

23°, 337° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	62 45.9 +33.2	121.4	62 14.0 +34.8	123.0	61 40.6 +36.4	124.6	61 05.9 +37.8	126.1	60 30.0 +39.1	127.5	59 52.9 +40.4	128.9	59 14.7 +41.6	130.2	58 35.5 +42.7	131.4	58 35.5 +42.7	131.4	58 35.5 +42.7	131.4	58 35.5 +42.7	131.4	58 35.5 +42.7	131.4	0
1	63 19.1 +31.8	119.5	62 48.8 +33.5	121.2	62 17.0 +35.0	122.9	61 43.7 +36.6	124.4	61 09.1 +38.0	125.9	60 33.3 +39.4	127.4	59 56.3 +40.6	128.7	59 18.2 +41.8	130.1	59 18.2 +41.8	130.1	59 18.2 +41.8	130.1	59 18.2 +41.8	130.1	59 18.2 +41.8	130.1	1
2	63 50.9 +30.2	117.6	63 22.3 +31.9	119.4	62 52.0 +33.7	121.1	62 20.3 +35.3	122.7	61 47.1 +36.9	124.3	61 12.7 +38.2	125.8	60 36.9 +39.6	127.3	60 00.0 +40.9	128.6	60 00.0 +40.9	128.6	60 00.0 +40.9	128.6	60 00.0 +40.9	128.6	60 00.0 +40.9	128.6	2
3	64 21.1 +28.5	115.6	63 54.2 +30.5	117.5	63 25.7 +32.3	119.3	62 55.6 +33.9	121.0	62 24.0 +35.5	122.6	61 50.9 +37.1	124.2	61 16.5 +38.5	125.7	60 40.9 +39.8	127.2	60 40.9 +39.8	127.2	60 40.9 +39.8	127.2	60 40.9 +39.8	127.2	60 40.9 +39.8	127.2	3
4	64 49.6 +26.8	113.6	64 24.7 +28.8	115.5	63 58.0 +30.6	117.4	63 29.5 +32.5	119.2	62 59.5 +34.2	120.9	62 28.0 +35.8	122.5	61 55.0 +37.4	124.1	61 20.7 +38.8	125.6	61 20.7 +38.8	125.6	61 20.7 +38.8	125.6	61 20.7 +38.8	125.6	61 20.7 +38.8	125.6	4
5	65 16.4 +24.5	111.5	64 53.5 +27.0	113.5	64 28.6 +29.1	115.4	64 02.0 +31.0	117.3	63 33.7 +32.8	119.0	63 03.8 +34.5	120.8	62 32.4 +36.0	122.4	61 59.5 +37.6	124.0	61 59.5 +37.6	124.0	61 59.5 +37.6	124.0	61 59.5 +37.6	124.0	61 59.5 +37.6	124.0	5
6	65 41.3 +23.0	109.3	65 20.5 +25.2	111.3	64 57.7 +27.3	113.3	64 33.0 +29.3	115.3	64 06.5 +31.2	117.1	63 38.3 +33.0	118.9	63 08.4 +34.7	120.7	62 37.1 +36.3	122.3	62 37.1 +36.3	122.3	62 37.1 +36.3	122.3	62 37.1 +36.3	122.3	62 37.1 +36.3	122.3	6
7	66 04.3 +20.9	107.0	65 45.7 +23.2	109.2	65 25.0 +25.4	111.2	65 02.3 +27.5	113.2	64 37.7 +29.5	115.2	64 11.3 +31.4	117.0	63 43.1 +33.3	118.8	63 13.4 +35.0	120.6	63 13.4 +35.0	120.6	63 13.4 +35.0	120.6	63 13.4 +35.0	120.6	63 13.4 +35.0	120.6	7
8	66 25.2 +18.8	104.7	66 08.9 +21.2	106.9	65 50.4 +23.5	109.0	65 29.8 +25.7	111.1	65 07.2 +27.8	113.1	64 42.7 +29.9	115.1	64 16.4 +31.8	117.0	63 48.4 +33.5	118.8	63 48.4 +33.5	118.8	63 48.4 +33.5	118.8	63 48.4 +33.5	118.8	63 48.4 +33.5	118.8	8
9	66 44.0 +16.6	102.3	66 30.1 +19.1	104.6	66 13.9 +21.5	106.8	65 55.5 +23.8	108.9	65 35.0 +26.0	111.0	65 12.6 +28.1	113.0	64 48.2 +30.1	115.0	64 21.9 +32.0	116.9	64 21.9 +32.0	116.9	64 21.9 +32.0	116.9	64 21.9 +32.0	116.9	64 21.9 +32.0	116.9	9
10	67 00.6 +14.3	99.9	66 49.2 +16.8	102.2	66 35.4 +19.3	104.4	66 19.3 +21.7	106.6	66 01.0 +24.0	108.8	65 40.7 +26.2	110.9	65 18.3 +28.3	112.9	64 53.9 +30.4	114.9	64 53.9 +30.4	114.9	64 53.9 +30.4	114.9	64 53.9 +30.4	114.9	64 53.9 +30.4	114.9	10
11	67 14.9 +11.9	97.4	67 06.0 +14.5	99.7	66 54.7 +17.0	102.0	66 41.0 +19.6	104.3	66 25.0 +22.0	106.5	66 06.9 +24.3	108.7	65 46.6 +26.6	110.8	65 24.3 +28.7	112.8	65 24.3 +28.7	112.8	65 24.3 +28.7	112.8	65 24.3 +28.7	112.8	65 24.3 +28.7	112.8	11
12	67 26.8 +9.4	94.8	67 20.5 +12.1	97.2	67 11.7 +14.8	99.6	67 00.6 +17.3	101.9	66 47.0 +19.9	104.2	66 31.2 +22.3	106.4	66 13.2 +24.5	108.6	65 53.0 +26.8	110.7	65 53.0 +26.8	110.7	65 53.0 +26.8	110.7	65 53.0 +26.8	110.7	65 53.0 +26.8	110.7	12
13	67 36.2 +7.0	92.2	67 32.6 +9.7	94.7	67 26.5 +12.4	97.1	67 17.9 +15.0	99.4	67 06.9 +17.6	101.8	66 53.5 +20.1	104.1	66 37.7 +22.6	106.3	66 19.8 +24.8	108.5	66 19.8 +24.8	108.5	66 19.8 +24.8	108.5	66 19.8 +24.8	108.5	66 19.8 +24.8	108.5	13
14	67 43.2 +4.4	89.6	67 42.3 +7.2	92.1	67 38.9 +9.9	94.5	67 32.9 +12.7	96.9	67 24.5 +15.2	99.3	67 13.6 +17.8	101.6	67 00.3 +20.4	104.0	66 44.6 +22.9	106.2	66 44.6 +22.9	106.2	66 44.6 +22.9	106.2	66 44.6 +22.9	106.2	66 44.6 +22.9	106.2	14
15	67 47.6 +1.9	87.0	67 49.5 +4.6	89.4	67 48.8 +7.4	91.9	67 45.6 +10.1	94.3	67 39.7 +12.9	96.8	67 31.4 +15.6	99.2	67 20.7 +18.1	101.5	67 07.5 +20.6	103.9	67 07.5 +20.6	103.9	67 07.5 +20.6	103.9	67 07.5 +20.6	103.9	67 07.5 +20.6	103.9	15
16	67 49.5 -0.7	84.3	67 54.1 +2.1	86.8	67 56.2 +4.9	89.3	67 55.7 +7.6	91.7	67 52.6 +10.4	94.2	67 47.0 +13.1	96.6	67 38.8 +15.8	99.0	67 28.1 +18.4	101.4	67 28.1 +18.4	101.4	67 28.1 +18.4	101.4	67 28.1 +18.4	101.4	67 28.1 +18.4	101.4	16
17	67 48.8 -3.2	81.7	67 56.2 -0.5	84.1	68 01.1 +2.2	86.6	68 03.3 +5.1	89.1	68 03.0 +7.9	91.6	68 00.1 +10.6	94.0	67 54.6 +13.3	96.5	67 46.5 +16.1	98.9	67 46.5 +16.1	98.9	67 46.5 +16.1	98.9	67 46.5 +16.1	98.9	67 46.5 +16.1	98.9	17
18	67 45.6 -5.9	79.0	67 55.7 -3.1	81.5	68 03.3 -0.3	83.9	68 08.4 +2.5	86.4	68 10.9 +5.2	88.9	68 10.7 +8.1	90.4	68 07.9 +10.9	93.9	68 02.6 +13.6	96.4	68 02.6 +13.6	96.4	68 02.6 +13.6	96.4	68 02.6 +13.6	96.4	68 02.6 +13.6	96.4	18
19	67 39.7 -8.3	76.4	67 52.6 -5.6	78.8	68 03.0 -2.9	81.2	68 10.9 -0.2	83.7	68 16.1 +2.7	86.2	68 18.8 +5.5	88.7	68 18.8 +8.3	91.2	68 16.2 +11.1	93.7	68 16.2 +11.1	93.7	68 16.2 +11.1	93.7	68 16.2 +11.1	93.7	68 16.2 +11.1	93.7	19
20	67 31.4 -10.7	73.8	67 47.0 -8.2	76.2	68 00.1 -5.5	78.6	68 10.7 -2.8	81.0	68 18.8 0.0	83.5	68 24.3 +2.8	86.0	68 27.1 +5.7	88.5	68 27.3 +8.5	91.1	68 27.3 +8.5	91.1	68 27.3 +8.5	91.1	68 27.3 +8.5	91.1	68 27.3 +8.5	91.1	20
21	67 20.7 -13.2	71.3	67 38.8 -10.7	73.6	67 54.6 -8.1	75.9	68 07.9 -5.3	78.3	68 18.8 -2.6	80.8	68 27.1 +0.2	83.3	68 32.8 +3.0	85.8	68 35.8 +5.9	88.4	68 35.8 +5.9	88.4	68 35.8 +5.9	88.4	68 35.8 +5.9	88.4	68 35.8 +5.9	88.4	21
22	67 07.5 -15.6	68.7	67 28.1 -13.1	71.0	67 46.5 -10.5	73.3	68 02.6 -7.9	75.7	68 16.2 -5.2	78.1	68 27.3 -2.5	80.6	68 35.8 +0.4	83.1	68 41.7 +3.2	85.6	68 38.5 +7.5	86.6	68 38.5 +7.5	86.6	68 38.5 +7.5	86.6	68 38.5 +7.5	86.6	22
23	66 51.9 -17.8	66.3	67 15.0 -15.4	68.5	67 36.0 -13.0	70.7	67 54.7 -10.5	73.0	68 11.0 -7.8	75.4	68 24.8 -5.0	77.9	68 36.2 -2.3	80.4	68 44.9 +0.6	82.9	68 44.9 +0.6	82.9	68 44.9 +0.6	82.9	68 44.9 +0.6	82.9	68 44.9 +0.6	82.9	23
24	66 34.1 -19.9	63.9	66 59.6 -17.7	66.0	67 19.6 -15.7	69.0	67 07.6 -17.6	65.7	67 31.3 -15.3	67.9	67 52.8 -12.8	70.1	68 12.1 -10.3	72.5	68 28.9 -7.6	74.9	68 43.3 -4.8	77.4	68 43.3 -4.8	77.4	68 43.3 -4.8	77.4	68 43.3 -4.8	77.4	24
25	66 14.2 -22.1	61.5	66 41.9 -19.9	63.5	66 22.4 -17.6	65.7	66 07.6 -20.6	65.7	67 40.0 -15.2	67.5	68 01.8 -12.7	69.8	68 21.3 -10.1	72.2	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	25
26	65 52.1 -24.0	59.2	66 22.0 -22.0	61.2	66 50.0 -19.9	63.2	67 16.0 -17.6	65.3	67 40.0 -15.2	67.5	68 01.8 -12.7	69.8	68 21.3 -10.1	72.2	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	68 38.5 -7.5	74.6	26
27	65 28.1 -26.0	57.0	66 00.0 -20.4	24.1	65 26.7 -24.3	58.9	66 30.1 -22.0	60.8	66 58.4 -19.8	62.9	67 24.8 -17.6	65.0	67 49.1 -15.2	67.2	68 11.2 -12.7	69.5	68 31.0 -10.1	71.9	68 31.0 -10.1	71.9	68 31.0 -10.1	71.9	68 31.0 -10.1	71.9	27
28	65 02.1 -27.7	54.8	65 35.9 -25.9	56.6	66 08.1 -24.0	58.5	66 38.6 -22.0	60.5	66 07.2 -19.8	62.5	67 07.2 -17.5	64.7	67 58.5 -15.2	66.9	68 20.9 -12.6	69.2	68 35.8 -10.2	69.2	68 35.8 -10.2	69.2	68 35.8 -10.2	69.2	68 35.8 -10.2	69.2	28
29	64 15.9 -28.2	52.8	64 08.6 -25.5																						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $23^\circ$ ,  $337^\circ$

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	62	45.9	-34.6	121.4	62	14.0	-36.2	123.0	61	40.6	-37.6	124.6	61	05.9	-38.9	126.1	60	30.0	-40.2	127.5	59	52.9	-41.4	128.9	59	14.7	-42.5	130.2	58	35.5	-43.5	131.4	0
1	62	11.3	-35.9	123.1	61	37.8	-37.3	124.7	61	03.0	-38.7	126.2	60	27.0	-40.0	127.6	59	49.8	-41.1	129.0	59	11.5	-42.2	130.3	58	32.2	-43.3	131.5	57	52.0	-44.3	132.7	1
2	61	35.4	-37.1	124.8	61	00.5	-38.5	126.3	60	24.3	-39.7	127.7	59	47.0	-40.9	129.1	59	08.7	-42.1	130.4	58	29.3	-43.2	131.7	57	48.9	-44.1	132.9	57	07.7	-45.1	134.0	2
3	60	58.3	-38.3	126.5	60	22.0	-39.5	127.9	59	44.6	-40.7	129.3	59	06.1	-41.9	130.5	58	26.6	-42.9	131.8	57	46.1	-43.9	133.0	57	04.8	-44.8	134.1	56	22.6	-45.7	135.2	3
4	60	20.0	-39.3	128.0	59	42.5	-40.6	129.4	59	03.9	-41.7	130.7	58	24.2	-42.7	131.9	57	43.7	-43.7	133.1	57	02.2	-44.6	134.2	56	20.0	-45.5	135.3	55	36.9	-46.3	136.4	4
5	59	40.7	-40.4	129.6	59	01.9	-41.4	130.8	58	22.2	-42.5	132.1	57	41.5	-43.5	133.3	57	00.0	-44.5	134.4	56	17.6	-45.3	135.5	55	34.5	-46.2	136.5	54	50.6	-46.9	137.5	5
6	59	00.3	-41.3	131.0	58	20.5	-42.4	132.2	57	39.7	-43.4	133.4	56	58.0	-44.3	134.5	56	15.5	-45.1	135.6	55	32.3	-46.0	136.6	54	48.3	-46.7	137.6	54	03.7	-47.5	138.5	6
7	58	19.0	-42.1	132.4	57	38.1	-43.1	133.6	56	56.3	-44.0	134.7	56	13.7	-44.9	135.8	55	30.4	-45.8	136.8	54	46.3	-46.6	137.8	54	01.6	-47.3	138.7	53	16.2	-48.0	139.6	7
8	57	36.9	-43.0	133.7	56	55.0	-43.9	134.9	56	12.3	-44.8	135.9	55	28.8	-45.6	136.9	54	44.6	-46.4	137.9	53	59.7	-47.1	138.8	53	14.3	-47.9	139.7	52	28.2	-48.5	140.6	8
9	56	53.9	-43.7	135.0	56	11.1	-44.7	136.1	55	27.5	-45.5	137.1	54	43.2	-46.3	138.1	53	58.2	-47.0	139.0	53	12.6	-47.6	139.9	52	26.4	-48.3	140.7	51	39.7	-48.9	141.5	9
10	56	10.2	-44.5	136.3	55	26.4	-45.2	137.3	54	42.0	-46.1	138.2	53	56.9	-46.8	139.2	53	11.2	-47.5	140.0	52	25.0	-48.2	140.9	51	38.1	-48.7	141.7	50	50.8	-49.3	142.5	10
11	55	25.7	-45.1	137.5	54	41.2	-46.0	138.4	53	55.9	-46.6	139.3	53	10.1	-47.3	140.2	52	23.7	-48.0	141.1	51	36.8	-48.6	141.9	50	49.4	-49.2	142.6	50	01.5	-49.8	143.3	11
12	54	40.6	-45.8	138.6	53	55.2	-46.5	139.5	53	09.3	-47.2	140.4	52	22.8	-47.9	141.2	51	35.7	-48.4	142.0	50	48.2	-49.1	142.8	50	00.2	-49.6	143.5	49	11.7	-50.1	144.2	12
13	53	54.8	-46.3	139.7	53	08.7	-47.0	140.6	52	22.1	-47.7	141.4	51	34.9	-48.3	142.2	50	47.3	-48.9	143.0	49	59.1	-49.4	143.7	49	10.6	-50.0	144.4	48	21.6	-50.5	145.0	13
14	53	08.5	-46.9	140.8	52	21.7	-47.6	141.6	51	34.4	-48.2	142.4	50	46.6	-48.7	143.2	49	58.4	-49.3	143.9	48	09.7	-49.8	144.6	48	20.6	-50.3	145.2	47	31.1	-50.8	145.8	14
15	52	21.6	-47.5	141.8	51	34.1	-48.0	142.6	50	46.2	-48.6	143.4	49	57.9	-49.2	144.1	49	09.1	-49.7	144.8	48	19.9	-50.2	145.4	47	30.3	-50.7	146.0	46	40.3	-51.1	146.6	15
16	51	34.1	-47.9	142.8	50	46.1	-48.5	143.6	49	57.6	-49.1	144.3	49	08.7	-49.6	145.0	48	19.4	-50.1	145.6	47	29.7	-50.6	146.2	46	39.6	-51.0	146.8	45	49.2	-51.4	147.4	16
17	50	46.2	-48.3	143.8	49	57.6	-48.9	144.5	49	08.5	-49.4	145.2	48	19.1	-49.9	145.8	47	29.3	-50.4	146.4	46	39.1	-50.8	147.0	45	48.6	-51.2	147.6	44	57.8	-51.6	148.1	17
18	49	57.9	-48.8	144.7	49	08.7	-49.3	145.4	48	19.1	-49.8	146.0	47	29.2	-50.3	146.6	46	38.9	-50.7	147.2	45	48.3	-51.2	148.3	44	06.2	-52.0	148.8	18				
19	49	09.1	-49.2	145.6	48	19.4	-49.7	146.2	47	29.3	-50.2	146.9	46	38.9	-50.6	147.4	45	48.2	-51.1	148.0	44	51.7	-51.4	148.5	44	05.8	-51.4	149.0	43	14.2	-52.2	149.5	19
20	48	19.9	-49.6	146.5	47	29.7	-50.1	147.1	46	39.1	-50.5	147.7	45	48.3	-50.9	148.2	44	57.1	-51.3	148.7	44	05.7	-51.7	149.3	43	14.0	-52.1	149.7	42	22.0	-52.4	150.2	20
21	47	30.3	-50.0	147.3	46	39.6	-50.4	147.9	45	48.6	-50.8	148.4	44	57.4	-51.2	149.0	44	05.8	-51.6	149.5	43	14.0	-52.0	150.0	42	21.9	-52.6	150.9	21				
22	46	40.3	-50.2	148.1	45	49.2	-50.7	148.7	44	57.8	-51.1	149.2	44	06.2	-51.5	149.7	43	14.2	-51.8	150.2	42	22.0	-52.2	150.6	41	29.6	-52.5	151.1	40	37.0	-52.8	151.5	22
23	45	50.1	-50.6	148.9	44	58.5	-51.0	149.4	44	06.7	-51.3	149.9	43	14.7	-51.8	150.4	42	22.4	-52.1	150.9	41	29.9	-52.4	151.3	40	37.1	-52.7	151.7	39	44.2	-53.0	152.1	23
24	44	59.5	-50.9	149.7	44	07.5	-51.2	150.2	43	15.4	-51.7	150.7	42	22.9	-51.9	151.1	41	30.3	-52.3	151.5	40	37.5	-52.7	151.9	39	44.4	-52.9	152.3	38	51.2	-53.2	152.7	24
25	44	08.6	-51.2	150.4	43	16.3	-51.6	150.9	42	23.7	-51.8	151.3	41	31.0	-52.2	151.8	40	38.0	-52.5	152.2	39	44.8	-52.8	152.6	38	51.5	-53.1	153.0	37	58.0	-53.4	153.3	25
26	43	17.4	-51.4	151.2	42	24.7	-51.7	151.6	41	31.9	-52.1	152.0	40	38.8	-52.4	152.4	39	45.5	-52.7	152.8	38	52.0	-53.0	153.2	37	58.4	-53.3	153.5	26				
27	42	26.0	-51.7	151.9	41	33.0	-52.0	152.3	40	39.8	-52.4	152.7	39	46.4	-52.7	153.1	38	52.8	-52.9	153.4	37	59.0	-53.1	153.8	36	11.1	-53.7	154.4	27				
28	41	34.3	-51.9	152.5	40	41.0	-52.3	152.9	39	47.4	-52.5	153.3	38	53.7	-52.8	153.7	37	59.9	-53.1	154.0	36	11.7	-53.6	154.7	35	17.4	-53.9	155.0	28				
29	40	19.7	-53.1	153.6	39	24.7	-53.4	154.0	38	02.2	-52.9	154.6	37	07.9	-53.1	154.9	36	13.5	-53.4	155.2	35	19.0	-53.7	155.5	34	24.3	-53.8	155.8	30				
30	39	50.2	-52.3	153.9	38	56.3	-52.7	154.2	37	07.9	-53.1	154.9	36	13.5	-53.4	155.2	35	19.0	-53.7	155.5	34	24.3	-53.8	155.8	33	29.6	-54.1	156.1	30				
31	38	57.9	-52.6	154.5	38	03.6	-52.8	154.8	37	09.3	-53.1	155.2	36	14.8	-53.4	155.5	35	20.1	-53.6	155.8	34	32.5	-53.8	156.3	32	35.5	-54.3	156.6	31				
32	38	05.3	-52.7	155.1	37	10.8	-53.0	155.4	36	16.2	-53.3	155.7	35	21.4	-53.5	156.0	34	26.5	-53.7	156.3	33	31.5	-53.9	156.6	32	36.4	-54.1	157.1	31				
33	37	12.6	-52.9	155.7	36	17.8	-53.1	156.0	35	22.9	-53.4	156.3	34	27.9	-53.6	156.6	33	32.8	-53.8	156.8	32	36.4	-54.1	157.1	31	41.2	-54.3</						

24°, 336° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.												
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z													
0	61	56.1	+32.3	120.2	61	25.2	+34.0	121.8	60	53.0	+35.4	123.3	60	19.4	+36.9	124.8	59	44.6	+38.2	126.2	59	08.6	+39.5	127.5	58	31.5	+40.7	128.8	57	53.4	+41.8	130.1	0				
1	62	28.4	+30.9	118.4	61	59.2	+32.5	120.0	61	28.4	+34.2	121.6	60	56.3	+35.7	123.2	60	22.8	+37.1	124.6	59	48.1	+38.5	126.0	59	12.2	+39.8	127.4	58	35.2	+41.0	128.7	1				
2	62	59.3	+29.3	116.5	62	31.7	+31.1	118.2	62	02.6	+32.8	119.9	61	32.0	+34.4	121.5	60	59.9	+36.0	123.0	60	26.6	+37.3	124.5	59	52.0	+38.7	125.9	59	16.2	+40.0	127.3	2				
3	63	28.6	+27.7	114.6	63	02.8	+29.6	116.3	62	35.4	+31.3	118.1	62	06.4	+33.0	119.7	61	35.9	+34.6	121.4	61	03.9	+36.2	122.9	60	30.7	+37.6	124.4	59	56.2	+39.0	125.8	3				
4	63	56.3	+26.0	112.6	63	32.4	+27.9	114.4	63	06.7	+29.9	116.2	62	39.4	+31.6	117.9	62	10.5	+33.3	119.6	61	40.1	+34.9	121.2	61	08.3	+36.5	122.8	60	35.2	+37.8	124.3	4				
5	64	22.3	+24.2	110.5	64	00.3	+26.3	112.4	63	36.6	+28.2	114.3	63	11.0	+30.1	116.1	62	43.8	+31.9	117.8	62	15.0	+33.6	119.5	61	44.8	+35.1	121.1	61	13.0	+36.7	122.7	5				
6	64	46.5	+22.3	108.4	64	26.6	+24.4	110.3	64	04.8	+26.5	112.3	63	41.1	+28.5	114.1	63	15.7	+30.4	116.0	62	48.6	+32.2	117.7	62	19.9	+33.9	119.4	61	49.7	+35.5	121.0	6				
7	65	08.8	+20.3	106.2	64	51.0	+22.6	108.2	64	31.3	+24.7	110.2	64	09.6	+26.8	112.1	63	46.1	+28.7	114.0	63	20.8	+30.6	115.9	62	53.8	+32.4	117.6	62	25.2	+34.1	119.3	7				
8	65	29.1	+18.2	103.9	65	13.6	+20.6	106.0	64	56.0	+22.8	108.1	64	36.4	+25.0	110.1	64	14.8	+27.1	112.0	63	51.4	+29.1	113.9	63	26.2	+30.9	115.7	62	59.3	+32.7	117.5	8				
9	65	47.3	+16.2	101.6	65	34.2	+18.5	103.8	65	18.8	+20.9	105.9	65	01.4	+23.1	107.9	64	41.9	+25.3	110.0	64	20.5	+27.3	111.9	63	57.1	+29.4	113.8	63	32.0	+31.2	115.7	9				
10	66	03.5	+13.9*	99.2	65	52.7	+16.4	101.4	65	39.7	+18.8	103.6	65	24.5	+21.1	105.7	65	07.2	+23.3	107.8	64	47.8	+25.5	109.8	64	26.5	+27.6	111.8	64	03.2	+29.6	113.7	10				
11	66	17.4	+11.6	96.8	66	09.1	+14.1	99.1	65	58.5	+16.6	101.3	65	45.6	+19.1	103.5	65	30.5	+21.4	105.6	65	13.3	+23.7	107.7	64	54.1	+25.8	109.7	64	32.8	+28.0	111.7	11				
12	66	29.0	+9.3	94.4	66	23.2	+11.9	96.7	66	15.1	+14.4	98.9	66	04.7	+16.9	101.1	65	51.9	+19.4	103.3	65	37.0	+21.7	105.5	65	19.9	+23.9	107.6	65	00.8	+26.1	109.6	12				
13	66	38.3	+6.9*	91.9	66	35.1	+9.6	94.2	66	29.5	+12.2	96.5	66	21.6	+14.6	98.8	66	11.3	+17.1	101.0	65	58.7	+19.6*	103.2	65	43.8	+22.0	105.4	65	26.9	+24.2	107.5	13				
14	66	45.2	+4.6	89.4	66	44.7	+7.1	91.7	66	41.7	+9.8*	94.0	66	36.2	+12.4*	96.3	66	28.4	+15.0*	98.6	66	18.3	+17.4	100.9	66	05.8	+19.9	103.1	65	51.1	+22.3	105.3	14				
15	66	49.8	+2.0*	86.9	66	51.8	+4.8*	89.2	66	51.5	+7.3*	91.5	66	48.6	+10.1*	93.9	66	43.4	+12.6*	96.2	66	35.7	+15.2*	98.5	66	25.7	+17.7	100.8	66	13.4	+20.1	103.0	15				
16	66	51.8	-0.3*	84.3	66	56.6	+2.2*	86.6	66	58.8	+5.0*	89.0	66	58.7	+7.6*	91.4	66	56.0	+10.3	93.7	66	50.9	+12.9*	96.0	66	43.4	+15.5*	98.3	66	33.5	+18.0	100.6	16				
17	66	51.5	-2.9*	81.8	66	58.8	-0.1*	84.1	67	03.8	+2.5*	86.4	67	06.3	+5.1*	88.8	67	03.8	+7.8*	91.2	67	03.8	+10.5*	93.5	66	58.9	+13.1*	95.9	66	51.5	+15.8*	98.2	17				
18	66	48.6	-5.2*	79.2	66	58.7	-2.7*	81.5	67	06.3	0.0*	83.9	67	11.4	+2.7*	86.2	67	14.1	+5.4*	88.6	67	14.3	+8.1*	91.0	67	12.0	+10.8*	93.4	67	07.3	+13.4	95.8	18				
19	66	43.4	-7.7*	76.7	66	56.0	-5.1*	79.0	67	06.3	-2.5*	81.3	67	14.1	+0.2*	83.7	67	19.5	+2.9*	86.0	67	22.4	+5.6*	88.4	67	22.8	+8.3*	90.8	67	20.7	+11.0	93.2	19				
20	66	35.7	-10.0*	74.2	66	50.9	-7.5*	76.4	67	03.8	-4.9*	78.7	67	14.3	-2.3*	81.1	67	22.4	+0.4*	83.4	67	28.0	+3.1*	85.8	67	31.1	+5.8*	88.3	67	31.7	+8.5*	90.7	20				
21	66	25.7	-12.3*	71.7	66	43.4	-9.9*	73.9	66	58.9	-7.4*	76.2	67	12.0	-4.7*	78.5	67	22.8	-2.1*	80.8	67	31.1	+0.6*	83.2	67	36.9	+3.3*	85.6	67	40.2	+6.0*	88.1	21				
22	66	13.4	-14.6*	69.3	66	33.5	-12.2*	71.4	66	51.5	-9.8*	73.7	67	07.3	-7.3*	75.9	67	20.7	-4.7*	78.3	67	31.7	-2.0*	80.6	67	40.2	+0.8*	83.0	67	46.2	+3.5*	85.4	22				
23	65	58.8	-16.8*	66.9	66	21.3	-14.5*	69.0	66	41.7	-12.1*	71.2	67	00.0	-9.6*	73.4	67	16.0	-7.1*	75.7	67	29.7	-4.5*	78.0	67	41.0	-1.8*	80.4	67	49.7	+1.0*	82.8	23				
24	65	42.0	-18.9*	64.5	66	06.8	-16.7*	66.6	66	29.6	-14.4*	68.7	66	50.4	-12.0*	70.9	67	08.9	-9.5*	73.1	67	25.2	-7.0*	75.4	67	39.2	-4.4*	77.8	67	50.7	-1.7*	80.2	24				
25	65	23.1	-21.0	62.3	65	50.1	-18.8*	64.2	66	15.2	-16.6*	66.3	66	38.4	-14.4*	68.4	66	59.4	-11.9*	70.6	67	18.2	-9.4*	72.8	67	34.8	-6.9*	75.1	67	49.0	-4.2*	77.5	25				
26	65	02.1	-22.8	60.0	65	31.3	-20.9*	61.9	65	58.6	-18.8*	63.9	66	24.0	-16.5*	65.9	66	47.5	-14.3*	68.1	67	08.8	-11.8*	70.3	67	27.9	-9.3*	72.5	67	44.8	-6.8*	74.9	26				
27	64	39.3	-24.8*	57.8	65	10.4	-22.9	59.7	65	39.8	-20.8*	61.6	66	07.5	-18.8*	63.6	66	33.2	-16.5*	65.6	66	57.0	-14.2*	67.8	67	18.6	-11.8*	70.0	67	38.0	-9.2*	72.2	27				
28	64	14.5	-26.5	55.7	64	47.5	-24.7	57.5	65	19.0	-22.8	59.3	65	48.7	-20.8	61.2	66	16.7	-18.7	63.2	66	42.8	-16.5*	65.3	67	06.8	-14.1	67.4	67	28.8	-11.7	69.7	28				
29	63	48.0	-28.2	53.7	64	51.7	-34.1	45.7	63	35.6	-32.8	47.1	63	15.9	-31.4	48.6	63	55.0	-29.9	50.1	64	32.9	-28.3	51.7	65	09.4	-26.6	53.4	65	44.4	-24.8	55.2	29				
30	60	36.5	-36.5	42.8	61	20.1	-35.4	45.3	62	44.5	-32.8	46.7	63	25.1	-31.4	48.1	64	04.6	-30.0	49.7	64	42.8	-28.4	51.3	65	19.6	-26.6	53.0	65	36.5	-35.9	45.3	30				
31	60	0.0	-37.7	41.2	60	44.7	-36.5	42.3	61	28.7	-35.5	43.6	62	11.7	-34.2	44.9	62	53.7	-32.9	46.2	63	34.6	-31.4	47.7	64	14.4	-29.9	49.2	64	53.0	-28.4	50.8	36				
32	57	59.2	-38.7	39.6	60	08.2	-37.7	40.7	60	53.2	-36.6	41.9	61	37.5	-35.5	43.1	62	20.8	-34.3	44.4	63	03.2	-33.0	45.8	63	44.5	-31.6	48.8	63	37	-20.8*	60.1	66	46.6	-18.6	59.2	31
33	58	43.6	-39.7	38.1	59	30.5	-38.8	39.2	60	16																											

**LATITUDE CONTRARY NAME TO DECLINATION**      **L.H.A. 24°, 336°**

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	61 56.1 -33.7	120.2	61 25.2 -35.2	121.8	60 53.0 -36.7	123.3	60 19.4 -38.0	124.8	59 44.6 -39.3	126.2	59 08.6 -40.5	127.5	58 31.5 -41.6	128.8	57 53.4 -42.7	130.1	57 10.7 -43.5	131.4	57 27.2 -44.2	132.6	56 27.2 -44.3	131.5	55 43.0 -44.9	133.9	54 58.1 -45.6	135.0	0
1	61 22.4 -34.9	121.9	60 50.0 -36.4	123.4	60 16.3 -37.7	124.9	59 41.4 -39.0	126.3	59 05.3 -40.3	127.7	58 28.1 -41.4	129.0	57 49.9 -42.5	130.2	57 07.4 -43.3	131.5	56 27.2 -44.2	132.6	56 27.2 -44.3	131.5	55 43.0 -44.9	133.9	54 58.1 -45.6	135.0	4		
2	60 47.5 -36.2	123.6	60 13.6 -37.5	125.1	59 38.6 -38.9	126.5	59 02.4 -40.1	127.8	58 25.0 -41.1	129.1	57 46.7 -42.2	130.3	57 07.4 -43.3	131.5	56 27.2 -44.2	132.6	56 27.2 -44.3	131.5	55 43.0 -44.9	133.9	54 58.1 -45.6	135.0	2				
3	60 11.3 -37.3	125.2	59 36.1 -38.6	126.6	58 59.7 -39.8	128.0	58 22.3 -40.9	129.2	57 43.9 -42.1	130.5	57 04.5 -43.1	131.6	56 24.1 -44.0	132.8	55 40.1 -44.7	134.0	54 58.1 -45.6	135.0	3	55 40.1 -44.7	134.0	54 58.1 -45.6	135.0	4			
4	59 34.0 -38.4	126.8	58 57.5 -39.6	128.1	58 19.9 -40.7	129.4	57 41.4 -41.9	130.6	57 01.8 -42.8	131.8	56 21.4 -43.8	132.9	55 40.1 -44.7	134.0	54 58.1 -45.6	135.0	54 58.1 -45.6	135.0	54 58.1 -45.6	135.0	54 58.1 -45.6	135.0	4				
5	58 55.6 -39.4	128.3	58 17.9 -40.6	129.6	57 39.2 -41.7	130.8	56 59.5 -42.6	131.9	56 19.0 -43.6	133.1	55 37.6 -44.5	134.1	54 55.4 -45.4	135.2	54 12.5 -46.1	136.1	54 12.5 -46.1	136.1	54 12.5 -46.1	136.1	54 12.5 -46.1	136.1	5				
6	58 16.2 -40.4	129.7	57 37.3 -41.4	130.9	56 57.5 -42.4	132.1	56 16.9 -43.4	133.2	55 35.4 -44.3	134.3	54 53.1 -45.2	135.3	54 10.1 -46.0	136.3	53 26.4 -46.8	137.2	53 26.4 -46.8	137.2	53 26.4 -46.8	137.2	53 26.4 -46.8	137.2	6				
7	57 35.8 -41.2	131.1	56 55.9 -42.3	132.3	56 15.1 -43.2	133.4	55 33.5 -44.2	134.5	54 51.1 -45.0	135.5	54 07.9 -45.7	136.4	53 24.1 -46.5	137.4	52 39.6 -47.2	138.3	52 39.6 -47.2	138.3	52 39.6 -47.2	138.3	52 39.6 -47.2	138.3	7				
8	56 54.6 -42.1	132.5	56 13.6 -43.0	133.6	55 31.9 -44.0	134.6	54 49.3 -44.7	135.6	54 06.1 -45.6	136.6	53 22.2 -46.4	137.5	52 37.6 -47.1	138.4	51 52.4 -47.8	139.3	51 52.4 -47.8	139.3	51 52.4 -47.8	139.3	51 52.4 -47.8	139.3	8				
9	56 12.5 -42.9	133.8	55 30.6 -43.0	134.8	54 47.9 -44.6	135.8	54 04.6 -45.5	136.8	53 20.5 -46.2	137.7	52 35.8 -46.9	138.6	51 50.5 -47.6	139.4	51 04.6 -48.2	140.3	51 04.6 -48.2	140.3	51 04.6 -48.2	140.3	51 04.6 -48.2	140.3	9				
10	55 29.6 -43.5	135.0	54 46.8 -44.4	136.0	54 03.3 -45.2	137.0	53 19.1 -46.0	137.9	52 34.3 -46.7	138.8	51 48.9 -47.4	139.6	51 02.9 -48.0	140.4	50 16.4 -48.6	141.2	50 16.4 -48.6	141.2	50 16.4 -48.6	141.2	50 16.4 -48.6	141.2	10				
11	54 46.1 -44.3	136.2	54 02.4 -45.1	137.2	53 18.1 -45.9	138.1	52 33.1 -46.5	139.0	51 47.6 -47.3	139.8	51 01.5 -47.9	140.6	50 14.9 -48.5	141.4	49 27.8 -49.1	142.1	49 27.8 -49.1	142.1	49 27.8 -49.1	142.1	49 27.8 -49.1	142.1	11				
12	54 01.8 -44.9	137.4	53 17.3 -45.7	138.3	52 32.2 -46.4	139.1	51 46.6 -47.1	140.0	51 00.3 -47.7	140.8	50 13.6 -48.3	141.5	49 26.4 -48.9	142.3	48 38.7 -49.5	143.0	48 38.7 -49.5	143.0	48 38.7 -49.5	143.0	48 38.7 -49.5	143.0	12				
13	53 16.9 -45.6	138.5	52 31.6 -46.2	139.4	51 45.8 -46.9	140.2	50 59.5 -47.6	141.0	50 12.6 -48.2	141.7	49 25.3 -48.8	142.5	48 37.5 -49.3	143.2	47 49.2 -49.8	143.8	47 49.2 -49.8	143.8	47 49.2 -49.8	143.8	47 49.2 -49.8	143.8	13				
14	52 31.3 -46.0	139.6	51 45.4 -46.8	140.4	50 58.9 -47.4	141.2	50 11.9 -48.0	141.9	49 24.4 -48.6	142.7	48 36.5 -49.1	143.4	47 48.2 -49.7	144.0	46 59.4 -50.1	144.6	46 59.4 -50.1	144.6	46 59.4 -50.1	144.6	46 59.4 -50.1	144.6	14				
15	51 45.3 -46.7	140.6	50 58.6 -47.3	141.4	50 11.5 -47.9	142.1	49 23.9 -48.5	142.9	48 35.8 -49.0	143.6	47 47.4 -49.6	144.2	46 58.5 -50.0	144.8	46 09.3 -50.5	145.4	46 09.3 -50.5	145.4	46 09.3 -50.5	145.4	46 09.3 -50.5	145.4	15				
16	50 58.6 -47.1	141.6	50 11.3 -47.7	142.4	49 23.6 -48.3	143.1	48 35.4 -48.8	143.8	47 46.8 -49.4	144.4	46 57.8 -49.8	145.0	46 08.5 -50.4	145.6	45 18.8 -50.8	146.2	45 18.8 -50.8	146.2	45 18.8 -50.8	146.2	45 18.8 -50.8	146.2	16				
17	50 11.5 -47.6	142.6	49 23.6 -48.2	143.3	48 35.3 -48.7	144.0	47 46.6 -49.2	144.6	46 57.4 -49.7	145.3	46 08.0 -50.3	145.9	45 18.1 -50.6	146.4	44 28.0 -51.1	147.0	44 28.0 -51.1	147.0	44 28.0 -51.1	147.0	44 28.0 -51.1	147.0	17				
18	49 23.9 -48.1	143.5	48 35.4 -48.6	144.2	47 46.6 -49.2	144.9	46 57.3 -49.6	145.5	46 07.7 -50.1	146.1	45 17.7 -50.5	146.6	44 27.5 -51.0	147.2	43 36.9 -51.4	147.7	43 36.9 -51.4	147.7	43 36.9 -51.4	147.7	43 36.9 -51.4	147.7	18				
19	48 35.8 -48.4	144.4	47 46.8 -49.0	145.1	46 57.4 -49.4	145.7	46 07.7 -50.0	146.3	45 17.6 -50.4	146.9	44 27.2 -50.8	147.4	43 36.5 -51.2	147.9	42 45.5 -51.6	148.4	42 45.5 -51.6	148.4	42 45.5 -51.6	148.4	42 45.5 -51.6	148.4	19				
20	47 47.4 -48.9	145.3	46 57.8 -49.3	145.9	46 08.0 -49.9	146.5	45 17.7 -50.2	147.1	44 27.2 -50.7	147.6	43 36.4 -51.1	148.1	42 45.3 -51.5	148.6	41 53.9 -51.8	149.1	41 53.9 -51.8	149.1	41 53.9 -51.8	149.1	41 53.9 -51.8	149.1	20				
21	46 58.5 -49.2	146.2	46 08.5 -49.7	146.8	45 18.1 -50.1	147.3	44 27.5 -50.6	147.9	43 36.5 -51.0	148.4	42 45.3 -51.4	148.9	41 53.8 -51.7	149.3	41 02.1 -52.1	149.8	41 02.1 -52.1	149.8	41 02.1 -52.1	149.8	41 02.1 -52.1	149.8	21				
22	46 09.3 -49.6	147.0	45 18.8 -50.1	147.6	44 28.0 -50.5	148.1	43 36.9 -50.9	148.6	42 45.5 -51.2	149.1	41 53.9 -51.6	149.6	41 02.1 -52.0	150.0	40 10.0 -52.1	150.7	39 17.7 -52.5	151.1	39 17.7 -52.5	151.1	39 17.7 -52.5	151.1	22				
23	45 19.7 -50.0	147.8	44 28.7 -50.3	148.3	43 37.5 -50.7	148.9	42 46.0 -51.1	149.3	41 54.3 -51.5	149.8	41 02.3 -51.8	150.2	40 10.5 -52.1	150.9	39 18.0 -52.4	151.3	38 25.2 -52.7	151.7	38 25.2 -52.7	151.7	38 25.2 -52.7	151.7	24				
24	44 29.7 -50.2	148.6	43 38.4 -50.6	149.1	42 46.8 -51.0	149.6	41 54.9 -51.4	150.0	41 02.8 -51.7	150.5	40 10.5 -52.1	150.9	39 18.0 -52.4	151.3	38 25.2 -52.7	151.7	38 25.2 -52.7	151.7	38 25.2 -52.7	151.7	38 25.2 -52.7	151.7	24				
25	43 39.5 -50.5	149.4	42 47.8 -50.9	149.8	41 55.8 -51.3	150.3	41 03.5 -51.6	150.7	40 11.1 -52.0	151.1	39 18.4 -52.2	151.5	38 25.6 -52.6	151.9	37 32.5 -52.8	152.3	37 32.5 -52.8	152.3	37 32.5 -52.8	152.3	37 32.5 -52.8	152.3	25				
26	42 49.0 -50.8	150.1	41 56.9 -51.2	150.6	41 04.5 -51.5	151.0	40 11.9 -51.8	151.4	39 19.1 -52.1	151.8	38 26.2 -52.5	152.2	37 33.0 -52.5	152.5	36 39.7 -53.1	152.9	36 39.7 -53.1	152.9	36 39.7 -53.1	152.9	36 39.7 -53.1	152.9	26				
27	41 58.2 -51.1	150.8	41 05.7 -51.4	151.3	40 13.0 -51.8	151.7	39 20.1 -52.1	152.1	38 27.0 -52.4	152.4	37 33.7 -52.7	152.8	36 40.2 -52.9	153.1	35 46.6 -53.2	153.5	35 46.6 -53.2	153.5	35 46.6 -53.2	153.5	35 46.6 -53.2	153.5	27				
28	41 07.1 -51.3	151.5	40 14.3 -51.7	151.9	39 21.2 -51.9	152.3	38 28.0 -52.3	152.7	37 34.6 -52.6	153.1	36 41.0 -52.8	153.4	35 47.3 -53.1	153.7	34 53.4 -53.3	154.0	34 53.4 -53.3	154.0	34 53.4 -53.3	154.0	34 53.4 -53.3	154.0	28				
29	40 15.8 -52.5	155.4	39 01.3 -52.8	155.7	38 22.6 -53.2	156.0	37 29.3 -53.2	156.5	36 31.7 -53.2	156.9	35 31.7 -53.2	157.3	34 21.7 -53.7	157.6	30 26.5 -53.7	157.0	29 31.2 -54.1	157.2	29 31.2 -54.1	157.2	29 31.2 -54.1	157.2	29 31.2 -54.1	157.2	34		
30	39 24.2 -51.7	156.0	38 08.5 -52.9	156.3	37 13.5 -53.2	156.5	36 32.8 -53.4	156.8	35 23.3 -53.7	157.0	30 28.0 -53.9	157.3	29 32.6 -54.1	157.5	28 37.1 -54.2	157.											

25°, 335° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	61 05.7	+31.5	119.0	60 35.9	+33.0	120.6	60 04.7	+34.5	122.1	59 32.2	+36.0	123.5	58 58.4	+37.4	124.9	58 23.5	+38.7	126.3	57 47.5	+39.8	127.5	57 10.4	+41.0	128.8	0
1	61 37.2	+30.0	117.3	61 08.9	+31.7	118.9	60 39.2	+33.3	120.4	60 08.2	+34.8	121.9	59 35.8	+36.2	123.4	59 02.2	+37.6	124.8	58 27.3	+39.0	126.1	57 51.4	+40.1	127.4	1
2	62 07.2	+28.5	115.4	61 40.6	+30.3	117.1	61 12.5	+32.0	118.7	60 43.0	+33.5	120.3	61 20.0	+35.1	121.8	59 39.8	+36.5	123.3	59 06.3	+37.8	124.7	58 31.5	+39.2	126.0	2
3	62 35.7	+26.4	113.5	62 10.9	+28.8	115.3	61 44.5	+30.5	116.9	61 16.5	+32.2	118.6	60 47.1	+33.8	120.2	60 16.3	+35.3	121.7	59 44.1	+36.8	123.1	58 10.7	+38.1	124.5	3
4	63 02.6	+25.2	111.6	62 39.7	+27.1	113.4	62 15.0	+29.0	115.1	61 48.7	+30.8	116.8	61 20.9	+32.5	118.4	60 51.6	+34.1	120.0	60 20.9	+35.6	121.6	59 48.8	+37.1	123.0	4
5	63 27.8	+23.5	109.5	63 06.8	+25.5	111.4	62 44.0	+27.5	113.2	62 19.5	+29.3	115.0	61 53.4	+31.1	116.7	61 25.7	+32.8	118.3	60 56.5	+34.4	119.9	60 25.9	+35.9	121.4	5
6	63 51.3	+21.7	107.5	63 32.3	+23.8	109.4	63 11.5	+25.8	111.3	62 48.8	+27.8	113.1	62 24.5	+29.6	114.8	61 58.5	+31.3	116.6	61 30.9	+33.0	118.2	61 01.8	+34.6	119.8	6
7	64 13.0	+19.7	105.3	63 56.1	+21.9	107.3	63 37.3	+24.0	109.2	63 16.6	+26.0	111.1	62 54.1	+28.0	113.0	62 29.8	+29.9	114.7	62 03.9	+31.6	116.4	61 36.4	+33.3	118.1	7
8	64 32.7	+17.8	*103.2	64 18.0	+20.1	105.2	64 01.3	+22.2	107.2	63 42.6	+24.4	109.1	63 22.1	+26.3	111.0	62 59.7	+28.3	112.8	62 35.5	+30.2	114.6	62 09.7	+31.9	116.3	8
9	64 50.5	+15.7	*100.9	64 38.1	+18.0	*103.0	64 23.5	+20.3	105.0	64 07.0	+22.4	107.0	63 48.4	+24.6	109.0	63 05.7	+28.6	112.7	62 41.6	+30.5	114.5	9			
10	65 06.2	+13.6*	98.6	64 56.1	+16.0	*100.8	64 43.8	+18.3	*102.8	64 29.4	+20.6	104.9	64 13.0	+22.8	106.9	63 54.6	+24.9	108.8	63 34.3	+26.9	110.8	63 12.1	+28.9	112.6	10
11	65 19.8	+11.4*	96.3	65 12.1	+13.8*	98.5	65 02.1	+16.3	*100.6	64 50.0	+18.6	*102.7	64 35.8	+20.8	104.8	64 19.5	+23.0	106.8	64 01.2	+25.2	108.7	63 41.0	+27.2	110.7	11
12	65 31.2	+9.2*	94.0	65 25.9	+11.7*	96.1	65 18.4	+14.1*	98.3	65 08.6	+16.5	*100.4	64 56.6	+18.9	*102.6	64 42.5	+21.2	104.6	64 26.4	+23.3	106.6	64 08.2	+25.5	108.6	12
13	65 40.4	+6.9*	91.6	65 37.6	+9.4*	93.8	65 32.5	+11.9*	96.0	65 25.1	+14.4*	98.1	65 15.5	+16.8*	*100.3	65 03.7	+19.1	*102.4	64 49.7	+21.5	104.5	64 33.7	+23.6	106.5	13
14	65 47.3	+4.6*	89.2	65 47.0	+7.2*	91.4	65 44.4	+9.7*	93.6	65 39.5	+12.2*	95.8	65 32.3	+14.7*	98.0	65 22.8	+17.1	*100.2	65 11.2	+19.4	*102.3	64 57.3	+21.8	104.4	14
15	65 51.9	+2.3*	86.7	65 54.2	+4.8*	88.9	65 54.1	+7.4*	91.2	65 51.7	+9.9*	93.4	65 47.0	+12.4*	95.6	65 39.9	+14.9*	97.8	65 30.6	+17.3*	100.0	65 19.1	+19.7	*102.2	15
16	65 54.2	-0.1*	84.3	65 59.0	+2.5*	86.5	66 01.5	+5.0*	88.7	66 01.6	+7.6*	91.0	65 59.4	+10.2	93.2	65 54.8	+12.7*	95.5	65 47.9	+15.2*	97.7	65 38.8	+17.6*	99.9	16
17	65 54.1	-2.4*	81.8	66 01.5	+0.1*	84.0	66 06.5	+2.7*	86.3	66 09.2	+5.3*	88.5	66 09.6	+7.8*	90.8	66 07.5	+10.5*	93.1	66 03.1	+13.0*	95.3	65 56.4	+15.5*	97.6	17
18	65 51.7	-4.7*	79.4	66 01.6	-2.2*	81.6	66 09.2	+0.4*	83.8	66 14.5	+2.9*	86.1	66 17.4	+5.5*	88.4	66 18.0	+8.1*	90.6	66 16.1	+10.7*	92.9	66 11.9	+13.2	95.2	18
19	65 47.0	-7.1*	76.9	65 59.4	-4.6*	79.1	66 09.6	-2.1	81.3	66 17.4	+0.6*	83.6	66 22.9	+3.2*	85.9	66 26.1	+5.7*	88.2	66 26.8	+8.3*	90.5	66 25.1	+10.9*	92.7	19
20	65 39.9	-9.3*	74.5	65 54.8	-6.9*	76.7	66 07.5	-4.4*	78.9	66 18.0	-1.9*	81.1	66 26.1	+0.7*	83.4	66 31.8	+3.3*	85.7	66 35.1	+6.0*	88.0	66 36.0	+8.6*	90.3	20
21	65 30.6	-11.5*	72.1	65 47.9	-9.1*	74.3	66 03.1	-6.7*	76.4	66 16.1	-4.2*	78.6	66 26.8	-1.7*	80.9	66 35.1	+0.9*	83.2	66 41.1	+3.5*	85.5	66 44.6	+6.2*	87.8	21
22	65 19.1	-13.8*	69.8	65 38.8	-11.4*	71.8	65 56.4	-9.0*	74.0	66 11.9	-6.6*	76.2	66 25.1	-4.1*	78.4	66 36.0	-1.5*	80.6	66 44.6	+1.1*	82.9	66 50.8	+3.7*	85.3	22
23	65 05.3	-15.8*	67.5	65 27.4	-13.6*	69.5	65 47.4	-11.3*	71.6	66 05.3	-8.9*	73.7	66 21.0	-6.4*	75.9	66 34.5	-3.9*	78.1	66 45.7	-1.3*	80.4	66 54.5	+1.3*	82.7	23
24	64 49.5	-17.9*	65.2	65 13.8	-15.8*	67.1	65 36.1	-13.5*	69.2	65 56.4	-11.2*	71.3	66 14.6	-8.8*	73.4	66 30.6	-6.3*	75.6	66 44.4	-3.8*	77.9	66 55.8	-1.1*	80.2	24
25	64 31.6	-19.9	62.9	64 58.0	-17.8*	64.8	65 22.6	-15.7*	66.8	65 45.2	-13.4*	68.9	66 05.8	-11.0*	71.0	66 24.3	-8.6*	73.1	66 40.6	-6.1*	75.3	66 54.7	-3.6*	77.6	25
26	64 11.7	-21.7	60.8	64 40.2	-19.8	62.6	65 06.9	-17.7*	64.5	65 31.8	-15.6*	66.5	65 54.8	-13.4*	68.5	66 15.7	-11.0*	70.7	66 34.5	-8.6*	72.8	66 51.1	-6.1*	75.1	26
27	63 50.0	-23.6	58.6	64 20.4	-21.7	60.4	64 49.2	-19.7*	62.3	65 16.2	-17.6*	64.2	65 41.4	-15.5*	66.2	66 04.7	-13.2*	68.2	66 25.9	-10.9*	70.4	66 45.0	-8.4*	72.5	27
28	63 26.4	-25.4	56.6	63 58.7	-23.6	58.3	64 29.5	-21.7	60.1	64 58.6	-19.7*	61.9	65 25.9	-17.6*	63.8	65 51.5	-15.5*	65.8	66 15.0	-13.1*	67.9	66 36.6	-10.8*	70.0	28
29	63 01.0	-27.0	54.6	63 35.1	-25.3	56.2	64 07.8	-23.6	57.9	64 38.9	-21.7	59.7	65 08.3	-19.6*	61.5	65 36.0	-17.6*	63.5	66 01.9	-15.4*	65.5	66 25.8	-13.1*	67.6	29
30	62 34.0	-28.6	52.6	63 09.8	-27.0	54.2	63 44.2	-25.3	55.8	64 17.2	-23.5	57.5	64 48.7	-21.7	59.3	65 18.4	-19.6*	61.2	65 46.5	-17.6*	63.1	66 12.7	-15.4*	65.1	30
31	62 05.4	-30.1	50.7	62 42.8	-28.6	52.2	63 18.9	-26.9	53.8	63 53.7	-25.3	55.4	64 27.0	-23.5	57.1	64 58.8	-21.6	58.9	65 28.9	-19.6*	60.8	65 57.3	-17.5*	62.8	31
32	61 35.3	-31.5	48.9	62 14.2	-30.1	50.3	62 52.0	-28.6	51.8	63 28.4	-27.0	53.4	64 03.5	-25.3	55.0	64 37.2	-23.5	56.7	65 09.3	-21.6	58.5	65 39.8	-19.6*	60.4	32
33	61 03.8	-32.9	47.1	61 44.1	-31.5	48.5	62 23.4	-30.1	49.9	63 01.4	-28.6	51.4	63 38.2	-27.0	53.0	64 13.7	-25.3	54.6	64 47.7	-23.5	56.3	65 20.2	-21.7	58.1	33
34	60 30.9	-34.1	45.4	61 12.2	-34.5	30.7	55 02.6	-24.9	31.4	55 53.6	-42.2	32.2	56 44.2	-41.6	33.0	57 34.2	-40.7	33.9	58 23.8	-40.0	34.8	59 12.8	-39.1	35.7	34
35	59 56.8	-35.3	43.7	60 39.7	-34.2	45.0	61 21.7	-33.9	46.2	62 02.7	-31.6	47.6	62 42.6	-30.2	49.0	63 21.3	-28.6	50.5	63 58.8	-27.0	52.1	64 35.0	-25.4	53.8	35
36	59 21.5	-36.5	42.1	60 05.5	-35.3	43.3	60 48.8	-34.2	44.5	61 31.1	-33.0	45.8	62 12.4	-31.4	36.7	62 52.7	-30.3	48.6	63 31.8	-28.8	50.1	64 09.6	-27.1	51.7	36
37	58 45.0	-37.6	40.6	59 30.2	-36.6	41.7	60 14.6	-35.5	42.8	60 58.1	-34.2	44.1	61 40.8	-33.0	45.4										

**LATITUDE CONTRARY NAME TO DECLINATION**      **L.H.A. 25°, 335°**

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	61	05.7	-32.8	119.0	60	35.9	-34.3	120.6	60	04.7	-35.8	122.1	59	32.2	-37.1	123.5	58	58.4	-38.4	124.9	58	23.5	-39.6	126.3	57	47.5	-40.8	127.5	57	10.4	-41.9	128.8	0
1	60	32.9	-34.0	120.7	60	01.6	-35.5	122.2	59	28.9	-36.8	123.7	58	55.1	-38.2	125.1	58	20.0	-39.4	126.4	57	43.9	-40.6	127.7	57	06.7	-41.7	128.9	56	28.5	-42.7	130.1	1
2	59	58.9	-35.3	122.4	59	26.1	-36.7	123.8	58	52.1	-38.0	125.2	58	16.9	-39.2	126.5	57	40.6	-40.3	127.8	57	03.3	-41.4	129.0	56	25.0	-42.4	130.2	55	45.8	-43.4	131.3	2
3	59	23.6	-36.4	124.0	58	49.4	-37.7	125.4	58	14.1	-38.9	126.7	57	37.7	-40.1	128.0	57	00.3	-41.2	129.2	56	21.9	-42.2	130.4	55	42.6	-43.2	131.5	55	02.4	-44.1	132.6	3
4	58	47.2	-37.5	125.6	58	11.7	-38.7	126.9	57	35.2	-39.9	128.1	56	57.6	-40.9	129.4	56	19.1	-42.0	130.5	55	39.7	-43.0	131.6	54	59.4	-43.9	132.7	54	18.3	-44.8	133.7	4
5	58	09.7	-38.5	127.1	57	33.0	-39.7	128.3	56	55.3	-40.7	129.5	56	16.7	-41.8	130.7	55	37.1	-42.8	131.8	54	56.7	-43.7	132.9	53	33.5	-45.4	134.9	5				
6	57	31.2	-39.5	128.5	56	53.3	-40.5	129.7	56	14.6	-41.6	130.9	55	34.9	-42.6	132.0	54	54.3	-43.5	133.0	54	13.0	-44.4	134.0	53	30.9	-45.2	135.0	52	48.1	-45.9	136.0	6
7	56	51.7	-40.3	129.9	56	12.8	-41.4	131.0	55	33.0	-42.4	132.1	54	52.3	-43.3	133.2	54	10.8	-44.1	134.2	53	28.6	-45.0	135.2	52	45.7	-45.8	136.1	52	02.2	-46.6	137.0	7
8	56	11.4	-41.2	131.2	55	31.4	-42.2	132.3	54	50.6	-43.1	133.4	54	09.0	-44.0	134.4	53	26.7	-44.8	135.4	52	43.6	-45.5	136.3	51	59.9	-46.3	137.2	51	15.6	-47.0	138.0	8
9	55	30.2	-42.0	132.5	54	49.2	-42.2	133.6	54	07.5	-43.8	134.6	53	25.0	-44.6	135.5	52	41.9	-45.4	136.5	51	58.1	-46.2	137.4	50	28.6	-47.5	139.0	9				
10	54	48.2	-42.7	133.8	54	06.3	-43.6	134.8	53	23.7	-44.4	135.7	52	40.4	-45.2	136.7	51	56.5	-46.0	137.5	51	11.9	-46.7	138.4	50	26.8	-47.4	139.2	49	41.1	-48.0	140.0	10
11	54	05.5	-43.4	135.0	53	22.7	-44.2	135.9	52	39.3	-45.1	136.9	51	55.2	-45.8	137.7	51	10.5	-46.5	138.6	50	25.2	-47.1	139.4	49	39.4	-47.8	140.1	48	53.1	-48.4	140.9	11
12	53	22.1	-44.1	136.1	52	38.5	-44.9	137.1	51	54.2	-45.6	137.9	51	09.4	-46.3	138.8	50	24.0	-47.0	139.6	49	38.1	-47.6	140.3	48	51.6	-48.2	141.1	48	04.7	-48.8	141.8	12
13	52	38.0	-44.7	137.3	51	53.6	-45.4	138.1	50	08.6	-46.1	139.0	50	23.1	-46.8	139.8	49	37.0	-47.4	140.5	48	50.5	-48.1	141.3	48	03.4	-48.6	142.0	47	15.9	-49.1	142.6	13
14	51	53.3	-45.3	138.4	51	08.2	-46.4	139.2	50	22.5	-46.7	140.0	49	36.3	-47.3	140.7	48	49.6	-47.9	141.5	48	02.4	-48.5	142.2	47	14.8	-49.0	142.8	46	26.8	-49.6	143.5	14
15	51	08.0	-45.8	139.4	50	22.2	-46.5	140.2	49	35.8	-47.1	141.0	48	49.0	-47.8	141.7	48	01.7	-48.4	142.4	47	13.9	-48.8	143.0	46	25.8	-49.4	143.7	45	37.2	-49.8	144.3	15
16	50	22.2	-46.4	140.4	49	35.7	-47.0	141.2	48	48.7	-47.6	141.9	48	01.2	-48.1	142.6	47	13.3	-48.7	143.3	46	25.1	-49.3	143.9	45	36.4	-49.7	144.5	44	47.4	-50.2	145.1	16
17	49	35.8	-46.8	141.4	48	48.7	-47.5	142.1	48	01.1	-48.0	142.8	47	13.1	-48.6	143.5	46	24.6	-49.0	144.1	45	35.8	-49.5	144.7	44	46.7	-50.0	145.3	43	57.2	-50.5	145.8	17
18	48	49.0	-47.3	142.4	48	01.2	-47.9	143.1	47	13.1	-48.5	143.7	46	24.5	-48.9	144.3	45	35.6	-49.5	144.9	44	56.7	-50.4	146.1	43	06.7	-50.7	146.6	42	26.8	-49.6	147.3	18
19	48	01.7	-47.8	143.3	47	13.3	-48.2	144.0	46	24.6	-48.8	144.6	45	35.6	-49.3	145.2	43	56.4	-50.2	146.3	43	06.3	-50.6	146.8	42	16.0	-51.1	147.3	19				
20	47	13.9	-48.1	144.2	46	25.1	-48.7	144.8	45	35.8	-49.1	145.4	44	46.3	-49.6	146.0	43	56.4	-50.1	146.5	43	06.2	-50.5	147.0	42	15.7	-50.9	147.5	41	24.9	-51.3	148.0	20
21	46	25.8	-48.6	145.1	45	36.4	-49.4	145.7	44	46.7	-49.5	146.2	43	56.7	-50.0	146.8	43	06.3	-50.3	147.3	42	15.7	-50.8	147.8	41	24.8	-51.2	148.3	40	33.6	-51.5	148.7	21
22	45	37.2	-48.9	145.9	44	47.4	-49.4	146.5	43	57.2	-49.8	147.0	43	06.7	-50.2	147.5	42	16.0	-50.7	148.0	41	24.9	-51.0	148.5	40	33.6	-51.3	149.0	39	42.1	-51.7	149.4	22
23	44	48.3	-49.2	146.7	43	58.0	-49.7	147.3	43	07.4	-50.1	147.8	42	16.5	-50.5	148.3	41	25.3	-50.9	148.7	40	33.9	-51.3	149.2	39	42.3	-51.7	149.6	38	50.4	-52.0	150.0	23
24	43	59.1	-49.6	147.5	43	08.3	-50.0	148.1	42	17.3	-50.4	148.5	41	26.0	-50.8	149.0	40	34.4	-51.1	149.5	39	42.6	-51.5	149.9	38	50.6	-51.8	150.3	37	58.4	-52.1	150.7	24
25	43	09.5	-49.8	148.3	42	18.3	-50.2	148.8	41	26.9	-50.7	149.3	40	35.2	-51.0	149.7	39	43.3	-51.4	150.1	38	51.1	-51.7	150.5	37	06.3	-52.4	151.3	25				
26	42	19.7	-50.2	149.1	41	28.1	-50.6	149.5	40	36.2	-50.9	150.0	39	44.2	-51.3	150.4	38	51.9	-51.6	150.8	37	06.7	-52.2	151.2	36	13.9	-52.5	151.9	26				
27	41	29.5	-50.5	149.8	40	37.5	-50.8	150.3	39	45.3	-51.2	150.7	38	52.9	-51.5	151.1	37	00.3	-51.8	151.5	37	07.5	-52.1	151.8	36	14.5	-52.4	152.2	27				
28	40	39.0	-50.7	150.5	39	46.7	-51.0	151.0	38	54.1	-51.3	151.3	37	01.4	-51.7	151.7	37	08.5	-52.0	152.1	36	15.4	-52.4	152.4	35	22.1	-52.6	152.8	24				
29	39	48.3	-50.9	151.2	38	55.6	-51.2	151.6	38	02.8	-51.6	152.0	37	09.7	-51.9	152.4	36	16.5	-52.3	152.7	35	23.0	-52.4	153.0	34	29.5	-52.8	153.4	29				
30	38	57.4	-51.2	151.9	38	04.4	-51.5	152.3	37	11.2	-51.8	152.7	36	17.8	-52.1	153.0	35	24.2	-52.3	153.3	34	30.6	-52.7	153.6	33	36.7	-52.9	153.9	32				
31	38	06.2	-51.4	152.6	37	12.9	-51.7	152.9	36	19.4	-52.0	153.3	35	25.7	-52.3	153.6	34	31.9	-52.6	153.9	33	37.9	-52.8	154.2	31	49.6	-53.3	154.8	31				
32	37	14.8	-51.6	153.2	36	21.2	-51.9	153.6	35	27.4	-52.2	153.9	34	33.4	-52.5	154.2	33	39.3	-52.7	154.5	32	43.8	-53.2	155.0	31	56.3	-53.4	155.3	30				
33	36	23.2	-51.8	153.9	35	29.3	-52.1	154.2	34	35.2	-52.4	154.5	33	40.9	-52.6	154.8	32	46.6	-53.0	155.1	31	57.6	-53.4	155.6	30	02.9	-53.6	156.8	29				
34	31	34.4	-52.2	155.1	31	44.9	-52.4	15																									

26°, 334° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	60	14.8	+30.6	118.0	59	46.0	+32.2	119.5	59	15.8	+33.7	120.9	58	44.3	+35.1	122.4	58	11.6	+36.5	123.7	57	37.7	+37.8	125.0	57	02.7	+39.1	126.3	56	26.6	+40.3	127.5	0
1	60	45.4	+29.2	116.2	60	18.2	+30.8	117.8	59	49.5	+32.5	119.3	59	19.4	+34.0	120.8	58	48.1	+35.4	122.2	58	15.5	+36.8	123.6	57	41.8	+38.0	124.9	57	06.9	+39.3	126.2	1
2	61	14.6	+27.7	114.4	60	49.0	+29.5	116.0	60	22.0	+31.1	117.6	59	53.4	+32.8	119.2	59	23.5	+34.3	120.6	58	52.3	+35.7	122.1	58	19.8	+37.1	123.4	57	46.2	+38.3	124.8	2
3	61	42.3	+26.2	112.5	61	18.5	+28.0	114.2	60	53.1	+29.7	115.9	60	26.2	+31.4	117.5	59	57.8	+33.0	119.0	59	28.0	+34.5	120.5	58	56.9	+36.0	121.9	58	24.5	+37.4	123.3	3
4	62	08.5	+24.6	110.6	61	46.5	+26.5	112.4	61	22.8	+28.3	114.1	60	57.6	+30.0	115.7	60	30.8	+31.7	117.3	60	02.5	+33.3	118.9	59	32.9	+34.8	120.4	59	01.9	+36.2	121.8	4
5	62	33.1	+22.3	108.7	62	13.0	+24.8	110.5	61	51.1	+26.8	112.2	61	27.6	+28.6	113.9	61	02.5	+30.3	115.6	60	35.8	+32.0	117.2	60	07.7	+33.5	118.7	59	38.1	+35.1	120.2	5
6	62	55.9	+21.1	106.7	62	37.8	+23.1	108.5	62	17.9	+25.1	110.3	61	56.2	+27.0	112.1	61	32.8	+28.8	113.8	61	07.8	+30.6	115.5	60	41.2	+32.3	117.1	60	13.2	+33.9	118.6	6
7	63	17.0	+19.2	104.6	63	00.9	+21.4	106.5	62	43.0	+23.4	108.3	62	23.2	+25.4	110.2	62	01.6	+27.3	111.9	61	38.4	+29.1	113.7	61	13.5	+30.9	115.3	60	47.1	+32.5	116.9	7
8	63	36.2	+17.3	102.5	63	22.3	+19.5	104.4	63	06.4	+21.6	106.3	62	48.6	+23.7	108.2	62	28.9	+25.7	110.0	62	07.5	+27.6	111.8	61	44.4	+29.4	113.5	61	19.6	+31.2	115.2	8
9	63	53.5	+15.4	100.3	63	41.8	+17.6	102.3	63	28.0	+19.8	104.2	63	12.3	+21.9	106.2	62	54.6	+24.0	108.1	62	35.1	+26.9	109.9	62	13.8	+27.9	111.7	61	50.8	+29.7	113.4	9
10	64	08.9	+13.3*	98.1	63	59.4	+15.6*	100.1	63	47.8	+17.9	102.1	63	34.2	+20.1	104.1	63	18.6	+22.2	106.0	63	01.1	+24.3	107.9	62	41.7	+26.3	109.8	62	20.5	+28.2	111.6	10
11	64	22.2	+11.2*	95.8	64	15.0	+13.6*	97.9	64	05.7	+15.9*	99.9	63	54.3	+18.1	102.0	63	40.8	+20.4	103.9	63	25.4	+22.5	105.9	63	08.0	+24.6	107.8	62	48.7	+26.6	109.6	11
12	64	33.4	+9.1*	93.6	64	28.6	+11.4*	95.7	64	21.6	+13.8*	97.7	64	12.4	+16.2*	99.8	64	01.2	+18.4	101.8	63	47.9	+20.6	103.8	63	32.6	+22.8	105.8	63	15.3	+24.9	107.7	12
13	64	42.5	+6.8*	91.3	64	40.0	+9.4*	93.4	64	35.4	+11.7*	95.5	64	28.6	+14.1*	97.6	64	19.6	+16.5*	99.6	64	08.5	+18.8	101.7	63	55.4	+21.0	103.7	63	40.2	+23.1	105.6	13
14	64	49.3	+4.7*	88.9	64	49.4	+7.1*	91.1	64	47.1	+9.6*	93.2	64	42.7	+12.0*	95.3	64	36.1	+14.4*	97.4	64	27.3	+16.7*	99.5	64	16.4	+19.0*	101.5	64	03.3	+21.3	103.5	14
15	64	54.0	+2.5*	86.6	64	56.5	+4.9*	88.7	64	56.7	+7.4*	90.9	64	54.7	+9.9*	93.0	64	50.5	+12.6*	95.1	64	44.0	+14.7*	97.2	64	35.4	+17.0*	99.3	64	24.6	+19.3*	101.4	15
16	64	56.5	+0.2*	84.2	65	01.4	+2.7*	86.4	65	04.1	+5.2*	88.5	65	04.6	+7.6*	90.7	65	02.7	+10.1*	92.8	64	58.7	+12.5*	94.9	64	52.4	+14.9*	97.1	64	43.9	+17.3*	99.2	16
17	64	56.7	-2.0*	81.9	65	04.1	+0.5*	84.0	65	09.3	+2.9*	86.1	65	12.2	+5.4*	88.3	65	12.8	+7.9*	90.5	65	11.2	+10.4*	92.6	65	07.3	+12.9*	94.8	65	01.2	+15.3*	96.9	17
18	64	54.7	-4.2*	79.5	65	04.6	-1.9*	81.6	65	12.2	+0.6*	83.8	65	17.6	+3.1*	85.9	65	20.7	+5.7*	88.1	65	21.6	+8.1*	90.3	65	20.2	+10.6*	92.5	65	16.5	+13.0*	94.6	18
19	64	50.5	-6.5*	77.2	65	02.7	-4.0*	79.2	65	12.8	-1.6*	81.4	65	20.7	+0.8*	83.5	65	26.4	+3.3*	85.7	65	29.7	+5.9*	87.9	65	30.8	+8.4*	90.1	65	29.5	+10.9*	92.3	19
20	64	44.0	-8.6*	74.8	64	58.7	-6.3*	76.9	65	11.2	-3.9*	79.0	65	21.6	-1.4*	81.1	65	29.7	+1.1*	83.3	65	35.6	+3.6*	85.5	65	39.2	+6.0*	87.7	65	40.4	+8.6*	89.9	20
21	64	35.4	-10.8*	72.5	64	52.4	-8.5*	74.5	65	07.3	-6.1*	76.6	65	20.2	-3.7*	78.7	65	30.8	-1.3*	80.9	65	39.2	+1.2*	83.1	65	45.2	+3.8*	85.3	65	49.0	+6.4*	87.5	21
22	64	24.6	-12.9*	70.2	64	43.9	-10.6*	72.2	65	01.2	-8.3*	74.3	65	16.5	-6.0*	76.3	65	29.5	-3.5*	78.5	65	40.4	-1.0*	80.6	65	49.0	+1.5*	82.8	65	55.4	+4.0*	85.1	22
23	64	11.7	-14.9*	68.0	64	33.3	-12.8*	69.9	64	52.9	-10.5*	71.9	65	10.5	-8.2*	74.0	65	26.0	-5.8*	76.1	65	39.4	-3.4*	78.2	65	50.5	-0.9*	80.4	65	59.4	+1.6*	82.6	23
24	63	56.8	-16.9*	65.8	64	20.5	-14.8*	67.6	64	42.4	-12.7*	69.6	65	02.3	-10.4*	71.6	65	20.2	-8.1*	73.7	65	36.0	-5.7*	75.8	65	49.6	-3.2*	78.0	66	01.0	-0.7*	80.1	24
25	63	39.9	-18.9	63.6	64	05.7	-16.8*	65.4	64	29.7	-14.7*	67.3	64	51.9	-12.5*	69.3	65	12.1	-10.2*	71.3	65	30.3	-7.9*	73.4	65	46.4	-5.5*	75.5	66	00.3	-3.0*	77.7	25
26	63	21.0	-20.7	61.5	63	48.9	-18.8	63.2	64	15.0	-16.7*	65.1	64	39.4	-14.7*	67.0	65	01.9	-12.5*	69.0	65	22.4	-10.1*	71.0	65	40.9	-7.8*	73.1	65	57.3	-5.4*	75.2	26
27	63	00.3	-22.5	59.4	63	30.1	-20.7	61.1	63	58.3	-18.7	62.9	64	24.7	-16.6*	64.7	64	49.4	-14.5*	66.7	65	12.3	-12.4*	68.6	65	33.1	-10.0*	70.7	65	51.9	-7.7*	72.8	27
28	62	37.8	-24.2	57.3	63	09.4	-22.4	59.0	63	39.6	-20.6	60.7	64	08.1	-18.7	62.5	64	34.9	-16.6*	64.4	64	59.9	-14.5*	66.3	65	23.1	-12.3*	68.3	65	44.2	-9.9*	70.4	28
29	62	13.6	-25.9	55.4	62	47.0	-24.2	57.0	63	19.0	-22.4	58.6	63	49.4	-20.5	60.4	64	18.3	-18.6	62.2	64	45.4	-16.5*	64.0	65	10.8	-14.4*	66.0	65	34.3	-12.2*	68.0	29
30	61	47.7	-27.4	53.4	62	22.8	-25.8	55.0	62	56.6	-24.2	56.6	63	28.9	-22.4	58.2	63	59.7	-20.5	60.0	64	28.9	-18.6	61.8	64	56.4	-16.5*	63.7	65	22.1	-14.4*	65.6	30
31	61	20.3	-28.9	51.6	61	57.0	-27.4	53.0	62	32.4	-25.8	54.6	63	06.5	-24.1	56.2	63	39.2	-22.4	57.9	64	10.3	-20.4	59.6	64	39.9	-18.5*	61.4	61	07.7	-16.4*	63.3	31
32	60	51.4	-30.4	49.8	61	29.6	-28.9	51.2	62	06.6	-27.4	52.6	62	42.4	-25.8	54.2	63	18.6	-24.1	55.8	63	49.9	-22.5	57.5	64	21.4	-20.5	59.2	64	51.3	-18.6*	61.0	32
33	59	49.4	-33.0	46.3	61	41.4	-42.5	48.1	61	01.0	-35.4	42.1																					

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 26°, 334°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	60	14.8	-32.0	118.0	59	46.0	-33.5	119.5	59	15.8	-34.9	120.9	58	44.3	-36.3	122.4	58	11.6	-37.6	123.7	57	37.7	-38.8	125.0	57	02.7	-40.0	126.3	56	26.6	-41.0	127.5	0
1	59	42.8	-33.2	119.6	59	12.5	-34.7	121.1	58	40.9	-36.1	122.5	58	08.0	-37.3	123.9	57	34.0	-38.6	125.2	56	58.9	-39.8	126.5	56	22.7	-40.8	127.7	55	45.6	-41.9	128.8	1
2	59	09.6	-34.4	121.3	58	37.8	-35.7	122.7	58	04.8	-37.0	124.0	57	30.7	-38.3	125.3	56	55.4	-39.5	126.6	56	19.1	-40.5	127.8	55	41.9	-41.7	129.0	55	03.7	-42.7	130.1	2
3	58	35.2	-35.5	122.9	58	02.1	-36.6	124.2	57	27.8	-38.1	125.5	56	52.4	-39.3	126.8	56	15.9	-40.3	128.0	55	38.6	-41.5	129.1	55	00.2	-42.4	130.2	54	21.0	-43.3	131.3	3
4	57	59.7	-36.6	124.4	57	25.2	-37.8	125.7	56	49.7	-39.0	126.9	56	13.1	-40.1	128.1	55	35.6	-41.2	129.3	54	57.1	-42.1	130.4	54	17.8	-43.1	131.5	53	37.7	-44.0	132.5	4
5	57	23.1	-37.6	125.9	56	47.4	-38.4	127.1	56	10.7	-39.9	128.3	55	33.0	-41.0	129.5	54	54.4	-42.0	130.6	54	15.0	-42.9	131.6	53	34.7	-43.8	132.6	52	53.7	-44.7	133.6	5
6	56	45.5	-38.6	127.3	56	08.6	-39.7	128.5	55	30.8	-40.8	129.6	54	52.0	-41.7	130.7	54	12.4	-42.6	131.8	53	32.1	-43.6	132.8	52	50.9	-44.4	133.8	52	09.0	-45.2	134.7	6
7	56	06.9	-39.5	128.7	55	28.9	-40.5	129.8	54	50.0	-41.5	130.9	54	10.3	-42.5	132.0	53	29.8	-43.4	133.0	52	48.5	-44.3	134.0	52	06.5	-45.1	134.9	51	23.8	-45.8	135.8	7
8	55	27.4	-40.3	130.0	54	48.4	-41.4	131.1	54	08.5	-42.3	132.2	53	27.8	-43.2	133.2	52	46.4	-44.0	134.1	51	21.4	-45.6	136.0	50	38.0	-46.3	136.8	8				
9	54	47.1	-41.1	131.3	54	07.0	-42.0	132.4	53	26.2	-43.0	133.4	52	44.6	-43.8	134.3	52	02.4	-44.7	135.3	51	19.4	-45.4	136.1	50	35.8	-46.1	137.0	49	51.7	-46.8	137.8	9
10	54	06.0	-41.9	132.6	53	25.0	-42.8	133.6	52	43.2	-43.6	134.5	52	00.8	-44.4	135.5	51	17.7	-45.2	136.3	50	34.0	-45.9	137.2	49	49.7	-46.6	138.0	49	04.9	-47.3	138.8	10
11	53	24.1	-42.6	133.8	52	42.2	-43.4	134.8	51	59.6	-44.2	135.7	51	16.4	-45.0	136.5	50	32.5	-45.7	137.4	49	48.1	-46.5	138.2	49	03.1	-47.1	139.0	48	17.6	-47.7	139.7	11
12	52	41.5	-43.3	135.0	51	58.8	-44.1	135.9	51	15.4	-44.9	136.8	50	31.4	-45.6	137.6	49	46.8	-46.3	138.4	49	01.6	-46.9	139.2	48	16.0	-47.5	139.9	47	29.9	-48.2	140.6	12
13	51	58.2	-43.9	136.1	51	14.7	-44.7	137.0	50	30.5	-45.4	137.8	49	45.8	-46.1	138.6	49	00.5	-46.7	139.4	48	14.7	-47.3	140.1	47	28.5	-48.0	140.8	46	41.7	-48.5	141.5	13
14	51	14.3	-44.4	137.2	50	30.0	-45.2	138.0	49	45.1	-45.9	138.8	48	59.7	-46.6	139.6	48	13.8	-47.2	140.3	47	27.4	-47.8	141.0	46	40.5	-48.3	141.7	45	53.2	-48.9	142.3	14
15	50	29.9	-45.1	138.3	49	44.8	-45.7	139.1	48	59.2	-46.4	139.8	48	13.1	-47.0	140.5	47	26.6	-47.6	141.2	46	39.6	-48.2	141.9	45	52.2	-48.8	142.5	45	04.3	-49.2	143.2	15
16	49	44.8	-45.6	139.3	48	59.1	-46.3	140.1	48	12.8	-46.8	140.8	47	26.1	-47.4	141.5	46	39.0	-48.1	142.1	45	51.4	-48.6	142.8	45	03.4	-49.0	143.4	44	15.1	-49.6	144.0	16
17	48	59.2	-46.1	140.3	48	12.8	-46.7	141.0	47	26.0	-47.3	141.7	46	38.7	-47.9	142.4	45	50.9	-48.4	143.0	45	02.8	-48.9	143.6	44	14.4	-49.5	144.2	43	25.5	-49.9	144.7	17
18	48	13.1	-46.5	141.3	47	26.1	-47.1	141.9	46	38.7	-47.8	142.6	45	50.8	-48.3	143.2	45	02.5	-48.7	143.8	44	13.9	-49.3	144.4	43	24.9	-49.7	145.0	42	35.6	-50.1	145.5	18
19	47	26.6	-47.0	142.2	46	39.0	-47.6	142.9	45	50.9	-48.1	143.5	45	02.5	-48.6	144.1	44	13.8	-49.2	144.7	43	24.6	-49.5	145.2	42	35.2	-50.4	145.7	41	45.5	-50.5	146.2	19
20	46	39.6	-47.4	143.1	45	51.4	-48.0	143.7	45	02.8	-48.4	144.3	44	13.9	-49.0	144.9	43	24.6	-49.4	145.5	42	35.1	-49.9	146.0	41	45.2	-50.3	146.5	40	55.0	-50.7	147.0	20
21	45	52.2	-47.9	144.0	45	03.4	-48.3	144.6	44	14.4	-48.9	145.2	43	24.9	-49.3	145.7	42	35.2	-49.7	146.2	41	45.2	-50.2	146.7	40	54.9	-50.6	147.2	40	04.3	-50.9	147.7	21
22	45	04.3	-48.2	144.9	44	15.1	-48.7	145.4	43	25.5	-49.1	146.0	42	35.6	-49.6	146.5	41	45.5	-50.0	147.0	40	55.0	-50.4	147.5	40	04.3	-50.8	147.9	39	13.4	-51.2	148.4	22
23	44	16.1	-48.5	145.7	43	26.4	-49.0	146.2	42	36.4	-49.5	146.8	41	46.0	-49.8	147.2	40	55.5	-50.3	147.7	39	13.5	-51.1	148.6	38	22.2	-51.5	149.0	37	30.7	-51.6	149.7	24
24	43	27.6	-48.9	146.5	42	37.4	-49.4	147.0	41	46.9	-49.8	147.5	40	56.2	-50.2	148.0	39	13.9	-50.9	148.9	38	22.4	-51.2	149.3	37	30.7	-51.6	149.7	25				
25	42	38.7	-49.3	147.3	41	48.0	-49.6	147.8	40	57.1	-50.0	148.3	40	06.0	-50.5	148.7	39	14.6	-50.8	149.1	38	23.0	-51.2	149.5	37	31.2	-51.6	149.9	36	39.1	-51.8	150.3	25
26	41	49.4	-49.5	148.1	40	58.4	-49.9	148.5	40	07.1	-50.3	149.0	39	15.5	-50.6	149.4	38	23.8	-51.8	149.8	37	31.8	-51.4	150.2	36	39.6	-51.7	150.6	26				
27	40	59.9	-49.8	148.8	40	08.5	-50.2	149.3	39	16.8	-50.6	149.7	38	24.9	-51.0	150.1	37	32.8	-51.3	150.5	36	40.4	-51.5	150.9	35	47.9	-51.9	151.2	34	55.3	-52.2	151.6	27
28	40	10.1	-50.1	149.6	39	18.3	-50.5	150.0	38	26.2	-50.8	150.4	37	33.9	-51.1	150.8	36	41.5	-51.5	151.2	35	50.0	-51.6	151.8	34	40.4	-52.3	152.4	33	10.7	-52.5	152.7	29
29	39	20.0	-50.3	150.3	38	27.8	-50.7	150.7	37	35.4	-51.0	151.1	36	42.8	-51.3	151.5	35	50.0	-51.6	151.8	34	35.6	-52.8	152.5	33	28.6	-53.2	153.3	32	46.3	-53.2	155.3	34
30	38	29.7	-50.6	151.0	37	37.1	-50.9	151.4	36	44.4	-51.3	151.7	35	51.5	-51.6	152.1	34	58.4	-51.9	152.4	34	05.1	-52.1	152.7	33	11.7	-52.4	153.0	32	18.2	-52.7	153.3	30
31	37	39.1	-50.8	151.7	36	46.2	-51.1	152.0	35	53.1	-51.4	152.4	34	59.9	-51.7	152.7	34	06.5	-52.0	153.0	33	13.0	-52.3	153.3	32	19.3	-52.6	153.6	31				
32	36	48.3	-51.0	152.3	35	55.1	-51.4	152.7	35	01.7	-51.6	153.0	34	08.2	-52.0	153.3	33	14.5	-52.2	153.6	32	20.7	-52.5	153.9	31	36.7	-53.0	154.4	30				
33	35	57.3	-51.3	153.0	35	03.7	-51.5	153.3	34	10.1	-51.9	153.6</																					

27°, 333° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	59	23.4	+29.8	116.9	58	55.5	+31.4	118.4	58	26.3	+32.9	119.8	57	55.8	+34.3	121.2	57	24.1	+35.7	122.6	56	51.2	+37.0	123.9	56	17.2	+38.3	125.1	55	42.2	+39.4	126.3	0
1	59	53.2	+28.4	115.2	59	26.9	+30.1	116.7	58	59.2	+31.7	118.2	58	30.1	+33.2	119.7	57	59.8	+34.6	121.1	57	28.2	+36.0	122.4	56	55.5	+37.3	123.7	56	21.6	+38.6	125.0	1
2	60	21.6	+27.0	113.4	59	57.0	+28.7	115.0	59	30.9	+30.4	116.6	59	03.3	+32.0	118.1	58	34.4	+33.5	119.5	58	04.2	+34.9	120.9	57	32.8	+36.3	122.3	57	00.2	+37.5	123.6	2
3	60	48.6	+25.5	111.6	60	25.7	+27.3	113.3	60	01.3	+29.0	114.9	59	35.3	+30.6	116.4	59	07.9	+32.2	117.9	58	39.1	+33.8	119.4	58	09.1	+35.1	120.8	57	37.7	+36.6	122.1	3
4	61	14.1	+23.9	109.8	60	53.0	+25.8	111.5	60	30.3	+27.5	113.1	60	05.9	+29.3	114.7	59	40.1	+31.0	116.3	59	12.9	+32.5	117.8	58	44.2	+34.1	119.2	58	14.3	+35.5	120.6	4
5	61	38.0	+22.3	107.8	61	18.8	+24.2	109.6	60	57.8	+26.1	111.3	60	35.2	+27.9	112.9	60	11.1	+29.6	114.5	59	45.4	+31.2	116.1	59	18.3	+32.8	117.6	58	49.8	+34.3	119.1	5
6	62	00.3	+20.5	105.9	61	43.0	+22.5	107.7	61	23.9	+24.5	109.4	61	03.1	+26.4	111.1	60	40.7	+28.1	112.8	60	16.6	+29.9	114.4	59	51.1	+31.5	116.0	59	24.1	+33.1	117.5	6
7	62	20.8	+18.8	103.9	62	05.5	+20.8	105.7	61	48.4	+22.8	107.5	61	29.5	+24.7	109.3	61	08.8	+26.7	111.0	60	46.5	+28.5	112.6	60	22.6	+30.2	114.3	59	57.2	+31.9	115.8	7
8	62	39.6	+16.8	101.8	62	26.3	+19.1	103.7	62	11.2	+21.1	105.5	61	54.2	+23.1	107.3	61	35.5	+25.0	109.1	61	15.0	+26.3	110.8	60	52.8	+28.8	112.5	60	29.1	+30.5	114.1	8
9	62	56.5	+15.0	99.7	62	45.4	+17.1	101.6	62	32.3	+19.3	103.5	62	17.3	+21.5	105.4	62	00.5	+23.5	107.2	61	41.9	+25.4	109.1	61	21.6	+27.2	110.7	60	59.6	+29.0	112.4	9
10	63	11.5	+13.0*	97.6	63	02.5	+15.3	99.5	62	51.6	+17.5	101.4	62	38.8	+19.6	103.3	62	24.0	+21.7	105.2	62	07.3	+23.7	107.0	61	48.8	+25.7	108.8	61	28.6	+27.6	110.6	10
11	63	24.5	+11.0*	95.4	63	17.8	+13.3*	97.4	63	09.1	+15.6	99.3	62	58.4	+17.7	101.3	62	45.7	+19.9	103.2	62	31.0	+22.0	105.1	62	14.5	+24.1	106.9	61	56.2	+26.0	108.7	11
12	63	35.5	+9.0	93.2	63	31.1	+11.3*	95.2	63	24.7	+13.6*	97.2	63	16.1	+15.9	99.2	63	05.6	+18.0	101.1	62	53.0	+20.3	103.0	62	38.6	+22.3	104.9	62	22.2	+24.3	106.8	12
13	63	44.5	+6.9*	91.0	63	42.4	+9.3*	93.0	63	38.3	+11.5*	95.0	63	32.0	+13.9*	97.0	63	23.6	+16.2	99.0	63	13.3	+18.3	100.9	63	00.9	+20.5	102.9	62	46.5	+22.7	104.8	13
14	63	51.4	+4.8*	88.7	63	51.7	+7.1*	90.7	63	49.8	+9.6*	92.8	63	45.9	+11.8*	94.8	63	39.8	+14.1*	96.8	63	31.6	+16.4	98.8	63	21.4	+18.6	100.8	63	09.2	+20.8	102.7	14
15	63	56.2	+2.6*	86.4	63	58.8	+5.1*	88.5	63	59.4	+7.4*	90.5	63	57.7	+9.8*	92.6	63	53.9	+12.9*	94.6	63	48.0	+14.5*	96.7	63	40.0	+16.8	98.7	63	30.0	+18.9	100.6	15
16	63	58.8	+0.6*	84.2	64	03.9	+2.9*	86.2	64	06.8	+5.2*	88.3	64	07.5	+7.7*	90.3	64	06.1	+10.0*	92.4	64	02.5	+12.4*	94.4	63	56.8	+14.7*	96.5	63	48.9	+17.1	98.5	16
17	63	59.4	-1.7*	81.9	64	06.8	+0.7*	83.9	64	12.0	+3.2*	86.0	64	15.2	+5.5*	88.1	64	16.1	+7.9*	90.1	64	14.9	+10.3*	92.2	64	11.5	+12.7*	94.3	64	06.0	+15.0*	96.3	17
18	63	57.7	-3.8*	79.6	64	07.5	-1.4*	81.6	64	15.2	+0.9*	83.7	64	20.7	+3.3*	85.8	64	24.0	+5.8*	87.8	64	25.2	+8.2*	89.9	64	24.2	+10.6*	92.0	64	21.0	+12.9*	94.1	18
19	63	53.9	-5.9*	77.3	64	06.1	-3.6*	79.3	64	16.1	-1.2*	81.4	64	24.0	+1.2*	83.4	64	29.8	+3.6*	85.5	64	33.4	+6.0*	87.6	64	34.8	+8.4*	89.7	64	33.9	+10.9*	91.8	19
20	63	48.0	-8.0*	75.1	64	02.5	-5.7*	77.1	64	14.9	-3.4*	79.1	64	25.2	-1.0*	81.1	64	33.4	+1.4*	83.2	64	39.4	+3.8*	85.3	64	43.2	+6.2*	87.4	64	44.8	+8.7*	89.5	20
21	63	40.0	-10.0*	72.8	63	56.8	-7.9*	74.8	64	11.5	-5.5*	76.8	64	24.2	-3.2*	78.8	64	34.8	-0.9*	80.9	64	43.2	+1.6*	83.0	64	49.4	+4.1*	85.1	64	53.5	+6.4*	87.2	21
22	63	30.0	-12.1*	70.6	63	48.9	-9.9*	72.5	64	06.0	-7.7*	74.5	64	21.0	-5.4*	76.5	64	33.9	-3.0*	78.6	64	44.8	-0.6*	80.6	64	53.5	+1.8*	82.7	64	59.9	+4.3*	84.9	22
23	63	17.9	-14.1	68.4	63	39.0	-11.9*	70.3	63	58.3	-9.8*	72.2	64	15.6	-7.5*	74.2	64	30.9	-5.2*	76.2	64	44.2	-2.9*	78.3	64	55.3	-0.5*	80.4	65	04.2	+2.0*	82.5	23
24	63	03.8	-16.0	66.3	63	27.1	-14.0*	68.1	63	48.5	-11.8*	70.0	64	08.1	-9.6*	71.9	64	25.7	-7.3*	73.9	64	41.3	-5.0*	75.9	64	54.8	-2.6*	78.0	65	06.2	-0.2*	80.1	24
25	62	47.8	-17.9	64.2	63	13.1	-15.9	65.9	63	36.7	-13.8*	67.8	63	58.5	-11.7*	69.7	64	18.4	-9.5*	71.6	64	36.3	-7.2*	73.6	64	52.2	-4.9*	75.7	65	06.0	-2.5*	77.7	25
26	62	29.9	-19.7	62.1	62	57.2	-17.8	63.8	62	22.9	-15.8	65.6	63	46.8	-13.8*	67.4	64	08.9	-11.6*	69.4	64	29.1	-9.4*	71.3	64	47.3	-7.1*	73.3	65	03.5	-4.8*	75.4	26
27	62	10.2	-21.4	60.1	62	39.4	-19.6	61.7	63	07.1	-17.7	63.5	63	33.0	-15.7	65.3	63	57.3	-13.7*	67.1	64	19.7	-11.5*	69.0	64	40.2	-9.3*	71.0	64	58.7	-6.9*	73.0	27
28	61	48.8	-23.1	58.1	62	19.8	-21.4	59.7	62	49.4	-19.6	61.4	63	17.3	-17.6	63.1	63	43.6	-15.6	64.9	64	08.2	-13.6	66.8	64	30.9	-11.4*	68.7	64	51.8	-9.2*	70.7	28
29	61	25.7	-24.8	56.1	61	58.4	-23.0	57.7	62	29.8	-21.3	59.3	62	59.7	-19.5	61.0	61	20.0	-17.6	62.7	63	54.6	-15.5	64.5	64	19.5	-13.4*	66.4	64	42.6	-11.3*	68.4	29
30	58	35.4	-33.1	45.5	59	16.9	-31.8	46.7	60	37.6	-29.2	49.3	61	15.8	-27.7	50.7	61	53.3	-26.3	52.1	62	29.5	-24.7	53.6	63	04.4	-23.0	55.2	35				
31	58	02.3	-34.1	43.9	58	45.1	-33.0	45.1	60	08.1	-30.6	47.5	60	48.1	-29.3	48.8	61	27.0	-27.8	50.2	62	04.8	-26.3	51.7	62	41.4	-24.7	53.2	36				
32	57	28.2	-35.3	42.4	58	12.1	-34.2	43.5	58	55.2	-33.0	44.6	59	37.5	-31.9	45.8	60	18.8	-30.6	47.1	60	59.2	-29.3	48.4	61	38.5	-27.8	49.8	62	16.7	-26.3	51.2	37
33	56	52.9	-36.3	40.9	57	37.9	-35.3	41.9	59	05.6	-33.1	44.1	59	48.2	-31.9	45.3	60	29.9	-30.6	46.6	61												

**LATITUDE CONTRARY NAME TO DECLINATION**      **L.H.A. 27°, 333°**

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	59	23.4	-31.2	116.9	58	55.5	-32.7	118.4	58	26.3	-34.1	119.8	57	55.8	-35.5	121.2	57	24.1	-36.8	122.6	56	51.2	-38.0	123.9	56	17.2	-39.2	125.1	55	42.2	-40.3	126.3	0
1	58	52.2	-32.4	118.6	58	22.8	-33.8	120.0	57	52.2	-35.2	121.4	57	20.3	-36.5	122.7	56	47.3	-37.7	124.0	56	13.2	-38.9	125.3	55	38.0	-40.0	126.5	55	01.9	-41.2	127.6	1
2	58	19.8	-33.6	120.2	57	49.0	-34.9	121.6	57	17.0	-36.3	122.9	56	43.8	-37.5	124.2	56	09.6	-38.7	125.4	55	34.3	-39.9	126.6	54	58.0	-40.9	127.8	54	20.7	-41.8	128.9	2
3	57	46.2	-34.7	121.8	57	14.1	-36.0	123.1	56	40.7	-37.2	124.4	56	06.3	-38.4	125.6	55	30.9	-39.6	126.8	54	54.4	-40.6	127.9	54	17.1	-41.6	129.0	53	38.9	-42.6	130.1	3
4	57	11.5	-35.7	123.3	56	38.1	-37.1	124.6	56	03.5	-38.2	125.8	55	27.9	-39.3	127.0	54	51.3	-40.4	128.1	54	13.8	-41.4	129.2	53	35.5	-42.4	130.3	52	56.3	-43.3	131.3	4
5	56	35.8	-36.8	124.8	56	01.0	-37.0	126.0	55	25.3	-39.1	127.2	54	48.6	-40.2	128.3	54	10.9	-41.1	129.4	53	32.4	-42.1	130.4	52	53.1	-43.0	131.5	52	13.0	-43.9	132.4	5
6	55	59.0	-37.7	126.2	55	23.1	-38.9	127.4	54	46.2	-39.9	128.5	54	08.4	-40.9	129.6	53	29.8	-41.9	130.6	52	50.3	-42.8	131.6	52	10.1	-43.7	132.6	51	29.1	-44.5	133.5	6
7	55	21.3	-38.6	127.6	54	44.2	-39.7	128.7	54	06.3	-40.7	129.8	53	27.5	-41.7	130.8	52	47.9	-42.6	131.8	52	07.5	-43.5	132.8	51	26.4	-44.3	133.7	50	44.6	-45.1	134.6	7
8	54	42.7	-39.5	128.9	54	04.5	-40.4	130.0	53	25.6	-41.5	131.0	52	45.8	-42.4	132.0	52	05.3	-43.3	133.0	51	24.0	-44.1	133.9	50	42.1	-44.9	134.8	49	59.5	-45.6	135.6	8
9	54	03.2	-40.3	130.2	53	24.1	-41.3	131.2	52	44.1	-42.2	132.2	52	03.4	-43.0	133.2	51	22.0	-43.9	134.1	50	39.9	-44.6	135.0	49	57.2	-45.4	135.8	49	13.9	-46.1	136.6	9
10	53	22.9	-41.0	131.4	52	42.8	-42.0	132.4	52	01.9	-42.8	133.4	51	20.4	-43.7	134.3	50	38.1	-44.4	135.2	49	55.3	-45.2	136.0	49	11.8	-45.4	136.8	48	27.8	-46.6	137.6	10
11	52	41.9	-41.8	132.7	52	00.8	-42.6	133.6	51	19.1	-43.5	134.5	50	36.7	-44.2	135.4	49	53.7	-45.0	136.2	49	10.1	-45.7	137.0	48	25.9	-46.4	137.8	47	41.2	-47.1	138.5	11
12	52	00.1	-42.5	133.8	51	18.2	-43.3	134.7	50	35.6	-44.0	135.6	49	08.7	-45.5	136.4	48	24.4	-46.3	138.0	47	39.5	-46.9	138.8	46	54.1	-47.4	139.5	12				
13	51	17.6	-43.0	135.0	50	34.9	-43.9	135.8	49	15.6	-44.7	136.7	49	07.6	-45.3	137.5	48	23.2	-46.1	138.2	47	38.1	-46.6	139.0	46	52.6	-47.2	139.7	46	06.7	-47.9	140.4	13
14	50	34.6	-43.7	136.1	49	51.0	-44.4	136.9	49	06.9	-45.1	137.7	48	22.3	-45.8	138.5	47	37.1	-46.5	139.2	46	51.5	-47.1	139.9	46	18.8	-48.3	141.2	44				
15	49	50.9	-44.3	137.2	49	06.6	-45.0	137.9	48	21.8	-45.7	138.7	47	36.5	-46.4	139.4	46	50.6	-46.9	140.1	46	04.4	-47.5	140.8	45	17.7	-48.1	141.4	44	30.5	-48.6	142.1	15
16	49	06.6	-44.8	138.2	48	21.6	-45.5	138.9	47	36.1	-46.1	139.7	46	50.1	-46.7	140.4	46	03.7	-47.3	141.0	45	16.9	-48.0	141.7	44	29.6	-48.5	142.3	43	41.9	-48.9	142.9	16
17	48	21.8	-45.3	139.2	47	36.1	-46.0	139.9	46	50.0	-46.6	140.6	46	03.4	-47.2	141.3	45	16.4	-47.8	141.9	44	28.9	-48.2	142.5	43	41.1	-48.7	143.1	42	53.0	-49.3	143.7	17
18	47	36.5	-45.9	140.2	46	50.1	-46.4	140.9	46	03.4	-47.0	141.5	45	16.2	-47.6	142.2	44	28.6	-48.1	142.8	43	40.7	-49.1	143.9	42	03.7	-49.6	144.4	18				
19	46	50.6	-46.2	141.1	46	03.7	-46.8	141.8	45	16.4	-47.5	142.4	44	28.6	-47.9	143.0	43	40.5	-48.4	143.6	42	52.1	-49.0	144.1	42	03.3	-49.5	144.7	19				
20	46	04.4	-46.7	142.1	45	16.9	-47.3	142.7	44	28.9	-47.8	143.3	43	40.7	-48.3	143.9	42	52.1	-48.8	144.4	42	03.1	-49.3	144.9	41	13.8	-49.7	145.4	40	24.3	-50.2	145.9	20
21	45	17.7	-47.2	143.0	44	29.6	-47.7	143.5	43	41.1	-48.1	144.1	42	52.4	-48.7	144.7	42	03.3	-49.2	145.2	41	13.8	-49.5	145.7	40	24.1	-50.0	146.2	39	34.1	-50.3	146.6	21
22	44	30.5	-47.5	143.8	43	41.9	-48.0	144.4	42	53.0	-48.5	144.9	42	03.7	-49.0	145.5	41	14.1	-49.4	146.0	40	24.3	-49.9	146.4	39	34.1	-50.2	146.9	38	43.8	-50.7	147.3	22
23	43	43.0	-47.8	144.7	42	53.9	-48.3	145.2	42	04.5	-48.8	145.7	41	14.7	-49.2	146.2	40	24.7	-49.7	146.7	39	34.4	-50.1	147.2	38	43.9	-50.5	147.6	37	53.1	-50.8	148.0	23
24	42	55.2	-48.3	145.5	42	05.6	-48.7	146.0	41	15.7	-49.2	146.5	40	25.5	-49.6	147.0	39	35.0	-49.9	147.4	38	44.3	-50.3	147.9	37	02.3	-51.1	148.7	24				
25	42	06.9	-48.5	146.3	41	16.9	-49.0	146.8	40	26.5	-49.4	147.3	39	35.9	-49.8	147.7	38	45.1	-50.2	148.2	37	02.7	-51.0	149.0	36	11.2	-51.3	149.4	25				
26	41	18.4	-48.9	147.1	40	27.9	-49.3	147.6	39	37.1	-49.7	148.0	38	46.1	-50.1	148.4	37	34.9	-50.5	148.9	36	11.7	-51.1	149.6	35	19.9	-51.5	150.0	26				
27	40	29.5	-49.2	147.9	39	38.6	-49.6	148.3	38	47.4	-50.0	148.7	37	56.0	-50.3	149.1	37	04.4	-50.7	149.5	36	12.6	-51.1	149.9	35	20.6	-51.4	150.3	27				
28	39	40.3	-49.4	148.6	38	49.0	-49.8	149.0	37	57.4	-50.2	149.4	37	05.7	-50.6	149.8	36	13.7	-50.9	150.2	35	21.5	-51.2	150.9	34	29.2	-51.5	151.2	28				
29	38	50.9	-49.7	149.3	37	59.2	-50.1	149.7	37	07.2	-50.4	150.1	37	07.2	-50.4	150.5	36	15.1	-50.8	150.5	35	22.8	-51.1	150.9	34	30.3	-51.4	151.2	33				
30	38	01.2	-50.0	150.1	37	09.1	-50.3	150.4	36	16.8	-50.7	150.8	35	24.3	-51.0	151.2	34	31.7	-51.3	151.5	33	38.9	-51.6	151.8	32	45.9	-51.9	152.1	31				
31	37	11.2	-50.2	150.8	36	18.8	-50.6	151.1	35	26.1	-50.8	151.5	34	33.3	-51.2	151.8	33	40.4	-51.5	152.1	32	47.3	-51.8	152.4	31	00.6	-52.3	153.0	31				
32	36	21.0	-50.4	151.4	35	28.2	-50.8	151.8	34	35.3	-51.1	152.1	33	42.1	-51.3	152.4	32	48.9	-51.7	152.7	31	05.5	-52.0	153.0	30	08.3	-52.5	153.6	32				
33	35	30.6	-50.7	152.1	34	37.4	-50.9	152.4	33	44.2	-51.2	152.8	32	50.8	-51.6	153.1	31	57.2	-51.8	153.3	30	03.5	-52.1	153.9	29	15.8	-52.6	154.1	33				
34	34	39.9	-50.9	152.8	33	46.5	-51.2	153.1	32	52.1	-51.5	153.7	31	59.2	-51.7	15																	

28°, 332° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	58	31.5	+29.0	116.0	58	04.5	+30.7	117.4	57	36.3	+32.1	118.8	57	06.7	+33.6	120.2	56	36.0	+34.9	121.5	56	04.1	+36.2	122.8	55	31.1	+37.5	124.0	54	57.0	+38.7	125.2	0
1	59	00.5	+27.8	114.3	58	35.2	+29.3	115.8	58	08.4	+30.9	117.2	57	40.3	+32.4	118.6	57	10.9	+33.9	120.0	56	40.3	+35.3	121.3	56	08.6	+36.5	122.6	55	35.7	+37.8	123.8	1
2	59	28.3	+26.3	112.5	59	04.5	+28.1	114.1	58	39.3	+29.7	115.6	58	12.7	+31.3	117.0	57	44.8	+32.7	118.5	57	15.6	+34.1	119.8	56	45.1	+35.6	121.2	56	13.5	+36.8	122.4	2
3	59	54.6	+24.8	110.8	59	32.6	+26.6	112.3	59	09.0	+28.3	113.9	58	44.0	+29.9	115.4	58	17.5	+31.5	116.9	57	49.7	+33.0	118.3	57	20.7	+34.4	119.7	56	50.3	+35.9	121.0	3
4	60	19.4	+23.3	108.9	59	59.2	+25.1	110.6	59	37.3	+26.9	112.2	59	13.9	+28.6	113.7	58	49.0	+30.3	115.2	58	22.7	+31.9	116.7	57	55.1	+33.3	118.1	57	26.2	+34.7	119.5	4
5	60	42.7	+21.7	107.1	60	24.3	+23.6	108.7	60	04.2	+25.4	110.4	59	42.5	+27.2	112.0	59	19.3	+28.9	113.6	58	54.6	+30.5	115.1	58	28.4	+32.1	116.6	58	00.9	+33.6	118.0	5
6	61	04.4	+20.1	105.1	60	47.9	+22.0	106.9	60	29.6	+23.9	108.6	60	09.7	+25.7	110.2	59	48.2	+27.5	111.8	59	25.1	+29.2	113.4	59	00.5	+30.9	114.9	58	34.5	+32.4	116.4	6
7	61	24.5	+18.3	103.2	61	09.9	+20.3	104.9	60	53.5	+22.3	106.7	60	35.4	+24.2	108.4	60	15.7	+26.0	110.1	59	54.3	+27.8	111.7	59	31.4	+29.5	113.3	59	06.9	+31.2	114.8	7
8	61	42.8	+16.5	101.2	61	30.2	+18.6	103.0	61	15.8	+20.6	104.8	60	59.6	+22.6	106.5	60	41.7	+24.5	108.2	60	22.1	+26.4	109.9	60	0.9	+28.1	111.5	59	38.1	+29.8	113.1	8
9	61	59.3	+14.7	99.1	61	48.8	+16.8	101.0	61	36.4	+18.9	102.8	61	22.2	+20.9	104.6	61	48.5	+24.8	108.1	60	29.0	+26.7	109.7	60	07.9	+28.5	111.4	9				
10	62	14.0	+12.8	97.1	62	05.6	+15.0	98.9	61	55.3	+17.1	100.8	61	43.1	+19.2	102.6	61	29.1	+21.3	104.4	61	13.3	+23.2	106.2	60	55.7	+25.1	107.9	60	36.4	+27.0	109.6	10
11	62	26.8	+10.9	95.0	62	20.6	+13.1	96.9	62	12.4	+15.3	98.8	62	02.3	+17.5	100.6	61	50.4	+19.5	102.5	61	36.5	+21.5	104.3	61	20.8	+23.5	106.0	61	03.4	+25.4	107.8	11
12	62	37.7	+8.9	92.8	62	33.7	+11.1	94.8	62	27.7	+13.4	96.7	62	19.8	+15.5	98.6	62	09.9	+17.7	100.4	61	58.0	+19.8	102.3	61	44.3	+21.9	104.1	61	28.8	+23.8	105.9	12
13	62	46.6	+6.9*	90.7	62	44.8	+9.2	92.6	62	41.1	+11.4	94.6	62	35.3	+13.7	96.5	62	27.6	+15.8	98.4	62	17.8	+18.1	100.3	62	06.2	+20.1	102.1	61	52.6	+22.2	104.0	13
14	62	53.5	+4.9*	88.5	62	54.0	+7.2*	90.5	62	52.5	+9.5*	92.4	62	49.0	+11.7*	94.4	62	43.4	+14.0	96.3	62	35.9	+16.1	98.2	62	26.3	+18.3	100.1	62	14.8	+20.5	102.0	14
15	62	58.4	+2.8*	86.3	63	01.2	+5.1*	88.3	63	02.0	+7.4*	90.2	63	00.7	+9.7*	92.2	62	57.4	+12.0*	94.2	62	52.0	+14.3	96.1	62	44.6	+16.5	98.0	62	35.3	+18.6	99.9	15
16	63	01.2	+0.8*	84.1	63	06.3	+3.1*	86.1	63	09.4	+5.4*	88.0	63	10.4	+7.7*	90.0	63	09.4	+10.0*	92.0	63	06.3	+12.2*	94.0	63	01.1	+14.5	95.9	62	53.9	+16.7	97.9	16
17	63	02.0	-1.3*	81.9	63	09.4	+1.0*	83.9	63	14.8	+3.3*	85.8	63	18.1	+5.7*	87.8	63	19.4	+7.9*	89.8	63	18.5	+10.3*	91.8	63	15.6	+12.6*	93.8	63	10.6	+14.9	95.8	17
18	63	03.7	-3.3*	79.7	63	10.4	-1.0*	81.6	63	18.1	+1.3*	83.6	63	23.8	+3.5*	85.6	63	27.3	+5.9*	87.6	63	28.8	+8.2*	89.6	63	28.2	+10.5*	91.6	63	25.5	+12.8*	93.6	18
19	62	57.4	-5.4*	77.5	63	09.4	-3.1*	79.4	63	19.4	-0.9*	81.4	63	27.3	+1.5*	83.4	63	33.2	+3.8*	85.4	63	37.0	+6.2*	87.4	63	38.7	+8.5*	89.4	63	38.3	+10.9*	91.4	19
20	62	52.0	-7.4	75.3	63	06.3	-5.2*	77.2	63	18.5	-2.9*	79.2	63	28.8	-0.6*	81.1	63	37.0	+1.7*	83.1	63	43.2	+4.0*	85.1	63	47.2	+6.4*	87.1	63	49.2	+8.7*	89.2	20
21	62	44.6	-9.3*	73.1	63	01.1	-7.2*	75.0	63	15.6	-5.0*	76.9	63	28.2	-2.7*	78.9	63	38.7	-0.4*	80.9	63	47.2	+2.0*	82.9	63	53.6	+4.3*	84.9	63	57.9	+6.7*	86.9	21
22	62	35.3	-11.4	71.0	62	53.9	-9.2*	72.8	63	10.6	-7.0*	74.7	63	25.5	-4.8*	76.7	63	38.3	-2.5*	78.6	63	49.2	-0.3*	80.6	63	57.9	+2.1*	82.6	64	04.6	+4.5*	84.7	22
23	62	23.9	-13.2	68.9	62	44.7	-11.2	70.7	63	03.6	-9.0*	72.5	63	20.7	-6.9*	74.4	63	35.8	-4.6*	76.4	63	48.9	-2.3*	78.3	64	00.0	0.0*	80.3	64	09.1	+2.3*	82.4	23
24	62	10.7	-15.2	66.8	62	33.5	-13.1	68.5	62	54.6	-11.1*	70.4	63	13.8	-8.9*	72.2	63	31.2	-6.7*	74.1	63	46.6	-4.4*	76.1	64	00.0	-2.1*	78.1	64	11.4	+0.2*	80.1	24
25	61	55.5	-16.9	64.7	62	20.4	-15.0	66.4	62	43.5	-13.0	68.2	63	04.9	+10.9*	70.0	63	24.5	-8.8*	71.9	63	42.2	-6.6*	73.8	63	57.9	-4.3*	75.8	64	11.6	-2.0*	77.8	25
26	61	38.6	-18.7	62.7	62	05.4	-16.9	64.3	62	30.5	-14.9	66.1	62	54.0	-12.9	67.9	63	15.7	-10.8	69.7	63	35.6	-8.6*	71.6	63	53.6	-6.4*	73.5	64	09.6	-4.1*	75.5	26
27	61	19.9	-20.5	60.7	61	48.5	-18.6	62.3	62	15.6	-16.7	64.0	62	41.1	-14.8	65.7	63	04.9	-12.7*	67.5	63	27.0	-10.7*	69.4	63	47.2	-8.5*	71.3	64	05.5	-6.3*	73.2	27
28	60	59.4	-22.0	58.7	61	29.9	-20.4	60.3	61	58.9	-18.6	61.9	62	26.3	-16.7	63.6	62	52.2	-14.8	65.4	63	16.3	-12.7	67.2	63	38.7	-10.6*	69.0	63	59.2	-8.3*	70.9	28
29	60	37.4	-23.7	56.8	61	09.5	-22.0	58.3	61	40.3	-20.3	59.9	62	09.6	-18.4	61.6	62	37.4	-16.5	63.3	63	36.3	-14.6	65.0	63	28.1	-12.5*	66.8	63	50.9	-10.5*	68.7	29
30	60	13.7	-25.2	55.0	60	47.5	-23.6	56.4	61	20.0	-21.9	57.9	61	51.2	-20.3	59.5	62	20.9	-18.5	61.2	62	49.0	-16.5	62.9	63	15.6	-14.6*	64.6	63	40.4	-12.5*	66.5	30
31	59	48.5	-26.7	53.1	60	23.9	-25.2	53.6	59	58.7	-26.1	54.1	61	30.9	-21.9	57.5	62	02.4	-20.1	59.1	63	32.5	-18.4	60.8	63	01.0	-16.5	62.5	63	27.9	-14.5	64.3	31
32	59	21.8	-28.0	51.4	59	58.7	-26.6	52.7	60	34.5	-25.1	54.1	61	09.0	-23.5	55.6	61	42.3	-21.9	57.1	62	14.1	-20.1	58.7	62	44.5	-18.3	62.1	62	32.2	-16.4	64.1	32
33	58	53.8	-29.4	49.7	59	32.1	-28.0	50.9	60	09.4	-26.7	52.3	60	45.5	-25.1	53.7	61	20															

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 28°, 332°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	58 31.5 -30.4	116.0	58 04.5 -31.9	117.4	57 36.3 -33.4	118.8	57 06.7 -34.7	120.2	56 36.0 -36.0	121.5	56 04.1 -37.3	122.8	55 31.1 -38.5	124.0	54 57.0 -39.5	125.2	54 17.5 -40.4	126.5	54 52.6 -39.2	125.3	54 37.1 -41.1	127.7	52 56.0 -41.9	128.9	52 14.1 -42.5	130.1	0
1	58 01.1 -31.6	117.6	57 32.6 -33.0	119.0	57 02.9 -34.4	120.3	56 32.0 -35.7	121.7	56 00.0 -37.0	122.9	55 26.8 -38.1	124.1	54 52.6 -39.2	125.3	54 17.5 -40.4	126.5	54 52.6 -39.2	125.3	54 37.1 -41.1	127.7	52 56.0 -41.9	128.9	52 14.1 -42.5	130.1	4		
2	57 29.5 -32.8	119.2	56 59.6 -34.1	120.5	56 28.5 -35.4	121.8	55 56.3 -36.7	123.1	55 23.0 -37.9	124.3	54 48.7 -39.1	125.5	54 13.4 -40.2	126.6	53 37.1 -41.1	127.7	52 56.0 -41.9	128.9	52 14.1 -42.5	130.1	2						
3	56 56.7 -33.9	120.7	56 25.5 -35.2	122.0	55 53.1 -36.5	123.3	55 19.6 -37.6	124.5	54 45.1 -38.8	125.7	54 09.6 -39.8	126.8	53 33.2 -40.2	127.9	52 56.0 -41.9	128.9	52 14.1 -42.5	130.1	3								
4	56 22.8 -34.9	122.2	55 50.3 -36.2	123.5	55 16.6 -37.4	124.7	54 42.0 -38.6	125.9	54 06.3 -39.6	127.0	53 29.8 -40.6	128.1	52 52.4 -41.7	129.1	52 14.1 -42.5	130.1	4										
5	55 47.9 -36.0	123.7	55 14.1 -37.2	124.9	54 39.2 -38.2	126.1	54 03.4 -39.3	127.2	53 26.7 -40.4	128.3	52 49.2 -41.4	129.3	52 10.7 -42.3	130.3	51 31.6 -43.2	131.3	51 17.5 -44.2	132.3	51 28.4 -42.9	131.4	50 48.4 -43.8	132.4	50 04.6 -44.4	133.4	5		
6	55 11.9 -36.9	125.1	54 36.9 -38.0	126.3	54 01.0 -39.2	127.4	53 24.1 -40.2	128.5	52 46.3 -41.1	129.5	52 07.8 -42.1	130.5	51 28.4 -42.9	131.4	50 48.4 -43.8	132.4	50 04.6 -44.4	133.4	6								
7	54 35.0 -37.8	126.5	53 58.9 -38.9	127.6	53 21.8 -39.9	128.7	52 43.9 -40.9	129.7	52 05.2 -41.8	130.7	51 25.7 -42.7	131.6	50 45.5 -43.6	132.6	50 04.6 -44.4	133.4	7										
8	53 57.2 -38.6	127.8	53 20.0 -39.7	128.9	52 41.9 -40.7	129.9	52 03.0 -41.6	130.9	51 23.4 -42.5	131.8	50 43.0 -43.3	132.8	50 01.9 -44.1	133.6	49 20.2 -44.9	134.5	49 07.0 -44.7	134.7	48 35.3 -45.4	135.5	9						
9	53 18.6 -39.5	129.1	52 40.3 -40.4	130.1	52 01.2 -41.3	131.1	51 21.4 -42.2	132.1	50 40.9 -43.1	133.0	49 59.7 -44.0	133.8	49 17.8 -44.7	134.7	48 35.3 -45.4	135.5	9										
10	52 39.1 -40.2	130.3	51 59.9 -41.2	131.3	51 19.9 -42.1	132.3	50 39.2 -43.0	133.2	49 57.8 -43.8	134.1	49 15.7 -44.5	134.9	48 33.1 -45.2	135.7	47 49.9 -46.0	136.5	10										
11	51 58.9 -41.0	131.6	51 18.7 -41.2	132.5	50 37.8 -42.7	133.4	49 56.2 -43.5	134.3	49 14.0 -44.2	135.1	48 31.2 -45.0	135.9	47 47.9 -45.7	136.7	47 03.9 -46.3	137.4	11										
12	51 17.9 -41.6	132.7	50 36.8 -42.5	133.6	49 55.1 -43.3	134.5	49 12.7 -44.0	135.3	48 29.8 -44.8	136.1	47 46.2 -45.5	136.9	47 02.2 -46.2	137.6	46 17.6 -46.8	138.3	12										
13	50 36.3 -42.3	133.9	49 54.3 -43.1	134.7	49 11.8 -43.9	135.6	48 28.7 -44.7	136.4	47 45.0 -45.4	137.1	47 00.7 -46.0	137.9	46 16.0 -46.6	138.6	45 30.8 -47.3	139.2	13										
14	49 54.0 -43.0	135.0	49 11.2 -43.7	135.8	48 27.9 -44.4	136.6	47 44.0 -45.1	137.4	46 59.6 -45.7	138.1	46 14.7 -46.4	138.8	45 29.4 -47.1	139.5	44 43.5 -47.6	140.1	14										
15	49 11.0 -43.5	136.1	48 27.5 -44.2	136.9	47 43.5 -44.9	137.6	46 58.9 -45.6	138.3	46 13.9 -46.3	139.0	45 28.3 -46.8	139.7	44 42.3 -47.4	140.4	43 55.9 -48.0	141.0	15										
16	48 27.5 -44.0	137.1	47 43.3 -44.7	137.9	46 58.6 -45.5	138.6	46 13.3 -46.0	139.3	45 27.6 -46.6	140.0	44 41.5 -47.3	140.6	43 54.9 -47.8	141.2	43 07.9 -48.3	141.8	16										
17	47 43.5 -44.6	138.1	46 58.6 -45.3	138.9	46 13.1 -45.8	139.5	45 27.3 -46.5	140.2	44 41.0 -47.1	140.8	43 54.2 -47.6	141.5	43 07.1 -48.2	142.0	42 19.6 -48.6	142.6	17										
18	46 58.9 -45.0	139.1	46 13.3 -45.7	139.8	45 27.3 -46.3	140.5	44 40.8 -46.9	141.1	43 53.9 -47.5	141.7	43 06.6 -48.0	142.3	42 18.9 -48.4	142.9	41 31.0 -49.0	143.4	18										
19	46 13.9 -45.6	140.1	45 27.6 -46.1	140.7	44 41.0 -46.8	141.4	43 53.9 -47.3	142.0	42 06.4 -47.8	142.6	42 18.6 -48.3	143.1	41 30.5 -48.4	143.6	40 42.0 -49.3	144.2	19										
20	45 28.3 -46.0	141.0	44 41.5 -46.6	141.6	43 54.2 -47.1	142.2	43 06.6 -47.7	142.8	42 18.6 -48.1	143.4	41 30.3 -48.6	143.9	40 41.7 -49.2	144.4	39 52.7 -49.5	144.9	20										
21	44 42.3 -46.4	141.9	43 54.9 -47.0	142.5	43 07.1 -47.5	143.1	42 18.9 -47.9	143.6	41 30.5 -48.5	144.2	40 41.7 -49.0	144.7	39 52.5 -49.3	145.2	39 03.2 -49.9	145.6	21										
22	43 55.9 -46.8	142.8	43 07.9 -47.3	143.4	42 19.6 -47.8	143.9	41 31.0 -48.4	144.5	40 42.0 -48.8	145.0	39 52.7 -49.2	145.4	39 03.2 -49.7	145.9	38 13.3 -50.0	146.4	22										
23	43 09.1 -47.2	143.7	42 20.6 -47.7	144.2	41 31.8 -48.2	144.7	40 42.6 -48.6	145.2	39 53.2 -49.1	145.7	39 03.5 -49.5	146.2	38 13.5 -49.9	146.6	37 23.3 -50.4	147.1	23										
24	42 21.9 -47.5	144.5	41 32.9 -48.0	145.0	40 43.6 -48.5	145.5	39 54.0 -49.0	146.0	39 04.1 -49.4	146.5	38 14.0 -49.8	146.9	37 23.6 -50.2	147.3	36 32.9 -50.5	147.7	24										
25	41 34.4 -47.9	145.3	40 44.9 -48.4	145.8	39 55.1 -48.8	146.3	39 05.0 -49.2	146.8	38 14.7 -49.6	147.2	37 24.2 -50.0	147.6	36 33.4 -50.4	148.0	35 42.4 -50.7	148.4	25										
26	40 46.5 -48.2	146.1	39 56.5 -48.6	146.6	39 06.3 -49.1	147.1	38 15.8 -49.5	147.5	37 25.1 -49.9	147.9	36 34.2 -50.3	148.3	35 43.0 -50.6	148.7	34 51.7 -51.0	149.1	26										
27	39 58.3 -48.5	146.9	39 07.9 -49.0	147.4	38 17.2 -49.3	147.8	37 26.3 -49.7	148.2	36 35.2 -50.1	148.6	35 43.9 -50.5	149.0	34 52.4 -50.8	149.3	34 00.7 -51.2	149.7	27										
28	39 09.8 -48.9	147.7	38 18.9 -49.2	148.1	37 27.9 -49.6	148.5	36 36.6 -50.0	148.9	35 45.1 -50.3	149.3	34 53.4 -50.6	149.6	34 01.6 -51.0	150.0	33 09.5 -51.3	150.3	28										
29	38 20.9 -49.0	148.4	37 29.7 -49.5	148.8	36 38.3 -49.9	149.2	35 46.6 -50.2	149.6	34 54.8 -50.6	150.0	34 02.8 -50.9	150.3	33 10.6 -51.3	150.6	32 18.2 -51.5	150.9	29										
30	37 31.9 -49.4	149.2	36 40.2 -49.7	149.5	35 48.4 -50.1	149.9	34 56.4 -50.4	150.3	34 04.2 -50.7	150.6	33 11.9 -51.1	150.9	32 19.3 -51.3	151.2	31 26.7 -51.7	151.5	30										
31	36 42.5 -49.6	149.9	35 50.5 -49.9	150.2	34 58.3 -50.3	150.6	34 06.0 -50.6	150.9	33 13.5 -51.0	151.2	32 20.8 -51.3	151.6	31 28.0 -51.6	151.8	30 35.0 -51.9	152.1	31										
32	35 52.9 -49.8	150.6	35 00.6 -50.2	150.9	34 08.0 -50.5	151.2	33 15.4 -50.9	151.6	32 22.5 -51.1	151.9	31 29.5 -51.4	152.2	30 36.4 -51.7	152.4	29 43.1 -52.0	152.7	32										
33	35 03.1 -50.1	151.3	34 10.4 -50.4	151.6	33 17.5 -50.7	151.9	32 24.5 -51.0	152.2	31 31.4 -51.3	152.5	30 38.1 -51.6	152.8	29 44.7 -51.9	153.0	28 51.1 -52.1	153.3	33										
34	34 13.0 -50.3	151.9	33 20.0 -50.6	152.2	32 26.8 -50.9	152.5	31 33.5 -51.2	152.8	30 40.1 -51.5	153.1	29 46.5 -51.7	153.4	28 52.8 -52.0	153.6	27 59.0 -52.3	153.8	34										
35	33 22.7 -50.5	152.6	32 29.4 -50.8	152.9	31 35.9 -51.1	153.2	30 42.3 -51.3	153.4	29 48.6 -51.6	153.7	28 54.8 -51.9	153.9	28 00.8 -52.1	154.2	27 06.7 -52.4	154.4	35										
36	32 32.2 -50.6	153.2	31 38.6 -51.0	153.5	30 44.8 -51.2	153.8	29 51.0 -51.6	154.0	28 57.0 -51.8	154.3	28 02.9 -52.1	154.5	27 08.7 -52.3	154.7	26 14.3 -52.5	154.9	36										
37	31 41.6 -50.9	153.9	30 47.6 -51.9	154.1	29 53.6 -51.4	154.4	28 59.4 -51.6	154.6	28 05.2 -51.9	154.9	27 10.8 -52.1	155.2	26 16.4 -52.4	155.3	25 21.8 -52.6	155.5	37										
38	30 50.7 -51.0	154.5	29 56.5 -51.3	154.7	29 02.2 -51.6	155.0	28 07.8 -51.8	155.2	27 13.3 -52.1	155.4	26 24.0 -52.6	155.8	24 29.2 -52.8	156.0	24 36.4 -52.8	156.5	38										
39	29 59.7 -51.2	155.1	29 05.2 -51.5	155.3	28 10.6 -51.7	155.6	27 16.0 -52.0	155.8	26 21.2 -52.2</																		

29°, 331° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	57	39.1	+28.4	115.0	57	13.1	+29.9	116.4	56	45.7	+31.5	117.8	56	17.1	+32.9	119.1	55	47.3	+34.2	120.4	55	16.4	+35.5	121.7	54	44.3	+36.8	122.9	54	11.2	+38.0	124.1	0
1	58	07.5	+27.1	113.4	57	43.0	+28.7	114.8	57	17.2	+30.2	116.2	56	50.0	+31.7	117.6	56	21.5	+33.2	119.0	55	51.9	+34.5	120.3	55	21.1	+35.8	121.5	54	49.2	+37.1	122.7	1
2	58	34.6	+25.7	111.7	58	11.7	+27.3	113.2	57	47.4	+28.9	114.6	57	21.7	+30.5	116.1	56	54.7	+32.0	117.4	56	26.4	+33.5	118.8	55	56.9	+34.8	120.1	55	26.3	+36.1	121.3	2
3	59	00.3	+24.2	109.9	58	39.0	+26.0	111.5	58	16.3	+27.7	113.0	57	52.2	+29.3	114.4	57	26.7	+30.8	115.9	56	59.9	+32.3	117.3	56	31.7	+33.8	118.6	56	02.4	+35.1	119.9	3
4	59	24.5	+22.7	108.1	59	05.0	+24.5	109.7	58	44.0	+26.3	111.3	58	21.5	+27.9	112.8	57	57.5	+29.6	114.3	57	32.2	+31.1	115.7	57	05.5	+32.6	117.1	56	37.5	+34.1	118.5	4
5	59	47.2	+21.2	106.3	59	29.5	+23.1	107.9	59	10.3	+24.8	109.5	58	49.4	+26.6	111.1	58	27.1	+28.3	112.6	58	03.3	+29.8	114.1	57	38.1	+31.4	115.5	57	11.6	+32.9	117.0	5
6	60	08.4	+19.6	104.4	59	52.6	+21.5	106.1	59	35.1	+23.3	107.8	59	16.0	+25.2	109.4	58	55.6	+26.8	110.9	58	33.2	+28.5	112.5	58	09.5	+30.2	113.9	57	44.5	+31.7	115.4	6
7	60	28.0	+17.8	102.5	60	14.1	+19.8	104.2	59	58.4	+21.8	105.9	59	41.2	+23.6	107.6	59	22.2	+25.5	109.2	59	01.7	+27.3	110.8	58	39.7	+28.9	112.3	58	16.2	+30.6	113.8	7
8	60	45.8	+16.2	100.6	60	33.9	+18.2	102.3	60	20.2	+20.2	104.0	60	04.8	+22.1	105.7	59	47.7	+24.0	107.4	59	29.0	+25.7	109.0	59	08.6	+27.6	110.6	58	46.8	+29.2	112.1	8
9	61	02.0	+14.4	98.6	60	52.1	+16.5	100.4	60	40.4	+18.5	102.1	60	26.9	+20.5	103.9	60	11.7	+22.4	105.6	59	54.7	+24.3	107.2	59	36.2	+26.1	108.9	59	16.0	+27.8	110.5	9
10	61	16.4	+12.6	96.6	61	08.6	+14.7	98.4	60	58.9	+16.8	100.2	60	47.4	+18.8	101.9	60	34.1	+20.8	103.7	60	19.0	+22.8	105.4	60	02.3	+24.6	107.1	59	43.8	+26.5	108.7	10
11	61	29.0	+10.8	94.6	61	23.3	+12.9	96.4	61	15.7	+15.0	98.2	61	06.2	+17.1	100.0	60	54.9	+19.1	101.8	60	41.8	+21.1	103.5	60	26.9	+23.0	105.2	60	10.3	+24.9	106.9	11
12	61	39.8	+8.8	92.5	61	36.2	+11.0	94.3	61	30.7	+13.2	96.2	61	23.3	+15.3	98.0	61	14.0	+17.4	99.8	61	02.9	+19.1	101.6	60	49.9	+21.4	103.3	60	35.2	+23.4	105.1	12
13	61	48.6	+6.9	90.4	61	47.2	+9.1	92.3	61	43.9	+11.3	94.1	61	38.6	+13.5	96.0	61	31.4	+15.6	97.8	61	22.3	+17.7	99.6	61	11.3	+19.8	101.4	60	58.6	+21.7	103.2	13
14	61	55.5	+5.0	88.3	61	56.3	+7.2	90.2	61	55.2	+9.4	92.0	61	52.1	+11.6	93.9	61	47.0	+13.8	95.8	61	40.0	+15.9	97.6	61	31.1	+18.0	99.4	61	20.3	+20.1	101.3	14
15	62	00.5	+3.0	86.2	62	03.5	+5.3	88.1	62	04.6	+7.5	89.9	62	03.7	+9.7	91.8	62	00.8	+11.9	93.7	61	55.9	+14.1	95.6	61	49.1	+16.2	97.4	61	40.4	+18.3	99.3	15
16	62	03.5	+1.1	84.0	62	08.8	+3.3*	85.9	62	12.1	+5.5*	87.8	62	13.4	+7.7	89.7	62	12.7	+9.9	91.6	62	10.0	+12.2	93.5	62	05.3	+14.4	95.4	61	58.7	+16.6	97.3	16
17	62	04.6	-0.9*	81.9	62	12.1	+1.3*	83.8	62	17.6	+3.5*	85.7	62	21.1	+5.8	87.6	62	22.6	+8.1	89.5	62	22.2	+10.2	91.4	62	19.7	+12.5	93.3	62	15.3	+14.6	95.2	17
18	62	03.7	-2.9*	79.8	62	13.4	-0.7*	81.6	62	21.1	+1.5	83.5	62	26.9	+3.8*	85.4	62	30.7	+6.0*	87.3	62	32.4	+8.3	89.3	62	32.2	+10.5	91.2	62	29.9	+12.8	93.1	18
19	62	00.8	-4.9	77.6	62	12.7	-2.7*	79.5	62	22.6	-0.4*	81.4	62	30.7	+1.7*	83.3	62	36.7	+4.0*	85.2	62	40.7	+6.3*	87.1	62	42.7	+8.6*	89.1	62	42.7	+10.8	91.0	19
20	61	55.9	-6.8	75.5	62	10.0	-4.7	77.4	62	22.2	-2.5*	79.2	62	32.4	-0.2*	81.1	62	40.7	+2.0*	83.0	62	47.0	+4.3*	84.9	62	51.3	+6.5*	86.9	62	53.5	+8.9*	88.8	20
21	61	49.1	-8.7	73.4	62	05.3	-6.6	75.2	62	19.7	-4.4*	77.1	62	32.2	-2.3*	78.9	62	42.7	0.0*	80.8	62	51.3	+2.2*	82.8	62	57.8	+4.6*	84.7	63	02.4	+6.8*	86.7	21
22	61	40.4	-10.6	71.3	61	58.7	-8.5	73.1	62	15.3	-6.5	74.9	62	29.9	-4.2*	76.8	62	42.7	-2.0	78.7	62	53.5	+0.2*	80.6	63	02.4	+4.7*	84.5	22				
23	61	29.8	-12.5	69.3	61	50.2	-10.5	71.0	62	08.8	-8.3	72.8	62	25.7	-6.3*	74.6	62	40.7	-4.1*	76.5	62	53.7	-1.8*	78.4	63	04.8	+0.4*	80.3	63	13.9	+2.7*	82.3	23
24	61	17.3	-14.3	67.2	61	39.7	-12.3	68.9	62	00.5	-10.3	70.7	62	19.4	-8.2	72.5	62	36.6	-6.1	74.3	62	51.9	-3.9*	76.2	63	05.2	-1.6*	78.1	63	16.6	+0.6*	80.0	24
25	61	03.0	-16.0	65.2	61	27.4	-14.1	66.9	61	50.2	-12.2	68.6	62	11.2	-10.1	70.3	62	30.5	-8.0*	72.1	62	48.0	-5.9*	74.0	63	03.6	-3.7*	75.9	63	17.2	-1.4*	77.8	25
26	60	47.0	-17.8	63.2	61	13.3	-16.0	64.8	61	38.0	-14.1	66.5	62	01.1	-12.1	68.2	62	22.5	-10.1	70.0	62	42.1	-7.9*	71.8	62	59.9	-5.8*	73.7	63	15.8	-3.6*	75.6	26
27	60	29.2	-19.5	61.3	60	57.3	-17.7	62.8	61	23.9	-15.8	64.5	61	49.0	-13.9	66.2	62	12.4	-11.9	67.9	62	34.2	-9.9*	69.7	62	54.1	-7.8	71.5	63	12.2	-5.6*	73.4	27
28	60	09.7	-21.0	59.4	60	39.6	-19.3	60.9	61	08.1	-17.6	62.5	61	35.1	-15.8	64.1	62	00.5	-13.8	65.8	62	24.3	-11.9	67.5	62	46.3	-9.7*	69.3	63	06.6	-7.8	71.2	28
29	59	48.7	-22.7	57.5	60	20.3	-21.0	59.0	58	50.5	-26.9	51.2	59	35.3	-25.5	52.6	60	11.2	-24.0	53.9	60	45.9	-22.5	55.4	61	19.3	-20.8	56.9	61	51.4	-19.0	58.4	34
30	59	26.0	-24.1	55.7	59	59.3	-22.6	57.1	60	31.2	-20.9	58.6	61	01.8	-19.2	60.1	61	31.0	-17.4	61.7	61	58.7	-15.5	63.3	62	24.8	-13.6	65.0	62	49.3	-11.6	66.8	30
31	59	01.9	-25.6	53.9	59	36.7	-24.1	55.2	60	10.3	-22.5	56.7	60	42.6	-20.9	58.2	61	13.6	-19.2	59.7	61	43.2	-17.4	61.3	62	11.2	-15.5	63.0	62	37.7	-13.6	64.7	31
32	58	36.3	-26.9	52.1	59	12.6	-25.5	53.4	59	47.8	-24.1	54.8	60	21.7	-22.4	56.2	60	54.4	-20.8	57.7	61	25.8	-19.1	59.3	61	55.7	-17.3	62.6	62	21.1	-15.4	64.6	32
33	58	09.4	-28.3	50.4	58	47.1	-27.0	51.7	59	23.7	-25.5	53.0	59	59.3	-24.0	54.4	60	33.6</															

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 29°, 331°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	57 39.1	-29.6	115.0	57 13.1	-31.1	116.4	56 45.7	-32.5	117.8	56 17.1	-33.9	119.1	55 47.3	-35.2	120.4	55 16.4	-36.5	121.7	54 44.3	-37.7	122.9	54 11.2	-38.8	124.1	0
1	57 09.5	-30.9	116.6	56 42.0	-32.3	118.0	56 13.2	-33.7	119.3	55 43.2	-35.0	120.6	55 12.1	-36.2	121.9	54 39.9	-37.4	123.1	54 06.6	-38.5	124.2	53 32.4	-39.6	125.3	1
2	56 38.6	-32.0	118.2	56 09.7	-33.4	119.5	55 39.5	-34.7	120.8	55 08.2	-35.9	122.0	54 35.9	-37.2	123.2	54 02.5	-38.3	124.4	53 28.1	-39.4	125.5	52 52.8	-40.5	126.6	2
3	56 06.6	-33.1	119.7	55 36.3	-34.4	121.0	55 04.8	-35.7	122.2	54 32.3	-36.9	123.4	53 58.7	-38.0	124.6	53 24.2	-39.1	125.7	52 48.7	-40.1	126.8	52 12.3	-41.1	127.8	3
4	55 33.5	-34.1	121.2	55 01.9	-35.4	122.5	54 29.1	-36.6	123.6	53 55.4	-37.7	124.8	53 20.7	-38.8	125.9	52 45.1	-39.9	127.0	52 08.6	-40.9	128.0	51 31.2	-41.8	129.0	4
5	54 59.4	-35.2	122.7	54 26.5	-36.4	123.9	53 52.5	-37.5	125.0	53 17.7	-38.6	126.1	52 41.9	-39.7	127.2	52 05.2	-40.6	128.2	51 27.7	-41.6	129.2	50 49.4	-42.5	130.1	5
6	54 24.2	-36.1	124.1	53 50.1	-37.2	125.2	53 15.0	-38.3	126.3	52 39.1	-39.4	127.4	52 02.2	-40.4	128.4	51 24.6	-41.4	129.4	50 46.1	-42.2	130.3	50 06.9	-43.1	131.2	6
7	53 48.1	-37.0	125.4	53 12.9	-38.1	126.5	52 36.7	-39.1	127.6	51 59.7	-40.2	128.6	51 21.8	-41.0	129.6	50 43.2	-42.0	130.5	50 03.9	-42.9	131.4	49 23.8	-43.7	132.3	7
8	53 11.1	-37.9	126.8	52 34.8	-38.9	127.8	51 57.6	-39.9	128.8	51 19.5	-40.8	129.8	50 40.8	-41.8	130.7	50 01.2	-42.6	131.7	49 21.0	-43.4	132.5	48 40.1	-44.2	133.4	8
9	52 33.2	-38.6	128.0	51 55.9	-39.7	129.1	51 17.7	-40.7	130.0	50 38.7	-41.5	131.0	49 59.0	-42.4	131.9	48 37.6	-43.2	132.7	47 55.9	-44.7	134.4	47 07.5	-45.7	135.4	9
10	51 54.6	-39.5	129.3	51 16.2	-40.4	130.3	50 37.0	-41.3	131.2	49 57.2	-42.2	132.1	49 16.6	-43.0	133.0	48 35.4	-43.8	133.8	47 53.6	-44.6	134.6	47 11.2	-45.3	135.4	10
11	51 15.1	-40.1	130.5	50 35.8	-41.1	131.4	49 55.7	-41.9	132.3	49 15.0	-42.8	133.2	48 33.6	-43.5	134.0	47 51.6	-44.3	134.8	47 09.0	-45.0	135.6	46 25.9	-45.7	136.3	11
12	50 35.0	-40.9	131.7	49 54.7	-41.7	132.6	49 13.8	-42.5	133.4	48 32.2	-43.3	134.3	47 50.1	-44.1	135.1	47 07.3	-44.8	135.8	46 24.0	-45.5	136.6	45 40.2	-46.2	137.3	12
13	49 54.1	-41.5	132.8	49 13.0	-42.3	133.7	48 31.3	-43.2	134.5	47 48.9	-43.9	135.3	47 06.0	-44.6	136.1	46 22.5	-45.3	136.8	45 38.5	-45.9	137.5	44 54.0	-46.5	138.2	13
14	49 12.6	-42.1	133.9	48 30.7	-43.0	134.8	47 48.1	-43.7	135.5	47 05.0	-44.4	136.3	46 21.4	-45.1	137.0	45 37.2	-45.7	137.7	44 52.6	-46.4	138.4	44 07.5	-47.0	139.1	14
15	48 30.5	-42.8	135.0	47 47.7	-43.5	135.8	47 04.4	-44.2	136.6	46 20.6	-44.9	137.3	45 36.3	-45.6	138.0	44 51.5	-46.2	138.7	44 06.2	-46.8	139.3	43 20.5	-47.4	139.9	15
16	47 47.7	-43.3	136.1	47 04.2	-44.0	136.8	46 20.2	-44.7	137.5	45 35.7	-45.4	138.2	44 50.7	-46.0	138.9	44 05.3	-46.6	139.5	43 19.4	-47.1	140.2	42 33.1	-47.7	140.8	16
17	47 04.4	-43.8	137.1	46 20.2	-44.5	137.8	45 35.5	-45.2	138.5	44 50.3	-45.8	139.2	44 04.7	-46.4	139.8	43 18.7	-47.0	140.4	42 32.3	-47.6	141.0	41 45.4	-48.0	141.6	17
18	46 20.6	-44.3	138.1	45 35.7	-45.0	138.8	44 50.3	-45.6	139.4	44 04.5	-46.2	140.1	43 18.3	-46.8	140.7	42 31.7	-47.3	141.3	41 44.7	-47.8	141.8	40 57.4	-48.4	142.4	18
19	45 36.3	-44.8	139.1	44 50.7	-45.4	139.7	44 04.7	-46.0	140.4	43 18.3	-46.6	141.0	42 31.5	-47.1	141.5	41 44.7	-47.7	142.1	40 56.9	-48.2	142.6	40 09.0	-48.7	143.2	19
20	44 51.5	-45.3	140.0	44 05.3	-45.9	140.6	43 18.7	-46.4	141.2	42 31.7	-47.0	141.8	41 44.4	-47.5	142.4	40 56.7	-48.0	142.9	40 08.7	-48.5	143.4	39 20.3	-48.9	143.9	20
21	44 06.2	-45.7	140.9	43 19.4	-46.3	141.5	42 32.3	-46.9	142.1	41 44.7	-47.3	142.7	40 56.9	-47.9	143.2	40 08.7	-48.4	143.7	39 20.2	-48.8	144.2	38 31.4	-49.3	144.7	21
22	43 20.5	-46.1	141.8	42 33.1	-46.6	142.4	41 45.4	-47.2	142.9	40 57.4	-47.7	143.5	40 09.0	-48.2	144.0	39 20.3	-48.6	144.5	38 31.4	-49.1	144.9	37 42.1	-49.5	145.4	22
23	42 34.4	-46.5	142.7	41 46.5	-47.0	143.2	40 58.2	-47.5	143.8	40 09.7	-48.0	144.3	39 20.8	-48.4	144.8	38 31.7	-48.9	145.2	37 42.3	-49.4	145.7	36 52.6	-49.7	146.1	23
24	41 47.9	-46.9	143.6	40 59.5	-47.4	144.1	40 10.7	-47.8	144.6	39 21.7	-48.3	145.1	38 32.4	-48.8	145.5	37 42.8	-49.2	146.0	36 52.9	-49.6	146.4	36 02.9	-50.0	146.8	24
25	41 01.0	-47.2	144.4	40 12.1	-47.7	144.9	39 22.9	-48.2	145.4	38 33.4	-48.6	145.8	37 43.6	-49.0	146.3	36 53.6	-49.4	146.7	36 03.3	-49.8	147.1	35 12.9	-50.2	147.5	25
26	40 13.8	-47.5	145.2	39 24.4	-48.0	145.7	38 34.7	-48.4	146.1	37 44.8	-48.9	146.6	36 54.6	-49.3	147.0	36 04.2	-49.7	147.4	35 13.5	-50.4	148.1	34 22.7	-50.5	148.6	26
27	39 26.3	-47.9	146.0	38 36.4	-48.3	146.4	37 46.3	-48.8	146.9	36 55.9	-49.2	147.3	36 05.3	-49.5	147.7	35 14.5	-49.9	148.1	34 23.5	-50.3	148.4	33 32.2	-50.6	148.8	27
28	38 38.4	-48.2	146.8	37 48.1	-48.6	147.2	36 57.5	-49.0	147.6	36 06.7	-49.3	148.0	35 15.8	-49.8	148.4	34 24.6	-50.2	148.7	33 33.2	-50.5	149.1	32 41.6	-50.8	149.4	28
29	37 50.2	-48.4	147.5	36 59.5	-48.8	147.9	36 08.5	-49.2	148.3	35 17.4	-47.9	147.8	34 26.0	-50.0	149.1	33 34.4	-50.3	149.4	32 42.7	-50.7	149.7	31 50.8	-51.0	150.1	29
30	37 01.8	-48.8	148.3	36 10.6	-49.1	148.7	35 19.3	-49.5	149.0	34 27.7	-49.8	149.4	33 36.0	-50.2	149.7	32 44.1	-50.5	150.1	31 52.0	-50.8	150.4	30 59.8	-51.2	150.7	30
31	36 13.0	-49.0	149.0	35 21.5	-49.4	149.4	34 29.8	-49.7	149.7	33 37.9	-50.1	150.1	32 45.8	-50.4	150.7	31 53.6	-50.8	151.0	30 08.6	-51.3	151.3	31			
32	35 24.0	-49.2	149.7	34 32.1	-49.5	150.1	33 40.1	-50.0	150.4	32 47.8	-50.3	150.7	31 55.4	-50.6	151.0	30 10.1	-51.2	151.6	29 17.3	-51.5	151.9	32			
33	34 34.8	-49.4	150.4	33 42.6	-49.8	150.7	32 50.1	-50.1	151.1	31 57.5	-50.4	151.4	31 04.8	-50.8	151.7	30 11.9	-51.0	151.9	29 18.9	-51.3	152.2	28 25.8	-51.7	152.5	33
34	33 45.4	-49.7	151.1	32 52.8	-50.1	151.4	32 00.0	-50.3	151.7	31 07.1	-50.7	152.0	30 14.0	-50.9	152.3	29 20.9	-51.3	152.8	28 27.6	-51.5	152.8	27 34.1	-51.7	153.0	34
35	32 55.7	-49.9	151.8	32 02.7	-50.2	152.1	31 09.7	-50.6	152.3	30 16.4	-50.8	152.6	29 23.1	-51.1	152.9	28 29.6	-51.4	153.1	27 36.1	-51.7	153.4	26 42.4	-52.0	153.6	35
36	32 05.8	-50.1	152.4	31 12.5	-50.4	152.7	30 19.1	-50.7	153.0	29 25.6	-51.0	153.2	28 32.0	-51.3	153.5	27 38.2	-51.5	153.7	26 44.4	-52.1	153.9	25 50.4	-52.0	154.2	

30°, 330° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	56	46.4	+27.8	114.1	56	21.2	+29.3	115.5	55	54.8	+30.7	116.9	55	27.0	+32.2	118.2	54	58.1	+33.6	119.4	54	28.1	+34.8	120.6	53	57.0	+36.1	121.8	53	24.8	+37.3	123.0	0
1	57	14.2	+26.4	112.5	56	50.5	+28.0	113.9	56	25.5	+29.5	115.3	55	59.2	+31.0	116.7	55	31.7	+32.4	118.0	55	02.9	+33.9	119.2	54	33.1	+35.1	120.5	54	02.1	+36.4	121.7	1
2	57	40.6	+25.0	110.8	57	18.5	+26.7	112.3	56	55.0	+28.4	113.7	56	30.2	+29.9	115.1	56	04.1	+31.4	116.5	55	36.8	+32.7	117.8	55	08.2	+34.1	119.1	54	38.5	+35.4	120.3	2
3	58	05.6	+23.7	109.1	57	45.2	+25.4	110.6	57	23.4	+27.0	112.1	57	00.1	+28.6	113.5	56	35.5	+30.1	114.9	56	09.5	+31.7	116.3	55	42.3	+33.1	117.6	55	13.9	+34.5	118.9	3
4	58	29.3	+22.2	107.4	58	10.6	+24.0	108.9	57	50.4	+25.7	110.4	57	28.7	+27.3	111.9	57	05.6	+29.0	113.3	56	41.2	+30.4	114.7	56	15.4	+32.0	116.1	55	48.4	+33.3	117.4	4
5	58	51.5	+20.7	105.6	58	34.6	+22.5	107.2	58	16.1	+24.2	108.7	57	56.0	+26.0	110.2	57	34.6	+27.6	111.7	57	11.6	+29.3	113.2	56	47.4	+30.8	114.6	56	21.7	+32.3	115.9	5
6	59	12.2	+19.1	103.8	58	57.1	+21.0	105.4	58	40.3	+22.9	107.0	58	22.0	+24.6	108.5	58	02.2	+26.3	110.1	57	40.9	+28.0	111.5	57	18.2	+29.5	113.0	56	54.0	+31.2	114.4	6
7	59	31.3	+17.5	101.9	59	18.1	+19.4	103.6	59	03.2	+21.3	105.2	58	46.6	+23.2	106.8	58	28.5	+25.0	108.4	58	08.9	+26.6	109.9	57	47.7	+28.3	111.4	57	25.2	+29.9	112.8	7
8	59	48.8	+15.8	100.0	59	37.5	+17.8	101.7	59	24.5	+19.7	103.4	59	09.8	+21.6	105.0	58	53.5	+23.4	106.6	58	35.5	+25.3	108.2	58	16.0	+27.0	109.7	57	55.1	+28.6	111.2	8
9	60	04.7	+14.1	98.1	59	55.3	+16.2	99.8	59	44.2	+18.2	101.5	59	31.4	+20.1	103.2	59	16.9	+22.0	104.8	59	00.8	+23.4	106.4	58	43.0	+25.6	108.0	58	23.7	+27.3	109.6	9
10	60	18.8	+12.4	96.1	60	11.5	+14.5	97.9	60	02.4	+16.5	99.6	59	51.5	+18.5	101.3	59	38.9	+20.4	103.0	59	24.6	+22.2	104.6	59	08.6	+24.1	106.3	58	51.0	+25.9	107.8	10
11	60	31.2	+10.7	94.2	60	26.0	+12.7	95.9	60	18.9	+14.7	97.7	60	10.0	+16.7	99.4	59	59.3	+18.8	101.1	59	46.8	+20.8	102.8	59	32.7	+22.6	104.5	59	16.9	+24.5	106.1	11
12	60	41.9	+8.8	92.2	60	38.7	+10.9	93.9	60	33.6	+13.0	95.7	60	26.7	+15.1	97.5	60	18.1	+17.1	99.2	60	07.6	+19.1	100.9	59	55.3	+21.1	102.6	59	41.4	+22.9	104.3	12
13	60	50.7	+6.9	90.1	60	49.6	+9.1	91.9	60	46.6	+11.2	93.7	60	41.8	+13.3	95.5	60	35.2	+15.3	97.3	60	26.7	+17.4	99.0	60	16.4	+19.4	100.7	60	04.3	+21.4	102.4	13
14	60	57.6	+5.1	88.1	60	58.7	+7.2	89.9	60	57.8	+9.4	91.7	60	55.1	+11.5	93.5	60	50.5	+13.7	95.3	60	44.1	+15.7	97.1	60	35.8	+17.7	98.8	60	25.7	+19.7	100.6	14
15	61	02.7	+3.2	86.0	61	05.9	+5.4	87.8	61	07.2	+7.5	89.7	61	06.6	+9.7	91.5	61	04.2	+11.8	93.3	61	59.8	+13.9	95.1	60	53.5	+16.1	96.9	60	45.4	+18.1	98.6	15
16	61	05.9	+1.3	84.0	61	11.3	+3.4	85.8	61	14.7	+5.7	87.6	61	16.3	+7.8	89.4	61	16.0	+9.9	91.2	61	13.7	+12.1	93.1	61	09.6	+14.2	94.9	61	03.5	+16.3	96.7	16
17	61	07.2	-0.6	81.9	61	14.7	+1.6	83.7	61	20.4	+3.7	85.5	61	24.1	+5.9	87.3	61	25.9	+8.1	89.2	61	25.8	+10.3	91.0	61	23.8	+12.4	92.9	61	19.8	+14.6	94.7	17
18	61	06.6	-2.4	79.8	61	16.3	-0.3	81.6	61	24.1	+1.8	83.4	61	30.0	+4.0	85.3	61	34.0	+6.2	87.1	61	36.1	+8.3	89.0	61	36.2	+10.5	90.8	61	34.4	+12.7	92.7	18
19	61	04.2	-4.4	77.8	61	16.0	-2.3	79.5	61	25.9	-0.1	81.3	61	34.0	+2.1	83.2	61	40.2	+4.2	85.0	61	44.4	+6.5	86.9	61	46.7	+8.7	88.7	61	47.1	+10.8	90.6	19
20	60	59.8	-6.3	75.7	61	13.7	-4.1	77.5	61	25.8	-2.0	79.3	61	36.1	+0.1	81.1	61	44.4	+2.3	82.9	61	50.9	+4.5*	84.8	61	55.4	+6.7*	86.6	61	57.9	+8.9	88.5	20
21	60	53.5	-8.1	73.7	61	09.6	-6.1	75.4	61	23.8	-4.0	77.2	61	36.2	-1.8	79.0	61	46.7	+0.4	80.8	61	55.4	+2.5	82.6	62	02.1	+4.7	84.5	62	06.8	+7.0	86.4	21
22	60	45.4	-9.9	71.6	61	03.5	-7.9	73.3	61	19.8	-5.8	75.1	61	34.4	-3.8	76.9	61	47.1	-1.6	78.7	61	57.9	+0.6	80.5	62	06.8	+2.8	82.4	62	13.8	+5.0*	84.3	22
23	60	35.5	-11.7	69.6	60	55.6	-9.7	71.3	61	14.0	-7.7	73.0	61	30.6	-5.6	74.8	61	45.5	-3.5	76.6	61	58.5	-1.4	78.4	62	09.6	+0.8*	80.2	62	18.8	+3.0	82.1	23
24	60	23.8	-13.5	67.6	60	45.9	-11.6	69.3	61	06.3	-9.6	71.0	61	25.0	-7.6	72.7	61	42.0	-5.5	74.5	61	57.1	-3.3	76.3	62	10.4	-1.2	78.1	62	21.8	+1.1*	80.0	24
25	60	10.3	-15.2	65.7	60	34.3	-13.3	67.3	60	56.7	-11.4	68.9	61	17.4	-9.4	70.6	61	36.5	-7.4	72.4	61	53.8	-5.3*	74.1	62	09.2	-3.1	76.0	62	22.9	-1.0*	77.8	25
26	59	55.1	-16.9	63.7	60	21.0	-15.1	65.3	60	45.3	-13.2	66.9	61	08.0	-11.3	68.6	61	29.1	-9.3	70.3	61	48.5	-7.3	72.0	62	06.1	-5.1*	73.8	62	19.9	-3.0*	75.7	26
27	59	38.2	-18.5	61.8	60	05.9	-16.8	63.3	60	32.1	-15.0	64.9	60	56.7	-13.0	66.5	61	19.8	-11.1	68.2	61	41.2	-9.1	69.9	62	01.0	-7.1	71.7	62	18.9	-5.0	73.5	27
28	59	19.7	-20.1	59.9	59	49.1	-18.4	61.4	60	17.1	-16.6	63.0	60	43.7	-14.9	64.5	61	08.7	-13.0	66.2	61	32.1	-11.0	67.9	61	53.9	-9.0	69.6	62	13.9	-6.9	71.4	28
29	58	59.6	-21.6	58.1	59	30.7	-20.0	59.5	58	10.5	-18.4	61.0	59	28.8	-16.8	62.6	60	55.5	-17.4	64.2	61	21.1	-12.6	65.8	61	44.9	-10.9	67.5	62	07.0	-8.9	69.2	29
30	58	38.0	-23.1	56.3	59	10.7	-21.6	57.7	59	42.1	-19.9	59.1	60	12.2	-18.2	60.6	60	41.0	-16.5	62.2	61	08.2	-14.6	63.8	61	34.0	-12.8	65.4	61	58.1	-10.8	67.1	30
31	58	14.9	-24.5	54.5	58	49.1	-23.0	55.9	59	22.2	-21.5	57.3	59	54.0	-19.9	58.7	60	24.5	-18.2	60.2	60	53.6	-16.4	61.8	61	21.2	-14.5	63.4	61	47.3	-12.6	65.0	31
32	57	50.4	-25.9	52.8	58	26.1	-24.5	54.1	57	00.7	-23.0	55.4	59	34.1	-21.4	56.8	60	06.3	-19.8	58.3	57	37.2	-24.8	60.2	57	06.7	-16.4	61.4	61	34.7	-14.5	63.0	32
33	57	24.5	-27.3	51.1	58	01.6	-25.8	52.4	57	37.7	-24.4	53.7	59	12.7	-22.9																		

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 30°, 330°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	56 46.4 -28.9	114.1	56 21.2 -30.4	115.5	55 54.8 -31.9	116.9	55 27.0 -33.2	118.2	54 58.1 -34.5	119.4	54 28.1 -35.8	120.6	53 57.0 -37.0	121.8	53 24.8 -38.1	123.0	50 06.5 -41.8	129.0	50 43.9 -40.8	128.1	50 06.5 -41.8	129.0	5 0		
1	56 17.5 -30.2	115.7	55 50.8 -31.6	117.1	55 22.9 -32.9	118.4	54 53.8 -34.2	119.6	54 23.6 -35.5	120.8	53 52.3 -36.7	122.0	53 20.0 -37.8	123.2	52 46.7 -38.9	124.3	52 46.7 -38.9	124.3	1 1						
2	55 47.3 -31.2	117.3	55 19.2 -32.6	118.6	54 50.0 -34.0	119.8	54 19.6 -35.2	121.0	53 48.1 -36.4	122.2	53 15.6 -37.5	123.3	52 42.2 -38.7	124.4	52 07.8 -39.7	125.5	2 2								
3	55 16.1 -32.4	118.8	54 46.6 -33.7	120.0	54 16.0 -34.9	121.2	53 44.4 -36.2	122.4	53 11.7 -37.3	123.5	52 38.1 -38.4	124.6	52 03.5 -39.4	125.7	51 28.1 -40.5	126.7	3 3								
4	54 43.7 -33.4	120.3	54 12.9 -34.6	121.5	53 41.1 -35.9	122.6	53 08.2 -37.0	123.8	52 34.4 -38.1	124.8	51 59.7 -39.2	125.9	51 24.1 -40.2	126.9	50 47.6 -41.1	127.9	4 4								
5	54 10.3 -34.4	121.7	53 38.3 -35.6	122.8	53 05.2 -36.7	124.0	52 31.2 -37.8	125.1	51 56.3 -38.9	126.1	51 20.5 -39.9	127.1	50 43.9 -40.8	128.1	50 06.5 -41.8	129.0	5 5								
6	53 35.9 -35.3	123.1	53 02.7 -36.5	124.2	52 28.5 -37.6	125.3	51 53.4 -38.6	126.3	51 17.4 -39.6	127.3	50 40.6 -40.6	128.3	50 03.1 -41.6	129.2	49 24.7 -42.4	130.2	6 6								
7	53 00.6 -36.2	124.4	52 26.2 -37.3	125.5	51 50.9 -38.4	126.5	51 14.8 -39.4	127.6	50 37.8 -40.4	128.5	50 00.0 -41.2	129.5	49 21.5 -42.1	130.4	48 42.3 -43.0	131.2	7 7								
8	52 24.4 -37.1	125.7	51 48.9 -38.2	126.8	51 12.5 -39.1	127.8	50 35.4 -40.1	128.7	49 57.4 -41.0	129.7	49 18.8 -41.9	130.6	48 39.4 -42.8	131.4	47 59.3 -43.5	132.3	8 8								
9	51 47.3 -37.9	127.0	51 10.7 -38.2	128.0	50 33.4 -39.9	129.0	49 55.3 -40.8	129.9	49 16.4 -41.7	130.8	48 36.9 -42.6	131.7	47 56.6 -43.3	132.5	47 15.8 -44.1	133.3	9 9								
10	51 09.4 -38.7	128.3	50 31.8 -39.6	129.2	49 53.5 -40.5	130.2	49 14.5 -41.5	131.0	48 34.7 -42.2	131.9	47 54.3 -43.0	132.7	47 13.3 -43.4	133.5	46 31.7 -44.6	134.3	10 10								
11	50 30.7 -39.3	129.5	49 52.2 -40.3	130.4	49 13.0 -41.2	131.3	48 33.0 -42.0	132.1	47 52.5 -42.9	133.0	47 11.3 -43.6	133.8	46 29.5 -44.4	134.5	45 47.1 -45.0	135.3	11 11								
12	49 51.4 -40.1	130.7	49 11.9 -41.0	131.5	48 31.8 -41.8	132.4	47 51.0 -42.6	133.2	47 09.6 -43.4	134.0	46 27.7 -44.2	134.8	45 45.1 -44.8	135.5	45 02.1 -45.5	136.2	12 12								
13	49 11.3 -40.8	131.8	48 30.9 -41.6	132.7	47 50.0 -42.4	133.5	47 08.4 -43.2	134.3	46 26.2 -43.9	135.0	45 43.5 -44.6	135.7	45 00.3 -45.3	136.4	44 16.6 -46.0	137.1	13 13								
14	48 30.5 -41.4	132.9	47 49.3 -42.1	133.7	47 07.6 -43.0	134.5	46 25.2 -43.7	135.3	45 42.3 -44.4	136.0	44 58.9 -45.1	136.7	44 15.0 -45.7	137.4	43 30.6 -46.3	138.0	14 14								
15	47 49.1 -41.9	134.0	47 07.2 -42.8	134.8	46 24.6 -43.5	135.5	45 41.5 -44.2	136.3	44 57.9 -44.9	137.0	44 13.8 -45.5	137.6	43 29.3 -46.2	138.3	42 44.3 -46.7	138.9	15 15								
16	47 07.2 -42.6	135.1	46 24.4 -43.3	135.8	45 41.1 -44.0	136.5	44 57.3 -44.6	137.2	44 13.0 -45.3	137.9	43 28.3 -45.9	138.5	42 43.1 -46.5	139.1	41 57.6 -47.1	139.7	16 16								
17	46 24.6 -43.1	136.1	45 41.1 -43.8	136.8	44 57.1 -44.4	137.5	44 12.7 -45.2	138.2	43 27.7 -45.7	138.8	42 42.4 -46.3	139.4	41 56.6 -46.9	140.0	41 10.5 -47.5	140.6	17 17								
18	45 41.5 -43.6	137.1	44 57.3 -44.3	137.8	44 12.7 -45.0	138.4	43 27.5 -45.5	139.1	42 42.0 -46.1	139.7	41 56.1 -46.7	140.3	41 09.7 -47.2	140.8	40 23.0 -47.7	141.4	18 18								
19	44 57.9 -44.1	138.1	44 13.0 -44.7	138.7	43 27.7 -45.3	139.4	42 42.0 -45.9	140.0	41 55.9 -46.5	140.5	41 09.4 -47.1	141.1	40 22.5 -47.6	141.6	39 35.3 -48.1	142.2	19 19								
20	44 13.8 -44.5	139.0	43 28.3 -45.2	139.7	42 42.4 -45.8	140.3	41 56.1 -46.4	140.8	41 09.4 -46.9	141.4	40 22.3 -47.4	141.9	39 34.9 -47.9	142.4	38 47.2 -48.4	142.9	20 20								
21	43 29.3 -45.0	140.0	42 43.1 -45.8	140.6	41 56.6 -46.1	141.1	41 09.7 -46.7	141.7	40 22.5 -47.2	142.2	39 34.9 -47.7	142.7	38 47.0 -48.2	143.2	37 58.8 -48.7	143.7	21 21								
22	42 44.3 -45.4	140.9	41 57.6 -46.0	141.4	41 10.5 -46.5	142.0	40 23.0 -47.0	142.5	39 35.3 -47.6	143.0	38 47.2 -48.0	143.5	37 58.8 -48.5	144.0	37 10.1 -48.9	144.4	22 22								
23	41 58.9 -45.8	141.7	41 11.6 -46.4	142.3	40 24.0 -46.9	142.8	39 36.0 -47.4	143.3	38 47.7 -47.8	143.8	37 59.2 -48.4	144.3	37 10.3 -48.8	144.7	36 21.2 -49.2	145.1	23 23								
24	41 13.1 -46.2	142.6	40 25.2 -46.7	143.1	39 37.1 -47.2	143.6	38 48.6 -47.7	144.1	37 59.9 -48.2	144.6	37 10.8 -48.6	145.0	36 21.5 -49.0	145.4	35 32.0 -49.4	145.9	24 24								
25	40 26.9 -46.6	143.5	39 38.5 -47.0	144.0	38 49.9 -47.6	144.4	38 0.9 -48.0	144.9	37 11.7 -48.4	145.3	36 22.2 -48.8	145.8	35 32.5 -49.2	146.2	34 42.6 -49.7	146.5	25 25								
26	39 40.3 -46.8	143.8	38 51.5 -47.4	144.8	38 0.2 -47.8	145.2	37 12.9 -48.2	145.6	36 23.3 -48.7	146.1	35 33.4 -49.1	146.5	34 43.3 -49.5	146.9	33 52.9 -49.9	147.2	26 26								
27	38 53.5 -47.3	145.1	38 0.4 -47.6	145.5	37 14.5 -48.1	146.0	36 24.7 -48.6	146.4	35 34.6 -49.0	146.8	34 44.3 -49.4	147.2	33 53.8 -49.8	147.5	33 0.0 -50.1	147.9	27 27								
28	38 06.2 -47.5	145.9	37 16.5 -48.0	146.3	36 26.4 -48.4	146.7	35 36.1 -48.8	147.1	34 45.6 -49.1	147.5	33 54.9 -49.5	147.9	33 04.0 -49.9	148.2	32 12.9 -50.2	148.5	28 28								
29	37 18.7 -47.8	146.6	36 28.5 -48.3	147.1	35 38.0 -48.6	147.4	34 47.3 -49.0	147.8	33 56.5 -49.5	148.2	33 05.4 -49.8	148.5	32 14.1 -50.1	148.9	31 22.7 -50.5	149.2	29 29								
30	36 30.9 -48.1	147.4	35 40.2 -48.5	147.8	34 49.4 -48.9	148.2	33 58.3 -49.3	148.5	33 07.0 -49.6	148.9	32 15.6 -50.0	149.2	31 24.0 -50.4	149.5	30 32.2 -50.7	149.8	30 30								
31	35 42.8 -48.4	148.1	34 51.7 -48.7	148.5	34 00.5 -49.1	149.8	33 09.0 -49.5	149.2	32 17.4 -49.8	149.5	31 25.6 -50.2	149.9	30 33.6 -50.5	150.2	29 41.5 -50.8	150.4	31 31								
32	34 54.4 -48.6	148.9	34 03.0 -49.0	149.2	33 11.4 -49.4	149.6	32 19.5 -49.7	149.9	31 27.6 -50.1	150.2	30 35.4 -50.3	150.5	29 43.1 -50.6	150.8	28 50.7 -51.0	151.0	32 32								
33	34 05.8 -48.8	149.6	33 14.0 -49.2	149.9	32 22.0 -49.6	150.2	31 29.8 -49.9	150.5	30 37.5 -50.2	150.8	29 45.1 -50.6	151.1	28 52.5 -50.9	151.4	27 59.7 -51.1	151.6	33 33								
34	33 17.0 -49.1	150.3	32 24.8 -49.4	150.6	31 35.4 -49.7	151.2	30 39.9 -50.1	151.5	29 47.3 -50.4	151.5	28 54.5 -50.7	151.7	28 01.6 -51.0	152.0	27 08.6 -51.3	152.2	34 34								
35	32 27.9 -49.3	151.0	31 35.4 -49.7	151.3	30 42.7 -50.0	151.6	29 49.8 -50.2	151.8	28 56.9 -50.6	152.1	28 03.8 -50.9	152.3	27 10.6 -51.1	152.6	26 17.3 -51.4	152.8	35 35								
36	31 38.6 -49.5	151.6	30 45.7 -49.8	151.9	29 52.7 -50.1	152.2	28 59.6 -50.5	152.5	28 06.3 -50.7	152.7	27 12.9 -51.0	152.9	26 19.5 -51.3	153.2	25 25.9 -51.6	153.4	36 36								
37	30 49.1 -49.7	152.3	29 55.9 -50.0	152.6	29 02.6 -50.3	152.8	28 09.1 -50.6	153.1	27 15.6 -50.9	153.3	26 21.9 -51.1	153.7	25 28.2 -51.5	154.0	24 34.3 -51.7	154.0	37 37								
38	29 59.4 -49.9	152.9	29 05.9 -50.2	153.2	28 12.3 -50.5	153.4	27 18.5 -50.7	153.7	26 24.7 -51.0	153.9	25 30.8 -51.3	154.1	24 36.7 -51.5	154.3	23 42.6 -51.8	154.5	38 38								
39	29 09.5 -50.1	153.6	28 15.7 -50.4	153.8	27 21.8 -50.7	154.1	26 27.8 -50.9	154.3	25 33.7 -51.2	154.5	24 39.5 -51.4	154.7	23 45.2 -51.7	154.9	22 50.8 -51.9	155.1	39 39								
40	28 19.4 -50.3	154.2	27 25.3 -50.5	154.4	26 31.1 -50.8	154.7	25 36.9 -51.2	154.9	24 42.5 -51.3	155.1	23 48.1 -51.6	155.3	22 53.5 -51.8	155.4</td											

31°, 329° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z									
0	55	53.4	+27.1	113.3	55	29.0	+28.6	114.6	55	03.4	+30.0	115.9	54	36.5	+31.5	117.2	54	08.5	+32.8	118.5	53	39.4	+34.1	119.6	53	09.2	+35.3	120.8	52	37.9	+36.6	121.9	0
1	56	20.5	+25.8	111.7	55	57.6	+27.4	113.1	55	33.4	+28.9	114.4	55	08.0	+30.4	115.7	54	41.3	+31.8	117.0	54	13.5	+33.2	118.3	53	44.5	+34.5	119.5	53	14.5	+35.7	120.6	1
2	56	46.3	+24.5	110.1	56	25.0	+26.1	111.5	56	02.3	+27.7	112.9	55	38.4	+29.2	114.2	55	13.1	+30.7	115.5	54	46.7	+32.1	116.8	54	19.0	+33.5	118.1	53	50.2	+34.8	119.3	2
3	57	10.8	+23.1	108.4	56	51.1	+24.8	109.8	56	30.0	+26.5	111.3	56	07.6	+28.0	112.7	55	43.8	+29.6	114.0	55	18.8	+31.0	115.3	54	52.5	+32.4	116.6	54	25.0	+33.8	117.9	3
4	57	33.9	+21.7	106.7	57	15.9	+23.5	108.2	56	56.5	+25.1	109.6	56	35.6	+26.8	111.1	56	13.4	+28.3	112.5	55	49.8	+29.8	113.8	55	24.9	+31.3	115.2	54	58.8	+32.7	116.5	4
5	57	55.6	+20.2	104.9	57	39.4	+22.0	106.5	57	21.6	+23.8	108.0	57	02.4	+25.4	109.4	56	41.7	+27.1	110.9	56	19.6	+28.7	112.3	55	56.2	+30.2	113.6	55	31.5	+31.7	115.0	5
6	58	15.8	+18.7	103.2	58	01.4	+20.5	104.7	57	45.4	+22.3	106.2	57	27.8	+24.1	107.8	57	08.8	+25.8	109.2	56	48.3	+27.4	110.7	56	26.4	+29.0	112.1	56	03.2	+30.5	113.5	6
7	58	34.5	+17.2	101.3	58	21.9	+19.1	102.9	58	07.7	+20.9	104.5	57	51.9	+22.7	106.0	57	34.6	+24.4	107.6	57	15.7	+26.1	109.0	56	55.4	+27.8	110.5	56	33.7	+29.3	111.9	7
8	58	51.7	+15.6	99.5	58	41.0	+17.5	101.1	58	28.6	+19.4	102.7	58	14.6	+21.2	104.3	57	59.0	+23.0	105.8	57	41.8	+24.8	107.4	57	23.2	+26.4	108.9	57	03.0	+28.1	110.3	8
9	59	07.3	+13.6	97.6	58	58.5	+15.8	99.3	58	48.0	+17.8	100.9	58	35.8	+19.7	102.5	58	22.0	+21.5	104.1	58	06.6	+23.3	105.7	57	49.6	+25.1	107.2	57	31.1	+26.8	108.7	9
10	59	21.2	+12.2	95.7	59	14.3	+14.3	97.4	59	05.8	+16.2	99.0	58	55.5	+18.1	100.7	58	43.5	+20.0	102.3	58	29.9	+21.9	103.9	58	14.7	+23.7	105.5	57	57.9	+25.5	107.0	10
11	59	33.4	+10.5	93.8	59	28.6	+12.5	95.5	59	22.0	+14.5	97.2	59	13.6	+16.5	98.8	59	03.5	+18.5	100.5	58	51.8	+20.4	102.1	58	38.4	+22.2	103.7	58	23.4	+24.0	105.3	11
12	59	43.9	+8.8	91.8	59	41.1	+10.8	93.5	59	36.5	+12.9	95.3	59	30.1	+14.9	96.9	59	22.0	+16.8	98.6	59	12.2	+18.7	100.3	59	00.6	+20.7	101.9	58	47.4	+22.5	103.5	12
13	59	52.7	+7.0	89.9	59	51.9	+9.1	91.6	59	49.4	+11.1	93.3	59	45.0	+13.2	95.0	59	38.8	+15.2	96.7	59	30.9	+17.2	98.4	59	21.3	+19.1	100.1	59	09.9	+21.1	101.7	13
14	59	59.7	+5.2	87.9	60	01.0	+7.3	89.6	60	00.5	+9.3	91.4	59	58.2	+11.4	93.1	59	54.0	+13.5	94.8	59	48.1	+15.5	96.5	59	40.4	+17.5	98.2	59	31.0	+19.4	99.9	14
15	60	04.9	+3.4	85.9	60	08.3	+5.5	87.6	60	09.8	+7.6	89.4	60	09.6	+9.6	91.1	60	07.5	+11.7	92.9	60	03.6	+13.8	94.6	59	57.9	+15.8	96.3	59	50.4	+17.8	98.0	15
16	60	08.3	+1.5	83.9	60	13.8	+3.6	85.6	60	17.4	+5.8	87.4	60	19.2	+7.9	89.1	60	19.2	+10.0	90.9	60	17.4	+12.0	92.6	60	13.7	+14.1	94.4	60	08.2	+16.2	96.1	16
17	60	09.8	-0.2	81.9	60	17.4	+1.8	83.6	60	23.2	+3.9	85.4	60	27.1	+6.1	87.1	60	29.2	+8.2	88.9	60	29.4	+10.3	90.7	60	27.8	+12.4	92.4	60	24.4	+14.4	94.2	17
18	60	09.6	-2.1	79.9	60	19.2	0.0	81.6	60	27.1	+2.1	83.3	60	33.2	+4.2	85.1	60	37.4	+6.3	86.9	60	39.7	+8.4	88.6	60	40.2	+10.5	90.4	60	38.8	+12.7	92.2	18
19	60	07.5	-3.9	77.9	60	19.2	-1.8	79.6	60	29.2	+0.2	81.3	60	37.4	+2.3	83.1	60	43.7	+4.4	84.8	60	48.1	+6.6	86.6	60	50.7	+8.8	88.4	60	51.5	+10.8	90.2	19
20	60	03.6	-5.7	75.9	60	17.4	-3.7	77.6	60	29.4	-1.6	79.3	60	39.7	+0.5	81.0	60	48.1	+2.6	82.8	60	54.7	+4.8	84.6	60	59.5	+6.8	86.4	61	02.3	+9.0	88.2	20
21	59	57.9	-7.5	73.9	60	13.7	-5.5	75.5	60	27.8	-3.4	77.3	60	40.2	-1.4	79.0	60	50.7	+0.8	80.7	60	59.5	+2.8	82.5	61	06.3	+5.0	84.3	61	11.3	+7.2	86.1	21
22	59	50.4	-9.3	71.9	60	08.2	-7.3	73.5	60	24.4	-5.3	75.2	60	38.8	-3.2	77.0	60	51.5	-1.2	78.7	61	02.3	+1.0	80.5	61	11.3	+3.1	82.3	61	18.5	+5.2	84.1	22
23	59	41.1	-11.0	69.9	60	00.9	-9.0	71.6	60	19.1	-7.1	73.2	60	35.6	-5.1	74.9	60	50.3	-3.0	76.6	61	03.3	-1.0	78.4	61	14.4	+1.2	80.2	61	23.7	+3.4	82.0	23
24	59	30.1	-12.7	68.0	59	51.9	-10.9	69.6	60	12.0	-8.9	71.2	60	30.5	-6.9	72.9	60	47.3	-4.9	74.6	61	02.3	-2.8	76.3	61	15.6	-0.7	78.1	61	27.1	+1.4	79.9	24
25	59	17.4	-14.3	66.1	59	41.0	-12.5	67.6	60	03.1	-10.7	69.2	60	23.6	-8.8	70.9	60	42.4	-6.8	72.6	60	59.5	-4.7	74.3	61	14.9	-2.6	76.0	61	28.5	-0.5	77.8	25
26	59	03.1	-16.1	64.2	59	28.5	-14.3	65.7	59	52.4	-12.4	67.3	60	14.8	-10.5	68.9	60	35.6	-8.5	70.5	60	54.8	-6.6	72.2	61	12.3	-4.6	74.0	61	28.0	-2.5	75.7	26
27	58	47.0	-17.6	62.3	59	14.2	-15.9	63.8	59	40.0	-14.1	65.3	60	04.3	-12.3	66.9	60	27.1	-10.4	68.5	60	48.2	-8.4	70.2	61	07.7	-6.4	71.9	61	25.5	-4.3	73.6	27
28	58	29.4	-19.1	60.5	58	58.3	-17.4	61.9	59	25.9	-15.8	63.4	59	52.0	-13.9	64.9	60	16.7	-12.1	66.5	60	39.8	-10.2	68.2	61	01.3	-8.2	69.8	61	21.2	-6.3	71.5	28
29	58	10.3	-20.7	58.7	58	40.9	-19.1	60.1	57	27.9	-24.8	62.6	58	03.9	-23.4	63.8	58	38.7	-21.9	65.5	59	44.9	-18.7	67.9	61	14.9	-8.1	69.5	59	34.9	-24.8	50.2	39
30	57	49.6	-22.1	56.9	58.2	-20.6	58.2	57	05.1	-26.1	59.9	57	22.4	-23.3	60.9	57	50.7	-23.4	62.6	59	26.2	-20.3	64.2	60	43.0	-11.9	65.8	61	06.8	-10.0	67.4	30	
31	55	45.5	-28.6	48.6	56	24.8	-27.4	49.7	56	57.4	-28.8	50.7	56	35.2	-24.7	51.6	56	30.2	-23.3	52.9	59	05.9	-21.9	54.2	59	40.4	-20.3	55.6	36				
32	55	16.9	-29.8	47.0	55	57.4	-28.6	48.1	56	37.0	-27.3	49.2	57	15.8	-26.1	50.4	57	53.5	-24.7	51.6	58	30.2	-23.3	52.9	59	05.9	-21.9	54.2	59	40.4	-20.3	55.6	36
33	54	47.1	-30.9	45.5	55	28.8	-29.8	46.5	56	09.7	-30.8	47.6	55	49.7	-27.4	48.7	57	28.8	-26.1	49.9	56	08.9</											

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $31^{\circ}$ ,  $329^{\circ}$

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	55 53.4 -28.3	113.3	55 29.0 -29.8	114.6	55 03.4 -31.2	115.9	54 36.5 -32.5	117.2	54 08.5 -33.8	118.5	53 39.4 -35.1	119.6	53 09.2 -36.3	120.8	52 37.9 -37.4	121.9	52 00.5 -38.3	123.2	52 32.9 -37.2	122.1	52 00.5 -38.3	123.2	52 00.5 -38.3	123.2	0
1	55 25.1 -29.5	114.9	54 59.2 -30.8	116.2	54 32.2 -32.2	117.4	54 04.0 -33.6	118.7	53 34.7 -34.8	119.9	53 04.3 -36.0	121.0	52 28.3 -36.9	122.3	51 55.7 -38.0	123.4	51 22.2 -39.0	124.5	52 32.9 -37.2	122.1	51 55.7 -38.0	123.4	51 22.2 -39.0	124.5	2
2	54 55.6 -30.5	116.4	54 28.4 -32.0	117.7	54 00.0 -33.3	118.9	53 30.4 -34.5	120.1	52 59.9 -35.7	121.2	52 24.2 -36.6	122.5	51 51.4 -37.7	123.6	51 17.7 -38.7	124.7	50 43.2 -39.8	125.7	50 39.0 -39.5	125.9	50 03.4 -40.4	126.8	4		
3	54 25.1 -31.7	117.9	53 56.4 -32.9	119.1	53 26.7 -34.2	120.3	52 55.9 -35.4	121.4	52 47.6 -37.4	123.8	51 13.7 -38.4	124.9	50 39.0 -39.5	125.9	50 03.4 -40.4	126.8	50 39.0 -39.5	125.9	50 03.4 -40.4	126.8	4				
4	53 53.4 -32.7	119.3	53 23.5 -33.9	120.5	52 52.5 -35.1	121.7	52 20.5 -36.3	122.8	51 47.6 -37.4	123.8	51 13.7 -38.4	124.9	50 39.0 -39.5	125.9	50 03.4 -40.4	126.8	50 03.4 -40.4	126.8	50 03.4 -40.4	126.8	4				
5	53 20.7 -33.6	120.7	52 49.6 -34.5	121.9	52 17.4 -36.0	123.0	51 44.2 -37.1	124.1	51 10.2 -38.2	125.1	50 35.3 -39.2	126.1	49 59.5 -40.1	127.1	49 23.0 -41.1	128.0	49 59.5 -40.1	127.1	49 23.0 -41.1	128.0	5				
6	52 47.1 -34.6	122.1	52 14.7 -35.7	123.2	51 41.4 -36.9	124.3	51 07.1 -37.9	125.3	50 32.0 -38.9	126.3	49 56.1 -39.9	127.3	49 19.4 -40.9	128.2	48 41.9 -41.7	129.1	48 41.9 -41.7	129.1	48 41.9 -41.7	129.1	6				
7	52 12.5 -35.5	123.5	51 39.0 -36.6	124.5	51 04.5 -37.6	125.5	50 29.2 -38.7	126.5	49 53.1 -39.7	127.5	49 16.2 -40.6	128.4	48 38.5 -41.4	129.3	48 00.2 -42.4	130.2	48 00.2 -42.4	130.2	48 00.2 -42.4	130.2	7				
8	51 37.0 -36.3	124.8	51 02.4 -37.4	125.8	50 26.9 -38.4	126.8	49 50.5 -39.3	127.7	49 13.4 -40.3	128.7	48 35.6 -41.2	129.5	47 57.1 -42.1	130.4	47 17.8 -42.8	131.2	47 17.8 -42.8	131.2	47 17.8 -42.8	131.2	8				
9	51 00.7 -37.1	126.0	50 25.0 -38.1	127.0	49 48.5 -39.2	128.0	49 11.2 -40.1	128.9	48 33.1 -40.9	129.8	47 45.4 -44.8	130.6	47 15.0 -42.6	131.5	46 35.0 -43.5	132.3	46 35.0 -43.5	132.3	46 35.0 -43.5	132.3	9				
10	50 23.6 -37.9	127.3	49 46.9 -38.5	128.2	49 09.3 -39.8	129.1	48 31.1 -40.7	130.0	47 52.2 -41.6	130.9	47 12.6 -42.4	131.7	46 32.4 -43.2	132.5	45 51.5 -43.9	133.3	45 51.5 -43.9	133.3	45 51.5 -43.9	133.3	10				
11	49 45.7 -38.6	128.5	49 08.0 -39.6	129.4	48 29.5 -40.4	130.3	47 50.4 -41.3	131.1	47 10.6 -42.1	131.9	46 30.2 -42.9	132.7	45 49.2 -43.7	133.5	45 07.6 -44.4	134.2	45 07.6 -44.4	134.2	45 07.6 -44.4	134.2	11				
12	49 07.1 -39.4	129.7	48 28.4 -40.2	130.5	47 49.1 -41.1	131.4	47 09.1 -41.9	132.2	46 28.5 -42.7	133.0	45 47.3 -43.5	133.7	45 05.5 -44.2	134.5	44 23.2 -44.9	135.2	44 23.2 -44.9	135.2	44 23.2 -44.9	135.2	12				
13	48 27.7 -40.0	130.8	47 48.2 -40.5	131.7	47 08.0 -41.7	132.5	46 27.2 -42.5	133.2	45 45.8 -43.2	134.0	45 03.8 -43.9	134.7	44 21.3 -44.6	135.4	43 38.3 -45.2	136.1	43 38.3 -45.2	136.1	43 38.3 -45.2	136.1	13				
14	47 47.7 -40.6	131.9	47 07.3 -41.4	132.7	46 26.3 -42.2	133.5	45 44.7 -43.0	134.3	45 02.6 -43.8	135.0	44 19.9 -44.4	135.7	43 36.7 -45.1	136.4	42 53.1 -45.8	137.0	42 53.1 -45.8	137.0	42 53.1 -45.8	137.0	14				
15	47 07.1 -41.2	133.0	46 25.9 -42.1	133.8	45 44.1 -42.8	134.5	45 01.7 -43.5	135.3	44 18.8 -44.2	136.0	43 35.5 -44.9	136.6	42 51.6 -45.5	137.3	42 07.3 -46.1	137.9	42 07.3 -46.1	137.9	42 07.3 -46.1	137.9	15				
16	46 25.9 -41.8	134.1	45 43.8 -42.5	134.8	45 01.3 -43.3	135.5	44 18.2 -44.0	136.2	43 34.6 -44.6	136.9	42 50.6 -45.3	137.5	42 06.1 -45.8	138.1	41 21.2 -46.4	138.7	41 21.2 -46.4	138.7	41 21.2 -46.4	138.7	16				
17	45 44.1 -42.4	135.1	45 01.3 -43.1	135.8	44 18.0 -43.8	136.5	43 34.2 -44.4	137.2	42 50.0 -45.1	137.8	42 05.3 -45.7	138.4	41 20.2 -46.2	139.0	40 34.8 -46.9	139.6	40 34.8 -46.9	139.6	40 34.8 -46.9	139.6	17				
18	45 01.7 -42.9	136.1	44 18.2 -43.6	136.8	43 34.2 -44.2	137.5	42 49.8 -44.9	138.1	42 04.9 -45.5	138.7	41 19.6 -46.0	139.3	40 33.6 -46.4	140.1	39 47.3 -46.6	140.7	39 47.3 -46.6	140.7	39 47.3 -46.6	140.7	18				
19	44 18.8 -43.3	137.1	43 34.6 -44.0	137.8	42 50.0 -44.7	138.4	42 04.9 -45.3	139.0	41 19.4 -45.8	139.6	40 33.6 -46.4	140.1	39 47.3 -46.6	140.7	39 00.8 -47.5	141.2	39 00.8 -47.5	141.2	39 00.8 -47.5	141.2	19				
20	43 35.5 -43.9	138.1	42 50.6 -44.5	138.7	42 05.3 -45.1	139.3	41 19.6 -45.6	139.9	40 33.6 -46.3	140.4	39 47.2 -46.8	141.0	39 00.4 -47.3	141.5	38 13.3 -47.8	142.0	38 13.3 -47.8	142.0	38 13.3 -47.8	142.0	20				
21	42 51.6 -44.3	139.0	42 06.1 -44.5	139.6	41 20.2 -45.4	140.2	40 34.0 -46.1	140.7	39 47.3 -46.5	141.3	39 00.4 -47.1	141.8	38 13.1 -47.6	142.3	37 25.5 -48.1	142.7	37 25.5 -48.1	142.7	37 25.5 -48.1	142.7	21				
22	42 07.3 -44.7	139.9	41 21.2 -45.3	140.5	40 34.8 -45.9	141.0	39 47.9 -46.4	141.6	39 00.8 -47.0	142.1	38 13.3 -47.4	142.6	37 25.5 -47.9	143.0	36 37.4 -48.4	143.5	36 37.4 -48.4	143.5	36 37.4 -48.4	143.5	22				
23	41 22.6 -45.1	140.8	40 35.9 -45.6	141.4	39 48.9 -46.2	141.9	39 01.5 -46.7	142.4	38 13.8 -47.2	142.9	37 25.9 -47.8	143.3	36 37.6 -48.2	143.8	35 49.0 -48.6	144.2	35 49.0 -48.6	144.2	35 49.0 -48.6	144.2	23				
24	40 37.5 -45.5	141.7	39 50.3 -46.1	142.2	39 02.7 -46.6	142.7	38 14.8 -47.1	143.2	37 26.6 -47.5	143.7	36 38.1 -48.0	144.1	35 49.4 -48.4	144.5	35 00.4 -48.9	144.9	35 00.4 -48.9	144.9	35 00.4 -48.9	144.9	24				
25	39 52.0 -45.9	142.5	39 04.2 -46.4	143.0	38 16.1 -46.9	143.5	37 27.7 -47.3	144.0	36 39.1 -47.9	144.4	35 50.1 -48.2	144.8	35 01.0 -48.7	145.3	34 11.5 -49.1	145.6	34 11.5 -49.1	145.6	34 11.5 -49.1	145.6	25				
26	39 06.1 -46.2	143.4	38 17.8 -46.7	143.9	37 29.2 -47.2	144.3	36 40.4 -47.7	144.7	35 51.2 -48.0	145.2	35 01.9 -48.5	145.6	34 12.3 -49.4	146.0	33 22.4 -49.3	146.3	33 22.4 -49.3	146.3	33 22.4 -49.3	146.3	26				
27	38 19.9 -46.5	144.2	37 31.1 -47.0	144.6	36 42.0 -47.4	145.1	35 52.7 -47.9	145.5	35 03.2 -48.4	145.9	34 13.4 -48.8	146.3	33 23.3 -49.1	146.7	32 33.1 -49.5	147.0	32 33.1 -49.5	147.0	32 33.1 -49.5	147.0	27				
28	37 33.4 -46.9	145.0	36 44.1 -47.3	145.4	35 54.6 -47.8	145.8	34 05.8 -48.2	146.2	34 14.8 -48.6	146.6	33 24.6 -49.0	147.0	32 34.5 -49.4	147.4	31 43.6 -49.8	147.7	31 43.6 -49.8	147.7	31 43.6 -49.8	147.7	28				
29	36 46.5 -47.2	145.8	35 56.8 -47.7	146.2	35 06.8 -48.0	147.0	34 16.6 -48.5	147.4	33 26.2 -48.9	147.3	32 35.6 -49.2	147.7	31 44.8 -49.6	148.0	30 53.8 -49.9	148.3	30 53.8 -49.9	148.3	30 53.8 -49.9	148.3	29				
30	35 59.3 -47.4	146.5	35 09.1 -47.8	146.9	34 18.8 -48.3	147.3	33 28.1 -48.6	147.7	32 37.3 -49.0	148.0	31 46.4 -49.5	148.4	30 55.2 -49.8	148.7	30 03.9 -50.2	149.0	30 03.9 -50.2	149.0	30 03.9 -50.2	149.0	30				
31	35 11.9 -47.8	147.3	34 21.3 -48.2	147.7	33 30.5 -48.6	148.0	32 39.5 -48.9	148.4	31 48.3 -49.3	148.7	30 56.9 -49.6	149.0	30 05.4 -50.0	149.3	29 13.7 -50.3	149.6	29 13.7 -50.3	149.6	29 13.7 -50.3	149.6	31				
32	34 24.1 -48.0	148.0	33 33.1 -48.4	148.4	32 41.9 -48.7	148.7	31 50.6 -49.2	149.1	30 59.0 -49.5	149.4	30 07.3 -49.8	149.7	29 15.4 -50.1	150.0	28 23.4 -50.5	150.2	28 23.4 -50.5	150.2	28 23.4 -50.5	150.2	32				
33	33 36.1 -48.2	148.8	32 44.7 -48.6	149.1	31 53.2 -49.0	149.4	31 01.4 -49.3	149.7	3																

32°, 328° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	
0	55 00.0	+26.5	112.5	54 36.4	+28.0	113.8	54 11.6	+29.4	115.1	53 45.6	+30.8	116.3	53 18.4	+32.2	117.5	52 50.1	+33.5	118.7	52 20.8	+34.7	119.8	51 50.4	+36.0	120.9	0
1	55 26.5	+25.2	110.9	55 04.4	+26.8	112.3	54 41.0	+28.3	113.6	54 16.4	+29.8	114.9	53 50.6	+31.1	116.1	53 23.6	+32.5	117.3	52 55.5	+33.9	118.5	52 26.4	+35.1	119.6	1
2	55 51.7	+23.9	109.3	55 31.2	+25.5	110.7	55 09.3	+27.1	112.0	54 46.2	+28.6	113.4	54 21.7	+30.1	114.6	53 56.1	+31.5	115.9	53 29.4	+32.8	117.1	53 01.5	+34.1	118.3	2
3	56 15.6	+22.7	107.7	55 56.7	+24.3	109.1	55 36.4	+25.9	110.5	55 14.8	+27.4	111.8	54 51.8	+29.0	113.1	54 27.6	+30.4	114.4	54 02.2	+31.8	115.7	53 35.6	+33.2	116.9	3
4	56 38.3	+21.2	106.0	56 21.0	+22.9	107.4	56 02.3	+24.6	108.9	55 42.2	+26.2	110.3	55 20.8	+27.7	111.6	54 58.0	+29.3	112.9	54 34.0	+30.7	114.2	54 08.8	+32.1	115.5	4
5	56 59.5	+19.8	104.3	56 43.9	+21.6	105.8	56 26.9	+23.3	107.2	56 08.4	+25.0	108.7	56 48.5	+26.6	110.0	55 27.3	+28.1	111.4	55 04.7	+29.7	112.8	54 40.9	+31.1	114.1	5
6	57 19.3	+18.4	102.6	57 05.5	+20.2	104.1	56 50.2	+21.9	105.5	56 33.4	+23.6	107.0	56 15.1	+25.3	108.4	55 55.4	+26.9	109.8	55 34.4	+28.4	111.2	55 12.0	+29.9	112.6	6
7	57 37.7	+16.8	100.8	57 25.7	+18.6	102.3	57 12.1	+20.5	103.8	56 57.0	+22.2	105.3	56 40.4	+23.9	106.8	56 22.3	+25.6	108.2	56 02.8	+27.2	109.7	55 41.9	+28.8	111.0	7
8	57 54.5	+15.3	99.0	57 44.3	+17.2	100.5	57 32.6	+19.0	102.1	57 19.2	+20.8	103.6	57 04.3	+22.6	105.1	56 47.9	+24.3	106.6	56 30.0	+26.0	108.1	56 10.7	+27.6	109.5	8
9	58 09.8	+13.7	97.2	58 01.5	+15.6	98.7	57 51.6	+17.5	100.3	57 40.0	+19.4	101.9	57 26.9	+21.1	103.4	57 12.2	+22.4	104.9	56 56.0	+24.6	106.4	56 38.3	+26.3	107.9	9
10	58 23.5	+12.1	95.3	58 17.1	+14.0	96.9	58 09.1	+15.9	98.5	57 59.4	+17.8	100.1	57 48.0	+19.7	101.7	57 35.1	+21.5	103.2	57 20.6	+23.3	104.7	57 04.6	+25.0	106.2	10
11	58 35.6	+10.4	93.4	58 31.1	+12.4	95.1	58 25.0	+14.3	96.7	58 17.2	+16.3	98.3	58 07.7	+18.2	99.9	57 56.6	+20.0	101.5	57 43.9	+21.8	103.0	57 29.6	+23.6	104.5	11
12	58 46.0	+8.7	91.5	58 43.5	+10.8	93.2	58 39.3	+12.8	94.8	58 33.5	+14.6	96.4	58 25.9	+16.6	98.1	58 16.6	+18.5	99.7	58 05.7	+20.4	101.3	57 53.2	+22.2	102.8	12
13	58 54.7	+7.1	89.6	58 54.3	+9.0	91.3	58 52.1	+11.0	92.9	58 48.1	+13.1	94.6	58 42.5	+15.0	96.2	58 35.1	+17.0	97.9	58 26.1	+18.8	99.5	58 15.4	+20.7	101.1	13
14	59 01.8	+5.3	87.7	59 03.3	+7.4	89.4	59 03.1	+9.4	91.0	59 01.2	+11.3	92.7	58 57.5	+13.3	94.4	58 52.1	+15.3	96.0	58 44.9	+17.3	97.6	58 36.1	+19.2	99.3	14
15	59 07.1	+3.6	85.8	59 10.7	+5.6	87.4	59 12.5	+7.6	89.1	59 12.5	+9.7	90.8	59 10.8	+11.7	92.5	59 07.4	+13.7	94.1	59 02.2	+15.7	95.8	58 55.3	+17.6	97.4	15
16	59 10.7	+1.8	83.8	59 16.3	+3.8	85.5	59 20.1	+5.9	87.2	59 22.2	+7.9	88.8	59 22.5	+10.0	90.5	59 21.1	+12.0	92.2	59 17.9	+14.0	93.9	59 12.9	+16.0	95.6	16
17	59 12.5	0.0	81.9	59 20.1	+2.1	83.5	59 26.0	+4.1	85.2	59 30.1	+6.2	86.9	59 32.5	+8.2	88.6	59 33.1	+10.2	90.3	59 31.9	+12.3	92.0	59 28.9	+14.3	93.7	17
18	59 12.5	-1.7	79.9	59 22.2	+0.3	81.6	59 30.1	+2.4	83.2	59 36.3	+4.4	84.9	59 40.7	+6.5	86.6	59 43.3	+8.6	88.3	59 44.2	+10.5	90.1	59 43.2	+12.6	91.8	18
19	59 10.8	-3.4	78.0	59 22.5	-1.4	79.6	59 32.5	+0.6	81.3	59 40.7	+2.6	83.0	59 47.2	+4.7	84.7	59 51.9	+6.7	86.4	59 54.7	+8.9	88.1	59 55.8	+10.9	89.8	19
20	59 07.4	-5.2	76.0	59 21.1	-3.2	77.6	59 33.1	-1.2	79.3	59 43.3	+0.9	81.0	59 51.9	+2.8	82.7	59 58.6	+5.0	84.4	60 03.6	+7.0	86.1	60 06.7	+9.1	87.9	20
21	59 02.2	-6.9	74.1	59 17.9	-5.0	75.7	59 31.9	-3.0	77.3	59 44.2	-1.0	79.0	59 54.7	+1.1	80.7	60 03.6	+3.1	82.4	60 10.6	+5.2	84.1	60 15.8	+7.3	85.9	21
22	58 55.3	-8.6	72.1	59 12.9	-6.7	73.7	59 28.9	-4.8	75.4	59 43.2	-2.7	77.0	59 55.8	-0.7	78.7	60 06.7	+1.3	80.4	60 15.8	+3.4	82.1	60 23.1	+5.5	83.9	22
23	58 46.7	-10.4	70.2	59 06.2	-8.4	71.8	59 24.1	-6.5	73.4	59 40.5	-4.6	75.0	59 55.1	-2.5	76.7	60 08.0	-0.5	78.4	60 19.2	+1.6	80.1	60 28.6	+3.7	81.9	23
24	58 36.3	-11.9	68.3	58 57.8	-10.2	69.9	59 17.6	-8.2	71.4	59 35.9	-6.3	73.1	59 52.6	-4.4	74.7	60 07.5	-2.3	76.4	60 20.8	-0.3	78.1	60 32.3	+1.8	79.8	24
25	58 24.4	-13.6	66.5	58 47.6	-11.8	68.0	59 09.4	-10.0	69.5	59 29.6	-8.1	71.1	59 48.2	-6.1	72.7	60 05.2	-4.1	74.4	60 20.5	-2.1	76.1	60 34.1	0.0	77.8	25
26	58 10.8	-15.2	64.6	58 35.8	-13.4	66.1	58 59.4	-11.6	67.6	59 21.5	-9.7	69.2	59 42.1	-7.9	70.7	60 01.1	-5.9	72.4	60 18.4	-3.9	74.1	60 34.1	-2.0	75.8	26
27	57 55.6	-16.7	62.8	58 22.4	-15.0	64.2	58 47.8	-13.3	65.7	59 11.8	-11.5	67.2	59 34.2	-9.6	68.8	59 55.2	-7.8	70.4	60 14.5	-5.8	72.0	60 32.1	-3.7	73.7	27
28	57 38.9	-18.3	61.0	58 07.4	-16.7	62.4	58 34.5	-14.9	63.8	59 00.3	-13.2	65.3	59 24.6	-11.3	66.8	59 47.4	-9.4	68.4	60 08.7	-7.5	70.0	60 28.4	-5.6	71.7	28
29	57 20.6	-19.7	59.2	57 50.7	-18.1	60.6	58 19.6	-16.5	62.0	58 47.1	-14.8	63.4	59 13.3	-13.1	64.9	59 38.0	-11.2	66.5	60 01.2	-9.4	68.0	60 22.8	-7.4	69.7	29
30	57 00.9	-21.1	57.5	57 32.6	-19.6	58.8	58 03.1	-18.0	60.1	58 32.3	-16.4	61.6	59 00.2	-14.6	63.0	59 26.8	-13.0	64.5	59 51.8	-11.1	66.1	60 15.4	-9.2	67.7	30
31	56 39.8	-22.5	55.7	57 13.0	-21.1	57.0	57 45.1	-19.6	58.3	58 15.9	-17.9	59.7	58 45.6	-16.3	61.1	59 13.8	-14.5	62.6	59 40.7	-12.8	64.1	60 06.2	-11.0	65.7	31
32	56 17.3	-23.9	54.1	56 51.9	-22.4	55.3	57 25.5	-20.9	56.6	57 58.0	-19.4	57.9	58 29.3	-17.9	59.3	58 59.3	-16.2	60.7	59 27.9	-14.5	62.2	59 55.2	-12.7	63.7	32
33	55 53.4	-25.2	52.4	56 29.5	-23.8	53.6	57 04.6	-22.4	54.9	57 38.6	-21.0	56.1	58 11.4	-19.4	57.5	58 43.1	-17.8	58.9	59 13.4	-16.1	60.3	59 42.5	-14.4	61.8	33
34	55 28.2	-26.3	50.8	56 49.3	-24.5	51.1	56 17.6	-23.6	52.0	55 40.3	-27.6	47.8	55 12.7	-28.7	56.0	55 25.3	-19.4	57.0	58 57.3	-17.7	58.4	59 28.1	-16.1	59.9	34
35	55 01.9	-27.6	49.2	55 40.6	-26.3	50.5	55 14.3	-27.6	51.2	55 35.3	-23.7	52.7	55 45.1	-22.3	53.5	55 20.3	-20.8	54.8	58 54.3	-19.2	56.1	55 39.3	-17.7	58.0	35
36	54 34.3	-28.8	47.7	54 46.7	-28.7	47.2	55 27.1	-27.6	48.3	56 06.6	-26.3	49.4	56 45.2	-25.0	50.5	55 22.8	-23.6	51.7	55 59.5	-22.3	53.0	58 35.1	-20.8	54.3	36
37	53 35.7	-30.9	44.7	54 18.0	-29.8	45.7	50 45.9	-28.7	46.7	55 40.3	-27.6	47.8	56 20.2	-26.3	48.9	56 59.2	-25.1	50.0							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 32°, 328°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	55 00.0 -27.7	112.5	54 36.4 -29.1	113.8	54 11.6 -30.5	115.1	53 45.6 -31.9	116.3	53 18.4 -33.2	117.5	52 50.1 -34.4	118.7	52 20.8 -35.6	119.8	51 50.4 -36.7	120.9	50	50.4 -36.7	120.9	51 50.4 -36.7	120.9	51 13.7 -37.6	122.2	51 13.7 -37.6	122.2	0
1	54 32.3 -28.8	114.0	54 07.3 -30.2	115.3	53 41.1 -31.6	116.5	53 13.7 -32.9	117.7	52 45.2 -34.1	118.9	52 15.7 -35.3	120.0	51 45.2 -36.5	121.1	51 08.7 -37.3	122.4	50 36.1 -38.4	123.4	50 36.1 -38.4	123.4	50 36.1 -38.4	123.4	50 36.1 -38.4	123.4	2	
2	54 03.5 -29.9	115.5	53 37.1 -31.3	116.8	53 09.5 -32.6	118.0	52 40.8 -33.8	119.1	52 11.1 -35.0	120.3	51 40.4 -36.2	121.4	51 08.7 -37.3	122.4	50 36.1 -38.4	123.4	50 36.1 -38.4	123.4	50 36.1 -38.4	123.4	50 36.1 -38.4	123.4	3			
3	53 33.6 -30.9	117.0	53 05.8 -32.2	118.2	52 36.9 -33.5	119.4	52 07.0 -34.7	120.5	51 36.1 -35.9	121.6	51 04.2 -37.0	122.6	50 31.4 -38.1	123.7	49 57.7 -39.1	124.7	49 57.7 -39.1	124.7	49 57.7 -39.1	124.7	49 57.7 -39.1	124.7	49 57.7 -39.1	124.7	4	
4	53 02.7 -32.0	118.4	52 33.6 -33.3	119.6	52 03.4 -34.4	120.7	51 32.3 -35.6	121.8	51 00.2 -36.7	122.9	50 27.2 -37.8	123.9	49 53.3 -38.8	124.9	49 18.6 -39.8	125.8	49 18.6 -39.8	125.8	49 18.6 -39.8	125.8	49 18.6 -39.8	125.8	49 18.6 -39.8	125.8	4	
5	52 30.7 -32.9	119.8	52 00.3 -34.1	121.0	51 29.0 -35.3	122.0	50 56.7 -36.4	123.1	50 23.5 -37.5	124.1	49 49.4 -38.5	125.1	49 14.5 -39.6	126.0	48 38.8 -40.4	127.0	48 38.8 -40.4	127.0	48 38.8 -40.4	127.0	48 38.8 -40.4	127.0	48 38.8 -40.4	127.0	5	
6	51 57.8 -33.9	121.2	51 26.2 -35.0	122.3	50 53.7 -36.1	123.3	50 20.3 -37.2	124.3	49 46.0 -38.2	125.3	49 10.9 -39.2	126.3	48 35.0 -40.1	127.2	47 58.4 -41.1	128.1	47 58.4 -41.1	128.1	47 58.4 -41.1	128.1	47 58.4 -41.1	128.1	47 58.4 -41.1	128.1	6	
7	51 23.9 -34.7	122.5	50 51.2 -35.9	123.6	50 17.6 -37.0	124.6	49 43.1 -38.0	125.6	49 07.8 -39.0	126.5	48 31.7 -39.9	127.4	47 54.9 -40.8	128.3	47 17.3 -41.6	129.2	47 17.3 -41.6	129.2	47 17.3 -41.6	129.2	47 17.3 -41.6	129.2	47 17.3 -41.6	129.2	7	
8	50 49.2 -35.6	123.8	50 15.3 -36.6	124.8	49 40.6 -37.7	125.8	49 05.1 -38.7	126.8	48 28.8 -39.6	127.7	47 51.8 -40.5	128.5	47 14.1 -41.4	129.4	46 35.7 -42.3	130.2	46 35.7 -42.3	130.2	46 35.7 -42.3	130.2	46 35.7 -42.3	130.2	46 35.7 -42.3	130.2	8	
9	50 13.6 -36.4	125.1	49 38.7 -37.5	126.1	49 02.9 -38.4	127.0	48 26.4 -39.3	127.9	47 49.2 -40.2	128.8	47 11.3 -41.1	129.6	46 32.7 -42.0	130.4	45 53.4 -42.7	131.2	45 53.4 -42.7	131.2	45 53.4 -42.7	131.2	45 53.4 -42.7	131.2	45 53.4 -42.7	131.2	9	
10	49 37.2 -37.2	126.3	49 01.2 -38.1	127.3	48 24.5 -39.1	128.2	47 47.1 -40.0	129.0	47 09.0 -40.9	129.9	46 30.2 -41.7	130.7	45 50.7 -42.5	131.5	45 10.7 -43.3	132.2	45 10.7 -43.3	132.2	45 10.7 -43.3	132.2	45 10.7 -43.3	132.2	45 10.7 -43.3	132.2	10	
11	49 00.0 -37.9	127.5	48 23.1 -38.8	128.4	47 45.4 -39.7	129.3	47 07.1 -40.6	130.1	46 28.1 -41.5	131.0	45 48.5 -42.3	131.7	45 08.2 -43.0	132.5	44 27.4 -43.8	133.2	44 27.4 -43.8	133.2	44 27.4 -43.8	133.2	44 27.4 -43.8	133.2	44 27.4 -43.8	133.2	11	
12	48 22.1 -38.5	128.7	47 44.3 -39.5	129.6	47 05.7 -40.4	130.4	46 26.5 -41.2	131.2	45 46.6 -42.0	132.0	45 06.2 -42.8	132.7	44 25.2 -43.5	133.5	43 43.6 -44.2	134.2	43 43.6 -44.2	134.2	43 43.6 -44.2	134.2	43 43.6 -44.2	134.2	43 43.6 -44.2	134.2	12	
13	47 43.6 -39.3	129.9	47 04.8 -40.2	130.7	46 25.3 -40.9	131.5	45 45.3 -41.8	132.3	45 04.6 -42.5	133.0	44 23.4 -43.3	133.7	43 41.7 -44.0	134.4	42 59.4 -44.6	135.1	42 59.4 -44.6	135.1	42 59.4 -44.6	135.1	42 59.4 -44.6	135.1	42 59.4 -44.6	135.1	13	
14	47 04.3 -39.9	131.0	46 24.6 -40.7	131.8	45 44.4 -41.6	132.5	45 03.5 -42.3	133.3	44 22.1 -43.1	134.0	43 40.1 -43.7	134.7	42 57.7 -44.4	135.4	42 14.8 -45.1	136.0	42 14.8 -45.1	136.0	42 14.8 -45.1	136.0	42 14.8 -45.1	136.0	42 14.8 -45.1	136.0	14	
15	46 24.4 -40.5	132.1	45 43.9 -41.3	132.8	45 02.8 -42.1	133.6	44 21.2 -42.8	134.3	43 39.0 -43.5	135.0	42 56.4 -44.2	135.6	42 13.3 -44.9	136.3	41 29.7 -45.5	136.9	41 29.7 -45.5	136.9	41 29.7 -45.5	136.9	41 29.7 -45.5	136.9	41 29.7 -45.5	136.9	15	
16	45 43.9 -41.1	133.1	45 02.6 -41.9	133.9	44 20.7 -42.5	134.6	43 38.4 -43.3	135.3	42 55.5 -44.0	135.9	42 12.2 -44.6	136.6	41 28.4 -45.3	137.2	40 44.2 -45.9	137.8	40 44.2 -45.9	137.8	40 44.2 -45.9	137.8	40 44.2 -45.9	137.8	40 44.2 -45.9	137.8	16	
17	45 02.8 -41.6	134.2	44 20.7 -42.3	134.9	43 38.2 -43.1	135.6	42 55.1 -43.8	136.2	42 11.5 -44.4	136.8	41 27.6 -45.1	137.5	40 43.1 -45.6	138.0	39 58.3 -46.2	138.6	39 58.3 -46.2	138.6	39 58.3 -46.2	138.6	39 58.3 -46.2	138.6	39 58.3 -46.2	138.6	17	
18	44 21.2 -42.2	135.2	43 38.4 -42.9	135.9	42 55.1 -43.6	136.5	42 11.3 -44.2	137.1	41 27.1 -44.8	137.7	40 42.5 -45.4	138.3	39 57.5 -46.0	138.9	39 12.1 -46.6	139.4	39 12.1 -46.6	139.4	39 12.1 -46.6	139.4	39 12.1 -46.6	139.4	39 12.1 -46.6	139.4	18	
19	43 39.0 -42.6	136.2	42 55.5 -43.3	136.8	42 11.5 -43.9	137.4	41 27.1 -44.6	138.0	40 42.3 -45.2	138.6	39 57.1 -45.8	139.2	39 11.5 -46.4	139.7	38 25.5 -46.9	140.2	38 25.5 -46.9	140.2	38 25.5 -46.9	140.2	38 25.5 -46.9	140.2	38 25.5 -46.9	140.2	19	
20	42 56.4 -43.1	137.1	42 12.2 -43.8	137.8	41 27.6 -44.5	138.4	40 42.5 -45.0	138.9	39 57.1 -45.6	139.5	39 11.3 -46.2	140.0	38 25.1 -46.7	140.5	37 38.6 -47.2	141.0	37 38.6 -47.2	141.0	37 38.6 -47.2	141.0	37 38.6 -47.2	141.0	37 38.6 -47.2	141.0	20	
21	42 13.3 -43.6	138.1	41 28.4 -44.2	138.7	40 43.1 -44.8	139.3	39 57.5 -45.4	139.8	39 11.5 -46.0	140.3	38 25.1 -46.5	140.8	37 38.4 -47.4	141.3	36 51.4 -47.5	141.8	36 51.4 -47.5	141.8	36 51.4 -47.5	141.8	36 51.4 -47.5	141.8	36 51.4 -47.5	141.8	21	
22	41 29.7 -44.0	139.0	40 44.2 -44.6	139.6	39 58.3 -45.2	140.1	38 12.1 -45.8	140.7	38 25.5 -46.3	141.2	37 38.6 -46.8	141.6	36 51.4 -47.3	142.1	36 03.9 -47.7	142.6	36 03.9 -47.7	142.6	36 03.9 -47.7	142.6	36 03.9 -47.7	142.6	36 03.9 -47.7	142.6	22	
23	40 45.7 -44.5	139.9	39 59.6 -45.0	140.5	39 13.1 -45.5	141.0	38 26.3 -46.1	141.5	37 39.2 -46.6	142.0	36 51.8 -47.1	142.4	36 04.1 -47.6	142.9	35 16.2 -48.1	143.3	35 16.2 -48.1	143.3	35 16.2 -48.1	143.3	35 16.2 -48.1	143.3	35 16.2 -48.1	143.3	23	
24	40 01.2 -44.8	140.8	39 14.6 -45.4	141.3	38 27.6 -45.9	141.8	37 40.2 -46.4	142.3	36 52.6 -46.9	142.8	36 04.7 -47.4	143.2	35 16.5 -47.9	143.6	34 28.1 -48.3	144.0	34 28.1 -48.3	144.0	34 28.1 -48.3	144.0	34 28.1 -48.3	144.0	34 28.1 -48.3	144.0	24	
25	39 16.4 -45.2	141.7	38 29.2 -45.7	142.2	37 41.7 -46.3	142.6	36 53.8 -46.7	143.1	36 05.7 -47.2	143.5	35 17.3 -47.7	144.0	34 28.7 -48.1	144.4	33 39.8 -48.6	144.8	33 39.8 -48.6	144.8	33 39.8 -48.6	144.8	33 39.8 -48.6	144.8	33 39.8 -48.6	144.8	25	
26	38 31.2 -45.5	142.5	37 43.5 -46.1	143.0	36 55.4 -46.6	143.4	36 07.1 -47.1	143.9	35 18.5 -47.5	144.3	34 29.6 -47.9	144.7	33 40.6 -48.4	145.1	32 51.2 -48.7	145.5	32 51.2 -48.7	145.5	32 51.2 -48.7	145.5	32 51.2 -48.7	145.5	32 51.2 -48.7	145.5	26	
27	37 45.7 -45.9	143.3	36 57.4 -46.4	143.8	36 08.8 -46.8	144.2	35 20.0 -47.3	144.6	34 31.0 -47.8	145.0	33 41.7 -48.2	145.4	32 52.2 -48.6	145.8	32 02.5 -49.0	146.2	32 02.5 -49.0	146.2	32 02.5 -49.0	146.2	32 02.5 -49.0	146.2	32 02.5 -49.0	146.2	27	
28	36 59.8 -46.3	144.1	36 11.0 -46.7	144.6	35 22.0 -47.2	145.0	34 32.7 -48.6	145.4	33 42.4 -48.0	145.8	32 53.5 -48.4	146.2	32 03.6 -48.8	146.5	31 42.9 -48.4	1										

33°, 327° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z													
0	54 06.3 +25.9	111.7		53 43.5 +27.4	113.0		53 19.4 +28.9	114.2		52 54.2 +30.2	115.4		52 27.9 +31.6	116.6		52 00.5 +32.8	117.8		51 32.0 +34.1	118.9		51 02.5 +35.3	120.0		0
1	54 32.2 +24.7	110.2		54 10.9 +26.2	111.5		53 48.3 +27.7	112.8		53 24.4 +29.2	114.0		52 59.5 +30.5	115.2		52 33.3 +31.9	116.4		52 06.1 +33.2	117.6		51 37.8 +34.5	118.7		1
2	54 56.9 +23.4	108.6		54 37.1 +25.0	109.9		54 16.0 +26.5	111.3		53 53.6 +28.1	112.5		53 30.0 +29.5	113.8		53 05.2 +30.9	115.0		52 39.3 +32.2	116.2		52 12.3 +33.5	117.4		2
3	55 20.3 +22.2	107.0		55 02.1 +23.8	108.4		54 42.5 +25.4	109.7		54 21.7 +26.8	111.0		53 59.5 +28.4	112.3		53 36.1 +29.8	113.6		53 11.5 +31.3	114.8		52 45.8 +32.6	116.0		3
4	55 42.5 +20.8	105.4		55 25.9 +22.4	106.8		55 07.9 +24.1	108.1		54 48.5 +25.7	109.5		54 27.9 +27.2	110.8		54 05.9 +28.8	112.1		53 42.8 +30.1	113.4		53 18.4 +31.5	114.6		4
5	56 03.3 +19.4	103.7		55 48.3 +21.2	105.1		55 32.0 +22.8	106.5		55 14.2 +24.5	107.9		54 55.1 +26.1	109.3		54 34.7 +27.5	110.6		54 12.9 +29.1	111.9		53 49.9 +30.5	113.2		5
6	56 22.7 +18.0	102.0		56 09.5 +19.7	103.4		55 54.8 +21.5	104.9		55 38.7 +23.1	106.3		55 21.2 +24.7	107.7		55 02.6 +26.4	109.1		54 42.0 +27.9	110.4		54 20.4 +29.5	111.7		6
7	56 40.7 +16.5	100.2		56 29.2 +18.4	101.7		56 16.3 +20.1	103.2		56 01.8 +21.9	104.7		55 45.9 +23.6	106.1		55 28.6 +25.2	107.5		55 09.9 +26.8	108.8		54 49.9 +28.3	110.2		7
8	56 57.2 +15.1	98.5		56 47.6 +16.9	100.0		56 36.4 +18.7	101.5		56 23.7 +20.4	103.0		56 09.5 +22.1	104.4		55 53.8 +23.8	105.9		55 36.7 +25.5	107.3		55 18.2 +27.0	108.7		8
9	57 12.3 +13.5	96.7		57 04.5 +15.3	98.2		56 55.1 +17.2	99.8		56 44.1 +19.0	101.3		56 31.6 +20.8	102.8		56 17.6 +22.5	104.2		56 02.2 +24.2	105.7		55 45.2 +25.9	107.1		9
10	57 25.8 +11.9	94.9		57 19.8 +13.9	96.5		57 12.3 +15.7	98.0		57 03.1 +17.6	99.5		56 52.4 +19.4	101.0		56 40.1 +21.2	102.5		56 26.4 +22.8	104.0		56 11.1 +24.6	105.5		10
11	57 37.7 +10.4	93.1		57 33.7 +12.2	94.7		57 28.0 +14.2	96.2		57 20.7 +16.0	97.8		57 11.8 +17.9	99.3		57 01.3 +19.7	100.8		56 49.2 +21.5	102.3		56 35.7 +23.2	103.8		11
12	57 48.1 +8.7	91.2		57 45.9 +10.7	92.8		57 42.2 +12.6	94.4		57 36.7 +14.5	96.0		57 29.7 +16.4	97.5		57 21.0 +18.2	99.1		57 10.7 +20.1	100.6		56 58.9 +21.8	102.1		12
13	57 56.8 +7.1	89.4		57 56.6 +9.0	91.0		57 54.8 +10.9	92.6		57 51.2 +13.0	94.2		57 46.1 +14.8	95.7		57 39.2 +16.8	97.3		57 30.8 +18.6	98.9		57 20.7 +20.4	100.4		13
14	58 03.9 +5.4	87.5		58 05.6 +7.4	89.1		58 05.7 +9.4	90.7		58 04.2 +11.3	92.3		58 00.9 +13.2	93.9		57 56.0 +15.1	95.5		57 49.4 +17.0	97.1		57 41.1 +19.0	98.7		14
15	58 09.3 +3.7	85.6		58 13.0 +5.8	87.2		58 15.1 +7.7	88.8		58 15.5 +9.6	90.5		58 14.1 +11.7	92.1		58 11.1 +13.6	93.7		58 06.4 +15.6	95.3		58 00.1 +17.4	96.9		15
16	58 13.0 +2.1	83.7		58 18.8 +4.0	85.3		58 22.8 +6.0	87.0		58 25.1 +8.1	88.6		58 25.8 +10.0	90.2		58 24.7 +12.0	91.8		58 22.0 +13.9	93.5		58 17.5 +15.8	95.1		16
17	58 15.1 +0.4	81.8		58 22.8 +2.3	83.4		58 28.8 +4.4	85.1		58 33.2 +6.3	86.7		58 35.8 +8.3	88.3		58 36.7 +10.3	90.0		58 35.9 +12.3	91.6		58 33.3 +14.3	93.2		17
18	58 15.5 -1.4	79.9		58 25.1 +0.7	81.5		58 33.2 +2.6	83.1		58 39.5 +4.6	84.8		58 44.1 +6.6	86.4		58 47.0 +8.6	88.1		58 48.2 +10.6	89.7		58 47.6 +12.6	91.4		18
19	58 14.1 -3.0	78.0		58 25.8 -1.1	79.6		58 35.8 +0.9	81.2		58 44.1 +2.9	82.9		58 50.7 +4.9	84.5		58 55.6 +6.8	86.1		58 58.8 +8.9	87.8		58 00.2 +10.9	89.5		19
20	58 11.1 -4.7	76.1		58 24.7 -2.7	77.7		58 36.7 -0.8	79.3		58 47.0 +1.2	80.9		58 55.6 +3.2	82.6		59 02.5 +5.2	84.2		59 07.7 +7.2	85.9		59 11.1 +9.2	87.6		20
21	58 06.4 -6.3	74.2		58 22.0 -4.5	75.8		58 35.9 -2.6	77.4		58 48.2 -0.6	79.0		58 58.8 +1.4	80.6		59 07.7 +3.4	82.3		59 14.9 +5.4	83.9		59 20.3 +7.5	85.6		21
22	58 00.1 -8.0	72.4		58 17.5 -6.1	73.9		58 33.3 -4.2	75.5		58 47.6 -2.3	77.1		59 00.2 -0.2	78.7		59 11.1 +1.7	80.3		59 20.3 +3.8	82.0		59 27.8 +5.8	83.7		22
23	57 52.1 -9.7	70.5		58 11.4 -7.8	72.0		58 29.1 -5.9	73.6		58 45.3 -4.0	75.1		58 59.9 -2.1	76.7		59 12.8 -0.1	78.4		59 24.1 +1.9	80.0		59 33.6 +3.9	81.7		23
24	57 42.4 -11.2	68.6		58 03.6 -0.9	70.1		58 23.2 -7.6	71.7		58 41.3 -5.7	73.2		58 57.8 -3.8	74.8		59 12.7 -1.8	76.4		59 26.0 +0.2	78.1		59 37.5 +2.2	79.7		24
25	57 31.2 -12.8	66.8		57 54.1 -11.1	68.3		58 15.6 -9.3	69.8		58 35.6 -7.4	71.3		58 54.0 -5.5	72.9		59 10.9 -3.6	74.5		59 26.2 -1.6	76.1		59 39.7 +0.4	77.8		25
26	57 18.4 -14.4	65.0		57 43.0 -12.6	66.4		58 06.3 -10.9	67.9		58 28.2 -9.1	69.4		58 48.5 -7.5	70.9		59 07.3 -5.3	72.5		59 24.6 -3.4	74.1		59 40.1 -1.4	75.8		26
27	57 04.0 -15.9	63.2		57 30.4 -14.2	64.6		57 55.4 -12.5	66.0		58 19.1 -10.7	67.5		58 41.3 -8.9	69.0		59 02.0 -7.0	70.6		59 21.2 -5.2	72.2		59 38.7 -3.1	73.8		27
28	56 48.1 -17.4	61.4		57 16.2 -15.8	62.8		57 42.9 -14.1	64.2		58 08.4 -12.4	65.6		58 32.4 -10.6	67.1		58 55.0 -8.8	68.7		59 16.0 -6.8	70.2		59 35.6 -5.0	71.8		28
29	56 30.7 -18.0	59.7		57 00.4 -17.2	61.0		57 28.8 -15.6	62.4		57 56.0 -13.9	63.8		58 21.8 -12.2	65.5		58 46.2 -10.4	66.7		59 09.2 -8.6	68.3		59 30.6 -6.7	69.9		29
30	56 11.9 -20.2	58.0		56 43.2 -18.7	59.3		57 13.2 -17.1	60.6		57 42.1 -15.5	62.0		58 09.6 -13.8	63.4		58 35.8 -12.1	64.9		59 00.6 -10.3	66.4		59 23.9 -8.5	67.9		30
31	55 51.7 -21.5	56.3		56 24.5 -20.1	57.5		56 56.1 -18.6	58.8		57 26.6 -17.1	60.2		57 55.8 -15.4	61.6		58 23.7 -13.7	63.0		58 50.3 -12.0	64.4		59 15.4 -10.1	66.0		31
32	55 30.2 -22.9	54.6		56 04.4 -21.5	55.8		56 37.5 -20.0	57.1		57 09.5 -18.5	58.4		57 40.4 -17.0	59.7		58 10.0 -15.3	61.1		58 38.3 -13.6	62.6		58 05.3 -11.9	64.0		32
33	55 07.3 -24.2	53.0		55 42.9 -22.8	54.2		56 17.5 -21.4	55.4		56 51.0 -19.9	56.6		57 23.4 -18.4	58.0		57 54.7 -16.9	59.3		58 24.7 -15.2	60.7		58 53.4 -13.5	62.1		33
34	54 43.1 -25.3	51.4		55 20.1 -22.4	52.5		55 56.1 -22.8	53.7		56 31.1 -21.4	54.9		57 05.0 -19.9	56.2		57 37.8 -18.3	57.5		58 09.5 -16.8	58.9		58 39.9 -15.2	60.3		34
35	54 17.8 -26.6	49.9		54 56.0 -25.3	50.9		55 33.3 -24.0	52.1		56 09.7 -22.6	53.2		56 45.1 -21.2	54.5		57 19.5 -19.9	55.7		57 52.7 -18.3	57.0		58 24.7 -16.7	58.4		35
36	53 51.2 -27.7	48.3		53 30.7 -26.5	49.4		55 09.3 -25.3	50.5		55 47.1 -24.0	51.6		56 23.9 -22.7	52.8		56 59.6 -21.2	54.0		57 34.4 -19.8	55.3		58 08.0 -18.3	56.6		36
37	53 23.5 -28.8	46.8		54 04.2 -27.7	47.8		54 44.0 -26.5	48.9		55 23.1 -25.3	50.0		56 01.2 -24.0	51.1		56 38.4 -22.6</td									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $33^\circ$ ,  $327^\circ$

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	54 06.3	-27.1	111.7	53 43.5	-28.5	113.0	53 19.4	-29.9	114.2	52 54.2	-31.2	115.4	52 27.9	-32.6	116.6	52 00.5	-33.8	117.8	51 32.0	-35.0	118.9	51 02.5	-36.2	120.0	0
1	53 39.2	-28.1	113.2	53 15.0	-29.6	114.5	52 49.5	-30.9	115.7	52 23.0	-32.2	116.9	51 55.3	-33.4	118.0	51 26.7	-34.7	119.1	50 57.0	-35.9	120.2	50 26.3	-36.9	121.2	1
2	53 11.1	-29.3	114.7	52 45.4	-30.6	115.9	52 18.6	-31.9	117.1	51 50.8	-33.2	118.2	51 21.9	-34.4	119.3	50 52.0	-35.5	120.4	50 21.1	-36.6	121.5	49 49.4	-37.7	122.5	2
3	52 41.8	-30.3	116.2	52 14.8	-31.6	117.3	51 46.7	-32.8	118.5	51 17.6	-34.1	119.6	50 47.5	-35.2	120.6	50 16.5	-36.4	121.7	49 44.5	-37.4	122.7	49 11.7	-38.5	123.7	3
4	52 11.5	-31.3	117.6	51 43.2	-32.6	118.7	51 13.9	-33.8	119.8	50 43.5	-34.9	120.9	50 12.3	-36.0	121.9	49 40.1	-37.1	122.9	49 07.1	-38.2	123.9	48 33.2	-39.1	124.8	4
5	51 40.2	-32.2	119.0	51 10.6	-33.4	120.1	50 40.1	-34.6	121.1	50 08.6	-35.7	122.2	49 36.3	-36.9	123.2	49 03.0	-37.8	124.1	48 28.9	-38.2	125.1	47 54.1	-39.8	126.0	5
6	51 08.0	-33.2	120.3	50 37.2	-34.3	121.4	50 05.5	-35.5	122.4	49 32.9	-36.5	123.4	48 59.4	-37.5	124.4	48 25.2	-38.6	125.3	47 50.1	-39.5	126.2	47 14.3	-40.4	127.1	6
7	50 34.8	-34.0	121.6	50 02.9	-35.2	122.7	49 30.0	-36.2	123.7	48 56.4	-37.3	124.6	48 21.9	-38.3	125.5	47 46.6	-39.2	126.4	47 10.6	-40.1	127.3	46 33.9	-41.0	128.2	7
8	50 00.8	-34.9	122.9	49 27.7	-35.4	123.9	48 53.8	-37.0	124.9	48 19.1	-38.0	125.8	47 43.6	-38.9	126.7	47 07.4	-39.8	127.6	46 30.5	-40.7	128.4	45 52.9	-41.6	129.2	8
9	49 25.9	-35.7	124.2	48 51.8	-36.7	125.1	48 16.8	-37.7	126.1	47 41.1	-38.6	127.0	47 04.7	-39.6	127.8	46 27.6	-40.5	128.7	45 49.8	-41.4	129.5	45 11.3	-42.1	130.2	9
10	48 50.2	-36.4	125.4	48 15.1	-37.5	126.3	47 39.1	-38.4	127.2	47 02.5	-39.3	128.1	46 25.1	-40.2	128.9	45 47.1	-41.0	129.7	45 08.4	-41.8	130.5	44 29.2	-42.7	131.3	10
11	48 13.8	-37.2	126.6	47 37.6	-38.1	127.5	47 00.7	-39.0	128.4	46 23.2	-40.0	129.2	45 44.9	-40.7	130.0	45 06.1	-41.6	130.8	44 26.6	-42.4	131.5	43 46.5	-43.1	132.2	11
12	47 36.6	-37.8	127.8	46 59.5	-38.8	128.6	46 21.7	-39.7	129.5	45 43.2	-40.5	130.3	45 04.2	-41.4	131.0	44 24.5	-42.2	131.8	43 44.2	-42.9	132.5	43 03.4	-43.6	133.2	12
13	46 58.8	-38.6	128.9	46 20.7	-39.4	129.8	45 42.0	-40.2	130.5	45 02.7	-41.1	131.3	44 22.8	-41.8	132.1	43 42.3	-42.6	132.8	43 01.3	-43.3	133.5	42 19.8	-44.0	134.1	13
14	46 20.2	-39.1	130.1	45 41.3	-40.4	130.8	45 01.8	-40.9	131.6	44 21.6	-41.6	132.3	43 41.0	-42.4	133.1	42 59.7	-43.1	133.7	42 18.0	-43.8	134.4	41 35.8	-44.5	135.0	14
15	45 41.1	-39.8	131.1	45 01.3	-40.6	131.9	44 20.9	-41.3	132.6	43 40.0	-42.1	133.6	42 58.6	-42.9	134.0	42 16.6	-43.5	134.7	41 34.2	-44.2	135.3	40 51.3	-44.9	135.9	15
16	45 01.3	-40.4	132.2	44 20.7	-41.1	132.9	43 39.6	-41.9	133.6	42 57.9	-42.6	134.3	42 15.7	-43.3	135.0	41 33.1	-44.0	135.6	40 50.0	-45.7	136.2	40 06.4	-45.2	136.8	16
17	44 20.9	-40.9	133.3	43 39.6	-41.7	134.0	42 57.7	-42.4	134.6	42 15.3	-43.1	135.3	41 32.4	-43.8	135.9	40 49.1	-44.4	136.5	40 05.3	-45.0	137.1	39 21.2	-45.6	137.7	17
18	43 40.0	-41.4	134.3	42 57.9	-42.2	134.9	42 15.3	-42.9	135.6	41 32.2	-43.6	136.2	40 48.6	-44.1	136.8	40 04.7	-44.8	137.4	39 20.3	-45.4	138.0	38 35.6	-46.0	138.5	18
19	42 58.6	-42.0	135.3	42 15.7	-42.6	135.9	41 32.4	-43.3	136.5	40 48.6	-43.9	137.1	40 04.5	-44.6	137.7	39 19.9	-45.2	138.3	38 34.9	-45.7	138.8	37 49.6	-46.3	139.3	19
20	42 16.6	-42.4	136.2	41 33.1	-43.1	136.9	40 49.1	-43.8	137.4	40 04.7	-44.4	138.0	39 19.9	-45.0	138.6	38 34.7	-45.5	139.1	37 49.2	-46.1	139.6	37 03.3	-46.6	140.1	20
21	41 34.2	-42.9	137.2	40 50.0	-43.6	138.7	40 05.3	-44.1	138.3	39 20.3	-44.7	139.8	38 34.9	-45.3	139.4	37 49.2	-45.9	139.9	37 03.1	-46.4	140.4	36 16.7	-46.9	140.9	21
22	40 51.3	-43.3	138.1	40 06.4	-43.9	138.7	39 21.2	-44.5	139.2	38 35.6	-45.1	139.8	37 49.6	-45.7	140.3	37 03.3	-46.2	140.7	36 16.7	-46.7	141.2	35 29.8	-47.2	141.7	22
23	40 08.0	-43.8	139.0	39 22.5	-44.3	139.6	38 36.7	-45.0	140.1	37 50.5	-45.5	140.6	37 03.9	-45.9	141.1	36 17.1	-46.5	141.5	35 30.0	-47.0	142.0	34 42.6	-47.5	142.4	23
24	39 24.2	-44.1	139.9	38 38.2	-44.7	140.4	37 51.7	-45.2	140.9	37 05.0	-45.8	141.4	36 18.0	-46.4	141.9	35 30.6	-46.8	142.3	34 43.0	-47.3	142.7	33 55.1	-47.7	143.2	24
25	38 40.1	-44.5	140.8	37 53.5	-45.1	141.3	37 06.5	-45.6	141.8	36 19.2	-46.2	142.2	35 31.6	-46.6	142.7	34 43.8	-47.1	143.1	33 55.7	-47.5	143.5	33 07.4	-48.0	143.9	25
26	37 55.6	-44.9	141.6	37 08.4	-45.4	142.1	36 20.9	-45.9	142.6	35 33.1	-46.4	143.0	34 45.0	-46.9	143.4	33 56.7	-47.3	143.8	33 08.2	-47.4	144.2	32 19.4	-48.3	144.6	26
27	37 10.7	-45.2	142.5	36 23.0	-45.8	142.9	35 35.0	-46.3	143.4	34 46.7	-46.7	143.8	33 58.1	-47.1	144.2	33 09.4	-47.6	144.6	32 20.4	-48.1	144.9	31 31.1	-48.4	145.3	27
28	36 25.5	-45.6	143.3	35 37.2	-46.0	143.7	34 48.7	-46.5	144.1	34 00.0	-47.0	144.5	33 11.0	-47.5	144.9	32 21.8	-47.9	145.3	31 32.3	-48.2	145.7	30 42.7	-48.7	146.0	28
29	35 39.9	-45.9	144.1	34 51.2	-46.4	144.5	34 02.2	-46.8	144.9	33 13.0	-47.3	145.3	32 23.5	-47.6	145.7	31 33.9	-48.1	146.0	30 44.1	-48.5	146.3	29 54.0	-48.8	146.7	29
30	34 54.0	-46.2	144.9	34 04.8	-46.6	145.3	33 15.4	-47.1	145.7	32 25.7	-47.5	146.0	31 35.9	-47.9	146.4	30 45.8	-48.3	146.7	29 55.6	-48.7	147.0	29 05.2	-49.1	147.3	30
31	34 07.8	-46.4	145.7	33 18.2	-46.6	146.0	32 28.3	-47.3	146.4	31 38.2	-47.7	146.8	30 48.0	-48.2	147.1	29 57.5	-48.5	147.4	28 16.1	-49.3	148.0	31			
32	33 21.4	-46.8	146.4	32 31.3	-47.2	146.8	31 41.0	-47.6	147.1	30 50.5	-48.0	147.5	29 59.8	-48.3	147.8	29 09.0	-48.7	148.1	28 18.0	-49.1	148.4	27 26.8	-49.4	148.6	32
33	32 34.6	-47.0	147.0	31 44.1	-47.4	147.5	30 53.4	-47.8	147.8	29 10.5	-48.1	148.2	29 11.5	-48.6	148.5	28 20.3	-48.9	148.7	27 28.9	-49.2	149.0	26 37.4	-49.6	149.3	33
34	31 47.6	-47.2	147.5	30 56.7	-48.0	148.2	29 17.6	-48.6	148.5	28 26.0	-49.2	148.9	27 34.2	-48.9	149.5	26 42.3	-49.3	150.0	25 50.2	-49.5	150.3	24 58.1	-49.9	150.5	35
35	31 00.4	-47.5	148.6	30 09.1	-47.9	148.9	29 29.4	-48.4	149.9	27 37.4	-48.8	150.2	26 45.3	-49.1	150.4	25 53.0	-49.4	150.7	25 00.7	-49.8	150.9	24 08.2	-50.1	151.1	36
36	30 12.9	-47.7	149.3	29 21.2	-48.1	149.6	28 37.5	-48.8	150.2	27 41.0	-49.7	150.6	26 48.0	-50.0	151.0	25 03.6	-49.6	151.3	24 10.9	-49.9					

34°, 326° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	53 12.3 +25.4	111.0	52 50.2 +26.9	112.2	52 26.9 +28.3	113.4	52 02.5 +29.7	114.6	51 37.0 +31.0	115.8	51 10.4 +32.2	116.9	50 42.7 +33.5	118.0	50 14.1 +34.7	119.0	50	48.8 +33.9	117.8	50	48.8 +33.9	117.8	50	48.8 +33.9	117.8	0
1	53 37.7 +24.2	109.5	53 17.1 +25.6	110.7	52 55.2 +27.2	112.0	52 32.2 +28.5	113.2	52 08.0 +29.9	114.4	51 42.6 +31.3	115.5	51 16.2 +32.6	116.7	50 48.8 +33.9	117.8	51	22.7 +32.9	116.4	51	22.7 +32.9	116.4	51	22.7 +32.9	116.4	1
2	54 01.9 +22.9	107.9	53 42.7 +24.6	109.2	53 22.4 +26.0	110.5	53 00.7 +27.5	111.7	52 37.9 +29.0	113.0	52 13.9 +30.4	114.2	51 48.8 +31.7	115.3	51 22.7 +32.9	116.4	51	55.6 +32.0	115.1	51	55.6 +32.0	115.1	51	55.6 +32.0	115.1	2
3	54 24.8 +21.7	106.3	54 07.3 +23.2	107.7	53 48.4 +24.8	109.0	53 28.2 +26.4	110.3	53 06.9 +27.8	111.5	52 44.3 +29.2	112.7	52 20.5 +30.7	113.9	51 55.6 +32.0	115.1	52	27.6 +31.0	113.7	52	27.6 +31.0	113.7	52	27.6 +31.0	113.7	3
4	54 46.5 +20.4	104.7	54 30.5 +22.1	106.1	54 13.2 +23.7	107.4	53 54.6 +25.2	108.7	53 34.7 +26.7	110.0	53 13.5 +28.2	111.3	52 51.2 +29.6	112.5	52	27.6 +31.0	113.7	52	27.6 +31.0	113.7	52	27.6 +31.0	113.7	4		
5	55 06.9 +19.0	103.1	54 52.6 +20.7	104.5	54 36.9 +22.4	105.8	54 19.8 +24.0	107.2	54 01.4 +25.6	108.5	53 41.7 +27.1	109.8	53 20.8 +28.6	111.1	52 58.6 +30.0	112.3	52	58.6 +30.0	112.3	52	58.6 +30.0	112.3	52	58.6 +30.0	112.3	5
6	55 25.9 +17.7	101.4	55 13.3 +19.4	102.8	54 59.3 +21.1	104.2	54 43.8 +22.8	105.6	54 27.0 +24.3	107.0	54 08.8 +25.9	108.3	53 49.4 +27.4	109.6	53 28.6 +28.9	110.9	53	28.6 +28.9	110.9	53	28.6 +28.9	110.9	53	28.6 +28.9	110.9	6
7	55 43.6 +16.3	99.7	55 32.7 +18.0	101.2	55 20.4 +19.7	102.6	55 06.6 +21.4	104.0	54 51.3 +23.1	105.4	54 34.7 +24.7	106.7	54 16.8 +26.3	108.1	53 57.5 +27.8	109.4	53	57.5 +27.8	109.4	53	57.5 +27.8	109.4	53	57.5 +27.8	109.4	7
8	55 59.9 +14.8	98.0	55 50.7 +16.6	99.5	55 40.1 +18.4	100.9	55 28.0 +20.1	102.4	55 14.4 +21.8	103.8	54 59.4 +23.5	105.2	54 43.1 +25.0	106.5	54 25.3 +26.7	107.9	54	25.3 +26.7	107.9	54	25.3 +26.7	107.9	54	25.3 +26.7	107.9	8
9	56 14.7 +13.3	96.3	56 07.3 +15.2	97.8	55 58.5 +16.9	99.2	55 48.1 +18.7	100.7	55 36.2 +20.5	102.1	55 22.9 +22.1	103.5	55 08.1 +23.8	104.9	54 52.0 +25.4	106.3	54	52.0 +25.4	106.3	54	52.0 +25.4	106.3	54	52.0 +25.4	106.3	9
10	56 28.0 +11.8	94.5	56 22.5 +13.7	96.0	56 15.4 +15.5	97.5	56 06.8 +17.3	99.0	55 56.7 +19.0	100.5	55 45.0 +20.8	101.9	55 31.9 +22.5	103.3	55 17.4 +24.2	104.7	55	17.4 +24.2	104.7	55	17.4 +24.2	104.7	55	17.4 +24.2	104.7	10
11	56 39.8 +10.3	92.7	56 36.2 +12.1	94.3	56 30.9 +14.0	95.8	56 24.1 +15.9	97.3	56 15.7 +17.7	98.8	56 05.8 +19.5	100.2	55 54.4 +21.2	101.7	55 41.6 +22.8	103.1	55	41.6 +22.8	103.1	55	41.6 +22.8	103.1	55	41.6 +22.8	103.1	11
12	56 50.1 +8.7	90.9	56 48.3 +10.6	92.5	56 44.9 +12.5	94.0	56 40.0 +14.3	95.5	56 33.4 +16.2	97.0	56 25.3 +18.0	98.5	56 15.6 +19.8	100.0	56 04.4 +21.6	101.5	56	04.4 +21.6	101.5	56	04.4 +21.6	101.5	56	04.4 +21.6	101.5	12
13	56 58.8 +7.2	89.1	56 58.9 +9.1	90.7	56 57.4 +11.0	92.2	56 54.3 +12.8	93.7	56 49.6 +14.7	95.3	56 43.3 +16.5	96.8	56 35.4 +18.4	98.3	56 26.0 +20.1	99.8	56	26.0 +20.1	99.8	56	26.0 +20.1	99.8	56	26.0 +20.1	99.8	13
14	57 06.0 +5.5	87.3	57 08.0 +7.4	88.9	57 08.4 +9.3	90.4	57 07.1 +11.3	92.0	57 04.3 +13.1	93.5	56 59.8 +15.1	95.0	56 53.8 +16.8	96.6	56 46.1 +18.7	98.1	56	46.1 +18.7	98.1	56	46.1 +18.7	98.1	56	46.1 +18.7	98.1	14
15	57 11.5 +3.9	85.5	57 15.4 +5.9	87.0	57 17.7 +7.8	88.6	57 18.4 +9.7	90.1	57 17.4 +11.7	91.7	57 14.9 +13.5	93.3	57 10.6 +15.4	94.8	57 04.8 +17.3	96.3	57	04.8 +17.3	96.3	57	04.8 +17.3	96.3	57	04.8 +17.3	96.3	15
16	57 15.4 +2.3	83.6	57 21.3 +4.2	85.2	57 25.5 +6.2	86.7	57 28.1 +8.1	88.3	57 29.1 +10.0	89.9	57 28.4 +11.9	91.4	57 26.0 +13.9	93.0	57 22.1 +15.7	94.6	57	22.1 +15.7	94.6	57	22.1 +15.7	94.6	57	22.1 +15.7	94.6	16
17	57 17.7 +0.7	81.8	57 25.5 +2.6	83.3	57 31.7 +4.5	84.9	57 36.2 +6.5	86.5	57 39.1 +8.4	88.0	57 40.3 +10.3	89.6	57 39.9 +12.2	91.2	57 37.8 +14.2	92.8	57	37.8 +14.2	92.8	57	37.8 +14.2	92.8	57	37.8 +14.2	92.8	17
18	57 18.4 -1.0	79.9	57 28.1 +1.0	81.5	57 36.2 +2.9	83.0	57 42.7 +4.8	84.6	57 47.5 +6.7	86.2	57 50.6 +8.8	87.8	57 52.1 +10.7	89.4	57 52.0 +12.6	91.0	57	52.0 +12.6	91.0	57	52.0 +12.6	91.0	57	52.0 +12.6	91.0	18
19	57 17.4 -2.5	78.1	57 29.1 -0.7	79.6	57 39.1 +1.2	81.2	57 47.5 +3.1	82.7	57 54.2 +5.2	84.3	57 59.4 +7.0	85.9	58 02.8 +9.0	87.5	58 04.6 +11.0	89.1	58	04.6 +11.0	89.1	58	04.6 +11.0	89.1	58	04.6 +11.0	89.1	19
20	57 14.9 -4.3	76.2	57 28.4 -2.4	77.8	57 40.3 -0.4	79.3	57 50.6 +1.5	80.9	57 59.4 +3.4	82.4	58 06.4 +5.4	84.0	58 11.8 +7.4	85.6	58 15.6 +9.3	87.2	58	15.6 +9.3	87.2	58	15.6 +9.3	87.2	58	15.6 +9.3	87.2	20
21	57 10.6 -5.8	74.4	57 26.0 -3.9	75.9	57 39.9 -2.1	77.4	57 52.1 -0.1	79.0	58 02.8 +1.8	80.6	58 11.8 +3.8	82.1	58 19.2 +5.7	83.7	58 24.9 +7.7	85.4	58	24.9 +7.7	85.4	58	24.9 +7.7	85.4	58	24.9 +7.7	85.4	21
22	57 04.8 -7.4	72.6	57 22.1 -5.6	74.0	57 37.8 -3.7	75.6	57 52.0 -1.9	77.1	58 04.6 +0.1	78.7	58 15.6 +2.0	80.2	58 24.9 +4.0	81.8	58 32.6 +5.9	83.5	58	32.6 +5.9	83.5	58	32.6 +5.9	83.5	58	32.6 +5.9	83.5	22
23	56 57.4 -9.0	70.7	57 16.5 -7.2	72.2	57 34.1 -5.4	73.7	57 50.1 -3.4	75.2	58 04.7 -1.6	76.8	58 17.6 +0.3	78.3	58 28.9 +2.3	79.9	58 38.5 +4.3	81.6	58	38.5 +4.3	81.6	58	38.5 +4.3	81.6	58	38.5 +4.3	81.6	23
24	56 48.4 -10.6	68.9	57 09.3 -8.8	70.4	57 28.7 -7.0	71.8	57 46.7 -5.2	73.3	58 03.1 -3.3	74.9	58 17.9 -1.3	76.4	58 31.2 +0.6	78.0	58 42.8 +2.6	79.6	58	42.8 +2.6	79.6	58	42.8 +2.6	79.6	58	42.8 +2.6	79.6	24
25	56 37.8 -12.0	67.1	57 00.5 -10.4	68.5	57 21.7 -8.6	70.0	57 41.5 -6.8	71.5	57 59.8 -4.9	73.0	58 16.6 -3.1	74.5	58 31.8 -1.1	76.1	58 45.4 +0.8	77.7	58	45.4 +0.8	77.7	58	45.4 +0.8	77.7	58	45.4 +0.8	77.7	25
26	56 25.8 -13.6	65.4	56 50.1 -11.9	66.7	57 13.1 -10.2	68.2	57 34.7 -8.4	69.6	57 54.9 -6.6	71.1	58 13.5 -4.7	72.6	58 30.7 -2.9	74.2	58 46.2 -0.9	75.8	58	46.2 -0.9	75.8	58	46.2 -0.9	75.8	58	46.2 -0.9	75.8	26
27	56 12.2 -15.1	63.6	56 38.2 -13.4	65.0	57 02.9 -11.7	66.4	57 26.3 -10.0	67.8	57 48.3 -8.2	69.3	58 08.8 -6.4	70.8	58 27.8 -4.5	72.3	58 45.3 -2.6	73.9	58	45.3 -2.6	73.9	58	45.3 -2.6	73.9	58	45.3 -2.6	73.9	27
28	55 57.1 -16.5	61.9	56 24.8 -15.0	63.2	56 51.2 -13.3	64.6	57 16.3 -11.6	66.0	57 40.1 -9.1	67.4	58 24.2 -7.6	68.9	58 23.3 -6.2	70.4	58 42.7 -4.3	71.9	58	42.7 -4.3	71.9	58	42.7 -4.3	71.9	58	42.7 -4.3	71.9	28
29	53 33.3 -25.6	50.5	54 11.0 -24.3	51.5	54 47.9 -23.0	52.6	55 23.9 -21.7	53.8	55 58.8 -20.3	55.0	56 32.8 -18.9	56.2	57 05.6 -17.4	57.5	57 37.3 -15.8	58.8	57	37.3 -15.8	58.8	57	37.3 -15.8	58.8	57	37.3 -15.8	58.8	35
30	53 07.7 -26.7	48.9	53 46.7 -25.5	50.0	54 24.9 -24.3	51.0	55 02.2 -23.0	52.1	55 38.5 -21.6	53.3	56 13.9 -20.3	54.5	56 48.2 -18.8	55.7	57 21.5 -17.3	57.0	57	21.5 -17.3	57.0	57						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $34^\circ$ ,  $326^\circ$

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	53	12.3	-26.5	111.0	52	50.2	-27.9	112.2	52	26.9	-29.3	113.4	52	02.5	-30.6	114.6	51	37.0	-32.0	115.8	51	10.4	-33.2	116.9	50	42.7	-34.4	118.0	50	14.1	-35.6	119.0	0
1	52	45.8	-27.5	112.5	52	22.3	-29.0	113.7	51	57.6	-30.3	114.9	51	31.9	-31.6	116.0	51	05.0	-32.8	117.1	50	37.2	-34.1	118.2	50	08.3	-35.2	119.3	49	38.5	-36.3	120.3	1
2	52	18.3	-28.7	113.9	51	53.3	-29.9	115.1	51	27.3	-31.2	116.3	51	00.3	-32.5	117.4	50	32.2	-33.7	118.4	50	03.1	-34.9	119.5	49	33.1	-36.0	120.5	49	02.2	-37.1	121.5	2
3	51	49.6	-29.7	115.4	51	23.4	-31.0	116.5	50	56.1	-32.2	117.6	50	27.8	-33.5	118.7	49	58.5	-34.6	119.7	49	28.2	-35.7	120.8	48	57.1	-36.4	121.7	48	25.1	-37.8	122.7	3
4	51	19.9	-30.6	116.8	50	52.4	-31.9	117.9	50	23.9	-33.1	118.9	49	54.3	-34.2	120.0	49	23.9	-35.4	121.0	48	52.5	-36.4	122.0	48	20.3	-37.5	122.9	47	47.3	-38.5	123.9	4
5	50	49.3	-31.6	118.1	50	20.5	-32.8	119.2	49	50.8	-34.0	120.2	49	20.1	-35.1	121.3	48	48.5	-36.1	122.2	48	16.1	-37.2	123.2	47	42.8	-38.2	124.1	47	08.8	-39.2	125.0	5
6	50	17.7	-32.5	119.5	49	47.7	-33.6	120.5	49	16.8	-34.8	121.5	48	45.0	-35.8	122.5	48	12.4	-36.9	123.4	47	38.9	-37.9	124.4	47	04.6	-38.8	125.3	46	29.6	-39.7	126.1	6
7	49	45.2	-33.3	120.8	49	14.1	-34.5	121.8	48	42.0	-35.5	122.8	48	09.2	-36.6	123.7	47	35.5	-37.6	124.6	47	01.0	-38.6	125.5	46	25.8	-39.5	126.4	45	49.9	-40.4	127.2	7
8	49	11.9	-34.2	122.1	48	39.6	-35.2	123.0	48	06.5	-36.3	124.0	47	32.6	-37.3	124.9	46	57.9	-38.3	125.8	46	22.4	-39.2	126.6	45	46.3	-40.1	127.4	45	09.5	-41.0	128.3	8
9	48	37.7	-35.0	123.3	48	04.4	-36.1	124.3	47	30.2	-37.0	125.2	46	55.3	-38.0	126.0	46	19.6	-38.9	126.9	45	43.2	-39.8	127.7	45	06.2	-40.7	128.5	44	28.5	-41.5	129.3	9
10	48	02.7	-35.7	124.5	47	28.3	-36.7	125.4	46	53.2	-37.7	126.3	46	17.3	-38.6	127.2	45	40.7	-39.5	128.0	45	03.4	-40.3	128.8	44	25.5	-41.2	129.5	43	47.0	-42.0	130.3	10
11	47	27.0	-36.4	125.7	46	51.6	-37.4	126.6	46	15.5	-38.4	127.4	45	38.7	-39.3	128.3	45	01.2	-40.1	129.1	44	23.1	-41.0	129.8	43	44.3	-41.7	130.6	43	05.0	-42.5	131.3	11
12	46	50.6	-37.2	126.9	46	14.2	-38.1	127.7	45	37.1	-39.0	128.6	44	59.4	-39.8	129.3	44	21.1	-40.7	130.1	43	42.1	-41.5	130.8	43	02.6	-42.2	131.5	42	22.5	-42.9	132.2	12
13	46	13.4	-37.8	128.0	45	36.1	-38.7	128.9	44	58.1	-39.5	129.6	44	19.6	-40.4	130.4	43	40.4	-41.2	131.1	43	00.6	-41.9	131.8	42	20.4	-42.7	132.5	41	39.6	-43.5	133.2	13
14	45	35.6	-38.5	129.2	44	57.4	-39.3	129.9	44	18.6	-40.2	130.7	43	39.2	-41.0	131.4	42	59.2	-41.7	132.1	42	18.7	-42.5	132.8	41	37.7	-43.2	133.5	40	56.1	-43.8	134.1	14
15	44	57.1	-39.0	130.2	44	18.1	-39.9	131.0	43	38.4	-40.7	131.7	42	58.2	-41.5	132.4	42	17.5	-42.2	133.1	41	36.2	-42.9	133.8	40	54.5	-43.6	134.4	40	12.3	-44.3	135.0	15
16	44	18.1	-39.7	131.3	43	38.2	-40.5	132.0	42	57.7	-41.2	132.7	42	16.7	-41.9	133.4	41	35.3	-42.7	134.1	40	53.3	-43.3	134.7	40	10.9	-44.0	135.3	39	28.0	-44.6	135.9	16
17	43	38.4	-40.2	132.4	42	57.7	-41.0	133.1	42	16.5	-41.7	133.7	41	34.8	-42.4	134.4	40	52.6	-43.1	135.0	40	10.0	-43.8	135.6	39	26.9	-44.4	136.2	38	43.4	-45.0	136.7	17
18	42	58.2	-40.7	133.4	42	16.7	-41.4	134.0	41	34.8	-42.2	134.7	40	52.4	-42.9	135.3	40	0.95	-43.5	135.9	39	26.2	-44.2	136.5	38	42.5	-44.8	137.0	37	58.4	-45.4	137.6	18
19	42	17.5	-41.3	134.4	41	35.3	-42.0	135.0	40	52.6	-42.6	135.6	39	26.0	-44.0	136.8	38	42.0	-44.5	137.4	37	57.7	-45.1	137.9	37	13.0	-45.7	138.4	19				
20	41	36.2	-41.7	135.4	40	53.3	-42.4	136.0	40	10.0	-43.1	136.6	39	26.2	-43.7	137.1	38	42.0	-44.3	137.7	37	57.5	-44.9	138.2	37	12.6	-45.5	138.7	36	27.3	-46.0	139.2	20
21	40	54.5	-42.2	136.3	40	10.9	-42.8	136.9	39	26.9	-43.5	137.5	38	42.5	-44.1	138.0	37	57.7	-44.7	138.5	37	12.6	-45.3	139.0	36	27.1	-45.8	139.5	35	41.3	-46.4	140.0	21
22	40	12.3	-42.6	137.2	39	28.0	-43.2	137.8	38	43.4	-43.9	138.4	37	58.4	-44.5	138.9	37	13.0	-45.0	139.4	36	27.3	-45.6	139.9	35	41.3	-46.1	140.3	34	54.9	-46.6	140.8	22
23	39	29.7	-43.1	138.2	38	44.8	-43.7	138.7	37	59.5	-44.2	139.2	37	13.9	-44.8	139.7	36	28.0	-45.4	140.2	35	41.7	-45.9	140.7	34	55.2	-46.5	141.1	33	21.4	-47.2	142.3	24
24	38	46.6	-43.5	139.1	38	01.1	-44.1	139.6	37	15.3	-44.7	140.1	36	29.1	-45.2	140.6	35	42.6	-45.7	141.0	34	55.8	-46.2	141.5	33	21.4	-47.2	142.3	24				
25	38	03.1	-43.8	139.9	37	17.0	-44.4	140.4	36	30.6	-44.9	140.9	35	43.9	-45.5	141.4	34	56.9	-46.0	141.8	34	09.6	-46.5	142.2	33	22.0	-46.9	142.6	32	34.2	-47.4	143.0	25
26	37	19.3	-44.2	140.8	36	32.6	-44.7	141.3	35	45.7	-45.3	141.7	34	58.4	-45.8	142.2	34	10.9	-46.3	142.6	33	35.1	-47.4	143.4	31	46.8	-47.7	143.8	30				
27	36	35.1	-44.6	141.6	35	47.9	-45.1	142.1	35	04.0	-45.4	142.5	34	12.6	-46.1	143.0	33	24.6	-46.6	143.4	32	36.3	-47.0	143.7	31	59.1	-47.9	144.5	27				
28	35	50.5	-44.9	142.5	35	02.8	-45.4	142.9	34	14.8	-45.9	143.3	33	26.5	-46.3	143.7	32	38.0	-46.8	144.1	31	49.3	-47.2	144.5	30	10.4	-47.7	145.2	28				
29	30	29.9	-46.9	147.9	29	39.0	-47.3	148.2	28	47.9	-47.6	148.5	27	56.7	-48.0	148.8	27	05.3	-48.3	149.0	26	13.8	-48.7	149.3	25	22.2	-49.1	149.5	24	30.4	-49.4	149.8	35
30	29	43.0	-47.1	148.6	28	51.7	-47.4	148.9	28	00.3	-47.8	149.2	27	08.7	-48.2	149.4	26	17.0	-48.6	149.7	25	25.1	-48.9	149.9	24	33.1	-49.2	150.2	23	41.0	-49.5	150.4	36
31	28	55.9	-47.3	149.3	28	04.3	-47.7	149.6	27	12.5	-48.1	149.9	26	20.5	-48.4	150.1	25	28.4	-48.7	150.4	24	36.2	-49.0	150.6	23	43.9	-49.4	150.8	22	51.5	-49.7	151.0	37
32	28	08.6	-47.5	150.0	27	16.6	-47.9	150.3	26	24.4	-48.2	150.5	25	32.1	-48.5	150.8	24	39.7	-48.9	151.0	23	47.2	-49.2	151.2	22	54.5	-49.5	151.4	21	01.8	-49.8	151.6	38
33	27	21.1	-47.7	150.7	26	28.7	-48.1	151.0	25	36.2	-48.4</																						

35°, 325° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	52 18.1	+24.8	110.3	51 56.7	+26.3	111.5	51 34.1	+27.8	112.7	51 10.5	+29.0	113.8	50 45.7	+30.4	114.9	50 19.9	+31.7	116.0	49 53.1	+32.9	117.1	49 25.2	+34.2	118.1	0
1	52 42.9	+23.7	108.8	52 23.0	+25.2	110.0	52 01.9	+26.6	111.2	51 39.5	+28.1	112.4	51 16.1	+29.4	113.6	50 51.6	+30.7	114.7	50 26.0	+32.0	115.8	49 59.4	+33.3	116.9	1
2	53 06.6	+22.5	107.3	52 48.2	+24.0	108.5	52 28.5	+25.5	109.8	52 07.6	+27.0	111.0	51 45.5	+28.4	112.2	51 22.3	+29.8	113.3	50 58.0	+31.1	114.5	50 32.7	+32.3	115.6	2
3	53 29.1	+21.3	105.7	53 12.2	+22.8	107.0	52 54.0	+24.4	108.3	52 34.6	+25.9	109.5	52 13.9	+27.4	110.7	51 52.1	+28.1	111.9	51 29.1	+30.2	113.1	51 05.0	+31.5	114.2	3
4	53 50.4	+20.0	104.1	53 35.0	+21.7	105.5	53 18.4	+23.2	106.7	53 00.5	+24.7	108.0	52 41.3	+26.2	109.3	52 20.9	+27.7	110.5	51 59.3	+29.1	111.7	51 36.5	+30.5	112.9	4
5	54 10.4	+18.7	102.5	53 56.7	+20.3	103.9	53 41.6	+22.0	105.2	53 25.2	+23.6	106.5	53 07.5	+25.1	107.8	52 48.6	+26.6	109.0	52 28.4	+28.1	110.3	52 07.0	+29.5	111.5	5
6	54 29.1	+17.3	100.9	54 17.0	+19.1	102.3	54 03.6	+20.7	103.6	53 48.8	+22.3	105.0	53 32.6	+24.0	106.3	53 15.2	+25.4	107.6	52 56.5	+26.9	108.8	52 36.5	+28.4	110.1	6
7	54 46.4	+16.0	99.2	54 36.1	+17.7	100.6	54 24.3	+19.4	102.0	54 11.1	+21.1	103.4	53 56.6	+22.7	104.7	53 40.6	+24.3	106.0	53 23.4	+25.9	107.3	53 04.9	+27.4	108.6	7
8	55 02.4	+14.7	97.6	54 53.8	+16.4	99.0	54 43.7	+18.1	100.4	54 32.2	+19.8	101.8	54 19.3	+21.4	103.1	54 04.9	+23.1	104.5	53 49.3	+24.6	105.8	53 32.3	+26.2	107.1	8
9	55 17.1	+13.1	95.9	55 10.2	+14.9	97.3	55 01.8	+16.7	98.7	54 52.0	+18.4	100.1	54 40.7	+20.1	101.5	54 28.0	+21.6	102.9	54 13.9	+23.5	104.3	53 58.5	+25.0	105.6	9
10	55 30.2	+11.7	94.2	55 25.1	+13.5	95.6	55 18.5	+15.3	97.0	55 10.4	+17.1	98.5	55 00.8	+18.8	99.9	54 49.8	+20.5	101.3	54 37.4	+22.1	102.7	54 23.5	+23.8	104.0	10
11	55 41.9	+10.3	92.4	55 38.6	+12.1	93.9	55 33.8	+13.9	95.3	55 27.5	+15.6	96.8	55 19.6	+17.5	98.2	55 10.3	+19.2	99.6	54 59.5	+20.9	101.1	54 47.3	+22.6	102.4	11
12	55 52.2	+8.7	90.7	55 50.7	+10.6	92.1	55 47.7	+12.4	93.6	55 43.1	+14.3	95.1	55 37.1	+16.0	96.5	55 29.5	+17.8	98.0	55 20.4	+19.5	99.4	55 09.9	+21.2	100.8	12
13	56 00.9	+7.2	88.9	56 01.3	+9.0	90.4	56 00.1	+10.9	91.9	55 57.4	+12.7	93.3	55 53.1	+14.5	94.8	55 47.3	+16.3	96.3	55 39.9	+18.2	97.7	55 31.1	+19.9	99.2	13
14	56 08.1	+5.6	87.1	56 10.3	+7.5	88.6	56 11.0	+9.4	90.1	56 10.1	+11.2	91.6	56 07.6	+13.1	93.1	56 03.6	+15.0	94.6	55 58.1	+16.7	96.0	55 51.0	+18.5	97.5	14
15	56 13.7	+4.1	85.3	56 17.8	+6.0	86.8	56 20.4	+7.8	88.3	56 21.3	+9.8	89.8	56 20.7	+11.6	91.3	56 18.6	+13.4	92.8	56 14.8	+15.3	94.3	56 09.5	+17.1	95.8	15
16	56 17.8	+2.6	83.5	56 23.8	+4.4	85.0	56 28.2	+6.3	86.5	56 31.1	+8.1	88.0	56 32.3	+10.1	89.6	56 32.0	+11.9	91.1	56 30.1	+13.8	92.6	56 26.6	+15.6	94.1	16
17	56 20.4	+0.9	81.7	56 28.2	+2.9	83.2	56 34.5	+4.7	84.7	56 39.2	+6.6	86.2	56 42.4	+8.5	87.8	56 43.9	+10.4	89.3	56 43.9	+12.2	90.8	56 42.2	+14.1	92.3	17
18	56 21.3	-0.6	79.9	56 31.1	+1.2	81.4	56 39.2	+3.2	82.9	56 45.8	+5.1	84.4	56 50.9	+6.9	86.0	56 54.3	+8.8	87.5	56 56.1	+10.7	89.0	56 56.3	+12.6	90.6	18
19	56 20.7	-2.1	78.1	56 32.3	-0.3	79.6	56 42.4	+1.5	81.1	56 50.9	+3.4	82.6	56 57.5	+5.3	84.1	57 03.1	+7.3	85.7	57 06.8	+9.2	87.2	57 08.9	+11.1	88.8	19
20	56 18.6	-3.8	76.3	56 32.0	-1.9	77.8	56 43.9	0.0	79.3	56 54.3	+1.8	80.8	57 03.1	+3.7	82.3	57 10.4	+5.6	83.8	57 16.0	+7.5	85.4	57 20.0	+9.5	86.9	20
21	56 14.8	-5.3	74.5	56 30.1	-3.5	76.0	56 43.9	-1.7	77.5	56 56.1	+0.2	79.0	57 06.8	+2.1	80.5	57 16.0	+4.0	82.0	57 23.5	+6.0	83.6	57 29.5	+7.8	85.1	21
22	56 09.5	-6.8	72.7	56 26.6	-5.1	74.2	56 42.2	-3.2	75.6	56 56.3	-1.3	77.1	57 08.9	+0.5	78.6	57 20.0	+2.4	80.2	57 29.5	+4.2	81.7	57 37.3	+6.2	83.3	22
23	56 02.7	-8.4	71.0	56 21.5	-6.6	72.4	56 39.0	-4.8	73.8	56 55.0	-3.0	75.3	57 09.4	-1.1	76.8	57 22.4	+0.7	78.3	57 33.7	+2.7	79.8	57 43.5	+4.6	81.4	23
24	55 54.3	-9.9	69.2	56 14.9	-8.2	70.6	56 34.2	-6.4	72.0	56 52.0	-4.6	73.5	57 08.3	-2.8	74.9	57 23.1	-0.9	76.5	57 36.4	+1.0	78.0	57 48.1	+2.9	79.5	24
25	55 44.4	-11.4	67.4	56 06.7	-9.6	68.8	56 27.8	-8.0	70.2	56 47.4	-6.2	71.6	57 05.5	-4.3	73.1	57 22.2	-2.5	74.6	57 37.4	-0.6	76.1	57 51.0	+1.3	77.7	25
26	55 33.0	-12.8	65.7	55 57.1	-11.2	67.0	56 19.8	-9.5	68.4	56 41.2	-7.8	69.8	57 01.2	-6.0	71.3	57 19.7	-4.1	72.7	57 36.8	-2.3	74.2	57 52.3	-0.4	75.8	26
27	55 20.2	-14.3	64.0	55 45.9	-12.7	65.3	56 10.3	-11.0	66.6	55 33.4	-9.3	68.0	56 55.2	-7.5	69.4	57 15.6	-5.8	70.9	57 34.5	-4.0	72.4	57 51.9	-2.1	73.9	27
28	55 05.9	-15.7	62.3	55 33.2	-14.1	63.6	55 59.3	-12.5	64.9	56 24.1	-10.8	66.2	56 47.7	-9.2	67.6	57 09.8	-6.1	71.9	57 30.5	-5.6	70.5	57 49.8	-3.8	72.0	28
29	54 50.2	-17.1	60.6	55 19.1	-15.5	61.8	55 46.8	-14.0	63.1	56 13.3	-12.3	64.5	56 38.5	-10.6	65.8	57 02.4	-8.3	67.2	57 24.9	-7.1	68.7	57 46.0	-5.3	70.1	29
30	54 33.1	-18.4	58.9	55 03.6	-17.0	60.1	55 32.8	-15.4	61.4	56 01.0	-13.9	62.7	56 27.9	-12.2	64.0	56 53.5	-10.6	65.4	57 17.8	-8.8	66.8	57 40.7	-7.1	68.3	30
31	54 14.7	-19.7	57.3	54 46.6	-18.3	58.5	55 17.4	-16.8	59.7	55 47.1	-15.2	61.0	56 15.7	-13.7	62.3	56 42.9	-12.0	63.6	57 09.0	-10.4	65.0	57 33.6	-8.6	66.4	31
32	53 55.0	-21.0	55.7	54 28.3	-19.6	56.8	55 00.6	-18.1	58.0	55 31.9	-16.7	59.3	55 02.0	-15.2	60.5	56 30.9	-13.6	61.8	56 58.6	-11.9	63.2	57 25.0	-10.3	64.6	32
33	53 34.0	-22.2	54.1	54 08.7	-20.8	55.4	54 42.5	-19.5	56.4	55 15.2	-18.1	57.6	55 46.8	-16.6	58.8	56 17.3	-15.0	60.1	56 46.7	-13.5	61.4	57 14.7	-11.8	62.8	33
34	53 11.8	-23.4	52.5	53 47.9	-22.3	53.6	54 20.7	-21.8	55.7	54 57.1	-20.3	56.8	54 04.0	-19.7	58.4	55 41.4	-18.0	59.5	56 33.2	-15.0	58.3	57 02.9	-13.3	61.0	34
35	52 48.4	-24.6	51.0	53 25.7	-23.3	52.1	54 02.2	-22.1	53.1	54 37.7	-20.7	54.3	55 12.3	-19.4	55.4	55 45.8	-17.9	56.6	56 18.2	-16.4	57.9	56 49.6	-14.9	59.2	35
36	52 23.8	-25.7	49.5	53 02.4	-24.5	50.5	53 40.1	-23.3	51.6	54 17.0	-22.0	52.6	54 52.9	-20.7	53.8	55 27.9	-19.3	54.9	56 01.8	-17.8	56.1	56 34.7	-16.3	57.4	36
37	51 58.1	-26.8	48.0	52 37.9	-25.7	49.0	53 16.8	-24.4	50.0	53 55.0	-23.3	51.1	54 32.2	-21.9	52.1	55 08.6	-20.6	53.3							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $35^\circ$ ,  $325^\circ$

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	52	18.1	-26.0	110.3	51	56.7	-27.4	111.5	51	34.1	-28.7	112.7	51	10.5	-30.1	113.8	50	45.7	-31.3	114.9	50	19.9	-32.6	116.0	49	53.1	-33.8	117.1	49	25.2	-34.9	118.1	0
1	51	52.1	-27.0	111.8	51	29.3	-28.3	112.9	51	05.4	-29.7	114.1	50	40.4	-31.0	115.2	50	14.4	-32.3	116.3	49	47.3	-33.5	117.3	49	19.3	-34.7	118.4	48	50.3	-35.8	119.4	1
2	51	25.1	-28.0	113.2	51	01.0	-29.4	114.3	50	35.7	-30.7	115.4	50	09.4	-31.9	116.5	49	42.1	-33.1	117.6	49	13.8	-34.2	118.6	48	44.6	-35.4	119.6	48	14.5	-36.4	120.6	2
3	50	57.1	-29.1	114.6	50	31.6	-30.4	115.7	50	05.0	-31.6	116.8	49	37.5	-32.8	117.8	49	09.0	-34.0	118.9	48	39.6	-35.1	119.9	48	09.2	-36.1	120.8	47	38.1	-37.2	121.8	3
4	50	28.0	-30.0	116.0	50	01.2	-31.2	117.1	49	33.4	-32.4	118.1	49	04.7	-33.6	119.1	48	35.0	-34.7	120.1	48	04.5	-35.8	121.1	47	33.1	-36.9	122.0	47	00.9	-37.9	122.9	4
5	49	58.0	-30.9	117.3	49	30.0	-32.2	118.4	49	01.0	-33.3	119.4	48	31.1	-34.5	120.4	48	00.3	-35.5	121.3	47	28.7	-36.6	122.3	46	23.0	-38.6	124.1	5				
6	49	27.1	-31.9	118.7	48	57.8	-33.0	119.7	48	27.7	-34.1	120.7	47	56.6	-35.2	121.6	47	24.8	-36.3	122.5	46	52.1	-37.3	123.5	46	18.6	-38.2	124.3	45	44.4	-39.1	125.2	6
7	48	55.2	-32.6	120.0	48	24.8	-33.8	120.9	47	53.6	-34.9	121.9	47	21.4	-35.9	122.8	46	48.5	-36.9	123.7	46	14.8	-37.9	124.6	45	40.4	-38.8	125.4	45	05.3	-39.8	126.3	7
8	48	22.6	-33.5	121.2	47	51.0	-34.6	122.2	47	18.7	-35.7	123.1	46	45.5	-36.6	124.0	46	11.6	-37.6	124.9	45	36.9	-38.5	125.7	45	01.6	-39.5	126.5	44	25.5	-40.3	127.3	8
9	47	49.1	-34.3	122.5	47	16.4	-35.3	123.4	46	43.0	-36.3	124.3	46	08.9	-37.4	125.1	45	34.0	-38.3	126.0	44	58.4	-39.2	126.8	44	22.1	-40.2	127.6	43	45.2	-40.9	128.3	9
10	47	14.8	-35.1	123.7	46	41.1	-36.1	124.6	46	06.7	-37.0	125.4	45	31.5	-37.9	126.3	44	55.7	-38.9	127.1	44	19.2	-39.7	127.9	43	42.1	-40.6	128.6	43	04.3	-41.4	129.4	10
11	46	39.7	-35.7	124.9	46	05.0	-36.7	125.7	45	29.7	-37.7	126.6	44	53.6	-38.6	127.4	44	16.8	-39.4	128.1	43	39.5	-40.3	128.9	43	01.5	-41.1	129.6	42	22.9	-41.9	130.3	11
12	46	04.0	-36.5	126.0	45	28.3	-37.4	126.9	44	52.0	-38.3	127.7	44	15.0	-39.2	128.4	43	37.4	-40.0	129.9	42	59.2	-40.9	129.9	42	20.4	-41.6	130.6	41	41.0	-42.3	131.3	12
13	45	27.5	-37.1	127.2	44	50.9	-38.0	128.0	44	13.7	-38.9	128.7	43	35.8	-39.7	129.5	42	57.4	-40.6	130.2	42	18.3	-41.3	130.9	41	38.8	-42.1	131.6	40	58.7	-42.8	132.2	13
14	44	50.4	-37.8	128.3	44	12.9	-38.7	129.1	43	34.8	-39.5	129.8	42	56.1	-40.3	130.5	42	16.8	-41.1	131.2	41	37.0	-41.8	131.9	40	56.7	-42.6	132.5	40	15.9	-43.3	133.2	14
15	44	12.6	-38.4	129.4	43	34.2	-39.2	130.1	42	55.3	-40.0	130.8	42	15.8	-40.8	131.5	41	35.7	-41.5	132.2	40	55.2	-42.3	132.8	40	14.1	-42.9	133.5	39	32.6	-43.6	134.1	15
16	43	34.2	-38.9	130.4	42	55.0	-39.7	131.2	42	15.3	-40.6	131.8	41	35.0	-41.3	132.5	40	54.2	-42.0	133.2	40	12.9	-42.7	133.8	39	31.2	-43.4	134.4	38	49.0	-44.1	135.0	16
17	42	55.3	-39.5	131.5	42	15.3	-40.3	132.2	41	34.7	-41.0	132.8	40	53.7	-41.8	133.5	40	12.2	-42.5	134.1	39	30.2	-43.2	134.7	38	47.8	-43.8	135.3	38	04.9	-44.4	135.8	17
18	42	15.8	-40.1	132.5	41	35.0	-40.8	133.2	40	53.7	-41.5	133.8	40	11.9	-42.2	134.4	39	29.7	-42.9	135.0	38	47.0	-43.5	135.6	38	04.0	-44.2	136.1	37	20.5	-44.8	136.7	18
19	41	35.7	-40.5	133.5	40	54.2	-41.3	134.1	40	12.2	-42.0	134.8	39	29.7	-42.7	135.3	38	46.8	-43.3	135.9	38	03.5	-43.9	136.5	37	19.8	-45.7	137.5	19				
20	40	55.2	-41.1	134.5	40	12.9	-41.7	135.1	39	30.2	-42.4	135.7	38	47.0	-43.0	136.3	38	03.5	-43.7	136.8	37	19.6	-44.3	137.3	36	35.3	-44.9	137.8	35	50.6	-45.4	138.3	20
21	40	14.1	-41.5	135.5	39	31.2	-42.2	136.0	38	47.8	-42.9	136.6	38	04.0	-43.5	137.1	37	19.8	-44.1	137.7	36	35.3	-44.7	138.2	35	50.4	-45.2	138.7	35	05.2	-45.8	139.1	21
22	39	32.6	-41.9	136.4	38	49.0	-42.6	137.0	38	04.9	-43.2	137.5	37	20.5	-43.8	138.0	36	35.7	-44.4	138.5	35	50.6	-45.0	139.0	35	05.2	-45.5	139.5	34	19.4	-46.0	139.9	22
23	38	50.7	-42.4	137.3	38	06.4	-43.0	137.9	37	21.7	-43.6	138.4	36	36.7	-44.2	138.9	35	51.3	-44.7	139.4	35	05.6	-45.3	139.8	34	19.7	-45.9	140.3	33	33.4	-46.4	140.7	23
24	38	08.3	-42.8	138.2	37	23.4	-43.4	138.7	36	38.1	-44.0	139.2	35	52.5	-44.5	139.7	35	06.6	-45.1	140.2	34	20.3	-45.6	140.6	33	33.8	-46.1	141.0	24				
25	37	25.5	-43.2	139.1	36	40.0	-43.8	139.6	35	54.1	-44.3	140.1	35	08.0	-44.9	140.5	34	21.5	-45.4	141.0	33	34.7	-45.9	141.4	32	47.7	-46.4	141.8	32	00.4	-46.8	142.2	25
26	36	42.3	-43.5	140.0	35	56.2	-44.1	140.5	35	09.8	-44.6	140.9	34	23.1	-45.2	141.3	33	36.1	-45.7	141.8	32	48.8	-46.1	142.2	32	01.3	-46.6	142.6	31	13.6	-47.1	142.9	26
27	35	58.8	-43.9	140.8	35	12.1	-44.4	141.3	34	25.2	-45.0	141.7	33	37.9	-45.5	142.1	32	50.4	-45.9	142.5	32	02.7	-46.5	142.9	31	14.7	-46.9	143.3	30	26.5	-47.4	143.6	27
28	35	14.9	-44.3	141.7	34	27.7	-44.8	142.1	33	40.2	-45.3	142.5	32	52.4	-45.7	142.9	31	16.2	-46.7	143.7	30	27.8	-47.1	144.0	29	39.1	-47.5	144.4	28				
29	29	58.8	-46.3	147.2	29	08.3	-46.7	147.5	28	17.6	-47.0	147.8	27	36.8	-47.4	148.0	26	35.8	-47.8	148.3	25	44.7	-48.2	148.6	24	53.4	-48.5	148.8	24	02.1	-48.9	149.0	35
30	29	12.5	-46.4	147.9	28	21.6	-46.8	148.2	27	30.6	-47.3	148.5	26	39.4	-47.6	148.7	25	48.0	-48.0	149.0	24	56.5	-48.3	149.2	24	04.9	-48.6	149.5	23	13.2	-49.0	149.7	36
31	28	26.1	-46.7	148.6	27	34.8	-47.1	148.9	26	43.3	-47.4	149.1	25	51.8	-47.9	149.4	25	00.0	-48.1	149.6	24	08.2	-48.5	149.9	23	16.3	-48.9	150.1	22	24.2	-49.2	150.3	37
32	27	39.4	-47.0	149.3	26	47.7	-48.4	149.6	25	55.9	-47.7	149.8	25	03.9	-47.9	150.1	24	11.9	-48.3	150.3	23	19.7	-48.6	150.5	22	27.4	-49.8	150.7	21	35.0	-49.2	150.9	38
33	26	52.4	-47.1	150.0	26	00.4	-47.5</																										

36°, 324° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z																
0	51 23.6	+24.4	109.6	51 02.9	+25.8	110.8	50 41.1	+27.1	111.9	50 18.1	+28.6	113.0	49 54.1	+29.9	114.1	49 29.1	+31.1	115.2	49 03.0	+32.4	116.3	48 36.0	+33.6	117.3	0
1	51 48.0	+23.2	108.1	51 28.7	+24.7	109.3	51 08.2	+26.2	110.5	50 46.7	+27.5	111.7	50 24.0	+28.9	112.8	50 00.2	+30.2	113.9	49 35.4	+31.5	115.0	49 09.6	+32.7	116.0	1
2	52 11.2	+22.0	106.6	51 53.4	+23.6	107.9	51 34.4	+25.0	109.1	51 14.2	+26.5	110.2	50 52.9	+27.9	111.4	50 30.4	+29.3	112.5	50 06.9	+30.6	113.6	49 42.3	+31.9	114.7	2
3	52 33.2	+20.8	105.1	52 17.0	+22.4	106.4	51 59.4	+24.0	107.6	51 40.7	+25.4	108.8	51 20.8	+26.8	110.0	50 59.7	+28.2	111.2	50 37.5	+29.6	112.3	50 14.2	+30.9	113.4	3
4	52 54.1	+19.6	103.6	52 39.4	+21.2	104.8	52 23.4	+22.8	106.1	52 06.1	+24.3	107.3	51 47.6	+25.8	108.6	51 27.9	+27.3	109.7	51 07.1	+28.6	110.9	50 45.1	+30.0	112.1	4
5	53 13.7	+18.4	102.0	53 00.6	+20.0	103.3	52 46.2	+21.5	104.6	52 30.4	+23.2	105.8	52 13.4	+24.7	107.1	51 55.2	+26.1	108.3	51 35.7	+27.6	109.5	51 15.1	+29.0	110.7	5
6	53 32.1	+17.1	100.4	53 20.6	+18.8	101.7	53 07.7	+20.4	103.0	52 53.6	+21.9	104.3	52 38.1	+23.5	105.6	52 21.3	+25.1	106.8	52 03.3	+26.5	108.1	51 44.1	+28.0	109.3	6
7	53 49.2	+15.8	98.8	53 39.4	+17.4	100.1	53 28.1	+19.1	101.5	53 15.5	+20.8	102.8	53 01.6	+22.3	104.1	52 46.4	+23.9	105.3	52 29.8	+25.5	106.6	52 12.1	+26.9	107.8	7
8	54 05.0	+14.4	97.1	53 56.8	+16.1	98.5	53 47.2	+17.8	99.9	53 36.3	+19.4	101.2	53 23.9	+21.1	102.5	53 10.3	+22.7	103.8	52 55.3	+24.2	105.1	52 39.0	+25.8	106.4	8
9	54 19.4	+13.0	95.5	54 12.9	+14.8	96.9	54 05.0	+16.5	98.2	53 55.7	+18.2	99.6	53 45.0	+19.9	100.9	53 33.0	+21.5	102.3	53 19.5	+23.1	103.6	53 04.8	+24.6	104.9	9
10	54 32.4	+11.6	93.8	54 27.7	+13.4	95.2	54 21.5	+15.2	96.6	54 13.9	+16.9	98.0	54 04.9	+18.6	99.3	53 54.5	+20.2	100.7	53 42.6	+21.9	102.0	53 29.4	+23.5	103.4	10
11	54 44.0	+10.2	92.1	54 41.1	+12.0	93.5	54 36.7	+13.7	94.9	54 30.8	+15.5	96.3	54 23.5	+17.2	97.7	54 14.7	+18.9	99.1	54 04.5	+20.6	100.5	53 52.9	+22.3	101.8	11
12	54 54.2	+8.7	90.4	54 53.1	+10.5	91.8	54 50.4	+12.3	93.2	54 46.3	+14.1	94.7	54 40.7	+15.8	96.1	54 33.6	+17.6	97.5	54 25.1	+19.3	98.8	54 15.2	+20.9	100.2	12
13	55 02.9	+7.3	88.7	55 03.6	+9.1	90.1	55 02.7	+10.9	91.5	55 00.4	+12.7	93.0	54 56.5	+14.5	94.4	54 51.2	+16.2	95.8	54 44.4	+18.0	97.2	54 36.1	+19.7	98.6	13
14	55 10.2	+5.8	86.9	55 12.7	+7.6	88.4	55 13.6	+9.4	89.8	55 13.1	+11.2	91.3	55 11.0	+13.0	92.7	55 07.4	+14.8	94.1	55 02.4	+16.5	95.6	54 55.8	+18.3	97.0	14
15	55 16.0	+4.3	85.2	55 20.3	+6.1	86.6	55 23.0	+8.0	88.1	55 24.3	+9.7	89.5	55 24.0	+11.6	91.0	55 22.2	+13.4	92.4	55 18.9	+15.2	93.9	55 14.1	+17.0	95.3	15
16	55 20.3	+2.7	83.4	55 26.4	+4.6	84.9	55 31.0	+6.4	86.3	55 34.0	+8.3	87.8	55 35.6	+10.1	89.2	55 35.6	+11.9	90.7	55 34.1	+13.8	92.2	55 31.1	+15.5	93.6	16
17	55 23.0	+1.3	81.7	55 31.0	+3.0	83.1	55 37.4	+4.9	84.6	55 42.3	+6.8	86.0	55 45.7	+8.6	87.5	55 47.5	+10.5	89.0	55 47.9	+12.2	90.4	55 46.6	+14.1	91.9	17
18	55 24.3	-0.3	79.9	55 34.0	+1.6	81.4	55 42.3	+3.4	82.8	55 49.1	+5.2	84.3	55 54.3	+7.1	85.7	55 58.0	+8.9	87.2	56 00.1	+10.8	88.7	56 00.7	+12.6	90.2	18
19	55 24.0	-1.8	78.2	55 35.6	0.0	79.6	55 45.7	+1.8	81.0	55 54.3	+3.7	82.5	56 01.4	+5.5	84.0	56 06.9	+7.4	85.4	56 10.9	+9.3	86.9	56 13.3	+11.1	88.4	19
20	55 22.2	-3.3	76.4	55 35.6	-1.5	77.8	55 47.5	+0.4	79.3	55 58.0	+2.1	80.7	56 06.9	+4.0	82.2	56 14.3	+5.9	83.7	56 20.2	+7.7	85.2	56 24.4	+9.6	86.7	20
21	55 18.9	-4.8	74.6	55 34.1	-3.0	76.1	55 47.9	-1.3	77.5	56 00.1	+0.6	78.9	56 10.9	+2.4	80.4	56 20.2	+4.2	81.9	56 27.9	+6.1	83.4	56 34.0	+8.1	84.9	21
22	55 14.1	-6.3	72.9	55 31.1	-4.6	74.3	55 46.6	-2.7	75.7	56 00.7	-0.9	77.1	56 13.3	+0.9	78.6	56 24.4	+2.8	80.1	56 34.0	+4.6	81.6	56 42.1	+6.4	83.1	22
23	55 07.8	-7.7	71.2	55 26.5	-6.0	72.5	55 43.9	-4.3	73.9	55 59.8	-2.6	75.3	56 14.2	-0.7	76.8	56 27.2	+1.1	78.3	56 38.6	+3.0	79.7	56 48.5	+4.9	81.2	23
24	55 00.1	-9.3	69.4	55 20.5	-7.6	70.8	55 39.6	-5.9	72.2	55 57.2	-4.0	73.6	56 13.5	-2.3	75.0	56 28.3	-0.4	76.4	56 41.6	+1.4	77.9	56 53.4	+3.3	79.4	24
25	54 50.8	-10.7	67.7	55 12.9	-9.0	69.0	55 33.7	-7.3	70.4	55 53.2	-5.6	71.8	56 11.2	-3.8	73.2	56 27.9	-2.0	74.6	56 43.0	-0.2	76.1	56 56.7	+1.6	77.6	25
26	54 40.1	-12.1	66.0	55 03.9	-10.5	67.3	55 26.4	-8.8	68.6	55 47.6	-7.1	70.0	56 07.4	-5.3	71.4	56 25.9	-3.6	72.8	56 42.8	-1.7	74.3	56 58.3	+0.1	75.8	26
27	54 28.0	-13.5	64.3	54 53.4	-11.9	65.6	55 17.6	-10.3	66.9	55 40.5	-8.6	68.2	56 02.1	-7.0	69.6	56 22.3	-5.2	71.0	56 41.1	-3.4	72.5	56 58.4	-1.5	73.9	27
28	54 14.5	-14.9	62.6	54 41.5	-13.3	63.9	55 07.3	-11.8	65.2	55 31.9	-10.1	66.5	55 55.1	-8.4	67.8	56 17.1	-6.7	69.2	56 37.7	-5.0	70.6	56 56.9	-3.2	72.1	28
29	53 59.6	-16.2	61.0	54 28.2	-14.8	62.2	54 55.5	-13.1	63.5	55 21.8	-11.6	64.8	55 46.7	-9.9	66.1	56 10.4	-8.3	67.4	56 32.7	-6.5	68.8	56 53.7	-4.8	70.3	29
30	53 43.4	-17.6	59.4	54 13.4	-16.1	60.5	54 42.4	-14.6	61.8	55 10.2	-13.0	63.0	55 36.8	-11.4	64.3	56 02.1	-9.7	65.7	56 26.2	-8.1	67.0	56 48.9	-6.3	68.4	30
31	53 25.8	-18.4	57.7	53 57.3	-17.4	58.9	54 27.8	-15.9	60.1	54 57.2	-14.5	61.3	55 25.4	-12.9	62.6	55 52.4	-11.3	63.9	56 18.1	-9.6	65.2	56 42.6	-7.9	66.6	31
32	53 07.0	-20.1	56.2	53 39.9	-18.7	57.3	54 11.9	-17.3	58.4	54 42.7	-15.8	59.6	55 12.5	-14.3	60.9	55 41.1	-12.7	62.2	56 08.5	-11.1	63.5	56 34.7	-9.5	64.8	32
33	52 46.9	-21.3	54.6	53 21.2	-19.9	55.7	53 54.6	-18.6	56.8	54 26.9	-17.2	58.0	54 58.2	-15.7	59.2	55 28.4	-14.2	60.4	55 57.4	-12.6	61.7	56 25.2	-11.0	63.0	33
34	52 25.6	-22.4	53.0	49 43.1	-36.7	51.4	45 34.2	-36.1	51.9	46 25.0	-35.5	52.4	47 15.4	-34.8	53.0	45.6	-34.2	53.6	48 55.3	-33.4	54.3	49 44.7	-32.6	54.9	34
35	52 03.2	-23.6	51.5	52 40.1	-22.4	52.6	52 32.7	-23.5	50.5	53 10.4	-22.1	51.6	53 47.3	-21.0	52.6	54 23.3	-19.7	53.7	54 58.3	-18.3	54.9	55 32.3	-16.8	56.1	35
36	51 39.6	-24.8	50.0	51 33.5	-23.9	52.1	51 31.5	-21.1	53.1	53 41.0	-20.7	54.7	54 20.5	-20.4	55.4	55 15.2	-16.9	56.5	55 47.7	-15.4	57.8	56	34.0	-14.0	59.5
37	51 14.8	-25.8	48.6	51 54.2	-24.7	49.5	52 32.7	-23.5	50.5	53 10.4	-22.1	51.6	53 47.3	-21.0	52.6	54 23.3	-19.7	53.7	54 58.3</						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $36^\circ$ , 324°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	51	23.6	-25.4	109.6	51	02.9	-26.8	110.8	50	41.1	-28.2	111.9	50	18.1	-29.5	113.0	49	54.1	-30.8	114.1	49	29.1	-32.1	115.2	49	03.0	-33.2	116.3	48	36.0	-34.4	117.3	0
1	50	58.2	-26.5	111.1	50	36.1	-27.9	112.2	50	12.9	-29.2	113.3	49	48.6	-30.4	114.4	49	23.3	-31.7	115.5	48	57.0	-32.8	116.5	48	29.8	-34.1	117.5	48	01.6	-35.2	118.5	1
2	50	31.7	-27.5	112.5	50	08.2	-28.8	113.6	49	43.7	-30.1	114.7	49	18.2	-31.4	115.7	48	51.6	-32.5	116.8	48	24.2	-33.7	117.8	47	55.7	-34.8	118.8	47	26.4	-35.9	119.7	2
3	50	04.2	-28.4	113.9	49	39.4	-29.7	114.9	49	13.6	-31.0	116.0	48	46.8	-32.1	117.0	48	19.1	-33.3	118.0	47	50.5	-34.5	119.0	47	20.9	-35.5	120.0	46	50.5	-36.6	120.9	3
4	49	35.8	-29.5	115.2	49	09.7	-30.7	116.3	48	42.6	-31.8	117.3	48	14.7	-33.1	118.3	47	45.8	-34.2	119.3	47	16.0	-35.2	120.2	46	45.4	-36.3	121.1	46	13.9	-37.3	122.0	4
5	49	06.3	-30.3	116.6	48	39.0	-31.4	117.6	48	10.8	-32.7	118.6	47	41.6	-33.8	119.5	47	11.6	-34.9	120.5	46	40.8	-36.0	121.4	46	09.1	-37.2	122.3	45	36.6	-37.9	123.2	5
6	48	36.0	-31.2	117.9	48	07.5	-32.3	118.9	47	38.1	-33.5	119.8	47	07.8	-34.5	120.8	46	36.7	-35.6	121.7	46	08.4	-36.6	122.6	45	32.1	-37.6	123.4	44	58.7	-38.5	124.3	6
7	48	04.8	-32.0	119.2	47	35.2	-33.2	120.1	47	04.6	-34.2	121.1	46	33.3	-35.3	122.0	46	01.1	-36.3	122.8	45	28.2	-37.3	123.7	44	54.5	-38.2	124.5	44	20.2	-39.2	125.3	7
8	47	32.8	-32.9	120.4	47	02.0	-34.0	121.4	46	30.4	-35.0	122.3	45	58.0	-36.1	123.1	45	24.8	-37.0	124.0	44	50.9	-37.9	124.8	44	16.3	-38.9	125.6	43	41.0	-39.7	126.4	8
9	46	59.9	-33.6	121.7	46	28.0	-34.6	122.6	45	55.4	-35.7	123.4	45	21.9	-36.6	124.3	44	47.8	-37.6	125.1	44	13.0	-38.6	125.9	43	37.4	-39.4	126.7	43	01.3	-40.3	127.4	9
10	46	26.3	-34.4	122.9	45	53.4	-35.4	123.7	45	19.7	-36.4	124.6	44	45.3	-37.3	125.4	44	10.2	-38.3	126.2	43	34.4	-39.1	127.0	42	58.0	-39.9	127.7	42	21.0	-40.8	128.4	10
11	45	51.9	-35.1	124.0	45	18.0	-36.1	124.9	44	43.3	-37.0	125.7	44	08.0	-38.0	126.5	43	31.9	-38.8	127.3	42	55.3	-39.7	128.0	42	18.1	-40.5	128.7	41	40.2	-41.2	129.4	11
12	45	16.8	-35.7	125.2	44	41.9	-36.7	126.0	44	06.3	-37.7	126.8	43	30.0	-38.5	127.6	42	53.1	-39.3	128.3	42	15.6	-40.2	129.0	41	37.6	-41.0	129.7	40	59.0	-41.8	130.4	12
13	44	41.1	-36.5	126.3	44	05.2	-37.4	127.1	43	28.6	-38.2	127.9	42	51.5	-39.1	128.6	42	13.8	-40.0	129.3	41	35.4	-40.7	130.0	40	56.6	-41.5	130.7	40	17.2	-42.2	131.3	13
14	44	04.6	-37.1	127.5	43	27.8	-37.9	128.2	42	50.4	-38.4	128.9	42	12.4	-39.6	129.7	41	33.8	-40.4	130.3	40	54.7	-41.2	131.0	40	15.1	-41.8	131.6	39	35.0	-42.6	132.3	14
15	43	27.5	-37.6	128.5	42	49.9	-38.6	129.3	42	11.6	-39.4	130.0	41	32.8	-40.2	130.7	40	53.4	-40.9	131.3	40	13.5	-41.6	132.0	39	33.2	-42.4	132.6	38	52.4	-43.1	133.2	15
16	42	49.9	-38.3	129.6	42	11.3	-39.1	130.3	41	32.2	-39.8	131.0	40	52.6	-40.6	131.6	40	12.5	-41.4	132.3	39	31.9	-41.2	132.9	38	50.8	-42.3	133.5	38	09.3	-43.4	134.1	16
17	42	11.6	-38.8	130.7	41	32.2	-39.6	131.3	40	52.4	-40.4	132.0	40	12.0	-41.1	132.6	39	31.1	-41.8	132.3	38	49.8	-42.5	133.8	38	08.0	-43.1	134.4	37	25.9	-43.9	134.9	17
18	41	32.8	-39.4	131.7	40	52.6	-40.1	132.3	40	12.0	-40.9	133.0	39	30.9	-41.6	133.6	38	49.3	-42.3	134.2	38	07.3	-42.9	134.7	37	24.9	-43.6	135.3	36	42.0	-44.1	135.8	18
19	40	53.4	-39.9	132.7	40	12.5	-40.6	133.3	39	31.1	-41.3	133.9	38	49.3	-42.0	134.5	38	07.0	-42.6	135.1	37	24.4	-43.4	135.6	35	57.9	-44.6	136.6	19				
20	40	13.5	-40.3	133.7	39	31.9	-41.1	134.3	38	49.8	-41.8	134.8	38	07.3	-42.4	135.4	37	24.4	-43.1	135.9	36	41.0	-43.6	136.5	35	57.4	-44.3	137.0	35	13.3	-44.8	137.5	20
21	39	33.2	-40.8	134.6	38	50.8	-41.5	135.2	38	08.0	-42.1	135.8	36	41.3	-43.4	136.8	35	57.4	-44.1	137.3	35	13.1	-44.6	137.8	34	28.5	-45.2	138.3	21				
22	38	52.4	-41.3	135.6	38	09.3	-41.9	136.1	37	25.9	-42.6	136.7	36	42.0	-43.2	137.2	35	57.9	-43.8	137.7	35	13.3	-44.3	138.6	33	43.3	-45.5	139.1	22				
23	38	11.1	-41.7	136.5	37	27.4	-42.4	137.0	36	43.3	-43.0	137.5	35	58.8	-43.5	138.0	35	14.1	-44.2	138.5	34	29.9	-44.4	139.3	33	44.3	-45.1	139.8	32	12.1	-46.1	140.2	24
24	37	29.4	-42.1	137.4	36	45.0	-42.7	137.9	36	00.3	-43.3	138.4	35	15.3	-43.9	138.9	34	27.4	-44.5	139.5	32	58.3	-45.5	140.2	32	12.1	-47.4	141.7	24				
25	36	47.3	-42.5	138.3	36	02.3	-43.1	138.8	35	17.0	-43.7	139.3	34	31.4	-44.3	139.7	33	45.5	-44.8	140.2	32	59.2	-45.3	140.6	32	12.8	-45.8	141.0	31	26.0	-46.3	141.4	25
26	36	04.8	-42.9	139.2	35	19.2	-43.8	139.6	34	33.3	-44.0	140.1	33	47.1	-44.5	140.5	33	00.7	-45.1	140.9	32	13.9	-45.5	141.4	31	27.0	-46.1	142.1	30				
27	35	21.9	-43.3	140.0	34	35.7	-43.8	140.5	33	49.3	-44.3	140.9	33	02.6	-44.9	141.3	32	15.6	-45.4	141.7	31	28.4	-45.9	142.1	30	40.9	-46.3	142.5	27				
28	34	38.6	-43.6	140.9	33	51.9	-44.1	141.3	33	05.0	-44.7	141.7	32	17.7	-45.1	142.1	31	30.2	-45.6	142.5	30	42.5	-46.1	142.9	29	54.6	-46.6	143.2	29	06.4	-47.0	143.6	28
29	33	55.0	-43.9	141.7	33	07.8	-44.4	142.1	32	20.3	-44.9	142.5	31	32.6	-45.5	142.9	30	44.6	-45.9	143.3	29	08.0	-46.4	143.6	28	19.0	-47.4	144.3	29				
30	33	11.1	-44.2	142.5	32	23.4	-44.8	142.9	31	35.4	-45.3	143.3	30	47.1	-45.6	143.7	29	58.7	-46.1	144.0	29	10.1	-46.6	144.3	28	21.2	-47.0	144.7	27	32.2	-47.5	145.0	30
31	32	26.9	-44.6	143.3	31	38.6	-45.0	143.7	30	50.1	-45.4	144.1	30	01.5	-46.0	144.4	29	12.6	-46.4	144.7	28	23.5	-46.8	145.1	26	44.7	-47.6	145.7	31				
32	31	42.3	-44.8	144.1	30	53.6	-45.3	144.5	30	04.7	-45.8	144.8	29	15.5	-46.2	145.2	28	26.2	-46.6	145.5	27	36.7	-47.1	145.8	26	47.0	-47.5	146.3	32				
33	30	57.5	-45.1	144.9	30	08.3	-45.5	145.2	29	18.9	-46.0	145.6	28	29.3	-46.4	145.9	27	39.6	-46.9	146.2	26	49.6	-47.2	146.5	25	59.5	-47.6	1					

37°, 323° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	50 28.9	+23.9	109.0	50 08.9	+25.2	110.1	49 47.7	+26.7	111.2	49 25.5	+28.0	112.3	49 02.2	+29.3	113.4	48 37.9	+30.6	114.4	48 12.6	+31.8	115.4	47 46.3	+33.1	116.4	0
1	50 52.8	+22.8	107.5	50 34.1	+24.3	108.7	50 14.4	+25.6	109.8	49 53.5	+27.0	110.9	49 31.5	+28.4	112.0	49 08.5	+29.7	113.1	48 44.4	+31.0	114.2	48 19.4	+32.2	115.2	1
2	51 15.6	+21.6	106.0	50 58.4	+23.1	107.2	50 40.0	+24.6	108.4	50 20.5	+26.1	109.5	49 59.9	+27.4	110.7	49 38.2	+28.8	111.8	49 15.4	+30.1	112.9	48 51.6	+31.4	113.9	2
3	51 37.2	+20.5	104.5	51 21.5	+22.0	105.8	51 04.6	+23.6	106.9	50 46.6	+24.9	108.1	50 27.3	+26.4	109.3	50 07.0	+27.7	110.4	49 45.5	+29.1	111.5	49 23.0	+30.4	112.6	3
4	51 57.7	+19.3	103.0	51 43.5	+20.9	104.3	51 28.2	+22.3	105.5	51 11.5	+23.9	106.7	50 53.7	+25.4	107.9	50 34.7	+26.8	109.0	50 14.6	+28.2	110.2	49 53.4	+29.5	111.3	4
5	52 17.0	+18.1	101.5	52 04.4	+19.7	102.7	51 50.5	+21.3	104.0	51 35.4	+22.8	105.2	51 19.1	+24.2	106.4	51 01.5	+25.8	107.6	50 42.8	+27.2	108.8	50 22.9	+28.6	109.9	5
6	52 35.1	+16.8	99.9	52 24.1	+18.4	101.2	52 11.8	+20.0	102.5	51 58.2	+21.6	103.7	51 43.3	+23.2	104.9	51 27.3	+24.6	106.2	51 10.0	+26.1	107.4	50 51.5	+27.5	108.5	6
7	52 51.9	+15.5	98.3	52 42.5	+17.2	99.6	52 31.8	+18.9	100.9	52 19.8	+20.4	102.2	52 06.5	+22.0	103.4	51 51.9	+23.5	104.7	51 36.1	+25.0	105.9	51 19.0	+26.5	107.1	7
8	53 07.4	+14.3	96.7	52 59.7	+15.9	98.0	52 50.7	+17.5	99.4	52 40.2	+19.2	100.6	52 28.5	+20.8	101.9	52 15.4	+22.4	103.2	52 01.1	+23.9	104.4	51 45.5	+25.4	105.7	8
9	53 21.7	+12.8	95.1	53 15.6	+14.6	96.4	53 08.2	+16.3	97.8	52 59.4	+18.0	99.1	52 49.3	+19.6	100.4	52 37.8	+21.2	101.7	52 25.0	+22.8	102.9	52 10.9	+24.4	104.2	9
10	53 34.6	+11.5	93.5	53 30.2	+13.3	94.8	53 24.5	+15.0	96.2	53 17.4	+16.6	97.5	53 08.9	+18.3	98.8	52 59.0	+20.0	100.1	52 47.8	+21.6	101.4	52 35.3	+23.1	102.7	10
11	53 46.1	+10.2	91.8	53 43.5	+11.9	93.2	53 39.5	+13.6	94.5	53 34.0	+15.4	95.9	53 27.2	+17.0	97.2	53 19.0	+18.7	98.6	53 09.4	+20.3	99.9	52 58.4	+22.0	101.2	11
12	53 56.3	+8.7	90.1	53 55.4	+10.5	91.5	53 53.1	+12.3	92.9	53 49.4	+14.0	94.2	53 44.2	+15.7	95.6	53 37.7	+17.4	97.0	53 29.7	+19.1	98.3	53 20.4	+20.7	99.6	12
13	54 05.0	+7.3	88.4	54 05.9	+9.1	89.8	54 05.4	+10.8	91.2	54 03.4	+12.6	92.6	53 59.9	+14.4	94.0	53 55.1	+16.1	95.3	53 48.8	+17.8	96.7	53 41.1	+19.5	98.1	13
14	54 12.3	+5.8	86.8	54 15.0	+7.7	88.1	54 16.2	+9.5	89.5	54 16.0	+11.2	90.9	54 14.3	+13.0	92.3	54 11.2	+14.7	93.7	54 06.6	+16.4	95.1	54 00.6	+18.1	96.4	14
15	54 18.2	+4.5	85.1	54 22.7	+6.2	86.4	54 25.7	+8.0	87.8	54 27.2	+9.8	89.2	54 27.3	+11.6	90.6	54 25.9	+13.3	92.0	54 23.0	+15.1	93.4	54 18.7	+16.9	94.8	15
16	54 22.7	+3.0	83.3	54 28.9	+4.8	84.7	54 33.7	+6.6	86.1	54 37.0	+8.4	87.5	54 38.9	+10.1	88.9	54 39.2	+12.0	90.4	54 38.1	+13.7	91.8	54 35.6	+15.4	93.2	16
17	54 25.7	+1.5	81.6	54 33.7	+3.3	83.0	54 40.3	+5.1	84.4	54 45.4	+6.9	85.8	54 49.0	+8.7	87.2	54 51.2	+10.5	88.7	54 51.8	+12.3	90.1	54 51.0	+14.1	91.5	17
18	54 27.2	+0.1	79.9	54 37.0	+1.9	81.3	54 45.4	+3.6	82.7	54 52.3	+5.4	84.1	54 57.7	+7.3	85.5	55 01.7	+9.0	86.9	55 04.1	+10.9	88.4	55 05.1	+12.6	89.8	18
19	54 27.3	-1.4	78.2	54 38.9	+0.3	79.6	54 49.0	+2.2	81.0	54 57.7	+4.0	82.4	55 05.0	+5.7	83.8	55 10.7	+7.6	85.2	55 15.0	+9.4	86.6	55 17.7	+11.2	88.1	19
20	54 25.9	-2.9	76.5	54 39.2	-1.1	77.8	54 51.2	+0.6	79.2	55 01.7	+2.4	80.6	55 10.7	+4.3	82.0	55 18.3	+6.1	83.5	55 24.4	+7.8	84.9	55 28.9	+9.7	86.4	20
21	54 23.0	-4.3	74.7	54 38.1	-2.5	76.1	54 51.8	-0.8	77.5	55 04.1	+1.0	78.9	55 15.0	+2.7	80.3	55 24.4	+4.5	81.7	55 32.2	+6.4	83.2	55 38.6	+8.3	84.6	21
22	54 18.7	-5.7	73.0	54 35.6	-4.1	74.4	54 51.0	-2.3	75.7	55 05.1	-0.6	77.1	55 17.7	+1.3	78.5	55 28.9	+3.1	80.0	55 38.6	+4.9	81.4	55 46.9	+6.7	82.9	22
23	54 13.0	-7.2	71.3	54 31.5	-5.5	72.7	54 48.7	-3.8	74.0	55 04.5	-2.0	75.4	55 19.0	-0.3	76.8	55 32.0	+1.5	78.2	55 43.5	+3.3	79.6	55 53.6	+5.1	81.1	23
24	54 05.8	-8.7	69.6	54 26.0	-7.0	70.9	54 44.9	-5.2	72.3	55 02.5	-3.5	73.6	55 18.7	-1.8	75.0	55 33.5	0.0	76.4	55 46.8	+1.9	77.9	55 58.7	+3.7	79.3	24
25	53 57.1	-10.0	68.0	54 19.0	-8.4	69.2	54 39.7	-6.8	70.6	54 59.0	-5.1	71.9	55 16.9	-3.3	73.3	55 33.5	-1.5	74.7	55 48.7	+0.2	76.1	56 02.4	+2.0	77.5	25
26	53 47.1	-11.4	66.3	54 10.6	-9.8	67.5	54 32.9	-8.1	68.8	54 53.9	-6.5	70.2	55 13.6	-4.8	71.5	55 32.0	-3.1	72.9	55 48.9	-1.3	74.3	56 04.4	+0.6	75.7	26
27	53 35.7	-12.8	64.6	54 00.8	-11.2	65.9	54 24.8	-9.6	67.1	54 47.4	-7.9	68.4	55 08.8	-6.2	69.8	55 28.9	-4.5	71.1	55 47.6	-2.8	72.5	56 05.0	-1.1	73.9	27
28	53 22.9	-14.1	63.0	53 49.6	-12.5	64.2	54 15.2	-11.1	65.4	54 39.5	-9.4	66.7	55 02.6	-7.8	68.0	55 24.4	-6.1	69.4	55 44.8	-4.3	70.7	56 03.9	-2.6	72.1	28
29	53 08.8	-15.4	61.4	53 37.1	-14.0	62.5	54 04.1	-12.4	63.8	54 30.1	-10.8	65.0	54 54.8	-9.2	66.3	55 18.3	-7.6	67.6	55 40.5	-5.9	69.0	56 01.3	-4.1	70.4	29
30	52 53.4	-16.7	59.7	53 23.1	-15.2	60.9	53 51.7	-13.7	62.1	54 19.3	-12.3	63.3	54 45.6	-10.7	64.6	55 10.7	-9.0	65.9	55 34.6	-7.4	67.2	55 57.2	-5.7	68.6	30
31	52 36.7	-18.0	58.2	53 07.9	-16.6	59.3	53 38.0	-15.1	60.5	54 07.0	-13.6	61.7	54 34.9	-12.0	62.9	55 01.7	-10.5	64.2	55 27.2	-8.8	65.5	55 51.5	-7.2	66.8	31
32	52 18.7	-19.1	56.6	52 51.3	-17.8	57.7	53 22.9	-16.5	58.8	53 53.4	-15.0	60.4	54 22.9	-13.5	61.2	54 51.2	-11.9	62.4	55 18.4	-10.4	63.7	55 44.3	-8.7	65.0	32
33	51 59.6	-20.4	55.1	52 33.5	-19.1	56.1	53 06.4	-17.7	57.2	53 38.4	-16.3	58.4	54 09.4	-14.9	59.5	54 39.3	-13.4	60.7	55 08.0	-11.8	62.0	55 35.6	-10.2	63.3	33
34	51 39.2	-21.6	53.5	52 14.4	-20.3	54.6	52 48.7	-18.9	55.6	53 22.1	-17.6	56.7	54 54.5	-16.1	57.9	54 25.9	-14.7	59.1	54 56.2	-13.2	60.3	55 25.4	-11.7	61.5	34
35	51 17.6	-22.6	52.0	51 54.1	-21.4	53.0	52 29.8	-20.2	54.1	53 04.5	-18.8	55.1	53 38.4	-17.5	56.3	54 11.2	-16.1	57.4	54 43.0	-14.6	58.6	55 13.7	-13.1	59.8	35
36	50 55.0	-23.8	50.6	51 32.7	-22.6	51.5	52 45.7	-20.1	53.5	52 20.9	-18.8	54.6	53 55.1	-17.4	55.8	54 28.4	-16.0	56.9	55 00.6	-14.5	58.1	56			
37	50 31.2	-24.8	49.1	51 10.1	-23.7	50.0	51 48.3	-22.6	51.0	52 25.6	-21.3	52.0	53 02.1	-20.0	53.1	53 37.7	-18.7	54.1	54 12.4	-17.4	55.3	54 46.1</td			

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $37^{\circ}$ , 323°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	50 28.9	-24.9	109.0	50 08.9	-26.4	110.1	49 47.7	-27.7	111.2	49 25.5	-29.0	112.3	49 02.2	-30.3	113.4	48 37.9	-31.5	114.4	48 12.6	-32.7	115.4	47 46.3	-33.8	116.4	0
1	50 04.0	-26.0	110.4	49 42.5	-27.3	111.5	49 20.0	-28.6	112.6	48 56.5	-29.9	113.6	48 31.9	-31.1	114.7	48 06.4	-32.3	115.7	47 39.9	-33.5	116.7	47 12.5	-34.6	117.7	1
2	49 38.0	-26.9	111.8	49 15.2	-28.2	112.9	48 51.4	-29.5	113.9	48 26.6	-30.8	115.0	48 00.8	-32.0	116.0	47 34.1	-33.1	116.9	47 06.4	-34.2	117.9	46 37.9	-35.3	118.9	2
3	49 11.1	-27.9	113.2	48 47.0	-29.2	114.2	48 21.9	-30.4	115.2	47 55.8	-31.6	116.2	47 28.8	-32.7	117.2	47 01.0	-33.9	118.2	46 32.2	-35.0	119.1	46 02.6	-36.0	120.0	3
4	48 43.2	-28.9	114.5	48 17.8	-30.1	115.5	47 51.5	-31.3	116.5	47 24.2	-32.4	117.5	46 56.1	-33.6	118.5	46 27.1	-34.7	119.4	45 57.2	-35.7	120.3	45 26.6	-36.8	121.2	4
5	48 14.3	-29.7	115.8	47 47.7	-30.5	116.8	47 20.2	-32.1	117.8	46 51.8	-33.2	118.7	46 22.5	-34.3	119.7	45 52.4	-35.3	120.6	45 21.5	-36.3	121.4	44 49.8	-37.3	122.3	5
6	47 44.6	-30.6	117.1	47 16.8	-31.7	118.1	46 48.1	-32.8	119.0	46 18.6	-34.0	119.9	45 48.2	-35.0	120.8	44 17.1	-36.1	121.7	44 45.2	-37.1	122.6	44 12.5	-38.0	123.4	6
7	47 14.0	-31.4	118.4	46 45.1	-32.6	119.3	46 15.3	-33.7	120.2	45 44.6	-34.7	121.1	45 13.2	-35.7	122.0	44 41.0	-36.6	122.8	44 08.1	-37.6	123.7	43 34.5	-38.5	124.5	7
8	46 42.6	-32.2	119.6	46 12.5	-33.3	120.6	45 41.6	-34.3	121.4	45 09.9	-35.3	122.3	44 37.5	-36.4	123.1	44 04.4	-37.4	124.0	43 30.5	-38.2	124.7	42 56.0	-39.2	125.5	8
9	46 10.4	-33.0	120.9	45 39.2	-34.0	121.7	45 07.3	-35.1	122.6	44 34.6	-36.1	123.4	44 01.1	-37.0	124.3	43 27.0	-37.9	125.0	42 52.3	-38.8	125.8	42 16.8	-39.6	126.5	9
10	45 37.4	-33.7	122.1	45 05.2	-34.8	122.9	44 32.2	-35.7	123.8	43 58.5	-36.7	124.6	43 24.1	-37.6	125.3	42 49.1	-38.5	126.1	42 13.5	-39.4	126.8	41 37.2	-40.2	127.6	10
11	45 03.7	-34.4	123.2	44 30.4	-35.4	124.1	43 56.5	-36.4	124.9	43 21.8	-37.3	125.7	42 46.5	-38.1	126.4	42 10.6	-39.0	127.1	41 34.1	-39.9	127.9	40 57.0	-40.7	128.5	11
12	44 29.3	-35.2	124.4	43 55.0	-36.1	125.2	43 20.1	-37.0	126.0	42 44.5	-37.9	126.7	42 08.4	-38.8	127.5	41 31.6	-39.6	128.2	40 54.2	-40.4	128.8	40 16.3	-41.1	129.5	12
13	43 54.1	-35.7	125.5	43 18.9	-36.7	126.3	42 43.1	-37.6	127.0	42 06.6	-38.4	127.8	41 29.6	-39.3	128.5	40 52.0	-40.1	129.2	40 13.8	-40.8	129.8	39 35.2	-41.7	130.5	13
14	43 18.4	-36.4	126.6	42 42.2	-37.3	127.4	42 05.5	-38.1	128.1	41 28.2	-39.0	128.8	40 50.3	-39.8	129.5	40 11.9	-40.6	130.1	39 33.0	-41.3	130.8	38 53.5	-42.0	131.4	14
15	42 42.0	-37.1	127.7	42 04.9	-37.8	128.4	41 27.4	-38.7	129.1	40 49.2	-39.5	129.8	40 10.5	-40.3	130.5	39 31.3	-41.0	131.1	38 51.7	-41.8	131.7	38 11.5	-42.5	132.3	15
16	42 04.9	-37.5	128.8	41 27.1	-38.4	129.5	40 48.7	-39.3	130.2	40 09.7	-40.0	130.8	39 30.2	-40.7	131.4	38 50.3	-41.5	132.0	38 09.9	-42.2	132.6	37 29.0	-42.8	133.2	16
17	41 27.4	-38.2	129.8	40 48.7	-39.0	130.5	40 09.4	-39.7	131.1	39 29.7	-40.5	131.8	38 49.5	-41.2	132.4	38 08.8	-41.9	133.0	37 27.7	-42.6	133.5	36 46.2	-43.2	134.1	17
18	40 49.2	-38.7	130.9	40 09.7	-39.5	131.5	39 29.7	-40.2	132.1	38 49.2	-40.9	132.7	38 08.3	-41.6	133.3	37 26.9	-42.3	133.9	36 45.1	-42.9	134.4	36 03.0	-43.6	134.9	18
19	40 10.5	-39.2	131.9	39 30.2	-39.9	132.5	38 49.5	-40.7	133.1	38 08.3	-41.4	133.7	37 26.7	-42.1	134.2	36 02.4	-44.7	134.8	35 19.4	-44.0	135.8	35 19.4	-44.0	135.8	19
20	39 31.3	-39.6	132.9	38 50.3	-40.4	133.4	38 08.8	-41.1	134.0	37 26.9	-41.8	134.6	36 44.6	-42.4	135.1	36 01.9	-43.1	135.6	35 18.8	-43.6	136.1	34 35.4	-44.3	136.6	20
21	38 51.7	-40.2	133.8	38 09.9	-40.9	134.4	37 27.7	-41.5	134.9	36 45.1	-42.1	135.5	36 02.2	-42.8	136.0	35 18.8	-43.4	136.5	34 35.2	-44.1	137.0	33 51.1	-44.6	137.4	21
22	38 11.5	-40.6	134.8	37 29.0	-41.2	135.3	36 46.2	-41.9	135.8	36 03.0	-42.6	136.4	35 19.4	-43.2	136.9	34 35.4	-43.8	137.3	33 51.1	-44.3	137.8	33 06.5	-44.9	138.2	22
23	37 30.9	-41.0	135.7	36 47.8	-41.7	136.2	36 04.3	-42.4	136.7	35 20.4	-42.9	137.2	34 36.2	-43.5	137.7	33 51.6	-44.1	138.2	33 06.8	-44.7	138.6	32 21.6	-45.1	139.0	23
24	36 49.9	-41.5	136.6	36 06.1	-42.1	137.1	35 21.9	-42.7	137.6	34 37.5	-43.3	138.1	33 52.7	-43.9	138.5	33 07.5	-44.4	139.0	32 22.1	-44.9	139.4	31 36.5	-45.5	139.8	24
25	36 08.4	-41.8	137.5	35 24.0	-42.5	138.0	34 39.2	-43.0	138.5	33 54.2	-43.6	138.9	33 08.8	-44.2	139.4	32 23.1	-44.7	139.8	31 37.2	-45.2	140.2	30 51.0	-45.7	140.6	25
26	35 26.6	-42.3	138.4	34 41.5	-42.8	138.9	33 56.2	-43.4	139.3	33 10.6	-44.0	139.7	32 24.6	-44.4	140.2	31 38.4	-45.0	140.6	30 52.0	-45.5	140.9	30 05.3	-46.0	141.3	26
27	34 44.3	-42.5	139.3	33 58.7	-43.1	139.7	33 12.8	-42.7	140.1	32 26.6	-44.2	140.6	31 40.2	-44.8	140.9	30 53.4	-45.2	141.3	30 06.5	-45.8	141.7	29 19.3	-46.2	142.0	27
28	34 01.8	-43.0	140.1	33 15.6	-43.5	140.5	32 29.1	-44.0	141.0	31 42.4	-44.6	141.3	30 55.4	-45.0	141.7	30 08.2	-45.5	142.1	29 20.7	-46.0	142.4	28 33.1	-46.5	142.8	28
29	33 18.8	-42.3	141.0	32 32.1	-43.8	141.4	31 45.1	-44.3	141.8	30 57.8	-44.8	142.1	30 10.4	-45.3	142.5	29 22.7	-45.7	142.8	28 34.7	-46.2	143.2	27 46.6	-46.7	143.5	29
30	32 35.6	-43.6	141.8	31 48.3	-44.1	142.2	30 10.8	-44.6	142.5	30 13.0	-45.1	142.9	29 25.1	-45.6	143.2	28 36.9	-46.0	143.6	27 48.5	-46.4	143.9	26 59.9	-46.8	144.2	30
31	31 52.0	-43.9	142.6	31 04.2	-44.4	143.0	29 27.9	-45.3	143.7	28 39.5	-45.8	144.0	27 50.9	-46.3	144.3	26 21.1	-47.6	144.6	26 13.1	-47.1	144.9	31			
32	31 08.1	-44.2	142.4	30 19.8	-44.7	143.8	29 31.3	-45.1	144.1	28 42.6	-45.6	144.4	27 53.7	-46.0	144.7	27 06.4	-46.4	145.0	26 15.4	-46.9	145.3	25 26.0	-47.3	145.6	32
33	30 23.9	-44.5	144.2	29 35.1	-44.9	144.5	28 46.2	-45.4	144.8	27 57.0	-45.8	145.2	27 07.7	-46.2	145.5	26 18.2	-46.7	145.7	25 28.5	-47.0	146.0	24 38.7	-47.5	146.3	33
34	29 39.4	-44.7	145.0	28 50.2	-45.2	145.3	27 15.2	-46.9	145.6	26 23.9	-47.6	146.0	25 39.0	-48.7	146.5	24 41.5	-49.2	147.0	23 53.7	-48.8	147.3	14 59.6	-49.0	147.9	45
35	28 54.7	-45.0	145.7	28 05.0	-45.4	146.0	27 15.2	-45.9	146.3	26 25.2	-46.3	146.6	25 35.0	-46.6	146.9	24 44.7	-47.1	147.1	23 54.2	-47.4	147.4	23 03.6	-47.8	147.6	35
36	28 09.7	-45.2	146.5	27 19.6	-45.6	146.8	26 29.3	-46.0	147.0	25 38.9	-46.4	147.3	24 48.4	-46.9	147.6	23 57.6	-47.2	147.8	23 06.8	-47.6	14				

38°, 322° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	49 34.0	+23.4	108.3	49 14.6	+24.8	109.4	48 54.1	+26.2	110.5	48 32.5	+27.6	111.6	48 10.0	+28.8	112.6	47 46.4	+30.1	113.6	47 21.8	+31.4	114.6	46 56.4	+32.5	115.6	0
1	49 57.4	+22.4	106.9	49 39.4	+23.8	108.0	49 20.3	+25.2	109.1	49 00.1	+26.5	110.2	48 38.8	+27.9	111.3	48 16.5	+29.2	112.3	47 53.2	+30.4	113.4	47 28.9	+31.7	114.4	1
2	50 19.8	+21.2	105.5	50 03.2	+22.7	106.6	49 45.5	+24.2	107.7	49 26.6	+25.6	108.9	49 06.7	+27.0	110.0	48 45.7	+28.3	111.0	48 23.6	+29.6	112.1	48 00.6	+30.8	113.1	2
3	50 41.0	+20.2	104.0	50 25.9	+21.7	105.2	50 09.7	+23.1	106.3	49 52.2	+24.6	107.5	49 33.7	+25.9	108.6	49 14.0	+27.3	109.7	48 53.2	+28.7	110.8	48 31.4	+30.0	111.8	3
4	51 01.2	+18.9	102.5	50 47.6	+20.5	103.7	50 32.8	+22.0	104.9	50 16.8	+23.5	106.0	49 59.6	+25.0	107.2	49 41.3	+26.4	108.3	49 21.9	+27.8	109.4	49 01.4	+29.1	110.5	4
5	51 20.1	+17.8	101.0	51 08.1	+19.4	102.2	50 54.8	+20.9	103.4	50 40.3	+22.4	104.6	50 24.6	+23.9	105.8	50 07.7	+25.4	106.9	49 49.7	+26.7	108.1	49 30.5	+28.1	109.2	5
6	51 37.9	+16.6	99.4	51 27.5	+18.1	100.7	51 15.7	+19.7	101.9	51 02.7	+21.3	103.1	50 48.5	+22.8	104.3	50 33.0	+24.3	105.5	50 16.4	+25.7	106.7	49 58.6	+27.2	107.8	6
7	51 54.5	+15.4	97.9	51 45.6	+17.0	99.2	51 35.4	+18.6	100.4	51 24.0	+20.1	101.6	51 11.3	+21.6	102.9	50 57.3	+23.2	104.1	50 42.1	+24.7	105.2	50 25.8	+26.1	106.4	7
8	52 09.9	+14.0	96.3	52 02.6	+15.7	97.6	51 54.0	+17.3	98.9	51 44.1	+19.0	100.1	51 32.9	+20.5	101.4	51 20.5	+22.0	102.6	51 06.8	+23.6	103.8	50 51.9	+25.0	105.0	8
9	52 23.9	+12.8	94.7	52 18.3	+14.5	96.0	52 11.3	+16.1	97.3	51 03.1	+17.7	98.6	51 53.4	+19.4	99.8	51 42.5	+21.0	101.1	51 30.4	+22.4	102.3	51 16.9	+24.0	103.5	9
10	52 36.7	+11.5	93.1	52 32.8	+13.1	94.4	52 27.4	+14.9	95.7	52 20.8	+16.5	97.0	52 12.8	+18.1	98.3	52 03.5	+19.7	99.6	51 52.8	+21.3	100.8	51 40.9	+22.9	102.1	10
11	52 48.2	+10.1	91.5	52 45.9	+11.8	92.8	52 42.3	+13.5	94.1	52 37.3	+15.2	95.4	52 30.9	+16.9	96.7	52 23.2	+18.5	98.0	52 14.1	+20.1	99.3	52 03.8	+21.7	100.6	11
12	52 58.3	+8.8	89.9	52 57.7	+10.5	91.2	52 55.8	+12.2	92.5	52 52.5	+13.9	93.8	52 47.8	+15.5	95.2	52 41.7	+17.2	96.5	52 34.2	+18.9	97.8	52 25.5	+20.5	99.1	12
13	53 07.1	+7.4	88.2	53 08.2	+9.2	89.6	53 08.0	+10.9	90.9	53 06.4	+12.5	92.2	53 03.3	+14.3	93.6	52 58.9	+16.0	94.9	52 53.1	+17.7	96.2	52 46.0	+19.2	97.5	13
14	53 14.5	+6.0	86.6	53 17.4	+7.7	87.9	53 18.9	+9.5	89.3	53 18.9	+11.3	90.6	53 17.6	+13.0	91.9	53 14.9	+14.6	93.3	53 10.8	+16.3	94.6	53 05.2	+18.1	95.9	14
15	53 20.5	+4.6	84.9	53 25.1	+6.4	86.2	53 28.4	+8.1	87.6	53 30.2	+9.8	88.9	53 30.6	+11.6	90.3	53 29.5	+13.4	91.6	53 27.1	+15.0	93.0	53 23.3	+16.7	94.3	15
16	53 25.1	+3.3	83.2	53 31.5	+5.0	84.6	53 36.5	+6.7	85.9	53 40.0	+8.5	87.3	53 42.2	+10.2	88.6	53 42.9	+11.9	89.0	53 42.1	+13.7	91.4	53 40.0	+15.4	92.7	16
17	53 28.4	+1.8	81.6	53 36.5	+3.5	82.9	53 43.2	+5.3	84.3	53 48.5	+7.0	85.6	53 52.4	+8.8	87.0	53 54.8	+10.6	88.3	53 55.8	+12.3	89.7	53 55.4	+14.1	91.1	17
18	53 30.2	+0.4	79.9	53 40.0	+2.2	81.2	53 48.5	+3.9	82.6	53 55.5	+5.7	83.9	54 01.2	+7.4	85.3	54 05.4	+9.1	86.7	54 08.1	+11.0	88.1	54 09.5	+12.6	89.4	18
19	53 30.6	-1.1	78.2	53 42.2	+0.7	79.5	53 52.4	+2.4	80.9	54 01.2	+4.2	82.2	54 08.6	+5.9	83.6	54 14.5	+7.8	85.0	54 19.1	+9.5	86.4	54 22.1	+11.3	87.8	19
20	53 29.5	-2.4	76.5	53 42.9	-0.8	77.8	53 54.8	+1.0	79.2	54 05.4	+2.7	80.5	54 14.5	+4.6	81.9	54 22.3	+6.3	83.3	54 28.6	+8.0	84.7	54 33.4	+9.9	86.1	20
21	53 27.1	-3.8	74.8	53 42.1	-2.1	76.2	53 55.8	-0.4	77.5	54 08.1	+1.4	78.8	54 19.1	+3.0	80.2	54 28.6	+4.8	81.6	54 36.6	+6.7	83.0	54 43.3	+8.4	84.4	21
22	53 23.3	-5.3	73.2	53 40.0	-3.6	74.5	53 55.4	-1.9	75.8	54 09.5	-0.2	77.1	54 22.1	+1.6	78.5	54 33.4	+3.4	79.9	54 43.3	+5.1	81.2	54 51.7	+6.9	82.7	22
23	53 18.0	-6.6	71.5	53 36.4	-4.9	72.8	53 53.5	-3.3	74.1	54 09.3	-1.6	75.4	54 23.7	+0.2	76.8	54 36.8	+1.9	78.1	54 48.4	+3.7	79.5	54 58.6	+5.5	80.9	23
24	53 11.4	-8.0	69.8	53 31.5	-6.4	71.1	53 50.2	-4.7	72.4	54 07.7	-3.0	73.7	54 23.9	-1.3	75.0	54 38.7	+0.4	76.4	54 52.1	+2.2	77.8	55 04.1	+3.9	79.2	24
25	53 03.4	-9.4	68.2	53 25.1	-7.8	69.4	53 45.5	-6.1	70.7	54 04.7	-4.5	72.0	54 22.6	-2.8	73.3	54 39.1	-1.0	74.7	54 54.3	+0.7	76.0	55 08.0	+2.5	77.4	25
26	52 54.0	-10.7	66.5	53 17.3	-9.1	67.8	53 39.4	-7.5	69.0	54 00.2	-5.9	70.3	54 19.8	-4.2	71.6	54 38.1	-2.5	73.0	54 55.0	-0.8	74.3	55 10.5	+1.0	75.7	26
27	52 43.3	-12.1	64.9	53 08.2	-10.6	66.1	53 31.9	-9.0	67.4	53 54.3	-7.3	68.6	54 15.6	-5.7	69.9	54 35.6	-4.0	71.2	54 54.2	-2.3	72.6	55 11.5	-0.5	73.9	27
28	52 31.2	-13.3	63.3	52 57.6	-11.8	64.5	53 22.9	-10.3	65.7	53 47.0	-8.7	66.9	54 09.9	-7.1	68.2	54 31.6	-5.5	69.5	54 51.9	-3.7	70.8	55 11.0	-2.1	72.2	28
29	52 17.9	-14.6	61.7	52 45.8	-13.2	62.9	53 12.6	-11.6	64.0	53 38.3	-10.1	65.3	54 02.8	-8.5	66.5	54 26.1	-6.3	67.8	54 48.2	-5.3	69.1	55 08.9	-3.5	70.4	29
30	52 03.3	-15.9	60.1	52 32.6	-14.4	61.2	53 01.0	-13.0	62.4	53 28.2	-11.5	63.6	53 54.3	-9.9	64.8	54 19.2	-8.3	66.1	54 42.9	-6.7	67.4	55 05.4	-5.1	68.7	30
31	51 47.4	-17.1	58.6	52 18.2	-15.8	59.7	52 48.0	-14.3	60.8	53 16.7	-12.8	62.0	53 44.4	-11.3	63.2	54 10.9	-9.8	64.4	54 36.2	-8.1	65.7	55 00.3	-6.5	67.0	31
32	51 30.3	-18.4	57.0	52 02.4	-16.9	58.1	52 33.7	-15.6	59.2	53 03.9	-14.1	60.3	53 31.1	-12.7	61.5	54 01.1	-11.2	62.7	54 28.1	-9.6	63.9	54 53.8	-8.0	65.2	32
33	51 11.9	-19.5	55.5	51 45.5	-18.2	56.5	52 18.1	-16.8	57.6	52 49.8	-15.5	58.7	53 20.4	-14.0	59.9	53 50.0	-12.5	61.0	54 18.5	-11.0	62.3	54 45.8	-9.4	63.5	33
34	50 52.4	-20.6	54.0	51 27.3	-19.4	55.0	52 01.3	-18.1	56.0	52 34.3	-16.7	57.1	53 06.4	-15.3	58.2	53 37.5	-13.9	59.4	54 07.5	-12.4	60.6	54 36.4	-10.8	61.8	34
35	51 07.9	-20.5	53.5	51 43.2	-19.3	54.5	52 17.6	-18.0	55.5	52 51.1	-16.6	56.6	53 23.6	-15.2	57.7	53 55.1	-13.8	58.9	54 25.6	-12.3	60.1	55 05.4	-11.1	61.5	35
36	50 10.1	-22.9	51.0	50 47.4	-21.7	52.0	51 23.9	-20.4	53.0	51 59.6	-19.1	54.0	52 34.5	-17.9	55.0	53 08.4	-16.5	56.1	53 41.3	-15.1	57.3	54 13.3	-13.7	58.4	36
37	49 47.2	-23.9	49.6	50 25.7	-22.7	50.5	51 03.5	-21.6	51.5	51 40.5	-20.4	52.5	52 16.6	-19.1	53.5	52 51.9	-17.8	54.5	53 26.2	-16.4					

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $38^\circ$ ,  $322^\circ$

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	49 34.0	-24.5	108.3	49 14.6	-25.8	109.4	48 54.1	-27.2	110.5	48 32.5	-28.4	111.6	48 10.0	-29.8	112.6	47 46.4	-31.0	113.6	47 21.8	-32.1	114.6	46 56.4	-33.3	115.6	0
1	49 09.5	-25.4	109.7	48 48.8	-26.8	110.8	48 26.9	-28.1	111.9	48 04.1	-29.4	112.9	47 40.2	-30.6	113.9	47 15.4	-31.8	114.9	46 49.7	-32.9	115.9	46 23.1	-34.1	116.8	1
2	48 44.1	-26.4	111.1	48 22.0	-27.8	112.2	47 58.8	-29.0	113.2	47 34.7	-30.2	114.2	47 09.6	-31.4	115.2	46 43.6	-32.5	116.2	46 16.8	-33.7	117.1	45 49.0	-34.8	118.0	2
3	48 17.7	-27.4	112.5	47 54.2	-28.6	113.5	47 29.8	-29.8	114.5	47 04.5	-31.1	115.5	46 38.2	-32.2	116.4	46 11.1	-33.4	117.4	45 43.1	-34.5	118.3	45 14.2	-35.5	119.2	3
4	47 50.3	-28.3	113.8	47 25.6	-29.5	114.8	47 00.0	-30.7	115.8	46 33.4	-31.8	116.7	46 06.0	-33.0	117.7	45 37.7	-34.0	118.6	45 08.6	-35.1	119.5	44 38.7	-36.1	120.3	4
5	47 22.0	-29.1	115.1	46 56.1	-30.2	116.1	46 29.3	-31.5	117.0	46 01.6	-32.7	118.0	45 33.0	-33.7	118.9	45 03.7	-34.8	119.7	44 33.5	-35.8	120.6	44 02.6	-36.8	121.4	5
6	46 52.9	-30.0	116.4	46 25.8	-31.2	117.3	45 57.8	-32.3	118.3	45 28.9	-33.3	119.2	44 59.3	-34.4	120.0	44 28.9	-35.4	120.9	43 57.7	-36.4	121.7	43 25.8	-37.4	122.5	6
7	46 22.9	-30.8	117.7	45 54.6	-31.9	118.6	45 25.5	-33.0	119.5	44 55.6	-34.1	120.3	44 24.9	-35.1	121.2	43 53.5	-36.1	122.0	43 21.3	-37.1	122.8	42 48.4	-38.0	123.6	7
8	45 52.1	-31.7	118.9	45 22.7	-32.7	119.8	44 52.5	-33.8	120.6	44 21.5	-34.8	121.5	43 49.8	-35.8	122.3	43 17.4	-36.8	123.1	42 44.2	-37.6	123.9	42 10.4	-38.5	124.6	8
9	45 20.4	-32.3	120.1	44 50.0	-33.5	121.0	44 18.7	-34.4	121.8	43 46.7	-35.4	122.6	43 14.0	-36.4	123.4	42 40.6	-37.3	124.2	41 30.9	-38.2	124.9	41 31.9	-39.1	125.7	9
10	44 48.1	-33.1	121.3	44 16.5	-34.1	122.1	43 44.3	-35.1	122.9	43 11.3	-36.1	123.7	42 37.6	-37.0	124.5	42 03.3	-37.9	125.3	41 28.4	-38.4	126.0	40 52.8	-39.6	126.7	10
11	44 15.0	-33.8	122.5	43 42.4	-34.8	123.3	43 09.2	-35.8	124.1	42 35.2	-36.6	124.8	42 00.6	-37.5	125.6	41 25.4	-38.4	126.3	40 49.6	-39.3	127.0	40 13.2	-40.1	127.7	11
12	43 41.2	-34.5	123.6	43 07.6	-35.4	124.4	42 33.4	-36.3	125.2	41 58.6	-37.3	125.9	41 23.1	-38.2	126.6	40 47.0	-39.0	127.3	40 10.3	-39.8	128.0	39 33.1	-40.5	128.6	12
13	43 06.7	-35.1	124.7	42 32.2	-36.0	125.5	41 57.1	-37.0	126.2	41 21.3	-37.8	126.9	40 44.9	-38.6	127.6	40 08.0	-39.5	128.3	39 30.5	-40.2	129.0	38 52.6	-41.1	129.6	13
14	42 31.6	-35.7	125.8	41 56.2	-36.7	126.6	41 20.1	-37.5	127.3	40 43.5	-38.4	128.0	40 06.3	-39.2	128.6	39 28.5	-39.9	129.3	38 50.3	-40.7	129.9	38 11.5	-41.4	130.5	14
15	41 55.9	-36.4	126.9	41 19.5	-37.2	127.6	40 42.6	-38.1	128.3	40 05.1	-38.9	129.0	39 27.1	-39.7	129.6	38 48.6	-40.4	130.3	38 09.6	-41.2	130.9	37 30.1	-41.9	131.4	15
16	41 19.5	-36.9	128.0	40 42.3	-37.8	128.7	40 04.5	-38.5	129.3	39 26.2	-39.3	130.0	38 47.4	-40.1	130.6	38 08.2	-40.9	131.2	37 28.4	-41.6	131.8	36 48.2	-42.3	132.3	16
17	40 42.6	-37.5	129.0	40 04.5	-38.3	129.7	39 26.0	-39.1	130.3	38 46.9	-39.9	131.0	38 07.3	-40.6	131.5	37 27.3	-41.3	132.1	36 46.8	-42.0	132.7	36 05.9	-42.6	133.2	17
18	40 05.1	-38.0	130.1	39 26.2	-38.8	130.7	38 46.9	-39.6	131.3	38 07.0	-40.3	131.9	37 26.7	-41.0	132.5	36 46.0	-41.7	133.0	36 04.8	-42.3	133.6	35 23.3	-43.0	134.1	18
19	39 27.1	-38.5	131.1	38 47.4	-39.2	131.7	38 07.3	-40.0	132.3	37 26.7	-40.7	132.8	36 45.7	-41.4	133.4	36 04.3	-42.1	133.9	35 22.5	-42.8	134.4	34 40.3	-43.4	134.9	19
20	38 48.6	-39.0	132.1	38 08.2	-39.8	132.6	37 27.3	-40.5	133.2	36 46.0	-41.2	133.8	36 04.3	-41.8	134.3	35 22.2	-42.5	134.8	34 39.7	-43.1	135.3	33 56.9	-43.7	135.8	20
21	38 09.6	-39.5	133.0	37 28.4	-40.2	133.6	36 46.8	-40.9	134.1	36 04.8	-41.5	134.7	35 22.5	-42.2	135.2	34 39.7	-42.8	135.7	33 56.6	-43.4	136.1	33 13.2	-44.0	136.6	21
22	37 30.1	-40.0	134.0	36 48.2	-40.6	134.5	36 05.9	-41.3	135.1	35 23.3	-42.0	135.6	34 40.3	-42.6	136.0	33 56.9	-43.2	136.5	33 13.2	-43.8	137.0	32 29.2	-44.3	137.4	22
23	36 50.1	-40.3	134.9	36 07.6	-41.1	135.4	35 24.6	-41.6	135.9	34 41.3	-42.3	136.4	33 57.7	-42.9	136.9	33 13.7	-43.5	137.4	32 29.4	-44.0	137.8	31 44.9	-44.7	138.2	23
24	36 09.8	-40.8	135.8	35 26.5	-41.4	136.3	34 43.0	-42.1	136.8	33 59.0	-42.6	137.3	33 14.8	-43.3	137.7	32 30.2	-43.8	138.2	31 45.4	-44.4	138.6	31 00.2	-44.9	139.0	24
25	35 29.0	-41.2	136.7	34 45.1	-41.8	137.2	34 00.9	-42.4	137.7	33 16.4	-43.0	138.1	32 31.5	-43.5	138.6	31 46.4	-44.1	139.0	30 01.0	-44.6	139.4	30 15.3	-45.1	139.8	25
26	34 47.8	-41.6	137.6	34 03.3	-42.2	138.1	33 18.5	-42.8	138.5	32 33.4	-43.3	139.0	31 48.0	-43.9	139.4	30 16.4	-44.9	140.2	29 30.2	-45.4	140.5	26			
27	34 06.2	-41.9	138.5	33 21.1	-42.5	139.0	32 35.7	-43.0	139.4	31 50.1	-43.7	139.8	31 04.1	-44.1	140.2	30 17.9	-44.7	140.6	29 44.8	-45.7	141.3	27			
28	33 24.3	-42.3	139.4	32 38.6	-42.8	139.8	31 52.7	-43.4	140.2	31 06.4	-43.9	140.6	30 20.0	-44.5	141.0	29 33.2	-44.9	141.3	28 46.3	-45.4	141.7	27 59.1	-45.9	142.0	28
29	32 42.0	-42.6	140.2	31 55.8	-43.2	140.6	31 09.3	-43.7	141.0	30 22.5	-44.2	141.4	29 35.5	-44.7	141.7	28 48.3	-45.2	142.1	28 00.9	-45.7	142.4	27 13.2	-46.1	142.7	29
30	31 59.4	-42.9	141.0	31 12.6	-43.4	141.4	30 25.6	-44.0	141.8	29 38.3	-44.5	142.2	28 50.8	-44.9	142.5	28 03.1	-45.4	142.8	27 15.2	-45.9	143.1	26 27.1	-46.3	143.5	30
31	31 16.5	-43.3	141.9	30 29.2	-43.8	142.2	29 41.6	-44.2	142.6	28 53.8	-44.7	142.9	28 05.9	-45.2	143.3	27 17.7	-45.7	143.6	26 29.3	-46.1	143.9	25 40.8	-46.6	144.2	31
32	30 33.2	-43.5	142.7	29 45.4	-44.0	143.0	28 57.4	-44.6	143.4	28 09.1	-45.0	143.7	27 20.7	-45.5	144.0	26 32.0	-45.8	144.3	25 43.2	-46.3	144.6	24 54.2	-46.7	144.9	32
33	29 49.7	-43.8	143.5	29 01.4	-44.3	143.8	28 12.8	-44.7	144.1	27 24.1	-45.2	144.4	26 35.2	-45.6	144.7	25 46.2	-46.1	145.0	24 46.9	-46.5	145.3	24 07.5	-46.9	145.5	33
34	29 05.9	-44.1	144.3	28 17.1	-44.6	144.6	27 43.1	-45.3	145.0	26 02.0	-47.0	145.2	25 00.7	-47.7	145.5	24 09.1	-48.3	145.7	23 20.8	-49.0	146.0	23 01.4	-49.3	146.2	34
35	28 21.8	-44.4	145.0	27 32.5	-44.8	145.3	26 43.1	-45.3	145.6	25 53.5	-45.7	145.9	25 03.7	-46.1	146.2	24 13.8	-46.5	146.4	22 33.7	-46.8	146.7	22 33.5	-47.2	146.9	35
36	27 37.4	-44.6	145.8	26 47.7	-45.0	146.1	25 57.8	-45.4	146.4	25 07.8	-45.9	146.6	24 17.6	-46.2	146.9	23 27.3	-46.6	147.1	22 36.9	-47.1	147.3	21 46.3	-47.4		

39°, 321° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z																
0	48 38.9 +23.0	107.7		48 20.1 +24.4	108.8		48 00.2 +25.8	109.9		47 39.3 +27.1	110.9		47 17.4 +28.4	111.9		46 54.6 +29.6	112.9		46 30.8 +30.8	113.9		46 06.0 +32.1	114.8		0
1	49 01.9 +21.9	106.3		48 44.5 +23.3	107.4		48 26.0 +24.7	108.5		48 06.4 +26.1	109.6		47 45.8 +27.5	110.6		47 24.2 +28.7	111.6		47 01.6 +30.0	112.6		46 38.1 +31.2	113.6		1
2	49 23.8 +20.9	104.9		49 07.8 +22.4	106.0		48 50.7 +23.8	107.1		48 32.5 +25.2	108.2		48 13.3 +26.5	109.3		47 52.9 +27.9	110.3		47 31.6 +29.1	111.3		47 09.3 +30.4	112.4		2
3	49 44.7 +19.8	103.5		49 30.2 +21.3	104.6		49 14.5 +22.7	105.7		48 57.7 +24.2	106.8		48 39.8 +25.5	107.9		48 20.8 +26.3	109.0		48 00.7 +28.3	110.0		47 39.7 +29.5	111.1		3
4	50 04.5 +18.7	102.0		49 51.5 +20.2	103.1		49 37.2 +21.7	104.3		49 21.9 +23.1	105.4		49 05.3 +24.6	106.5		48 47.7 +25.9	107.6		48 29.0 +27.3	108.7		48 09.2 +28.6	109.8		4
5	50 23.2 +17.3	100.5		50 11.7 +19.0	101.7		49 58.9 +20.6	102.8		49 45.0 +22.1	104.0		49 29.9 +23.5	105.1		49 13.6 +25.0	106.3		48 56.3 +26.3	107.4		48 37.8 +27.7	108.5		5
6	50 40.7 +16.4	99.0		50 30.7 +18.0	100.2		50 19.5 +19.5	101.4		50 07.1 +20.9	102.6		49 53.4 +22.5	103.7		49 38.6 +23.9	104.9		49 22.6 +25.4	106.0		49 05.5 +26.8	107.1		6
7	50 57.1 +15.1	97.5		50 48.7 +16.7	98.7		50 39.0 +18.3	99.9		50 28.0 +19.9	101.1		50 15.9 +21.4	102.3		50 02.5 +22.9	103.4		49 48.0 +24.3	104.6		49 32.3 +25.8	105.7		7
8	51 12.2 +14.0	95.9		51 05.4 +15.5	97.2		50 57.3 +17.1	98.4		50 47.9 +18.7	99.6		50 37.3 +20.2	100.8		50 25.4 +21.8	102.0		50 12.3 +23.3	103.2		49 58.1 +24.7	104.3		8
9	51 26.2 +12.6	94.4		51 20.9 +14.3	95.6		51 14.4 +15.9	96.9		51 06.6 +17.5	98.1		50 57.5 +19.1	99.3		50 47.2 +20.0	100.5		50 35.6 +22.2	101.7		50 22.8 +23.7	102.9		9
10	51 38.8 +11.4	92.8		51 35.2 +13.1	94.1		51 30.3 +14.7	95.3		51 24.1 +16.3	96.6		51 16.6 +17.9	97.8		51 07.8 +19.5	99.0		50 57.8 +21.0	100.3		50 46.5 +22.5	101.5		10
11	51 50.2 +10.1	91.2		51 48.3 +11.8	92.5		51 45.0 +13.5	93.8		51 40.4 +15.1	95.0		51 34.5 +16.7	96.3		51 27.3 +18.3	97.5		51 18.8 +19.9	98.8		51 09.0 +21.5	100.0		11
12	52 00.3 +8.9	89.6		52 00.1 +10.5	90.9		51 58.5 +12.1	92.2		51 55.5 +13.8	93.5		51 51.2 +15.5	94.7		51 45.6 +17.1	96.0		51 38.7 +18.7	97.3		51 30.5 +20.3	98.5		12
13	52 09.2 +7.4	88.0		52 10.6 +9.1	89.3		52 10.6 +10.9	90.6		52 09.3 +12.6	91.9		52 06.7 +14.2	93.2		52 02.7 +15.9	94.4		51 57.4 +17.5	95.7		51 50.8 +19.1	97.0		13
14	52 16.6 +6.2	86.4		52 19.7 +7.9	87.7		52 21.5 +9.5	89.0		52 21.9 +11.2	90.3		52 20.9 +12.9	91.6		52 18.6 +14.6	92.9		52 14.9 +16.3	94.2		52 09.9 +17.9	95.4		14
15	52 22.8 +4.8	84.8		52 27.6 +6.5	86.1		52 31.0 +8.2	87.4		52 33.1 +9.9	88.7		52 33.8 +11.6	90.0		52 33.2 +13.3	91.3		52 31.2 +14.9	92.6		52 27.8 +16.6	93.9		15
16	52 27.6 +3.4	83.1		52 34.1 +5.1	84.4		52 39.2 +6.9	85.7		52 43.0 +8.6	87.0		52 45.4 +10.3	88.4		52 46.5 +12.0	89.7		52 46.1 +13.7	91.0		52 44.4 +15.4	92.3		16
17	52 31.0 +2.1	81.5		52 39.2 +3.8	82.8		52 46.1 +5.5	84.1		52 51.6 +7.2	85.4		52 55.7 +8.9	86.7		52 58.5 +10.6	88.0		52 59.8 +12.4	89.4		52 58.9 +14.0	90.7		17
18	52 33.1 +0.7	79.8		52 43.0 +2.4	81.1		52 51.6 +4.1	82.4		52 58.8 +5.8	83.3		53 04.6 +7.6	85.1		53 09.1 +9.3	86.4		53 12.2 +11.0	87.7		53 13.8 +12.8	89.1		18
19	52 33.8 -0.6	78.2		52 45.4 +1.1	79.5		52 55.7 +2.8	80.8		53 04.6 +4.5	82.1		53 12.2 +6.2	83.4		53 18.4 +7.9	84.8		53 23.2 +9.6	86.1		53 26.6 +11.3	87.4		19
20	52 33.2 -2.0	76.6		52 46.5 -0.4	77.8		52 58.5 +1.3	79.1		53 09.1 +3.1	80.4		53 18.4 +4.8	81.8		53 26.3 +6.5	83.1		53 32.8 +8.3	84.4		53 37.9 +10.0	85.8		20
21	52 31.2 -3.4	74.9		52 46.1 -1.7	76.2		52 59.8 -0.0	77.5		53 12.2 +1.6	78.8		53 23.2 +3.4	80.1		53 32.8 +5.1	81.4		53 41.1 +6.8	82.8		53 47.9 +8.6	84.1		21
22	52 27.8 -4.8	73.3		52 44.4 -3.1	74.5		52 59.8 -1.4	75.8		53 13.8 +0.3	77.1		53 26.6 +1.9	78.4		53 37.9 +3.7	79.7		53 47.9 +5.4	81.1		53 56.5 +7.2	82.4		22
23	52 23.0 -6.0	71.6		52 41.3 -4.4	72.9		52 58.4 -2.9	74.1		53 14.1 -1.1	75.4		53 28.5 +0.6	76.7		53 41.6 +2.3	78.1		53 53.3 +4.1	79.4		54 03.7 +5.7	80.8		23
24	52 17.0 -7.5	70.0		52 36.9 -5.9	71.2		52 55.5 -4.1	72.5		53 13.0 -2.6	73.8		53 29.1 -0.9	75.1		53 43.9 +0.8	76.4		53 57.4 +2.5	77.7		54 09.4 +4.4	79.1		24
25	52 09.5 -8.7	68.4		52 31.0 -7.1	69.6		52 51.4 -5.6	70.8		53 10.4 -3.9	72.1		53 28.2 -2.2	73.4		53 44.7 -0.5	74.7		53 59.9 +1.2	76.0		54 13.8 +2.8	77.4		25
26	52 00.8 -10.1	66.8		52 23.9 -8.5	68.0		52 48.5 -6.9	69.2		53 06.5 -5.3	70.4		53 26.0 -3.7	71.7		53 44.2 -2.0	73.0		54 01.1 -0.3	74.3		54 16.6 +1.4	75.6		26
27	51 50.7 -11.3	65.2		52 15.4 -9.9	66.4		52 38.9 -8.3	67.5		53 01.2 -6.7	68.8		53 22.3 -5.1	70.0		53 42.2 -3.5	71.3		54 00.8 -1.8	72.6		54 18.0 0.0	73.9		27
28	51 39.4 -12.6	63.6		52 05.5 -11.1	64.7		52 30.6 -9.6	65.9		52 54.5 -8.1	67.1		53 17.2 -6.4	68.4		53 38.7 -4.8	69.6		53 59.0 -3.2	70.9		54 18.0 -1.5	72.2		28
29	51 26.8 -13.6	62.0		51 54.4 -12.4	63.1		52 21.0 -11.0	64.3		52 46.4 -9.4	65.5		53 10.8 -7.9	66.7		53 33.9 -6.3	67.9		53 55.8 -4.6	69.2		54 16.5 -3.0	70.5		29
30	51 12.9 -15.1	60.5		51 42.0 -13.7	61.6		52 10.0 -12.2	62.7		52 37.0 -10.7	63.9		53 02.9 -9.2	65.0		53 27.6 -7.6	66.3		53 51.2 -6.0	67.5		54 13.5 -4.4	68.8		30
31	50 57.8 -16.2	58.9		51 28.3 -14.9	60.0		51 57.8 -13.5	61.1		52 26.3 -12.1	62.2		52 53.7 -10.6	63.4		53 20.0 -9.0	64.6		53 45.2 -7.5	65.8		54 09.1 -5.8	67.1		31
32	50 41.5 -17.4	57.4		51 13.4 -16.1	58.4		51 44.3 -14.7	59.5		52 14.2 -13.3	60.6		52 41.1 -11.4	61.8		53 11.0 -10.4	62.9		53 37.7 -8.8	64.2		54 03.3 -7.3	65.4		32
33	50 24.1 -18.7	55.9		50 57.3 -17.4	56.9		51 29.6 -16.0	58.0		52 00.9 -14.6	59.0		52 31.3 -13.2	60.2		53 00.6 -11.7	61.3		53 28.9 -10.3	62.5		53 56.0 -8.7	63.7		33
34	50 05.4 -19.7	54.4		50 39.9 -18.5	55.4		51 13.6 -17.2	56.4		51 46.3 -15.9	57.5		52 18.1 -14.5	58.6		52 48.9 -13.1	59.7		53 18.8 -11.5	60.8		53 47.3 -10.0	62.0		34
35	49 45.7 -20.9	52.9		50 21.4 -19.6	53.9		50 36.4 -18.4	54.9		51 30.4 -17.0	55.9		52 03.6 -15.7	57.0		52 35.8 -14.3	58.1		53 07.1 -13.0	59.2		53 37.3 -11.5	60.4		35
36	49 24.8 -21.9	51.5		50 01.8 -20.7	52.4		50 38.0 -19.5	53.4		51 13.4 -18.3	54.4		51 47.9 -17.0	55.4		52 21.5 -15.6	56.5		52 54.1 -14.2	57.6		53 25.8 -12.8	58.7		36
37	49 02.9 -22.9	50.1		49 41.1 -21.8	51.0		50 18.5 -20.6	51.9		50 55.1 -19.4	52.9		51 30.9 -18.1	53.9		52 05.9 -16.9	54.9		53 29.9 -15.5	56.0</					

**LATITUDE CONTRARY NAME TO DECLINATION**      **L.H.A. 39°, 321°**

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	48 38.9 -24.0	107.7	48 20.1 -25.4	108.8	48 00.2 -26.7	109.9	47 39.3 -27.9	110.9	47 17.4 -29.2	111.9	46 54.6 -30.5	112.9	46 30.8 -31.7	113.9	46 06.0 -32.8	114.8	46 06.0 -32.8	114.8	46 06.0 -32.8	114.8	46 06.0 -32.8	114.8	46 06.0 -32.8	114.8	0
1	48 14.9 -25.0	109.1	47 54.7 -26.3	110.2	47 33.5 -27.6	111.2	47 11.4 -28.9	112.2	46 48.2 -30.1	113.2	46 24.1 -31.2	114.2	45 59.1 -32.4	115.1	45 33.2 -33.5	116.0	45 33.2 -33.5	116.0	45 33.2 -33.5	116.0	45 33.2 -33.5	116.0	45 33.2 -33.5	116.0	1
2	47 49.9 -25.9	110.5	47 28.4 -27.2	111.5	47 05.9 -28.4	112.5	46 42.5 -29.7	113.5	46 18.1 -30.8	114.4	45 52.9 -32.1	115.4	45 26.7 -33.2	116.3	44 59.7 -34.3	117.2	44 59.7 -34.3	117.2	44 59.7 -34.3	117.2	44 59.7 -34.3	117.2	44 59.7 -34.3	117.2	2
3	47 24.0 -26.9	111.8	47 01.2 -28.1	112.8	46 37.5 -29.4	113.8	46 12.8 -30.5	114.7	45 47.3 -31.7	115.7	45 20.8 -32.8	116.6	44 53.5 -33.8	117.5	44 25.4 -34.9	118.4	44 25.4 -34.9	118.4	44 25.4 -34.9	118.4	44 25.4 -34.9	118.4	44 25.4 -34.9	118.4	3
4	46 57.1 -27.7	113.1	46 33.1 -29.0	114.1	46 08.1 -30.1	115.0	45 42.3 -31.3	116.0	45 15.6 -32.4	116.9	44 48.0 -33.5	117.8	44 19.7 -34.6	118.6	43 50.5 -35.6	119.5	43 50.5 -35.6	119.5	43 50.5 -35.6	119.5	43 50.5 -35.6	119.5	43 50.5 -35.6	119.5	4
5	46 29.4 -28.6	114.4	46 04.1 -29.3	115.4	45 38.0 -30.9	116.3	45 11.0 -32.1	117.2	44 43.2 -33.2	118.1	44 14.5 -34.2	118.9	43 45.1 -35.2	119.8	43 14.9 -36.2	120.6	43 14.9 -36.2	120.6	43 14.9 -36.2	120.6	43 14.9 -36.2	120.6	43 14.9 -36.2	120.6	5
6	46 00.8 -29.4	115.7	45 34.3 -30.5	116.6	45 07.1 -31.8	117.5	44 38.9 -32.8	118.4	44 10.0 -33.8	119.2	43 40.3 -34.9	120.0	43 09.9 -35.9	120.9	42 38.7 -36.8	121.7	42 38.7 -36.8	121.7	42 38.7 -36.8	121.7	42 38.7 -36.8	121.7	42 38.7 -36.8	121.7	6
7	45 31.4 -30.3	116.9	45 03.8 -31.4	117.8	44 35.3 -32.4	118.7	44 06.1 -33.5	119.6	43 36.2 -34.6	120.4	43 05.4 -35.5	121.2	42 34.0 -36.5	122.0	42 01.9 -37.5	122.8	42 01.9 -37.5	122.8	42 01.9 -37.5	122.8	42 01.9 -37.5	122.8	42 01.9 -37.5	122.8	7
8	45 01.1 -31.0	118.2	44 32.4 -32.1	119.0	44 02.9 -33.2	119.9	43 32.6 -34.1	120.7	43 01.6 -35.1	121.5	42 29.9 -36.1	122.3	41 57.5 -37.1	123.1	41 24.4 -37.9	123.8	41 24.4 -37.9	123.8	41 24.4 -37.9	123.8	41 24.4 -37.9	123.8	41 24.4 -37.9	123.8	8
9	44 30.1 -31.7	119.4	44 00.3 -32.4	120.2	43 29.7 -33.8	121.0	42 58.5 -34.9	121.8	42 26.5 -35.8	122.6	41 53.8 -36.8	123.4	41 20.4 -37.6	124.1	40 46.5 -38.5	124.8	40 46.5 -38.5	124.8	40 46.5 -38.5	124.8	40 46.5 -38.5	124.8	40 46.5 -38.5	124.8	9
10	43 58.4 -32.5	120.6	43 27.5 -33.5	121.4	42 55.9 -34.5	122.2	42 23.6 -35.4	122.9	41 50.7 -36.4	123.7	41 17.0 -37.3	124.4	40 42.8 -38.2	125.2	40 08.0 -39.1	125.8	40 08.0 -39.1	125.8	40 08.0 -39.1	125.8	40 08.0 -39.1	125.8	40 08.0 -39.1	125.8	10
11	43 25.9 -33.2	121.7	42 54.0 -34.2	122.5	42 21.4 -35.1	123.3	41 48.2 -36.1	124.0	41 14.3 -37.0	124.8	40 39.7 -37.8	125.5	40 04.6 -38.7	126.2	39 28.9 -39.5	126.8	39 28.9 -39.5	126.8	39 28.9 -39.5	126.8	39 28.9 -39.5	126.8	39 28.9 -39.5	126.8	11
12	42 52.7 -33.8	122.9	42 19.8 -34.8	123.6	41 46.3 -35.8	124.4	41 12.1 -36.7	125.1	40 37.3 -37.5	125.8	40 01.9 -38.4	126.5	39 25.9 -39.2	127.2	38 49.4 -40.0	127.8	38 49.4 -40.0	127.8	38 49.4 -40.0	127.8	38 49.4 -40.0	127.8	38 49.4 -40.0	127.8	12
13	42 18.9 -34.5	124.0	41 45.0 -35.4	124.7	41 10.5 -36.3	125.4	40 35.4 -37.2	126.1	39 59.8 -38.1	126.8	39 23.5 -38.9	127.5	38 46.7 -39.6	128.1	38 09.4 -40.4	128.8	38 09.4 -40.4	128.8	38 09.4 -40.4	128.8	38 09.4 -40.4	128.8	38 09.4 -40.4	128.8	13
14	41 44.4 -35.1	125.1	41 09.6 -36.0	125.8	40 34.2 -36.9	126.5	39 58.2 -37.7	127.2	39 21.7 -38.5	127.8	38 44.6 -39.3	128.5	38 07.1 -40.2	129.1	37 29.0 -40.9	129.7	37 29.0 -40.9	129.7	37 29.0 -40.9	129.7	37 29.0 -40.9	129.7	37 29.0 -40.9	129.7	14
15	41 09.3 -35.7	126.2	40 33.6 -36.6	126.9	39 57.3 -37.4	127.5	39 20.5 -38.2	128.2	38 43.2 -39.1	128.8	38 05.3 -39.8	129.4	37 26.9 -40.5	130.0	36 48.1 -41.3	130.6	36 48.1 -41.3	130.6	36 48.1 -41.3	130.6	36 48.1 -41.3	130.6	36 48.1 -41.3	130.6	15
16	40 33.6 -36.3	127.2	39 57.0 -37.1	127.9	39 19.9 -37.9	128.5	38 42.3 -38.8	129.2	38 04.1 -39.5	129.8	37 25.5 -40.3	130.4	36 46.4 -41.0	131.0	36 06.8 -41.7	131.5	36 06.8 -41.7	131.5	36 06.8 -41.7	131.5	36 06.8 -41.7	131.5	36 06.8 -41.7	131.5	16
17	39 57.3 -36.8	128.3	39 19.9 -37.6	128.9	38 42.0 -38.5	129.5	38 03.5 -39.2	130.2	37 24.6 -40.0	130.7	36 45.2 -40.7	131.3	36 05.4 -41.4	131.9	35 25.1 -42.0	132.4	35 25.1 -42.0	132.4	35 25.1 -42.0	132.4	35 25.1 -42.0	132.4	35 25.1 -42.0	132.4	17
18	39 20.5 -37.3	129.3	38 42.3 -38.2	129.9	38 03.5 -38.9	130.5	37 24.3 -39.7	131.1	36 44.6 -40.4	131.7	36 04.5 -41.1	132.2	35 24.0 -41.8	132.8	34 43.1 -42.5	133.3	34 43.1 -42.5	133.3	34 43.1 -42.5	133.3	34 43.1 -42.5	133.3	34 43.1 -42.5	133.3	18
19	38 43.2 -37.9	130.3	38 04.1 -38.6	130.9	37 24.6 -39.4	131.5	36 44.6 -40.1	132.0	36 04.2 -40.8	132.6	35 23.4 -41.5	133.1	34 42.2 -44.2	133.6	34 00.6 -42.8	134.1	34 00.6 -42.8	134.1	34 00.6 -42.8	134.1	34 00.6 -42.8	134.1	34 00.6 -42.8	134.1	19
20	38 05.3 -38.4	131.3	37 25.5 -39.1	131.9	36 45.2 -39.8	132.4	36 04.5 -40.5	133.0	35 23.4 -41.2	133.5	34 41.9 -41.9	134.0	34 00.0 -42.5	134.5	33 17.8 -43.1	135.0	33 17.8 -43.1	135.0	33 17.8 -43.1	135.0	33 17.8 -43.1	135.0	33 17.8 -43.1	135.0	20
21	37 26.9 -38.8	132.3	36 46.4 -39.4	132.8	36 05.4 -40.3	133.4	35 24.0 -40.9	133.9	34 42.2 -41.6	134.4	34 00.0 -42.2	134.9	33 17.5 -42.4	135.3	32 34.7 -43.5	135.8	32 34.7 -43.5	135.8	32 34.7 -43.5	135.8	32 34.7 -43.5	135.8	32 34.7 -43.5	135.8	21
22	36 48.1 -39.3	133.2	36 06.8 -40.0	133.8	35 25.1 -40.6	134.3	34 43.1 -41.4	134.8	34 00.6 -41.9	135.3	33 17.8 -42.6	135.7	32 34.7 -43.2	136.2	31 51.2 -43.7	136.6	31 51.2 -43.7	136.6	31 51.2 -43.7	136.6	31 51.2 -43.7	136.6	31 51.2 -43.7	136.6	22
23	36 08.8 -39.7	134.2	35 26.8 -40.3	134.7	34 44.5 -41.1	135.2	34 01.7 -41.6	135.7	33 18.7 -42.3	136.1	32 35.2 -42.9	136.6	31 51.5 -43.5	137.0	31 07.5 -44.1	137.4	31 07.5 -44.1	137.4	31 07.5 -44.1	137.4	31 07.5 -44.1	137.4	31 07.5 -44.1	137.4	23
24	35 29.1 -40.1	135.1	34 46.5 -40.4	135.6	33 22.0 -41.8	136.9	32 38.0 -42.4	137.4	31 53.7 -42.9	137.8	31 09.1 -43.5	138.2	30 24.3 -44.0	138.6	29 39.1 -44.7	139.0	29 39.1 -44.7	139.0	29 39.1 -44.7	139.0	29 39.1 -44.7	139.0	29 39.1 -44.7	139.0	25
25	34 49.0 -40.5	136.0	34 05.7 -41.2	136.5	26 10.4 -44.6	144.9	25 21.2 -45.1	145.2	24 31.8 -45.4	145.5	23 42.3 -45.9	145.7	22 52.7 -46.3	146.0	22 02.9 -46.7	146.2	22 02.9 -46.7	146.2	22 02.9 -46.7	146.2	22 02.9 -46.7	146.2	22 02.9 -46.7	146.2	25
26	34 08.5 -40.9	136.9	33 24.5 -41.5	137.3	26 40.2 -42.1	137.8	24 30.5 -43.2	138.2	23 10.8 -43.8	138.0	20 45.6 -43.8	138.9	20 40.2 -43.8	139.0	28 54.5 -44.8	139.7	28 54.5 -44.8	139.7	28 54.5 -44.8	139.7	28 54.5 -44.8	139.7	28 54.5 -44.8	139.7	26
27	33 27.6 -41.3	137.6	29 10.4 -43.4	138.2	28 22.8 -43.9	142.7	27 35.0 -44.3	143.0	26 47.0 -44.8	143.3	25 58.5 -45.3	143.6	25 10.5 -45.8	143.9	25 20.5 -45.8	144.3	24 21.9 -46.1	144.1	24 21.9 -46.1	144.1	24 21.9 -46.1	144.1	24 21.9 -46.1	144.1	24
28	32 46.3 -41.6	138.6	28 01.0 -42.1	139.2	27 51.8 -42.4	139.2	26 50.9 -43.4	140.7	25 00.7 -45.9	146.9	22 10.3 -46.2	147.3	20 29.3 -47.0	147.6	20 29.3 -4										

40°, 320° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	47	43.6	+22.6	107.1	47	25.4	+23.9	108.2	47	06.1	+25.4	109.2	46	45.9	+26.6	110.2	46	24.7	+27.9	111.2	46	02.5	+29.2	112.2	45	39.4	+30.4	113.1	45	15.4	+31.5	114.1	0
1	48	06.2	+21.6	105.8	47	49.3	+23.0	106.8	47	31.5	+24.3	107.9	47	12.5	+25.7	108.9	46	52.6	+27.0	109.9	46	31.7	+28.3	110.9	46	09.8	+29.5	111.9	45	46.9	+30.8	112.8	1
2	48	27.8	+20.5	104.4	48	12.3	+22.0	105.4	47	55.8	+23.4	106.5	47	38.2	+24.8	107.6	47	19.6	+26.1	108.6	47	00.0	+27.4	109.6	46	39.3	+28.7	110.6	46	17.7	+29.9	111.6	2
3	48	48.3	+19.5	102.9	48	34.3	+21.0	104.0	48	19.2	+22.4	105.1	48	03.0	+23.8	106.2	47	45.7	+25.2	107.3	47	27.4	+26.5	108.3	47	08.0	+27.8	109.3	46	47.6	+29.1	110.3	3
4	49	07.8	+18.4	101.5	48	55.3	+19.8	102.6	48	41.6	+21.3	103.7	48	26.8	+22.7	104.8	48	10.9	+24.1	105.9	47	53.9	+25.5	107.0	47	35.8	+26.9	108.0	47	16.7	+28.3	109.1	4
5	49	26.2	+17.3	100.0	49	15.1	+18.8	101.2	49	02.9	+20.3	102.3	48	49.5	+21.8	103.4	48	35.0	+23.2	104.5	48	19.4	+24.6	105.6	48	02.7	+26.0	106.7	47	45.0	+27.3	107.8	5
6	49	43.5	+16.1	98.6	49	33.9	+17.7	99.7	49	23.2	+19.2	100.9	49	11.3	+20.7	102.0	48	58.2	+22.2	103.1	48	44.0	+23.6	104.2	48	28.7	+25.0	105.3	48	12.3	+26.4	106.4	6
7	49	59.6	+15.0	97.1	49	51.6	+16.5	98.2	49	42.4	+18.1	99.4	49	32.0	+19.6	100.6	49	20.4	+21.1	101.7	49	07.6	+22.6	102.8	48	53.7	+24.0	104.0	48	38.7	+25.4	105.1	7
8	50	14.6	+13.8	95.6	50	08.1	+15.4	96.7	50	00.5	+16.9	97.9	49	51.6	+18.5	99.1	49	41.5	+20.0	100.3	49	30.2	+21.5	101.4	49	17.7	+23.0	102.6	49	04.1	+24.4	103.7	8
9	50	28.4	+12.5	94.0	50	23.5	+14.2	95.2	50	17.4	+15.8	96.4	50	10.1	+17.3	97.6	50	01.5	+18.9	98.8	49	51.7	+20.4	100.0	49	40.7	+21.9	101.1	49	28.5	+23.4	102.3	9
10	50	40.9	+11.4	92.5	50	37.7	+13.0	93.7	50	33.2	+14.6	94.9	50	27.4	+16.2	96.1	50	20.4	+17.7	97.3	50	12.1	+19.3	98.5	50	02.6	+20.8	99.7	49	51.9	+22.3	100.9	10
11	50	52.3	+10.1	90.9	50	50.7	+11.7	92.2	50	47.8	+13.3	93.4	50	43.6	+14.9	94.6	50	38.1	+16.6	95.8	50	31.4	+18.1	97.0	50	23.4	+19.7	98.2	50	14.2	+21.2	99.4	11
12	51	0.2	+8.8	89.4	51	02.4	+10.5	90.6	51	01.1	+12.1	91.8	50	58.5	+13.8	93.1	50	54.7	+15.3	94.3	50	49.5	+17.0	95.5	50	43.1	+18.6	96.8	50	35.4	+20.1	98.0	12
13	51	11.2	+7.6	87.8	51	12.9	+9.2	89.0	51	13.2	+10.9	90.3	51	12.3	+12.5	91.5	51	10.0	+14.2	92.8	51	06.5	+15.8	94.0	51	01.7	+17.3	95.2	50	55.5	+19.0	96.5	13
14	51	18.8	+6.3	86.2	51	22.1	+8.0	87.5	51	24.1	+9.6	88.7	51	24.8	+11.3	90.0	51	24.2	+12.9	91.2	51	22.3	+14.5	92.5	51	19.0	+16.2	93.7	51	14.5	+17.8	95.0	14
15	51	25.1	+5.0	84.6	51	30.1	+6.6	85.9	51	33.7	+8.3	87.1	51	36.1	+9.9	88.4	51	37.1	+11.6	89.6	51	36.8	+13.3	90.9	51	35.2	+14.9	92.2	51	32.3	+16.5	93.4	15
16	51	30.1	+3.6	83.0	51	36.7	+5.3	84.3	51	42.0	+7.0	85.5	51	46.0	+8.7	86.8	51	48.7	+10.4	88.1	51	50.1	+12.0	89.3	51	50.1	+13.7	90.6	51	48.8	+15.3	91.9	16
17	51	33.7	+2.4	81.4	51	42.0	+4.0	82.7	51	49.0	+5.7	83.9	51	54.7	+7.4	85.2	51	59.1	+9.0	86.5	52	02.1	+10.7	87.7	52	03.8	+12.4	89.0	52	04.1	+14.1	90.3	17
18	51	36.1	+1.0	79.8	51	46.0	+2.7	81.1	51	54.7	+4.4	82.3	52	02.1	+6.0	83.6	52	08.1	+7.8	84.9	52	12.8	+9.5	86.1	52	16.2	+11.1	87.4	52	18.2	+12.8	88.7	18
19	51	37.1	-0.3	78.2	51	48.7	+1.4	79.4	51	59.1	+3.0	80.7	52	08.1	+4.7	82.0	52	15.9	+6.4	83.2	52	22.3	+8.0	84.5	52	27.3	+9.8	85.8	52	31.0	+11.5	87.1	19
20	51	36.8	-1.6	76.6	51	50.1	0.0	77.8	52	02.1	+1.7	79.1	52	12.8	+3.4	80.3	52	22.3	+5.0	81.6	52	30.3	+6.8	82.9	52	37.1	+8.4	84.2	52	42.5	+10.1	85.5	20
21	51	35.2	-2.9	75.0	51	50.1	-1.3	76.2	52	03.8	+0.3	77.4	52	16.2	+2.0	78.7	52	27.3	+3.7	80.0	52	37.1	+5.4	81.3	52	45.5	+7.1	82.6	52	52.6	+8.8	83.9	21
22	51	32.3	-4.3	73.4	51	48.8	-2.6	74.6	52	04.1	-0.9	75.8	52	18.2	+0.7	77.1	52	31.0	+2.3	78.3	52	42.5	+4.0	79.6	52	52.6	+5.7	80.9	53	01.4	+7.4	82.2	22
23	51	28.0	-5.5	71.8	51	46.2	-4.0	73.0	52	03.2	-2.4	74.2	52	18.9	-0.7	75.4	52	33.3	+1.0	76.7	52	46.5	+2.6	78.0	52	58.3	+4.3	79.3	53	08.8	+6.0	80.6	23
24	51	22.5	-6.9	70.2	51	42.2	-5.2	71.4	52	00.8	-3.7	72.6	52	18.2	-2.1	73.8	52	34.3	-0.4	75.1	52	49.1	+1.3	76.3	53	02.6	+3.0	77.6	53	14.8	+4.7	78.9	24
25	51	15.6	-8.1	68.6	51	37.0	-6.6	69.8	51	57.1	-5.0	70.9	52	16.1	-3.4	72.2	52	33.9	-1.8	73.4	52	50.4	-0.2	74.7	53	05.6	+1.5	76.0	53	19.5	+3.2	77.3	25
26	51	07.5	-9.4	67.0	51	30.4	-7.9	68.2	51	52.1	-6.3	69.3	52	12.7	-4.7	70.5	52	32.1	-3.1	71.8	52	50.2	-1.5	73.0	53	07.1	+0.2	74.3	53	22.7	+1.9	75.6	26
27	50	58.1	-10.7	65.4	51	22.5	-9.2	66.6	51	45.8	-7.6	67.7	52	08.0	-6.1	68.9	52	29.0	-4.5	70.1	52	48.7	-2.8	71.4	53	07.3	-1.2	72.6	53	24.6	+0.4	73.9	27
28	50	47.4	-11.9	63.9	51	13.3	-10.4	65.0	51	38.2	-9.0	66.1	52	01.9	-7.4	67.3	52	24.5	-5.9	68.5	52	45.9	-4.3	69.7	53	06.1	-2.7	72.2	53	14.8	+4.7	73.2	28
29	50	35.5	-13.1	62.3	51	02.9	-11.7	63.4	51	29.2	-32.2	64.5	51	54.5	-8.7	65.7	52	18.6	-7.2	66.9	52	41.6	-5.6	68.1	53	03.4	-4.0	69.3	53	24.0	-2.3	70.6	29
30	48	59.3	-19.9	53.4	49	34.7	-18.7	54.3	50	09.3	-17.5	55.3	50	43.1	-16.2	56.3	51	16.0	-14.9	57.3	51	47.9	-13.5	58.4	52	18.9	-12.1	59.5	52	48.9	-10.7	60.6	30
31	48	39.4	-21.1	51.9	49	16.0	-19.9	52.8	50	26.9	-17.4	53.8	51	01.1	-16.1	55.8	51	34.4	-14.8	56.8	52	06.8	-13.4	57.9	52	38.2	-12.0	59.0	31				
32	48	18.3	-22.0	50.5	51	43.6	-20.9	51.4	50	33.2	-19.7	52.3	50	09.5	-18.5	53.3	50	45.0	-17.3	54.2	51	19.6	-15.9	55.2	51	53.4	-14.6	56.3	52	26.2	-13.2	57.4	32
33	48	45.3	-23.0	49.1	49	13.5	-20.8	50.9	49	51.0	-19.6	51.8	50	27.7	-18.4	52.7	51	03.7	-17.2	53.7	51	38.8	-15.9	54.7	52</								

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 40°, 320°**

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	47 43.6 -23.6	107.1	47 25.4 -24.9	108.2	47 06.1 -26.2	109.2	46 45.9 -27.5	110.2	46 24.7 -28.8	111.2	46 02.5 -30.0	112.2	45 39.4 -31.2	113.1	45 15.4 -32.3	114.1	45 15.4 -32.3	114.1	45 15.4 -32.3	114.1	45 15.4 -32.3	114.1	45 15.4 -32.3	114.1	0
1	47 20.0 -24.5	108.5	47 00.5 -25.9	109.5	46 39.9 -27.1	110.5	46 18.4 -28.4	111.5	45 55.9 -29.5	112.5	45 32.5 -30.7	113.4	45 08.2 -31.9	114.3	44 43.1 -33.1	115.2	44 43.1 -33.1	115.2	44 43.1 -33.1	115.2	44 43.1 -33.1	115.2	44 43.1 -33.1	115.2	1
2	46 55.5 -25.5	109.8	46 34.6 -26.7	110.8	46 12.8 -28.0	111.8	45 50.0 -29.2	112.8	45 26.4 -30.4	113.7	45 01.8 -31.6	114.6	44 36.3 -32.6	115.5	44 10.0 -33.7	116.4	44 10.0 -33.7	116.4	44 10.0 -33.7	116.4	44 10.0 -33.7	116.4	44 10.0 -33.7	116.4	2
3	46 30.0 -26.3	111.2	46 07.9 -27.6	112.1	45 44.8 -28.8	113.1	45 20.8 -30.0	114.0	44 56.0 -31.2	114.9	44 30.2 -32.2	115.8	44 03.7 -33.4	116.7	43 36.3 -34.4	117.6	43 36.3 -34.4	117.6	43 36.3 -34.4	117.6	43 36.3 -34.4	117.6	43 36.3 -34.4	117.6	3
4	46 03.7 -27.2	112.5	45 40.3 -28.4	113.4	45 16.0 -29.6	114.3	44 50.8 -30.7	115.3	44 24.8 -31.9	116.1	43 58.0 -33.0	117.0	43 30.3 -34.0	117.9	43 01.9 -35.1	118.7	43 01.9 -35.1	118.7	43 01.9 -35.1	118.7	43 01.9 -35.1	118.7	43 01.9 -35.1	118.7	4
5	45 36.5 -28.1	113.7	45 11.9 -29.3	114.7	44 46.4 -30.4	115.6	44 20.1 -31.5	116.5	43 52.9 -32.6	117.3	43 25.0 -33.7	118.2	42 56.3 -34.7	119.0	42 26.8 -35.6	119.8	42 26.8 -35.6	119.8	42 26.8 -35.6	119.8	42 26.8 -35.6	119.8	42 26.8 -35.6	119.8	5
6	45 08.4 -28.9	115.0	44 42.6 -30.0	115.9	44 16.0 -31.2	116.8	43 48.6 -32.3	117.6	43 20.3 -33.3	118.5	42 51.3 -34.3	119.3	42 21.6 -35.3	120.1	41 51.2 -36.3	120.9	41 51.2 -36.3	120.9	41 51.2 -36.3	120.9	41 51.2 -36.3	120.9	41 51.2 -36.3	120.9	6
7	44 39.5 -29.6	116.2	44 12.6 -30.8	117.1	43 44.8 -31.8	118.0	43 16.3 -32.9	118.8	42 47.0 -33.9	119.6	42 17.0 -35.0	120.4	41 46.3 -35.9	121.2	41 14.9 -36.9	121.9	41 14.9 -36.9	121.9	41 14.9 -36.9	121.9	41 14.9 -36.9	121.9	41 14.9 -36.9	121.9	7
8	44 09.9 -30.5	117.5	43 41.8 -31.5	118.3	43 13.0 -32.6	119.1	42 43.4 -33.6	120.0	42 13.1 -34.6	120.7	41 42.0 -35.1	121.5	41 10.4 -36.6	122.3	40 38.0 -37.4	123.0	40 38.0 -37.4	123.0	40 38.0 -37.4	123.0	40 38.0 -37.4	123.0	40 38.0 -37.4	123.0	8
9	43 39.4 -31.1	118.7	43 10.3 -32.2	119.5	42 40.4 -33.3	120.3	42 09.8 -34.3	121.1	41 38.5 -35.3	121.8	41 06.5 -36.2	122.6	40 33.8 -37.0	123.3	40 06.6 -38.0	124.0	40 06.6 -38.0	124.0	40 06.6 -38.0	124.0	40 06.6 -38.0	124.0	40 06.6 -38.0	124.0	9
10	43 08.3 -31.9	119.8	42 38.1 -32.9	120.6	42 07.1 -33.9	121.4	41 35.5 -34.8	122.2	41 03.2 -35.8	122.9	40 30.3 -36.7	123.6	39 56.8 -37.6	124.3	39 22.6 -38.4	125.0	39 22.6 -38.4	125.0	39 22.6 -38.4	125.0	39 22.6 -38.4	125.0	39 22.6 -38.4	125.0	10
11	42 36.4 -32.6	121.0	42 05.2 -33.6	121.8	41 33.2 -34.5	122.5	41 00.7 -35.5	123.3	40 27.4 -36.3	124.0	39 53.6 -37.3	124.7	39 19.2 -38.1	125.4	38 44.2 -39.0	126.0	38 44.2 -39.0	126.0	38 44.2 -39.0	126.0	38 44.2 -39.0	126.0	38 44.2 -39.0	126.0	11
12	42 03.8 -33.2	122.1	41 31.6 -34.2	122.9	40 58.7 -35.1	123.6	40 25.2 -36.1	124.3	39 51.1 -37.0	125.0	39 16.3 -37.8	125.7	38 41.1 -38.7	126.3	38 05.2 -39.4	127.0	38 05.2 -39.4	127.0	38 05.2 -39.4	127.0	38 05.2 -39.4	127.0	38 05.2 -39.4	127.0	12
13	41 30.6 -33.8	123.2	40 57.4 -34.8	124.0	40 23.6 -35.7	124.7	39 49.1 -36.6	125.4	39 14.1 -37.4	126.0	38 38.5 -38.2	126.7	38 02.4 -39.1	127.3	37 25.8 -39.9	127.9	37 25.8 -39.9	127.9	37 25.8 -39.9	127.9	37 25.8 -39.9	127.9	37 25.8 -39.9	127.9	13
14	40 56.8 -34.5	124.3	40 22.6 -35.4	125.0	39 47.9 -36.3	125.7	39 12.5 -37.1	126.4	38 36.7 -38.0	127.0	38 00.3 -38.8	127.7	37 23.3 -39.5	128.3	36 45.9 -40.3	128.9	36 45.9 -40.3	128.9	36 45.9 -40.3	128.9	36 45.9 -40.3	128.9	36 45.9 -40.3	128.9	14
15	40 22.3 -35.1	125.4	39 47.2 -35.9	126.1	39 11.6 -36.8	126.8	38 35.4 -37.6	127.4	37 58.7 -38.4	128.0	37 21.5 -39.2	128.6	36 43.8 -40.0	129.2	36 05.6 -40.7	129.8	36 05.6 -40.7	129.8	36 05.6 -40.7	129.8	36 05.6 -40.7	129.8	36 05.6 -40.7	129.8	15
16	39 47.2 -35.6	126.5	39 11.3 -36.5	127.1	38 34.8 -37.3	127.8	37 57.8 -38.2	128.4	37 20.3 -39.0	129.0	36 42.3 -39.7	129.6	36 03.8 -40.4	130.1	35 24.9 -41.1	130.7	35 24.9 -41.1	130.7	35 24.9 -41.1	130.7	35 24.9 -41.1	130.7	35 24.9 -41.1	130.7	16
17	39 11.6 -36.2	127.5	38 34.8 -37.0	128.2	37 57.5 -37.9	128.8	37 19.6 -38.6	129.4	36 41.3 -39.3	130.0	36 02.6 -40.1	130.5	35 23.4 -40.8	131.1	34 43.8 -41.5	131.6	34 43.8 -41.5	131.6	34 43.8 -41.5	131.6	34 43.8 -41.5	131.6	34 43.8 -41.5	131.6	17
18	38 35.4 -36.7	128.5	37 57.8 -37.5	129.2	37 19.6 -38.3	129.8	36 41.0 -39.0	130.3	36 02.0 -39.8	130.9	35 22.5 -40.5	131.4	34 42.6 -41.2	132.0	34 02.3 -41.9	132.6	33 41.4 -42.6	133.2	33 41.4 -42.6	133.2	33 41.4 -42.6	133.2	33 41.4 -42.6	133.2	18
19	37 58.7 -37.2	129.6	37 20.3 -38.0	130.1	36 41.3 -38.7	130.7	36 02.0 -39.5	131.3	35 22.2 -40.2	131.8	34 42.0 -40.9	132.3	34 01.4 -41.6	132.8	33 20.4 -42.2	133.6	33 20.4 -42.2	133.6	33 20.4 -42.2	133.6	33 20.4 -42.2	133.6	33 20.4 -42.2	133.6	19
20	37 21.5 -37.7	130.5	36 42.3 -38.5	131.1	36 02.6 -39.2	131.7	35 22.5 -39.9	132.2	34 42.0 -40.6	132.7	34 01.1 -41.3	133.2	33 19.8 -41.9	133.7	32 38.2 -42.6	134.2	32 38.2 -42.6	134.2	32 38.2 -42.6	134.2	32 38.2 -42.6	134.2	32 38.2 -42.6	134.2	20
21	36 43.8 -38.2	131.5	36 03.8 -38.5	132.1	35 23.4 -39.6	132.6	34 42.6 -40.3	133.1	34 01.4 -41.0	133.6	33 19.8 -41.6	134.1	32 37.9 -42.3	134.6	31 55.6 -42.8	135.0	31 55.6 -42.8	135.0	31 55.6 -42.8	135.0	31 55.6 -42.8	135.0	31 55.6 -42.8	135.0	21
22	36 05.6 -38.6	132.5	35 24.9 -39.3	133.0	34 43.8 -40.0	133.5	34 02.3 -40.7	134.0	33 20.4 -41.3	134.5	32 38.2 -42.0	134.9	31 55.6 -42.6	135.4	31 12.8 -42.3	135.8	31 12.8 -42.3	135.8	31 12.8 -42.3	135.8	31 12.8 -42.3	135.8	31 12.8 -42.3	135.8	22
23	35 27.0 -39.1	133.4	34 45.6 -39.8	133.9	34 03.8 -40.5	134.4	33 21.6 -41.1	134.9	32 39.1 -41.7	135.4	31 56.2 -42.3	135.8	31 13.0 -42.9	136.2	30 29.6 -43.5	136.6	30 29.6 -43.5	136.6	30 29.6 -43.5	136.6	30 29.6 -43.5	136.6	30 29.6 -43.5	136.6	23
24	34 47.9 -39.4	134.3	34 05.8 -40.1	134.8	33 24.3 -40.8	135.3	32 40.5 -41.4	135.8	31 57.4 -42.1	136.2	31 13.9 -42.6	136.6	30 36.0 -43.2	137.0	29 35.7 -43.7	137.4	29 35.7 -43.7	137.4	29 35.7 -43.7	137.4	29 35.7 -43.7	137.4	29 35.7 -43.7	137.4	24
25	34 08.5 -39.9	135.3	33 25.7 -40.5	135.7	32 42.5 -41.1	136.2	31 59.1 -41.8	136.6	31 15.3 -42.3	137.0	30 31.3 -43.0	137.4	29 46.9 -43.5	137.8	29 02.3 -44.0	138.2	29 02.3 -44.0	138.2	29 02.3 -44.0	138.2	29 02.3 -44.0	138.2	29 02.3 -44.0	138.2	25
26	33 28.6 -40.3	136.2	32 45.2 -40.9	136.6	32 01.4 -41.5	137.0	31 17.3 -42.1	137.5	30 33.0 -42.7	137.9	29 48.3 -43.2	138.3	29 03.4 -43.7	138.6	28 18.3 -44.3	139.0	28 18.3 -44.3	139.0	28 18.3 -44.3	139.0	28 18.3 -44.3	139.0	28 18.3 -44.3	139.0	26
27	32 48.3 -40.6	137.0	32 04.3 -41.3	137.5	31 19.9 -41.4	137.9	30 35.2 -42.3	138.3	29 50.3 -42.9	138.7	29 05.1 -43.5	139.1	28 19.7 -44.0	139.4	27 34.0 -44.5	139.8	27 34.0 -44.5	139.8	27 34.0 -44.5	139.8	27 34.0 -44.5	139.8	27 34.0 -44.5	139.8	27
28	32 07.7 -41.0	137.9	31 23.0 -41.5	138.3	30 38.1 -42.2	138.7	29 52.9 -42.7	139.1	29 07.4 -43.3	139.5	28 21.6 -43.7	139.8	27												

41°, 319° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	46 48.1 +22.2	106.6	46 30.5 +23.6	107.6	46 11.9 +24.9	108.6	45 52.2 +26.2	109.6	45 31.7 +27.4	110.5	45 10.2 +28.7	111.5	44 47.7 +30.0	112.4	44 24.4 +31.1	113.3	44 55.5 +30.3	112.1	45 25.8 +29.6	110.9	45 44.9 +25.1	104.4	45 55.4 +28.6	109.6	44 51.9 +26.9	107.1	5		
1	47 10.3 +21.3	105.2	46 54.1 +22.6	106.3	46 36.8 +23.9	107.3	46 18.4 +25.3	108.3	45 59.1 +26.6	109.3	45 38.9 +27.8	110.2	45 17.7 +29.1	111.2	44 55.5 +26.1	105.8	46 44.9 +24.7	104.7	47 18.8 +26.1	105.8	46 34.6 +23.7	103.4	47 44.9 +25.1	104.4	47 22.6 +12.8	88.4	48 10.0 +24.1	103.1	8
2	47 31.6 +20.2	103.8	47 16.7 +21.6	104.9	47 00.7 +23.0	105.9	46 43.7 +24.4	107.0	46 25.7 +25.7	108.0	46 06.7 +27.0	109.0	45 46.8 +28.2	109.9	45 25.8 +29.6	110.9	45 33.7 +26.2	107.7	46 15.0 +27.5	108.7	45 55.4 +28.6	109.6	46 24.0 +27.9	108.4	46 42.5 +26.5	107.4	46 24.0 +27.9	108.4	4
3	47 51.8 +19.1	102.4	47 38.3 +20.6	103.5	47 23.7 +22.1	104.6	47 08.1 +23.4	105.6	46 51.4 +24.8	106.6	46 33.7 +24.2	107.6	46 15.0 +27.5	108.7	45 55.4 +28.6	109.6	46 42.5 +26.5	107.4	46 24.0 +27.9	108.4	46 42.5 +26.5	107.4	46 24.0 +27.9	108.4	4				
4	48 10.9 +18.2	101.0	47 58.9 +19.6	102.1	47 45.8 +21.0	103.2	47 31.5 +22.5	104.3	47 16.2 +23.9	105.3	46 59.9 +25.2	106.3	46 42.5 +26.5	107.4	46 24.0 +27.9	108.4	46 51.9 +26.9	107.1	46 31.4 +23.1	101.7	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	9				
5	48 29.1 +17.0	99.6	48 18.5 +18.5	100.7	48 06.8 +20.0	101.8	47 54.0 +21.4	102.9	47 40.1 +22.8	104.0	47 25.1 +24.2	105.0	47 09.0 +25.6	106.1	46 51.9 +26.9	107.1	46 31.4 +23.1	101.7	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	5						
6	48 46.1 +16.0	98.1	48 37.0 +17.5	99.3	48 26.8 +19.0	100.4	48 15.4 +20.4	101.5	48 02.9 +21.9	102.6	47 49.3 +23.3	103.7	47 34.6 +24.7	104.7	47 18.8 +26.1	105.8	46 51.9 +26.9	107.1	46 31.4 +23.1	101.7	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	6				
7	49 02.1 +14.8	96.7	48 54.5 +16.3	97.8	48 45.8 +17.8	98.9	48 35.8 +19.4	100.1	48 24.8 +20.8	101.2	48 12.6 +22.3	102.3	47 59.3 +23.7	103.4	47 44.9 +25.1	104.4	47 22.6 +12.8	88.4	48 10.0 +24.1	103.1	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	7				
8	49 16.9 +13.6	95.2	49 10.8 +15.3	96.3	49 03.6 +16.8	97.5	49 55.2 +18.3	98.6	49 45.6 +19.8	99.8	49 34.9 +21.2	100.9	48 23.0 +22.7	102.0	48 10.0 +24.1	103.1	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	8						
9	49 30.5 +12.5	93.7	49 26.1 +14.0	94.9	49 20.4 +15.6	96.0	49 13.5 +17.1	97.2	49 05.4 +18.7	98.3	48 56.1 +20.2	99.5	48 45.7 +21.6	100.6	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	9						
10	49 43.0 +11.3	92.2	49 40.1 +12.9	93.4	49 36.0 +14.5	94.5	49 30.6 +16.1	95.7	49 24.1 +17.6	96.9	49 16.3 +19.1	98.0	49 07.3 +20.6	99.2	48 57.2 +22.1	100.3	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	48 34.1 +23.1	101.7	10						
11	49 54.3 +10.1	90.7	49 53.0 +11.7	91.8	49 50.5 +13.3	93.0	49 46.7 +14.9	94.2	49 41.7 +16.4	95.4	49 35.4 +18.0	96.6	49 27.9 +19.6	97.7	49 19.3 +21.0	98.9	49 34.1 +23.1	101.7	49 34.1 +23.1	101.7	49 34.1 +23.1	101.7	11						
12	50 04.4 +8.9	89.1	50 04.7 +10.5	90.3	50 03.8 +12.1	91.5	50 01.6 +13.7	92.7	50 58.1 +15.3	93.9	49 53.4 +16.8	95.1	49 47.5 +18.4	96.3	49 40.3 +19.9	97.4	50 02.2 +20.2	99.5	48 57.3 +20.2	99.5	48 57.3 +20.2	99.5	12						
13	50 13.3 +7.7	87.6	50 15.2 +9.3	88.8	50 15.9 +10.9	90.0	50 15.3 +12.5	91.2	50 13.4 +14.1	92.4	50 10.2 +15.7	93.6	50 05.9 +17.2	94.8	50 00.2 +18.8	96.0	50 19.0 +17.7	94.5	50 19.0 +17.7	94.5	50 19.0 +17.7	94.5	13						
14	50 21.0 +6.4	86.0	50 24.5 +8.0	87.2	50 26.8 +9.6	88.4	50 27.8 +11.2	89.7	50 27.5 +12.9	90.9	50 25.9 +14.5	92.1	50 23.1 +16.1	93.3	50 19.0 +17.7	94.5	50 19.0 +17.7	94.5	50 19.0 +17.7	94.5	50 19.0 +17.7	94.5	14						
15	50 27.4 +5.1	84.5	50 32.5 +6.8	85.7	50 36.4 +8.4	86.9	50 39.0 +10.1	88.1	50 40.4 +11.6	89.3	50 40.4 +13.3	90.6	50 39.2 +14.9	91.8	50 36.7 +16.5	93.0	50 34.4 +17.3	94.0	50 34.4 +17.3	94.0	50 34.4 +17.3	94.0	15						
16	50 32.5 +3.8	82.9	50 39.3 +5.5	84.1	50 44.8 +7.2	85.3	50 49.1 +8.8	86.6	50 52.0 +10.5	87.8	50 53.7 +12.1	89.0	50 54.1 +13.7	90.2	50 53.2 +15.3	91.5	50 53.2 +15.3	91.5	50 53.2 +15.3	91.5	50 53.2 +15.3	91.5	16						
17	50 36.4 +2.6	81.3	50 44.8 +4.3	82.5	50 52.0 +5.9	83.8	50 57.9 +7.5	85.0	51 02.5 +9.1	86.2	51 05.8 +10.8	87.5	51 07.8 +12.4	88.7	51 08.5 +14.1	89.9	51 02.2 +11.2	87.1	51 22.6 +12.8	88.4	51 22.6 +12.8	88.4	17						
18	50 39.0 +1.4	79.8	50 49.1 +2.9	81.0	50 57.9 +4.6	82.2	51 05.4 +6.2	83.4	51 11.6 +7.9	84.6	51 16.6 +9.5	85.9	51 20.2 +11.2	87.1	51 22.6 +12.8	88.4	51 22.6 +12.8	88.4	51 22.6 +12.8	88.4	51 22.6 +12.8	88.4	18						
19	50 40.4 0.0	78.2	50 52.0 +1.7	79.4	51 02.5 +3.3	80.6	51 11.6 +5.0	81.8	51 19.5 +6.6	83.1	51 26.1 +8.3	84.3	51 31.4 +10.0	85.6	51 35.4 +11.6	86.8	51 31.4 +11.6	86.8	51 31.4 +11.6	86.8	51 31.4 +11.6	86.8	19						
20	50 40.4 -1.2	76.6	50 53.7 +0.4	77.8	51 05.8 +2.0	79.0	51 16.6 +3.6	80.2	51 26.1 +5.3	81.5	51 34.4 +7.0	82.7	51 41.4 +8.6	84.0	51 47.0 +10.3	85.2	50 40.4 +1.2	77.8	50 40.4 +1.2	77.8	50 40.4 +1.2	77.8	20						
21	50 39.2 -2.5	75.0	50 54.1 -0.9	76.2	51 07.8 +0.7	77.4	51 20.2 +2.4	78.6	51 31.4 +4.0	79.9	51 41.4 +5.6	81.1	51 50.0 +7.3	82.4	51 57.3 +9.0	83.6	51 20.2 +2.4	77.8	51 20.2 +2.4	77.8	51 20.2 +2.4	77.8	21						
22	50 36.7 -3.7	73.5	50 53.2 -2.2	74.6	51 08.5 -0.6	75.8	51 22.6 +1.0	77.0	51 35.4 +2.7	78.3	51 47.0 +4.3	79.5	51 57.3 +6.0	80.8	52 06.3 +7.6	82.0	52 06.3 +7.6	82.0	52 06.3 +7.6	82.0	52 06.3 +7.6	82.0	22						
23	50 33.0 -5.1	71.9	50 51.0 -3.4	73.0	51 07.9 -1.8	74.2	51 23.6 -0.2	75.4	51 38.1 +1.4	76.7	51 51.3 +3.0	77.9	52 03.3 +4.6	79.1	52 13.9 +6.4	80.4	52 13.9 +6.4	80.4	52 13.9 +6.4	80.4	52 13.9 +6.4	80.4	23						
24	50 27.9 -6.3	70.3	50 47.6 -4.8	71.5	51 06.1 -3.2	72.6	51 23.4 -1.6	73.8	51 39.5 0.0	75.0	51 54.3 +1.7	76.3	52 07.9 +3.3	77.5	52 20.3 +4.9	78.8	52 20.3 +4.9	78.8	52 20.3 +4.9	78.8	52 20.3 +4.9	78.8	24						
25	50 21.6 -7.5	68.8	50 42.8 -6.0	69.9	51 02.9 -4.5	71.0	51 21.8 -2.9	72.2	51 39.5 -1.3	73.4	51 56.0 +0.3	74.7	52 11.2 +2.0	75.9	52 25.2 +3.7	77.2	52 25.2 +3.7	77.2	52 25.2 +3.7	77.2	52 25.2 +3.7	77.2	25						
26	50 14.1 -8.4	67.2	50 36.8 -7.3	68.3	50 58.4 -5.7	69.5	51 18.9 -4.2	70.6	51 38.2 -6.6	71.8	51 56.3 -1.0	73.0	52 13.2 +0.6	74.3	52 28.9 +2.2	75.5	52 28.9 +2.2	75.5	52 28.9 +2.2	75.5	52 28.9 +2.2	75.5	26						
27	50 50.3 -10.0	65.7	50 29.5 -8.5	66.8	50 52.7 -7.1	67.9	51 14.7 -5.5	69.0	51 35.6 -3.9	70.2	51 55.3 -2.3	71.4	52 13.8 -0.7	72.6	52 31.1 +0.9	73.7	52 31.1 +0.9	73.7	52 31.1 +0.9	73.7	52 31.1 +0.9	73.7	27						
28	49 55.3 -11.2	64.1	50 21.0 -9.8	65.1	50 19.4 -14.3	58.6	50 22.7 -13.0	59.6	50 52.6 -11.6	60.7	51 21.5 -10.2	61.8	51 49.3 -8.7	62.9	52 16.1 -7.2	64.0	52 16.1 -7.2	64.0	52 16.1 -7.2	64.0	52 16.1 -7.2	64.0	28						
29	49 44.1 -12.4	55.2	49 04.0 -16.8	56.1	49 37.6 -15.5	57.1	50 09.7 -14.2	58.1	50 41.0 -12.9	59.1	51 11.3 -11.5	60.2	51 40.6 -10.0	61.3	52 08.9 -8.6	62.4	52 08.9 -8.6	62.4	52 08.9 -8.6	62.4	52 08.9 -8.6	62.4	29						
30	48 12.7 -19.1	53.8	48 47.8 -17.9	54.7	49 22.1 -16.7	55.6	49 55.5 -15.3	56.6	50 28.1 -14.0	57.6	50 59.8 -12.7	58.6	51 30.6 -11.3	59.7	52 00.3 -9.8	60.8	52 00.3 -9.8	60.8	52 00.3 -9.8	60.8	52 00.3 -9.8	60.8	30</td						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $41^\circ$ ,  $319^\circ$

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	46 48.1	-23.1	106.6	46 30.5	-24.5	107.6	46 11.9	-25.8	108.6	45 52.2	-27.0	109.6	45 31.7	-28.3	110.5	45 10.2	-29.5	111.5	44 47.7	-30.6	112.4	44 24.4	-31.8	113.3	0
1	46 25.0	-24.1	107.9	46 06.0	-25.4	108.9	45 46.1	-26.7	109.9	45 25.2	-27.9	110.8	45 03.4	-29.1	111.8	44 40.7	-30.3	112.7	44 17.1	-31.5	113.6	43 52.6	-32.5	114.5	1
2	46 00.9	-25.0	109.2	45 40.6	-26.2	110.2	45 19.4	-27.5	111.2	44 57.3	-28.7	112.1	44 34.3	-29.9	113.0	44 10.4	-31.1	113.9	43 45.6	-32.1	114.8	43 20.1	-33.3	115.7	2
3	45 35.9	-25.9	110.6	45 14.4	-27.2	111.5	44 51.9	-28.3	112.4	44 28.6	-29.5	113.3	44 04.4	-30.7	114.2	43 39.3	-31.7	115.1	43 13.5	-32.9	116.0	42 46.8	-33.9	116.8	3
4	45 10.0	-26.7	111.8	44 47.2	-27.9	112.8	44 23.6	-29.1	113.7	43 59.1	-30.3	114.6	43 33.7	-31.3	115.4	43 07.6	-32.5	116.3	42 40.6	-33.5	117.1	42 12.9	-34.5	117.9	4
5	44 43.3	-27.6	113.1	44 19.3	-28.7	114.0	43 54.5	-29.9	114.9	43 28.8	-31.0	115.7	43 02.4	-32.1	116.6	42 35.1	-33.1	117.4	42 07.1	-34.1	118.2	41 38.4	-35.2	119.0	5
6	44 15.7	-28.3	114.3	43 50.6	-29.5	115.2	43 24.6	-30.6	116.1	42 57.8	-31.7	116.9	42 30.3	-32.8	117.7	42 02.0	-33.8	118.5	41 33.0	-34.8	119.3	41 03.2	-35.7	120.1	6
7	43 47.4	-29.1	115.6	43 21.1	-30.2	116.4	42 54.0	-31.3	117.3	42 26.1	-32.3	118.1	41 57.5	-33.4	118.9	41 28.2	-34.4	119.7	40 58.2	-35.4	120.4	40 27.5	-36.4	121.2	7
8	43 18.3	-29.9	116.8	42 50.9	-31.0	117.6	42 22.7	-32.0	118.4	41 53.8	-33.1	119.2	41 24.1	-34.0	120.0	40 53.8	-35.0	120.7	40 22.8	-36.0	121.5	39 51.1	-36.8	122.2	8
9	42 48.4	-30.6	118.0	42 19.9	-31.6	118.8	41 50.7	-32.7	119.6	41 20.7	-33.7	120.3	40 50.1	-34.7	121.1	40 18.8	-35.6	121.8	39 46.8	-36.5	122.5	39 14.3	-37.4	123.2	9
10	42 17.8	-31.3	119.1	41 48.3	-32.4	119.9	41 18.0	-33.3	120.7	40 47.0	-34.3	121.4	40 15.4	-35.2	122.2	39 43.2	-36.2	122.9	39 10.3	-37.0	123.6	38 36.9	-38.0	124.2	10
11	41 46.5	-31.9	120.3	41 15.9	-32.9	121.0	40 44.7	-34.0	121.8	40 12.7	-34.9	122.5	39 40.2	-35.8	123.2	39 07.0	-36.7	123.9	38 33.3	-37.6	124.6	37 58.9	-38.4	125.2	11
12	41 14.6	-32.6	121.4	40 43.0	-33.6	122.2	40 10.7	-34.5	122.9	39 37.8	-35.4	123.6	39 04.4	-36.4	124.2	38 30.3	-37.2	124.9	37 55.7	-38.0	125.6	37 20.5	-38.8	126.2	12
13	40 42.0	-33.3	122.5	40 09.4	-34.2	123.2	39 36.2	-35.1	123.9	39 02.4	-36.0	124.6	38 28.0	-36.8	125.3	37 53.1	-37.7	125.9	37 17.7	-38.6	126.5	36 41.7	-39.3	127.1	13
14	40 08.7	-33.8	123.6	39 35.2	-34.8	124.3	39 01.1	-35.7	125.0	38 26.4	-36.5	125.6	37 51.2	-37.4	126.3	36 39.1	-38.2	126.9	36 02.4	-39.8	128.1	35 24.2	-40.8	128.9	14
15	39 34.9	-34.5	124.7	39 00.4	-35.3	125.4	38 25.4	-36.2	126.0	37 49.9	-37.1	126.6	37 13.8	-37.9	127.3	36 37.2	-38.6	127.9	36 00.2	-39.5	128.4	35 22.6	-40.1	129.0	15
16	39 00.4	-35.0	125.8	38 25.1	-35.9	126.4	37 49.2	-36.7	127.0	37 12.8	-37.5	127.6	36 35.9	-38.3	128.2	35 58.6	-39.1	128.8	35 20.7	-39.8	129.4	34 42.5	-40.6	129.9	16
17	38 25.4	-35.5	126.8	37 49.2	-36.4	127.4	37 12.5	-37.2	128.0	36 35.3	-38.0	128.6	35 57.6	-38.7	129.2	35 19.5	-39.5	129.7	34 40.9	-40.2	130.3	34 01.9	-40.9	130.8	17
18	37 49.9	-36.1	127.8	37 12.8	-36.9	128.4	36 35.3	-37.7	129.0	35 57.3	-38.4	129.6	35 18.9	-39.2	130.1	34 40.0	-39.9	130.7	34 00.7	-40.6	131.2	33 21.0	-41.3	131.7	18
19	37 13.8	-36.6	128.8	36 35.9	-37.3	129.4	35 57.6	-38.1	130.0	35 18.9	-38.9	130.5	34 39.7	-39.6	131.0	34 00.1	-40.4	131.6	33 20.1	-41.4	132.1	32 39.7	-41.7	132.5	19
20	36 37.2	-37.0	129.8	35 58.6	-37.9	130.4	35 19.5	-38.6	130.9	34 40.0	-39.3	131.4	34 00.1	-40.0	132.0	33 19.7	-40.6	132.5	32 39.1	-41.4	132.9	31 58.0	-42.0	133.4	20
21	36 00.2	-37.6	130.8	35 20.7	-38.2	131.3	34 40.9	-39.0	131.9	34 00.7	-39.7	132.4	33 20.1	-40.4	132.9	32 39.1	-41.1	133.3	31 57.7	-41.7	133.8	31 16.0	-42.3	134.2	21
22	35 22.6	-37.9	131.8	34 42.5	-38.7	132.3	34 01.9	-39.4	132.8	33 21.0	-40.1	133.3	32 39.7	-40.8	133.7	31 58.0	-41.4	134.2	31 16.0	-42.0	134.6	30 33.7	-42.6	135.1	22
23	34 44.7	-38.5	132.7	34 03.8	-39.1	133.2	33 22.5	-39.8	133.7	32 40.9	-40.5	134.2	31 58.9	-41.1	134.6	31 16.6	-41.7	135.0	30 34.0	-42.3	135.5	29 51.1	-42.9	135.9	23
24	34 06.2	-38.8	133.6	33 24.7	-39.5	134.1	32 42.7	-40.1	134.6	32 00.4	-40.8	135.0	31 17.8	-41.4	135.5	30 34.9	-42.0	135.9	29 51.7	-42.6	136.3	29 08.2	-43.2	136.7	24
25	33 27.4	-39.2	134.5	32 45.2	-39.9	135.0	32 02.6	-40.6	135.5	31 19.6	-41.1	135.9	30 36.4	-41.7	136.3	29 52.9	-42.4	136.7	29 09.1	-42.9	137.1	28 25.0	-43.5	137.5	25
26	32 48.2	-39.6	135.5	32 05.3	-40.3	135.9	31 22.0	-40.8	136.3	30 38.5	-41.5	136.7	29 54.7	-42.1	137.1	29 10.5	-42.6	137.5	28 26.2	-43.2	137.9	27 41.5	-43.7	138.2	26
27	32 08.6	-40.0	136.3	31 25.0	-40.6	136.8	30 41.2	-41.2	137.2	29 57.0	-41.8	137.6	29 12.6	-42.4	138.0	28 27.9	-42.9	138.3	27 43.0	-43.5	138.7	26 57.8	-44.0	139.0	27
28	31 28.6	-40.3	137.2	30 44.4	-40.9	137.6	30 00.0	-41.5	138.0	29 15.2	-42.1	138.4	28 30.2	-42.6	138.8	27 45.0	-43.2	139.1	26 59.5	-43.7	139.5	26 13.8	-44.2	139.8	28
29	30 48.3	-40.7	138.1	30 03.5	-41.3	138.5	29 18.5	-41.9	138.9	28 33.1	-42.3	139.2	27 47.6	-42.9	139.6	27 01.8	-43.4	139.9	26 15.8	-43.6	140.2	25 29.6	-44.4	140.5	29
30	30 07.6	-41.0	138.9	29 22.2	-41.5	139.3	28 36.6	-42.1	139.7	27 50.8	-42.7	140.0	27 04.7	-43.2	140.3	26 18.4	-43.7	140.7	25 31.9	-44.2	141.0	24 45.2	-44.7	141.3	30
31	29 26.6	-41.3	139.8	28 40.7	-41.9	140.1	27 54.5	-42.4	140.5	27 08.1	-42.9	140.8	26 21.5	-43.4	141.1	25 34.7	-43.9	141.4	24 47.7	-44.4	141.7	24 00.5	-44.9	142.0	31
32	28 45.3	-41.6	140.6	27 58.8	-42.1	140.9	27 12.1	-42.6	141.3	26 25.2	-43.2	141.6	25 38.1	-43.7	141.9	24 50.8	-44.8	142.2	24 03.3	-44.6	142.5	23 15.6	-45.0	142.7	32
33	28 03.7	-41.9	141.4	27 16.7	-42.4	141.8	26 29.5	-43.0	142.1	25 42.0	-43.4	142.4	24 54.4	-43.8	142.7	24 06.7	-44.4	142.9	23 18.7	-44.8	143.2	22 30.6	-45.3	143.4	33
34	27 21.8	-42.2	142.2	26 34.3	-42.7	142.5	25 46.5	-43.1	142.8	24 58.6	-43.6	143.1	24 10.6	-44.1	143.4	23 22.3	-44.6	143.7	22 33.9	-45.0	143.9	21 45.3	-45.4	144.2	34
35	26 39.6	-42.4	143.0	25 51.6	-42.9	143.3	25 03.4	-43.4	143.6	24 15.0	-43.9	143.9	23 26.5	-44.4	144.1	22 37.7	-44.7	144.4	21 48.9	-45.2	144.6	20 59.9	-45.6	144.9	35
36	25 57.2	-42.7	143.8	25 08.7	-43.2	144.1	24 20.0	-43.6	144.4	23 31.1	-44.0	144.6	22 42.1	-44.5	144.9	21 53.0	-44.9								

42°, 318° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	45 52.5	+21.8	106.0	45 35.4	+23.2	107.0	45 17.4	+24.5	108.0	44 58.4	+25.8	108.9	44 38.4	+27.1	109.9	44 17.6	+28.3	110.8	43 55.8	+29.5	111.7	43 33.2	+30.7	112.6	0
1	46 14.3	+20.9	104.7	45 58.6	+22.3	105.7	45 41.9	+23.6	106.7	45 24.2	+24.9	107.7	45 05.5	+26.2	108.6	44 45.9	+27.4	109.6	44 25.3	+28.7	110.5	44 03.9	+29.8	111.4	1
2	46 35.2	+19.9	103.3	46 20.9	+21.3	104.4	46 05.5	+22.6	105.4	45 49.1	+24.0	106.4	45 31.7	+25.3	107.3	45 13.3	+26.6	108.3	44 54.0	+27.9	109.3	44 33.7	+29.2	110.2	2
3	46 55.1	+18.8	102.0	46 42.2	+20.3	103.0	46 28.1	+21.7	104.0	46 13.1	+23.1	105.0	45 57.0	+24.4	106.0	45 39.9	+25.8	107.0	45 21.9	+27.0	108.0	45 02.9	+28.2	109.0	3
4	47 14.0	+17.9	100.6	47 02.5	+19.3	101.6	46 49.8	+20.8	102.7	46 36.2	+22.1	103.7	46 21.4	+23.5	104.7	46 05.7	+24.8	105.7	45 48.9	+26.2	106.7	45 31.1	+27.5	107.7	4
5	47 31.9	+16.8	99.2	47 21.8	+18.3	100.2	47 10.6	+19.7	101.3	46 58.3	+21.2	102.3	46 44.9	+22.6	103.4	46 30.5	+24.0	104.4	46 15.1	+25.3	105.4	45 58.6	+26.6	106.4	5
6	47 48.7	+15.8	97.7	47 40.1	+17.2	98.8	47 30.3	+18.7	99.9	47 19.5	+20.1	101.0	47 07.5	+21.6	102.0	46 54.5	+22.9	103.1	46 40.4	+24.3	104.1	46 25.2	+25.7	105.1	6
7	48 04.5	+14.6	96.3	47 57.3	+16.2	97.4	47 49.0	+17.7	98.5	47 39.6	+19.1	99.6	47 29.1	+20.6	100.7	47 17.4	+22.0	101.7	47 04.7	+23.4	102.8	46 50.9	+24.8	103.8	7
8	48 19.1	+13.6	94.8	48 13.5	+15.1	96.0	48 06.7	+16.6	97.1	47 58.7	+18.1	98.2	47 49.7	+19.5	99.3	47 39.4	+21.1	100.3	47 28.1	+22.5	101.4	47 15.7	+23.8	102.5	8
9	48 32.7	+12.4	93.4	48 28.6	+13.9	94.5	48 23.3	+15.5	95.6	48 16.8	+17.0	96.7	48 09.2	+18.5	97.8	48 00.5	+19.9	98.9	47 50.6	+21.4	100.0	47 39.5	+22.9	101.1	9
10	48 45.1	+11.3	91.9	48 42.5	+12.9	93.0	48 38.8	+14.4	94.2	48 33.8	+16.0	95.3	48 27.7	+17.5	96.4	48 20.4	+19.0	97.5	48 12.0	+20.4	98.6	48 02.4	+21.9	99.7	10
11	48 56.4	+10.1	90.4	48 55.4	+11.7	91.5	48 53.2	+13.2	92.7	48 49.8	+14.7	93.8	48 45.2	+16.3	95.0	48 39.4	+17.8	96.1	48 32.4	+19.4	97.2	48 24.3	+20.8	98.3	11
12	49 06.5	+8.9	88.9	49 07.1	+10.5	90.0	49 06.4	+12.1	91.2	49 04.5	+13.7	92.4	49 01.5	+15.2	93.5	48 57.2	+16.8	94.7	48 51.8	+18.2	95.8	48 45.1	+19.8	96.9	12
13	49 15.4	+7.8	87.4	49 17.6	+9.3	88.5	49 18.5	+10.9	89.7	49 18.2	+12.5	90.9	49 16.7	+14.0	92.0	49 14.0	+15.6	93.2	49 10.0	+17.2	94.3	49 04.9	+18.7	95.5	13
14	49 23.2	+6.5	85.9	49 26.9	+8.1	87.0	49 29.4	+9.7	88.2	49 30.7	+11.3	89.4	49 30.7	+12.9	90.5	49 29.6	+14.5	91.7	49 27.2	+16.0	92.9	49 23.6	+17.6	94.0	14
15	49 29.7	+5.3	84.3	49 35.0	+7.0	85.5	49 39.1	+8.6	86.7	49 42.0	+10.1	87.8	49 43.6	+11.8	89.0	49 44.1	+13.3	90.2	49 43.2	+14.9	91.4	49 41.2	+16.4	92.6	15
16	49 35.0	+4.1	82.8	49 42.0	+5.7	84.0	49 47.7	+7.3	85.1	49 52.1	+8.9	86.3	49 55.4	+10.5	87.5	49 57.4	+12.1	88.7	49 58.1	+13.7	89.9	49 57.6	+15.3	91.1	16
17	49 39.1	+2.9	81.3	49 47.7	+4.4	82.4	49 55.0	+6.0	83.6	50 01.0	+7.7	84.8	50 05.9	+9.3	86.0	50 09.5	+10.9	87.2	50 11.8	+12.5	88.4	50 12.9	+14.1	89.6	17
18	49 42.0	+1.6	79.7	49 52.1	+3.3	80.9	50 01.0	+4.9	82.0	50 08.7	+6.5	83.2	50 15.2	+8.0	84.4	50 20.4	+9.6	85.6	50 24.3	+11.3	86.8	50 27.0	+12.9	88.0	18
19	49 43.6	+0.5	78.2	49 55.4	+2.0	79.3	50 05.9	+3.6	80.5	50 15.2	+5.2	81.7	50 23.2	+6.8	82.9	50 30.0	+8.5	84.1	50 35.6	+10.1	85.3	50 39.9	+11.7	86.5	19
20	49 44.1	-0.9	76.6	49 57.4	+0.7	77.8	50 09.5	+2.3	78.9	50 20.4	+3.9	80.1	50 30.0	+5.6	81.3	50 38.5	+7.2	82.5	50 45.7	+8.8	83.7	50 51.6	+10.4	85.0	20
21	49 43.2	-2.0	75.1	49 58.1	-0.5	76.2	50 11.8	+1.1	77.4	50 24.3	-0.2	78.6	50 35.6	+4.3	79.7	50 45.7	+5.8	81.0	50 54.5	+7.5	82.2	51 02.0	+9.2	83.4	21
22	49 41.2	-3.3	73.5	49 57.6	-1.7	74.7	50 12.9	-0.2	75.8	50 27.0	+1.4	77.0	50 39.9	+3.0	78.2	50 51.6	+4.6	79.4	51 02.0	+6.3	80.6	51 11.2	+7.9	81.8	22
23	49 37.9	-4.6	72.0	49 55.9	-3.0	73.1	50 12.7	-1.4	74.3	50 28.4	+0.2	75.4	50 42.9	+1.8	76.6	50 56.2	+3.4	77.8	51 08.3	+5.0	79.0	51 19.1	+6.6	80.2	23
24	49 33.3	-5.7	70.4	49 52.9	-4.3	71.6	50 11.3	-2.7	72.7	50 28.6	-1.2	73.8	50 44.7	+0.4	75.0	50 59.6	+2.0	76.2	51 13.3	+3.6	77.4	51 25.7	+5.3	78.6	24
25	49 27.6	-7.0	68.9	49 48.6	-5.4	70.0	50 08.6	-3.9	71.1	50 27.4	-2.4	72.3	50 45.1	-0.8	73.4	51 01.6	+0.8	74.6	51 16.9	+2.4	75.8	51 31.0	+4.0	77.0	25
26	49 20.6	-8.1	67.4	49 43.2	-6.7	68.5	50 04.7	-5.2	69.6	50 25.0	-3.6	70.7	50 44.3	-2.1	71.9	51 02.4	-0.5	73.0	51 19.3	+1.1	74.2	51 35.0	+2.7	75.4	26
27	49 12.5	-9.4	65.9	49 36.5	-7.9	66.9	49 59.5	-6.4	68.0	50 21.4	-4.9	69.1	50 42.2	-3.4	70.3	51 01.9	-1.8	71.4	51 20.4	-0.3	72.6	51 37.7	+1.4	73.8	27
28	49 03.1	-10.5	64.4	49 28.6	-9.1	65.4	49 53.1	-7.7	66.5	50 16.5	-6.2	67.6	50 38.8	-4.6	68.7	51 00.1	-3.2	69.9	51 20.1	-1.5	71.0	51 39.1	0.0	72.2	28
29	48 52.6	-11.7	62.9	49 19.5	-10.3	63.9	49 45.4	-8.8	64.9	50 10.3	-7.4	66.0	50 34.2	-5.9	67.1	50 56.9	-4.4	68.3	51 18.6	-2.9	69.4	51 39.1	-1.3	70.6	29
30	48 40.9	-12.8	61.4	49 09.2	-11.4	62.4	49 36.6	-10.1	63.4	50 02.9	-8.6	64.5	50 28.3	-7.2	65.6	50 52.5	-5.6	66.7	51 15.7	-4.1	67.8	51 37.8	-2.6	69.0	30
31	48 28.1	-13.8	59.9	48 57.8	-12.6	60.9	49 26.5	-11.2	61.9	49 54.3	-9.8	62.9	50 21.1	-8.4	64.0	50 46.9	-7.0	65.1	51 11.6	-5.5	66.2	51 35.2	-3.9	67.4	31
32	48 14.2	-15.0	58.4	48 45.2	-13.8	59.4	49 15.3	-12.4	60.4	49 44.5	-11.1	61.4	50 12.7	-9.6	62.5	50 39.9	-8.2	63.5	51 06.1	-6.7	64.6	51 31.3	-5.2	65.8	32
33	47 59.2	-16.2	57.0	47 06.4	-20.1	50.0	47 44.0	-19.0	51.6	48 20.9	-17.9	52.5	48 57.0	-21.6	53.4	49 32.4	-15.4	54.3	50 07.0	-14.2	55.3	50 40.7	-12.9	56.3	33
34	47 43.0	-17.2	55.5	47 02.6	-21.1	49.4	47 25.0	-20.0	50.2	48 03.0	-18.9	51.1	48 40.4	-17.7	52.0	49 17.0	-16.5	52.9	49 52.8	-15.3	53.8	50 27.8	-14.0	54.8	34
35	47 25.8	-18.2	54.1	48 00.6	-17.0	55.0	48 34.6	-15.8	55.9	49 07.8	-14.5	56.9	49 40.2	-13.3	57.9	50 11.6	-11.9	58.9	50 42.1	-10.5	59.9	51 11.7	-9.1	61.0	35
36	47 07.6	-19.2	52.7	47 43.6	-18.1	53.6	48 18.8	-16.9	54.5	48 53.3	-15.7	55.4	49 26.9	-14.4	56.4	49 59.7	-13.1	57.4	50 31.6	-11.7	58.4	51 02.6	-10.3	59.4	36
37	46 48.4	-20.3	51.3	47 25.5	-19.1	52.2	48 01.9	-17.9	53.0	48 37.6	-16.7	54.0	49 12.5	-15.5	54.9	49 46.6	-14.2	55.8	50 19.9	-12.9	56.8	50 52.			

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 42°, 318°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	45 52.5 -22.8	106.0	45 35.4 -24.1	107.0	45 17.4 -25.4	108.0	44 58.4 -26.7	108.9	44 38.4 -27.8	109.9	44 17.6 -29.1	110.8	43 55.8 -30.2	111.7	43 33.2 -31.4	112.6	43 01.8 -32.0	113.8	43 19.4 -32.2	114.9	42 29.8 -32.8	114.9	41 57.0 -33.4	116.0	41 23.6 -34.1	117.2	0
1	45 29.7 -23.6	107.4	45 11.3 -24.9	108.3	44 52.0 -26.2	109.3	44 31.7 -27.4	110.2	44 10.6 -28.7	111.1	43 48.5 -29.8	112.0	43 25.6 -31.0	112.9	43 01.8 -32.0	113.8	43 14.9 -32.2	114.9	42 29.8 -32.8	114.9	42 54.6 -31.6	114.1	42 29.8 -32.8	114.9	2		
2	45 06.1 -24.6	108.7	44 46.4 -25.8	109.6	44 25.8 -27.0	110.5	44 04.3 -28.2	111.4	43 41.9 -29.4	112.3	43 18.7 -30.6	113.2	42 54.6 -31.6	114.1	42 29.8 -32.8	114.9	41 57.0 -33.4	116.0	41 23.6 -34.1	117.2	4						
3	44 41.5 -25.4	110.0	44 20.6 -26.7	110.9	43 58.8 -27.9	111.8	43 36.1 -29.1	112.7	43 12.5 -30.1	113.5	42 48.1 -31.2	114.4	42 23.0 -32.4	115.2	41 50.6 -33.0	116.4	41 23.6 -34.1	117.2	4								
4	44 16.1 -26.2	111.2	43 53.9 -27.4	112.1	43 30.9 -28.6	113.0	43 07.0 -29.7	113.9	42 42.4 -30.9	114.7	42 16.9 -32.0	115.6	41 50.6 -33.0	116.4	41 23.6 -34.1	117.2	4										
5	43 49.9 -27.1	112.5	43 26.5 -28.2	113.4	43 02.3 -29.4	114.2	42 37.3 -30.5	115.1	42 11.5 -31.6	115.9	41 44.9 -32.6	116.7	41 17.6 -33.7	117.5	40 49.5 -34.6	118.2	40 49.5 -34.6	118.2	5								
6	43 22.8 -27.8	113.7	42 58.3 -29.0	114.6	42 32.9 -30.1	115.4	42 06.8 -31.2	116.2	41 39.9 -32.2	117.0	41 12.3 -33.3	117.8	40 43.9 -34.2	118.6	40 14.9 -35.2	119.3	40 14.9 -35.2	119.3	6								
7	42 55.0 -28.6	114.9	42 29.3 -29.7	115.8	42 02.8 -30.8	116.6	41 35.6 -31.8	117.4	41 07.7 -32.9	118.2	40 39.0 -33.9	118.9	40 09.7 -34.9	119.7	39 39.7 -35.8	120.4	39 39.7 -35.8	120.4	7								
8	42 26.4 -29.3	116.1	41 59.6 -30.4	116.9	41 32.0 -31.4	117.7	41 03.8 -32.5	118.5	40 34.8 -33.5	119.3	40 05.1 -34.4	120.0	39 34.8 -33.5	120.7	39 03.9 -36.4	121.4	39 03.9 -36.4	121.4	8								
9	41 57.1 -30.1	117.3	41 29.2 -31.1	118.1	41 00.6 -32.1	118.9	40 31.3 -33.2	119.6	40 01.3 -34.1	120.3	39 30.7 -35.1	121.1	38 59.4 -36.4	121.8	38 27.5 -36.9	122.4	38 27.5 -36.9	122.4	9								
10	41 27.0 -30.7	118.5	40 58.1 -31.8	119.2	40 28.5 -32.8	120.0	39 58.1 -33.7	120.7	39 27.2 -34.7	121.4	38 55.6 -35.6	122.1	38 23.4 -36.5	122.8	37 50.6 -37.3	123.4	37 50.6 -37.3	123.4	10								
11	40 56.3 -31.4	119.6	40 26.3 -32.4	120.3	39 55.7 -33.4	121.1	39 24.4 -34.3	121.8	38 52.5 -35.2	122.5	38 20.0 -36.1	123.1	37 46.9 -37.0	123.8	37 13.3 -37.9	124.4	37 13.3 -37.9	124.4	11								
12	40 24.9 -32.0	120.7	39 53.9 -33.0	121.4	39 22.3 -33.9	122.1	38 50.1 -34.9	122.8	38 17.3 -35.8	123.5	37 43.9 -36.7	124.2	37 09.9 -37.5	124.8	36 35.4 -38.3	125.4	36 35.4 -38.3	125.4	12								
13	39 52.9 -32.7	121.8	39 20.9 -33.6	122.5	38 48.4 -34.5	123.2	38 15.2 -35.4	123.9	37 41.5 -36.3	124.5	37 07.2 -37.1	125.1	36 32.4 -37.9	125.8	35 57.1 -38.8	126.4	35 57.1 -38.8	126.4	13								
14	39 20.2 -33.2	122.9	38 47.3 -34.1	123.6	38 13.9 -35.1	124.3	37 39.8 -35.9	124.9	37 05.2 -36.8	125.5	36 30.1 -37.6	126.1	35 54.5 -38.5	126.7	35 18.3 -39.1	127.3	35 18.3 -39.1	127.3	14								
15	38 47.0 -33.8	124.0	38 13.2 -34.8	124.6	37 38.8 -35.6	125.3	37 03.9 -36.5	125.9	36 28.4 -37.3	126.5	35 52.5 -38.1	127.1	35 16.0 -38.8	127.7	34 39.2 -39.7	128.2	34 39.2 -39.7	128.2	15								
16	38 13.2 -34.4	125.0	37 38.4 -35.2	125.7	37 03.2 -36.1	126.3	36 27.4 -36.9	126.9	35 51.1 -37.7	127.5	35 14.4 -38.5	128.0	34 37.2 -39.3	128.6	33 59.5 -39.9	129.1	33 59.5 -39.9	129.1	16								
17	37 38.8 -34.9	126.1	37 03.2 -35.8	126.7	36 27.1 -36.6	127.3	35 50.5 -37.4	127.9	35 13.4 -38.2	128.4	34 35.9 -38.9	129.0	33 57.9 -39.6	129.5	33 19.6 -40.4	130.0	33 19.6 -40.4	130.0	17								
18	37 03.9 -35.5	127.1	36 27.4 -36.3	127.7	35 50.5 -37.1	128.3	35 13.1 -37.9	128.8	34 35.2 -38.6	129.4	33 57.0 -39.4	129.9	33 18.3 -40.1	130.4	32 39.2 -40.8	130.9	32 39.2 -40.8	130.9	18								
19	36 28.4 -35.9	128.1	35 51.1 -36.7	128.7	35 13.4 -37.5	129.2	34 35.2 -38.2	129.8	33 56.6 -39.0	130.3	33 17.6 -39.7	130.8	32 38.2 -40.4	131.3	31 58.4 -41.1	131.8	31 58.4 -41.1	131.8	19								
20	35 52.5 -36.5	129.1	35 14.4 -37.2	129.7	34 35.9 -38.0	130.2	33 57.0 -38.7	130.7	33 17.6 -39.4	131.2	32 37.9 -40.1	131.7	31 57.8 -40.8	132.2	31 17.3 -41.4	132.6	31 17.3 -41.4	132.6	20								
21	35 16.0 -36.8	130.1	34 37.2 -37.7	130.6	33 57.9 -38.3	131.1	33 18.3 -39.1	131.6	32 38.2 -39.8	132.1	31 57.8 -40.5	132.6	31 17.0 -41.1	133.0	30 35.9 -41.7	133.5	30 35.9 -41.7	133.5	21								
22	34 39.2 -37.4	131.0	33 59.5 -38.0	131.6	33 19.6 -38.8	132.1	32 39.2 -39.5	132.5	31 58.4 -40.1	133.0	31 17.3 -40.8	133.4	30 35.9 -41.4	133.9	29 54.2 -42.1	134.3	29 54.2 -42.1	134.3	22								
23	34 01.8 -37.8	132.0	33 21.5 -38.5	132.5	32 40.8 -39.2	133.0	31 59.7 -39.8	133.4	31 18.3 -40.5	133.9	30 36.5 -41.1	134.3	29 54.5 -41.8	134.7	29 12.1 -42.3	135.1	29 12.1 -42.3	135.1	23								
24	33 24.0 -38.1	132.9	32 43.0 -38.9	133.4	32 01.6 -39.5	133.9	31 19.9 -40.2	134.3	30 37.8 -40.8	134.7	29 55.4 -41.4	135.1	29 12.7 -42.0	135.5	28 29.8 -42.7	135.9	28 29.8 -42.7	135.9	24								
25	32 45.9 -38.6	133.8	32 04.1 -39.2	134.3	31 22.1 -39.9	134.7	30 39.7 -40.6	135.2	29 57.0 -41.2	135.6	29 14.0 -41.8	136.0	28 30.7 -42.4	136.4	27 47.1 -42.9	136.7	27 47.1 -42.9	136.7	25								
26	32 07.3 -39.0	134.8	31 24.9 -39.6	135.2	30 42.2 -40.3	135.6	29 59.1 -40.8	136.0	29 15.8 -41.5	136.4	28 32.2 -42.0	136.8	27 48.3 -46.2	137.2	27 04.2 -43.2	137.5	27 04.2 -43.2	137.5	26								
27	31 28.3 -39.3	135.7	30 45.3 -40.0	136.1	30 01.9 -40.6	136.5	29 18.3 -41.2	136.9	28 34.3 -41.7	137.2	27 50.2 -42.4	137.6	27 05.7 -42.9	138.0	26 21.0 -43.4	138.3	26 21.0 -43.4	138.3	27								
28	30 49.0 -39.7	136.5	30 05.3 -40.3	136.9	29 21.3 -40.9	137.3	28 37.1 -41.5	137.7	27 52.6 -42.1	138.1	27 07.8 -42.6	138.4	26 22.8 -43.1	138.7	25 37.6 -43.6	139.1	25 37.6 -43.6	139.1	28								
29	30 09.3 -40.0	137.4	29 25.0 -40.6	137.8	28 40.4 -41.2	138.2	27 55.6 -41.8	138.5	27 10.5 -42.3	138.9	26 25.2 -42.8	139.2	25 39.7 -43.4	139.5	24 54.0 -43.9	139.8	24 54.0 -43.9	139.8	29								
30	29 29.3 -40.4	138.3	28 44.4 -40.9	138.6	27 59.2 -41.5	139.0	27 13.8 -42.0	139.3	26 28.2 -42.6	139.7	25 42.4 -43.1	140.0	24 56.3 -43.6	140.3	24 10.1 -44.1	140.6	24 10.1 -44.1	140.6	30								
31	28 48.9 -40.6	139.1	28 03.5 -41.3	139.5	27 17.7 -41.7	139.8	26 31.8 -42.3	140.2	25 45.6 -43.2	140.4	24 59.3 -43.3	140.7	24 12.7 -43.4	141.0	23 26.0 -44.3	141.3	23 26.0 -44.3	141.3	31								
32	28 08.3 -41.0	139.9	27 22.2 -41.5	140.3	26 36.0 -42.1	140.6	25 49.5 -42.6	140.9	25 02.8 -43.0	141.2	24 16.0 -43.6	141.5	23 28.9 -43.0	141.8	22 41.7 -44.5	142.0	22 41.7 -44.5	142.0	32								
33	27 27.3 -41.2	140.8	26 40.7 -41.8	141.1	25 53.9 -42.3	141.4	25 06.9 -42.8	141.7	24 19.8 -43.3	142.0	23 32.4 -43.8	142.3	22 44.9 -44.3	142.5	21 57.2 -44.7	142.8	21 57.2 -44.7	142.8	33								
34	26 46.1 -41.6	141.6	25 58.9 -42.0	141.9	25 11.6 -42.5	142.2	24 44.1 -43.0	142.5	23 36.5 -42.5	142.7	22 48.6 -43.9	143.0	22 00.6 -44.4	143.2	21 12.5 -44.9	143.5	21 12.5 -44.9	143.5	34								
35	26 04.5 -41.8	142.4	25 16.9 -42.3	142.7	24 29.1 -42.8	143.0	23 41.1 -43.2	143.2	22 53.0 -43.8	143.5	22 04.7 -44.2	143.7	21 16.2 -44.6	144.0	20 27.6 -45.0	144.2	20 27.6 -45.0	144.2	35								
36	25 22.7 -42.0	143.2	24 34.6 -42.5	143.5	23 46.3 -43.0	143.7	22 57.9 -43.5	144.0	22 09.2 -43.9	144.2	21 20.5 -44.4	144.5	20 31.6 -44.8</														

43°, 317° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	44	56.7	+21.5	105.5	44	40.2	+22.8	106.5	44	22.7	+24.1	107.4	44	04.3	+25.4	108.3	43	45.0	+26.6	109.2	43	24.8	+27.8	110.1	43	03.7	+29.0	111.0	42	41.7	+30.2	111.9	0
1	45	18.2	+20.6	104.2	45	03.0	+21.9	105.2	44	46.8	+23.3	106.1	44	29.7	+24.5	107.1	44	11.6	+25.8	108.0	43	52.6	+27.1	108.9	43	32.7	+28.3	109.8	43	11.9	+29.5	110.7	1
2	45	38.8	+19.6	102.8	45	24.9	+21.0	103.8	45	10.1	+22.3	104.8	44	54.2	+23.7	105.8	44	37.4	+25.0	106.7	44	19.7	+26.2	107.7	44	01.0	+27.5	108.6	43	41.4	+28.7	109.5	2
3	45	58.4	+18.6	101.5	45	45.9	+20.0	102.5	45	32.4	+21.4	103.5	45	17.9	+22.8	104.5	45	02.4	+24.1	105.5	44	45.9	+25.4	106.4	44	28.5	+26.7	107.4	44	10.1	+28.0	108.3	3
4	46	17.0	+17.6	100.1	46	05.9	+19.1	101.1	45	53.8	+20.5	102.2	45	40.7	+21.8	103.2	45	26.5	+23.2	104.2	45	11.3	+24.5	105.1	44	55.2	+25.8	106.1	44	38.1	+27.1	107.0	4
5	46	34.6	+16.7	98.7	46	25.0	+18.1	99.8	46	14.3	+19.5	100.8	46	02.5	+20.9	101.8	45	49.7	+22.3	102.8	45	35.8	+23.7	103.8	45	21.0	+25.0	104.8	45	05.2	+26.2	105.8	5
6	46	51.3	+15.5	97.3	46	43.1	+17.0	98.4	46	33.8	+18.5	99.4	46	23.4	+19.9	100.5	46	12.0	+21.3	101.5	45	59.5	+22.7	102.5	45	46.0	+24.0	103.5	45	31.4	+25.4	104.5	6
7	47	06.8	+14.6	95.9	47	00.1	+16.0	97.0	46	52.3	+17.4	98.0	46	43.3	+18.9	99.1	46	33.3	+20.3	100.1	46	22.2	+21.7	101.2	46	10.0	+23.2	102.2	45	56.8	+24.5	103.2	7
8	47	21.4	+13.4	94.5	47	16.1	+15.0	95.6	47	09.7	+16.5	96.6	47	02.2	+17.9	97.7	46	53.6	+19.4	98.8	46	43.9	+20.8	99.8	46	33.2	+22.2	100.9	46	21.3	+23.6	101.9	8
9	47	34.8	+12.4	93.0	47	31.1	+13.8	94.1	47	26.2	+15.3	95.2	47	20.1	+16.9	96.3	47	13.0	+18.3	97.4	47	04.7	+19.8	98.4	46	55.4	+21.2	99.5	46	44.9	+22.6	100.6	9
10	47	47.2	+11.2	91.6	47	44.9	+12.8	92.7	47	41.5	+14.3	93.8	47	37.0	+15.8	94.9	47	31.3	+17.3	96.0	47	24.5	+18.8	97.1	47	16.6	+20.2	98.1	47	07.5	+21.7	99.2	10
11	47	58.4	+10.2	90.1	47	57.7	+11.7	91.2	47	55.8	+13.2	92.3	47	52.8	+14.7	93.5	47	48.6	+16.2	94.6	47	43.3	+17.7	95.7	47	36.8	+19.2	96.7	47	29.2	+20.7	97.8	11
12	48	08.6	+8.9	88.7	48	09.4	+10.5	89.8	48	09.0	+12.1	90.9	48	07.5	+13.6	92.0	48	04.8	+15.2	93.1	48	01.0	+16.7	94.2	47	56.0	+18.2	95.3	47	49.9	+19.6	96.4	12
13	48	17.5	+7.9	87.2	48	19.9	+9.4	88.3	48	21.1	+11.0	89.4	48	21.1	+12.5	90.5	48	20.0	+14.0	91.7	48	17.7	+15.5	92.8	48	14.2	+17.0	93.9	48	09.5	+18.6	95.0	13
14	48	25.4	+6.6	85.7	48	29.3	+8.2	86.8	48	32.1	+9.8	87.9	48	33.6	+11.4	89.1	48	34.0	+12.9	90.2	48	33.2	+14.5	91.3	48	31.2	+16.0	92.5	48	28.1	+17.5	93.6	14
15	48	32.0	+5.5	84.2	48	37.5	+7.1	85.3	48	41.9	+8.6	86.4	48	45.0	+10.2	87.6	48	46.9	+11.8	88.7	48	47.7	+13.3	89.9	48	47.2	+14.9	91.0	48	45.6	+16.4	92.1	15
16	48	37.5	+4.4	82.7	48	44.6	+5.9	83.8	48	50.5	+7.4	84.9	48	55.2	+9.0	86.1	48	58.7	+10.6	87.2	49	01.0	+12.2	88.4	49	02.1	+13.7	89.5	49	02.0	+15.3	90.7	16
17	48	41.9	+3.1	81.2	48	50.5	+4.7	82.3	48	57.9	+6.3	83.4	49	04.2	+7.9	84.6	49	09.3	+9.4	85.7	49	13.2	+11.0	86.9	49	15.8	+12.6	88.0	49	17.3	+14.1	89.2	17
18	48	45.0	+1.9	79.6	48	55.2	+3.5	80.8	49	04.2	+5.1	81.9	49	12.1	+6.6	83.1	49	18.7	+8.2	84.2	49	24.2	+9.8	85.4	49	28.4	+11.4	86.5	49	31.4	+13.0	87.7	18
19	48	46.9	+0.8	78.1	48	58.7	+2.3	79.3	49	09.3	+3.9	80.4	49	18.7	+5.5	81.5	49	26.6	+7.1	82.7	49	34.0	+8.6	83.9	49	39.8	+10.2	85.0	49	44.4	+11.8	86.2	19
20	48	47.7	-0.5	76.6	49	01.0	+1.1	77.7	49	13.2	+2.6	78.9	49	24.2	+4.2	80.0	49	34.0	+5.8	81.2	49	42.6	+7.4	82.3	49	50.0	+9.0	83.5	49	56.2	+10.6	84.7	20
21	48	47.2	-1.6	75.1	49	02.1	-0.1	76.2	49	15.8	+1.5	77.3	49	28.4	+3.0	78.5	49	39.8	+4.6	79.6	49	50.0	+6.2	80.8	49	59.0	+7.8	82.0	50	06.8	+9.3	83.1	21
22	48	45.6	-2.9	73.6	49	02.0	-1.3	74.7	49	17.3	+0.2	75.8	49	31.4	+1.8	76.9	49	44.4	+3.3	78.1	49	56.2	+4.9	79.2	50	06.8	+6.5	80.4	50	16.1	+8.2	81.6	22
23	48	42.7	-4.0	72.1	49	00.7	-2.6	73.2	49	17.5	-1.0	74.3	49	33.2	+0.5	75.4	49	47.7	+2.2	76.5	50	01.1	+3.7	77.7	50	13.3	+5.3	78.9	50	24.3	+6.9	80.1	23
24	48	38.7	-5.2	70.6	48	58.1	-3.7	71.6	49	16.5	-2.2	72.7	49	33.7	-0.6	73.9	49	49.9	+0.8	75.0	50	04.8	+2.5	76.1	50	18.6	+4.0	77.3	50	31.2	+5.6	78.5	24
25	48	33.5	-6.4	69.0	48	54.4	-4.9	70.1	49	14.3	-3.4	71.2	49	33.1	-1.9	72.3	49	50.7	-0.3	73.4	50	07.3	+1.2	74.6	50	22.6	+2.8	75.7	50	36.8	+4.4	76.9	25
26	48	27.1	-7.5	67.5	48	49.5	-6.1	68.6	49	10.9	-4.6	69.7	49	31.2	-3.1	70.8	49	50.4	-1.6	71.9	50	08.5	-0.1	73.0	50	25.4	+1.5	74.2	50	41.2	+3.1	75.4	26
27	48	19.6	-8.8	66.1	48	43.4	-7.3	67.1	49	06.3	-5.9	68.2	48	28.1	-4.4	69.2	49	48.8	-2.9	70.3	50	08.4	-1.3	71.5	50	26.9	+0.3	72.6	50	44.3	+1.8	73.8	27
28	48	10.8	-9.8	64.6	48	36.1	-8.4	65.6	49	00.4	-7.0	66.6	49	23.7	-5.5	67.7	49	45.9	-4.0	68.8	50	07.1	-2.5	69.9	50	27.2	+1.1	71.0	50	46.1	+0.5	72.2	28
29	48	01.0	-11.0	63.1	48	27.7	-9.6	64.1	48	53.4	-8.2	65.1	49	18.2	-6.8	66.2	49	41.9	-5.3	67.2	50	04.6	-3.0	68.3	50	26.1	-2.2	69.5	50	46.6	-0.7	70.6	29
30	47	50.0	-12.1	61.6	48	18.1	-10.8	62.6	48	45.2	-9.3	63.6	49	11.4	-8.0	64.7	49	36.6	-6.5	65.7	50	00.7	-5.0	66.8	50	23.9	-3.6	67.9	50	45.9	-2.0	69.0	30
31	47	37.9	-13.2	60.2	48	07.3	-11.8	61.1	48	35.9	-10.6	62.1	49	03.4	-9.1	63.1	49	30.1	-7.8	64.2	49	55.7	-6.3	65.2	50	20.3	-4.8	66.3	50	43.9	-3.4	67.5	31
32	47	24.7	-14.2	58.7	47	55.5	-13.0	59.7	48	25.3	-11.6	60.6	48	54.3	-10.3	61.6	49	22.3	-8.9	62.7	49	49.4	-7.5	63.7	50	15.5	-6.1	64.8	50	40.5	-4.5	65.9	32
33	47	10.5	-15.4	57.3	47	42.5	-14.1	58.2	48	13.7	-12.8	59.2	48	44.0	-11.5	60.1	49	13.4	-10.1	61.1	49	41.9	-8.7	62.									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 43°, 317°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.											
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z												
0	44 56.7 -22.4	105.5	44 40.2 -23.7	106.5	44 22.7 -24.9	107.4	44 04.3 -26.2	108.3	43 45.0 -27.5	109.2	43 24.8 -28.7	110.1	43 03.7 -29.8	111.0	42 41.7 -30.9	111.9	42 20.7 -31.6	112.2	42 10.8 -31.6	113.0	42 0.8 -31.6	113.0	0													
1	44 34.3 -23.2	106.8	44 16.5 -24.5	107.8	43 57.8 -25.8	108.7	43 38.1 -27.0	109.6	43 17.5 -28.2	110.5	42 56.1 -29.4	111.3	42 33.9 -30.5	112.2	42 10.8 -31.6	113.0	42 0.8 -31.6	113.0	1	44 11.1 -24.2	108.1	43 52.0 -25.4	109.0	43 32.0 -26.6	109.9	43 11.1 -27.8	110.8	42 49.3 -28.9	111.7	42 26.7 -30.1	112.5	42 03.4 -31.3	113.4	41 39.2 -32.3	114.2	2
2	44 46.9 -24.9	109.4	43 26.6 -26.2	110.3	43 05.4 -27.4	111.2	42 43.3 -28.6	112.0	42 20.4 -29.7	112.9	41 56.6 -30.7	113.7	41 32.1 -31.8	114.5	41 06.9 -33.0	115.3	41 43.2 -34.0	116.1	40 33.9 -35.5	116.4	40 33.9 -35.5	116.4	4													
3	43 22.0 -25.8	110.6	43 00.4 -27.0	111.5	42 38.0 -28.2	112.4	42 14.7 -29.3	113.2	41 50.7 -30.4	114.0	41 25.9 -31.5	114.8	41 00.3 -32.6	115.6	40 33.9 -35.5	116.4	40 33.9 -35.5	116.4	4																	
4	42 56.2 -26.6	111.9	42 33.4 -27.7	112.7	42 09.8 -28.8	113.6	41 45.4 -29.9	114.4	41 20.3 -31.1	115.2	40 54.4 -32.2	116.0	40 27.7 -33.1	116.8	40 00.4 -34.2	117.5	5																			
5	42 29.6 -27.3	113.1	42 05.7 -28.5	113.9	41 41.0 -29.6	114.7	41 15.5 -30.7	115.5	40 49.2 -31.7	116.3	40 22.2 -32.7	117.1	39 54.6 -33.8	117.8	39 26.2 -34.7	118.6	6																			
6	42 02.3 -28.1	114.3	41 37.2 -29.2	115.1	41 11.4 -30.3	115.9	40 44.8 -31.3	116.7	40 17.5 -32.4	117.4	39 49.5 -33.4	118.2	39 20.8 -34.3	118.9	38 51.5 -35.3	119.6	7																			
7	41 34.2 -28.8	115.5	41 08.0 -29.5	116.3	40 41.1 -30.9	117.0	40 13.5 -32.0	117.8	39 45.1 -32.9	118.5	39 16.1 -33.9	119.3	38 46.5 -34.9	120.0	38 16.2 -35.8	120.7	8																			
8	41 05.4 -29.5	116.7	40 38.1 -30.5	117.4	40 10.2 -31.6	118.2	39 41.5 -32.6	118.9	39 12.2 -33.6	119.6	38 42.2 -34.5	120.3	38 11.6 -35.5	121.0	37 40.4 -36.4	121.7	9																			
9	40 35.9 -30.1	117.8	40 07.6 -31.2	118.6	39 38.6 -32.2	119.3	39 08.9 -33.2	120.0	38 38.6 -34.1	120.7	38 07.7 -35.1	121.4	37 36.1 -35.4	122.0	37 04.0 -36.8	122.7	10																			
10	40 05.8 -30.9	118.9	39 36.4 -31.8	119.7	39 06.4 -32.8	120.4	38 35.7 -33.7	121.1	38 04.5 -34.7	121.7	37 32.6 -35.6	122.4	37 00.2 -36.5	123.0	36 27.2 -37.3	123.7	11																			
11	39 34.9 -31.4	120.1	39 04.6 -32.5	120.8	38 33.6 -33.4	121.4	38 02.0 -34.4	122.1	37 29.8 -35.2	122.8	36 57.0 -36.1	123.4	36 23.7 -36.9	124.0	35 49.9 -37.8	124.6	12																			
12	39 03.5 -32.1	121.2	38 32.1 -33.0	121.8	38 00.2 -34.0	122.5	37 27.6 -34.8	123.2	36 54.6 -35.8	123.8	36 20.9 -36.6	124.4	35 46.8 -37.5	125.0	35 12.1 -38.2	125.6	13																			
13	38 31.4 -32.6	122.2	37 59.1 -33.6	122.9	37 26.2 -34.5	123.5	36 52.8 -35.4	124.2	36 18.8 -36.2	124.8	35 44.3 -37.0	125.4	35 09.3 -37.8	126.0	34 33.9 -38.7	126.5	14																			
14	37 58.8 -33.3	123.3	37 25.5 -34.1	124.0	36 51.7 -35.0	124.6	36 17.4 -35.8	125.2	35 42.6 -36.7	125.8	35 07.3 -37.5	126.4	34 31.5 -38.3	126.9	33 55.2 -39.0	127.5	15																			
15	37 25.5 -33.8	124.4	36 51.4 -34.7	125.0	36 16.7 -35.5	125.6	35 41.6 -36.4	126.2	35 05.9 -37.2	126.7	34 29.8 -38.0	127.3	33 53.2 -38.7	127.8	33 16.2 -39.5	128.4	16																			
16	36 51.7 -34.3	125.4	36 16.7 -35.1	126.0	35 41.2 -36.0	126.6	35 05.2 -36.8	127.2	34 28.7 -37.5	127.7	33 51.8 -38.3	128.2	33 14.5 -39.1	128.8	32 36.7 -39.8	129.3	17																			
17	36 17.4 -34.8	126.4	35 41.6 -35.7	127.0	35 05.2 -36.5	127.6	34 28.4 -37.2	128.1	33 51.2 -38.1	128.6	33 13.5 -38.9	129.2	32 35.4 -39.5	129.7	31 56.9 -40.2	130.1	18																			
18	35 42.6 -35.3	127.4	35 05.9 -36.1	128.0	34 28.7 -36.9	128.5	33 51.2 -37.7	129.1	33 13.1 -38.4	129.6	32 34.7 -39.1	130.1	31 55.9 -39.9	130.6	31 16.7 -40.5	131.0	19																			
19	35 07.3 -35.8	128.4	34 29.8 -36.6	129.0	33 51.8 -37.3	129.5	33 13.5 -38.1	130.0	32 34.7 -38.8	130.5	31 55.6 -39.6	131.0	31 16.0 -40.2	131.4	30 36.2 -40.9	131.9	20																			
20	34 31.5 -36.3	129.4	33 53.2 -37.0	129.9	33 14.5 -37.8	130.4	32 35.4 -38.5	130.9	31 55.9 -39.2	131.4	31 16.0 -39.8	131.9	30 35.8 -40.5	132.3	29 55.3 -41.2	132.7	21																			
21	33 55.2 -36.7	130.4	33 16.2 -37.5	130.9	32 36.7 -38.2	131.3	31 56.9 -38.9	131.8	31 16.7 -39.6	132.3	30 36.2 -40.3	132.7	29 55.3 -40.9	133.1	29 14.1 -41.5	133.6	22																			
22	33 18.5 -37.1	131.3	32 38.7 -37.8	131.8	31 58.5 -38.5	132.3	31 18.0 -39.2	132.7	30 37.1 -39.9	133.2	29 55.9 -40.5	133.6	29 14.4 -41.2	134.0	28 32.6 -41.8	134.4	23																			
23	32 41.4 -37.6	132.2	32 00.9 -38.3	132.7	31 20.0 -38.9	133.2	30 38.8 -39.6	133.6	29 57.2 -40.2	134.0	29 15.4 -40.9	134.4	28 33.2 -41.4	134.8	27 50.8 -42.1	135.2	24																			
24	32 03.8 -37.9	133.2	31 22.6 -38.6	133.6	30 41.1 -39.3	134.1	29 59.2 -39.9	134.5	29 17.0 -40.6	134.9	28 34.5 -41.2	135.3	27 51.8 -41.8	135.6	27 08.7 -42.3	136.0	25																			
25	31 25.9 -38.3	134.1	30 44.0 -39.0	134.5	29 01.8 -39.7	134.9	29 19.3 -40.3	135.3	28 36.4 -40.8	135.7	27 53.3 -41.4	136.1	27 10.0 -42.1	136.5	26 26.4 -42.6	136.8	26																			
26	30 47.6 -38.7	135.0	30 05.0 -39.3	135.4	29 22.1 -39.9	135.8	28 39.0 -40.6	136.2	27 55.6 -41.2	136.5	27 11.9 -41.8	136.9	26 27.9 -42.3	137.2	25 43.8 -42.9	137.6	27																			
27	30 08.9 -39.1	135.9	29 25.7 -39.7	136.3	28 42.2 -40.3	136.6	27 58.4 -40.8	137.0	27 14.4 -41.4	137.4	26 30.1 -42.0	137.7	25 45.6 -42.5	138.0	25 00.9 -43.1	138.4	28																			
28	29 29.8 -39.3	136.7	28 46.0 -40.4	137.1	28 01.9 -40.6	137.5	27 17.6 -41.2	137.8	26 33.0 -41.8	138.2	25 48.1 -41.2	138.5	25 03.1 -42.3	138.8	24 17.8 -43.3	139.1	29																			
29	28 50.5 -39.8	137.6	28 06.0 -40.3	138.0	27 21.3 -40.8	138.3	26 36.4 -41.4	138.7	25 51.2 -41.9	139.0	25 05.9 -42.5	139.3	24 20.3 -43.1	139.6	23 34.5 -43.5	139.9	30																			
30	28 10.7 -40.0	138.5	27 25.7 -40.6	138.8	26 40.5 -41.2	139.1	25 55.0 -41.7	139.5	25 09.3 -42.3	139.8	24 23.4 -42.8	140.1	23 37.2 -43.2	140.4	22 51.0 -43.8	140.6	31																			
31	27 30.7 -40.3	139.3	26 45.1 -40.9	139.6	25 59.3 -41.4	140.0	25 13.3 -42.0	140.3	24 27.0 -42.4	140.6	23 40.6 -43.0	140.8	22 54.0 -43.5	141.1	22 07.2 -43.9	141.4	32																			
32	26 50.4 -40.6	140.1	26 04.2 -41.1	140.4	25 17.9 -41.7	140.8	24 31.3 -42.2	141.0	23 44.6 -42.7	141.3	22 57.6 -43.2	141.6	22 10.5 -43.6	141.9	21 23.3 -44.2	142.1	33																			
33	26 09.8 -40.9	141.0	25 23.1 -41.4	141.3	24 36.2 -41.9	141.5	23 49.1 -42.4	141.8	23 01.9 -42.9	142.1	22 14.4 -43.3	142.3	21 26.9 -43.3	142.6	20 39.1 -44.3	142.8	34																			
34	25 28.9 -41.1	141.8	24 41.7 -41.7	142.1	23 54.3 -42.2	142.3	23 06.7 -42.7	142.6	22 19.0 -43.2	142.9	21 31.1 -43.6	143.1	20 43.0 -44.0	143.3	19 54.8 -44.5	143.5	35																			
35	24 47.8 -41.5	142.6	24 00.0 -41.9	142.8	23 12.1 -42.4	143.1	22 24.0 -42.8	143.4	21 35.8 -43.3	143.6	20 47.5 -43.8	143.8	19 59.0 -44.3	144.0	19 10.3 -44.6	144.3	36																			
36	24 06.3 -41.6	143.4	23 18.1 -42.1	143.6	22 29.7 -42.6	143.9	21 41.2 -43.1	144.1	20 52.5 -43.5	144.3	20 03.7 -44.0	144.6	19 14.7 -44.3	144.8	18 25.7 -44.8	145.0	37																			
37	23 24.7 -41.9	144.2	22 36.0 -42.4	144.4	21 47.1 -42.8	144.6	20 58.1 -43.2	144.9	19 09.0 -43.7	145.1	19 19.7 -44.1	145.3	18 30.4 -44.6	145.5	17 40.9 -45.0	145.7	38																			
38	22 42.8 -42.1	144.9	21 53.6 -42.5	145.2	21 04.3 -43.0	145.4	20 14.9 -43.5	145.6	19 25.3 -43.9	145.8	18 35.6 -44.3	146.0	17 45.8 -44.7	146.2	16 55.9 -45.1	146.4	39																			
39	22 00.7 -42.3	145.7	21 11.1 -42.8	145.9	20 21.3 -43.2	146.1	19 31.4 -43.6	146.3	18 41.4 -44.0	146.5	17 51.3 -44.4	146.7	17 01.1 -44.8	146.9	16 10.8 -																					

44°, 316° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	44 00.8	+21.2	105.0	43 44.8	+22.5	105.9	43 27.9	+23.7	106.8	43 10.0	+25.1	107.7	42 51.3	+26.3	108.6	42 31.7	+27.5	109.5	42 11.3	+28.6	110.4	41 50.0	+29.8	111.2	0
1	44 22.0	+20.2	103.7	44 07.3	+21.6	104.6	43 51.6	+22.9	105.6	43 35.1	+24.1	106.5	43 17.6	+25.4	107.4	42 59.2	+26.7	108.3	42 39.9	+27.9	109.2	42 19.8	+29.1	110.0	1
2	44 42.2	+19.3	102.4	44 28.9	+20.6	103.3	44 14.5	+22.0	104.3	43 59.2	+23.4	105.2	43 43.0	+24.6	106.2	43 25.9	+25.9	107.1	43 07.8	+27.1	108.0	42 48.9	+28.3	108.8	2
3	45 01.5	+18.4	101.0	44 49.5	+19.8	102.0	44 36.5	+21.2	103.0	44 22.6	+22.4	103.9	44 07.6	+23.8	104.9	43 51.8	+25.0	105.8	43 34.9	+26.4	106.7	43 17.2	+27.6	107.6	3
4	45 19.9	+17.4	99.7	45 09.3	+18.8	100.7	44 57.7	+20.2	101.7	44 45.0	+21.6	102.6	44 31.4	+22.9	103.6	44 16.8	+24.2	104.6	44 01.3	+25.5	105.5	43 44.8	+26.8	106.4	4
5	45 37.3	+16.5	98.3	45 28.1	+17.9	99.3	45 17.9	+19.2	100.3	45 06.6	+20.6	101.3	44 54.3	+22.0	102.3	44 41.0	+23.4	103.3	44 26.8	+24.6	104.2	44 11.6	+25.9	105.2	5
6	45 53.8	+15.4	96.9	45 46.0	+16.8	98.0	45 37.1	+18.3	99.0	45 27.2	+19.7	100.0	45 16.3	+21.1	101.0	45 04.4	+22.4	102.0	44 51.4	+23.8	102.9	44 37.5	+25.1	103.9	6
7	46 09.2	+14.4	95.6	46 02.8	+15.9	96.6	45 55.4	+17.3	97.6	45 46.9	+18.8	98.6	45 37.4	+20.1	99.6	45 26.8	+21.5	100.7	45 15.2	+22.9	101.6	45 02.6	+24.2	102.6	7
8	46 23.6	+13.3	94.2	46 18.7	+14.8	95.2	46 12.7	+16.3	96.2	46 05.7	+17.7	97.3	45 57.5	+19.2	98.3	45 48.3	+20.6	99.3	45 38.1	+22.0	100.3	45 26.8	+23.4	101.3	8
9	46 36.9	+12.3	92.7	46 33.5	+13.8	93.8	46 29.0	+15.3	94.8	46 23.4	+16.7	95.9	46 16.7	+18.2	96.9	46 08.9	+19.6	98.0	46 00.1	+21.0	99.0	45 50.2	+22.4	100.0	9
10	46 49.2	+11.3	91.3	46 47.3	+12.7	92.4	46 44.3	+14.2	93.4	46 40.1	+15.7	94.5	46 34.9	+17.1	95.5	46 28.5	+18.7	96.6	46 21.1	+20.0	97.6	46 12.6	+21.4	98.7	10
11	47 00.5	+10.1	89.9	47 00.0	+11.7	90.9	46 58.5	+13.2	92.0	46 55.8	+14.7	93.1	46 52.0	+16.2	94.2	46 47.2	+17.6	95.2	46 41.1	+19.1	96.3	46 34.0	+20.5	97.3	11
12	47 10.6	+9.1	88.4	47 11.7	+10.6	89.5	47 11.7	+12.0	90.6	47 10.5	+13.6	91.7	47 08.2	+15.1	92.7	47 04.8	+16.5	93.8	47 00.2	+18.1	94.9	46 54.5	+19.5	95.9	12
13	47 19.7	+7.9	87.0	47 22.3	+9.4	88.1	47 23.7	+11.0	89.1	47 24.1	+12.5	90.2	47 23.3	+14.0	91.3	47 21.3	+15.5	92.4	47 18.3	+17.0	93.5	47 14.0	+18.5	94.6	13
14	47 27.6	+6.8	85.5	47 31.7	+8.4	86.6	47 34.7	+9.9	87.7	47 36.6	+11.4	88.7	47 37.3	+12.9	89.9	47 36.8	+14.5	91.0	47 35.3	+15.9	92.1	47 32.5	+17.5	93.2	14
15	47 34.4	+5.7	84.0	47 40.1	+7.2	85.1	47 44.6	+8.7	86.2	47 48.0	+10.3	87.3	47 50.2	+11.8	88.4	47 51.3	+13.3	89.5	47 51.2	+14.9	90.6	47 50.0	+16.3	91.7	15
16	47 40.1	+4.5	82.6	47 47.3	+6.0	83.6	47 53.3	+7.7	84.7	47 58.3	+9.1	85.8	48 02.0	+10.7	87.0	48 04.6	+12.3	88.1	48 06.1	+13.7	89.2	48 06.3	+15.3	90.3	16
17	47 44.6	+3.4	81.1	47 53.3	+5.0	82.2	48 01.0	+6.4	83.3	48 07.4	+8.0	84.4	48 12.7	+9.6	85.5	48 16.9	+11.1	86.6	48 19.8	+12.7	87.7	48 21.6	+14.2	88.8	17
18	47 48.0	+2.2	79.6	47 58.3	+3.7	80.7	48 07.4	+5.3	81.8	48 15.4	+6.9	82.9	48 22.3	+8.4	84.0	48 28.0	+9.9	85.1	48 32.5	+11.5	86.2	48 35.8	+13.1	87.4	18
19	47 50.2	+1.1	78.1	48 02.0	+2.6	79.2	48 12.7	+4.2	80.3	48 22.3	+5.7	81.4	48 30.7	+7.2	82.5	48 37.9	+8.4	83.6	48 44.0	+10.4	84.8	48 48.9	+11.9	85.9	19
20	47 51.3	-0.1	76.6	48 04.6	+1.5	77.7	48 16.9	+2.9	78.8	48 28.0	+4.5	79.9	48 37.9	+6.1	81.0	48 46.7	+7.7	82.1	48 54.4	+9.1	83.3	49 00.8	+10.7	84.4	20
21	47 51.2	-1.2	75.1	48 06.1	+0.2	76.2	48 19.8	+1.8	77.3	48 32.5	+3.3	78.4	48 44.0	+4.9	79.5	48 54.4	+6.4	80.6	49 03.5	+8.0	81.8	49 11.5	+9.6	82.9	21
22	47 50.0	-2.4	73.6	48 06.3	-0.8	74.7	48 21.6	+0.7	75.8	48 35.8	+2.2	76.9	48 48.9	+3.7	78.0	49 00.8	+5.2	79.1	49 11.5	+6.9	80.2	49 21.1	+8.4	81.4	22
23	47 47.6	-3.6	72.1	48 05.5	-2.1	73.2	48 22.3	-0.6	74.3	48 38.0	+0.9	75.4	48 52.6	+2.5	76.5	49 06.0	+4.1	77.6	49 18.4	+5.6	78.7	49 29.5	+7.2	79.9	23
24	47 44.0	-4.7	70.7	48 03.4	-3.2	71.7	48 21.7	-1.7	72.8	48 38.9	-0.2	73.9	48 55.1	+1.3	75.0	49 10.1	+2.8	76.1	49 24.0	+4.4	77.2	49 36.7	+5.9	78.3	24
25	47 39.3	-5.8	69.2	48 00.2	-4.4	70.2	48 20.0	-2.9	71.3	48 38.7	-1.4	72.3	48 56.4	+0.1	73.4	49 12.9	+1.6	74.5	49 28.4	+3.1	75.7	49 42.6	+4.8	76.8	25
26	47 33.5	-7.0	67.7	47 55.8	-5.5	68.7	48 17.1	-4.1	69.8	48 37.3	-2.6	70.8	48 56.5	-1.1	71.9	49 14.5	+0.5	73.0	49 31.5	+2.0	74.1	49 47.4	+3.5	75.3	26
27	47 26.5	-8.0	66.2	47 50.3	-6.7	67.2	48 13.0	-5.3	68.3	48 34.7	-3.8	69.3	48 55.4	-2.4	70.4	49 15.0	-0.8	71.5	49 33.5	+0.7	72.6	49 50.9	+2.2	73.7	27
28	47.18.5	-9.2	64.8	47 43.6	-7.8	65.8	48 07.7	-6.4	66.8	48 30.9	-5.0	67.8	48 53.0	-3.5	68.9	49 14.2	-2.1	69.9	49 34.2	-0.5	71.0	49 53.1	+1.0	72.2	28
29	47 09.3	-10.3	63.3	47 35.8	-9.0	64.3	48 01.3	-7.5	65.3	48 25.9	-6.1	66.3	48 49.5	-4.7	67.3	49 12.1	-3.2	68.4	49 33.7	-1.8	69.5	49 54.1	-0.2	70.6	29
30	46 59.0	-11.4	61.9	47 26.8	-10.0	62.8	47 53.8	-8.7	63.8	48 19.8	-7.3	64.8	48 44.8	-5.8	65.8	49 08.9	-4.4	66.9	49 31.9	-2.9	68.0	49 53.9	-1.4	69.1	30
31	46 47.6	-12.5	60.4	47 16.8	-11.2	61.4	47 45.1	-9.8	62.3	48 12.5	-8.5	63.3	48 39.0	-7.1	64.3	49 04.5	-5.7	65.4	49 29.0	-4.2	66.4	49 52.5	-2.7	67.5	31
32	46 35.1	-13.5	59.0	47 05.6	-12.2	59.9	47 35.3	-11.0	60.9	48 04.0	-9.5	61.8	48 31.9	-8.2	62.8	48 58.8	-6.8	63.8	49 24.8	-5.4	64.9	49 49.8	-4.0	66.0	32
33	46 21.6	-14.5	57.6	46 53.4	-13.3	58.5	47 24.3	-12.0	59.4	47 54.5	-10.8	60.4	48 23.7	-9.4	61.3	48 52.0	-8.0	62.3	49 19.4	-6.6	63.4	49 45.8	-5.2	64.4	33
34	46 07.1	-15.6	56.2	46 40.1	-14.7	57.1	46 38.7	-13.6	58.0	47 43.6	-12.3	58.9	48 44.0	-10.5	59.8	49 44.0	-9.2	60.8	49 12.8	-7.8	61.8	49 40.6	-6.4	62.9	34
35	45 51.5	-16.6	54.8	45 25.7	-15.3	55.6	46 59.2	-14.1	56.5	47 31.9	-12.9	57.4	48 03.8	-11.6	58.4	48 34.8	-10.3	59.3	49 05.0	-9.0	60.3	49 34.2	-7.6	61.3	35
36	45 34.9	-17.5	53.4	46 10.4	-16.4	54.2	46 45.1	-15.3	55.1	47 19.0	-14.0	56.0	47 52.2	-12.8	56.9	48 24.5	-11.5	57.8	48 56.0	-10.1	58.8	49 26.6	-8.8	59.8	36
37	45 17.4	-18.5	52.1	45 54.0	-17.4	52.9	46 29.8	-16.2	53.7	47 05.0	-15.1	54.6	47 39.4	-13.8	55.5	48 13.0	-12.6	56.4	48 45.9	-11.4	57.3	49 17.8	-10.0	58.3	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $44^\circ$ , 316°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	44 00.8 -22.0	105.0	43 44.8 -23.3	105.9	43 27.9 -24.6	106.8	43 10.0 -25.8	107.7	42 51.3 -27.0	108.6	42 31.7 -28.2	109.5	42 11.3 -29.4	110.4	41 50.0 -30.5	111.2	40 0.0 -31.6	112.0	39 10.9 -33.7	116.8	39 37.6 -32.7	116.0	39 10.9 -33.7	116.8	5
1	43 38.8 -22.9	106.3	43 21.5 -24.2	107.2	43 03.3 -25.4	108.1	42 44.2 -26.6	109.0	42 24.3 -27.8	109.8	42 03.5 -29.0	110.7	41 41.9 -30.1	111.5	41 19.5 -31.2	112.4	41 20.7 -34.8	117.8	39 0.4 -33.3	117.1	38 37.2 -34.3	117.8	38 0.4 -33.3	117.8	1
2	43 15.9 -23.7	107.6	42 57.3 -24.9	108.5	42 37.9 -26.2	109.3	42 17.6 -27.3	110.2	41 56.5 -28.5	111.0	41 34.5 -29.6	111.9	41 11.8 -30.8	112.7	40 48.3 -31.9	113.5	40 0.9 -34.8	117.5	38 28.1 -34.8	118.9	38 0.9 -34.8	118.9	2		
3	42 52.2 -24.6	108.8	42 32.4 -25.8	109.7	42 11.7 -26.9	110.6	41 50.3 -28.1	111.4	41 28.0 -29.3	112.2	41 0.9 -30.4	113.0	40 41.0 -31.4	113.8	40 16.4 -32.4	114.6	39 44.0 -33.1	115.7	39 44.0 -33.1	115.7	39 44.0 -33.1	115.7	3		
4	42 27.6 -25.3	110.1	42 06.6 -26.5	110.9	41 44.8 -27.7	111.8	41 22.2 -28.9	112.6	40 58.7 -29.9	113.4	40 34.5 -31.0	114.2	40 09.6 -32.0	114.9	39 44.0 -33.1	115.7	39 44.0 -33.1	115.7	39 44.0 -33.1	115.7	39 44.0 -33.1	115.7	4		
5	42 02.3 -26.1	111.3	41 40.1 -27.3	112.1	41 17.1 -28.4	112.9	40 53.3 -29.5	113.7	40 28.8 -30.6	114.5	40 0.3 -31.6	115.3	39 37.6 -32.7	116.0	39 10.9 -33.7	116.8	39 10.9 -33.7	116.8	39 10.9 -33.7	116.8	39 10.9 -33.7	116.8	5		
6	41 36.2 -26.9	112.5	41 12.8 -27.9	113.3	40 48.7 -29.1	114.1	40 23.8 -30.1	114.9	39 58.2 -31.2	115.7	39 31.9 -32.3	116.4	39 0.4 -33.3	117.1	38 37.2 -34.3	117.8	38 0.4 -33.3	117.8	38 0.4 -33.3	117.8	38 0.4 -33.3	117.8	6		
7	41 09.3 -27.5	113.7	40 44.9 -28.7	114.5	40 19.6 -29.7	115.3	39 53.7 -30.9	116.0	39 27.0 -31.9	116.8	38 59.6 -32.8	117.5	38 31.6 -33.8	118.2	38 0.2 -34.8	118.9	38 0.2 -34.8	118.9	38 0.2 -34.8	118.9	38 0.2 -34.8	118.9	7		
8	40 41.8 -28.3	114.9	40 16.2 -29.4	115.6	39 49.9 -30.5	116.4	39 22.8 -31.4	117.1	38 55.1 -32.4	117.9	38 26.8 -33.5	118.6	37 57.8 -34.4	119.2	37 28.1 -35.3	119.9	37 28.1 -35.3	119.9	37 28.1 -35.3	119.9	37 28.1 -35.3	119.9	8		
9	40 13.5 -29.0	116.0	39 46.8 -30.4	116.8	39 19.4 -31.0	117.5	38 51.4 -32.1	118.2	38 22.7 -33.1	118.9	37 53.3 -34.0	119.6	37 23.4 -34.2	120.3	36 52.8 -35.8	120.9	36 52.8 -35.8	120.9	36 52.8 -35.8	120.9	36 52.8 -35.8	120.9	9		
10	39 44.5 -29.6	117.2	39 16.8 -30.7	117.9	38 48.4 -31.7	118.6	38 19.3 -32.6	119.3	37 49.6 -33.6	120.0	37 19.3 -34.5	120.7	36 48.5 -35.5	121.3	36 17.0 -36.3	121.9	36 17.0 -36.3	121.9	36 17.0 -36.3	121.9	36 17.0 -36.3	121.9	10		
11	39 14.9 -30.3	118.3	38 46.1 -31.3	119.0	38 16.7 -32.3	119.7	37 46.7 -33.3	120.4	37 16.0 -34.1	121.0	36 44.8 -35.1	121.7	36 13.0 -35.9	122.3	35 40.7 -36.8	122.9	35 40.7 -36.8	122.9	35 40.7 -36.8	122.9	35 40.7 -36.8	122.9	11		
12	38 44.6 -30.9	119.4	38 14.8 -31.8	120.1	37 44.4 -32.8	120.8	37 13.4 -33.7	121.4	36 41.9 -34.7	122.1	36 0.9 -35.5	122.7	35 37.1 -36.4	123.3	35 0.9 -37.3	123.9	35 0.9 -37.3	123.9	35 0.9 -37.3	123.9	35 0.9 -37.3	123.9	12		
13	38 13.7 -31.5	120.5	37 43.0 -32.5	121.2	37 11.6 -33.4	121.8	36 39.7 -34.3	122.5	36 0.7 -35.2	123.1	35 34.2 -36.0	123.7	35 0.0 -36.3	124.3	34 26.6 -37.7	124.8	34 26.6 -37.7	124.8	34 26.6 -37.7	124.8	34 26.6 -37.7	124.8	13		
14	37 42.2 -32.1	121.6	37 10.5 -33.0	122.2	36 38.2 -33.9	122.9	36 05.4 -34.8	123.5	35 32.0 -35.6	124.1	34 58.2 -36.5	124.7	34 23.8 -37.3	125.2	33 48.9 -38.1	125.8	33 48.9 -38.1	125.8	33 48.9 -38.1	125.8	33 48.9 -38.1	125.8	14		
15	37 10.1 -32.6	122.6	36 37.5 -33.6	123.3	36 04.3 -34.4	123.9	35 30.6 -35.3	124.5	34 56.4 -36.2	125.1	34 21.7 -37.0	125.6	33 46.5 -37.8	126.2	33 10.8 -38.5	126.7	33 10.8 -38.5	126.7	33 10.8 -38.5	126.7	33 10.8 -38.5	126.7	15		
16	36 37.5 -33.2	123.7	36 03.9 -34.0	124.3	35 29.9 -35.0	124.9	34 55.3 -35.8	125.5	34 20.2 -36.6	126.0	33 44.7 -37.4	126.6	33 08.7 -38.1	127.1	32 32.3 -38.9	127.6	32 32.3 -38.9	127.6	32 32.3 -38.9	127.6	32 32.3 -38.9	127.6	16		
17	36 04.3 -33.7	124.7	35 29.9 -34.6	125.3	34 54.9 -35.4	125.9	34 19.5 -36.2	126.4	33 43.6 -37.0	127.0	33 07.3 -37.8	127.5	32 30.6 -38.6	128.0	31 53.4 -39.3	128.5	31 53.4 -39.3	128.5	31 53.4 -39.3	128.5	31 53.4 -39.3	128.5	17		
18	35 30.6 -34.2	125.7	34 55.3 -35.1	126.3	34 19.5 -35.9	126.9	33 43.3 -36.7	127.4	33 06.6 -37.4	127.9	32 29.5 -38.2	128.4	31 52.0 -38.9	128.9	31 14.1 -39.6	129.4	31 14.1 -39.6	129.4	31 14.1 -39.6	129.4	31 14.1 -39.6	129.4	18		
19	34 56.4 -34.7	126.8	34 20.2 -35.5	127.3	33 43.6 -36.3	127.8	33 06.6 -37.1	128.4	32 29.2 -37.9	128.9	31 51.3 -38.5	129.4	31 13.1 -39.3	129.8	30 34.5 -40.0	130.3	30 34.5 -40.0	130.3	30 34.5 -40.0	130.3	30 34.5 -40.0	130.3	19		
20	34 21.7 -35.2	127.7	33 44.7 -36.0	128.3	33 07.3 -36.7	128.8	32 29.5 -37.5	129.3	31 51.3 -38.2	129.8	31 12.8 -39.0	130.2	30 33.8 -39.6	130.7	29 54.5 -40.3	131.1	29 54.5 -40.3	131.1	29 54.5 -40.3	131.1	29 54.5 -40.3	131.1	20		
21	33 46.5 -35.7	128.7	33 08.7 -36.4	129.2	32 30.6 -37.2	129.7	31 52.0 -37.9	130.2	31 13.1 -38.6	130.7	30 33.8 -39.3	131.1	29 54.2 -40.3	131.6	29 14.2 -40.7	132.0	29 14.2 -40.7	132.0	29 14.2 -40.7	132.0	29 14.2 -40.7	132.0	21		
22	33 10.8 -36.0	129.7	32 32.3 -36.8	130.2	31 53.4 -37.6	130.7	31 14.1 -38.2	131.1	30 34.5 -39.6	131.6	29 54.5 -39.6	132.0	29 14.2 -40.3	132.4	28 33.5 -40.9	132.8	28 33.5 -40.9	132.8	28 33.5 -40.9	132.8	28 33.5 -40.9	132.8	22		
23	32 34.8 -36.6	130.6	31 55.5 -37.3	131.1	31 15.8 -37.9	131.6	30 35.9 -38.7	132.0	29 55.5 -39.3	132.5	29 14.9 -40.0	132.9	28 33.9 -40.6	133.3	27 52.6 -41.2	133.7	27 52.6 -41.2	133.7	27 52.6 -41.2	133.7	27 52.6 -41.2	133.7	23		
24	31 58.2 -36.9	131.6	31 18.2 -37.6	132.0	30 37.9 -38.3	132.5	29 57.2 -39.0	132.9	29 16.2 -39.6	133.3	28 34.9 -40.3	133.7	27 53.3 -40.4	134.1	27 11.4 -41.6	134.5	27 11.4 -41.6	134.5	27 11.4 -41.6	134.5	27 11.4 -41.6	134.5	24		
25	31 21.3 -37.3	132.5	30 40.6 -38.0	132.9	29 59.6 -38.7	133.4	29 18.2 -39.3	133.8	28 36.6 -40.0	134.2	27 54.6 -40.6	134.6	27 12.4 -41.2	134.9	26 29.8 -41.8	135.3	26 29.8 -41.8	135.3	26 29.8 -41.8	135.3	26 29.8 -41.8	135.3	25		
26	30 44.0 -37.7	133.4	30 02.6 -38.3	133.8	29 20.9 -39.0	134.3	28 38.9 -39.7	134.6	27 56.6 -40.3	135.0	27 14.0 -40.9	135.4	26 31.2 -41.5	135.8	25 48.0 -42.0	136.1	25 48.0 -42.0	136.1	25 48.0 -42.0	136.1	25 48.0 -42.0	136.1	26		
27	30 06.3 -38.0	134.3	29 24.3 -38.7	134.7	28 41.9 -39.3	135.1	27 59.2 -39.9	135.5	27 16.3 -40.6	135.9	26 33.1 -41.1	136.2	25 49.7 -41.8	136.6	25 06.0 -42.3	136.9	25 06.0 -42.3	136.9	25 06.0 -42.3	136.9	25 06.0 -42.3	136.9	27		
28	29 28.3 -38.4	135.2	28 45.6 -39.1	135.6	28 02.6 -39.7	136.0	27 19.3 -40.3	136.3	26 35.7 -40.8	136.7	25 52.0 -41.5	137.0	25 07.9 -42.0	137.4	24 23.7 -42.5	137.8	24 23.7 -42.5	137.8	24 23.7 -42.5	137.8	24 23.7 -42.5	137.8	28		
29	28 49.9 -38.8	136.1	28 06.5 -39.3	136.5	27 22.9 -40.0	137.2	27 11.1 -40.5	137.6	26 39.0 -40.5	138.2	25 54.9 -41.1	141.5	25 10.5 -41.1	141.7	22 6.8 -43.2	141.5	22 6.8 -43.2	141.5	22 6.8 -43.2	141.5	22 6.8 -43.2	141.5	22		
30	28 11.1 -39.0	137.0	27 27.2 -39.7	137.3	26 42.9 -40.2	137.7	25 58.5 -40.9	138.0	25 13.8 -41.4	138.3	24 28.8 -41.9	138.6	23 43.7 -42.4	139.0	22 58.4 -43.0	139.2	22 58.4 -43.0	139.2	22 58.4 -43.0	139.2	22 58.4				

45°, 315° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	43 04.8 +20.8	104.5	42 49.3 +22.1	105.4	42 32.9 +23.4	106.3	42 15.6 +24.7	107.2	41 57.5 +25.8	108.0	41 38.5 +27.1	108.9	41 18.6 +28.3	109.7	40 58.0 +29.4	110.5	40	58.0 +29.4	110.5	40	58.0 +29.4	110.5	40	58.0 +29.4	110.5	0
1	43 25.6 +20.0	103.2	43 11.4 +21.3	104.1	42 56.3 +22.6	105.0	42 40.3 +23.8	105.9	42 23.3 +25.2	106.8	42 05.6 +26.3	107.7	41 46.9 +27.5	108.5	41 27.4 +28.7	109.4	41	27.4 +28.7	109.4	41	27.4 +28.7	109.4	41	27.4 +28.7	109.4	1
2	43 45.6 +19.0	101.9	43 32.7 +20.4	102.9	43 18.9 +21.7	103.8	43 04.1 +23.0	104.7	42 48.5 +24.2	105.6	42 31.9 +25.5	106.5	42 14.4 +26.8	107.3	41 56.1 +28.0	108.2	42	14.4 +26.8	107.3	41	56.1 +28.0	108.2	42	14.4 +26.8	107.3	2
3	44 04.6 +18.1	100.6	43 53.1 +19.5	101.6	43 40.6 +20.8	102.5	43 27.1 +22.2	103.4	43 12.7 +23.5	104.3	42 57.4 +24.3	105.2	42 41.2 +26.0	106.1	42 24.1 +27.2	107.0	42	24.1 +27.2	107.0	42	24.1 +27.2	107.0	42	24.1 +27.2	107.0	3
4	44 22.7 +17.3	99.3	44 12.6 +18.6	100.2	44 01.4 +20.0	101.2	43 49.3 +21.3	102.1	43 36.2 +22.6	103.1	43 22.2 +23.9	104.0	43 07.2 +25.2	104.9	42 51.3 +26.5	105.8	42	51.3 +26.5	105.8	42	51.3 +26.5	105.8	42	51.3 +26.5	105.8	4
5	44 40.0 +16.2	97.9	44 31.2 +17.6	98.9	44 21.4 +19.0	99.9	44 10.6 +20.4	100.8	43 58.8 +21.8	101.8	43 46.1 +23.1	102.7	43 32.4 +24.4	103.7	43 17.8 +25.6	104.6	43	17.8 +25.6	104.6	43	17.8 +25.6	104.6	43	17.8 +25.6	104.6	5
6	44 56.2 +15.3	96.6	44 48.8 +16.7	97.6	44 40.4 +18.1	98.5	44 31.0 +19.5	99.5	44 20.6 +20.8	100.5	44 09.2 +22.1	101.4	43 56.8 +23.5	102.4	43 43.4 +24.9	103.3	43	43.4 +24.9	103.3	43	43.4 +24.9	103.3	43	43.4 +24.9	103.3	6
7	45 11.5 +14.3	95.2	45 05.5 +15.7	96.2	44 58.5 +17.2	97.2	44 50.5 +18.5	98.2	44 41.4 +20.0	99.2	44 31.4 +21.3	100.1	44 20.3 +22.7	101.1	44 08.3 +23.9	102.1	44	08.3 +23.9	102.1	44	08.3 +23.9	102.1	44	08.3 +23.9	102.1	7
8	45 25.8 +13.2	93.8	45 21.2 +14.8	94.8	45 15.7 +16.1	95.8	45 09.0 +17.6	96.8	45 01.4 +19.0	97.8	44 52.7 +20.4	98.8	44 43.0 +21.7	99.8	44 32.2 +23.1	100.8	44	32.2 +23.1	100.8	44	32.2 +23.1	100.8	44	32.2 +23.1	100.8	8
9	45 39.0 +12.3	92.4	45 36.0 +13.7	93.5	45 31.8 +15.2	94.5	45 26.6 +16.6	95.5	45 20.4 +18.0	96.5	45 13.1 +19.4	97.5	45 04.7 +20.8	98.5	44 55.3 +22.3	99.5	44	55.3 +22.3	99.5	44	55.3 +22.3	99.5	44	55.3 +22.3	99.5	9
10	45 51.3 +11.2	91.0	45 49.7 +12.7	92.1	45 47.0 +14.2	93.1	45 43.2 +15.6	94.1	45 38.4 +17.1	95.1	45 32.5 +18.5	96.1	45 25.5 +19.9	97.2	45 17.6 +21.2	98.2	45	17.6 +21.2	98.2	45	17.6 +21.2	98.2	45	17.6 +21.2	98.2	10
11	46 02.5 +10.2	89.6	46 02.4 +11.6	90.7	46 01.2 +13.1	91.7	45 58.8 +14.6	92.7	45 55.5 +16.0	93.8	45 51.0 +17.5	94.8	45 45.4 +19.0	95.8	45 38.8 +20.4	96.8	45	38.8 +20.4	96.8	45	38.8 +20.4	96.8	45	38.8 +20.4	96.8	11
12	46 12.7 +9.1	88.2	46 14.0 +10.6	89.2	46 14.3 +12.1	90.3	46 13.4 +13.6	91.3	46 11.5 +15.1	92.4	46 08.5 +16.5	93.4	46 04.4 +17.9	94.4	45 59.2 +19.4	95.5	45	59.2 +19.4	95.5	45	59.2 +19.4	95.5	45	59.2 +19.4	95.5	12
13	46 21.8 +8.0	86.8	46 24.6 +9.6	87.8	46 26.4 +11.0	88.9	46 27.0 +12.5	89.9	46 26.6 +14.0	91.0	46 25.0 +15.5	92.0	46 22.3 +17.0	93.1	46 18.6 +18.4	94.1	46	18.6 +18.4	94.1	46	18.6 +18.4	94.1	46	18.6 +18.4	94.1	13
14	46 29.8 +7.0	85.3	46 34.2 +8.4	86.4	46 37.4 +10.0	87.4	46 39.5 +11.5	88.5	46 40.6 +12.9	89.6	46 40.5 +14.4	90.6	46 39.3 +15.9	91.7	46 37.0 +17.4	92.7	46	37.0 +17.4	92.7	46	37.0 +17.4	92.7	46	37.0 +17.4	92.7	14
15	46 36.8 +5.8	83.9	46 42.6 +7.4	84.9	46 47.4 +8.8	86.0	46 51.0 +10.4	87.1	46 53.5 +11.9	88.1	46 54.9 +13.4	89.2	46 55.2 +14.9	90.3	46 54.4 +16.3	91.3	46	54.4 +16.3	91.3	46	54.4 +16.3	91.3	46	54.4 +16.3	91.3	15
16	46 42.6 +4.8	82.4	46 50.0 +6.2	83.5	46 56.2 +7.8	84.5	47 01.4 +9.2	85.6	47 05.4 +10.8	86.7	47 08.3 +12.3	87.8	47 10.1 +13.8	88.8	47 10.7 +15.3	89.9	47	10.7 +15.3	89.9	47	10.7 +15.3	89.9	47	10.7 +15.3	89.9	16
17	46 47.4 +3.6	81.0	46 56.2 +5.2	82.0	47 04.0 +6.6	83.1	47 10.6 +8.2	84.2	47 16.2 +9.7	85.2	47 20.6 +11.2	86.3	47 23.9 +12.7	87.4	47 26.0 +14.3	88.5	47	26.0 +14.3	88.5	47	26.0 +14.3	88.5	47	26.0 +14.3	88.5	17
18	46 51.0 +2.5	79.5	47 01.4 +4.0	80.6	47 10.6 +5.6	81.6	47 18.8 +7.1	82.7	47 25.9 +8.6	83.8	47 31.8 +10.1	84.9	47 36.6 +11.6	86.0	47 40.3 +13.1	87.1	47	40.3 +13.1	87.1	47	40.3 +13.1	87.1	47	40.3 +13.1	87.1	18
19	46 53.5 +1.4	78.1	47 05.4 +2.9	79.1	47 16.2 +4.4	80.2	47 25.9 +5.9	81.2	47 34.5 +7.4	82.3	47 41.9 +9.0	83.4	47 48.2 +10.5	84.5	47 53.4 +12.0	85.6	47	53.4 +12.0	85.6	47	53.4 +12.0	85.6	47	53.4 +12.0	85.6	19
20	46 54.9 +0.3	76.6	47 08.3 +1.8	77.6	47 20.6 +3.3	78.7	47 31.8 +4.8	79.8	47 41.9 +6.3	80.8	47 50.9 +7.8	81.9	47 58.7 +9.4	83.0	48 05.4 +11.0	84.1	48	05.4 +11.0	84.1	48	05.4 +11.0	84.1	48	05.4 +11.0	84.1	20
21	46 55.2 -0.8	75.1	47 10.1 +0.6	76.2	47 23.9 +2.1	77.2	47 36.6 +3.7	78.3	47 48.2 +5.2	79.4	47 58.7 +6.7	80.5	48 08.1 +8.3	81.6	48 16.4 +9.7	82.7	48	16.4 +9.7	82.7	48	16.4 +9.7	82.7	48	16.4 +9.7	82.7	21
22	46 54.4 -2.0	73.7	47 10.7 -0.5	74.7	47 26.0 +1.0	75.7	47 40.3 +2.5	76.8	47 53.4 +4.0	77.9	48 05.4 +5.6	79.0	48 16.4 +7.0	80.1	48 26.1 +8.6	81.2	48	26.1 +8.6	81.2	48	26.1 +8.6	81.2	48	26.1 +8.6	81.2	22
23	46 52.4 -3.1	72.2	47 10.2 -1.6	73.2	47 27.0 -0.1	74.3	47 42.8 +1.3	75.3	47 57.4 +2.9	76.4	48 11.0 +4.4	77.5	48 23.4 +5.9	78.6	48 34.7 +7.5	79.7	48	34.7 +7.5	79.7	48	34.7 +7.5	79.7	48	34.7 +7.5	79.7	23
24	46 49.3 -4.1	70.7	47 08.6 -2.7	71.8	47 26.9 -1.3	72.8	47 44.1 +0.2	73.8	48 00.3 +1.7	74.9	48 15.4 +2.3	76.0	48 29.3 +4.8	77.1	48 42.2 +6.3	78.2	48	42.2 +6.3	78.2	48	42.2 +6.3	78.2	48	42.2 +6.3	78.2	24
25	46 45.2 -5.3	69.3	47 05.9 -3.9	70.3	47 25.6 -2.4	71.3	47 44.3 -0.9	72.4	48 02.0 +0.5	73.4	48 18.6 +2.0	74.5	48 34.1 +3.6	75.6	48 48.5 +5.1	76.7	48	48.5 +5.1	76.7	48	48.5 +5.1	76.7	48	48.5 +5.1	76.7	25
26	46 39.9 -6.4	67.8	47 02.0 -5.0	68.8	47 23.2 -3.5	69.8	47 43.4 -2.1	70.9	48 02.5 -0.6	71.9	48 20.6 -0.9	73.0	48 37.7 +2.3	74.1	48 53.6 +3.9	75.2	48	53.6 +3.9	75.2	48	53.6 +3.9	75.2	48	53.6 +3.9	75.2	26
27	46 33.5 -7.5	66.4	46 57.0 -6.0	67.4	47 19.7 -4.7	68.4	47 41.3 -3.3	69.4	48 01.9 -1.8	70.4	48 21.5 -0.3	71.5	48 40.0 +1.2	72.5	48 57.5 +2.7	73.6	48	57.5 +2.7	73.6	48	57.5 +2.7	73.6	48	57.5 +2.7	73.6	27
28	46 26.0 -8.6	64.9	46 51.0 -7.2	65.9	47 15.0 -5.8	66.9	47 38.0 -4.3	67.9	48 00.1 -2.9	68.9	48 21.2 -1.5	70.0	48 41.2 -0.0	71.0	49 00.2 +1.5	72.1	49	00.2 +1.5	72.1	49	00.2 +1.5	72.1	49	00.2 +1.5	72.1	28
29	46 17.4 -9.6	63.5	46 41.3 -8.1	64.5	47 29.7 -6.6	65.0	47 43.8 -12.2	65.7	47 57.7 -10.8	66.5	48 15.4 -9.6	69.5	48 16.3 -8.3	70.5	48 45.4 -6.9	71.5	48	45.4 -6.9	71.5	48	45.4 -6.9	71.5	48	45.4 -6.9	71.5	29
30	46 04.1 -15.8	55.1	45 38.0 -14.5	55.9	46 11.3 -13.4	56.8	46 43.8 -12.2	57.7	47 15.4 -10.8	58.6	47 46.3 -9.6	59.5	48 16.3 -8.3	60.5	48 45.4 -6.9	61.5	48	45.4 -6.9	61.5	48	45.4 -6.9	61.5	48	45.4 -6.		

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 45°, 315°**

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.									
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z										
0	43 04.8 -21.7	104.5	42 49.3 -23.0	105.4	42 32.9 -24.2	106.3	42 15.6 -25.4	107.2	41 57.5 -26.7	108.0	41 38.5 -27.9	108.9	41 18.6 -28.9	109.7	40 58.0 -30.1	110.5	0	43 04.8 -21.7	104.5	42 49.3 -23.0	105.4	42 32.9 -24.2	106.3	42 15.6 -25.4	107.2	41 57.5 -26.7	108.0	41 38.5 -27.9	108.9	41 18.6 -28.9	109.7	40 58.0 -30.1	110.5	0
1	42 43.1 -22.5	105.8	42 26.3 -23.8	106.7	42 08.7 -25.0	107.5	41 50.2 -26.2	108.4	41 30.8 -27.4	109.2	41 10.6 -28.5	110.1	40 49.7 -29.7	110.9	40 27.9 -30.8	111.7	1	42 43.1 -22.5	105.8	42 26.3 -23.8	106.7	42 08.7 -25.0	107.5	41 50.2 -26.2	108.4	41 30.8 -27.4	109.2	41 10.6 -28.5	110.1	40 49.7 -29.7	110.9	40 27.9 -30.8	111.7	1
2	42 20.6 -23.4	107.0	42 02.5 -24.5	107.9	41 43.7 -25.8	108.8	41 24.0 -27.0	109.6	41 03.4 -28.1	110.4	40 42.1 -29.2	111.2	40 20.0 -30.3	112.0	39 57.1 -31.4	112.8	2	42 20.6 -23.4	107.0	42 02.5 -24.5	107.9	41 43.7 -25.8	108.8	41 24.0 -27.0	109.6	41 03.4 -28.1	110.4	40 42.1 -29.2	111.2	40 20.0 -30.3	112.0	39 57.1 -31.4	112.8	2
3	41 57.2 -24.1	108.3	41 38.0 -25.4	109.1	41 17.9 -26.5	110.0	40 57.0 -27.6	110.8	40 35.3 -28.8	111.6	40 12.9 -29.9	112.4	39 49.7 -31.0	113.1	39 25.7 -32.0	113.9	3	41 57.2 -24.1	108.3	41 38.0 -25.4	109.1	41 17.9 -26.5	110.0	40 57.0 -27.6	110.8	40 35.3 -28.8	111.6	40 12.9 -29.9	112.4	39 49.7 -31.0	113.1	39 25.7 -32.0	113.9	3
4	41 33.1 -24.9	109.5	41 12.6 -26.0	110.3	40 51.4 -27.2	111.2	40 29.4 -28.4	112.0	40 06.5 -29.4	112.7	39 43.0 -30.6	113.5	39 18.7 -31.6	114.3	38 53.7 -32.7	115.0	4	41 33.1 -24.9	109.5	41 12.6 -26.0	110.3	40 51.4 -27.2	111.2	40 29.4 -28.4	112.0	40 06.5 -29.4	112.7	39 43.0 -30.6	113.5	39 18.7 -31.6	114.3	38 53.7 -32.7	115.0	4
5	41 08.2 -25.7	110.7	40 46.6 -26.4	111.5	40 24.2 -28.0	112.3	40 01.0 -29.1	113.1	39 37.1 -30.2	113.9	39 12.4 -31.2	114.6	38 47.1 -32.2	115.4	38 21.0 -33.2	116.1	5	41 08.2 -25.7	110.7	40 46.6 -26.4	111.5	40 24.2 -28.0	112.3	40 01.0 -29.1	113.1	39 37.1 -30.2	113.9	39 12.4 -31.2	114.6	38 47.1 -32.2	115.4	38 21.0 -33.2	116.1	5
6	40 42.5 -26.3	111.9	40 19.8 -27.6	112.7	39 56.2 -28.6	113.5	39 31.9 -29.7	114.2	39 06.9 -30.7	115.0	38 41.2 -31.7	115.7	38 14.9 -32.8	116.4	37 47.8 -33.7	117.1	6	40 42.5 -26.3	111.9	40 19.8 -27.6	112.7	39 56.2 -28.6	113.5	39 31.9 -29.7	114.2	39 06.9 -30.7	115.0	38 41.2 -31.7	115.7	38 14.9 -32.8	116.4	37 47.8 -33.7	117.1	6
7	40 16.2 -27.1	113.1	39 52.2 -28.2	113.9	39 27.6 -29.3	114.6	39 02.2 -30.3	115.4	38 36.2 -31.4	116.1	38 09.5 -32.4	116.8	37 42.1 -33.4	117.5	37 14.1 -34.3	118.2	7	40 16.2 -27.1	113.1	39 52.2 -28.2	113.9	39 27.6 -29.3	114.6	39 02.2 -30.3	115.4	38 36.2 -31.4	116.1	38 09.5 -32.4	116.8	37 42.1 -33.4	117.5	37 14.1 -34.3	118.2	7
8	39 49.1 -27.8	114.3	39 24.0 -28.8	115.0	38 58.3 -29.9	115.8	38 31.9 -31.0	116.5	38 04.8 -31.9	117.2	37 37.1 -33.0	117.9	37 08.7 -33.9	118.5	36 39.8 -34.9	119.2	8	39 49.1 -27.8	114.3	39 24.0 -28.8	115.0	38 58.3 -29.9	115.8	38 31.9 -31.0	116.5	38 04.8 -31.9	117.2	37 37.1 -33.0	117.9	37 08.7 -33.9	118.5	36 39.8 -34.9	119.2	8
9	39 21.3 -28.5	115.4	38 55.2 -29.5	116.1	38 28.4 -30.6	116.9	38 00.9 -31.5	117.6	37 32.9 -32.6	118.3	37 04.1 -33.4	118.9	36 34.8 -34.4	119.6	36 04.9 -35.3	120.2	9	39 21.3 -28.5	115.4	38 55.2 -29.5	116.1	38 28.4 -30.6	116.9	38 00.9 -31.5	117.6	37 32.9 -32.6	118.3	37 04.1 -33.4	118.9	36 34.8 -34.4	119.6	36 04.9 -35.3	120.2	9
10	38 52.8 -29.1	116.6	38 25.7 -30.2	117.3	37 57.8 -31.1	118.0	37 29.4 -32.1	118.6	37 00.3 -33.1	119.3	36 30.7 -34.1	120.0	36 00.4 -34.9	120.6	35 29.6 -35.8	121.2	10	38 52.8 -29.1	116.6	38 25.7 -30.2	117.3	37 57.8 -31.1	118.0	37 29.4 -32.1	118.6	37 00.3 -33.1	119.3	36 30.7 -34.1	120.0	36 00.4 -34.9	120.6	35 29.6 -35.8	121.2	10
11	38 23.7 -29.7	117.7	37 55.5 -30.7	118.4	37 26.7 -31.7	119.0	36 57.3 -32.7	119.7	36 27.2 -33.6	120.3	35 56.6 -34.5	121.0	35 25.5 -35.4	121.6	34 53.8 -36.3	122.2	11	38 23.7 -29.7	117.7	37 55.5 -30.7	118.4	37 26.7 -31.7	119.0	36 57.3 -32.7	119.7	36 27.2 -33.6	120.3	35 56.6 -34.5	121.0	35 25.5 -35.4	121.6	34 53.8 -36.3	122.2	11
12	37 54.0 -30.4	118.8	37 24.8 -31.4	119.4	36 55.0 -32.3	120.1	36 24.6 -33.2	120.7	35 53.6 -34.1	121.4	35 22.1 -35.0	122.0	34 50.1 -35.9	122.6	34 17.5 -36.7	123.2	12	37 54.0 -30.4	118.8	37 24.8 -31.4	119.4	36 55.0 -32.3	120.1	36 24.6 -33.2	120.7	35 53.6 -34.1	121.4	35 22.1 -35.0	122.0	34 50.1 -35.9	122.6	34 17.5 -36.7	123.2	12
13	37 23.6 -30.9	119.9	36 53.4 -31.9	120.5	36 22.7 -32.9	121.2	35 51.4 -33.8	121.8	35 19.5 -34.7	122.4	34 47.1 -35.5	123.0	34 14.2 -36.4	123.6	33 40.8 -37.2	124.1	13	37 23.6 -30.9	119.9	36 53.4 -31.9	120.5	36 22.7 -32.9	121.2	35 51.4 -33.8	121.8	35 19.5 -34.7	122.4	34 47.1 -35.5	123.0	34 14.2 -36.4	123.6	33 40.8 -37.2	124.1	13
14	36 52.7 -31.5	120.9	36 21.5 -32.4	121.6	35 49.8 -33.3	122.2	35 17.6 -34.2	122.8	34 44.8 -35.1	123.4	34 11.6 -36.0	124.0	33 37.8 -36.8	124.5	33 03.6 -37.6	125.1	14	36 52.7 -31.5	120.9	36 21.5 -32.4	121.6	35 49.8 -33.3	122.2	35 17.6 -34.2	122.8	34 44.8 -35.1	123.4	34 11.6 -36.0	124.0	33 37.8 -36.8	124.5	33 03.6 -37.6	125.1	14
15	36 21.2 -32.1	122.0	35 49.1 -33.0	122.6	35 16.5 -33.9	123.2	34 43.4 -34.8	123.8	34 09.7 -35.5	124.4	33 35.6 -36.4	124.9	33 01.0 -37.2	125.5	32 26.0 -38.0	126.0	15	36 21.2 -32.1	122.0	35 49.1 -33.0	122.6	35 16.5 -33.9	123.2	34 43.4 -34.8	123.8	34 09.7 -35.5	124.4	33 35.6 -36.4	124.9	33 01.0 -37.2	125.5	32 26.0 -38.0	126.0	15
16	35 49.1 -32.6	123.0	35 16.1 -33.5	123.6	34 42.6 -34.3	124.2	34 08.6 -35.2	124.8	33 34.2 -36.1	125.3	32 59.2 -35.8	125.9	32 23.8 -37.6	126.4	31 48.0 -38.3	126.9	16	35 49.1 -32.6	123.0	35 16.1 -33.5	123.6	34 42.6 -34.3	124.2	34 08.6 -35.2	124.8	33 34.2 -36.1	125.3	32 59.2 -35.8	125.9	32 23.8 -37.6	126.4	31 48.0 -38.3	126.9	16
17	35 16.5 -33.1	124.1	34 42.6 -34.0	124.7	34 08.3 -34.9	125.2	33 33.4 -35.6	125.8	32 58.1 -36.4	126.3	32 22.4 -37.2	126.8	31 46.2 -38.0	127.3	31 09.7 -38.8	127.8	17	35 16.5 -33.1	124.1	34 42.6 -34.0	124.7	34 08.3 -34.9	125.2	33 33.4 -35.6	125.8	32 58.1 -36.4	126.3	32 22.4 -37.2	126.8	31 46.2 -38.0	127.3	31 09.7 -38.8	127.8	17
18	34 43.4 -33.7	125.1	34 08.6 -34.4	125.7	33 33.4 -35.3	126.2	32 57.8 -36.1	126.7	32 21.7 -36.9	127.2	31 45.2 -37.7	127.7	30 08.2 -38.3	128.2	30 30.9 -39.1	129.0	18	34 43.4 -33.7	125.1	34 08.6 -34.4	125.7	33 33.4 -35.3	126.2	32 57.8 -36.1	126.7	32 21.7 -36.9	127.2	31 45.2 -37.7	127.7	30 08.2 -38.3	128.2	30 30.9 -39.1	129.0	18
19	34 09.7 -34.1	126.1	33 21.7 -34.1	126.8	32 01.2 -38.7	127.3	32 21.7 -35.7	127.2	31 21.7 -36.5	127.7	30 47.4 -38.1	128.2	30 29.8 -39.7	129.1	29 51.8 -40.4	129.6	19	34 09.7 -34.1	126.1	33 21.7 -34.1	126.8	32 01.2 -38.7	127.3	32 21.7 -35.7	127.2	31 21.7 -36.5	127.7	30 47.4 -38.1	128.2	30 29.8 -39.7	129.1	29 51.8 -40.4	129.6	19
20	33 35.6 -34.6	127.1	32 59.2 -35.4	127.6	32 22.4 -36.2	128.1	31 45.2 -37.0	128.6	31 07.5 -37.6	129.1	30 29.5 -38.4	129.5	29 51.1 -39.1	130.0	29 12.0 -39.4	130.4	20	33 35.6 -34.6	127.1	32 59.2 -35.4	127.6	32 22.4 -36.2	128.1	31 45.2 -37.0	128.6	31 07.5 -37.6	129.1	30 29.5 -38.4	129.5	29 51.1 -39.1	130.0	29 12.0 -39.4	130.4	20
21	33 01.0 -35.0	128.1	32 23.8 -35.8	128.6	31 46.2 -36.5	129.1	31 08.1 -37.3	129.5	30 29.9 -38.1	130.0	29 51.1 -38.7	1																						