59'	34°	9°30'	+59'	34°	21
22	5°29'	+59'	33°	6°19'	+59'	33°	7°09'	+59'	33°	7°59'	+59'	33°	8°49'	+59'	33°	9°39'	+59'	34°	10°29'	+59'	34°	22
23	6°27'	+59'	33°	7°18'	+59'	33°	8°08'	+59'	33°	8°58'	+59'	33°	9°48'	+59'	33°	10°39'	+59'	33°	11°29'	+59'	34°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	16°16'	-59'	143°	15°28'	-59'	143°	14°40'	-59'	144°	13°51'	-59'	144°	13°03'	-59'	144°	12°14'	-59'	144°	11°26'	-59'	144°	0
1	15°17'	-59'	144°	14°29'	-59'	144°	13°41'	-59'	144°	12°52'	-59'	144°	12°04'	-59'	144°	11°15'	-59'	144°	10°26'	-59'	144°	1
2	14°19'	-59'	144°	13°30'	-59'	144°	12°42'	-59'	144°	11°53'	-59'	144°	11°05'	-59'	144°	10°16'	-59'	144°	9°27'	-59'	144°	2
3	13°20'	-59'	144°	12°31'	-59'	144°	11°43'	-59'	144°	10°54'	-59'	144°	10°05'	-59'	144°	9°16'	-59'	145°	8°28'	-59'	145°	3
4	12°21'	-59'	144°	11°33'	-59'	144°	10°44'	-59'	144°	9°55'	-59'	144°	9°06'	-59'	145°	8°17'	-59'	145°	7°28'	-59'	145°	4
5	11°22'	-59'	144°	10°34'	-59'	144°	9°45'	-59'	145°	8°56'	-59'	145°	8°07'	-59'	145°	7°18'	-59'	145°	6°29'	-59'	145°	5
6	10°24'	-59'	145°	9°35'	-59'	145°	8°46'	-59'	145°	7°57'	-59'	145°	7°08'	-59'	145°	6°19'	-59'	145°	5°29'	-59'	145°	6
7	9°25'	-59'	145°	8°36'	-59'	145°	7°47'	-59'	145°	6°58'	-59'	145°	6°08'	-59'	145°	5°19'	-59'	145°	4°30'	-59'	145°	7
8	8°26'	-59'	145°	7°37'	-59'	145°	6°48'	-59'	145°	5°58'	-59'	145°	5°09'	-59'	145°	4°20'	-59'	145°	3°31'	-59'	145°	8
9	7°27'	-59'	145°	6°38'	-59'	145°	5°49'	-59'	145°	4°59'	-59'	145°	4°10'	-59'	145°	3°21'	-59'	145°	2°31'	-59'	145°	9
10	6°28'	-59'	145°	5°39'	-59'	145°	4°50'	-59'	145°	4°00'	-59'	146°	3°11'	-59'	146°	2°21'	-59'	146°	1°32'	-59'	146°	10
11	5°30'	-59'	146°	4°40'	-59'	146°	3°51'	-59'	146°	3°01'	-59'	146°	2°11'	-59'	146°	1°22'	-59'	146°	0°32'	-59'	146°	11
12	4°31'	-59'	146°	3°41'	-59'	146°	2°51'	-59'	146°	2°02'	-59'	146°	1°12'	-59'	146°	0°23'	-59'	146°	0°27'	+59'	34°	12
13	3°32'	-59'	146°	2°42'	-59'	146°	1°52'	-59'	146°	1°03'	-59'	146°	0°13'	-59'	146°	0°37'	+59'	34°	1°27'	+59'	34°	13
14	2°33'	-59'	146°	1°43'	-59'	146°	0°53'	-59'	146°	0°04'	-59'	146°	0°46'	+59'	34°	1°36'	+59'	34°	2°26'	+59'	34°	14
15	1°34'	-59'	146°	0°44'	-59'	146°	0°06'	+59'	34°	0°56'	+59'	34°	1°46'	+59'	34°	2°35'	+59'	34°	3°25'	+59'	34°	15
16	0°35'	-59'	147°	0°15'	+59'	33°	1°05'	+59'	33°	1°55'	+59'	33°	2°45'	+59'	34°	3°35'	+59'	34°	4°25'	+59'	34°	16
17	0°23'	+59'	33°	1°14'	+59'	33°	2°04'	+59'	33°	2°54'	+59'	33°	3°44'	+59'	33°	4°34'	+59'	33°	5°24'	+59'	33°	17
18	1°22'	+59'	33°	2°13'	+59'	33°	3°03'	+59'	33°	3°53'	+59'	33°	4°43'	+59'	33°	5°33'	+59'	33°	6°24'	+59'	33°	18
19	2°21'	+59'	33°	3°11'	+59'	33°	4°02'	+59'	33°	4°52'	+59'	33°	5°43'	+59'	33°	6°33'	+59'	33°	7°23'	+59'	33°	19
20	3°20'	+59'	33°	4°10'	+59'	33°	5°01'	+59'	33°	5°51'	+59'	33°	6°42'	+59'	33°	7°32'	+59'	33°	8°22'	+59'	33°	20
21	4°19'	+59'	32°	5°09'	+59'	33°	6°00'	+59'	33°	6°50'	+59'	33°	7°41'	+59'	33°	8°31'	+59'	33°	9°22'	+59'	33°	21
22	5°18'	+59'	32°	6°08'	+59'	32°	6°59'	+59'	32°	7°50'	+59'	32°	8°40'	+59'	33°	9°31'	+59'	33°	10°21'	+59'	33°	22
23	6°16'	+59'	32°	7°07'	+59'	32°	7°58'	+59'	32°	8°49'	+59'	32°	9°39'	+59'	32°	10°30'	+59'	32°	11°21'	+59'	33°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

145° 215° LHA — Latitude SAME as DECLINATION — 145° 215° LHA

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

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

34° 326° LHA — Latitude CONTRARY to Declination — 34° 326° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	16°28'	-59'	144°	15°40'	-59'	144°	14°51'	-59'	145°	14°02'	-59'	145°	13°13'	-59'	145°	12°23'	-59'	145°	11°34'	-59'	145°	0
1	15°30'	-59'	145°	14°41'	-59'	145°	13°52'	-59'	145°	13°03'	-59'	145°	12°13'	-59'	145°	11°24'	-59'	145°	10°35'	-59'	145°	1
2	14°31'	-59'	145°	13°42'	-59'	145°	12°53'	-59'	145°	12°03'	-59'	145°	11°14'	-59'	145°	10°25'	-59'	145°	9°35'	-59'	145°	2
3	13°32'	-59'	145°	12°43'	-59'	145°	11°53'	-59'	145°	11°04'	-59'	145°	10°15'	-59'	145°	9°25'	-59'	146°	8°36'	-59'	146°	3
4	12°33'	-59'	145°	11°44'	-59'	145°	10°54'	-59'	145°	10°05'	-59'	145°	9°16'	-59'	146°	8°26'	-59'	146°	7°36'	-59'	146°	4
5	11°34'	-59'	145°	10°45'	-59'	145°	9°55'	-59'	146°	9°06'	-59'	146°	8°16'	-59'	146°	7°27'	-59'	146°	6°37'	-59'	146°	5
6	10°35'	-59'	146°	9°46'	-59'	146°	8°56'	-59'	146°	8°07'	-59'	146°	7°17'	-59'	146°	6°27'	-59'	146°	5°38'	-59'	146°	6
7	9°37'	-59'	146°	8°47'	-59'	146°	7°57'	-59'	146°	7°08'	-59'	146°	6°18'	-59'	146°	5°28'	-59'	146°	4°38'	-59'	146°	7
8	8°38'	-59'	146°	7°48'	-59'	146°	6°58'	-59'	146°	6°08'	-59'	146°	5°18'	-59'	146°	4°29'	-59'	146°	3°39'	-59'	146°	8
9	7°39'	-59'	146°	6°49'	-59'	146°	5°59'	-59'	146°	5°09'	-59'	146°	4°19'	-59'	146°	3°29'	-59'	146°	2°39'	-59'	146°	9
10	6°40'	-59'	146°	5°50'	-59'	146°	5°00'	-59'	146°	4°10'	-59'	146°	3°20'	-59'	147°	2°30'	-59'	147°	1°40'	-59'	147°	10
11	5°41'	-59'	147°	4°51'	-59'	147°	4°01'	-59'	147°	3°11'	-59'	147°	2°21'	-59'	147°	1°30'	-59'	147°	0°40'	-59'	147°	11
12	4°42'	-59'	147°	3°52'	-59'	147°	3°02'	-59'	147°	2°12'	-59'	147°	1°21'	-59'	147°	0°31'	-59'	147°	0°19'	+59'	33°	12
13	3°43'	-59'	147°	2°53'	-59'	147°	2°03'	-59'	147°	1°12'	-59'	147°	0°22'	-59'	147°	0°28'	+59'	33°	1°19'	+59'	33°	13
14	2°44'	-59'	147°	1°54'	-59'	147°	1°04'	-59'	147°	0°13'	-59'	147°	0°37'	+59'	33°	1°28'	+59'	33°	2°18'	+59'	33°	14
15	1°45'	-59'	147°	0°55'	-59'	147°	0°04'	-59'	147°	0°46'	+59'	33°	1°36'	+59'	33°	2°27'	+59'	33°	3°17'	+59'	33°	15
16	0°47'	-59'	147°	0°04'	+59'	33°	0°55'	+59'	33°	1°45'	+59'	33°	2°36'	+59'	33°	3°26'	+59'	33°	4°17'	+59'	33°	16
17	0°12'	+59'	32°	1°03'	+59'	32°	1°54'	+59'	32°	2°44'	+59'	32°	3°35'	+59'	32°	4°26'	+59'	32°	5°16'	+59'	32°	17
18	1°11'	+59'	32°	2°02'	+59'	32°	2°53'	+59'	32°	3°44'	+59'	32°	4°34'	+59'	32°	5°25'	+59'	32°	6°16'	+59'	32°	18
19	2°10'	+59'	32°	3°01'	+59'	32°	3°52'	+59'	32°	4°43'	+59'	32°	5°34'	+59'	32°	6°24'	+59'	32°	7°15'	+59'	32°	19
20	3°09'	+59'	32°	4°00'	+59'	32°	4°51'	+59'	32°	5°42'	+59'	32°	6°33'	+59'	32°	7°24'	+59'	32°	8°15'	+59'	32°	20
21	4°08'	+59'	32°	4°59'	+59'	32°	5°50'	+59'	32°	6°41'	+59'	32°	7°32'	+59'	32°	8°23'	+59'	32°	9°14'	+59'	32°	21
22	5°07'	+59'	31°	5°58'	+59'	31°	6°49'	+59'	31°	7°40'	+59'	32°	8°31'	+59'	32°	9°23'	+59'	32°	10°14'	+59'	32°	22
23	6°06'	+59'	31°	6°57'	+59'	31°	7°48'	+59'	31°	8°39'	+59'	31°	9°31'	+59'	31°	10°22'	+59'	32°	11°13'	+59'	32°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	16°40'	-59'	145°	15°51'	-59'	146°	15°01'	-59'	146°	14°12'	-59'	146°	13°22'	-59'	146°	12°32'	-59'	146°	11°42'	-59'	146°	0
1	15°41'	-59'	146°	14°52'	-59'	146°	14°02'	-59'	146°	13°12'	-59'	146°	12°23'	-59'	146°	11°33'	-59'	146°	10°43'	-59'	146°	1
2	14°42'	-59'	146°	13°53'	-59'	146°	13°03'	-59'	146°	12°13'	-59'	146°	11°23'	-59'	146°	10°33'	-59'	146°	9°43'	-59'	146°	2
3	13°44'	-59'	146°	12°54'	-59'	146°	12°04'	-59'	146°	11°14'	-59'	146°	10°24'	-59'	146°	9°34'	-59'	147°	8°44'	-59'	147°	3
4	12°45'	-59'	146°	11°55'	-59'	146°	11°05'	-59'	146°	10°15'	-59'	146°	9°25'	-59'	147°	8°35'	-59'	147°	7°45'	-59'	147°	4
5	11°46'	-59'	146°	10°56'	-59'	146°	10°06'	-59'	147°	9°16'	-59'	147°	8°25'	-59'	147°	7°35'	-59'	147°	6°45'	-59'	147°	5
6	10°47'	-59'	147°	9°57'	-59'	147°	9°07'	-59'	147°	8°16'	-59'	147°	7°26'	-59'	147°	6°36'	-59'	147°	5°46'	-59'	147°	6
7	9°48'	-59'	147°	8°58'	-59'	147°	8°07'	-59'	147°	7°17'	-59'	147°	6°27'	-59'	147°	5°37'	-59'	147°	4°46'	-59'	147°	7
8	8°49'	-59'	147°	7°59'	-59'	147°	7°08'	-59'	147°	6°18'	-59'	147°	5°28'	-59'	147°	4°37'	-59'	147°	3°47'	-59'	147°	8
9	7°50'	-59'	147°	7°00'	-59'	147°	6°09'	-59'	147°	5°19'	-59'	147°	4°28'	-59'	147°	3°38'	-59'	147°	2°47'	-59'	147°	9
10	6°51'	-59'	147°	6°01'	-59'	147°	5°10'	-59'	147°	4°20'	-59'	147°	3°29'	-59'	147°	2°38'	-59'	148°	1°48'	-59'	148°	10
11	5°52'	-59'	147°	5°02'	-59'	148°	4°11'	-59'	148°	3°20'	-59'	148°	2°30'	-59'	148°	1°39'	-59'	148°	0°48'	-59'	148°	11
12	4°53'	-59'	148°	4°03'	-59'	148°	3°12'	-59'	148°	2°21'	-59'	148°	1°30'	-59'	148°	0°40'	-59'	148°	0°11'	+59'	32°	12
13	3°54'	-59'	148°	3°03'	-59'	148°	2°13'	-59'	148°	1°22'	-59'	148°	0°31'	-59'	148°	0°20'	+59'	32°	1°11'	+59'	32°	13
14	2°55'	-59'	148°	2°04'	-59'	148°	1°14'	-59'	148°	0°23'	-59'	148°	0°28'	+59'	32°	1°19'	+59'	32°	2°10'	+59'	32°	14
15	1°56'	-59'	148°	1°05'	-59'	148°	0°14'	-59'	148°	0°37'	+59'	32°	1°28'	+59'	32°	2°19'	+59'	32°	3°10'	+59'	32°	15
16	0°57'	-59'	148°	0°06'	-59'	148°	0°45'	+59'	32°	1°36'	+59'	32°	2°27'	+59'	32°	3°18'	+59'	32°	4°09'	+59'	32°	16
17	0°01'	+59'	31°	0°53'	+59'	31°	1°44'	+59'	31°	2°35'	+59'	31°	3°26'	+59'	31°	4°17'	+59'	31°	5°09'	+59'	32°	17
18	1°00'	+59'	31°	1°52'	+59'	31°	2°43'	+59'	31°	3°34'	+59'	31°	4°26'	+59'	31°	5°17'	+59'	31°	6°08'	+59'	31°	18
19	1°59'	+59'	31°	2°51'	+59'	31°	3°42'	+59'	31°	4°34'	+59'	31°	5°25'	+59'	31°	6°16'	+59'	31°	7°08'	+59'	31°	19
20	2°58'	+59'	31°	3°50'	+59'	31°	4°41'	+59'	31°	5°33'	+59'	31°	6°24'	+59'	31°	7°16'	+59'	31°	8°07'	+59'	31°	20
21	3°57'	+59'	31°	4°49'	+59'	31°	5°40'	+59'	31°	6°32'	+59'	31°	7°24'	+59'	31°	8°15'	+59'	31°	9°07'	+59'	31°	21
22	4°56'	+59'	30°	5°48'	+59'	31°	6°40'	+59'	31°	7°31'	+59'	31°	8°23'	+59'	31°	9°14'	+59'	31°	10°06'	+59'	31°	22
23	5°55'	+59'	30°	6°47'	+59'	30°	7°39'	+59'	30°	8°30'	+59'	30°	9°22'	+59'	31°	10°14'	+59'	31°	11°05'	+59'	31°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

147° 213° LHA — Latitude SAME as DECLINATION — 147° 213° LHA

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

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

32° 328° LHA — Latitude CONTRARY to Declination — 32° 328° LHA

Dec°	70			71			72			73			74			75			76			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	16°52'	-59'	146°	16°02'	-59'	147°	15°12'	-59'	147°	14°21'	-59'	147°	13°31'	-59'	147°	12°41'	-59'	147°	11°50'	-59'	147°	0
1	15°53'	-59'	147°	15°03'	-59'	147°	14°12'	-59'	147°	13°22'	-59'	147°	12°32'	-59'	147°	11°41'	-59'	147°	10°51'	-59'	147°	1
2	14°54'	-59'	147°	14°04'	-59'	147°	13°13'	-59'	147°	12°23'	-59'	147°	11°32'	-59'	147°	10°42'	-59'	147°	9°51'	-59'	147°	2
3	13°55'	-59'	147°	13°05'	-59'	147°	12°14'	-59'	147°	11°24'	-59'	147°	10°33'	-59'	147°	9°43'	-59'	148°	8°52'	-59'	148°	3
4	12°56'	-59'	147°	12°05'	-59'	147°	11°15'	-59'	147°	10°24'	-59'	147°	9°34'	-59'	148°	8°43'	-59'	148°	7°52'	-59'	148°	4
5	11°57'	-59'	147°	11°06'	-59'	147°	10°16'	-59'	148°	9°25'	-59'	148°	8°34'	-59'	148°	7°44'	-59'	148°	6°53'	-59'	148°	5
6	10°58'	-59'	148°	10°07'	-59'	148°	9°17'	-59'	148°	8°26'	-59'	148°	7°35'	-59'	148°	6°44'	-59'	148°	5°53'	-60'	148°	6
7	9°59'	-59'	148°	9°08'	-59'	148°	8°17'	-59'	148°	7°27'	-59'	148°	6°36'	-59'	148°	5°45'	-59'	148°	4°54'	-60'	148°	7
8	9°00'	-59'	148°	8°09'	-59'	148°	7°18'	-59'	148°	6°27'	-59'	148°	5°36'	-59'	148°	4°45'	-59'	148°	3°54'	-60'	148°	8
9	8°01'	-59'	148°	7°10'	-59'	148°	6°19'	-59'	148°	5°28'	-59'	148°	4°37'	-59'	148°	3°46'	-59'	148°	2°55'	-60'	148°	9
10	7°02'	-59'	148°	6°11'	-59'	148°	5°20'	-59'	148°	4°29'	-59'	148°	3°38'	-59'	148°	2°47'	-59'	149°	1°55'	-60'	149°	10
11	6°03'	-59'	148°	5°12'	-59'	149°	4°21'	-59'	149°	3°30'	-59'	149°	2°38'	-59'	149°	1°47'	-59'	149°	0°56'	-60'	149°	11
12	5°04'	-59'	149°	4°13'	-59'	149°	3°22'	-59'	149°	2°30'	-59'	149°	1°39'	-59'	149°	0°48'	-59'	149°	0°04'	+60'	31°	12
13	4°05'	-59'	149°	3°14'	-59'	149°	2°22'	-59'	149°	1°31'	-59'	149°	0°40'	-59'	149°	0°12'	+59'	31°	1°03'	+60'	31°	13
14	3°06'	-59'	149°	2°15'	-59'	149°	1°23'	-59'	149°	0°32'	-59'	149°	0°20'	+59'	31°	1°11'	+59'	31°	2°03'	+60'	31°	14
15	2°07'	-59'	149°	1°16'	-59'	149°	0°24'	-59'	149°	0°28'	+59'	31°	1°19'	+59'	31°	2°11'	+59'	31°	3°02'	+60'	31°	15
16	1°08'	-59'	149°	0°16'	-59'	149°	0°35'	+59'	31°	1°27'	+59'	31°	2°18'	+59'	31°	3°10'	+59'	31°	4°02'	+60'	31°	16
17	0°09'	-59'	150°	0°43'	+59'	30°	1°34'	+59'	30°	2°26'	+59'	30°	3°18'	+59'	31°	4°09'	+59'	31°	5°01'	+60'	31°	17
18	0°50'	+59'	30°	1°42'	+59'	30°	2°34'	+59'	30°	3°25'	+59'	30°	4°17'	+59'	30°	5°09'	+59'	30°	6°01'	+59'	30°	18
19	1°49'	+59'	30°	2°41'	+59'	30°	3°33'	+59'	30°	4°25'	+59'	30°	5°17'	+59'	30°	6°08'	+59'	30°	7°00'	+59'	30°	19
20	2°48'	+59'	30°	3°40'	+59'	30°	4°32'	+59'	30°	5°24'	+59'	30°	6°16'	+59'	30°	7°08'	+59'	30°	8°00'	+59'	30°	20
21	3°47'	+59'	30°	4°39'	+59'	30°	5°31'	+59'	30°	6°23'	+59'	30°	7°15'	+59'	30°	8°07'	+59'	30°	8°59'	+59'	30°	21
22	4°46'	+59'	30°	5°38'	+59'	30°	6°30'	+59'	30°	7°22'	+59'	30°	8°15'	+59'	30°	9°07'	+59'	30°	9°59'	+59'	30°	22
23	5°45'	+59'	29°	6°37'	+59'	29°	7°29'	+59'	29°	8°22'	+59'	30°	9°14'	+59'	30°	10°06'	+59'	30°	10°58'	+59'	30°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70			71			72			73			74			75			76			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	17°03'	-59'	147°	16°12'	-59'	148°	15°22'	-59'	148°	14°31'	-59'	148°	13°40'	-59'	148°	12°49'	-59'	148°	11°58'	-60'	148°	0
1	16°04'	-59'	148°	15°13'	-59'	148°	14°22'	-59'	148°	13°32'	-59'	148°	12°41'	-59'	148°	11°50'	-59'	148°	10°59'	-60'	148°	1
2	15°05'	-59'	148°	14°14'	-59'	148°	13°23'	-59'	148°	12°32'	-59'	148°	11°41'	-59'	148°	10°50'	-59'	148°	9°59'	-60'	148°	2
3	14°06'	-59'	148°	13°15'	-59'	148°	12°24'	-59'	148°	11°33'	-59'	148°	10°42'	-59'	148°	9°51'	-59'	149°	9°00'	-60'	149°	3
4	13°07'	-59'	148°	12°16'	-59'	148°	11°25'	-59'	148°	10°34'	-59'	148°	9°43'	-59'	149°	8°51'	-59'	149°	8°00'	-60'	149°	4
5	12°08'	-59'	148°	11°17'	-59'	148°	10°26'	-59'	149°	9°34'	-59'	149°	8°43'	-59'	149°	7°52'	-59'	149°	7°00'	-60'	149°	5
6	11°09'	-59'	149°	10°18'	-59'	149°	9°26'	-59'	149°	8°35'	-59'	149°	7°44'	-59'	149°	6°52'	-59'	149°	6°01'	-60'	149°	6
7	10°10'	-59'	149°	9°19'	-59'	149°	8°27'	-59'	149°	7°36'	-59'	149°	6°44'	-59'	149°	5°53'	-59'	149°	5°01'	-60'	149°	7
8	9°11'	-59'	149°	8°19'	-59'	149°	7°28'	-59'	149°	6°36'	-59'	149°	5°45'	-59'	149°	4°53'	-59'	149°	4°02'	-60'	149°	8
9	8°12'	-59'	149°	7°20'	-59'	149°	6°29'	-59'	149°	5°37'	-59'	149°	4°46'	-59'	149°	3°54'	-59'	149°	3°02'	-60'	149°	9
10	7°13'	-59'	149°	6°21'	-59'	149°	5°30'	-59'	149°	4°38'	-59'	149°	3°46'	-59'	149°	2°55'	-59'	149°	2°03'	-60'	150°	10
11	6°14'	-59'	149°	5°22'	-59'	149°	4°30'	-59'	150°	3°39'	-59'	150°	2°47'	-59'	150°	1°55'	-59'	150°	1°03'	-60'	150°	11
12	5°15'	-59'	150°	4°23'	-59'	150°	3°31'	-59'	150°	2°39'	-59'	150°	1°47'	-59'	150°	0°56'	-59'	150°	0°04'	-60'	150°	12
13	4°16'	-59'	150°	3°24'	-59'	150°	2°32'	-59'	150°	1°40'	-59'	150°	0°48'	-59'	150°	0°04'	+59'	30°	0°56'	+60'	30°	13
14	3°16'	-59'	150°	2°25'	-59'	150°	1°33'	-59'	150°	0°41'	-59'	150°	0°11'	+59'	30°	1°03'	+59'	30°	1°55'	+60'	30°	14
15	2°17'	-59'	150°	1°25'	-59'	150°	0°33'	-59'	150°	0°19'	+59'	30°	1°11'	+59'	30°	2°03'	+59'	30°	2°55'	+60'	30°	15
16	1°18'	-59'	150°	0°26'	-59'	150°	0°26'	+59'	30°	1°18'	+59'	30°	2°10'	+59'	30°	3°02'	+59'	30°	3°54'	+60'	30°	16
17	0°19'	-59'	150°	0°33'	+59'	30°	1°25'	+59'	30°	2°17'	+59'	30°	3°10'	+59'	30°	4°02'	+59'	30°	4°54'	+60'	30°	17
18	0°40'	+59'	29°	1°32'	+59'	29°	2°24'	+59'	29°	3°17'	+59'	29°	4°09'	+59'	29°	5°01'	+59'	29°	5°53'	+60'	30°	18
19	1°39'	+59'	29°	2°31'	+59'	29°	3°24'	+59'	29°	4°16'	+59'	29°	5°08'	+59'	29°	6°01'	+59'	29°	6°53'	+60'	29°	19
20	2°38'	+59'	29°	3°30'	+59'	29°	4°23'	+59'	29°	5°15'	+59'	29°	6°08'	+59'	29°	7°00'	+59'	29°	7°52'	+60'	29°	20
21	3°37'	+59'	29°	4°29'	+59'	29°	5°22'	+59'	29°	6°15'	+59'	29°	7°07'	+59'	29°	8°00'	+59'	29°	8°52'	+60'	29°	21
22	4°36'	+59'	29°	5°29'	+59'	29°	6°21'	+59'	29°	7°14'	+59'	29°	8°06'	+59'	29°	8°59'	+59'	29°	9°51'	+60'	29°	22
23	5°35'	+59'	28°	6°28'	+59'	28°	7°20'	+59'	29°	8°13'	+59'	29°	9°06'	+59'	29°	9°58'	+59'	29°	10°51'	+60'	29°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

149° 211° LHA — Latitude SAME as DECLINATION — 149° 211° LHA

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

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

30° 330° LHA — Latitude CONTRARY to Declination — 30° 330° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°14'	-59'	148°	16°23'	-59'	149°	15°31'	-59'	149°	14°40'	-59'	149°	13°49'	-59'	149°	12°57'	-59'	149°	12°06'	-60'	149°	0
1	16°15'	-59'	149°	15°23'	-59'	149°	14°32'	-59'	149°	13°41'	-59'	149°	12°49'	-59'	149°	11°58'	-59'	149°	11°06'	-60'	149°	1
2	15°16'	-59'	149°	14°24'	-59'	149°	13°33'	-59'	149°	12°41'	-59'	149°	11°50'	-59'	149°	10°58'	-59'	149°	10°07'	-60'	149°	2
3	14°17'	-59'	149°	13°25'	-59'	149°	12°34'	-59'	149°	11°42'	-59'	149°	10°50'	-59'	149°	9°59'	-59'	150°	9°07'	-60'	150°	3
4	13°18'	-59'	149°	12°26'	-59'	149°	11°34'	-59'	149°	10°43'	-59'	149°	9°51'	-59'	150°	8°59'	-59'	150°	8°07'	-60'	150°	4
5	12°18'	-59'	149°	11°27'	-59'	149°	10°35'	-59'	150°	9°43'	-59'	150°	8°52'	-59'	150°	8°00'	-59'	150°	7°08'	-60'	150°	5
6	11°19'	-59'	150°	10°28'	-59'	150°	9°36'	-59'	150°	8°44'	-59'	150°	7°52'	-59'	150°	7°00'	-59'	150°	6°08'	-60'	150°	6
7	10°20'	-59'	150°	9°29'	-59'	150°	8°37'	-59'	150°	7°45'	-59'	150°	6°53'	-59'	150°	6°01'	-59'	150°	5°09'	-60'	150°	7
8	9°21'	-59'	150°	8°29'	-59'	150°	7°37'	-59'	150°	6°45'	-59'	150°	5°53'	-59'	150°	5°01'	-59'	150°	4°09'	-60'	150°	8
9	8°22'	-59'	150°	7°30'	-59'	150°	6°38'	-59'	150°	5°46'	-59'	150°	4°54'	-59'	150°	4°02'	-59'	150°	3°10'	-60'	150°	9
10	7°23'	-59'	150°	6°31'	-59'	150°	5°39'	-59'	150°	4°47'	-59'	150°	3°55'	-59'	150°	3°02'	-59'	150°	2°10'	-60'	150°	10
11	6°24'	-59'	150°	5°32'	-59'	150°	4°40'	-59'	150°	3°47'	-59'	151°	2°55'	-59'	151°	2°03'	-59'	151°	1°11'	-60'	151°	11
12	5°25'	-59'	151°	4°33'	-59'	151°	3°40'	-59'	151°	2°48'	-59'	151°	1°56'	-59'	151°	1°03'	-59'	151°	0°11'	-60'	151°	12
13	4°26'	-59'	151°	3°33'	-59'	151°	2°41'	-59'	151°	1°49'	-59'	151°	0°56'	-59'	151°	0°04'	-59'	151°	0°49'	+60'	29°	13
14	3°27'	-59'	151°	2°34'	-59'	151°	1°42'	-59'	151°	0°49'	-59'	151°	0°03'	+59'	29°	0°56'	+59'	29°	1°48'	+60'	29°	14
15	2°28'	-59'	151°	1°35'	-59'	151°	0°42'	-59'	151°	0°10'	+59'	29°	1°03'	+59'	29°	1°55'	+59'	29°	2°48'	+60'	29°	15
16	1°28'	-59'	151°	0°36'	-59'	151°	0°17'	+59'	29°	1°09'	+59'	29°	2°02'	+59'	29°	2°55'	+59'	29°	3°47'	+60'	29°	16
17	0°29'	-59'	151°	0°23'	+59'	29°	1°16'	+59'	29°	2°09'	+59'	29°	3°01'	+59'	29°	3°54'	+59'	29°	4°47'	+60'	29°	17
18	0°30'	+59'	28°	1°23'	+59'	28°	2°15'	+59'	28°	3°08'	+59'	28°	4°01'	+59'	28°	4°54'	+59'	29°	5°46'	+60'	29°	18
19	1°29'	+59'	28°	2°22'	+59'	28°	3°15'	+59'	28°	4°08'	+59'	28°	5°00'	+59'	28°	5°53'	+59'	28°	6°46'	+60'	28°	19
20	2°28'	+59'	28°	3°21'	+59'	28°	4°14'	+59'	28°	5°07'	+59'	28°	6°00'	+59'	28°	6°53'	+59'	28°	7°45'	+60'	28°	20
21	3°27'	+59'	28°	4°20'	+59'	28°	5°13'	+59'	28°	6°06'	+59'	28°	6°59'	+59'	28°	7°52'	+59'	28°	8°45'	+60'	28°	21
22	4°26'	+59'	28°	5°19'	+59'	28°	6°12'	+59'	28°	7°06'	+59'	28°	7°59'	+59'	28°	8°52'	+59'	28°	9°45'	+60'	28°	22
23	5°25'	+59'	28°	6°19'	+59'	28°	7°12'	+59'	28°	8°05'	+59'	28°	8°58'	+59'	28°	9°51'	+59'	28°	10°44'	+60'	28°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°24'	-59'	149°	16°33'	-59'	150°	15°41'	-59'	150°	14°49'	-59'	150°	13°57'	-59'	150°	13°05'	-60'	150°	12°13'	-60'	150°	0
1	16°25'	-59'	150°	15°33'	-59'	150°	14°42'	-59'	150°	13°50'	-59'	150°	12°58'	-59'	150°	12°05'	-60'	150°	11°13'	-60'	150°	1
2	15°26'	-59'	150°	14°34'	-59'	150°	13°42'	-59'	150°	12°50'	-59'	150°	11°58'	-59'	150°	11°06'	-60'	150°	10°14'	-60'	151°	2
3	14°27'	-59'	150°	13°35'	-59'	150°	12°43'	-59'	150°	11°51'	-59'	150°	10°59'	-59'	150°	10°06'	-60'	151°	9°14'	-60'	151°	3
4	13°28'	-59'	150°	12°36'	-59'	150°	11°44'	-59'	150°	10°52'	-59'	150°	9°59'	-59'	151°	9°07'	-60'	151°	8°15'	-60'	151°	4
5	12°29'	-59'	150°	11°37'	-59'	150°	10°44'	-59'	151°	9°52'	-59'	151°	9°00'	-59'	151°	8°07'	-60'	151°	7°15'	-60'	151°	5
6	11°30'	-59'	151°	10°37'	-59'	151°	9°45'	-59'	151°	8°53'	-59'	151°	8°00'	-59'	151°	7°08'	-60'	151°	6°15'	-60'	151°	6
7	10°31'	-59'	151°	9°38'	-59'	151°	8°46'	-59'	151°	7°53'	-59'	151°	7°01'	-59'	151°	6°08'	-60'	151°	5°16'	-60'	151°	7
8	9°31'	-59'	151°	8°39'	-59'	151°	7°46'	-59'	151°	6°54'	-59'	151°	6°01'	-59'	151°	5°09'	-60'	151°	4°16'	-60'	151°	8
9	8°32'	-59'	151°	7°40'	-59'	151°	6°47'	-59'	151°	5°55'	-59'	151°	5°02'	-59'	151°	4°09'	-60'	151°	3°17'	-60'	151°	9
10	7°33'	-59'	151°	6°40'	-59'	151°	5°48'	-59'	151°	4°55'	-59'	151°	4°03'	-59'	151°	3°10'	-60'	151°	2°17'	-60'	151°	10
11	6°34'	-59'	151°	5°41'	-59'	151°	4°49'	-59'	151°	3°56'	-59'	152°	3°03'	-59'	152°	2°10'	-60'	152°	1°18'	-60'	152°	11
12	5°35'	-59'	152°	4°42'	-59'	152°	3°49'	-59'	152°	2°56'	-59'	152°	2°04'	-59'	152°	1°11'	-60'	152°	0°18'	-60'	152°	12
13	4°36'	-59'	152°	3°43'	-59'	152°	2°50'	-59'	152°	1°57'	-59'	152°	1°04'	-59'	152°	0°11'	-60'	152°	0°42'	+60'	28°	13
14	3°36'	-59'	152°	2°44'	-59'	152°	1°51'	-59'	152°	0°58'	-59'	152°	0°05'	-59'	152°	0°48'	+60'	28°	1°41'	+60'	28°	14
15	2°37'	-59'	152°	1°44'	-59'	152°	0°51'	-59'	152°	0°02'	+59'	28°	0°55'	+59'	28°	1°48'	+60'	28°	2°41'	+60'	28°	15
16	1°38'	-59'	152°	0°45'	-59'	152°	0°08'	+59'	28°	1°01'	+59'	28°	1°54'	+59'	28°	2°47'	+60'	28°	3°40'	+60'	28°	16
17	0°39'	-59'	152°	0°14'	+59'	28°	1°07'	+59'	28°	2°01'	+59'	28°	2°54'	+59'	28°	3°47'	+60'	28°	4°40'	+60'	28°	17
18	0°20'	+59'	27°	1°13'	+59'	27°	2°07'	+59'	27°	3°00'	+59'	27°	3°53'	+59'	28°	4°46'	+60'	28°	5°40'	+60'	28°	18
19	1°19'	+59'	27°	2°13'	+59'	27°	3°06'	+59'	27°	3°59'	+59'	27°	4°53'	+59'	27°	5°46'	+60'	27°	6°39'	+60'	27°	19
20	2°19'	+59'	27°	3°12'	+59'	27°	4°05'	+59'	27°	4°59'	+59'	27°	5°52'	+59'	27°	6°45'	+60'	27°	7°39'	+60'	27°	20
21	3°18'	+59'	27°	4°11'	+59'	27°	5°05'	+59'	27°	5°58'	+59'	27°	6°52'	+59'	27°	7°45'	+60'	27°	8°38'	+60'	27°	21
22	4°17'	+59'	27°	5°10'	+59'	27°	6°04'	+59'	27°	6°57'	+59'	27°	7°51'	+59'	27°	8°44'	+60'	27°	9°38'	+60'	27°	22
23	5°16'	+59'	27°	6°10'	+59'	27°	7°03'	+59'	27°	7°57'	+59'	27°	8°50'	+59'	27°	9°44'	+60'	27°	10°37'	+60'	27°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

151° 209° LHA — Latitude SAME as DECLINATION — 151° 209° 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 CONTRARY to Declination — 28° 332° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°35'	-59'	150°	16°42'	-59'	151°	15°50'	-59'	151°	14°58'	-59'	151°	14°05'	-59'	151°	13°13'	-60'	151°	12°20'	-60'	151°	0
1	16°35'	-59'	151°	15°43'	-59'	151°	14°51'	-59'	151°	13°58'	-59'	151°	13°06'	-59'	151°	12°13'	-60'	151°	11°20'	-60'	151°	1
2	15°36'	-59'	151°	14°44'	-59'	151°	13°51'	-59'	151°	12°59'	-59'	151°	12°06'	-59'	151°	11°14'	-60'	151°	10°21'	-60'	152°	2
3	14°37'	-59'	151°	13°45'	-59'	151°	12°52'	-59'	151°	11°59'	-59'	151°	11°07'	-59'	151°	10°14'	-60'	152°	9°21'	-60'	152°	3
4	13°38'	-59'	151°	12°45'	-59'	151°	11°53'	-59'	151°	11°00'	-59'	152°	10°07'	-59'	152°	9°14'	-60'	152°	8°22'	-60'	152°	4
5	12°39'	-59'	151°	11°46'	-59'	151°	10°53'	-59'	152°	10°01'	-59'	152°	9°08'	-59'	152°	8°15'	-60'	152°	7°22'	-60'	152°	5
6	11°40'	-59'	152°	10°47'	-59'	152°	9°54'	-59'	152°	9°01'	-59'	152°	8°08'	-59'	152°	7°15'	-60'	152°	6°22'	-60'	152°	6
7	10°40'	-59'	152°	9°48'	-59'	152°	8°55'	-59'	152°	8°02'	-59'	152°	7°09'	-59'	152°	6°16'	-60'	152°	5°23'	-60'	152°	7
8	9°41'	-59'	152°	8°48'	-59'	152°	7°55'	-59'	152°	7°02'	-59'	152°	6°09'	-59'	152°	5°16'	-60'	152°	4°23'	-60'	152°	8
9	8°42'	-59'	152°	7°49'	-59'	152°	6°56'	-59'	152°	6°03'	-59'	152°	5°10'	-59'	152°	4°17'	-60'	152°	3°24'	-60'	152°	9
10	7°43'	-59'	152°	6°50'	-59'	152°	5°57'	-59'	152°	5°03'	-59'	152°	4°10'	-59'	152°	3°17'	-60'	152°	2°24'	-60'	152°	10
11	6°44'	-59'	152°	5°50'	-59'	152°	4°57'	-59'	152°	4°04'	-59'	152°	3°11'	-59'	153°	2°18'	-60'	153°	1°24'	-60'	153°	11
12	5°44'	-59'	153°	4°51'	-59'	153°	3°58'	-59'	153°	3°05'	-59'	153°	2°11'	-59'	153°	1°18'	-60'	153°	0°25'	-60'	153°	12
13	4°45'	-59'	153°	3°52'	-59'	153°	2°59'	-59'	153°	2°05'	-59'	153°	1°12'	-59'	153°	0°18'	-60'	153°	0°35'	+60'	27°	13
14	3°46'	-59'	153°	2°53'	-59'	153°	1°59'	-59'	153°	1°06'	-59'	153°	0°12'	-59'	153°	0°41'	+60'	27°	1°34'	+60'	27°	14
15	2°47'	-59'	153°	1°53'	-59'	153°	1°00'	-59'	153°	0°06'	-59'	153°	0°47'	+59'	27°	1°41'	+60'	27°	2°34'	+60'	27°	15
16	1°48'	-59'	153°	0°54'	-59'	153°	0°00'	-59'	153°	0°53'	+59'	27°	1°47'	+59'	27°	2°40'	+60'	27°	3°34'	+60'	27°	16
17	0°48'	-59'	153°	0°05'	+59'	27°	0°59'	+59'	27°	1°53'	+59'	27°	2°46'	+59'	27°	3°40'	+60'	27°	4°33'	+60'	27°	17
18	0°11'	+59'	27°	1°05'	+59'	27°	1°58'	+59'	27°	2°52'	+59'	27°	3°46'	+59'	27°	4°39'	+60'	27°	5°33'	+60'	27°	18
19	1°10'	+59'	26°	2°04'	+59'	26°	2°58'	+59'	26°	3°51'	+59'	26°	4°45'	+59'	26°	5°39'	+60'	26°	6°33'	+60'	27°	19
20	2°09'	+59'	26°	3°03'	+59'	26°	3°57'	+59'	26°	4°51'	+59'	26°	5°45'	+59'	26°	6°38'	+60'	26°	7°32'	+60'	26°	20
21	3°09'	+59'	26°	4°02'	+59'	26°	4°56'	+59'	26°	5°50'	+59'	26°	6°44'	+59'	26°	7°38'	+60'	26°	8°32'	+60'	26°	21
22	4°08'	+59'	26°	5°02'	+59'	26°	5°56'	+59'	26°	6°50'	+59'	26°	7°44'	+59'	26°	8°37'	+60'	26°	9°31'	+60'	26°	22
23	5°07'	+59'	26°	6°01'	+59'	26°	6°55'	+59'	26°	7°49'	+59'	26°	8°43'	+59'	26°	9°37'	+60'	26°	10°31'	+60'	26°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	17°45'	-59'	152°	16°52'	-59'	152°	15°59'	-59'	152°	15°06'	-59'	152°	14°13'	-60'	152°	13°20'	-60'	152°	12°27'	-60'	152°	0
1	16°45'	-59'	152°	15°52'	-59'	152°	15°00'	-59'	152°	14°07'	-59'	152°	13°14'	-60'	152°	12°20'	-60'	152°	11°27'	-60'	152°	1
2	15°46'	-59'	152°	14°53'	-59'	152°	14°00'	-59'	152°	13°07'	-59'	152°	12°14'	-60'	152°	11°21'	-60'	152°	10°28'	-60'	153°	2
3	14°47'	-59'	152°	13°54'	-59'	152°	13°01'	-59'	152°	12°08'	-59'	152°	11°15'	-60'	152°	10°21'	-60'	153°	9°28'	-60'	153°	3
4	13°48'	-59'	152°	12°55'	-59'	152°	12°01'	-59'	152°	11°08'	-59'	153°	10°15'	-60'	153°	9°22'	-60'	153°	8°28'	-60'	153°	4
5	12°48'	-59'	152°	11°55'	-59'	152°	11°02'	-59'	153°	10°09'	-59'	153°	9°15'	-60'	153°	8°22'	-60'	153°	7°29'	-60'	153°	5
6	11°49'	-59'	153°	10°56'	-59'	153°	10°03'	-59'	153°	9°09'	-59'	153°	8°16'	-60'	153°	7°23'	-60'	153°	6°29'	-60'	153°	6
7	10°50'	-59'	153°	9°57'	-59'	153°	9°03'	-59'	153°	8°10'	-59'	153°	7°16'	-60'	153°	6°23'	-60'	153°	5°29'	-60'	153°	7
8	9°51'	-59'	153°	8°57'	-59'	153°	8°04'	-59'	153°	7°10'	-59'	153°	6°17'	-60'	153°	5°23'	-60'	153°	4°30'	-60'	153°	8
9	8°51'	-59'	153°	7°58'	-59'	153°	7°04'	-59'	153°	6°11'	-59'	153°	5°17'	-60'	153°	4°24'	-60'	153°	3°30'	-60'	153°	9
10	7°52'	-59'	153°	6°59'	-59'	153°	6°05'	-59'	153°	5°11'	-59'	153°	4°18'	-60'	153°	3°24'	-60'	153°	2°31'	-60'	153°	10
11	6°53'	-59'	153°	5°59'	-59'	153°	5°06'	-59'	153°	4°12'	-59'	153°	3°18'	-60'	153°	2°25'	-60'	154°	1°31'	-60'	154°	11
12	5°54'	-59'	153°	5°00'	-59'	154°	4°06'	-59'	154°	3°13'	-59'	154°	2°19'	-60'	154°	1°25'	-60'	154°	0°31'	-60'	154°	12
13	4°54'	-59'	154°	4°01'	-59'	154°	3°07'	-59'	154°	2°13'	-59'	154°	1°19'	-60'	154°	0°25'	-60'	154°	0°28'	+60'	26°	13
14	3°55'	-59'	154°	3°01'	-59'	154°	2°07'	-59'	154°	1°14'	-59'	154°	0°20'	-60'	154°	0°34'	+60'	26°	1°28'	+60'	26°	14
15	2°56'	-59'	154°	2°02'	-59'	154°	1°08'	-59'	154°	0°14'	-59'	154°	0°40'	+60'	26°	1°34'	+60'	26°	2°28'	+60'	26°	15
16	1°57'	-59'	154°	1°03'	-59'	154°	0°09'	-59'	154°	0°45'	+59'	26°	1°39'	+60'	26°	2°33'	+60'	26°	3°27'	+60'	26°	16
17	0°57'	-59'	154°	0°03'	-59'	154°	0°51'	+59'	26°	1°45'	+59'	26°	2°39'	+60'	26°	3°33'	+60'	26°	4°27'	+60'	26°	17
18	0°02'	+59'	26°	0°56'	+59'	26°	1°50'	+59'	26°	2°44'	+59'	26°	3°38'	+60'	26°	4°32'	+60'	26°	5°27'	+60'	26°	18
19	1°01'	+59'	25°	1°55'	+59'	25°	2°50'	+59'	25°	3°44'	+59'	25°	4°38'	+60'	26°	5°32'	+60'	26°	6°26'	+60'	26°	19
20	2°00'	+59'	25°	2°55'	+59'	25°	3°49'	+59'	25°	4°43'	+59'	25°	5°37'	+60'	25°	6°32'	+60'	25°	7°26'	+60'	25°	20
21	3°00'	+59'	25°	3°54'	+59'	25°	4°48'	+59'	25°	5°43'	+59'	25°	6°37'	+60'	25°	7°31'	+60'	25°	8°25'	+60'	25°	21
22	3°59'	+59'	25°	4°53'	+59'	25°	5°48'	+59'	25°	6°42'	+59'	25°	7°36'	+60'	25°	8°31'	+60'	25°	9°25'	+60'	25°	22
23	4°58'	+59'	25°	5°53'	+59'	25°	6°47'	+59'	25°	7°42'	+59'	25°	8°36'	+60'	25°	9°30'	+60'	25°	10°25'	+60'	25°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

153° 207° LHA — Latitude SAME as DECLINATION — 153° 207° LHA

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

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

26° 334° LHA — Latitude CONTRARY to Declination — 26° 334° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	17°54'	-59'	153°	17°01'	-59'	153°	16°08'	-59'	153°	15°14'	-59'	153°	14°21'	-60'	153°	13°27'	-60'	153°	12°34'	-60'	153°	0
1	16°55'	-59'	153°	16°02'	-59'	153°	15°08'	-59'	153°	14°15'	-59'	153°	13°21'	-60'	153°	12°28'	-60'	153°	11°34'	-60'	153°	1
2	15°56'	-59'	153°	15°02'	-59'	153°	14°09'	-59'	153°	13°15'	-59'	153°	12°22'	-60'	153°	11°28'	-60'	153°	10°34'	-60'	154°	2
3	14°56'	-59'	153°	14°03'	-59'	153°	13°09'	-59'	153°	12°16'	-59'	153°	11°22'	-60'	153°	10°28'	-60'	154°	9°35'	-60'	154°	3
4	13°57'	-59'	153°	13°04'	-59'	153°	12°10'	-59'	153°	11°16'	-59'	154°	10°22'	-60'	154°	9°29'	-60'	154°	8°35'	-60'	154°	4
5	12°58'	-59'	153°	12°04'	-59'	153°	11°10'	-59'	154°	10°17'	-59'	154°	9°23'	-60'	154°	8°29'	-60'	154°	7°35'	-60'	154°	5
6	11°59'	-59'	154°	11°05'	-59'	154°	10°11'	-59'	154°	9°17'	-59'	154°	8°23'	-60'	154°	7°30'	-60'	154°	6°36'	-60'	154°	6
7	10°59'	-59'	154°	10°05'	-59'	154°	9°12'	-59'	154°	8°18'	-59'	154°	7°24'	-60'	154°	6°30'	-60'	154°	5°36'	-60'	154°	7
8	10°00'	-59'	154°	9°06'	-59'	154°	8°12'	-59'	154°	7°18'	-59'	154°	6°24'	-60'	154°	5°30'	-60'	154°	4°36'	-60'	154°	8
9	9°01'	-59'	154°	8°07'	-59'	154°	7°13'	-59'	154°	6°19'	-59'	154°	5°25'	-60'	154°	4°31'	-60'	154°	3°37'	-60'	154°	9
10	8°01'	-59'	154°	7°07'	-59'	154°	6°13'	-59'	154°	5°19'	-60'	154°	4°25'	-60'	154°	3°31'	-60'	154°	2°37'	-60'	154°	10
11	7°02'	-59'	154°	6°08'	-59'	154°	5°14'	-59'	154°	4°20'	-60'	154°	3°26'	-60'	154°	2°31'	-60'	154°	1°37'	-60'	155°	11
12	6°03'	-59'	154°	5°09'	-59'	154°	4°14'	-59'	155°	3°20'	-60'	155°	2°26'	-60'	155°	1°32'	-60'	155°	0°38'	-60'	155°	12
13	5°03'	-59'	155°	4°09'	-59'	155°	3°15'	-59'	155°	2°21'	-60'	155°	1°26'	-60'	155°	0°32'	-60'	155°	0°22'	+60'	25°	13
14	4°04'	-59'	155°	3°10'	-59'	155°	2°16'	-59'	155°	1°21'	-60'	155°	0°27'	-60'	155°	0°27'	+60'	25°	1°22'	+60'	25°	14
15	3°05'	-59'	155°	2°10'	-59'	155°	1°16'	-59'	155°	0°22'	-60'	155°	0°33'	+60'	25°	1°27'	+60'	25°	2°21'	+60'	25°	15
16	2°05'	-59'	155°	1°11'	-59'	155°	0°17'	-59'	155°	0°38'	+60'	25°	1°32'	+60'	25°	2°27'	+60'	25°	3°21'	+60'	25°	16
17	1°06'	-59'	155°	0°12'	-59'	155°	0°43'	+59'	25°	1°37'	+60'	25°	2°32'	+60'	25°	3°26'	+60'	25°	4°21'	+60'	25°	17
18	0°07'	-59'	155°	0°48'	+59'	25°	1°42'	+59'	25°	2°37'	+60'	25°	3°31'	+60'	25°	4°26'	+60'	25°	5°20'	+60'	25°	18
19	0°53'	+59'	24°	1°47'	+59'	24°	2°42'	+59'	25°	3°36'	+60'	25°	4°31'	+60'	25°	5°25'	+60'	25°	6°20'	+60'	25°	19
20	1°52'	+59'	24°	2°47'	+59'	24°	3°41'	+59'	24°	4°36'	+60'	24°	5°30'	+60'	24°	6°25'	+60'	24°	7°20'	+60'	25°	20
21	2°51'	+59'	24°	3°46'	+59'	24°	4°41'	+59'	24°	5°35'	+59'	24°	6°30'	+60'	24°	7°25'	+60'	24°	8°19'	+60'	24°	21
22	3°50'	+59'	24°	4°45'	+59'	24°	5°40'	+59'	24°	6°35'	+59'	24°	7°30'	+60'	24°	8°24'	+60'	24°	9°19'	+60'	24°	22
23	4°50'	+59'	24°	5°45'	+59'	24°	6°39'	+59'	24°	7°34'	+59'	24°	8°29'	+60'	24°	9°24'	+60'	24°	10°19'	+60'	24°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	18°03'	-59'	154°	17°10'	-59'	154°	16°16'	-59'	154°	15°22'	-60'	154°	14°28'	-60'	154°	13°34'	-60'	154°	12°40'	-60'	154°	0
1	17°04'	-59'	154°	16°10'	-59'	154°	15°16'	-59'	154°	14°22'	-60'	154°	13°28'	-60'	154°	12°34'	-60'	154°	11°40'	-60'	154°	1
2	16°05'	-59'	154°	15°11'	-59'	154°	14°17'	-59'	154°	13°23'	-60'	154°	12°29'	-60'	154°	11°35'	-60'	154°	10°41'	-60'	155°	2
3	15°06'	-59'	154°	14°12'	-59'	154°	13°17'	-59'	154°	12°23'	-60'	154°	11°29'	-60'	154°	10°35'	-60'	155°	9°41'	-60'	155°	3
4	14°06'	-59'	154°	13°12'	-59'	154°	12°18'	-59'	154°	11°24'	-60'	155°	10°30'	-60'	155°	9°35'	-60'	155°	8°41'	-60'	155°	4
5	13°07'	-59'	154°	12°13'	-59'	154°	11°19'	-59'	155°	10°24'	-60'	155°	9°30'	-60'	155°	8°36'	-60'	155°	7°42'	-60'	155°	5
6	12°08'	-59'	155°	11°13'	-59'	155°	10°19'	-59'	155°	9°25'	-60'	155°	8°31'	-60'	155°	7°36'	-60'	155°	6°42'	-60'	155°	6
7	11°08'	-59'	155°	10°14'	-59'	155°	9°20'	-59'	155°	8°25'	-60'	155°	7°31'	-60'	155°	6°37'	-60'	155°	5°42'	-60'	155°	7
8	10°09'	-59'	155°	9°15'	-59'	155°	8°20'	-59'	155°	7°26'	-60'	155°	6°31'	-60'	155°	5°37'	-60'	155°	4°42'	-60'	155°	8
9	9°09'	-59'	155°	8°15'	-59'	155°	7°21'	-59'	155°	6°26'	-60'	155°	5°32'	-60'	155°	4°37'	-60'	155°	3°43'	-60'	155°	9
10	8°10'	-59'	155°	7°16'	-59'	155°	6°21'	-59'	155°	5°27'	-60'	155°	4°32'	-60'	155°	3°38'	-60'	155°	2°43'	-60'	155°	10
11	7°11'	-59'	155°	6°16'	-59'	155°	5°22'	-59'	155°	4°27'	-60'	155°	3°33'	-60'	155°	2°38'	-60'	155°	1°43'	-60'	155°	11
12	6°11'	-59'	155°	5°17'	-59'	155°	4°22'	-59'	156°	3°28'	-60'	156°	2°33'	-60'	156°	1°38'	-60'	156°	0°44'	-60'	156°	12
13	5°12'	-59'	156°	4°17'	-59'	156°	3°23'	-59'	156°	2°28'	-60'	156°	1°33'	-60'	156°	0°39'	-60'	156°	0°16'	+60'	24°	13
14	4°13'	-59'	156°	3°18'	-59'	156°	2°23'	-59'	156°	1°29'	-60'	156°	0°34'	-60'	156°	0°21'	+60'	24°	1°16'	+60'	24°	14
15	3°13'	-59'	156°	2°19'	-59'	156°	1°24'	-59'	156°	0°29'	-60'	156°	0°26'	+60'	24°	1°21'	+60'	24°	2°15'	+60'	24°	15
16	2°14'	-59'	156°	1°19'	-59'	156°	0°24'	-59'	156°	0°31'	+60'	24°	1°25'	+60'	24°	2°20'	+60'	24°	3°15'	+60'	24°	16
17	1°15'	-59'	156°	0°20'	-59'	156°	0°35'	+59'	24°	1°30'	+60'	24°	2°25'	+60'	24°	3°20'	+60'	24°	4°15'	+60'	24°	17
18	0°15'	-59'	156°	0°40'	+59'	24°	1°35'	+59'	24°	2°30'	+60'	24°	3°25'	+60'	24°	4°19'	+60'	24°	5°14'	+60'	24°	18
19	0°44'	+59'	24°	1°39'	+59'	24°	2°34'	+59'	24°	3°29'	+60'	24°	4°24'	+60'	24°	5°19'	+60'	24°	6°14'	+60'	24°	19
20	1°44'	+59'	23°	2°39'	+59'	23°	3°34'	+59'	23°	4°29'	+60'	23°	5°24'	+60'	24°	6°19'	+60'	24°	7°14'	+60'	24°	20
21	2°43'	+59'	23°	3°38'	+59'	23°	4°33'	+59'	23°	5°28'	+60'	23°	6°23'	+60'	23°	7°18'	+60'	23°	8°13'	+60'	23°	21
22	3°42'	+59'	23°	4°37'	+59'	23°	5°33'	+59'	23°	6°28'	+60'	23°	7°23'	+60'	23°	8°18'	+60'	23°	9°13'	+60'	23°	22
23	4°42'	+59'	23°	5°37'	+59'	23°	6°32'	+59'	23°	7°27'	+60'	23°	8°22'	+60'	23°	9°18'	+60'	23°	10°13'	+60'	23°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

155° 205° LHA — Latitude SAME as DECLINATION — 155° 205° LHA

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

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

24° 336° LHA — Latitude CONTRARY to Declination — 24° 336° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	18°12'	-59'	155°	17°18'	-59'	155°	16°24'	-59'	155°	15°29'	-60'	155°	14°35'	-60'	155°	13°41'	-60'	155°	12°46'	-60'	155°	0
1	17°13'	-59'	155°	16°19'	-59'	155°	15°24'	-59'	155°	14°30'	-60'	155°	13°35'	-60'	155°	12°41'	-60'	155°	11°46'	-60'	155°	1
2	16°14'	-59'	155°	15°19'	-59'	155°	14°25'	-59'	155°	13°30'	-60'	155°	12°36'	-60'	155°	11°41'	-60'	155°	10°47'	-60'	156°	2
3	15°14'	-59'	155°	14°20'	-59'	155°	13°25'	-59'	155°	12°31'	-60'	155°	11°36'	-60'	156°	10°42'	-60'	156°	9°47'	-60'	156°	3
4	14°15'	-59'	155°	13°20'	-59'	155°	12°26'	-60'	155°	11°31'	-60'	156°	10°37'	-60'	156°	9°42'	-60'	156°	8°47'	-60'	156°	4
5	13°16'	-59'	155°	12°21'	-59'	155°	11°26'	-60'	156°	10°32'	-60'	156°	9°37'	-60'	156°	8°42'	-60'	156°	7°48'	-60'	156°	5
6	12°16'	-59'	156°	11°22'	-59'	156°	10°27'	-60'	156°	9°32'	-60'	156°	8°37'	-60'	156°	7°43'	-60'	156°	6°48'	-60'	156°	6
7	11°17'	-59'	156°	10°22'	-59'	156°	9°27'	-60'	156°	8°33'	-60'	156°	7°38'	-60'	156°	6°43'	-60'	156°	5°48'	-60'	156°	7
8	10°17'	-59'	156°	9°23'	-59'	156°	8°28'	-60'	156°	7°33'	-60'	156°	6°38'	-60'	156°	5°43'	-60'	156°	4°48'	-60'	156°	8
9	9°18'	-59'	156°	8°23'	-59'	156°	7°28'	-60'	156°	6°33'	-60'	156°	5°39'	-60'	156°	4°44'	-60'	156°	3°49'	-60'	156°	9
10	8°19'	-59'	156°	7°24'	-59'	156°	6°29'	-60'	156°	5°34'	-60'	156°	4°39'	-60'	156°	3°44'	-60'	156°	2°49'	-60'	156°	10
11	7°19'	-59'	156°	6°24'	-59'	156°	5°29'	-60'	156°	4°34'	-60'	156°	3°39'	-60'	156°	2°44'	-60'	156°	1°49'	-60'	156°	11
12	6°20'	-59'	156°	5°25'	-59'	156°	4°30'	-60'	156°	3°35'	-60'	157°	2°40'	-60'	157°	1°45'	-60'	157°	0°50'	-60'	157°	12
13	5°20'	-59'	157°	4°25'	-59'	157°	3°30'	-60'	157°	2°35'	-60'	157°	1°40'	-60'	157°	0°45'	-60'	157°	0°10'	+60'	23°	13
14	4°21'	-59'	157°	3°26'	-59'	157°	2°31'	-60'	157°	1°36'	-60'	157°	0°40'	-60'	157°	0°15'	+60'	23°	1°10'	+60'	23°	14
15	3°22'	-59'	157°	2°26'	-59'	157°	1°31'	-60'	157°	0°36'	-60'	157°	0°19'	+60'	23°	1°14'	+60'	23°	2°09'	+60'	23°	15
16	2°22'	-59'	157°	1°27'	-59'	157°	0°32'	-60'	157°	0°24'	+60'	23°	1°19'	+60'	23°	2°14'	+60'	23°	3°09'	+60'	23°	16
17	1°23'	-59'	157°	0°27'	-59'	157°	0°28'	+60'	23°	1°23'	+60'	23°	2°18'	+60'	23°	3°14'	+60'	23°	4°09'	+60'	23°	17
18	0°23'	-59'	157°	0°32'	+59'	23°	1°27'	+60'	23°	2°23'	+60'	23°	3°18'	+60'	23°	4°13'	+60'	23°	5°09'	+60'	23°	18
19	0°36'	+59'	23°	1°32'	+59'	23°	2°27'	+60'	23°	3°22'	+60'	23°	4°18'	+60'	23°	5°13'	+60'	23°	6°08'	+60'	23°	19
20	1°36'	+59'	22°	2°31'	+59'	22°	3°26'	+60'	23°	4°22'	+60'	23°	5°17'	+60'	23°	6°13'	+60'	23°	7°08'	+60'	23°	20
21	2°35'	+59'	22°	3°30'	+59'	22°	4°26'	+60'	22°	5°21'	+60'	22°	6°17'	+60'	22°	7°12'	+60'	23°	8°08'	+60'	23°	21
22	3°34'	+59'	22°	4°30'	+59'	22°	5°25'	+60'	22°	6°21'	+60'	22°	7°16'	+60'	22°	8°12'	+60'	22°	9°07'	+60'	22°	22
23	4°34'	+59'	22°	5°29'	+59'	22°	6°25'	+60'	22°	7°21'	+60'	22°	8°16'	+60'	22°	9°12'	+60'	22°	10°07'	+60'	22°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	18°21'	-59'	156°	17°26'	-59'	156°	16°32'	-60'	156°	15°37'	-60'	156°	14°42'	-60'	156°	13°47'	-60'	156°	12°52'	-60'	156°	0
1	17°22'	-59'	156°	16°27'	-59'	156°	15°32'	-60'	156°	14°37'	-60'	156°	13°42'	-60'	156°	12°47'	-60'	156°	11°52'	-60'	156°	1
2	16°22'	-59'	156°	15°27'	-59'	156°	14°33'	-60'	156°	13°38'	-60'	156°	12°43'	-60'	156°	11°48'	-60'	156°	10°53'	-60'	157°	2
3	15°23'	-59'	156°	14°28'	-59'	156°	13°33'	-60'	156°	12°38'	-60'	156°	11°43'	-60'	157°	10°48'	-60'	157°	9°53'	-60'	157°	3
4	14°23'	-59'	156°	13°28'	-59'	156°	12°33'	-60'	156°	11°38'	-60'	157°	10°43'	-60'	157°	9°48'	-60'	157°	8°53'	-60'	157°	4
5	13°24'	-59'	156°	12°29'	-59'	157°	11°34'	-60'	157°	10°39'	-60'	157°	9°44'	-60'	157°	8°49'	-60'	157°	7°53'	-60'	157°	5
6	12°25'	-59'	157°	11°29'	-59'	157°	10°34'	-60'	157°	9°39'	-60'	157°	8°44'	-60'	157°	7°49'	-60'	157°	6°54'	-60'	157°	6
7	11°25'	-59'	157°	10°30'	-59'	157°	9°35'	-60'	157°	8°40'	-60'	157°	7°44'	-60'	157°	6°49'	-60'	157°	5°54'	-60'	157°	7
8	10°26'	-59'	157°	9°30'	-60'	157°	8°35'	-60'	157°	7°40'	-60'	157°	6°45'	-60'	157°	5°50'	-60'	157°	4°54'	-60'	157°	8
9	9°26'	-59'	157°	8°31'	-60'	157°	7°36'	-60'	157°	6°40'	-60'	157°	5°45'	-60'	157°	4°50'	-60'	157°	3°55'	-60'	157°	9
10	8°27'	-59'	157°	7°31'	-60'	157°	6°36'	-60'	157°	5°41'	-60'	157°	4°45'	-60'	157°	3°50'	-60'	157°	2°55'	-60'	157°	10
11	7°27'	-59'	157°	6°32'	-60'	157°	5°37'	-60'	157°	4°41'	-60'	157°	3°46'	-60'	157°	2°50'	-60'	157°	1°55'	-60'	157°	11
12	6°28'	-59'	157°	5°32'	-60'	157°	4°37'	-60'	157°	3°42'	-60'	157°	2°46'	-60'	158°	1°51'	-60'	158°	0°55'	-60'	158°	12
13	5°28'	-59'	158°	4°33'	-60'	158°	3°37'	-60'	158°	2°42'	-60'	158°	1°47'	-60'	158°	0°51'	-60'	158°	0°04'	+60'	22°	13
14	4°29'	-59'	158°	3°33'	-60'	158°	2°38'	-60'	158°	1°42'	-60'	158°	0°47'	-60'	158°	0°09'	+60'	22°	1°04'	+60'	22°	14
15	3°29'	-59'	158°	2°34'	-60'	158°	1°38'	-60'	158°	0°43'	-60'	158°	0°13'	+60'	22°	1°08'	+60'	22°	2°04'	+60'	22°	15
16	2°30'	-59'	158°	1°34'	-60'	158°	0°39'	-60'	158°	0°17'	+60'	22°	1°12'	+60'	22°	2°08'	+60'	22°	3°04'	+60'	22°	16
17	1°31'	-59'	158°	0°35'	-60'	158°	0°21'	+60'	22°	1°16'	+60'	22°	2°12'	+60'	22°	3°08'	+60'	22°	4°03'	+60'	22°	17
18	0°31'	-59'	158°	0°25'	+60'	22°	1°20'	+60'	22°	2°16'	+60'	22°	3°12'	+60'	22°	4°07'	+60'	22°	5°03'	+60'	22°	18
19	0°28'	+59'	22°	1°24'	+60'	22°	2°20'	+60'	22°	3°16'	+60'	22°	4°11'	+60'	22°	5°07'	+60'	22°	6°03'	+60'	22°	19
20	1°28'	+59'	22°	2°24'	+60'	22°	3°19'	+60'	22°	4°15'	+60'	22°	5°11'	+60'	22°	6°07'	+60'	22°	7°03'	+60'	22°	20
21	2°27'	+59'	21°	3°23'	+60'	21°	4°19'	+60'	21°	5°15'	+60'	21°	6°11'	+60'	22°	7°06'	+60'	22°	8°02'	+60'	22°	21
22	3°27'	+59'	21°	4°23'	+60'	21°	5°19'	+60'	21°	6°14'	+60'	21°	7°10'	+60'	21°	8°06'	+60'	21°	9°02'	+60'	22°	22
23	4°26'	+59'	21°	5°22'	+60'	21°	6°18'	+60'	21°	7°14'	+60'	21°	8°10'	+60'	21°	9°06'	+60'	21°	10°02'	+60'	21°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

157° 203° LHA — Latitude SAME as DECLINATION — 157° 203° 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 CONTRARY to Declination — 22° 338° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	18°29'	-59'	157°	17°34'	-60'	157°	16°39'	-60'	157°	15°44'	-60'	157°	14°48'	-60'	157°	13°53'	-60'	157°	12°58'	-60'	157°	0
1	17°30'	-59'	157°	16°35'	-60'	157°	15°39'	-60'	157°	14°44'	-60'	157°	13°49'	-60'	157°	12°53'	-60'	157°	11°58'	-60'	157°	1
2	16°30'	-59'	157°	15°35'	-60'	157°	14°40'	-60'	157°	13°44'	-60'	157°	12°49'	-60'	157°	11°54'	-60'	158°	10°58'	-60'	158°	2
3	15°31'	-59'	157°	14°36'	-60'	157°	13°40'	-60'	157°	12°45'	-60'	157°	11°49'	-60'	158°	10°54'	-60'	158°	9°58'	-60'	158°	3
4	14°31'	-59'	157°	13°36'	-60'	157°	12°41'	-60'	157°	11°45'	-60'	158°	10°50'	-60'	158°	9°54'	-60'	158°	8°59'	-60'	158°	4
5	13°32'	-59'	157°	12°37'	-60'	158°	11°41'	-60'	158°	10°46'	-60'	158°	9°50'	-60'	158°	8°55'	-60'	158°	7°59'	-60'	158°	5
6	12°33'	-59'	158°	11°37'	-60'	158°	10°42'	-60'	158°	9°46'	-60'	158°	8°50'	-60'	158°	7°55'	-60'	158°	6°59'	-60'	158°	6
7	11°33'	-59'	158°	10°38'	-60'	158°	9°42'	-60'	158°	8°46'	-60'	158°	7°51'	-60'	158°	6°55'	-60'	158°	6°00'	-60'	158°	7
8	10°34'	-59'	158°	9°38'	-60'	158°	8°42'	-60'	158°	7°47'	-60'	158°	6°51'	-60'	158°	5°55'	-60'	158°	5°00'	-60'	158°	8
9	9°34'	-59'	158°	8°38'	-60'	158°	7°43'	-60'	158°	6°47'	-60'	158°	5°51'	-60'	158°	4°56'	-60'	158°	4°00'	-60'	158°	9
10	8°35'	-59'	158°	7°39'	-60'	158°	6°43'	-60'	158°	5°47'	-60'	158°	4°52'	-60'	158°	3°56'	-60'	158°	3°00'	-60'	158°	10
11	7°35'	-59'	158°	6°39'	-60'	158°	5°44'	-60'	158°	4°48'	-60'	158°	3°52'	-60'	158°	2°56'	-60'	158°	2°00'	-60'	158°	11
12	6°36'	-59'	158°	5°40'	-60'	158°	4°44'	-60'	158°	3°48'	-60'	158°	2°52'	-60'	158°	1°57'	-60'	158°	1°01'	-60'	159°	12
13	5°36'	-60'	158°	4°40'	-60'	159°	3°44'	-60'	159°	2°49'	-60'	159°	1°53'	-60'	159°	0°57'	-60'	159°	0°01'	-60'	159°	13
14	4°37'	-60'	159°	3°41'	-60'	159°	2°45'	-60'	159°	1°49'	-60'	159°	0°53'	-60'	159°	0°03'	+60'	21°	0°59'	+60'	21°	14
15	3°37'	-60'	159°	2°41'	-60'	159°	1°45'	-60'	159°	0°49'	-60'	159°	0°07'	+60'	21°	1°03'	+60'	21°	1°59'	+60'	21°	15
16	2°38'	-60'	159°	1°42'	-60'	159°	0°46'	-60'	159°	0°10'	+60'	21°	1°06'	+60'	21°	2°02'	+60'	21°	2°58'	+60'	21°	16
17	1°38'	-60'	159°	0°42'	-60'	159°	0°14'	+60'	21°	1°10'	+60'	21°	2°06'	+60'	21°	3°02'	+60'	21°	3°58'	+60'	21°	17
18	0°39'	-60'	159°	0°18'	+60'	21°	1°14'	+60'	21°	2°10'	+60'	21°	3°06'	+60'	21°	4°02'	+60'	21°	4°58'	+60'	21°	18
19	0°21'	+60'	21°	1°17'	+60'	21°	2°13'	+60'	21°	3°09'	+60'	21°	4°05'	+60'	21°	5°01'	+60'	21°	5°58'	+60'	21°	19
20	1°20'	+60'	21°	2°17'	+60'	21°	3°13'	+60'	21°	4°09'	+60'	21°	5°05'	+60'	21°	6°01'	+60'	21°	6°57'	+60'	21°	20
21	2°20'	+60'	20°	3°16'	+60'	21°	4°12'	+60'	21°	5°09'	+60'	21°	6°05'	+60'	21°	7°01'	+60'	21°	7°57'	+60'	21°	21
22	3°19'	+60'	20°	4°16'	+60'	20°	5°12'	+60'	20°	6°08'	+60'	20°	7°04'	+60'	20°	8°01'	+60'	21°	8°57'	+60'	21°	22
23	4°19'	+60'	20°	5°15'	+60'	20°	6°12'	+60'	20°	7°08'	+60'	20°	8°04'	+60'	20°	9°00'	+60'	20°	9°57'	+60'	20°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	18°37'	-59'	158°	17°42'	-60'	158°	16°46'	-60'	158°	15°50'	-60'	158°	14°55'	-60'	158°	13°59'	-60'	158°	13°03'	-60'	158°	0
1	17°38'	-60'	158°	16°42'	-60'	158°	15°46'	-60'	158°	14°51'	-60'	158°	13°55'	-60'	158°	12°59'	-60'	158°	12°03'	-60'	159°	1
2	16°38'	-60'	158°	15°43'	-60'	158°	14°47'	-60'	158°	13°51'	-60'	158°	12°55'	-60'	158°	12°00'	-60'	159°	11°04'	-60'	159°	2
3	15°39'	-60'	158°	14°43'	-60'	158°	13°47'	-60'	158°	12°51'	-60'	158°	11°56'	-60'	159°	11°00'	-60'	159°	10°04'	-60'	159°	3
4	14°39'	-60'	158°	13°43'	-60'	158°	12°48'	-60'	158°	11°52'	-60'	159°	10°56'	-60'	159°	10°00'	-60'	159°	9°04'	-60'	159°	4
5	13°40'	-60'	158°	12°44'	-60'	159°	11°48'	-60'	159°	10°52'	-60'	159°	9°56'	-60'	159°	9°00'	-60'	159°	8°04'	-60'	159°	5
6	12°40'	-60'	159°	11°44'	-60'	159°	10°48'	-60'	159°	9°52'	-60'	159°	8°57'	-60'	159°	8°01'	-60'	159°	7°05'	-60'	159°	6
7	11°41'	-60'	159°	10°45'	-60'	159°	9°49'	-60'	159°	8°53'	-60'	159°	7°57'	-60'	159°	7°01'	-60'	159°	6°05'	-60'	159°	7
8	10°41'	-60'	159°	9°45'	-60'	159°	8°49'	-60'	159°	7°53'	-60'	159°	6°57'	-60'	159°	6°01'	-60'	159°	5°05'	-60'	159°	8
9	9°42'	-60'	159°	8°46'	-60'	159°	7°50'	-60'	159°	6°54'	-60'	159°	5°57'	-60'	159°	5°01'	-60'	159°	4°05'	-60'	159°	9
10	8°42'	-60'	159°	7°46'	-60'	159°	6°50'	-60'	159°	5°54'	-60'	159°	4°58'	-60'	159°	4°02'	-60'	159°	3°05'	-60'	159°	10
11	7°43'	-60'	159°	6°46'	-60'	159°	5°50'	-60'	159°	4°54'	-60'	159°	3°58'	-60'	159°	3°02'	-60'	159°	2°06'	-60'	159°	11
12	6°43'	-60'	159°	5°47'	-60'	159°	4°51'	-60'	159°	3°55'	-60'	159°	2°58'	-60'	159°	2°02'	-60'	159°	1°06'	-60'	159°	12
13	5°43'	-60'	159°	4°47'	-60'	159°	3°51'	-60'	160°	2°55'	-60'	160°	1°59'	-60'	160°	1°02'	-60'	160°	0°06'	-60'	160°	13
14	4°44'	-60'	160°	3°48'	-60'	160°	2°51'	-60'	160°	1°55'	-60'	160°	0°59'	-60'	160°	0°03'	-60'	160°	0°54'	+60'	20°	14
15	3°44'	-60'	160°	2°48'	-60'	160°	1°52'	-60'	160°	0°55'	-60'	160°	0°01'	+60'	20°	0°57'	+60'	20°	1°53'	+60'	20°	15
16	2°45'	-60'	160°	1°48'	-60'	160°	0°52'	-60'	160°	0°04'	+60'	20°	1°01'	+60'	20°	1°57'	+60'	20°	2°53'	+60'	20°	16
17	1°45'	-60'	160°	0°49'	-60'	160°	0°07'	+60'	20°	1°04'	+60'	20°	2°00'	+60'	20°	2°57'	+60'	20°	3°53'	+60'	20°	17
18	0°46'	-60'	160°	0°11'	+60'	20°	1°07'	+60'	20°	2°04'	+60'	20°	3°00'	+60'	20°	3°56'	+60'	20°	4°53'	+60'	20°	18
19	0°14'	+60'	20°	1°10'	+60'	20°	2°07'	+60'	20°	3°03'	+60'	20°	4°00'	+60'	20°	4°56'	+60'	20°	5°52'	+60'	20°	19
20	1°13'	+60'	20°	2°10'	+60'	20°	3°06'	+60'	20°	4°03'	+60'	20°	4°59'	+60'	20°	5°56'	+60'	20°	6°52'	+60'	20°	20
21	2°13'	+60'	20°	3°09'	+60'	20°	4°06'	+60'	20°	5°03'	+60'	20°	5°59'	+60'	20°	6°56'	+60'	20°	7°52'	+60'	20°	21
22	3°12'	+60'	19°	4°09'	+60'	19°	5°06'	+60'	19°	6°02'	+60'	20°	6°59'	+60'	20°	7°55'	+60'	20°	8°52'	+60'	20°	22
23	4°12'	+60'	19°	5°09'	+60'	19°	6°05'	+60'	19°	7°02'	+60'	19°	7°58'	+60'	19°	8°55'	+60'	20°	9°52'	+60'	20°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

159° 201° LHA — Latitude SAME as DECLINATION — 159° 201° LHA

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

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

20° 340° LHA — Latitude CONTRARY to Declination — 20° 340° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	18°45' -60' 159°	17°49' -60' 159°	16°53' -60' 159°	15°57' -60' 159°	15°01' -60' 159°	14°05' -60' 159°	13°08' -60' 159°	0
1	17°45' -60' 159°	16°49' -60' 159°	15°53' -60' 159°	14°57' -60' 159°	14°01' -60' 159°	13°05' -60' 159°	12°09' -60' 160°	1
2	16°46' -60' 159°	15°50' -60' 159°	14°54' -60' 159°	13°57' -60' 159°	13°01' -60' 159°	12°05' -60' 160°	11°09' -60' 160°	2
3	15°46' -60' 159°	14°50' -60' 159°	13°54' -60' 159°	12°58' -60' 159°	12°02' -60' 160°	11°05' -60' 160°	10°09' -60' 160°	3
4	14°47' -60' 159°	13°50' -60' 159°	12°54' -60' 160°	11°58' -60' 160°	11°02' -60' 160°	10°06' -60' 160°	9°09' -60' 160°	4
5	13°47' -60' 159°	12°51' -60' 160°	11°55' -60' 160°	10°58' -60' 160°	10°02' -60' 160°	9°06' -60' 160°	8°09' -60' 160°	5
6	12°48' -60' 160°	11°51' -60' 160°	10°55' -60' 160°	9°59' -60' 160°	9°02' -60' 160°	8°06' -60' 160°	7°10' -60' 160°	6
7	11°48' -60' 160°	10°52' -60' 160°	9°55' -60' 160°	8°59' -60' 160°	8°03' -60' 160°	7°06' -60' 160°	6°10' -60' 160°	7
8	10°48' -60' 160°	9°52' -60' 160°	8°56' -60' 160°	7°59' -60' 160°	7°03' -60' 160°	6°07' -60' 160°	5°10' -60' 160°	8
9	9°49' -60' 160°	8°52' -60' 160°	7°56' -60' 160°	7°00' -60' 160°	6°03' -60' 160°	5°07' -60' 160°	4°10' -60' 160°	9
10	8°49' -60' 160°	7°53' -60' 160°	6°56' -60' 160°	6°00' -60' 160°	5°03' -60' 160°	4°07' -60' 160°	3°11' -60' 160°	10
11	7°50' -60' 160°	6°53' -60' 160°	5°57' -60' 160°	5°00' -60' 160°	4°04' -60' 160°	3°07' -60' 160°	2°11' -60' 160°	11
12	6°50' -60' 160°	5°54' -60' 160°	4°57' -60' 160°	4°01' -60' 160°	3°04' -60' 160°	2°07' -60' 160°	1°11' -60' 160°	12
13	5°50' -60' 160°	4°54' -60' 160°	3°57' -60' 160°	3°01' -60' 161°	2°04' -60' 161°	1°08' -60' 161°	0°11' -60' 161°	13
14	4°51' -60' 161°	3°54' -60' 161°	2°58' -60' 161°	2°01' -60' 161°	1°05' -60' 161°	0°08' -60' 161°	0°49' +60' 19°	14
15	3°51' -60' 161°	2°55' -60' 161°	1°58' -60' 161°	1°01' -60' 161°	0°05' -60' 161°	0°52' +60' 19°	1°48' +60' 19°	15
16	2°52' -60' 161°	1°55' -60' 161°	0°58' -60' 161°	0°02' -60' 161°	0°55' +60' 19°	1°52' +60' 19°	2°48' +60' 19°	16
17	1°52' -60' 161°	0°55' -60' 161°	0°01' +60' 19°	0°58' +60' 19°	1°55' +60' 19°	2°51' +60' 19°	3°48' +60' 19°	17
18	0°53' -60' 161°	0°04' +60' 19°	1°01' +60' 19°	1°58' +60' 19°	2°54' +60' 19°	3°51' +60' 19°	4°48' +60' 19°	18
19	0°07' +60' 19°	1°04' +60' 19°	2°01' +60' 19°	2°57' +60' 19°	3°54' +60' 19°	4°51' +60' 19°	5°48' +60' 19°	19
20	1°07' +60' 19°	2°03' +60' 19°	3°00' +60' 19°	3°57' +60' 19°	4°54' +60' 19°	5°51' +60' 19°	6°47' +60' 19°	20
21	2°06' +60' 19°	3°03' +60' 19°	4°00' +60' 19°	4°57' +60' 19°	5°54' +60' 19°	6°50' +60' 19°	7°47' +60' 19°	21
22	3°06' +60' 19°	4°03' +60' 19°	5°00' +60' 19°	5°56' +60' 19°	6°53' +60' 19°	7°50' +60' 19°	8°47' +60' 19°	22
23	4°05' +60' 18°	5°02' +60' 18°	5°59' +60' 18°	6°56' +60' 18°	7°53' +60' 19°	8°50' +60' 19°	9°47' +60' 19°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	18°52' -60' 160°	17°56' -60' 160°	16°59' -60' 160°	16°03' -60' 160°	15°06' -60' 160°	14°10' -60' 160°	13°13' -60' 160°	0
1	17°52' -60' 160°	16°56' -60' 160°	16°00' -60' 160°	15°03' -60' 160°	14°07' -60' 160°	13°10' -60' 160°	12°14' -60' 161°	1
2	16°53' -60' 160°	15°56' -60' 160°	15°00' -60' 160°	14°03' -60' 160°	13°07' -60' 160°	12°10' -60' 161°	11°14' -60' 161°	2
3	15°53' -60' 160°	14°57' -60' 160°	14°00' -60' 160°	13°04' -60' 161°	12°07' -60' 161°	11°11' -60' 161°	10°14' -60' 161°	3
4	14°54' -60' 160°	13°57' -60' 160°	13°01' -60' 161°	12°04' -60' 161°	11°07' -60' 161°	10°11' -60' 161°	9°14' -60' 161°	4
5	13°54' -60' 160°	12°58' -60' 161°	12°01' -60' 161°	11°04' -60' 161°	10°08' -60' 161°	9°11' -60' 161°	8°14' -60' 161°	5
6	12°54' -60' 161°	11°58' -60' 161°	11°01' -60' 161°	10°05' -60' 161°	9°08' -60' 161°	8°11' -60' 161°	7°15' -60' 161°	6
7	11°55' -60' 161°	10°58' -60' 161°	10°02' -60' 161°	9°05' -60' 161°	8°08' -60' 161°	7°11' -60' 161°	6°15' -60' 161°	7
8	10°55' -60' 161°	9°59' -60' 161°	9°02' -60' 161°	8°05' -60' 161°	7°08' -60' 161°	6°12' -60' 161°	5°15' -60' 161°	8
9	9°56' -60' 161°	8°59' -60' 161°	8°02' -60' 161°	7°05' -60' 161°	6°09' -60' 161°	5°12' -60' 161°	4°15' -60' 161°	9
10	8°56' -60' 161°	7°59' -60' 161°	7°03' -60' 161°	6°06' -60' 161°	5°09' -60' 161°	4°12' -60' 161°	3°15' -60' 161°	10
11	7°56' -60' 161°	7°00' -60' 161°	6°03' -60' 161°	5°06' -60' 161°	4°09' -60' 161°	3°12' -60' 161°	2°15' -60' 161°	11
12	6°57' -60' 161°	6°00' -60' 161°	5°03' -60' 161°	4°06' -60' 161°	3°09' -60' 161°	2°13' -60' 161°	1°16' -60' 161°	12
13	5°57' -60' 161°	5°00' -60' 161°	4°03' -60' 161°	3°07' -60' 161°	2°10' -60' 161°	1°13' -60' 162°	0°16' -60' 162°	13
14	4°58' -60' 162°	4°01' -60' 162°	3°04' -60' 162°	2°07' -60' 162°	1°10' -60' 162°	0°13' -60' 162°	0°44' +60' 18°	14
15	3°58' -60' 162°	3°01' -60' 162°	2°04' -60' 162°	1°07' -60' 162°	0°10' -60' 162°	0°47' +60' 18°	1°44' +60' 18°	15
16	2°58' -60' 162°	2°01' -60' 162°	1°04' -60' 162°	0°07' -60' 162°	0°50' +60' 18°	1°47' +60' 18°	2°44' +60' 18°	16
17	1°59' -60' 162°	1°02' -60' 162°	0°05' -60' 162°	0°52' +60' 18°	1°49' +60' 18°	2°46' +60' 18°	3°43' +60' 18°	17
18	0°59' -60' 162°	0°02' -60' 162°	0°55' +60' 18°	1°52' +60' 18°	2°49' +60' 18°	3°46' +60' 18°	4°43' +60' 18°	18
19	0°01' +60' 18°	0°58' +60' 18°	1°55' +60' 18°	2°52' +60' 18°	3°49' +60' 18°	4°46' +60' 18°	5°43' +60' 18°	19
20	1°00' +60' 18°	1°57' +60' 18°	2°54' +60' 18°	3°52' +60' 18°	4°49' +60' 18°	5°46' +60' 18°	6°43' +60' 18°	20
21	2°00' +60' 18°	2°57' +60' 18°	3°54' +60' 18°	4°51' +60' 18°	5°48' +60' 18°	6°46' +60' 18°	7°43' +60' 18°	21
22	2°59' +60' 18°	3°57' +60' 18°	4°54' +60' 18°	5°51' +60' 18°	6°48' +60' 18°	7°45' +60' 18°	8°42' +60' 18°	22
23	3°59' +60' 17°	4°56' +60' 18°	5°54' +60' 18°	6°51' +60' 18°	7°48' +60' 18°	8°45' +60' 18°	9°42' +60' 18°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

161° 199° LHA — Latitude SAME as DECLINATION — 161° 199° LHA

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

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

18° 342° LHA — Latitude CONTRARY to Declination — 18° 342° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	18°59'	-60'	161°	18°02'	-60'	161°	17°05'	-60'	161°	16°09'	-60'	161°	15°12'	-60'	161°	14°15'	-60'	161°	13°18'	-60'	161°	0
1	17°59'	-60'	161°	17°03'	-60'	161°	16°06'	-60'	161°	15°09'	-60'	161°	14°12'	-60'	161°	13°15'	-60'	161°	12°18'	-60'	162°	1
2	17°00'	-60'	161°	16°03'	-60'	161°	15°06'	-60'	161°	14°09'	-60'	161°	13°12'	-60'	162°	12°15'	-60'	162°	11°18'	-60'	162°	2
3	16°00'	-60'	161°	15°03'	-60'	161°	14°06'	-60'	161°	13°09'	-60'	162°	12°13'	-60'	162°	11°16'	-60'	162°	10°19'	-60'	162°	3
4	15°00'	-60'	161°	14°04'	-60'	161°	13°07'	-60'	162°	12°10'	-60'	162°	11°13'	-60'	162°	10°16'	-60'	162°	9°19'	-60'	162°	4
5	14°01'	-60'	162°	13°04'	-60'	162°	12°07'	-60'	162°	11°10'	-60'	162°	10°13'	-60'	162°	9°16'	-60'	162°	8°19'	-60'	162°	5
6	13°01'	-60'	162°	12°04'	-60'	162°	11°07'	-60'	162°	10°10'	-60'	162°	9°13'	-60'	162°	8°16'	-60'	162°	7°19'	-60'	162°	6
7	12°01'	-60'	162°	11°05'	-60'	162°	10°08'	-60'	162°	9°10'	-60'	162°	8°13'	-60'	162°	7°16'	-60'	162°	6°19'	-60'	162°	7
8	11°02'	-60'	162°	10°05'	-60'	162°	9°08'	-60'	162°	8°11'	-60'	162°	7°14'	-60'	162°	6°17'	-60'	162°	5°19'	-60'	162°	8
9	10°02'	-60'	162°	9°05'	-60'	162°	8°08'	-60'	162°	7°11'	-60'	162°	6°14'	-60'	162°	5°17'	-60'	162°	4°20'	-60'	162°	9
10	9°03'	-60'	162°	8°05'	-60'	162°	7°08'	-60'	162°	6°11'	-60'	162°	5°14'	-60'	162°	4°17'	-60'	162°	3°20'	-60'	162°	10
11	8°03'	-60'	162°	7°06'	-60'	162°	6°09'	-60'	162°	5°11'	-60'	162°	4°14'	-60'	162°	3°17'	-60'	162°	2°20'	-60'	162°	11
12	7°03'	-60'	162°	6°06'	-60'	162°	5°09'	-60'	162°	4°12'	-60'	162°	3°15'	-60'	162°	2°17'	-60'	162°	1°20'	-60'	162°	12
13	6°04'	-60'	162°	5°06'	-60'	162°	4°09'	-60'	162°	3°12'	-60'	162°	2°15'	-60'	162°	1°18'	-60'	162°	0°20'	-60'	162°	13
14	5°04'	-60'	162°	4°07'	-60'	163°	3°09'	-60'	163°	2°12'	-60'	163°	1°15'	-60'	163°	0°18'	-60'	163°	0°39'	+60'	17°	14
15	4°04'	-60'	163°	3°07'	-60'	163°	2°10'	-60'	163°	1°12'	-60'	163°	0°15'	-60'	163°	0°42'	+60'	17°	1°39'	+60'	17°	15
16	3°05'	-60'	163°	2°07'	-60'	163°	1°10'	-60'	163°	0°13'	-60'	163°	0°45'	+60'	17°	1°42'	+60'	17°	2°39'	+60'	17°	16
17	2°05'	-60'	163°	1°08'	-60'	163°	0°10'	-60'	163°	0°47'	+60'	17°	1°44'	+60'	17°	2°42'	+60'	17°	3°39'	+60'	17°	17
18	1°05'	-60'	163°	0°08'	-60'	163°	0°49'	+60'	17°	1°47'	+60'	17°	2°44'	+60'	17°	3°41'	+60'	17°	4°39'	+60'	17°	18
19	0°06'	-60'	163°	0°52'	+60'	17°	1°49'	+60'	17°	2°47'	+60'	17°	3°44'	+60'	17°	4°41'	+60'	17°	5°39'	+60'	17°	19
20	0°54'	+60'	17°	1°51'	+60'	17°	2°49'	+60'	17°	3°46'	+60'	17°	4°44'	+60'	17°	5°41'	+60'	17°	6°38'	+60'	17°	20
21	1°54'	+60'	17°	2°51'	+60'	17°	3°49'	+60'	17°	4°46'	+60'	17°	5°43'	+60'	17°	6°41'	+60'	17°	7°38'	+60'	17°	21
22	2°53'	+60'	17°	3°51'	+60'	17°	4°48'	+60'	17°	5°46'	+60'	17°	6°43'	+60'	17°	7°41'	+60'	17°	8°38'	+60'	17°	22
23	3°53'	+60'	17°	4°51'	+60'	17°	5°48'	+60'	17°	6°46'	+60'	17°	7°43'	+60'	17°	8°41'	+60'	17°	9°38'	+60'	17°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°05'	-60'	162°	18°08'	-60'	162°	17°11'	-60'	162°	16°14'	-60'	162°	15°17'	-60'	162°	14°20'	-60'	162°	13°23'	-60'	163°	0
1	18°06'	-60'	162°	17°09'	-60'	162°	16°12'	-60'	162°	15°14'	-60'	162°	14°17'	-60'	162°	13°20'	-60'	163°	12°23'	-60'	163°	1
2	17°06'	-60'	162°	16°09'	-60'	162°	15°12'	-60'	162°	14°15'	-60'	162°	13°17'	-60'	163°	12°20'	-60'	163°	11°23'	-60'	163°	2
3	16°06'	-60'	162°	15°09'	-60'	162°	14°12'	-60'	162°	13°15'	-60'	163°	12°18'	-60'	163°	11°20'	-60'	163°	10°23'	-60'	163°	3
4	15°07'	-60'	162°	14°10'	-60'	162°	13°12'	-60'	163°	12°15'	-60'	163°	11°18'	-60'	163°	10°21'	-60'	163°	9°23'	-60'	163°	4
5	14°07'	-60'	163°	13°10'	-60'	163°	12°13'	-60'	163°	11°15'	-60'	163°	10°18'	-60'	163°	9°21'	-60'	163°	8°23'	-60'	163°	5
6	13°07'	-60'	163°	12°10'	-60'	163°	11°13'	-60'	163°	10°16'	-60'	163°	9°18'	-60'	163°	8°21'	-60'	163°	7°24'	-60'	163°	6
7	12°08'	-60'	163°	11°10'	-60'	163°	10°13'	-60'	163°	9°16'	-60'	163°	8°18'	-60'	163°	7°21'	-60'	163°	6°24'	-60'	163°	7
8	11°08'	-60'	163°	10°11'	-60'	163°	9°13'	-60'	163°	8°16'	-60'	163°	7°19'	-60'	163°	6°21'	-60'	163°	5°24'	-60'	163°	8
9	10°08'	-60'	163°	9°11'	-60'	163°	8°14'	-60'	163°	7°16'	-60'	163°	6°19'	-60'	163°	5°21'	-60'	163°	4°24'	-60'	163°	9
10	9°09'	-60'	163°	8°11'	-60'	163°	7°14'	-60'	163°	6°16'	-60'	163°	5°19'	-60'	163°	4°22'	-60'	163°	3°24'	-60'	163°	10
11	8°09'	-60'	163°	7°12'	-60'	163°	6°14'	-60'	163°	5°17'	-60'	163°	4°19'	-60'	163°	3°22'	-60'	163°	2°24'	-60'	163°	11
12	7°09'	-60'	163°	6°12'	-60'	163°	5°14'	-60'	163°	4°17'	-60'	163°	3°19'	-60'	163°	2°22'	-60'	163°	1°24'	-60'	163°	12
13	6°10'	-60'	163°	5°12'	-60'	163°	4°15'	-60'	163°	3°17'	-60'	163°	2°20'	-60'	163°	1°22'	-60'	163°	0°25'	-60'	163°	13
14	5°10'	-60'	163°	4°12'	-60'	163°	3°15'	-60'	163°	2°17'	-60'	164°	1°20'	-60'	164°	0°22'	-60'	164°	0°35'	+60'	16°	14
15	4°10'	-60'	164°	3°13'	-60'	164°	2°15'	-60'	164°	1°18'	-60'	164°	0°20'	-60'	164°	0°38'	+60'	16°	1°35'	+60'	16°	15
16	3°11'	-60'	164°	2°13'	-60'	164°	1°15'	-60'	164°	0°18'	-60'	164°	0°40'	+60'	16°	1°37'	+60'	16°	2°35'	+60'	16°	16
17	2°11'	-60'	164°	1°13'	-60'	164°	0°16'	-60'	164°	0°42'	+60'	16°	1°40'	+60'	16°	2°37'	+60'	16°	3°35'	+60'	16°	17
18	1°11'	-60'	164°	0°13'	-60'	164°	0°44'	+60'	16°	1°42'	+60'	16°	2°39'	+60'	16°	3°37'	+60'	16°	4°35'	+60'	16°	18
19	0°11'	-60'	164°	0°46'	+60'	16°	1°44'	+60'	16°	2°42'	+60'	16°	3°39'	+60'	16°	4°37'	+60'	16°	5°35'	+60'	16°	19
20	0°48'	+60'	16°	1°46'	+60'	16°	2°44'	+60'	16°	3°41'	+60'	16°	4°39'	+60'	16°	5°37'	+60'	16°	6°34'	+60'	16°	20
21	1°48'	+60'	16°	2°46'	+60'	16°	3°43'	+60'	16°	4°41'	+60'	16°	5°39'	+60'	16°	6°37'	+60'	16°	7°34'	+60'	16°	21
22	2°48'	+60'	16°	3°45'	+60'	16°	4°43'	+60'	16°	5°41'	+60'	16°	6°39'	+60'	16°	7°36'	+60'	16°	8°34'	+60'	16°	22
23	3°47'	+60'	16°	4°45'	+60'	16°	5°43'	+60'	16°	6°41'	+60'	16°	7°38'	+60'	16°	8°36'	+60'	16°	9°34'	+60'	16°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

163° 197° LHA — Latitude SAME as DECLINATION — 163° 197° LHA

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

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

16° 344° LHA — Latitude CONTRARY to Declination — 16° 344° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°12'	-60'	163°	18°14'	-60'	163°	17°17'	-60'	163°	16°19'	-60'	163°	15°22'	-60'	163°	14°24'	-60'	163°	13°27'	-60'	164°	0
1	18°12'	-60'	163°	17°15'	-60'	163°	16°17'	-60'	163°	15°20'	-60'	163°	14°22'	-60'	163°	13°25'	-60'	164°	12°27'	-60'	164°	1
2	17°12'	-60'	163°	16°15'	-60'	163°	15°17'	-60'	163°	14°20'	-60'	163°	13°22'	-60'	164°	12°25'	-60'	164°	11°27'	-60'	164°	2
3	16°13'	-60'	163°	15°15'	-60'	163°	14°18'	-60'	163°	13°20'	-60'	164°	12°22'	-60'	164°	11°25'	-60'	164°	10°27'	-60'	164°	3
4	15°13'	-60'	163°	14°15'	-60'	164°	13°18'	-60'	164°	12°20'	-60'	164°	11°23'	-60'	164°	10°25'	-60'	164°	9°27'	-60'	164°	4
5	14°13'	-60'	164°	13°16'	-60'	164°	12°18'	-60'	164°	11°20'	-60'	164°	10°23'	-60'	164°	9°25'	-60'	164°	8°28'	-60'	164°	5
6	13°13'	-60'	164°	12°16'	-60'	164°	11°18'	-60'	164°	10°21'	-60'	164°	9°23'	-60'	164°	8°25'	-60'	164°	7°28'	-60'	164°	6
7	12°14'	-60'	164°	11°16'	-60'	164°	10°18'	-60'	164°	9°21'	-60'	164°	8°23'	-60'	164°	7°25'	-60'	164°	6°28'	-60'	164°	7
8	11°14'	-60'	164°	10°16'	-60'	164°	9°19'	-60'	164°	8°21'	-60'	164°	7°23'	-60'	164°	6°26'	-60'	164°	5°28'	-60'	164°	8
9	10°14'	-60'	164°	9°17'	-60'	164°	8°19'	-60'	164°	7°21'	-60'	164°	6°23'	-60'	164°	5°26'	-60'	164°	4°28'	-60'	164°	9
10	9°15'	-60'	164°	8°17'	-60'	164°	7°19'	-60'	164°	6°21'	-60'	164°	5°24'	-60'	164°	4°26'	-60'	164°	3°28'	-60'	164°	10
11	8°15'	-60'	164°	7°17'	-60'	164°	6°19'	-60'	164°	5°22'	-60'	164°	4°24'	-60'	164°	3°26'	-60'	164°	2°28'	-60'	164°	11
12	7°15'	-60'	164°	6°17'	-60'	164°	5°20'	-60'	164°	4°22'	-60'	164°	3°24'	-60'	164°	2°26'	-60'	164°	1°28'	-60'	164°	12
13	6°15'	-60'	164°	5°18'	-60'	164°	4°20'	-60'	164°	3°22'	-60'	164°	2°24'	-60'	164°	1°26'	-60'	164°	0°29'	-60'	164°	13
14	5°16'	-60'	164°	4°18'	-60'	164°	3°20'	-60'	164°	2°22'	-60'	164°	1°24'	-60'	164°	0°27'	-60'	164°	0°31'	+60'	16°	14
15	4°16'	-60'	165°	3°18'	-60'	165°	2°20'	-60'	165°	1°22'	-60'	165°	0°25'	-60'	165°	0°33'	+60'	15°	1°31'	+60'	15°	15
16	3°16'	-60'	165°	2°18'	-60'	165°	1°20'	-60'	165°	0°23'	-60'	165°	0°35'	+60'	15°	1°33'	+60'	15°	2°31'	+60'	15°	16
17	2°16'	-60'	165°	1°19'	-60'	165°	0°21'	-60'	165°	0°37'	+60'	15°	1°35'	+60'	15°	2°33'	+60'	15°	3°31'	+60'	15°	17
18	1°17'	-60'	165°	0°19'	-60'	165°	0°39'	+60'	15°	1°37'	+60'	15°	2°35'	+60'	15°	3°33'	+60'	15°	4°31'	+60'	15°	18
19	0°17'	-60'	165°	0°41'	+60'	15°	1°39'	+60'	15°	2°37'	+60'	15°	3°35'	+60'	15°	4°33'	+60'	15°	5°31'	+60'	15°	19
20	0°43'	+60'	15°	1°41'	+60'	15°	2°39'	+60'	15°	3°37'	+60'	15°	4°35'	+60'	15°	5°33'	+60'	15°	6°30'	+60'	15°	20
21	1°43'	+60'	15°	2°41'	+60'	15°	3°38'	+60'	15°	4°36'	+60'	15°	5°34'	+60'	15°	6°32'	+60'	15°	7°30'	+60'	15°	21
22	2°42'	+60'	15°	3°40'	+60'	15°	4°38'	+60'	15°	5°36'	+60'	15°	6°34'	+60'	15°	7°32'	+60'	15°	8°30'	+60'	15°	22
23	3°42'	+60'	15°	4°40'	+60'	15°	5°38'	+60'	15°	6°36'	+60'	15°	7°34'	+60'	15°	8°32'	+60'	15°	9°30'	+60'	15°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°17'	-60'	164°	18°20'	-60'	164°	17°22'	-60'	164°	16°24'	-60'	164°	15°26'	-60'	164°	14°29'	-60'	164°	13°31'	-60'	165°	0
1	18°18'	-60'	164°	17°20'	-60'	164°	16°22'	-60'	164°	15°24'	-60'	164°	14°27'	-60'	165°	13°29'	-60'	165°	12°31'	-60'	165°	1
2	17°18'	-60'	164°	16°20'	-60'	164°	15°22'	-60'	164°	14°25'	-60'	165°	13°27'	-60'	165°	12°29'	-60'	165°	11°31'	-60'	165°	2
3	16°18'	-60'	164°	15°20'	-60'	164°	14°23'	-60'	165°	13°25'	-60'	165°	12°27'	-60'	165°	11°29'	-60'	165°	10°31'	-60'	165°	3
4	15°18'	-60'	164°	14°21'	-60'	165°	13°23'	-60'	165°	12°25'	-60'	165°	11°27'	-60'	165°	10°29'	-60'	165°	9°31'	-60'	165°	4
5	14°19'	-60'	165°	13°21'	-60'	165°	12°23'	-60'	165°	11°25'	-60'	165°	10°27'	-60'	165°	9°29'	-60'	165°	8°31'	-60'	165°	5
6	13°19'	-60'	165°	12°21'	-60'	165°	11°23'	-60'	165°	10°25'	-60'	165°	9°27'	-60'	165°	8°29'	-60'	165°	7°32'	-60'	165°	6
7	12°19'	-60'	165°	11°21'	-60'	165°	10°23'	-60'	165°	9°26'	-60'	165°	8°28'	-60'	165°	7°30'	-60'	165°	6°32'	-60'	165°	7
8	11°19'	-60'	165°	10°22'	-60'	165°	9°24'	-60'	165°	8°26'	-60'	165°	7°28'	-60'	165°	6°30'	-60'	165°	5°32'	-60'	165°	8
9	10°20'	-60'	165°	9°22'	-60'	165°	8°24'	-60'	165°	7°26'	-60'	165°	6°28'	-60'	165°	5°30'	-60'	165°	4°32'	-60'	165°	9
10	9°20'	-60'	165°	8°22'	-60'	165°	7°24'	-60'	165°	6°26'	-60'	165°	5°28'	-60'	165°	4°30'	-60'	165°	3°32'	-60'	165°	10
11	8°20'	-60'	165°	7°22'	-60'	165°	6°24'	-60'	165°	5°26'	-60'	165°	4°28'	-60'	165°	3°30'	-60'	165°	2°32'	-60'	165°	11
12	7°20'	-60'	165°	6°22'	-60'	165°	5°24'	-60'	165°	4°26'	-60'	165°	3°28'	-60'	165°	2°30'	-60'	165°	1°32'	-60'	165°	12
13	6°21'	-60'	165°	5°23'	-60'	165°	4°25'	-60'	165°	3°27'	-60'	165°	2°29'	-60'	165°	1°30'	-60'	165°	0°32'	-60'	165°	13
14	5°21'	-60'	165°	4°23'	-60'	165°	3°25'	-60'	165°	2°27'	-60'	165°	1°29'	-60'	165°	0°31'	-60'	165°	0°27'	+60'	15°	14
15	4°21'	-60'	165°	3°23'	-60'	165°	2°25'	-60'	166°	1°27'	-60'	166°	0°29'	-60'	166°	0°29'	+60'	14°	1°27'	+60'	14°	15
16	3°21'	-60'	166°	2°23'	-60'	166°	1°25'	-60'	166°	0°27'	-60'	166°	0°31'	+60'	14°	1°29'	+60'	14°	2°27'	+60'	14°	16
17	2°22'	-60'	166°	1°24'	-60'	166°	0°25'	-60'	166°	0°33'	+60'	14°	1°31'	+60'	14°	2°29'	+60'	14°	3°27'	+60'	14°	17
18	1°22'	-60'	166°	0°24'	-60'	166°	0°34'	+60'	14°	1°33'	+60'	14°	2°31'	+60'	14°	3°29'	+60'	14°	4°27'	+60'	14°	18
19	0°22'	-60'	166°	0°36'	+60'	14°	1°34'	+60'	14°	2°32'	+60'	14°	3°31'	+60'	14°	4°29'	+60'	14°	5°27'	+60'	14°	19
20	0°38'	+60'	14°	1°36'	+60'	14°	2°34'	+60'	14°	3°32'	+60'	14°	4°30'	+60'	14°	5°29'	+60'	14°	6°27'	+60'	14°	20
21	1°37'	+60'	14°	2°36'	+60'	14°	3°34'	+60'	14°	4°32'	+60'	14°	5°30'	+60'	14°	6°28'	+60'	14°	7°27'	+60'	14°	21
22	2°37'	+60'	14°	3°35'	+60'	14°	4°34'	+60'	14°	5°32'	+60'	14°	6°30'	+60'	14°	7°28'	+60'	14°	8°27'	+60'	14°	22
23	3°37'	+60'	14°	4°35'	+60'	14°	5°33'	+60'	14°	6°32'	+60'	14°	7°30'	+60'	14°	8°28'	+60'	14°	9°26'	+60'	14°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

165° 195° LHA — Latitude SAME as DECLINATION — 165° 195° LHA

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

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

14° 346° LHA — Latitude CONTRARY to Declination — 14° 346° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	19°23' -60' 165°	18°25' -60' 165°	17°27' -60' 165°	16°29' -60' 165°	15°31' -60' 165°	14°33' -60' 166°	13°35' -60' 166°	0
1	18°23' -60' 165°	17°25' -60' 165°	16°27' -60' 165°	15°29' -60' 165°	14°31' -60' 166°	13°33' -60' 166°	12°35' -60' 166°	1
2	17°23' -60' 165°	16°25' -60' 165°	15°27' -60' 165°	14°29' -60' 166°	13°31' -60' 166°	12°33' -60' 166°	11°35' -60' 166°	2
3	16°24' -60' 165°	15°26' -60' 165°	14°27' -60' 166°	13°29' -60' 166°	12°31' -60' 166°	11°33' -60' 166°	10°35' -60' 166°	3
4	15°24' -60' 166°	14°26' -60' 166°	13°28' -60' 166°	12°29' -60' 166°	11°31' -60' 166°	10°33' -60' 166°	9°35' -60' 166°	4
5	14°24' -60' 166°	13°26' -60' 166°	12°28' -60' 166°	11°30' -60' 166°	10°31' -60' 166°	9°33' -60' 166°	8°35' -60' 166°	5
6	13°24' -60' 166°	12°26' -60' 166°	11°28' -60' 166°	10°30' -60' 166°	9°32' -60' 166°	8°33' -60' 166°	7°35' -60' 166°	6
7	12°24' -60' 166°	11°26' -60' 166°	10°28' -60' 166°	9°30' -60' 166°	8°32' -60' 166°	7°34' -60' 166°	6°35' -60' 166°	7
8	11°25' -60' 166°	10°26' -60' 166°	9°28' -60' 166°	8°30' -60' 166°	7°32' -60' 166°	6°34' -60' 166°	5°35' -60' 166°	8
9	10°25' -60' 166°	9°27' -60' 166°	8°28' -60' 166°	7°30' -60' 166°	6°32' -60' 166°	5°34' -60' 166°	4°36' -60' 166°	9
10	9°25' -60' 166°	8°27' -60' 166°	7°29' -60' 166°	6°30' -60' 166°	5°32' -60' 166°	4°34' -60' 166°	3°36' -60' 166°	10
11	8°25' -60' 166°	7°27' -60' 166°	6°29' -60' 166°	5°31' -60' 166°	4°32' -60' 166°	3°34' -60' 166°	2°36' -60' 166°	11
12	7°26' -60' 166°	6°27' -60' 166°	5°29' -60' 166°	4°31' -60' 166°	3°32' -60' 166°	2°34' -60' 166°	1°36' -60' 166°	12
13	6°26' -60' 166°	5°27' -60' 166°	4°29' -60' 166°	3°31' -60' 166°	2°33' -60' 166°	1°34' -60' 166°	0°36' -60' 166°	13
14	5°26' -60' 166°	4°28' -60' 166°	3°29' -60' 166°	2°31' -60' 166°	1°33' -60' 166°	0°34' -60' 166°	0°24' +60' 14°	14
15	4°26' -60' 166°	3°28' -60' 166°	2°29' -60' 166°	1°31' -60' 166°	0°33' -60' 166°	0°26' +60' 14°	1°24' +60' 14°	15
16	3°26' -60' 167°	2°28' -60' 167°	1°30' -60' 167°	0°31' -60' 167°	0°27' +60' 13°	1°25' +60' 13°	2°24' +60' 13°	16
17	2°27' -60' 167°	1°28' -60' 167°	0°30' -60' 167°	0°29' +60' 13°	1°27' +60' 13°	2°25' +60' 13°	3°24' +60' 13°	17
18	1°27' -60' 167°	0°28' -60' 167°	0°30' +60' 13°	1°28' +60' 13°	2°27' +60' 13°	3°25' +60' 13°	4°24' +60' 13°	18
19	0°27' -60' 167°	0°31' +60' 13°	1°30' +60' 13°	2°28' +60' 13°	3°27' +60' 13°	4°25' +60' 13°	5°23' +60' 13°	19
20	0°33' +60' 13°	1°31' +60' 13°	2°30' +60' 13°	3°28' +60' 13°	4°27' +60' 13°	5°25' +60' 13°	6°23' +60' 13°	20
21	1°33' +60' 13°	2°31' +60' 13°	3°30' +60' 13°	4°28' +60' 13°	5°26' +60' 13°	6°25' +60' 13°	7°23' +60' 13°	21
22	2°32' +60' 13°	3°31' +60' 13°	4°29' +60' 13°	5°28' +60' 13°	6°26' +60' 13°	7°25' +60' 13°	8°23' +60' 13°	22
23	3°32' +60' 13°	4°31' +60' 13°	5°29' +60' 13°	6°28' +60' 13°	7°26' +60' 13°	8°25' +60' 13°	9°23' +60' 13°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	19°28' -60' 166°	18°30' -60' 166°	17°31' -60' 166°	16°33' -60' 166°	15°35' -60' 166°	14°36' -60' 167°	13°38' -60' 167°	0
1	18°28' -60' 166°	17°30' -60' 166°	16°32' -60' 166°	15°33' -60' 166°	14°35' -60' 167°	13°37' -60' 167°	12°38' -60' 167°	1
2	17°28' -60' 166°	16°30' -60' 166°	15°32' -60' 167°	14°33' -60' 167°	13°35' -60' 167°	12°37' -60' 167°	11°38' -60' 167°	2
3	16°29' -60' 166°	15°30' -60' 167°	14°32' -60' 167°	13°34' -60' 167°	12°35' -60' 167°	11°37' -60' 167°	10°38' -60' 167°	3
4	15°29' -60' 167°	14°30' -60' 167°	13°32' -60' 167°	12°34' -60' 167°	11°35' -60' 167°	10°37' -60' 167°	9°38' -60' 167°	4
5	14°29' -60' 167°	13°31' -60' 167°	12°32' -60' 167°	11°34' -60' 167°	10°35' -60' 167°	9°37' -60' 167°	8°39' -60' 167°	5
6	13°29' -60' 167°	12°31' -60' 167°	11°32' -60' 167°	10°34' -60' 167°	9°35' -60' 167°	8°37' -60' 167°	7°39' -60' 167°	6
7	12°29' -60' 167°	11°31' -60' 167°	10°32' -60' 167°	9°34' -60' 167°	8°36' -60' 167°	7°37' -60' 167°	6°39' -60' 167°	7
8	11°30' -60' 167°	10°31' -60' 167°	9°33' -60' 167°	8°34' -60' 167°	7°36' -60' 167°	6°37' -60' 167°	5°39' -60' 167°	8
9	10°30' -60' 167°	9°31' -60' 167°	8°33' -60' 167°	7°34' -60' 167°	6°36' -60' 167°	5°37' -60' 167°	4°39' -60' 167°	9
10	9°30' -60' 167°	8°31' -60' 167°	7°33' -60' 167°	6°34' -60' 167°	5°36' -60' 167°	4°37' -60' 167°	3°39' -60' 167°	10
11	8°30' -60' 167°	7°32' -60' 167°	6°33' -60' 167°	5°35' -60' 167°	4°36' -60' 167°	3°38' -60' 167°	2°39' -60' 167°	11
12	7°30' -60' 167°	6°32' -60' 167°	5°33' -60' 167°	4°35' -60' 167°	3°36' -60' 167°	2°38' -60' 167°	1°39' -60' 167°	12
13	6°30' -60' 167°	5°32' -60' 167°	4°33' -60' 167°	3°35' -60' 167°	2°36' -60' 167°	1°38' -60' 167°	0°39' -60' 167°	13
14	5°31' -60' 167°	4°32' -60' 167°	3°34' -60' 167°	2°35' -60' 167°	1°36' -60' 167°	0°38' -60' 167°	0°21' +60' 13°	14
15	4°31' -60' 167°	3°32' -60' 167°	2°34' -60' 167°	1°35' -60' 167°	0°37' -60' 167°	0°22' +60' 13°	1°21' +60' 13°	15
16	3°31' -60' 167°	2°32' -60' 167°	1°34' -60' 168°	0°35' -60' 168°	0°23' +60' 12°	1°22' +60' 12°	2°21' +60' 12°	16
17	2°31' -60' 168°	1°33' -60' 168°	0°34' -60' 168°	0°25' +60' 12°	1°23' +60' 12°	2°22' +60' 12°	3°20' +60' 12°	17
18	1°31' -60' 168°	0°33' -60' 168°	0°26' +60' 12°	1°25' +60' 12°	2°23' +60' 12°	3°22' +60' 12°	4°20' +60' 12°	18
19	0°32' -60' 168°	0°27' +60' 12°	1°26' +60' 12°	2°24' +60' 12°	3°23' +60' 12°	4°22' +60' 12°	5°20' +60' 12°	19
20	0°28' +60' 12°	1°27' +60' 12°	2°26' +60' 12°	3°24' +60' 12°	4°23' +60' 12°	5°22' +60' 12°	6°20' +60' 12°	20
21	1°28' +60' 12°	2°27' +60' 12°	3°25' +60' 12°	4°24' +60' 12°	5°23' +60' 12°	6°21' +60' 12°	7°20' +60' 12°	21
22	2°28' +60' 12°	3°27' +60' 12°	4°25' +60' 12°	5°24' +60' 12°	6°23' +60' 12°	7°21' +60' 12°	8°20' +60' 12°	22
23	3°28' +60' 12°	4°26' +60' 12°	5°25' +60' 12°	6°24' +60' 12°	7°23' +60' 12°	8°21' +60' 12°	9°20' +60' 12°	23
Dec°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Hc° d' Z°	Dec°
	70	71	72	73	74	75	76	

167° 193° LHA — Latitude SAME as DECLINATION — 167° 193° LHA

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

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

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

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°33'	-60'	167°	18°34'	-60'	167°	17°36'	-60'	167°	16°37'	-60'	167°	15°38'	-60'	168°	14°40'	-60'	168°	13°41'	-60'	168°	0
1	18°33'	-60'	167°	17°34'	-60'	167°	16°36'	-60'	167°	15°37'	-60'	168°	14°39'	-60'	168°	13°40'	-60'	168°	12°41'	-60'	168°	1
2	17°33'	-60'	167°	16°34'	-60'	167°	15°36'	-60'	168°	14°37'	-60'	168°	13°39'	-60'	168°	12°40'	-60'	168°	11°41'	-60'	168°	2
3	16°33'	-60'	167°	15°35'	-60'	168°	14°36'	-60'	168°	13°37'	-60'	168°	12°39'	-60'	168°	11°40'	-60'	168°	10°42'	-60'	168°	3
4	15°33'	-60'	168°	14°35'	-60'	168°	13°36'	-60'	168°	12°38'	-60'	168°	11°39'	-60'	168°	10°40'	-60'	168°	9°42'	-60'	168°	4
5	14°34'	-60'	168°	13°35'	-60'	168°	12°36'	-60'	168°	11°38'	-60'	168°	10°39'	-60'	168°	9°40'	-60'	168°	8°42'	-60'	168°	5
6	13°34'	-60'	168°	12°35'	-60'	168°	11°36'	-60'	168°	10°38'	-60'	168°	9°39'	-60'	168°	8°40'	-60'	168°	7°42'	-60'	168°	6
7	12°34'	-60'	168°	11°35'	-60'	168°	10°37'	-60'	168°	9°38'	-60'	168°	8°39'	-60'	168°	7°41'	-60'	168°	6°42'	-60'	168°	7
8	11°34'	-60'	168°	10°35'	-60'	168°	9°37'	-60'	168°	8°38'	-60'	168°	7°39'	-60'	168°	6°41'	-60'	168°	5°42'	-60'	168°	8
9	10°34'	-60'	168°	9°35'	-60'	168°	8°37'	-60'	168°	7°38'	-60'	168°	6°39'	-60'	168°	5°41'	-60'	168°	4°42'	-60'	168°	9
10	9°34'	-60'	168°	8°36'	-60'	168°	7°37'	-60'	168°	6°38'	-60'	168°	5°40'	-60'	168°	4°41'	-60'	168°	3°42'	-60'	168°	10
11	8°34'	-60'	168°	7°36'	-60'	168°	6°37'	-60'	168°	5°38'	-60'	168°	4°40'	-60'	168°	3°41'	-60'	168°	2°42'	-60'	168°	11
12	7°35'	-60'	168°	6°36'	-60'	168°	5°37'	-60'	168°	4°38'	-60'	168°	3°40'	-60'	168°	2°41'	-60'	168°	1°42'	-60'	168°	12
13	6°35'	-60'	168°	5°36'	-60'	168°	4°37'	-60'	168°	3°39'	-60'	168°	2°40'	-60'	168°	1°41'	-60'	168°	**0°42'**	**-60'**	**168°**	13
14	5°35'	-60'	168°	4°36'	-60'	168°	3°37'	-60'	168°	2°39'	-60'	168°	1°40'	-60'	168°	**0°41'**	**-60'**	**168°**	0°18'	+60'	12°	14
15	4°35'	-60'	168°	3°36'	-60'	168°	2°38'	-60'	168°	1°39'	-60'	168°	**0°40'**	**-60'**	**168°**	0°19'	+60'	12°	1°18'	+60'	12°	15
16	3°35'	-60'	168°	2°36'	-60'	168°	1°38'	-60'	168°	**0°39'**	**-60'**	**168°**	0°20'	+60'	12°	1°19'	+60'	12°	2°17'	+60'	12°	16
17	2°35'	-60'	169°	1°37'	-60'	169°	**0°38'**	**-60'**	**169°**	0°21'	+60'	11°	1°20'	+60'	11°	2°19'	+60'	11°	3°17'	+60'	11°	17
18	1°36'	-60'	169°	**0°37'**	**-60'**	**169°**	0°22'	+60'	11°	1°21'	+60'	11°	2°20'	+60'	11°	3°19'	+60'	11°	4°17'	+60'	11°	18
19	**0°36'**	**-60'**	**169°**	0°23'	+60'	11°	1°22'	+60'	11°	2°21'	+60'	11°	3°20'	+60'	11°	4°18'	+60'	11°	5°17'	+60'	11°	19
20	0°24'	+60'	11°	1°23'	+60'	11°	2°22'	+60'	11°	3°21'	+60'	11°	4°20'	+60'	11°	5°18'	+60'	11°	6°17'	+60'	11°	20
21	1°24'	+60'	11°	2°23'	+60'	11°	3°22'	+60'	11°	4°21'	+60'	11°	5°19'	+60'	11°	6°18'	+60'	11°	7°17'	+60'	11°	21
22	2°24'	+60'	11°	3°23'	+60'	11°	4°22'	+60'	11°	5°20'	+60'	11°	6°19'	+60'	11°	7°18'	+60'	11°	8°17'	+60'	11°	22
23	3°24'	+60'	11°	4°23'	+60'	11°	5°21'	+60'	11°	6°20'	+60'	11°	7°19'	+60'	11°	8°18'	+60'	11°	9°17'	+60'	11°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°37'	-60'	168°	18°38'	-60'	168°	17°39'	-60'	168°	16°41'	-60'	169°	15°42'	-60'	169°	14°43'	-60'	169°	13°44'	-60'	169°	0
1	18°37'	-60'	168°	17°38'	-60'	168°	16°40'	-60'	169°	15°41'	-60'	169°	14°42'	-60'	169°	13°43'	-60'	169°	12°44'	-60'	169°	1
2	17°37'	-60'	168°	16°39'	-60'	169°	15°40'	-60'	169°	14°41'	-60'	169°	13°42'	-60'	169°	12°43'	-60'	169°	11°44'	-60'	169°	2
3	16°37'	-60'	169°	15°39'	-60'	169°	14°40'	-60'	169°	13°41'	-60'	169°	12°42'	-60'	169°	11°43'	-60'	169°	10°44'	-60'	169°	3
4	15°38'	-60'	169°	14°39'	-60'	169°	13°40'	-60'	169°	12°41'	-60'	169°	11°42'	-60'	169°	10°43'	-60'	169°	9°45'	-60'	169°	4
5	14°38'	-60'	169°	13°39'	-60'	169°	12°40'	-60'	169°	11°41'	-60'	169°	10°42'	-60'	169°	9°43'	-60'	169°	8°45'	-60'	169°	5
6	13°38'	-60'	169°	12°39'	-60'	169°	11°40'	-60'	169°	10°41'	-60'	169°	9°42'	-60'	169°	8°44'	-60'	169°	7°45'	-60'	169°	6
7	12°38'	-60'	169°	11°39'	-60'	169°	10°40'	-60'	169°	9°41'	-60'	169°	8°43'	-60'	169°	7°44'	-60'	169°	6°45'	-60'	169°	7
8	11°38'	-60'	169°	10°39'	-60'	169°	9°40'	-60'	169°	8°41'	-60'	169°	7°43'	-60'	169°	6°44'	-60'	169°	5°45'	-60'	169°	8
9	10°38'	-60'	169°	9°39'	-60'	169°	8°40'	-60'	169°	7°42'	-60'	169°	6°43'	-60'	169°	5°44'	-60'	169°	4°45'	-60'	169°	9
10	9°38'	-60'	169°	8°40'	-60'	169°	7°41'	-60'	169°	6°42'	-60'	169°	5°43'	-60'	169°	4°44'	-60'	169°	3°45'	-60'	169°	10
11	8°39'	-60'	169°	7°40'	-60'	169°	6°41'	-60'	169°	5°42'	-60'	169°	4°43'	-60'	169°	3°44'	-60'	169°	2°45'	-60'	169°	11
12	7°39'	-60'	169°	6°40'	-60'	169°	5°41'	-60'	169°	4°42'	-60'	169°	3°43'	-60'	169°	2°44'	-60'	169°	1°45'	-60'	169°	12
13	6°39'	-60'	169°	5°40'	-60'	169°	4°41'	-60'	169°	3°42'	-60'	169°	2°43'	-60'	169°	1°44'	-60'	169°	**0°45'**	**-60'**	**169°**	13
14	5°39'	-60'	169°	4°40'	-60'	169°	3°41'	-60'	169°	2°42'	-60'	169°	1°43'	-60'	169°	**0°44'**	**-60'**	**169°**	0°15'	+60'	11°	14
15	4°39'	-60'	169°	3°40'	-60'	169°	2°41'	-60'	169°	1°42'	-60'	169°	**0°43'**	**-60'**	**169°**	0°16'	+60'	11°	1°15'	+60'	11°	15
16	3°39'	-60'	169°	2°40'	-60'	169°	1°41'	-60'	169°	**0°42'**	**-60'**	**169°**	0°17'	+60'	11°	1°16'	+60'	11°	2°15'	+60'	11°	16
17	2°39'	-60'	169°	1°40'	-60'	169°	**0°41'**	**-60'**	**169°**	0°18'	+60'	11°	1°17'	+60'	11°	2°16'	+60'	11°	3°15'	+60'	11°	17
18	1°39'	-60'	170°	**0°40'**	**-60'**	**170°**	0°19'	+60'	10°	1°18'	+60'	10°	2°17'	+60'	10°	3°16'	+60'	10°	4°15'	+60'	10°	18
19	**0°40'**	**-60'**	**170°**	0°19'	+60'	10°	1°18'	+60'	10°	2°17'	+60'	10°	3°16'	+60'	10°	4°15'	+60'	10°	5°15'	+60'	10°	19
20	0°20'	+60'	10°	1°19'	+60'	10°	2°18'	+60'	10°	3°17'	+60'	10°	4°16'	+60'	10°	5°15'	+60'	10°	6°14'	+60'	10°	20
21	1°20'	+60'	10°	2°19'	+60'	10°	3°18'	+60'	10°	4°17'	+60'	10°	5°16'	+60'	10°	6°15'	+60'	10°	7°14'	+60'	10°	21
22	2°20'	+60'	10°	3°19'	+60'	10°	4°18'	+60'	10°	5°17'	+60'	10°	6°16'	+60'	10°	7°15'	+60'	10°	8°14'	+60'	10°	22
23	3°20'	+60'	10°	4°19'	+60'	10°	5°18'	+60'	10°	6°17'	+60'	10°	7°16'	+60'	10°	8°15'	+60'	10°	9°14'	+60'	10°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

169° 191° LHA — Latitude SAME as DECLINATION — 169° 191° LHA

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

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

10° 350° LHA — Latitude CONTRARY to Declination — 10° 350° LHA

Dec°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°41'	-60'	169°	18°42'	-60'	169°	17°43'	-60'	169°	16°44'	-60'	170°	15°45'	-60'	170°	14°46'	-60'	170°	13°47'	-60'	170°	0
1	18°41'	-60'	169°	17°42'	-60'	169°	16°43'	-60'	170°	15°44'	-60'	170°	14°45'	-60'	170°	13°46'	-60'	170°	12°47'	-60'	170°	1
2	17°41'	-60'	170°	16°42'	-60'	170°	15°43'	-60'	170°	14°44'	-60'	170°	13°45'	-60'	170°	12°46'	-60'	170°	11°47'	-60'	170°	2
3	16°41'	-60'	170°	15°42'	-60'	170°	14°43'	-60'	170°	13°44'	-60'	170°	12°45'	-60'	170°	11°46'	-60'	170°	10°47'	-60'	170°	3
4	15°41'	-60'	170°	14°42'	-60'	170°	13°43'	-60'	170°	12°44'	-60'	170°	11°45'	-60'	170°	10°46'	-60'	170°	9°47'	-60'	170°	4
5	14°42'	-60'	170°	13°43'	-60'	170°	12°44'	-60'	170°	11°44'	-60'	170°	10°45'	-60'	170°	9°46'	-60'	170°	8°47'	-60'	170°	5
6	13°42'	-60'	170°	12°43'	-60'	170°	11°44'	-60'	170°	10°45'	-60'	170°	9°45'	-60'	170°	8°46'	-60'	170°	7°47'	-60'	170°	6
7	12°42'	-60'	170°	11°43'	-60'	170°	10°44'	-60'	170°	9°45'	-60'	170°	8°46'	-60'	170°	7°46'	-60'	170°	6°47'	-60'	170°	7
8	11°42'	-60'	170°	10°43'	-60'	170°	9°44'	-60'	170°	8°45'	-60'	170°	7°46'	-60'	170°	6°47'	-60'	170°	5°47'	-60'	170°	8
9	10°42'	-60'	170°	9°43'	-60'	170°	8°44'	-60'	170°	7°45'	-60'	170°	6°46'	-60'	170°	5°47'	-60'	170°	4°47'	-60'	170°	9
10	9°42'	-60'	170°	8°43'	-60'	170°	7°44'	-60'	170°	6°45'	-60'	170°	5°46'	-60'	170°	4°47'	-60'	170°	3°48'	-60'	170°	10
11	8°42'	-60'	170°	7°43'	-60'	170°	6°44'	-60'	170°	5°45'	-60'	170°	4°46'	-60'	170°	3°47'	-60'	170°	2°48'	-60'	170°	11
12	7°42'	-60'	170°	6°43'	-60'	170°	5°44'	-60'	170°	4°45'	-60'	170°	3°46'	-60'	170°	2°47'	-60'	170°	1°48'	-60'	170°	12
13	6°42'	-60'	170°	5°43'	-60'	170°	4°44'	-60'	170°	3°45'	-60'	170°	2°46'	-60'	170°	1°47'	-60'	170°	0°48'	-60'	170°	13
14	5°43'	-60'	170°	4°43'	-60'	170°	3°44'	-60'	170°	2°45'	-60'	170°	1°46'	-60'	170°	0°47'	-60'	170°	0°12'	+60'	10°	14
15	4°43'	-60'	170°	3°44'	-60'	170°	2°44'	-60'	170°	1°45'	-60'	170°	0°46'	-60'	170°	0°13'	+60'	10°	1°12'	+60'	10°	15
16	3°43'	-60'	170°	2°44'	-60'	170°	1°44'	-60'	170°	0°45'	-60'	170°	0°14'	+60'	10°	1°13'	+60'	10°	2°12'	+60'	10°	16
17	2°43'	-60'	170°	1°44'	-60'	170°	0°45'	-60'	170°	0°15'	+60'	10°	1°14'	+60'	10°	2°13'	+60'	10°	3°12'	+60'	10°	17
18	1°43'	-60'	170°	0°44'	-60'	170°	0°15'	+60'	10°	1°15'	+60'	10°	2°14'	+60'	10°	3°13'	+60'	10°	4°12'	+60'	10°	18
19	0°43'	-60'	171°	0°16'	+60'	9°	1°15'	+60'	9°	2°14'	+60'	9°	3°14'	+60'	9°	4°13'	+60'	9°	5°12'	+60'	9°	19
20	0°17'	+60'	9°	1°16'	+60'	9°	2°15'	+60'	9°	3°14'	+60'	9°	4°14'	+60'	9°	5°13'	+60'	9°	6°12'	+60'	9°	20
21	1°17'	+60'	9°	2°16'	+60'	9°	3°15'	+60'	9°	4°14'	+60'	9°	5°13'	+60'	9°	6°13'	+60'	9°	7°12'	+60'	9°	21
22	2°17'	+60'	9°	3°16'	+60'	9°	4°15'	+60'	9°	5°14'	+60'	9°	6°13'	+60'	9°	7°13'	+60'	9°	8°12'	+60'	9°	22
23	3°16'	+60'	9°	4°16'	+60'	9°	5°15'	+60'	9°	6°14'	+60'	9°	7°13'	+60'	9°	8°13'	+60'	9°	9°12'	+60'	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°
	70			71			72			73			74			75			76			

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°	70 Hc°	d'	Z°	71 Hc°	d'	Z°	72 Hc°	d'	Z°	73 Hc°	d'	Z°	74 Hc°	d'	Z°	75 Hc°	d'	Z°	76 Hc°	d'	Z°	Dec°
0	19°45'	-60'	170°	18°45'	-60'	170°	17°46'	-60'	171°	16°47'	-60'	171°	15°48'	-60'	171°	14°49'	-60'	171°	13°49'	-60'	171°	0
1	18°45'	-60'	170°	17°46'	-60'	171°	16°46'	-60'	171°	15°47'	-60'	171°	14°48'	-60'	171°	13°49'	-60'	171°	12°49'	-60'	171°	1
2	17°45'	-60'	171°	16°46'	-60'	171°	15°46'	-60'	171°	14°47'	-60'	171°	13°48'	-60'	171°	12°49'	-60'	171°	11°50'	-60'	171°	2
3	16°45'	-60'	171°	15°46'	-60'	171°	14°46'	-60'	171°	13°47'	-60'	171°	12°48'	-60'	171°	11°49'	-60'	171°	10°50'	-60'	171°	3
4	15°45'	-60'	171°	14°46'	-60'	171°	13°47'	-60'	171°	12°47'	-60'	171°	11°48'	-60'	171°	10°49'	-60'	171°	9°50'	-60'	171°	4
5	14°45'	-60'	171°	13°46'	-60'	171°	12°47'	-60'	171°	11°47'	-60'	171°	10°48'	-60'	171°	9°49'	-60'	171°	8°50'	-60'	171°	5
6	13°45'	-60'	171°	12°46'	-60'	171°	11°47'	-60'	171°	10°47'	-60'	171°	9°48'	-60'	171°	8°49'	-60'	171°	7°50'	-60'	171°	6
7	12°45'	-60'	171°	11°46'	-60'	171°	10°47'	-60'	171°	9°48'	-60'	171°	8°48'	-60'	171°	7°49'	-60'	171°	6°50'	-60'	171°	7
8	11°45'	-60'	171°	10°46'	-60'	171°	9°47'	-60'	171°	8°48'	-60'	171°	7°48'	-60'	171°	6°49'	-60'	171°	5°50'	-60'	171°	8
9	10°45'	-60'	171°	9°46'	-60'	171°	8°47'	-60'	171°	7°48'	-60'	171°	6°48'	-60'	171°	5°49'	-60'	171°	4°50'	-60'	171°	9
10	9°46'	-60'	171°	8°46'	-60'	171°	7°47'	-60'	171°	6°48'	-60'	171°	5°48'	-60'	171°	4°49'	-60'	171°	3°50'	-60'	171°	10
11	8°46'	-60'	171°	7°46'	-60'	171°	6°47'	-60'	171°	5°48'	-60'	171°	4°49'	-60'	171°	3°49'	-60'	171°	2°50'	-60'	171°	11
12	7°46'	-60'	171°	6°46'	-60'	171°	5°47'	-60'	171°	4°48'	-60'	171°	3°49'	-60'	171°	2°49'	-60'	171°	1°50'	-60'	171°	12
13	6°46'	-60'	171°	5°47'	-60'	171°	4°47'	-60'	171°	3°48'	-60'	171°	2°49'	-60'	171°	1°49'	-60'	171°	0°50'	-60'	171°	13
14	5°46'	-60'	171°	4°47'	-60'	171°	3°47'	-60'	171°	2°48'	-60'	171°	1°49'	-60'	171°	0°49'	-60'	171°	0°10'	+60'	9°	14
15	4°46'	-60'	171°	3°47'	-60'	171°	2°47'	-60'	171°	1°48'	-60'	171°	0°49'	-60'	171°	0°11'	+60'	9°	1°10'	+60'	9°	15
16	3°46'	-60'	171°	2°47'	-60'	171°	1°47'	-60'	171°	0°48'	-60'	171°	0°11'	+60'	9°	1°11'	+60'	9°	2°10'	+60'	9°	16
17	2°46'	-60'	171°	1°47'	-60'	171°	0°47'	-60'	171°	0°12'	+60'	9°	1°11'	+60'	9°	2°10'	+60'	9°	3°10'	+60'	9°	17
18	1°46'	-60'	171°	0°47'	-60'	171°	0°12'	+60'	9°	1°12'	+60'	9°	2°11'	+60'	9°	3°10'	+60'	9°	4°10'	+60'	9°	18
19	0°46'	-60'	171°	0°13'	+60'	9°	1°12'	+60'	9°	2°12'	+60'	9°	3°11'	+60'	9°	4°10'	+60'	9°	5°10'	+60'	9°	19
20	0°14'	+60'	8°	1°13'	+60'	8°	2°12'	+60'	8°	3°12'	+60'	8°	4°11'	+60'	8°	5°10'	+60'	8°	6°10'	+60'	9°	20
21	1°14'	+60'	8°	2°13'	+60'	8°	3°12'	+60'	8°	4°12'	+60'	8°	5°11'	+60'	8°	6°10'	+60'	8°	7°10'	+60'	8°	21
22	2°13'	+60'	8°	3°13'	+60'	8°	4°12'	+60'	8°	5°12'	+60'	8°	6°11'	+60'	8°	7°10'	+60'	8°	8°10'	+60'	8°	22
23	3°13'	+60'	8°	4°13'	+60'	8°	5°12'	+60'	8°	6°11'	+60'	8°	7°11'	+60'	8°	8°10'	+60'	8°	9°10'	+60'	8°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	70			71			72			73			74			75			76			

171° 189° LHA — Latitude SAME as DECLINATION — 171° 189° LHA

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

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

8° 352° LHA — Latitude CONTRARY to Declination — 8° 352° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	19°48'	-60'	171°	18°48'	-60'	172°	17°49'	-60'	172°	16°50'	-60'	172°	15°50'	-60'	172°	14°51'	-60'	172°	13°52'	-60'	172°	0
1	18°48'	-60'	172°	17°49'	-60'	172°	16°49'	-60'	172°	15°50'	-60'	172°	14°50'	-60'	172°	13°51'	-60'	172°	12°52'	-60'	172°	1
2	17°48'	-60'	172°	16°49'	-60'	172°	15°49'	-60'	172°	14°50'	-60'	172°	13°51'	-60'	172°	12°51'	-60'	172°	11°52'	-60'	172°	2
3	16°48'	-60'	172°	15°49'	-60'	172°	14°49'	-60'	172°	13°50'	-60'	172°	12°51'	-60'	172°	11°51'	-60'	172°	10°52'	-60'	172°	3
4	15°48'	-60'	172°	14°49'	-60'	172°	13°49'	-60'	172°	12°50'	-60'	172°	11°51'	-60'	172°	10°51'	-60'	172°	9°52'	-60'	172°	4
5	14°48'	-60'	172°	13°49'	-60'	172°	12°49'	-60'	172°	11°50'	-60'	172°	10°51'	-60'	172°	9°51'	-60'	172°	8°52'	-60'	172°	5
6	13°48'	-60'	172°	12°49'	-60'	172°	11°49'	-60'	172°	10°50'	-60'	172°	9°51'	-60'	172°	8°51'	-60'	172°	7°52'	-60'	172°	6
7	12°48'	-60'	172°	11°49'	-60'	172°	10°50'	-60'	172°	9°50'	-60'	172°	8°51'	-60'	172°	7°51'	-60'	172°	6°52'	-60'	172°	7
8	11°48'	-60'	172°	10°49'	-60'	172°	9°50'	-60'	172°	8°50'	-60'	172°	7°51'	-60'	172°	6°51'	-60'	172°	5°52'	-60'	172°	8
9	10°48'	-60'	172°	9°49'	-60'	172°	8°50'	-60'	172°	7°50'	-60'	172°	6°51'	-60'	172°	5°51'	-60'	172°	4°52'	-60'	172°	9
10	9°49'	-60'	172°	8°49'	-60'	172°	7°50'	-60'	172°	6°50'	-60'	172°	5°51'	-60'	172°	4°51'	-60'	172°	3°52'	-60'	172°	10
11	8°49'	-60'	172°	7°49'	-60'	172°	6°50'	-60'	172°	5°50'	-60'	172°	4°51'	-60'	172°	3°51'	-60'	172°	2°52'	-60'	172°	11
12	7°49'	-60'	172°	6°49'	-60'	172°	5°50'	-60'	172°	4°50'	-60'	172°	3°51'	-60'	172°	2°52'	-60'	172°	1°52'	-60'	172°	12
13	6°49'	-60'	172°	5°49'	-60'	172°	4°50'	-60'	172°	3°50'	-60'	172°	2°51'	-60'	172°	1°52'	-60'	172°	0°52'	-60'	172°	13
14	5°49'	-60'	172°	4°49'	-60'	172°	3°50'	-60'	172°	2°50'	-60'	172°	1°51'	-60'	172°	0°52'	-60'	172°	0°08'	+60'	8°	14
15	4°49'	-60'	172°	3°49'	-60'	172°	2°50'	-60'	172°	1°51'	-60'	172°	0°51'	-60'	172°	0°08'	+60'	8°	1°08'	+60'	8°	15
16	3°49'	-60'	172°	2°50'	-60'	172°	1°50'	-60'	172°	0°51'	-60'	172°	0°09'	+60'	8°	1°08'	+60'	8°	2°08'	+60'	8°	16
17	2°49'	-60'	172°	1°50'	-60'	172°	0°50'	-60'	172°	0°09'	+60'	8°	1°09'	+60'	8°	2°08'	+60'	8°	3°08'	+60'	8°	17
18	1°49'	-60'	172°	0°50'	-60'	172°	0°10'	+60'	8°	1°09'	+60'	8°	2°09'	+60'	8°	3°08'	+60'	8°	4°08'	+60'	8°	18
19	0°49'	-60'	172°	0°10'	+60'	8°	1°10'	+60'	8°	2°09'	+60'	8°	3°09'	+60'	8°	4°08'	+60'	8°	5°08'	+60'	8°	19
20	0°11'	+60'	8°	1°10'	+60'	8°	2°10'	+60'	8°	3°09'	+60'	8°	4°09'	+60'	8°	5°08'	+60'	8°	6°08'	+60'	8°	20
21	1°11'	+60'	7°	2°10'	+60'	7°	3°10'	+60'	7°	4°09'	+60'	7°	5°09'	+60'	7°	6°08'	+60'	8°	7°08'	+60'	8°	21
22	2°11'	+60'	7°	3°10'	+60'	7°	4°10'	+60'	7°	5°09'	+60'	7°	6°09'	+60'	7°	7°08'	+60'	7°	8°08'	+60'	7°	22
23	3°11'	+60'	7°	4°10'	+60'	7°	5°10'	+60'	7°	6°09'	+60'	7°	7°09'	+60'	7°	8°08'	+60'	7°	9°08'	+60'	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°
	70			71			72			73			74			75			76			

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

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	19°51'	-60'	173°	18°51'	-60'	173°	17°52'	-60'	173°	16°52'	-60'	173°	15°53'	-60'	173°	14°53'	-60'	173°	13°54'	-60'	173°	0
1	18°51'	-60'	173°	17°51'	-60'	173°	16°52'	-60'	173°	15°52'	-60'	173°	14°53'	-60'	173°	13°53'	-60'	173°	12°54'	-60'	173°	1
2	17°51'	-60'	173°	16°51'	-60'	173°	15°52'	-60'	173°	14°52'	-60'	173°	13°53'	-60'	173°	12°53'	-60'	173°	11°54'	-60'	173°	2
3	16°51'	-60'	173°	15°51'	-60'	173°	14°52'	-60'	173°	13°52'	-60'	173°	12°53'	-60'	173°	11°53'	-60'	173°	10°54'	-60'	173°	3
4	15°51'	-60'	173°	14°51'	-60'	173°	13°52'	-60'	173°	12°52'	-60'	173°	11°53'	-60'	173°	10°53'	-60'	173°	9°54'	-60'	173°	4
5	14°51'	-60'	173°	13°51'	-60'	173°	12°52'	-60'	173°	11°52'	-60'	173°	10°53'	-60'	173°	9°53'	-60'	173°	8°54'	-60'	173°	5
6	13°51'	-60'	173°	12°51'	-60'	173°	11°52'	-60'	173°	10°52'	-60'	173°	9°53'	-60'	173°	8°53'	-60'	173°	7°54'	-60'	173°	6
7	12°51'	-60'	173°	11°52'	-60'	173°	10°52'	-60'	173°	9°52'	-60'	173°	8°53'	-60'	173°	7°53'	-60'	173°	6°54'	-60'	173°	7
8	11°51'	-60'	173°	10°52'	-60'	173°	9°52'	-60'	173°	8°52'	-60'	173°	7°53'	-60'	173°	6°53'	-60'	173°	5°54'	-60'	173°	8
9	10°51'	-60'	173°	9°52'	-60'	173°	8°52'	-60'	173°	7°53'	-60'	173°	6°53'	-60'	173°	5°53'	-60'	173°	4°54'	-60'	173°	9
10	9°51'	-60'	173°	8°52'	-60'	173°	7°52'	-60'	173°	6°53'	-60'	173°	5°53'	-60'	173°	4°53'	-60'	173°	3°54'	-60'	173°	10
11	8°51'	-60'	173°	7°52'	-60'	173°	6°52'	-60'	173°	5°53'	-60'	173°	4°53'	-60'	173°	3°53'	-60'	173°	2°54'	-60'	173°	11
12	7°51'	-60'	173°	6°52'	-60'	173°	5°52'	-60'	173°	4°53'	-60'	173°	3°53'	-60'	173°	2°54'	-60'	173°	1°54'	-60'	173°	12
13	6°51'	-60'	173°	5°52'	-60'	173°	4°52'	-60'	173°	3°53'	-60'	173°	2°53'	-60'	173°	1°54'	-60'	173°	0°54'	-60'	173°	13
14	5°51'	-60'	173°	4°52'	-60'	173°	3°52'	-60'	173°	2°53'	-60'	173°	1°53'	-60'	173°	0°54'	-60'	173°	0°06'	+60'	7°	14
15	4°52'	-60'	173°	3°52'	-60'	173°	2°52'	-60'	173°	1°53'	-60'	173°	0°53'	-60'	173°	0°06'	+60'	7°	1°06'	+60'	7°	15
16	3°52'	-60'	173°	2°52'	-60'	173°	1°52'	-60'	173°	0°53'	-60'	173°	0°07'	+60'	7°	1°06'	+60'	7°	2°06'	+60'	7°	16
17	2°52'	-60'	173°	1°52'	-60'	173°	0°52'	-60'	173°	0°07'	+60'	7°	1°07'	+60'	7°	2°06'	+60'	7°	3°06'	+60'	7°	17
18	1°52'	-60'	173°	0°52'	-60'	173°	0°08'	+60'	7°	1°07'	+60'	7°	2°07'	+60'	7°	3°06'	+60'	7°	4°06'	+60'	7°	18
19	0°52'	-60'	173°	0°08'	+60'	7°	1°07'	+60'	7°	2°07'	+60'	7°	3°07'	+60'	7°	4°06'	+60'	7°	5°06'	+60'	7°	19
20	0°08'	+60'	7°	1°08'	+60'	7°	2°07'	+60'	7°	3°07'	+60'	7°	4°07'	+60'	7°	5°06'	+60'	7°	6°06'	+60'	7°	20
21	1°08'	+60'	7°	2°08'	+60'	7°	3°07'	+60'	7°	4°07'	+60'	7°	5°07'	+60'	7°	6°06'	+60'	7°	7°06'	+60'	7°	21
22	2°08'	+60'	6°	3°08'	+60'	6°	4°07'	+60'	7°	5°07'	+60'	7°	6°07'	+60'	7°	7°06'	+60'	7°	8°06'	+60'	7°	22
23	3°08'	+60'	6°	4°08'	+60'	6°	5°07'	+60'	6°	6°07'	+60'	6°	7°07'	+60'	6°	8°06'	+60'	7°	9°06'	+60'	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°
	70			71			72			73			74			75			76			

173° 187° LHA — Latitude SAME as DECLINATION — 173° 187° LHA

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

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

6° 354° LHA — Latitude CONTRARY to Declination — 6° 354° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	19°53' -60' 174°	18°54' -60' 174°	17°54' -60' 174°	16°54' -60' 174°	15°55' -60' 174°	14°55' -60' 174°	13°55' -60' 174°	0
1	18°53' -60' 174°	17°54' -60' 174°	16°54' -60' 174°	15°54' -60' 174°	14°55' -60' 174°	13°55' -60' 174°	12°55' -60' 174°	1
2	17°53' -60' 174°	16°54' -60' 174°	15°54' -60' 174°	14°54' -60' 174°	13°55' -60' 174°	12°55' -60' 174°	11°55' -60' 174°	2
3	16°53' -60' 174°	15°54' -60' 174°	14°54' -60' 174°	13°54' -60' 174°	12°55' -60' 174°	11°55' -60' 174°	10°55' -60' 174°	3
4	15°53' -60' 174°	14°54' -60' 174°	13°54' -60' 174°	12°54' -60' 174°	11°55' -60' 174°	10°55' -60' 174°	9°55' -60' 174°	4
5	14°53' -60' 174°	13°54' -60' 174°	12°54' -60' 174°	11°54' -60' 174°	10°55' -60' 174°	9°55' -60' 174°	8°55' -60' 174°	5
6	13°53' -60' 174°	12°54' -60' 174°	11°54' -60' 174°	10°54' -60' 174°	9°55' -60' 174°	8°55' -60' 174°	7°55' -60' 174°	6
7	12°53' -60' 174°	11°54' -60' 174°	10°54' -60' 174°	9°54' -60' 174°	8°55' -60' 174°	7°55' -60' 174°	6°55' -60' 174°	7
8	11°53' -60' 174°	10°54' -60' 174°	9°54' -60' 174°	8°54' -60' 174°	7°55' -60' 174°	6°55' -60' 174°	5°55' -60' 174°	8
9	10°54' -60' 174°	9°54' -60' 174°	8°54' -60' 174°	7°55' -60' 174°	6°55' -60' 174°	5°55' -60' 174°	4°55' -60' 174°	9
10	9°54' -60' 174°	8°54' -60' 174°	7°54' -60' 174°	6°55' -60' 174°	5°55' -60' 174°	4°55' -60' 174°	3°56' -60' 174°	10
11	8°54' -60' 174°	7°54' -60' 174°	6°54' -60' 174°	5°55' -60' 174°	4°55' -60' 174°	3°55' -60' 174°	2°56' -60' 174°	11
12	7°54' -60' 174°	6°54' -60' 174°	5°54' -60' 174°	4°55' -60' 174°	3°55' -60' 174°	2°55' -60' 174°	1°56' -60' 174°	12
13	6°54' -60' 174°	5°54' -60' 174°	4°54' -60' 174°	3°55' -60' 174°	2°55' -60' 174°	1°55' -60' 174°	0°56' -60' 174°	13
14	5°54' -60' 174°	4°54' -60' 174°	3°54' -60' 174°	2°55' -60' 174°	1°55' -60' 174°	0°55' -60' 174°	0°04' +60' 6°	14
15	4°54' -60' 174°	3°54' -60' 174°	2°54' -60' 174°	1°55' -60' 174°	0°55' -60' 174°	0°05' +60' 6°	1°04' +60' 6°	15
16	3°54' -60' 174°	2°54' -60' 174°	1°54' -60' 174°	0°55' -60' 174°	0°05' +60' 6°	1°05' +60' 6°	2°04' +60' 6°	16
17	2°54' -60' 174°	1°54' -60' 174°	0°54' -60' 174°	0°05' +60' 6°	1°05' +60' 6°	2°05' +60' 6°	3°04' +60' 6°	17
18	1°54' -60' 174°	0°54' -60' 174°	0°06' +60' 6°	1°05' +60' 6°	2°05' +60' 6°	3°05' +60' 6°	4°04' +60' 6°	18
19	0°54' -60' 174°	0°06' +60' 6°	1°06' +60' 6°	2°05' +60' 6°	3°05' +60' 6°	4°05' +60' 6°	5°04' +60' 6°	19
20	0°06' +60' 6°	1°06' +60' 6°	2°05' +60' 6°	3°05' +60' 6°	4°05' +60' 6°	5°05' +60' 6°	6°04' +60' 6°	20
21	1°06' +60' 6°	2°06' +60' 6°	3°05' +60' 6°	4°05' +60' 6°	5°05' +60' 6°	6°05' +60' 6°	7°04' +60' 6°	21
22	2°06' +60' 6°	3°06' +60' 6°	4°05' +60' 6°	5°05' +60' 6°	6°05' +60' 6°	7°05' +60' 6°	8°04' +60' 6°	22
23	3°06' +60' 6°	4°06' +60' 6°	5°05' +60' 6°	6°05' +60' 6°	7°05' +60' 6°	8°05' +60' 6°	9°04' +60' 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°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	19°55' -60' 175°	18°55' -60' 175°	17°56' -60' 175°	16°56' -60' 175°	15°56' -60' 175°	14°56' -60' 175°	13°57' -60' 175°	0
1	18°55' -60' 175°	17°56' -60' 175°	16°56' -60' 175°	15°56' -60' 175°	14°56' -60' 175°	13°57' -60' 175°	12°57' -60' 175°	1
2	17°55' -60' 175°	16°56' -60' 175°	15°56' -60' 175°	14°56' -60' 175°	13°56' -60' 175°	12°57' -60' 175°	11°57' -60' 175°	2
3	16°55' -60' 175°	15°56' -60' 175°	14°56' -60' 175°	13°56' -60' 175°	12°56' -60' 175°	11°57' -60' 175°	10°57' -60' 175°	3
4	15°55' -60' 175°	14°56' -60' 175°	13°56' -60' 175°	12°56' -60' 175°	11°56' -60' 175°	10°57' -60' 175°	9°57' -60' 175°	4
5	14°55' -60' 175°	13°56' -60' 175°	12°56' -60' 175°	11°56' -60' 175°	10°56' -60' 175°	9°57' -60' 175°	8°57' -60' 175°	5
6	13°55' -60' 175°	12°56' -60' 175°	11°56' -60' 175°	10°56' -60' 175°	9°56' -60' 175°	8°57' -60' 175°	7°57' -60' 175°	6
7	12°55' -60' 175°	11°56' -60' 175°	10°56' -60' 175°	9°56' -60' 175°	8°56' -60' 175°	7°57' -60' 175°	6°57' -60' 175°	7
8	11°55' -60' 175°	10°56' -60' 175°	9°56' -60' 175°	8°56' -60' 175°	7°56' -60' 175°	6°57' -60' 175°	5°57' -60' 175°	8
9	10°55' -60' 175°	9°56' -60' 175°	8°56' -60' 175°	7°56' -60' 175°	6°56' -60' 175°	5°57' -60' 175°	4°57' -60' 175°	9
10	9°56' -60' 175°	8°56' -60' 175°	7°56' -60' 175°	6°56' -60' 175°	5°56' -60' 175°	4°57' -60' 175°	3°57' -60' 175°	10
11	8°56' -60' 175°	7°56' -60' 175°	6°56' -60' 175°	5°56' -60' 175°	4°56' -60' 175°	3°57' -60' 175°	2°57' -60' 175°	11
12	7°56' -60' 175°	6°56' -60' 175°	5°56' -60' 175°	4°56' -60' 175°	3°56' -60' 175°	2°57' -60' 175°	1°57' -60' 175°	12
13	6°56' -60' 175°	5°56' -60' 175°	4°56' -60' 175°	3°56' -60' 175°	2°56' -60' 175°	1°57' -60' 175°	0°57' -60' 175°	13
14	5°56' -60' 175°	4°56' -60' 175°	3°56' -60' 175°	2°56' -60' 175°	1°56' -60' 175°	0°57' -60' 175°	0°03' +60' 5°	14
15	4°56' -60' 175°	3°56' -60' 175°	2°56' -60' 175°	1°56' -60' 175°	0°57' -60' 175°	0°03' +60' 5°	1°03' +60' 5°	15
16	3°56' -60' 175°	2°56' -60' 175°	1°56' -60' 175°	0°56' -60' 175°	0°03' +60' 5°	1°03' +60' 5°	2°03' +60' 5°	16
17	2°56' -60' 175°	1°56' -60' 175°	0°56' -60' 175°	0°04' +60' 5°	1°03' +60' 5°	2°03' +60' 5°	3°03' +60' 5°	17
18	1°56' -60' 175°	0°56' -60' 175°	0°04' +60' 5°	1°04' +60' 5°	2°03' +60' 5°	3°03' +60' 5°	4°03' +60' 5°	18
19	0°56' -60' 175°	0°04' +60' 5°	1°04' +60' 5°	2°04' +60' 5°	3°03' +60' 5°	4°03' +60' 5°	5°03' +60' 5°	19
20	0°04' +60' 5°	1°04' +60' 5°	2°04' +60' 5°	3°04' +60' 5°	4°03' +60' 5°	5°03' +60' 5°	6°03' +60' 5°	20
21	1°04' +60' 5°	2°04' +60' 5°	3°04' +60' 5°	4°04' +60' 5°	5°03' +60' 5°	6°03' +60' 5°	7°03' +60' 5°	21
22	2°04' +60' 5°	3°04' +60' 5°	4°04' +60' 5°	5°04' +60' 5°	6°03' +60' 5°	7°03' +60' 5°	8°03' +60' 5°	22
23	3°04' +60' 5°	4°04' +60' 5°	5°04' +60' 5°	6°04' +60' 5°	7°03' +60' 5°	8°03' +60' 5°	9°03' +60' 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°
	70	71	72	73	74	75	76	

175° 185° LHA — Latitude SAME as DECLINATION — 175° 185° LHA

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

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

4° 356° LHA — Latitude CONTRARY to Declination — 4° 356° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	19°57' -60' 176°	18°57' -60' 176°	17°57' -60' 176°	16°57' -60' 176°	15°58' -60' 176°	14°58' -60' 176°	13°58' -60' 176°	0
1	18°57' -60' 176°	17°57' -60' 176°	16°57' -60' 176°	15°57' -60' 176°	14°58' -60' 176°	13°58' -60' 176°	12°58' -60' 176°	1
2	17°57' -60' 176°	16°57' -60' 176°	15°57' -60' 176°	14°57' -60' 176°	13°58' -60' 176°	12°58' -60' 176°	11°58' -60' 176°	2
3	16°57' -60' 176°	15°57' -60' 176°	14°57' -60' 176°	13°57' -60' 176°	12°58' -60' 176°	11°58' -60' 176°	10°58' -60' 176°	3
4	15°57' -60' 176°	14°57' -60' 176°	13°57' -60' 176°	12°57' -60' 176°	11°58' -60' 176°	10°58' -60' 176°	9°58' -60' 176°	4
5	14°57' -60' 176°	13°57' -60' 176°	12°57' -60' 176°	11°58' -60' 176°	10°58' -60' 176°	9°58' -60' 176°	8°58' -60' 176°	5
6	13°57' -60' 176°	12°57' -60' 176°	11°57' -60' 176°	10°58' -60' 176°	9°58' -60' 176°	8°58' -60' 176°	7°58' -60' 176°	6
7	12°57' -60' 176°	11°57' -60' 176°	10°57' -60' 176°	9°58' -60' 176°	8°58' -60' 176°	7°58' -60' 176°	6°58' -60' 176°	7
8	11°57' -60' 176°	10°57' -60' 176°	9°57' -60' 176°	8°58' -60' 176°	7°58' -60' 176°	6°58' -60' 176°	5°58' -60' 176°	8
9	10°57' -60' 176°	9°57' -60' 176°	8°57' -60' 176°	7°58' -60' 176°	6°58' -60' 176°	5°58' -60' 176°	4°58' -60' 176°	9
10	9°57' -60' 176°	8°57' -60' 176°	7°57' -60' 176°	6°58' -60' 176°	5°58' -60' 176°	4°58' -60' 176°	3°58' -60' 176°	10
11	8°57' -60' 176°	7°57' -60' 176°	6°57' -60' 176°	5°58' -60' 176°	4°58' -60' 176°	3°58' -60' 176°	2°58' -60' 176°	11
12	7°57' -60' 176°	6°57' -60' 176°	5°57' -60' 176°	4°58' -60' 176°	3°58' -60' 176°	2°58' -60' 176°	1°58' -60' 176°	12
13	6°57' -60' 176°	5°57' -60' 176°	4°57' -60' 176°	3°58' -60' 176°	2°58' -60' 176°	1°58' -60' 176°	0°58' -60' 176°	13
14	5°57' -60' 176°	4°57' -60' 176°	3°57' -60' 176°	2°58' -60' 176°	1°58' -60' 176°	0°58' -60' 176°	0°02' +60' 4°	14
15	4°57' -60' 176°	3°57' -60' 176°	2°57' -60' 176°	1°58' -60' 176°	0°58' -60' 176°	0°02' +60' 4°	1°02' +60' 4°	15
16	3°57' -60' 176°	2°57' -60' 176°	1°58' -60' 176°	0°58' -60' 176°	0°02' +60' 4°	1°02' +60' 4°	2°02' +60' 4°	16
17	2°57' -60' 176°	1°57' -60' 176°	0°58' -60' 176°	0°02' +60' 4°	1°02' +60' 4°	2°02' +60' 4°	3°02' +60' 4°	17
18	1°57' -60' 176°	0°57' -60' 176°	0°02' +60' 4°	1°02' +60' 4°	2°02' +60' 4°	3°02' +60' 4°	4°02' +60' 4°	18
19	0°57' -60' 176°	0°03' +60' 4°	1°02' +60' 4°	2°02' +60' 4°	3°02' +60' 4°	4°02' +60' 4°	5°02' +60' 4°	19
20	0°03' +60' 4°	1°03' +60' 4°	2°02' +60' 4°	3°02' +60' 4°	4°02' +60' 4°	5°02' +60' 4°	6°02' +60' 4°	20
21	1°03' +60' 4°	2°03' +60' 4°	3°02' +60' 4°	4°02' +60' 4°	5°02' +60' 4°	6°02' +60' 4°	7°02' +60' 4°	21
22	2°03' +60' 4°	3°03' +60' 4°	4°02' +60' 4°	5°02' +60' 4°	6°02' +60' 4°	7°02' +60' 4°	8°02' +60' 4°	22
23	3°03' +60' 4°	4°03' +60' 4°	5°02' +60' 4°	6°02' +60' 4°	7°02' +60' 4°	8°02' +60' 4°	9°02' +60' 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°
	70	71	72	73	74	75	76	

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°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	19°58' -60' 177°	18°58' -60' 177°	17°58' -60' 177°	16°59' -60' 177°	15°59' -60' 177°	14°59' -60' 177°	13°59' -60' 177°	0
1	18°58' -60' 177°	17°58' -60' 177°	16°58' -60' 177°	15°59' -60' 177°	14°59' -60' 177°	13°59' -60' 177°	12°59' -60' 177°	1
2	17°58' -60' 177°	16°58' -60' 177°	15°58' -60' 177°	14°59' -60' 177°	13°59' -60' 177°	12°59' -60' 177°	11°59' -60' 177°	2
3	16°58' -60' 177°	15°58' -60' 177°	14°58' -60' 177°	13°59' -60' 177°	12°59' -60' 177°	11°59' -60' 177°	10°59' -60' 177°	3
4	15°58' -60' 177°	14°58' -60' 177°	13°59' -60' 177°	12°59' -60' 177°	11°59' -60' 177°	10°59' -60' 177°	9°59' -60' 177°	4
5	14°58' -60' 177°	13°58' -60' 177°	12°59' -60' 177°	11°59' -60' 177°	10°59' -60' 177°	9°59' -60' 177°	8°59' -60' 177°	5
6	13°58' -60' 177°	12°58' -60' 177°	11°59' -60' 177°	10°59' -60' 177°	9°59' -60' 177°	8°59' -60' 177°	7°59' -60' 177°	6
7	12°58' -60' 177°	11°58' -60' 177°	10°59' -60' 177°	9°59' -60' 177°	8°59' -60' 177°	7°59' -60' 177°	6°59' -60' 177°	7
8	11°58' -60' 177°	10°58' -60' 177°	9°59' -60' 177°	8°59' -60' 177°	7°59' -60' 177°	6°59' -60' 177°	5°59' -60' 177°	8
9	10°58' -60' 177°	9°58' -60' 177°	8°59' -60' 177°	7°59' -60' 177°	6°59' -60' 177°	5°59' -60' 177°	4°59' -60' 177°	9
10	9°58' -60' 177°	8°58' -60' 177°	7°59' -60' 177°	6°59' -60' 177°	5°59' -60' 177°	4°59' -60' 177°	3°59' -60' 177°	10
11	8°58' -60' 177°	7°58' -60' 177°	6°59' -60' 177°	5°59' -60' 177°	4°59' -60' 177°	3°59' -60' 177°	2°59' -60' 177°	11
12	7°58' -60' 177°	6°58' -60' 177°	5°59' -60' 177°	4°59' -60' 177°	3°59' -60' 177°	2°59' -60' 177°	1°59' -60' 177°	12
13	6°58' -60' 177°	5°58' -60' 177°	4°59' -60' 177°	3°59' -60' 177°	2°59' -60' 177°	1°59' -60' 177°	0°59' -60' 177°	13
14	5°58' -60' 177°	4°59' -60' 177°	3°59' -60' 177°	2°59' -60' 177°	1°59' -60' 177°	0°59' -60' 177°	0°01' +60' 3°	14
15	4°58' -60' 177°	3°59' -60' 177°	2°59' -60' 177°	1°59' -60' 177°	0°59' -60' 177°	0°01' +60' 3°	1°01' +60' 3°	15
16	3°58' -60' 177°	2°59' -60' 177°	1°59' -60' 177°	0°59' -60' 177°	0°01' +60' 3°	1°01' +60' 3°	2°01' +60' 3°	16
17	2°58' -60' 177°	1°59' -60' 177°	0°59' -60' 177°	0°01' +60' 3°	1°01' +60' 3°	2°01' +60' 3°	3°01' +60' 3°	17
18	1°58' -60' 177°	0°59' -60' 177°	0°01' +60' 3°	1°01' +60' 3°	2°01' +60' 3°	3°01' +60' 3°	4°01' +60' 3°	18
19	0°58' -60' 177°	0°01' +60' 3°	1°01' +60' 3°	2°01' +60' 3°	3°01' +60' 3°	4°01' +60' 3°	5°01' +60' 3°	19
20	0°02' +60' 3°	1°01' +60' 3°	2°01' +60' 3°	3°01' +60' 3°	4°01' +60' 3°	5°01' +60' 3°	6°01' +60' 3°	20
21	1°02' +60' 3°	2°01' +60' 3°	3°01' +60' 3°	4°01' +60' 3°	5°01' +60' 3°	6°01' +60' 3°	7°01' +60' 3°	21
22	2°01' +60' 3°	3°01' +60' 3°	4°01' +60' 3°	5°01' +60' 3°	6°01' +60' 3°	7°01' +60' 3°	8°01' +60' 3°	22
23	3°01' +60' 3°	4°01' +60' 3°	5°01' +60' 3°	6°01' +60' 3°	7°01' +60' 3°	8°01' +60' 3°	9°01' +60' 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°
	70	71	72	73	74	75	76	

177° 183° LHA — Latitude SAME as DECLINATION — 177° 183° LHA

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

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

2° 358° LHA — Latitude CONTRARY to Declination — 2° 358° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	19°59' -60' 178°	18°59' -60' 178°	17°59' -60' 178°	16°59' -60' 178°	15°59' -60' 178°	14°59' -60' 178°	13°59' -60' 178°	0
1	18°59' -60' 178°	17°59' -60' 178°	16°59' -60' 178°	15°59' -60' 178°	14°59' -60' 178°	13°59' -60' 178°	12°59' -60' 178°	1
2	17°59' -60' 178°	16°59' -60' 178°	15°59' -60' 178°	14°59' -60' 178°	13°59' -60' 178°	12°59' -60' 178°	11°59' -60' 178°	2
3	16°59' -60' 178°	15°59' -60' 178°	14°59' -60' 178°	13°59' -60' 178°	12°59' -60' 178°	11°59' -60' 178°	10°59' -60' 178°	3
4	15°59' -60' 178°	14°59' -60' 178°	13°59' -60' 178°	12°59' -60' 178°	11°59' -60' 178°	10°59' -60' 178°	9°59' -60' 178°	4
5	14°59' -60' 178°	13°59' -60' 178°	12°59' -60' 178°	11°59' -60' 178°	10°59' -60' 178°	9°59' -60' 178°	8°59' -60' 178°	5
6	13°59' -60' 178°	12°59' -60' 178°	11°59' -60' 178°	10°59' -60' 178°	9°59' -60' 178°	8°59' -60' 178°	7°59' -60' 178°	6
7	12°59' -60' 178°	11°59' -60' 178°	10°59' -60' 178°	9°59' -60' 178°	8°59' -60' 178°	7°59' -60' 178°	6°59' -60' 178°	7
8	11°59' -60' 178°	10°59' -60' 178°	9°59' -60' 178°	8°59' -60' 178°	7°59' -60' 178°	6°59' -60' 178°	5°59' -60' 178°	8
9	10°59' -60' 178°	9°59' -60' 178°	8°59' -60' 178°	7°59' -60' 178°	6°59' -60' 178°	5°59' -60' 178°	4°59' -60' 178°	9
10	9°59' -60' 178°	8°59' -60' 178°	7°59' -60' 178°	6°59' -60' 178°	5°59' -60' 178°	4°59' -60' 178°	3°59' -60' 178°	10
11	8°59' -60' 178°	7°59' -60' 178°	6°59' -60' 178°	5°59' -60' 178°	4°59' -60' 178°	3°59' -60' 178°	3°00' -60' 178°	11
12	7°59' -60' 178°	6°59' -60' 178°	5°59' -60' 178°	4°59' -60' 178°	3°59' -60' 178°	2°59' -60' 178°	2°00' -60' 178°	12
13	6°59' -60' 178°	5°59' -60' 178°	4°59' -60' 178°	3°59' -60' 178°	2°59' -60' 178°	1°59' -60' 178°	1°00' -60' 178°	13
14	5°59' -60' 178°	4°59' -60' 178°	3°59' -60' 178°	2°59' -60' 178°	1°59' -60' 178°	0°59' -60' 178°	0°00' +60' 2°	14
15	4°59' -60' 178°	3°59' -60' 178°	2°59' -60' 178°	1°59' -60' 178°	0°59' -60' 178°	0°01' +60' 2°	1°00' +60' 2°	15
16	3°59' -60' 178°	2°59' -60' 178°	1°59' -60' 178°	0°59' -60' 178°	0°01' +60' 2°	1°01' +60' 2°	2°00' +60' 2°	16
17	2°59' -60' 178°	1°59' -60' 178°	0°59' -60' 178°	0°01' +60' 2°	1°01' +60' 2°	2°01' +60' 2°	3°00' +60' 2°	17
18	1°59' -60' 178°	0°59' -60' 178°	0°01' +60' 2°	1°01' +60' 2°	2°01' +60' 2°	3°01' +60' 2°	4°00' +60' 2°	18
19	0°59' -60' 178°	0°01' +60' 2°	1°01' +60' 2°	2°01' +60' 2°	3°01' +60' 2°	4°01' +60' 2°	5°00' +60' 2°	19
20	0°01' +60' 2°	1°01' +60' 2°	2°01' +60' 2°	3°01' +60' 2°	4°01' +60' 2°	5°01' +60' 2°	6°00' +60' 2°	20
21	1°01' +60' 2°	2°01' +60' 2°	3°01' +60' 2°	4°01' +60' 2°	5°01' +60' 2°	6°01' +60' 2°	7°00' +60' 2°	21
22	2°01' +60' 2°	3°01' +60' 2°	4°01' +60' 2°	5°01' +60' 2°	6°01' +60' 2°	7°01' +60' 2°	8°00' +60' 2°	22
23	3°01' +60' 2°	4°01' +60' 2°	5°01' +60' 2°	6°01' +60' 2°	7°01' +60' 2°	8°01' +60' 2°	9°00' +60' 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°
	70	71	72	73	74	75	76	

178° 182° LHA — Latitude SAME as DECLINATION — 178° 182° LHA

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

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

1° 359° LHA — Latitude CONTRARY to Declination — 1° 359° LHA

Dec°	70 Hc° d' Z°	71 Hc° d' Z°	72 Hc° d' Z°	73 Hc° d' Z°	74 Hc° d' Z°	75 Hc° d' Z°	76 Hc° d' Z°	Dec°
0	20°00' -60' 179°	19°00' -60' 179°	18°00' -60' 179°	17°00' -60' 179°	16°00' -60' 179°	15°00' -60' 179°	14°00' -60' 179°	0
1	19°00' -60' 179°	18°00' -60' 179°	17°00' -60' 179°	16°00' -60' 179°	15°00' -60' 179°	14°00' -60' 179°	13°00' -60' 179°	1
2	18°00' -60' 179°	17°00' -60' 179°	16°00' -60' 179°	15°00' -60' 179°	14°00' -60' 179°	13°00' -60' 179°	12°00' -60' 179°	2
3	17°00' -60' 179°	16°00' -60' 179°	15°00' -60' 179°	14°00' -60' 179°	13°00' -60' 179°	12°00' -60' 179°	11°00' -60' 179°	3
4	16°00' -60' 179°	15°00' -60' 179°	14°00' -60' 179°	13°00' -60' 179°	12°00' -60' 179°	11°00' -60' 179°	10°00' -60' 179°	4
5	15°00' -60' 179°	14°00' -60' 179°	13°00' -60' 179°	12°00' -60' 179°	11°00' -60' 179°	10°00' -60' 179°	9°00' -60' 179°	5
6	14°00' -60' 179°	13°00' -60' 179°	12°00' -60' 179°	11°00' -60' 179°	10°00' -60' 179°	9°00' -60' 179°	8°00' -60' 179°	6
7	13°00' -60' 179°	12°00' -60' 179°	11°00' -60' 179°	10°00' -60' 179°	9°00' -60' 179°	8°00' -60' 179°	7°00' -60' 179°	7
8	12°00' -60' 179°	11°00' -60' 179°	10°00' -60' 179°	9°00' -60' 179°	8°00' -60' 179°	7°00' -60' 179°	6°00' -60' 179°	8
9	11°00' -60' 179°	10°00' -60' 179°	9°00' -60' 179°	8°00' -60' 179°	7°00' -60' 179°	6°00' -60' 179°	5°00' -60' 179°	9
10	10°00' -60' 179°	9°00' -60' 179°	8°00' -60' 179°	7°00' -60' 179°	6°00' -60' 179°	5°00' -60' 179°	4°00' -60' 179°	10
11	9°00' -60' 179°	8°00' -60' 179°	7°00' -60' 179°	6°00' -60' 179°	5°00' -60' 179°	4°00' -60' 179°	3°00' -60' 179°	11
12	8°00' -60' 179°	7°00' -60' 179°	6°00' -60' 179°	5°00' -60' 179°	4°00' -60' 179°	3°00' -60' 179°	2°00' -60' 179°	12
13	7°00' -60' 179°	6°00' -60' 179°	5°00' -60' 179°	4°00' -60' 179°	3°00' -60' 179°	2°00' -60' 179°	1°00' -60' 179°	13
14	6°00' -60' 179°	5°00' -60' 179°	4°00' -60' 179°	3°00' -60' 179°	2°00' -60' 179°	1°00' -60' 179°	0°00' +60' 1°	14
15	5°00' -60' 179°	4°00' -60' 179°	3°00' -60' 179°	2°00' -60' 179°	1°00' -60' 179°	0°00' +60' 1°	1°00' +60' 1°	15
16	4°00' -60' 179°	3°00' -60' 179°	2°00' -60' 179°	1°00' -60' 179°	0°00' +60' 1°	1°00' +60' 1°	2°00' +60' 1°	16
17	3°00' -60' 179°	2°00' -60' 179°	1°00' -60' 179°	0°00' +60' 1°	1°00' +60' 1°	2°00' +60' 1°	3°00' +60' 1°	17
18	2°00' -60' 179°	1°00' -60' 179°	0°00' +60' 1°	1°00' +60' 1°	2°00' +60' 1°	3°00' +60' 1°	4°00' +60' 1°	18
19	1°00' -60' 179°	0°00' +60' 1°	1°00' +60' 1°	2°00' +60' 1°	3°00' +60' 1°	4°00' +60' 1°	5°00' +60' 1°	19
20	0°00' +60' 1°	1°00' +60' 1°	2°00' +60' 1°	3°00' +60' 1°	4°00' +60' 1°	5°00' +60' 1°	6°00' +60' 1°	20
21	1°00' +60' 1°	2°00' +60' 1°	3°00' +60' 1°	4°00' +60' 1°	5°00' +60' 1°	6°00' +60' 1°	7°00' +60' 1°	21
22	2°00' +60' 1°	3°00' +60' 1°	4°00' +60' 1°	5°00' +60' 1°	6°00' +60' 1°	7°00' +60' 1°	8°00' +60' 1°	22
23	3°00' +60' 1°	4°00' +60' 1°	5°00' +60' 1°	6°00' +60' 1°	7°00' +60' 1°	8°00' +60' 1°	9°00' +60' 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°
	70	71	72	73	74	75	76	

179° 181° LHA — Latitude SAME as DECLINATION — 179° 181° LHA

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

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

0° 360° LHA — Latitude CONTRARY to Declination — 0° 360° LHA

	70			71			72			73			74			75			76			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
0	20°00'	-60'	180°	19°00'	-60'	180°	18°00'	-60'	180°	17°00'	-60'	180°	16°00'	-60'	180°	15°00'	-60'	180°	14°00'	-60'	180°	0
1	19°00'	-60'	180°	18°00'	-60'	180°	17°00'	-60'	180°	16°00'	-60'	180°	15°00'	-60'	180°	14°00'	-60'	180°	13°00'	-60'	180°	1
2	18°00'	-60'	180°	17°00'	-60'	180°	16°00'	-60'	180°	15°00'	-60'	180°	14°00'	-60'	180°	13°00'	-60'	180°	12°00'	-60'	180°	2
3	17°00'	-60'	180°	16°00'	-60'	180°	15°00'	-60'	180°	14°00'	-60'	180°	13°00'	-60'	180°	12°00'	-60'	180°	11°00'	-60'	180°	3
4	16°00'	-60'	180°	15°00'	-60'	180°	14°00'	-60'	180°	13°00'	-60'	180°	12°00'	-60'	180°	11°00'	-60'	180°	10°00'	-60'	180°	4
5	15°00'	-60'	180°	14°00'	-60'	180°	13°00'	-60'	180°	12°00'	-60'	180°	11°00'	-60'	180°	10°00'	-60'	180°	9°00'	-60'	180°	5
6	14°00'	-60'	180°	13°00'	-60'	180°	12°00'	-60'	180°	11°00'	-60'	180°	10°00'	-60'	180°	9°00'	-60'	180°	8°00'	-60'	180°	6
7	13°00'	-60'	180°	12°00'	-60'	180°	11°00'	-60'	180°	10°00'	-60'	180°	9°00'	-60'	180°	8°00'	-60'	180°	7°00'	-60'	180°	7
8	12°00'	-60'	180°	11°00'	-60'	180°	10°00'	-60'	180°	9°00'	-60'	180°	8°00'	-60'	180°	7°00'	-60'	180°	6°00'	-60'	180°	8
9	11°00'	-60'	180°	10°00'	-60'	180°	9°00'	-60'	180°	8°00'	-60'	180°	7°00'	-60'	180°	6°00'	-60'	180°	5°00'	-60'	180°	9
10	10°00'	-60'	180°	9°00'	-60'	180°	8°00'	-60'	180°	7°00'	-60'	180°	6°00'	-60'	180°	5°00'	-60'	180°	4°00'	-60'	180°	10
11	9°00'	-60'	180°	8°00'	-60'	180°	7°00'	-60'	180°	6°00'	-60'	180°	5°00'	-60'	180°	4°00'	-60'	180°	3°00'	-60'	180°	11
12	8°00'	-60'	180°	7°00'	-60'	180°	6°00'	-60'	180°	5°00'	-60'	180°	4°00'	-60'	180°	3°00'	-60'	180°	2°00'	-60'	180°	12
13	7°00'	-60'	180°	6°00'	-60'	180°	5°00'	-60'	180°	4°00'	-60'	180°	3°00'	-60'	180°	2°00'	-60'	180°	1°00'	-60'	180°	13
14	6°00'	-60'	180°	5°00'	-60'	180°	4°00'	-60'	180°	3°00'	-60'	180°	2°00'	-60'	180°	1°00'	-60'	180°	0°00'	+60'	0°	14
15	5°00'	-60'	180°	4°00'	-60'	180°	3°00'	-60'	180°	2°00'	-60'	180°	1°00'	-60'	180°	0°00'	+60'	0°	1°00'	+60'	0°	15
16	4°00'	-60'	180°	3°00'	-60'	180°	2°00'	-60'	180°	1°00'	-60'	180°	0°00'	+60'	0°	1°00'	+60'	0°	2°00'	+60'	0°	16
17	3°00'	-60'	180°	2°00'	-60'	180°	1°00'	-60'	180°	0°00'	+60'	0°	1°00'	+60'	0°	2°00'	+60'	0°	3°00'	+60'	0°	17
18	2°00'	-60'	180°	1°00'	-60'	180°	0°00'	-60'	180°	1°00'	+60'	0°	2°00'	+60'	0°	3°00'	+60'	0°	4°00'	+60'	0°	18
19	1°00'	-60'	180°	0°00'	-60'	180°	1°00'	+60'	0°	2°00'	+60'	0°	3°00'	+60'	0°	4°00'	+60'	0°	5°00'	+60'	0°	19
20	0°00'	-60'	180°	1°00'	+60'	0°	2°00'	+60'	0°	3°00'	+60'	0°	4°00'	+60'	0°	5°00'	+60'	0°	6°00'	+60'	0°	20
21	1°00'	+60'	0°	2°00'	+60'	0°	3°00'	+60'	0°	4°00'	+60'	0°	5°00'	+60'	0°	6°00'	+60'	0°	7°00'	+60'	0°	21
22	2°00'	+60'	0°	3°00'	+60'	0°	4°00'	+60'	0°	5°00'	+60'	0°	6°00'	+60'	0°	7°00'	+60'	0°	8°00'	+60'	0°	22
23	3°00'	+60'	0°	4°00'	+60'	0°	5°00'	+60'	0°	6°00'	+60'	0°	7°00'	+60'	0°	8°00'	+60'	0°	9°00'	+60'	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°
	70			71			72			73			74			75			76			

180° 180° LHA — Latitude SAME as DECLINATION — 180° 180° LHA

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

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
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