

23°, 337° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	40	36.5	+55.9	149.0	39	45.0	+56.1	149.5	38	53.2	+56.3	149.9	38	01.2	+56.6	150.3	37	09.0	+56.8	150.6	36	16.6	+57.0	151.0	35	24.0	+57.2	151.4	34	31.3	+57.4	151.7	0
1	41	32.4	+55.7	148.5	40	41.1	+55.9	149.0	39	49.5	+56.2	149.4	38	57.8	+56.4	149.8	38	05.8	+56.7	150.2	37	13.6	+56.9	150.6	36	21.2	+57.1	151.0	35	28.7	+57.2	151.3	1
2	42	28.1	+55.5	148.0	41	37.0	+55.9	148.5	40	45.7	+56.2	149.0	39	54.2	+56.4	149.4	39	02.5	+56.6	149.8	38	10.5	+56.8	150.2	37	18.3	+57.0	150.6	36	25.9	+57.3	151.0	2
3	43	23.6	+55.5	147.5	42	32.9	+55.7	148.0	41	41.9	+55.9	148.5	40	50.6	+56.2	148.9	39	59.1	+56.4	149.4	39	07.3	+56.7	149.8	38	15.3	+57.0	150.2	37	23.2	+57.1	150.6	3
4	44	19.1	+55.2	147.0	43	28.6	+55.6	147.5	42	37.8	+55.9	148.0	41	46.8	+56.2	148.5	40	55.5	+56.4	148.9	40	04.0	+56.7	149.4	39	12.3	+56.8	149.8	38	20.3	+57.1	150.2	4
5	45	14.3	+55.1	146.4	44	24.2	+55.4	147.0	43	33.7	+55.7	147.5	42	43.0	+56.0	148.0	41	51.9	+56.3	148.5	41	00.7	+56.5	148.9	40	09.1	+56.8	149.4	39	17.4	+57.0	149.8	5
6	46	09.4	+55.0	145.9	45	19.6	+55.3	146.4	44	29.4	+55.6	147.0	43	39.0	+55.8	147.5	42	48.2	+56.2	148.0	41	57.2	+56.4	148.5	41	05.9	+56.7	149.0	40	14.4	+56.9	149.4	6
7	47	04.4	+54.7	145.3	46	14.9	+55.1	145.9	45	25.0	+55.4	146.5	44	34.8	+55.8	147.0	43	44.4	+56.0	147.3	42	53.6	+56.3	148.0	41	02.6	+56.5	148.5	41	11.3	+56.8	149.0	7
8	47	59.1	+54.6	144.7	47	10.0	+54.9	145.3	46	20.4	+55.3	145.9	45	30.6	+55.6	146.5	44	40.4	+55.9	147.0	43	49.9	+56.2	147.6	42	08.1	+56.7	148.5	41	04.8	+56.6	148.1	8
9	48	53.7	+54.3	144.1	48	04.9	+54.7	144.7	47	15.7	+55.1	145.3	46	26.2	+55.4	145.9	45	36.3	+55.8	146.5	44	46.1	+56.0	147.1	43	55.6	+56.3	147.6	42	04.8	+56.6	148.1	9
10	49	48.0	+54.1	143.4	48	59.6	+54.5	144.1	48	10.8	+54.9	144.8	47	21.6	+55.3	145.4	46	32.1	+55.6	146.0	45	42.1	+56.0	146.6	44	51.9	+56.2	147.1	43	01.4	+56.5	147.6	10
11	50	42.1	+53.9	142.7	49	54.1	+54.3	143.5	49	05.7	+54.7	144.1	48	16.9	+55.1	144.8	47	27.7	+55.4	145.4	46	38.1	+55.7	146.0	45	48.1	+56.1	146.6	44	57.9	+56.3	147.2	11
12	51	36.0	+53.6	142.0	50	48.4	+54.1	142.8	50	00.4	+54.0	143.5	49	12.0	+54.8	144.2	48	23.1	+55.2	144.9	47	33.8	+55.4	145.5	46	44.2	+55.9	146.1	45	54.2	+56.3	146.7	12
13	52	29.6	+53.3	141.3	51	42.5	+53.8	142.1	50	54.9	+54.3	142.9	50	06.8	+54.7	143.6	49	18.3	+55.1	144.3	48	29.4	+55.5	144.9	47	40.1	+55.8	145.6	46	50.5	+56.1	146.2	13
14	53	22.9	+53.0	140.5	52	36.3	+53.5	141.4	51	49.2	+54.0	142.2	50	01.5	+54.5	142.9	50	13.4	+54.9	143.7	49	24.9	+55.2	144.4	48	35.9	+55.6	145.0	47	46.6	+55.9	145.7	14
15	54	15.9	+52.7	139.7	53	29.8	+53.3	140.6	52	43.2	+53.7	141.5	51	56.0	+54.2	142.3	50	08.3	+54.6	143.0	50	20.1	+55.1	143.8	49	31.5	+55.5	144.4	48	42.5	+55.8	145.1	15
16	55	08.6	+52.4	138.9	54	23.1	+52.9	139.8	53	36.9	+53.5	140.7	52	50.2	+54.0	141.6	51	15.2	+54.8	142.4	50	27.0	+55.2	143.9	49	38.3	+55.6	144.6	48	47.7	+56.1	145.3	16
17	56	01.0	+51.9	138.0	55	16.0	+52.6	139.0	54	30.4	+53.1	139.9	53	44.2	+53.6	140.8	52	57.4	+54.1	141.7	51	20.0	+54.7	142.5	50	33.9	+55.5	144.0	49	41.7	+56.1	144.7	17
18	56	52.9	+51.6	137.1	56	08.6	+52.2	138.2	55	23.5	+52.8	139.1	54	37.8	+53.4	140.1	53	51.5	+53.9	140.9	53	04.7	+54.3	141.8	52	17.3	+54.8	142.6	51	29.4	+55.2	143.4	18
19	57	44.5	+51.1	136.2	57	00.8	+51.8	137.3	56	16.3	+52.5	138.3	55	31.2	+53.1	139.3	54	45.4	+53.6	140.2	53	59.0	+54.2	141.1	52	12.1	+54.6	141.9	51	24.6	+55.0	142.7	19
20	58	35.6	+50.6	135.2	57	52.6	+51.4	136.3	57	08.8	+52.1	137.4	56	24.3	+52.7	138.4	55	39.0	+53.3	139.4	54	53.2	+53.8	140.3	54	06.7	+54.3	141.2	53	19.6	+54.8	142.1	20
21	59	26.2	+50.1	134.2	58	44.0	+50.9	135.3	58	00.9	+51.6	136.5	57	17.0	+52.3	137.6	56	32.3	+53.0	138.6	55	47.0	+53.5	139.6	55	01.0	+54.1	140.5	54	14.4	+54.6	141.4	21
22	60	16.3	+49.5	133.1	59	34.9	+50.3	134.3	58	52.5	+51.2	135.5	58	09.3	+51.9	136.6	57	25.3	+52.5	137.7	56	40.5	+53.2	138.7	55	51.1	+53.7	139.7	54	22.2	+55.1	143.2	22
23	61	05.8	+48.9	131.9	60	25.2	+49.9	132.2	59	43.7	+50.6	134.5	59	01.2	+51.4	135.7	58	17.8	+52.2	136.8	57	33.7	+52.8	137.9	56	48.8	+53.5	138.9	55	03.3	+54.0	139.9	23
24	61	54.7	+48.3	130.7	61	15.1	+48.2	132.1	60	34.3	+50.2	133.4	59	10.0	+51.7	135.9	58	26.5	+52.5	137.0	57	42.3	+53.1	138.1	56	57.3	+53.6	139.1	24				
25	62	43.0	+47.5	129.4	62	04.3	+48.5	130.9	61	24.5	+49.5	132.3	60	43.6	+50.4	133.6	59	01.7	+51.3	134.9	59	19.0	+52.0	136.1	58	35.4	+52.7	137.2	57	50.9	+53.4	138.3	25
26	63	30.5	+46.7	128.1	62	52.8	+47.9	129.6	62	14.0	+48.9	131.1	61	34.0	+49.9	132.5	60	53.0	+50.7	133.8	60	11.0	+51.5	135.1	59	28.1	+52.3	136.3	58	44.3	+53.0	137.4	26
27	64	17.2	+45.8	126.6	63	40.7	+47.0	128.3	63	02.9	+48.1	129.8	62	23.9	+49.2	131.3	61	43.7	+50.2	132.7	61	02.5	+51.1	134.0	60	20.4	+51.8	135.3	59	37.3	+52.5	136.5	27
28	65	03.0	+44.8	125.1	64	27.7	+46.2	126.8	63	51.0	+47.4	128.5	63	13.1	+48.5	130.0	62	33.9	+49.5	131.5	61	53.6	+50.4	132.9	60	29.8	+52.2	135.5	59	43.0	+53.7	136.7	28
29	65	47.8	+43.8	123.5	71	44.2	+28.8	104.3	71	28.0	+31.7	102.7	71	08.8	+34.2	110.0	70	47.0	+36.7	112.7	70	22.6	+38.9	115.3	69	55.7	+41.1	117.8	68	26.7	+43.0	120.1	29
30	66	23.4	+23.0	98.4	71	13.0	+26.2	101.5	71	59.5	+29.2	104.5	71	43.0	+32.1	107.4	71	23.7	+34.6	110.3	71	01.5	+37.2	113.0	70	36.8	+39.5	115.6	70	09.7	+41.6	118.1	30
41	72	46.4	+20.1	95.3	72	39.2	+23.4	98.5	72	28.7	+26.6	101.6	72	15.1	+29.6	104.7	71	58.3	+32.5	107.7	71	38.7	+35.2	110.5	71	13.6	+37.6	113.3	70	51.3	+39.9	116.0	41
42	73	06.5	+17.0	92.1	73	02.6	+20.4	95.4	72	55.3	+23.8	98.6	72	44.7	+27.0	101.8	72	30.8	+30.1	104.9	72	13.9	+32.9	107									

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 23°, 337°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	40	36.5	-55.9	149.0	39	45.0	-56.2	149.5	38	53.2	-56.4	149.9	38	01.2	-56.6	150.3	37	09.0	-56.8	150.6	36	16.6	-57.0	151.0	35	24.0	-57.2	151.4	34	31.3	-57.4	151.7	0
1	39	40.6	-56.1	149.5	38	48.8	-56.3	149.9	37	56.8	-56.5	150.3	37	04.6	-56.8	150.7	36	12.2	-57.0	151.0	35	19.6	-57.2	151.4	34	26.8	-57.3	151.7	33	33.9	-57.5	152.0	1
2	38	44.5	-56.1	150.0	37	52.5	-56.4	150.3	37	00.3	-56.6	150.7	36	07.8	-56.8	151.1	35	15.2	-57.0	151.4	34	22.4	-57.1	151.8	33	29.5	-57.4	152.1	32	36.4	-57.5	152.4	2
3	37	48.4	-56.3	150.4	36	56.1	-56.5	150.8	36	03.7	-56.7	151.1	35	11.0	-56.9	151.5	34	18.2	-57.0	151.8	33	25.3	-57.3	152.1	32	32.1	-57.4	152.4	31	38.9	-57.6	152.7	3
4	36	52.1	-56.3	150.8	35	59.6	-56.5	151.1	35	07.0	-56.6	151.5	34	14.1	-56.9	151.9	33	21.2	-57.2	152.2	32	28.0	-57.3	152.5	31	34.7	-57.4	152.8	30	41.3	-57.6	153.0	4
5	35	55.8	-56.5	151.3	35	03.1	-56.7	151.6	34	10.2	-56.8	151.9	33	17.2	-57.0	152.2	32	24.0	-57.2	152.5	31	30.7	-57.4	152.8	30	37.3	-57.6	153.1	29	43.7	-57.7	153.4	5
6	34	59.3	-56.5	151.7	34	06.4	-56.7	152.0	33	13.4	-56.9	152.3	32	20.2	-57.1	152.6	31	26.8	-57.2	152.9	30	33.3	-57.4	153.2	29	39.7	-57.5	153.4	28	46.0	-57.7	153.7	6
7	34	02.8	-56.6	152.1	33	09.7	-56.8	152.4	32	16.5	-57.0	152.7	31	23.1	-57.2	153.0	30	29.6	-57.4	153.3	29	35.9	-57.4	153.5	28	42.2	-57.7	153.8	27	48.3	-57.8	154.0	7
8	33	06.2	-56.7	152.5	32	12.9	-56.9	152.8	31	19.5	-57.1	153.1	30	25.9	-57.2	153.3	29	32.2	-57.3	153.6	28	38.5	-57.4	153.8	27	44.5	-57.6	154.1	26	50.5	-57.8	154.3	8
9	32	09.5	-56.7	152.9	31	16.0	-56.9	153.2	30	22.4	-57.0	153.4	29	28.7	-57.2	153.7	28	34.9	-57.4	153.9	27	40.9	-57.5	154.2	26	46.9	-57.7	154.4	25	52.7	-57.8	154.6	9
10	31	12.8	-56.8	153.3	30	19.1	-57.0	153.5	29	25.4	-57.2	153.8	28	31.5	-57.3	154.0	27	37.5	-57.5	154.3	26	43.4	-57.6	154.5	25	49.2	-57.8	154.7	24	54.9	-57.9	154.9	10
11	30	16.0	-56.9	153.6	29	22.1	-57.0	153.9	28	28.2	-57.2	154.1	27	34.2	-57.4	154.4	26	40.0	-57.5	154.6	25	45.8	-57.7	154.8	24	51.4	-57.7	155.0	23	57.0	-57.9	155.2	11
12	29	19.1	-57.0	154.0	28	25.1	-57.1	154.2	27	31.0	-57.2	154.5	26	38.4	-57.4	154.7	25	42.5	-57.5	154.9	24	48.1	-57.6	155.1	23	53.7	-57.8	155.3	22	59.1	-57.9	155.5	12
13	28	22.1	-57.0	154.4	27	28.0	-57.2	154.6	26	33.8	-57.3	154.8	25	39.4	-57.4	155.0	24	45.0	-57.6	155.2	23	50.5	-57.7	155.4	22	55.9	-57.9	155.6	22	01.2	-58.0	155.8	13
14	27	25.1	-57.0	154.7	26	30.8	-57.1	154.9	25	36.5	-57.4	155.1	24	42.0	-57.5	155.3	23	47.4	-57.6	155.5	22	52.8	-57.8	155.7	21	58.0	-57.8	155.9	21	03.2	-57.9	156.0	14
15	26	28.1	-57.1	155.1	25	33.7	-57.3	155.3	24	39.1	-57.4	155.5	23	44.5	-57.5	155.6	22	49.8	-57.7	155.8	21	55.0	-57.8	156.0	20	05.3	-58.1	156.3	15				
16	25	31.0	-57.1	155.4	24	36.4	-57.3	155.6	23	41.7	-57.4	155.8	22	47.0	-57.6	156.0	21	52.1	-57.8	156.1	20	02.2	-57.9	156.3	19	02.3	-58.0	156.6	16				
17	24	33.9	-57.2	155.7	23	39.1	-57.3	155.9	22	44.3	-57.5	156.1	21	49.4	-57.6	156.3	20	54.5	-57.8	156.4	19	59.4	-57.8	156.6	18	09.2	-58.0	156.8	17				
18	23	36.7	-57.2	156.1	22	41.8	-57.4	156.2	21	46.8	-57.4	156.4	20	51.8	-57.6	156.6	19	56.7	-57.7	156.7	18	06.4	-58.0	157.0	17	11.2	-58.1	157.1	18				
19	22	39.5	-57.3	156.4	21	44.4	-57.4	156.6	20	49.4	-57.6	156.7	19	54.2	-57.6	156.9	18	59.0	-57.8	157.0	18	03.7	-57.8	157.1	17	08.4	-58.0	157.3	16	13.1	-58.1	157.4	19
20	21	42.2	-57.3	156.7	20	47.0	-57.4	156.9	19	51.8	-57.5	157.0	18	56.6	-57.7	157.2	17	60.5	-57.9	157.4	17	05.9	-57.9	157.6	16	10.4	-58.0	157.8	15	15.0	-58.1	157.9	20
21	20	44.9	-57.4	157.0	19	49.6	-57.5	157.2	18	54.3	-57.6	157.3	17	58.9	-57.7	157.4	17	63.4	-57.8	157.6	16	08.0	-58.0	157.7	15	12.4	-58.0	157.8	14	16.9	-58.2	157.9	21
22	19	47.5	-57.3	157.4	18	52.1	-57.5	157.5	17	56.7	-57.6	157.6	17	60.1	-57.7	157.7	16	65.6	-57.8	157.8	15	10.0	-57.9	158.0	14	14.4	-58.0	158.1	13	18.7	-58.1	158.2	22
23	18	50.2	-57.4	157.7	17	54.6	-57.5	157.8	16	59.1	-57.7	157.9	16	63.5	-57.8	158.0	15	67.8	-57.9	158.1	14	12.1	-58.0	158.2	13	16.4	-58.1	158.3	12	20.6	-58.2	158.4	23
24	17	52.8	-57.5	158.0	16	57.1	-57.7	158.1	16	60.4	-57.7	158.2	15	65.7	-57.8	158.3	14	70.9	-57.8	158.4	13	14.1	-57.9	158.5	12	18.3	-58.1	158.6	11	22.4	-58.1	158.7	24
25	16	55.3	-57.4	158.3	15	59.6	-57.6	158.4	15	63.8	-57.7	158.5	14	70.9	-57.8	158.6	13	12.1	-57.9	158.7	12	16.2	-58.0	158.8	11	20.2	-58.1	158.9	10	24.3	-58.2	158.9	25
26	15	57.9	-57.5	158.6	15	62.0	-57.6	158.7	14	66.1	-57.7	158.8	13	10.2	-57.9	158.9	12	14.2	-57.9	158.9	11	18.2	-58.0	159.0	10	22.1	-58.1	159.1	9	26.1	-58.2	159.1	26
27	15	00.4	-57.5	158.9	14	04.4	-57.6	159.0	13	08.4	-57.7	159.1	12	12.3	-57.8	159.1	11	16.3	-58.0	159.2	10	20.2	-58.1	159.3	9	24.0	-58.1	159.3	27				
28	14	02.9	-57.5	159.2	13	06.8	-57.6	159.3	12	10.7	-57.8	159.3	11	14.5	-57.9	159.4	10	18.3	-57.9	159.5	9	22.1	-58.0	159.5	8	25.9	-58.1	159.6	28				
29	13	05.4	-57.6	159.5	12	09.2	-57.7	159.5	11	12.9	-57.7	159.6	10	16.7	-57.9	159.7	9	20.4	-57.9	159.7	8	24.1	-58.0	159.8	7	27.8	-58.1	159.8	6	31.5	-58.2	159.9	29
30	12	07.8	-57.5	159.8	11	11.5	-57.6	160.1	10	15.4	-57.7	160.2	9	18.8	-57.8	160.9	8	22.5	-58.0	160.0	7	26.1	-58.1	160.1	6	30.9	-58.2	160.1	30				
31	11	19.9	-57.7	160.1	10	13.9	-57.7	160.2	9	17.4	-57.7	160.2	8	21.0	-57.9	160.2	7	24.5	-58.0	160.3	6	28.0	-58.0	160.3	5	31.5	-58.1	160.3	31				
32	10	22.7	-57.6	160.3	9	16.2	-57.7	160.4	8	19.7	-57.8	160.4	7	23.1	-57.9	160.5	6	26.5	-57.9	160.6	5	30.4	-58.0	160.6	4	33.4	-58.2	160.6	32				
33	9	25.4	-57.6	160.6	8	18.5	-57.7	160.7	7	21.8	-57.8	160.7	6	25.2	-57.9	160.7	5	28.6	-58.0	160.8	4	31.9	-58.1	160.8	3	35.6	-58.2	160.8	33				

24°, 336° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	40 14.3 +55.5 147.8	39 23.4 +55.8 148.2	38 32.3 +56.0 148.7	37 40.9 +56.3 149.1	36 49.4 +56.5 149.5	35 57.6 +56.7 149.8	35 05.6 +57.0 150.2	34 13.5 +57.1 150.5	0	41 09.8 +55.4 147.3	40 19.2 +55.7 147.8	39 28.3 +56.0 148.2	38 37.2 +56.2 148.6	37 45.9 +56.4 149.0	36 54.3 +56.7 149.4	36 02.6 +56.8 149.8	35 10.6 +57.1 150.2	1	42 05.2 +55.3 146.8	41 14.9 +55.5 147.3	40 24.3 +55.8 147.7	39 33.4 +56.1 148.2	38 42.3 +56.3 148.6	37 51.0 +56.6 149.0	36 59.4 +56.8 149.4	36 07.7 +57.0 149.8	2	43 00.5 +55.0 146.3	42 10.4 +55.4 146.8	41 20.1 +55.7 147.3	40 29.5 +56.0 147.7	39 38.6 +56.3 148.2	38 47.6 +56.4 148.6	37 56.2 +56.7 149.0	37 04.7 +56.9 149.4	3	44 55.5 +55.0 145.7	43 05.8 +55.3 146.2	42 15.8 +55.5 146.8	41 25.1 +55.8 147.2	40 34.9 +56.1 147.7	39 44.0 +56.4 148.2	38 52.9 +56.7 148.6	38 01.6 +56.9 149.0	4
5	44 50.5 +54.7 145.1	44 01.1 +55.1 145.7	43 11.3 +55.5 146.2	42 21.3 +55.7 146.7	41 31.0 +56.0 147.2	40 40.4 +56.3 147.7	39 49.6 +56.5 148.2	38 58.5 +56.7 148.6	5	45 45.2 +54.6 144.6	44 56.2 +54.9 145.2	44 06.8 +55.2 145.7	43 17.0 +55.6 146.2	42 27.0 +55.9 146.8	41 36.7 +56.1 147.2	40 46.1 +56.4 147.7	39 55.2 +56.7 148.2	6	46 39.8 +54.4 144.0	45 51.1 +54.7 144.6	45 02.0 +55.1 145.2	44 12.6 +55.4 145.7	43 22.9 +55.7 146.3	42 32.8 +56.1 146.8	41 42.5 +56.3 147.3	40 51.9 +56.6 147.7	7	47 34.2 +54.1 143.3	46 45.8 +54.6 144.0	45 57.1 +55.0 144.6	45 08.0 +55.3 145.2	44 18.6 +55.6 145.7	43 28.9 +56.1 146.3	42 38.8 +56.2 146.8	41 48.5 +56.4 147.3	8	48 28.3 +54.0 142.7	47 40.4 +54.4 143.4	46 52.1 +54.7 144.0	46 03.3 +55.1 144.6	45 14.2 +55.5 145.2	44 24.8 +55.7 145.8	43 35.0 +56.1 146.3	42 44.9 +56.4 146.8	9
10	49 22.3 +53.7 142.0	48 34.8 +54.1 142.7	47 46.8 +54.5 143.4	46 58.4 +54.9 144.1	46 09.7 +55.2 144.7	45 20.5 +55.6 145.3	44 31.1 +55.9 145.8	43 41.3 +56.2 146.4	10	50 16.0 +53.5 141.3	49 28.9 +53.9 142.1	48 41.3 +54.4 142.8	47 53.3 +54.8 143.5	47 04.9 +55.2 144.1	46 16.1 +55.5 144.7	45 27.0 +55.8 145.3	44 37.5 +56.1 145.9	11	51 09.5 +53.1 140.6	50 22.8 +53.7 141.4	49 35.7 +54.1 142.1	48 48.1 +54.5 142.8	48 00.1 +54.9 143.5	47 11.6 +55.3 144.2	46 22.8 +55.6 144.8	45 33.6 +55.9 145.4	12	52 02.6 +52.9 139.9	51 16.5 +53.4 140.7	50 29.8 +53.9 141.5	49 42.6 +54.3 142.2	48 55.0 +54.7 142.9	48 06.9 +55.1 143.6	47 18.4 +55.5 144.2	46 29.5 +55.9 144.9	13	52 55.5 +52.6 139.1	52 09.9 +53.1 140.0	51 23.7 +53.6 140.8	50 36.9 +54.1 141.5	49 49.7 +54.5 142.3	49 02.0 +54.9 143.0	48 13.9 +55.3 143.7	47 25.4 +55.6 144.3	14
15	53 48.1 +52.2 138.3	53 03.0 +52.8 139.2	52 17.3 +53.3 140.0	51 31.0 +53.8 140.9	50 44.2 +54.3 141.6	49 56.9 +54.8 142.4	48 09.2 +55.1 143.1	47 41.3 +56.2 144.3	15	54 40.3 +51.9 137.5	53 55.8 +52.5 138.4	53 10.6 +53.0 139.3	52 24.8 +53.6 140.1	51 38.5 +54.1 140.9	50 51.7 +54.5 141.7	50 04.3 +54.9 142.5	49 16.5 +55.3 143.2	21	55 32.2 +51.5 136.6	54 48.3 +52.1 137.6	54 03.6 +52.8 138.5	53 18.4 +53.3 139.4	52 32.6 +53.7 140.2	51 46.2 +54.2 141.1	50 59.2 +54.7 141.8	50 11.8 +55.1 142.6	22	56 23.7 +51.0 135.7	55 40.4 +51.7 136.7	55 56.4 +52.3 137.7	55 11.7 +52.9 138.6	53 26.3 +53.5 139.5	52 40.4 +54.0 140.4	51 53.9 +54.5 141.2	51 06.9 +55.0 142.0	23	57 14.7 +50.6 134.7	56 32.1 +51.3 135.8	55 48.7 +52.0 136.8	55 04.6 +52.6 137.8	54 19.8 +53.2 138.7	53 34.4 +53.8 139.6	52 48.4 +54.3 140.5	52 01.9 +54.7 141.3	24
20	58 05.3 +50.1 133.7	57 23.4 +50.9 134.8	56 40.7 +51.6 135.9	55 57.2 +52.3 136.9	55 13.0 +52.9 137.9	54 28.2 +53.4 138.9	53 42.7 +53.9 139.8	52 56.6 +54.4 140.6	20	58 41.8 +52.2 138.3	53 03.0 +52.8 139.2	52 17.3 +53.3 140.0	51 31.0 +53.8 140.9	50 44.2 +54.3 141.6	49 56.9 +54.8 142.4	49 09.2 +55.1 143.1	48 21.0 +55.5 143.8	25	59 44.9 +49.0 131.5	59 04.6 +49.9 132.8	58 23.4 +50.7 134.0	57 41.3 +51.4 135.1	56 58.4 +52.1 136.2	56 14.7 +52.8 137.3	55 30.3 +53.4 138.2	54 45.2 +53.9 139.2	26	60 33.9 +48.3 130.4	59 54.5 +49.3 131.7	59 14.1 +50.1 133.0	58 32.7 +51.0 134.2	57 50.5 +51.7 135.3	57 23.7 +53.0 137.4	55 39.1 +53.6 138.4	27	61 22.2 +47.6 129.2	60 43.8 +48.6 130.5	60 04.2 +49.3 131.9	59 23.7 +50.4 133.1	58 42.2 +51.2 134.3	57 59.9 +51.4 135.5	57 16.7 +52.6 136.6	56 32.7 +53.3 137.6	28	
25	62 09.8 +46.9 127.9	61 32.4 +48.0 129.3	60 53.8 +49.0 130.7	60 14.1 +49.9 132.1	59 33.5 +50.7 133.3	58 51.8 +51.6 134.3	58 09.3 +52.3 135.7	57 26.0 +52.9 136.8	25	62 56.7 +46.1 126.5	62 20.4 +47.2 128.0	61 42.8 +48.3 129.5	61 04.0 +49.3 130.9	60 24.2 +50.2 132.3	59 43.4 +51.0 133.5	59 01.6 +51.8 134.7	58 18.9 +52.6 135.9	29	63 18.7 +45.1 125.1	63 07.6 +46.4 126.7	62 31.1 +47.6 128.2	61 53.3 +48.7 129.7	61 14.4 +49.7 131.1	60 34.4 +50.6 132.5	59 53.4 +51.4 133.7	59 11.5 +52.1 135.0	30	64 27.9 +44.2 123.6	63 54.0 +45.6 125.3	63 18.7 +46.7 126.9	62 42.0 +47.9 128.5	62 0.1 +48.9 129.9	61 25.0 +49.9 131.4	60 44.8 +50.8 132.7	60 03.6 +51.7 134.0	31	65 12.1 +43.2 122.0	64 39.6 +44.5 123.8	64 05.4 +46.0 125.5	63 29.9 +47.2 127.1	62 53.0 +48.3 128.7	62 14.9 +49.3 130.2	61 35.6 +50.3 131.6	60 55.3 +51.1 132.9	32
30	65 55.3 +41.9 120.3	65 24.1 +43.5 122.2	64 51.4 +44.9 124.0	64 17.1 +46.2 125.7	63 41.3 +47.5 127.4	63 04.2 +48.7 128.9	62 25.9 +49.7 130.4	61 46.4 +50.7 131.9	30	66 37.2 +40.7 118.5	66 07.6 +42.4 120.5	65 36.3 +43.9 122.4	65 03.3 +45.4 124.2	64 28.8 +46.7 126.0	63 52.9 +46.0 127.6	63 15.6 +49.0 129.2	62 37.1 +50.0 130.7	31	67 17.9 +39.3 116.7	66 50.0 +41.1 118.7	66 20.2 +42.8 120.7	65 48.7 +44.3 122.7	65 15.5 +45.7 124.5	64 40.8 +47.0 126.2	64 04.6 +48.2 127.9	63 27.1 +49.3 129.5	32	68 57.2 +37.8 114.7	67 31.1 +39.7 116.9	67 03.0 +41.5 119.0	66 33.0 +43.2 121.0	66 01.2 +44.8 122.9	65 27.8 +46.2 124.8	64 52.8 +47.5 126.5	64 16.4 +48.7 128.2	33	69 35.0 +36.1 112.6	68 10.8 +38.2 114.9	67 44.5 +40.2 117.1	67 16.2 +42.0 119.2	66 46.0 +43.6 121.3	66 14.0 +45.1 123.2	65 40.3 +46.5 125.1	65 05.1 +47.8 126.8	34
35	69 11.1 +34.3 110.3	68 49.0 +36.6 112.8	68 24.7 +38.6 115.1	67 58.2 +40.5 117.3	67 29.6 +42.4 119.5	66 59.1 +44.1 121.5	66 26.8 +45.6 123.5	65 52.9 +47.0 125.4	35	69 45.4 +32.3+108.0	68 25.6 +34.7 110.5	69 03.3 +37.0 113.0	68 38.7 +39.1 115.4	68 12.0 +41.0 117.6	67 43.2 +42.8 119.8	67 12.4 +44.5 121.9	66 39.9 +46.0 123.8	36	70 17.7 +30.3+105.5	70 00.3 +32.8+108.2	69 40.3 +35.2 110.8	69 17.8 +37.5 113.2	68 53.0 +39.6 115.6	68 26.0 +41.5 117.9	67 56.9 +43.3 120.1	67 25.9 +44.9 122.2	37	70 48.0 +27.9+102.9	70 33.1 +30.7+105.7	70 15.5 +33.2+108.4	69 55.3 +35.6 111.0	69 32.6 +37.9 113.5	69 07.5 +40.0 115.9	68 40.2 +41.9 118.2	68 10.8 +43.7 120.4	38	71 15.9 +26.4+100.2	71 03.8 +28.3+103.1	70 48.7 +31.1+105.9	70 30.9 +33.7+108.6	70 10.5 +36.1 111.3	69 47.5 +38.3 113.8	69 22.1 +40.5 116.2	66 54.5 +42.4 118.6	39
40	71 41.3 +22.8 97.4	71 32.1 +25.8+100.3	71 19.8 +28.8+103.3	71 04.6 +31.5+106.1	70 46.6 +34.1+108.9	70 25.8 +36.6 111.5	70 02.6 +38.8 114.1	66 36.9 +41.0 116.6	40	72 04.1 +20.0 94.4	71 57.9 +23.2+97.5	71 48.6 +26.2+100.5	71 36.1 +29.2+103.4	71 20.7 +32.0+106.3	71 02.4 +34.6+109.1	70 41.4 +37.1 111.8	70 17.9 +39.3 114.4	41	72 24.1 +17.0 91.3	72 21.1 +20.3+ 94.5	72 14.8 +23.5+ 97.6	72 05.3 +26.6+100.6	71 52.7 +28.6+103.6	71 37.0 +32.5+106.6	71 18.5 +35.1+109.4	70 57.2 +37.5 112.1	42	72 41.1 +13.8+ 88.1	72 41.4 +17.3+ 88.1	72 38.3 +20.7+ 89.5	72 31.9 +23.9+ 90.7	72 22.3 +27.0+100.8	72 09.5 +30.0+103.9	71 53.6 +32.9+106.8	71 34.7 +35.6+109.7	43	72 54.9 +10.6+ 84.8	72 58.7 +14.0+ 84.8	72 59.0 +17.5+ 91.3	72 55.7 +21.0+ 92.0	72 49.3 +24.3+ 97.8	72 39.5 +35.7+101.0	72 26.5 +30.5+104.1	72 10.3 +33.4+107.1	44
45	73 05.5 +7.2+ 81.5	73 12.7 +10.8+ 84.7	73 16.5 +14.5+ 88.0	73 16.8 +17.9+ 91.4	73 13.6 +21.4+ 94.7	73 07.0 +24.7+ 98.0	72 57.0 +27.9+101.2	72 43.7 +31.0+104.4	45	73 12.7 +3.8+ 80.0	73 23.5 +7.3+ 81.3	73 30.8 +11.0+ 84.6	73 34.7 +14.5+ 88.0	73 35.0 +18.1+ 91.4	73 31.7 +21.7+ 94.8	73 24.9 +25.1+ 98.2	73 14.7 +28.4+101.4	46	73 16.5 +0.3+ 74.6	73 30.8 +3.9+ 77.8	73 41.8 +7.4+ 81.2	73 49.2 +11.2+ 84.6	73 53.1 +14.8+ 88.0	73 53.4 +18.4+ 91.5	73 50.0 +22.1+ 94.9	73 43.1 +25.5+ 98.3	47	73 16.8 -3.2+ 71.1	73 34.7 +0.3+ 74.3	73 49.2 +3.9+ 77.6	74 04.0 +17.5+ 84.5	74 11.8 +15.1+ 88.0	74 12.1 +18.7+ 91.6	74 08.6 +22.4+ 95.1	74 31.0 +19.1+ 91.6	49									
50	73 07.0 -10.0+ 64.2	73 31.7 -6.8+ 67.2	73 53.4 -3.4+ 70.4	74 11.8 +0.3+ 73.8	74 26.9 +3.9+ 77.2	74 38.4 +7.7+ 80.8	74 46.1 +11.7+ 84.4	74 50.1 +15.6+ 88.1	50	73 57.0 -13.3+ 60.8	73 24.9 -10.2+ 63.7	73 50.0 -6.9+ 66.8	74 1																																

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 24°, 336°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	40 14.3	-55.6	147.8	39 23.4	-55.9	148.2	38 32.3	-56.2	148.7	37 40.9	-56.4	149.1	36 49.4	-56.7	149.5	35 57.6	-56.8	149.8	35 05.6	-57.0	150.2	34 13.5	-57.3	150.5	0
1	39 18.7	-55.8	148.3	38 27.5	-56.0	148.7	37 36.1	-56.2	149.1	36 44.5	-56.4	149.5	35 52.7	-56.6	149.9	35 00.8	-56.9	150.2	34 08.6	-57.1	150.6	33 16.2	-57.2	150.9	1
2	38 22.9	-55.8	148.8	37 31.5	-56.1	149.2	36 39.9	-56.4	149.6	35 48.1	-56.6	149.9	34 56.1	-56.8	150.3	34 03.9	-57.0	150.6	33 11.5	-57.2	150.9	32 19.0	-57.4	151.2	3
3	37 27.1	-56.0	149.2	36 35.4	-56.2	149.6	35 43.5	-56.4	150.0	34 51.5	-56.6	150.3	33 59.3	-56.9	150.7	33 06.9	-57.0	151.0	32 14.3	-57.2	151.3	31 21.6	-57.4	151.6	4
4	36 31.1	-56.1	149.7	35 39.2	-56.3	150.0	34 47.1	-56.5	150.4	33 45.9	-56.8	150.7	32 02.4	-56.9	151.1	32 09.9	-57.1	151.4	31 17.1	-57.2	151.7	30 24.2	-57.4	151.9	5
5	35 35.0	-56.2	150.1	34 42.9	-56.4	150.5	33 50.6	-56.6	150.8	32 58.1	-56.7	151.1	32 05.5	-57.0	151.4	31 12.8	-57.2	151.7	30 19.9	-57.4	152.0	29 26.8	-57.5	152.3	6
6	34 38.8	-56.2	150.5	33 46.5	-56.5	150.9	32 54.0	-56.7	151.2	32 01.4	-56.9	151.5	31 08.5	-57.0	151.8	30 15.6	-57.2	152.1	29 22.5	-57.4	152.3	28 29.3	-57.5	152.6	7
7	33 42.6	-56.4	151.0	32 50.0	-56.5	151.3	31 57.3	-56.7	151.6	31 04.5	-56.9	151.9	30 11.5	-57.1	152.2	29 18.4	-57.3	152.4	28 25.1	-57.4	152.7	27 31.8	-57.6	152.9	8
8	32 46.2	-56.4	151.4	31 53.5	-56.6	151.7	31 00.6	-56.8	152.0	30 07.6	-57.0	152.2	29 14.4	-57.1	152.5	28 21.1	-57.3	152.8	27 27.7	-57.5	153.0	26 34.2	-57.6	153.2	9
9	31 49.8	-56.5	151.8	30 56.9	-56.7	152.1	30 03.8	-56.9	152.3	29 10.6	-57.0	152.6	28 17.3	-57.2	152.9	27 23.8	-57.4	153.1	26 30.2	-57.5	153.3	25 36.6	-57.7	153.5	10
10	30 53.3	-56.5	152.2	30 00.2	-56.8	152.4	29 06.9	-56.9	152.7	28 13.6	-57.1	153.0	27 20.1	-57.3	153.2	26 26.4	-57.4	153.4	25 32.7	-57.5	153.6	24 38.9	-57.7	153.9	11
11	29 56.8	-56.7	152.6	29 03.4	-56.8	152.8	28 10.0	-57.0	153.1	27 16.5	-57.2	153.3	26 22.8	-57.3	153.5	25 29.0	-57.4	153.7	24 35.2	-57.6	154.0	23 41.2	-57.7	154.2	12
12	29 00.1	-56.7	152.9	28 06.6	-56.8	153.2	27 13.0	-57.0	153.4	26 19.3	-57.2	153.6	25 25.5	-57.3	153.9	24 31.6	-57.5	154.1	23 37.6	-57.6	154.3	22 43.5	-57.8	154.4	13
13	28 03.4	-56.7	153.3	27 09.8	-57.0	153.5	26 16.0	-57.1	153.8	25 22.1	-57.2	154.0	24 28.2	-57.4	154.2	23 34.1	-57.5	154.4	22 40.0	-57.7	154.6	21 45.7	-57.8	154.7	14
14	27 06.7	-56.8	153.7	26 12.8	-56.9	153.9	25 18.9	-57.1	154.1	24 24.9	-57.3	154.3	23 30.8	-57.4	154.5	22 36.6	-57.6	154.7	21 42.3	-57.7	154.9	20 47.9	-57.8	155.0	15
15	26 09.9	-56.9	154.0	25 15.9	-57.0	154.3	24 21.8	-57.2	154.5	23 27.6	-57.3	154.6	22 33.4	-57.5	154.8	21 39.0	-57.6	155.0	20 44.6	-57.7	155.2	19 50.1	-57.8	155.3	16
16	25 13.0	-56.9	154.4	24 18.9	-57.1	154.6	23 24.6	-57.2	154.8	22 30.3	-57.4	155.0	21 35.9	-57.5	155.1	20 41.4	-57.6	155.3	19 46.9	-57.8	155.4	18 52.3	-57.9	155.6	17
17	24 16.1	-57.0	154.7	23 21.8	-57.1	154.9	22 27.4	-57.2	155.1	21 32.9	-57.4	155.3	20 38.4	-57.5	155.4	19 43.8	-57.7	155.6	18 49.1	-57.7	155.7	17 54.4	-57.9	155.9	18
18	23 19.1	-57.0	155.1	22 24.7	-57.2	155.3	21 30.2	-57.3	155.4	20 35.5	-57.4	155.6	19 40.9	-57.6	155.7	18 46.1	-57.6	155.9	17 51.4	-57.8	156.0	16 56.5	-57.9	156.1	19
19	22 22.1	-57.0	155.4	21 27.5	-57.2	155.6	20 32.9	-57.4	155.8	19 38.1	-57.4	155.9	18 43.3	-57.6	156.0	17 48.5	-57.7	156.2	16 53.5	-57.8	156.3	15 58.6	-58.0	156.4	20
20	21 25.1	-57.1	155.8	20 30.3	-57.2	155.9	19 35.5	-57.3	156.1	18 40.7	-57.5	156.2	17 45.7	-57.8	156.3	16 50.8	-57.8	156.5	15 55.7	-57.8	156.6	15 00.6	-57.9	156.7	21
21	20 28.0	-57.1	156.1	19 33.1	-57.2	156.2	18 38.2	-57.4	156.4	17 43.2	-57.5	156.5	16 48.1	-57.6	156.6	15 53.0	-57.7	156.7	14 57.9	-57.9	156.9	14 02.7	-58.0	157.0	22
22	19 30.9	-57.2	156.4	18 35.9	-57.3	156.6	17 40.8	-57.4	156.7	16 45.7	-57.6	156.8	15 50.5	-57.7	156.9	14 55.3	-57.8	157.0	13 00.0	-57.9	157.1	13 04.7	-58.0	157.2	23
23	18 33.7	-57.2	156.7	17 38.6	-57.3	156.9	16 43.4	-57.5	157.0	15 48.1	-57.6	157.1	14 52.8	-57.8	157.2	13 57.5	-57.8	157.3	13 02.1	-57.9	157.4	12 06.7	-58.0	157.5	24
24	17 36.5	-57.2	157.1	16 41.3	-57.4	157.2	15 45.9	-57.4	157.3	14 50.6	-57.6	157.4	13 55.2	-57.7	157.5	12 59.7	-57.8	157.6	11 06.3	-57.9	157.9	10 10.7	-58.0	158.0	25
25	16 39.3	-57.2	157.4	15 43.9	-57.3	157.5	14 48.5	-57.5	157.6	13 53.0	-57.6	157.7	12 57.5	-57.8	157.8	12 01.9	-57.8	157.9	11 06.3	-57.9	157.9	10 10.7	-58.0	158.0	26
26	15 42.1	-57.3	157.7	14 46.6	-57.4	157.8	13 51.0	-57.5	157.9	12 55.4	-57.6	158.0	11 59.7	-57.7	158.1	10 08.4	-58.0	158.2	9 12.7	-58.1	158.3	8 08.4	-58.0	158.4	27
27	14 44.8	-57.3	158.0	13 49.2	-57.5	158.1	12 53.5	-57.6	158.2	11 57.8	-57.7	158.3	10 02.0	-57.9	158.4	9 10.4	-57.9	158.4	8 12.5	-58.0	158.7	7 16.6	-58.1	158.8	28
28	13 47.5	-57.3	158.3	12 51.7	-57.4	158.4	11 55.9	-57.5	158.5	10 00.1	-57.6	158.5	9 04.9	-57.7	158.7	8 12.5	-58.0	158.7	7 14.5	-58.1	159.0	6 18.5	-58.1	159.0	29
29	12 50.2	-57.4	158.6	11 54.3	-57.4	158.7	10 58.4	-57.6	158.8	0 02.5	-57.7	158.8	9 06.5	-57.8	158.9	8 10.5	-57.8	158.9	7 14.5	-57.9	159.0	6 18.5	-58.1	159.0	29
30	11 52.8	-57.3	158.9	10 56.9	-57.5	159.0	10 00.8	-57.5	159.0	9 04.8	-57.7	159.1	8 08.7	-57.7	159.2	7 12.7	-57.9	159.2	6 16.6	-58.0	159.2	5 20.4	-58.0	159.3	30
31	10 55.5	-57.4	159.2	9 59.4	-57.5	159.3	9 03.3	-57.6	159.3	8 07.1	-57.7	159.4	7 11.0	-57.8	159.4	6 14.0	-57.9	159.5	5 18.6	-58.0	159.5	4 22.4	-58.1	159.5	31
32	9 58.1	-57.4	159.5	9 01.9	-57.5	159.6	8 05.7	-57.6	159.6	7 09.4	-57.7	159.7	6 13.2	-57.8	159.7	5 16.9	-57.9	159.7	4 20.6	-58.0	159.8	3 24.3	-58.1	159.8	32
33	9 00.7	-57.4	159.8	8 04.4	-57.5	159.8	7 08.1	-57.6	159.9	6 11.7	-57.7	159.9	5 15.4	-57.8	160.0	4 19.0	-57.9	160.0	3 22.6	-58.0	160.0	2 26.2	-58.1	160.0	33
34	8 03.3	-57.4	160.1	7 06.9	-57.5	160.1	6 10.5	-57.6	160.2	5 14.0	-57.7	160.2	4 17.5	-57.8	160.2	3 21.1	-57.9	161.0	2 26.4	-58.0	160.3	1 28.1	-58.1	160.3	34
35	7 05.9	-57.4	160.4	6 09.4	-57.6	160.4	5 12.8	-57.6	160.5	4 16.3	-57.7	160.5	3 19.7	-57.8	160.5	2 23.2	-57.9	160.5	1 26.6	-58.0	160.5	0 30.0	-58.1	160.5	35
36	6 08.5	-57.5	160.7	5 11.8	-57.6	160.7	4 15.2	-57.6	160.7	3 18.6	-57.8	160.8	2 21.9	-57.8	160.8	1 25.3	-58.0	160.8	0 28.6	-58.0	160.8	0 28.1	-5		

25°, 335° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	39 51.3 +55.2 146.6	39 01.1 +55.5 147.0	38 10.7 +55.7 147.5	37 19.9 +56.1 147.9	36 29.0 +56.3 148.3	35 37.9 +56.5 148.7	34 46.5 +56.7 149.0	33 55.0 +56.9 149.4	0	40 46.5 +55.1 146.1	39 56.6 +55.4 146.6	39 06.4 +55.7 147.0	38 16.0 +55.9 147.4	37 25.3 +56.2 147.9	36 34.4 +56.4 148.3	35 43.2 +56.7 148.6	34 51.9 +56.8 149.0	1	41 41.6 +54.9 145.6	40 52.0 +55.2 146.0	40 02.1 +55.5 146.5	39 11.9 +55.8 147.0	38 21.5 +56.0 147.4	37 30.8 +56.3 147.8	36 39.9 +56.6 148.2	35 48.8 +56.8 148.6	2	42 36.5 +54.8 145.0	41 47.2 +55.1 145.5	40 57.6 +55.4 146.0	40 07.7 +55.7 146.5	39 17.5 +56.0 147.0	38 27.1 +56.2 147.4	37 36.5 +56.4 147.8	36 45.6 +56.7 148.2	3	43 31.3 +54.5 144.5	42 42.3 +54.9 145.0	41 53.0 +55.2 145.5	41 03.4 +55.5 146.0	39 13.5 +55.8 146.5	38 23.3 +56.2 146.9	37 42.3 +56.4 147.4	37 42.3 +56.6 147.8	4																																																																																	
5	44 25.8 +54.4 143.9	43 37.2 +54.8 144.4	42 48.2 +55.1 145.0	41 58.9 +55.5 145.5	41 09.3 +55.8 146.0	40 19.5 +56.0 146.5	39 29.3 +56.3 146.9	38 38.9 +56.5 147.4	5	45 20.2 +54.3 143.3	44 32.0 +54.6 143.9	43 43.3 +55.0 144.4	42 54.4 +55.2 145.0	42 05.1 +55.5 145.5	41 15.5 +55.8 146.0	40 25.6 +56.1 146.5	39 35.4 +56.4 146.9	6	46 14.5 +54.0 142.7	45 26.6 +54.4 143.3	44 38.3 +54.7 143.9	43 49.6 +55.1 144.4	43 00.6 +55.5 145.0	42 11.3 +55.8 145.5	41 21.7 +56.1 146.0	40 31.8 +56.4 146.5	7	47 08.5 +53.7 142.0	46 21.0 +54.2 142.7	45 33.0 +54.6 143.3	44 44.7 +55.0 143.9	43 56.1 +55.3 144.5	43 07.1 +55.6 145.0	42 17.8 +55.9 145.5	41 28.2 +56.2 146.0	8	48 02.2 +53.6 141.4	47 15.2 +53.9 142.1	46 27.6 +54.4 142.7	45 39.7 +54.8 143.3	44 51.4 +55.1 143.9	44 02.7 +55.5 144.5	43 13.7 +55.8 145.0	42 24.4 +56.1 145.6	9																																																																																	
10	48 55.8 +53.3 140.7	48 09.1 +53.8 141.4	47 22.0 +54.2 142.1	46 34.5 +54.6 142.7	45 46.5 +55.0 143.4	44 58.2 +55.3 144.0	44 09.5 +55.7 144.5	43 20.5 +55.9 145.1	10	49 49.1 +53.1 140.0	49 02.9 +53.5 140.7	48 16.2 +54.0 141.4	47 29.1 +54.4 142.1	46 41.5 +54.8 142.8	45 53.5 +55.2 143.4	45 05.2 +55.5 144.0	44 16.4 +55.9 144.6	11	50 42.2 +52.7 139.3	49 56.4 +53.3 140.0	49 10.2 +53.7 140.8	48 23.5 +54.1 141.5	47 36.3 +54.6 142.2	46 48.7 +55.1 142.8	46 00.7 +55.3 143.5	45 12.3 +55.6 144.1	12	51 34.9 +52.5 138.5	50 49.7 +53.0 139.3	50 03.9 +53.5 140.1	49 17.6 +54.0 140.8	48 30.9 +54.4 141.6	47 43.7 +54.7 142.3	46 56.0 +55.2 142.9	46 07.9 +55.6 143.5	13	52 27.4 +52.1 137.7	51 42.7 +52.7 138.6	50 57.4 +53.2 139.4	50 11.6 +53.7 140.2	49 25.3 +54.1 140.9	48 38.4 +54.6 141.6	47 51.2 +55.0 142.3	47 03.5 +55.3 143.0	14																																																																																	
15	53 19.5 +51.7 136.9	52 35.4 +52.3 137.8	51 50.6 +52.9 138.6	51 05.3 +53.4 139.5	50 19.4 +54.0 140.3	49 33.0 +54.4 141.0	48 46.2 +54.8 141.7	47 58.8 +55.2 142.4	15	54 11.2 +51.4 136.0	53 27.7 +52.0 137.0	52 43.5 +52.6 137.9	51 58.7 +53.2 138.7	51 13.4 +53.6 139.6	50 27.4 +54.2 140.4	49 41.0 +54.6 141.1	48 54.0 +55.0 141.8	16	55 02.6 +51.0 135.1	54 19.7 +51.7 136.1	53 36.1 +52.3 137.1	52 51.9 +52.8 138.0	52 07.0 +53.4 138.8	51 21.6 +53.9 139.7	50 35.6 +54.3 140.5	49 49.0 +54.8 141.2	17	55 53.6 +50.6 134.2	56 11.4 +51.2 135.2	54 28.4 +51.9 136.2	53 44.7 +52.6 137.2	53 00.4 +53.1 138.1	52 15.5 +53.6 139.0	51 29.9 +54.1 139.8	50 43.8 +54.6 140.6	18	56 44.2 +50.0 133.2	56 02.6 +50.9 134.3	55 20.3 +51.6 135.4	54 37.3 +52.2 136.4	53 09.1 +53.3 138.2	52 24.0 +53.9 139.1	51 38.4 +54.4 139.9	19																																																																																		
20	57 34.2 +49.6 132.2	56 53.5 +50.3 133.4	56 11.9 +51.1 135.4	55 29.5 +51.7 135.5	54 46.3 +52.4 136.5	54 02.4 +53.1 137.4	53 17.9 +53.6 138.4	52 32.8 +54.1 139.2	20	58 23.8 +49.0 131.2	57 43.8 +49.9 132.4	57 03.0 +50.6 133.5	56 21.2 +51.4 134.6	55 38.7 +52.1 135.6	54 55.5 +52.7 136.6	54 11.5 +53.3 137.6	53 26.9 +53.8 138.5	21	59 12.8 +48.4 130.0	58 33.7 +49.3 131.3	57 53.6 +50.2 132.5	57 12.6 +51.0 133.7	56 30.8 +51.7 134.7	55 48.2 +52.3 135.8	55 04.8 +53.0 136.8	54 20.7 +53.5 137.8	22	60 01.2 +47.8 128.9	59 23.0 +48.7 130.2	58 43.8 +49.6 131.5	58 03.6 +50.4 132.7	57 22.5 +51.2 133.8	56 40.5 +52.0 134.9	55 57.8 +52.6 136.0	55 14.2 +53.3 137.0	23	60 49.0 +47.0 127.6	61 11.7 +48.1 129.0	59 33.4 +49.1 130.4	58 54.0 +50.0 131.6	58 13.7 +50.8 132.8	57 32.5 +51.4 134.0	56 50.4 +52.2 135.1	56 07.5 +52.9 136.2	24																																																																																	
25	61 36.0 +46.3 126.4	60 59.8 +47.4 127.8	60 22.5 +48.4 129.2	59 44.0 +49.4 130.5	59 04.5 +50.2 131.8	58 24.0 +51.1 133.0	57 42.6 +51.8 134.2	57 00.4 +52.5 135.3	25	62 22.3 +45.4 125.0	61 47.2 +46.7 126.5	61 10.9 +47.7 128.0	60 33.4 +48.7 129.4	59 54.7 +49.7 130.7	59 15.1 +50.5 132.0	58 34.4 +51.4 133.2	57 52.9 +52.1 134.4	26	63 25.3 +43.6 122.1	63 19.7 +44.9 123.8	62 45.6 +46.2 125.4	62 10.2 +47.4 126.9	61 33.5 +48.5 128.4	60 55.7 +49.4 129.8	60 16.7 +50.4 131.2	59 36.7 +51.2 132.5	27	64 35.9 +42.5 120.5	64 04.6 +44.0 122.3	63 31.8 +45.3 124.0	62 57.6 +46.6 125.6	62 22.0 +47.7 127.2	61 45.1 +48.8 128.6	61 07.1 +49.8 130.1	60 27.9 +50.7 131.4	28	65 18.4 +41.3 118.8	64 48.6 +42.9 120.7	64 17.1 +44.4 122.5	63 44.2 +45.7 124.2	63 09.7 +47.0 125.8	62 33.9 +48.1 127.4	61 56.9 +49.1 128.9	61 18.6 +50.1 130.3	29	65 59.7 +40.0 117.1	65 31.5 +41.7 119.0	65 01.5 +43.3 120.9	64 29.9 +44.7 122.7	63 56.7 +46.1 124.4	63 22.0 +47.4 126.1	62 46.0 +48.5 127.7	62 08.7 +49.5 129.2	30	66 39.7 +38.7 115.2	66 13.2 +40.5 117.3	65 44.8 +42.2 119.2	65 14.6 +43.7 121.1	64 48.2 +45.1 123.0	63 34.5 +47.7 124.7	62 58.2 +48.9 127.9	62 05.2 +51.7 133.5	31	67 18.4 +37.2 113.3	66 53.7 +39.1 115.4	66 27.0 +40.9 117.5	65 58.3 +42.6 119.5	65 27.9 +44.2 121.4	64 55.8 +46.3 123.2	64 22.2 +46.9 125.0	63 47.1 +48.1 126.6	32	67 55.6 +35.5 111.2	67 32.8 +37.6 113.5	67 07.9 +39.5 115.6	66 40.9 +41.4 117.7	66 12.1 +43.0 119.7	65 41.4 +44.6 121.7	65 09.1 +46.0 123.5	64 35.2 +47.3 125.3	33	68 31.1 +33.8 109.0	68 10.4 +36.0 111.4	67 47.4 +38.1 113.7	67 22.3 +39.9 115.9	66 55.1 +41.8 118.0	66 26.0 +43.4 120.0	65 55.1 +45.0 122.0	65 22.5 +46.4 123.8	34	69 04.9 +31.9+106.7	68 46.4 +34.2 109.2	68 25.5 +36.4 111.6	68 02.2 +38.5 113.9	67 36.9 +40.4 116.1	67 09.4 +42.3 118.3	66 40.1 +43.9 120.3	66 08.9 +45.4 122.3	35	69 36.8 +29.7+104.3	69 20.6 +32.3+106.9	69 01.9 +34.6 109.4	68 40.7 +36.9 111.8	68 17.3 +39.0 114.2	67 51.7 +40.9 116.4	67 24.0 +42.7 118.6	66 54.3 +44.4 120.6	36	70 06.5 +26.7+101.8	69 52.9 +30.2+104.5	69 36.5 +32.8+107.1	69 17.6 +35.1 109.6	68 56.3 +37.3 112.1	68 32.6 +39.4 114.4	68 06.7 +41.3 116.7	67 38.7 +43.1 118.9	37	70 34.1 +26.1+99.2	70 23.1 +27.9+101.9	70 09.3 +30.6+104.7	69 52.7 +32.2+107.3	69 33.6 +35.6 109.9	69 12.0 +37.8 112.3	68 48.0 +39.9 114.7	68 21.8 +41.8 117.0	38
40	70 59.2 +22.6+94.4	70 51.0 +25.6+99.3	70 39.8 +28.4+102.1	70 25.9 +31.1+104.8	70 09.2 +33.6+107.5	69 49.8 +36.0 110.1	69 27.9 +38.3 112.6	69 03.6 +40.4 115.1	40	71 18.2 +19.9+93.5	71 16.6 +22.9+96.5	71 08.3 +25.9+99.4	70 57.0 +28.8+102.3	70 42.8 +31.5+105.1	70 25.8 +31.4+107.8	70 06.2 +36.5 110.4	69 44.0 +38.8 113.0	41	71 41.7 +17.0+90.6	71 39.5 +20.2+93.6	71 34.2 +23.6+96.6	71 25.8 +26.3+99.5	71 14.3 +28.2+102.4	70 59.9 +32.0+105.3	70 42.7 +34.6+108.0	70 22.8 +37.0 110.7	42	71 58.7 +14.0+87.5	71 59.7 +17.3+90.6	71 57.5 +20.5+93.6	71 51.2 +23.7+96.7	71 43.6 +26.7+99.7	71 31.9 +29.7+102.7	71 17.3 +32.5+105.5	70 59.8 +35.1+108.3	43	72 12.7 +10.9+84.3	72 17.0 +14.3+87.4	72 18.0 +17.6+89.4	72 15.8 +20.9+93.7	72 10.5 +22.4+86.9	72 01.6 +24.7+92.9	71 49.8 +30.1+102.9	71 34.9 +32.9+105.8	44	72 23.6 +7.7+81.1	72 31.3 +11.0+84.2	72 35.6 +14.5+87.4	72 36.7 +17.9+90.6	72 34.4 +21.2+93.8	72 28.8 +24.4+96.9	72 19.9 +27.6+100.1	72 07.8 +30.6+103.1	45	72 31.3 +4.3+77.8	72 42.3 +7.8+80.9	72 50.1 +11.3+84.1	72 54.6 +14.7+87.4	72 55.6 +18.2+90.6	72 52.3 +21.6+93.9	72 47.5 +24.9+97.1	72 38.4 +28.1+100.3	46	72 35.6 +1.6+74.5	72 50.1 +4.5+77.6	73 01.4 +7.9+80.8	73 09.3 +11.4+84.1	73 13.8 +15.0+87.4	73 14.8 +18.5+90.7	73 12.4 +21.9+94.0	73 06.5 +25.3+97.3	47	72 36.7 -2.3+74.1	72 54.6 +1.0+74.0	73 09.3 +4.5+77.4	73 20.7 +21.8+80.6	73 28.8 +11.6+84.0	73 33.3 +15.2+87.3	73 34.3 +18.8+90.7	73 31.8 +22.3+94.1	48	72 34.4 -5.6+67.8	72 55.6 -2.4+70.8	73 13.6 +1.0+73.9	73 28.8 +4.5+77.2	73 40.4 +8.1+80.5	73 48.5 +11.8+83.9	73 53.1 +15.5+87.3	73 54.1 +19.7+90.8	49																																				
50	72 28.8 -8.9+64.5	72 53.2 -5.7+67.4	73 14.8 -24.7+70.5	73 33.3 +1.0+73.7	73 48.5 +4.6+77.0	74 00.3 +8.3+80.4	74 08.6 +12.0+83.8	74 13.2 +15.7+84.5	50	72 19.9 -12.1+61.2	72 47.5 -9.1+64.0	73 12.4 -5.9+67.0	73 34.3 -2.5+70.1	73 53.1 +1.0+73.4	74 08.6 +4.6+76.8	74 20.6 +8.3+80.2	74 28.9 +12.2+83.8																																																																																																													

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $25^\circ$ ,  $335^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	39	51.3	-55.3	146.6	39	01.1	-55.6	147.0	38	10.7	-55.9	147.5	37	19.9	-56.1	147.9	36	29.0	-56.4	148.3	35	37.9	-56.6	148.7	34	46.5	-56.8	149.0	33	55.0	-57.0	149.4	0
1	38	56.0	-55.4	147.1	38	05.5	-55.7	147.5	37	14.8	-56.0	147.9	36	23.8	-56.2	148.3	35	32.6	-56.4	148.7	34	41.3	-56.7	149.1	33	49.7	-56.9	149.4	32	58.0	-57.1	149.8	1
2	38	00.6	-55.6	147.6	37	09.8	-55.8	148.0	36	18.8	-56.1	148.4	35	27.6	-56.3	148.8	34	36.2	-56.5	149.1	33	44.6	-56.7	149.5	32	52.8	-56.9	149.8	32	00.9	-57.1	150.1	3
3	37	05.0	-55.7	148.1	36	14.0	-56.0	148.5	35	22.7	-56.2	148.8	34	31.3	-56.4	149.2	33	39.7	-56.7	149.5	32	47.9	-56.9	149.9	31	55.9	-57.0	150.2	31	03.8	-57.2	150.5	4
4	36	09.3	-55.8	148.5	35	18.0	-56.0	148.9	34	26.5	-56.2	149.3	33	34.9	-56.5	149.6	32	43.0	-56.6	149.9	31	51.0	-56.7	150.2	30	06.6	-57.3	150.8	4				
5	35	13.5	-55.9	149.0	34	22.0	-56.1	149.3	33	30.3	-56.4	149.7	32	38.4	-56.5	150.0	31	46.4	-56.8	150.3	30	54.2	-57.0	150.6	30	01.8	-57.1	150.9	29	09.3	-57.3	151.2	5
6	34	17.6	-56.0	149.4	33	25.9	-56.2	149.8	32	33.9	-56.4	150.1	31	41.9	-56.7	150.4	30	49.6	-56.8	150.7	29	57.2	-57.0	151.0	29	04.7	-57.2	151.3	28	12.0	-57.3	151.5	6
7	33	21.6	-56.0	149.9	32	29.7	-56.3	150.2	31	37.5	-56.5	150.5	30	45.2	-56.7	150.8	29	52.8	-56.8	151.1	29	00.2	-57.0	151.3	28	07.5	-57.2	151.6	27	14.7	-57.4	151.8	7
8	32	25.6	-56.2	150.3	31	33.4	-56.4	150.6	30	41.0	-56.6	150.9	29	48.5	-56.7	151.2	28	55.9	-56.9	151.4	28	03.2	-57.2	151.7	27	10.3	-57.3	151.9	26	17.3	-57.5	152.2	8
9	31	29.4	-56.2	150.7	30	37.0	-56.4	151.0	29	44.5	-56.7	151.3	28	51.8	-56.8	151.5	27	59.0	-57.0	151.8	27	06.0	-57.1	152.0	26	13.0	-57.3	152.3	25	19.8	-57.5	152.5	9
10	30	33.2	-56.3	151.1	29	40.6	-56.5	151.4	28	47.8	-56.7	151.6	27	55.0	-56.9	151.9	26	02.0	-57.1	152.1	26	08.9	-57.2	152.4	25	15.7	-57.4	152.6	24	22.3	-57.5	152.8	10
11	29	36.9	-56.4	151.5	28	44.1	-56.6	151.8	27	51.1	-56.7	152.0	26	58.1	-56.9	152.3	25	11.7	-57.3	152.7	24	18.3	-57.4	152.9	23	24.8	-57.5	153.1	11				
12	28	40.5	-56.5	151.9	27	47.5	-56.6	152.1	26	54.4	-56.8	152.4	25	01.2	-57.0	152.6	24	27.8	-57.1	152.8	23	20.9	-57.5	153.2	22	27.3	-57.6	153.4	12				
13	27	44.0	-56.5	152.3	26	50.9	-56.7	152.5	25	57.6	-56.9	152.7	25	04.2	-57.0	153.0	24	10.7	-57.2	153.2	23	17.1	-57.3	153.4	22	23.4	-57.4	153.6	21	29.7	-57.6	153.7	13
14	26	47.5	-56.5	152.7	25	54.2	-56.8	152.9	25	00.7	-56.9	153.1	24	07.2	-57.1	153.3	23	13.5	-57.2	153.5	22	19.8	-57.4	153.7	21	26.0	-57.6	153.9	20	32.1	-57.7	154.0	14
15	25	51.0	-56.7	153.0	24	57.4	-56.8	153.2	23	03.8	-56.9	153.4	22	10.1	-57.1	153.6	21	22.4	-57.4	154.0	20	28.4	-57.5	154.2	19	34.4	-57.7	154.3	15				
16	24	54.3	-56.6	153.4	24	00.6	-56.8	153.6	23	06.9	-57.0	153.8	22	13.0	-57.2	154.0	21	19.0	-57.3	154.1	20	25.0	-57.4	154.3	19	30.9	-57.6	154.5	16				
17	23	57.7	-56.8	153.8	23	03.8	-56.9	153.9	22	09.9	-57.1	154.1	21	15.8	-57.2	154.3	20	21.7	-57.3	154.5	19	27.6	-57.5	154.6	18	33.3	-57.6	154.8	17				
18	23	00.9	-56.7	154.1	22	06.9	-56.9	154.3	21	12.8	-57.1	154.5	20	18.6	-57.2	154.6	19	24.4	-57.4	154.8	18	30.1	-57.5	154.9	17	35.7	-57.6	155.1	16				
19	22	04.2	-56.8	154.5	21	10.0	-57.0	154.6	20	15.7	-57.1	154.8	19	21.4	-57.2	154.9	18	27.0	-57.4	155.1	17	32.6	-57.5	155.2	16	38.1	-57.7	155.4	15				
20	21	07.4	-56.9	154.8	20	13.0	-57.0	155.0	19	18.6	-57.1	155.1	18	24.2	-57.3	155.3	17	29.6	-57.4	155.4	16	35.1	-57.6	155.5	15	40.4	-57.6	155.6	14				
21	20	10.5	-56.9	155.1	19	16.0	-57.0	155.3	18	21.5	-57.2	155.4	17	26.9	-57.3	155.6	16	32.2	-57.4	155.7	15	37.5	-57.6	155.8	14	42.8	-57.7	155.9	13				
22	19	13.6	-56.9	155.5	18	19.0	-57.1	155.6	17	24.3	-57.2	155.8	16	29.6	-57.4	155.9	15	34.8	-57.5	156.0	14	39.9	-57.6	156.1	13	45.1	-57.8	156.2	12				
23	18	16.7	-57.0	155.8	17	21.9	-57.1	155.9	16	27.1	-57.3	156.1	15	32.2	-57.4	156.2	14	37.3	-57.5	156.3	13	42.3	-57.6	156.4	12	47.3	-57.7	156.5	11				
24	17	19.7	-57.0	156.1	16	24.8	-57.1	156.3	15	29.8	-57.2	157.4	14	34.8	-57.3	156.5	13	39.8	-57.5	156.6	12	44.7	-57.6	156.7	11	49.6	-57.7	156.8	10				
25	16	22.7	-57.0	156.5	15	27.7	-57.2	156.6	14	32.6	-57.3	156.7	13	37.5	-57.5	156.8	12	42.3	-57.6	156.9	11	47.1	-57.7	157.0	10	51.9	-57.8	157.1	25				
26	15	25.7	-57.1	156.8	14	30.5	-57.2	156.9	13	35.3	-57.3	157.0	12	40.0	-57.4	157.1	11	44.8	-57.6	157.2	10	49.4	-57.8	157.3	9	54.1	-57.8	157.3	8				
27	14	28.6	-57.1	157.1	13	33.3	-57.2	157.2	12	38.0	-57.4	157.3	11	42.6	-57.4	157.4	10	47.2	-57.6	157.5	9	51.8	-57.7	157.5	8	56.3	-57.8	157.6	7				
28	13	31.5	-57.1	157.4	12	36.1	-57.2	157.5	11	40.6	-57.3	157.6	10	45.2	-57.5	157.7	9	49.6	-57.6	157.7	8	54.1	-57.7	157.8	7	58.5	-57.8	157.9	6				
29	12	34.4	-57.1	157.7	11	38.9	-57.3	157.8	10	43.3	-57.4	157.9	9	47.7	-57.5	158.0	8	52.1	-57.6	158.0	7	57.0	-57.8	158.1	6	60.7	-57.9	158.2	5				
30	11	37.3	-57.2	158.1	10	41.6	-57.3	158.1	9	45.9	-57.4	158.2	8	50.2	-57.5	158.3	7	54.5	-57.6	158.4	6	58.7	-57.7	158.4	5	62.9	-57.8	158.4	4				
31	10	40.1	-57.1	158.4	9	44.3	-57.2	158.4	8	48.5	-57.4	158.5	7	52.7	-57.5	158.5	6	56.9	-57.7	158.6	5	60.1	-57.8	158.6	4	64.9	-57.9	158.7	3				
32	9	43.0	-57.2	158.7	8	47.1	-57.3	158.7	7	51.5	-57.4	158.8	6	55.2	-57.5	158.8	5	59.0	-57.6	158.9	4	63.7	-57.8	158.9	3	67.3	-57.9	159.0	2				
33	8	45.8	-57.2	159.0	7	49.8	-57.3	159.0	6	53.7	-57.4	159.1	5	57.7	-57.5	159.1	4	61.6	-57.6	159.2	3	65.4	-57.7	159.2	2	71.3	-57.8	159.2	1				
34	7	48.6	-57.2	159.3	6	52.5	-57.4	159.3	5	56.3	-57.5	159.4	4	60.0	-57.5	159.4	3	64.0	-57.7	159.5	2	68.6	-57.8	159.5	1	72.4	-57.9	159.5	0				
35	6	51.4	-57.2	159.6	5	55.1	-57.3	159.6	4	58.9	-57.5	159.7	3	62.6	-57.6	159.7	2	60.3	-57.8</td														

26°, 334° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	39 27.6	+54.9	145.4	38 38.1	+55.2	145.9	37 48.3	+55.5	146.3	36 58.3	+55.7	146.7	36 08.0	+56.0	147.1	35 17.5	+56.2	147.5	34 26.8	+56.5	147.9	33 35.8	+56.8	148.2	0
1	40 22.5	+54.7	144.9	39 33.3	+55.0	145.4	38 43.8	+55.3	145.8	37 54.0	+55.7	146.3	37 04.0	+55.9	146.7	36 13.7	+56.2	147.1	35 23.3	+56.4	147.5	34 32.6	+56.6	147.9	1
2	41 17.2	+54.6	144.3	40 28.3	+54.9	144.8	39 39.1	+55.3	145.3	38 49.7	+55.5	145.8	37 59.9	+55.8	146.2	37 09.9	+56.1	146.6	36 19.7	+56.3	147.1	35 29.2	+56.6	147.4	2
3	42 11.8	+54.4	143.8	41 23.2	+54.8	144.3	40 34.4	+55.0	144.8	39 45.2	+55.4	145.3	38 55.7	+55.7	145.8	38 06.0	+56.0	146.2	37 16.0	+56.2	146.6	36 25.8	+56.5	147.0	3
4	43 06.2	+54.3	143.2	42 18.0	+54.6	143.8	41 29.4	+55.1	144.3	40 40.6	+55.2	144.8	39 51.4	+55.6	145.5	39 02.4	+55.8	145.7	38 12.2	+56.2	146.2	37 22.3	+56.3	146.6	4
5	44 00.5	+54.0	142.6	43 12.6	+54.4	143.2	42 24.4	+54.8	143.7	41 35.8	+55.2	144.3	40 47.0	+55.4	144.8	39 57.8	+55.8	145.3	39 08.4	+56.0	145.7	38 18.6	+56.3	146.2	5
6	44 54.5	+53.8	142.0	44 07.0	+54.3	142.6	43 19.2	+54.6	143.2	42 31.0	+54.9	143.7	41 42.4	+55.3	144.3	40 53.6	+55.6	144.8	40 04.4	+55.9	145.3	39 14.9	+56.2	145.7	6
7	45 48.3	+53.7	141.4	45 01.3	+54.0	142.0	44 13.8	+54.4	142.6	43 25.9	+54.8	143.2	42 37.7	+55.2	143.7	41 49.2	+55.4	144.3	41 00.3	+55.8	144.8	40 11.1	+56.1	145.3	7
8	46 42.0	+53.4	140.7	45 55.3	+53.8	141.4	45 08.2	+54.3	142.0	44 20.7	+54.7	142.6	43 32.9	+55.0	143.2	42 44.6	+55.4	143.8	41 56.1	+55.6	144.3	41 07.2	+56.0	144.8	8
9	47 35.4	+53.1	140.1	46 49.1	+53.7	140.7	46 02.5	+54.0	141.4	45 15.4	+54.4	142.0	44 27.9	+54.8	142.7	43 40.0	+55.2	143.2	42 51.7	+55.6	143.8	42 03.2	+55.8	144.3	9
10	48 28.5	+53.0	139.4	47 42.8	+53.4	140.1	46 56.5	+53.8	140.8	46 09.8	+54.3	141.4	45 22.7	+54.6	142.1	44 35.2	+55.0	142.7	43 47.3	+55.3	143.3	42 59.0	+55.7	143.8	10
11	49 21.5	+52.6	138.6	48 36.2	+53.1	139.4	47 50.3	+53.6	140.1	47 04.1	+54.0	140.8	46 17.3	+54.5	141.5	45 30.2	+54.8	142.1	44 42.6	+55.2	142.7	43 54.7	+55.5	143.3	11
12	50 14.1	+52.3	137.9	49 29.3	+52.8	138.7	48 43.9	+53.4	139.5	47 58.1	+53.8	140.2	47 11.8	+54.3	140.9	46 25.0	+54.7	141.5	45 37.8	+55.1	142.2	44 50.2	+55.5	142.8	12
13	51 06.4	+52.0	137.1	50 22.1	+52.6	138.0	49 37.3	+53.1	138.8	48 51.9	+53.6	139.5	48 06.1	+54.0	140.2	47 19.7	+54.5	140.9	46 32.9	+54.9	141.6	45 45.7	+55.2	142.2	13
14	51 58.4	+51.7	136.3	51 14.7	+52.3	137.2	50 30.4	+52.8	138.0	49 45.5	+53.3	138.8	49 00.1	+53.8	139.6	48 14.2	+54.2	140.3	47 27.8	+54.6	141.0	46 40.9	+55.1	141.7	14
15	52 50.1	+51.3	135.5	52 07.0	+51.9	136.4	51 23.2	+52.5	137.3	50 38.8	+53.1	138.1	49 53.9	+53.6	138.9	49 08.4	+54.1	139.7	48 22.4	+54.5	140.4	47 36.0	+54.9	141.1	15
16	53 41.4	+50.9	134.6	52 58.9	+51.6	135.6	51 15.7	+52.2	136.5	51 31.9	+52.8	137.4	50 47.5	+53.3	138.2	50 02.5	+53.8	139.0	49 16.9	+54.3	139.8	48 30.9	+54.7	140.5	16
17	54 32.3	+50.5	133.7	53 50.5	+51.2	134.7	53 07.9	+51.9	135.6	52 24.7	+52.4	136.1	51 40.8	+53.0	137.5	50 56.3	+53.5	138.3	50 11.2	+54.0	139.1	49 25.6	+54.4	139.9	17
18	55 22.8	+50.1	132.8	54 41.7	+50.8	133.8	53 59.8	+51.4	134.8	53 17.1	+52.1	135.8	52 33.8	+52.7	136.7	51 49.8	+53.2	137.6	51 05.2	+53.8	138.4	50 20.0	+54.3	139.2	18
19	56 12.9	+49.6	131.8	55 32.5	+50.3	132.9	54 51.2	+51.1	133.9	54 09.2	+51.8	134.9	53 26.5	+52.3	135.9	52 43.0	+53.0	136.8	51 59.0	+53.5	137.7	51 14.3	+54.0	138.5	19
20	57 02.5	+49.0	130.8	56 22.8	+49.9	131.9	55 42.3	+50.3	133.0	55 01.0	+51.3	134.1	54 18.8	+52.1	135.1	53 36.6	+52.6	136.0	52 52.5	+53.2	137.0	52 08.3	+53.8	137.8	20
21	57 51.5	+48.5	129.7	57 12.7	+49.3	130.9	56 32.9	+50.2	132.1	55 52.3	+53.0	133.2	55 10.9	+51.6	134.2	54 28.6	+52.3	135.2	53 45.7	+52.9	136.2	53 02.1	+53.4	137.1	21
22	58 40.0	+47.8	128.6	58 02.0	+48.8	129.8	57 23.1	+49.7	131.1	56 43.2	+50.5	132.2	56 02.5	+51.2	133.3	55 20.9	+52.0	134.4	54 38.6	+52.6	135.4	53 55.5	+53.2	136.3	22
23	59 27.8	+47.2	127.4	58 50.8	+48.2	128.7	58 12.8	+49.1	130.0	57 33.7	+50.0	131.2	56 53.7	+50.8	132.4	56 12.9	+51.5	133.5	55 31.2	+52.2	134.5	54 48.7	+52.9	135.6	23
24	60 15.0	+46.5	126.2	59 39.0	+47.6	127.6	59 01.9	+48.5	128.9	58 23.7	+49.4	130.2	57 44.5	+50.3	131.4	57 04.4	+51.1	132.5	56 23.4	+51.8	133.7	55 41.6	+52.5	134.7	24
25	61 01.5	+45.7	124.9	60 26.6	+46.8	126.4	59 50.4	+47.9	127.7	59 13.1	+48.9	129.1	58 34.8	+49.8	130.3	57 55.5	+50.6	131.6	57 15.2	+51.4	132.7	56 34.1	+52.1	133.9	25
26	61 47.2	+44.9	123.5	61 13.4	+46.1	125.1	60 38.3	+47.2	126.5	60 02.0	+48.3	127.9	59 24.6	+49.2	129.3	58 46.1	+50.1	130.5	58 06.6	+50.9	131.8	57 26.2	+51.7	132.9	26
27	62 32.1	+44.0	122.1	61 59.5	+45.2	123.7	61 25.5	+46.5	125.3	60 50.3	+47.5	126.7	60 13.8	+48.6	128.1	59 36.2	+49.5	129.5	58 57.5	+50.5	130.8	58 17.9	+51.2	132.0	27
28	63 16.1	+42.9	120.6	62 44.7	+44.4	122.3	62 12.0	+45.6	123.9	61 37.8	+46.8	125.1	60 2.4	+47.9	126.9	60 25.7	+49.0	128.3	59 48.0	+49.9	129.7	58 09.1	+50.8	131.0	28
29	63 59.0	+41.9	119.1	63 29.1	+43.4	120.8	62 57.6	+44.7	122.5	62 24.6	+46.1	124.1	61 50.3	+47.2	125.7	61 14.7	+48.3	127.2	60 37.9	+49.3	128.6	59 59.9	+50.2	129.9	29
30	64 40.9	+40.8	117.4	64 12.5	+42.3	119.2	63 42.3	+43.8	121.0	63 10.7	+45.1	122.7	62 37.5	+46.4	124.3	62 03.0	+47.6	125.9	61 27.2	+48.6	127.4	60 50.1	+49.7	128.8	30
31	65 21.7	+39.4	115.7	64 54.8	+41.1	117.6	64 26.1	+42.7	119.5	63 55.8	+44.2	121.2	63 23.9	+45.6	122.9	62 50.6	+46.8	124.6	62 15.8	+48.0	126.2	61 39.8	+49.0	127.7	31
32	66 01.1	+38.1	113.8	65 35.9	+39.9	115.9	66 08.8	+41.6	117.8	64 40.0	+43.1	119.7	65 04.9	+45.6	121.5	63 37.4	+45.9	123.2	63 03.8	+47.2	124.9	62 28.8	+48.4	126.4	32
33	66 39.2	+36.7	111.9	66 15.8	+38.6	114.0	65 50.4	+40.4	116.1	65 23.1	+41.2	118.0	64 54.1	+43.5	119.9	64 23.5	+45.0	121.7	63 51.0	+46.3	123.5	63 17.2	+47.6	125.1	33
34	67 15.9	+35.0	110.9	66 30.8	+37.4	112.1	66 30.8	+38.9	114.2	66 05.1	+40.8	116.3	65 37.6	+42.5	118.3	65 08.3	+44.0	120.2	64 37.3	+45.5	122.0	64 04.8	+46.7	123.8	34
35	67 50.9	+33.2	107.8	67 31.4	+35.5	110.1	67 09.7	+37.5	112.3	66 45.9	+39.4	114.5	66 20.1	+41.2	116.5	65 52.3	+42.9	118.5	65 22.8	+44.4	120.5	64 51.5	+45.9	122.3	35
36	68 24.1	+31.4	105.5	68 06.9	+33.7	107.9	67 47.2	+35.9	110.3	67 25.3	+38.0	112.5													

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $26^\circ$ ,  $334^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	39 27.6 -55.0	145.4	38 38.1 -55.3	145.9	37 48.3 -55.6	146.3	36 58.3 -55.9	146.7	36 08.0 -56.1	147.1	35 17.5 -56.4	147.5	34 26.8 -56.6	147.9	33 35.8 -56.8	148.2	32 39.0 -56.8	148.6	31 42.2 -57.0	149.0	30 45.2 -57.0	149.4	29 48.2 -57.0	149.7	0												
1	38 32.6 -55.2	145.9	37 42.8 -55.5	146.4	36 52.7 -55.7	146.8	36 02.4 -56.0	147.2	35 11.9 -56.2	147.6	34 21.1 -56.4	147.9	33 30.2 -56.7	148.3	32 39.0 -56.8	148.6	31 42.2 -57.0	149.0	30 45.2 -57.0	149.4	29 48.2 -57.0	149.7	1														
2	37 37.4 -55.2	146.4	36 47.3 -55.5	146.8	35 57.0 -55.8	147.2	35 06.4 -56.0	147.6	34 15.7 -56.3	148.0	33 24.7 -56.5	148.3	32 33.5 -56.7	148.7	31 42.2 -57.0	149.0	30 45.2 -57.0	149.4	29 48.2 -57.0	149.7	3																
3	36 42.2 -55.4	146.9	35 51.8 -55.7	147.3	35 01.2 -55.9	147.7	34 10.4 -56.2	148.1	33 19.4 -56.4	148.4	32 28.2 -56.6	148.7	31 36.8 -56.8	149.1	30 45.2 -57.0	149.4	29 48.2 -57.0	149.7	28 51.2 -57.1	150.1	4																
4	35 46.8 -55.5	147.4	34 56.1 -55.7	147.8	34 05.3 -56.1	148.1	33 14.2 -56.2	148.5	32 23.0 -56.5	148.8	31 31.6 -56.7	149.1	30 40.0 -56.9	149.4	29 48.2 -57.0	149.7	28 51.2 -57.1	150.1	27 54.1 -57.2	150.4	5																
5	34 51.3 -55.6	147.8	34 00.4 -55.9	148.2	33 09.3 -56.1	148.6	32 18.0 -56.3	148.9	31 26.5 -56.5	149.2	30 34.9 -56.7	149.5	29 43.1 -56.9	149.8	28 51.2 -57.1	150.1	27 54.1 -57.2	150.4	26 59.9 -57.2	150.8	6																
6	33 55.7 -55.7	148.3	33 04.5 -55.9	148.6	32 13.2 -56.2	149.0	31 21.7 -56.4	149.3	30 30.0 -56.6	149.6	29 38.2 -56.8	149.9	28 46.2 -57.0	150.2	27 54.1 -57.2	150.4	26 59.9 -57.2	150.8	25 65.9 -57.2	151.0	7																
7	33 00.0 -55.8	148.7	32 08.6 -56.0	149.1	31 17.0 -56.2	149.4	30 25.3 -56.5	149.7	29 33.4 -56.6	150.0	28 41.4 -56.9	150.3	27 49.2 -57.0	150.5	26 55.1 -57.1	151.2	25 02.5 -57.3	151.5	24 05.2 -57.4	151.8	8																
8	32 04.2 -55.9	149.2	31 12.6 -56.1	149.5	30 20.8 -56.4	149.8	29 28.8 -56.5	150.1	28 36.8 -56.8	150.4	27 44.5 -56.8	150.6	26 52.2 -57.1	151.9	25 58.7 -57.2	151.1	24 08.8 -57.3	152.1	23 03.6 -57.3	152.2	22 10.5 -57.5	152.4	9														
9	31 08.3 -56.0	149.6	30 16.5 -56.2	149.9	29 24.5 -56.4	150.2	28 32.3 -56.6	150.5	27 40.0 -56.7	150.7	26 47.6 -56.9	151.0	25 55.1 -57.1	151.2	24 02.5 -57.3	151.5	23 02.5 -57.3	151.8	22 13.0 -57.4	152.0	10																
10	30 12.3 -56.0	150.0	29 20.3 -56.3	150.3	28 28.1 -56.5	150.6	27 35.7 -56.6	150.8	26 43.3 -56.9	151.1	25 50.7 -57.0	151.3	24 58.0 -57.2	151.6	23 05.2 -57.4	151.8	22 18.1 -57.5	152.0	21 17.7 -57.4	152.3	11																
11	29 16.3 -56.1	150.4	28 24.0 -56.3	150.7	27 31.6 -56.5	151.0	26 39.1 -56.7	151.2	25 46.4 -56.8	151.5	24 53.7 -57.1	151.7	23 00.8 -57.2	151.9	22 07.8 -57.3	152.1	21 23.1 -57.6	152.3	20 18.1 -57.5	152.5	12																
12	28 20.2 -56.2	150.8	27 27.7 -56.4	151.1	26 35.1 -56.5	151.3	25 42.4 -56.7	151.5	24 49.6 -57.0	151.8	23 56.6 -57.1	152.0	22 06.3 -57.3	152.5	21 13.0 -57.4	152.7	20 21.0 -57.5	152.9	19 23.1 -57.6	153.0	13																
13	27 24.0 -56.3	151.2	26 31.3 -56.4	151.5	25 38.5 -56.6	151.7	24 45.6 -56.8	151.9	23 52.6 -57.0	152.2	22 59.5 -57.1	152.4	21 09.0 -57.3	152.9	20 15.6 -57.5	153.0	19 22.1 -57.5	153.1	18 25.5 -57.6	153.2	14																
14	26 27.7 -56.3	151.6	25 34.9 -56.6	151.9	24 41.9 -56.7	152.1	23 48.8 -56.8	152.3	22 55.6 -57.0	152.5	21 02.4 -57.2	152.7	20 09.0 -57.3	152.9	19 18.1 -57.5	153.0	18 24.6 -57.5	153.1	17 27.4 -57.6	153.2	16																
15	25 31.4 -56.4	152.0	24 38.3 -56.5	152.2	23 45.2 -56.7	152.4	22 52.0 -56.9	152.6	21 58.6 -57.0	152.8	20 11.7 -57.4	153.2	19 18.1 -57.5	153.3	18 24.3 -57.4	153.4	17 27.4 -57.5	153.5	16 30.6 -57.6	153.6	15																
16	24 35.0 -56.4	152.4	23 41.8 -56.6	152.6	22 48.5 -56.8	152.8	21 55.1 -57.0	153.0	20 01.6 -57.1	153.2	19 14.3 -57.4	153.5	18 20.6 -57.5	153.6	17 23.1 -57.6	153.7	16 25.5 -57.6	153.8	15 28.6 -57.7	153.9	16																
17	23 38.6 -56.5	152.8	22 45.2 -56.7	153.0	21 51.7 -56.8	153.1	20 26.1 -57.0	153.3	19 04.5 -57.2	153.5	18 16.9 -57.4	153.8	17 23.1 -57.6	153.9	16 25.5 -57.6	154.0	15 28.6 -57.7	154.1	14 31.4 -57.7	154.2	13																
18	22 42.1 -56.5	153.1	21 48.5 -56.7	153.3	20 54.9 -56.9	153.5	19 01.1 -57.0	153.7	18 07.3 -57.1	153.8	17 19.5 -57.4	154.0	16 22.1 -57.5	154.4	15 27.9 -57.6	154.5	14 31.4 -57.7	154.6	13 34.6 -57.8	154.7	12																
19	21 45.6 -56.6	153.5	20 51.8 -56.7	153.7	19 58.0 -56.9	153.8	18 04.1 -57.0	154.0	17 10.2 -57.2	154.1	16 21.1 -57.3	154.3	15 36.9 -57.6	154.6	14 42.6 -57.5	154.7	13 46.6 -57.7	154.8	12 50.2 -57.7	154.9	11																
20	20 49.0 -56.7	153.9	19 55.1 -56.8	154.0	18 01.1 -56.9	154.2	17 07.1 -57.1	154.3	16 13.0 -57.3	154.5	15 18.8 -57.4	154.6	14 24.6 -57.5	154.7	13 30.3 -57.6	154.8	12 36.9 -57.7	154.9	11 42.0 -57.7	155.2	10																
21	19 52.3 -56.6	154.2	18 58.3 -56.8	154.4	18 04.2 -57.0	154.5	17 10.0 -57.1	154.6	16 15.7 -57.2	154.8	15 21.4 -57.4	154.9	14 27.1 -57.5	155.0	13 32.7 -57.7	155.1	12 39.6 -57.8	155.2	11 45.3 -57.9	155.3	10																
22	18 55.7 -56.7	154.6	18 01.5 -56.9	154.7	17 07.2 -57.0	154.8	16 12.9 -57.2	155.0	15 18.5 -57.3	155.1	14 24.0 -57.4	155.2	13 29.6 -57.6	155.3	12 35.0 -57.6	155.4	11 40.7 -57.7	155.5	10 43.4 -57.7	155.9	9																
23	17 59.0 -56.8	154.9	17 04.6 -56.9	155.0	16 10.2 -57.0	155.2	15 15.7 -57.2	155.3	14 21.2 -57.3	155.4	13 26.0 -57.4	155.5	12 32.0 -57.6	155.6	11 37.4 -57.7	155.7	10 43.4 -57.7	156.0	9 46.4 -57.8	156.2	8																
24	17 02.2 -56.7	155.2	16 07.7 -56.9	155.4	15 13.2 -57.1	155.5	14 18.5 -57.2	155.6	13 23.9 -57.3	155.7	12 29.2 -57.5	155.8	11 34.4 -57.7	155.9	10 39.7 -57.7	156.0	9 43.6 -57.8	156.2	8 48.8 -57.8	156.4	7																
25	16 05.5 -56.9	155.6	15 10.8 -57.0	155.7	14 16.1 -57.1	155.8	13 21.3 -57.2	155.9	12 26.6 -57.4	156.0	11 31.7 -57.4	156.1	10 36.9 -57.6	156.2	9 42.0 -57.7	156.3	8 48.2 -57.7	156.4	7 54.0 -57.8	156.5	6																
26	15 08.6 -56.8	155.9	14 13.8 -56.9	156.0	13 19.0 -57.1	156.1	12 24.1 -57.2	156.2	11 29.2 -57.4	156.3	10 34.3 -57.5	156.4	9 39.3 -57.6	156.4	8 44.3 -57.8	156.5	7 50.0 -57.8	156.6	6 56.9 -57.8	156.7	5																
27	14 11.8 -56.9	156.2	13 16.9 -57.0	156.3	12 21.9 -57.1	156.4	11 26.9 -57.3	156.5	10 31.8 -57.3	156.6	9 36.8 -57.5	156.7	8 41.7 -57.6	156.7	7 46.5 -57.7	156.8	6 52.0 -57.7	156.9	5 58.0 -57.7	157.0	4																
28	13 14.9 -56.8	156.6	12 19.9 -57.0	156.7	11 24.8 -57.1	156.8	10 29.6 -57.2	156.7	9 34.5 -57.3	156.9	8 39.3 -57.5	157.0	7 44.0 -57.6	157.0	6 48.8 -57.8	157.1	5 54.8 -57.8	157.2	4 60.0 -57.8	157.3	3																
29	12 18.1 -57.0	156.9	11 22.9 -57.1	157.0	10 27.6 -57.2	157.1	9 32.4 -57.3	157.2	8 37.1 -57.4	157.3	7 43.4 -57.5	157.4	6 49.4 -57.6	157.5	5 55.8 -57.6	157.6	4 61.8 -57.6	157.7	3 65.4 -57.7	157.8	2																
30	11 21.1 -56.9	157.2	10 25.8 -57.0	157.3	9 30.4 -57.1	157.4	8 35.1 -57.3	157.4	7 39.6 -57.4	157.5	6 44.2 -57.5	157.5	5 46.7 -57.6	157.6	4 51.1 -57.6	157.8	3 55.5 -57.7	157.9	2 60.0 -57.8	158.4	1																
31	10 24.2 -56.9	157.5	9 28.8 -57.1	157.6	8 33.3 -57.2	157.7	7 37.8 -57.4	157.7	6 42.2 -57.5	157.8	5 46.7 -57.6	157.8	4 51.1 -57.6	157.9	3 55.5 -57.7	158.1	2 60.0 -57.8	158.4	1 00.5 -57.7	159.0	0																
32	0 02.9 +57.1	19.0	0 59.6 +57.1	19.3	0 59.1 +57.3	19.3	1 55.7 +57.4	19.3	2 52.3 +57.5	19.3	3 48.9 +57.6	19.4	4 45.6 +57.6	19.4	5 42.1 +57.8	19.4	6 39.9 +57.7	19.1	7 37.6 +57.8	18.9	8 34.3 +57.7	18.7	9 31.1 +57.7	18.5	10 27.6 +57.7	18.3	11 23.8 +57.8	18.2	12 19.1 +57.5	18.0	13 15.4 +57.5	17.8	14 11.4 +57.4	17.6	15 7.0 +57.4	17.4	16 2.6

27°, 333° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	39 03.2 +54.5 144.2	38 14.3 +54.9 144.7	37 25.3 +55.1 145.1	36 35.9 +55.5 145.6	35 46.3 +55.7 146.0	34 56.4 +56.1 146.4	34 06.4 +56.2 146.7	33 16.1 +56.5 147.1	0	39 57.7 +54.4 143.7	39 09.2 +54.8 144.2	38 20.4 +55.1 144.6	37 31.4 +55.3 145.1	36 42.0 +55.7 145.5	35 52.5 +55.9 145.9	35 02.6 +56.2 146.3	34 12.6 +56.4 146.7	1	40 52.1 +54.3 143.1	40 04.0 +54.6 143.6	39 15.5 +54.9 144.1	38 26.7 +55.3 144.6	37 37.7 +55.5 145.0	36 48.4 +55.8 145.5	35 58.8 +56.1 145.9	35 09.0 +56.4 146.3	2	41 46.4 +54.0 142.6	40 58.6 +54.4 143.1	40 10.4 +54.8 143.6	39 22.0 +55.1 144.1	38 33.2 +55.4 144.6	37 44.2 +55.7 145.0	36 54.9 +56.0 145.5	36 05.4 +56.2 145.9	3	42 40.4 +53.9 142.0	41 53.0 +54.3 142.5	41 05.2 +54.6 143.1	40 17.1 +54.9 143.6	39 28.6 +55.3 144.1	38 39.9 +55.9 145.0	37 01.6 +56.2 145.4	4	
5	43 34.3 +53.7 141.4	42 47.3 +54.1 142.0	41 59.8 +54.5 142.5	41 12.0 +54.9 143.1	40 23.9 +55.2 143.6	39 35.5 +55.5 144.1	38 46.8 +55.7 144.5	37 57.8 +56.0 145.0	5	44 28.0 +53.5 140.8	43 41.4 +53.8 141.4	42 54.3 +54.3 141.9	42 06.9 +54.6 142.5	41 19.1 +55.0 143.0	40 31.0 +55.3 143.6	39 42.5 +55.7 144.1	38 53.8 +56.0 144.5	6	45 21.5 +53.3 140.1	44 35.2 +53.7 140.7	43 48.6 +54.1 141.4	43 01.5 +54.5 141.9	42 14.1 +54.8 142.5	41 26.3 +55.2 143.1	40 38.2 +55.5 143.6	39 49.8 +55.8 144.1	7	46 14.8 +53.0 139.5	45 28.9 +53.5 140.1	44 42.7 +53.9 140.8	43 56.0 +54.3 141.4	43 08.9 +54.7 142.0	42 21.5 +55.1 142.5	41 33.7 +55.4 143.1	40 45.6 +55.7 143.6	8	47 07.8 +52.8 138.8	46 22.4 +53.3 139.5	45 36.6 +53.7 140.1	44 50.3 +54.1 140.8	43 03.6 +54.5 141.4	43 16.6 +54.8 142.0	42 29.1 +55.2 142.6	41 41.3 +55.6 143.1	9
10	48 00.6 +52.5 138.1	47 15.7 +53.0 138.8	46 30.3 +53.5 139.5	45 44.4 +54.0 140.2	44 58.1 +54.4 140.8	44 11.4 +54.8 141.4	43 24.3 +55.1 142.0	42 36.9 +55.4 142.6	10	48 53.1 +52.2 137.3	48 08.7 +52.7 138.1	47 23.8 +53.2 138.8	46 38.4 +53.6 139.5	45 52.5 +54.1 140.2	45 06.2 +54.5 140.8	44 19.4 +55.0 141.5	43 32.3 +55.3 142.1	11	49 45.3 +51.9 136.6	49 01.4 +52.5 137.4	48 17.0 +53.0 138.1	47 32.0 +53.5 138.9	46 46.6 +53.9 139.6	46 00.7 +54.4 140.3	45 14.4 +54.7 140.9	44 27.6 +55.1 141.5	12	50 37.2 +51.6 135.8	49 53.9 +52.1 136.6	49 10.0 +52.7 137.4	48 25.5 +53.2 138.2	47 40.5 +53.7 138.9	46 55.1 +54.1 139.6	46 09.1 +54.6 140.3	45 22.7 +55.0 141.0	13	51 28.8 +51.2 135.0	50 46.0 +51.9 135.9	50 02.7 +52.4 136.7	49 18.7 +53.0 137.5	48 34.2 +53.5 138.3	47 49.2 +53.9 139.0	47 03.7 +54.3 139.7	46 17.7 +54.8 140.4	14
15	52 20.0 +50.9 134.1	51 37.9 +51.5 135.1	50 55.1 +52.1 135.9	50 11.7 +52.7 136.8	49 27.7 +53.2 137.6	48 43.1 +53.7 138.3	47 58.0 +54.2 139.1	47 12.5 +54.5 139.8	15	53 10.9 +50.4 133.3	52 29.4 +51.1 134.2	51 47.2 +51.8 135.1	50 04.4 +52.3 136.0	50 20.9 +52.9 136.9	49 36.8 +53.5 137.7	48 52.2 +53.9 138.4	48 07.0 +54.4 139.2	23	54 01.3 +50.1 132.4	53 20.5 +50.8 133.3	52 39.0 +51.4 134.3	51 56.7 +52.1 135.2	51 13.8 +52.6 136.1	50 30.3 +53.1 137.0	49 46.1 +53.7 137.8	49 01.4 +54.2 138.5	24	55 41.4 +49.5 131.4	54 11.3 +50.3 132.4	53 30.4 +51.0 133.4	52 48.8 +51.7 134.4	52 06.4 +52.3 135.3	51 23.4 +52.9 136.2	50 39.8 +53.4 137.1	49 55.6 +53.9 137.9	25	55 40.9 +49.1 130.4	55 01.6 +49.9 131.5	54 21.4 +50.6 132.6	53 40.5 +51.3 133.6	52 58.7 +52.0 134.5	52 16.3 +52.6 135.5	51 33.2 +53.2 136.3	50 49.5 +53.7 137.2	26
20	56 30.0 +48.5 129.4	55 51.5 +49.3 130.5	55 12.0 +50.2 131.6	54 31.8 +50.9 132.7	53 50.7 +51.6 133.7	53 08.9 +52.2 134.7	52 26.4 +52.8 135.6	51 43.2 +53.4 136.5	20	57 18.5 +48.0 128.3	56 40.8 +48.9 129.5	56 02.2 +49.7 130.7	55 22.7 +50.5 131.8	54 42.3 +51.2 132.8	54 01.1 +51.9 133.8	53 19.2 +52.6 134.8	52 36.6 +53.1 135.7	21	58 06.5 +47.3 127.2	57 29.7 +48.3 128.4	56 51.9 +49.2 129.6	56 13.2 +50.0 130.8	55 33.5 +50.8 131.9	54 53.0 +51.6 133.0	54 11.8 +52.1 134.0	53 29.7 +52.8 135.0	22	58 53.8 +46.7 126.0	58 18.0 +47.7 127.3	57 41.1 +48.6 128.6	57 03.2 +49.5 129.8	56 24.3 +50.3 131.0	55 03.9 +51.8 132.1	54 22.5 +52.5 134.2	53 17.7 +52.7 135.2	23	59 40.5 +45.9 124.8	59 05.7 +47.0 126.1	58 29.7 +48.0 127.5	57 14.6 +49.9 130.0	56 35.6 +50.7 131.1	55 55.7 +51.4 132.2	55 15.0 +52.1 133.3	54 24.7 +52.6 135.4	24
25	60 26.4 +45.2 123.5	59 52.7 +46.3 124.9	59 17.7 +47.4 126.3	58 41.7 +48.3 127.6	58 04.5 +49.3 128.9	57 26.3 +50.2 130.1	56 47.1 +51.0 131.3	56 07.1 +51.7 132.4	25	61 11.6 +44.3 122.1	60 39.0 +45.5 123.6	60 05.1 +46.7 125.1	59 30.0 +47.8 126.5	58 53.8 +48.7 127.8	58 16.5 +49.6 129.1	57 38.1 +50.5 130.3	56 58.8 +51.3 131.5	26	61 24.5 +44.7 120.7	61 24.5 +44.7 122.3	60 51.8 +45.9 123.8	60 17.8 +46.0 125.3	59 42.5 +48.1 126.7	59 06.1 +49.1 128.0	58 28.6 +50.0 129.3	57 50.1 +50.8 130.5	27	62 39.3 +44.2 119.2	62 09.2 +43.8 120.9	61 37.7 +45.1 122.5	61 04.8 +46.3 124.0	60 30.6 +47.4 125.5	59 55.2 +48.5 126.9	58 19.6 +49.4 128.2	58 40.9 +50.4 129.5	28	63 21.7 +41.3 117.7	63 53.0 +42.8 119.4	62 22.8 +44.2 121.1	61 51.5 +45.5 122.7	61 18.0 +46.7 124.2	60 43.7 +47.8 125.7	60 08.0 +48.9 127.1	58 31.3 +49.8 128.5	29
30	64 03.0 +40.2 116.0	63 35.8 +41.8 117.9	63 07.0 +43.2 119.6	62 36.6 +44.6 121.3	62 04.7 +45.9 122.9	61 31.5 +47.0 124.5	60 56.9 +48.2 125.9	60 21.1 +49.2 127.4	30	64 43.2 +38.9 114.3	64 17.6 +40.6 116.2	63 50.2 +42.2 118.0	63 21.2 +43.7 119.8	62 50.6 +45.0 121.3	62 18.5 +46.3 123.1	61 45.1 +47.4 124.7	61 10.3 +48.5 126.2	31	65 22.1 +37.6 112.5	64 58.2 +39.4 114.5	64 32.4 +41.1 116.4	64 04.9 +42.6 118.3	63 35.6 +44.1 120.0	63 04.8 +45.5 121.7	62 32.5 +46.7 123.4	61 58.8 +47.9 125.0	32	65 59.7 +36.1 110.6	65 37.6 +38.0 112.7	65 13.5 +39.7 114.7	64 47.5 +41.4 116.6	64 19.7 +43.0 118.5	63 50.3 +44.5 120.3	63 19.2 +45.9 122.0	62 46.7 +47.1 123.7	33	66 35.8 +34.5 108.6	66 15.6 +36.5 110.8	65 53.2 +38.5 112.9	65 28.9 +40.3 114.9	65 02.7 +42.0 116.9	64 34.8 +43.4 118.7	64 05.1 +44.9 120.6	63 33.8 +46.3 122.3	34
35	67 10.3 +32.9 106.6	66 52.1 +35.0 108.8	66 31.7 +37.0 110.0	66 09.2 +38.9 111.3	65 44.7 +40.7 115.1	65 18.2 +42.4 117.1	64 50.0 +43.9 119.0	64 20.1 +45.3 120.8	35	67 43.2 +30.9 105.4	67 27.1 +33.2 106.7	67 08.7 +35.4 109.0	66 48.1 +37.4 111.2	66 25.4 +39.3 113.3	66 00.6 +41.6 121.5	65 33.9 +42.8 117.4	65 05.4 +44.4 119.3	36	67 14.1 +29.1 102.1	68 00.3 +31.5 104.5	67 44.1 +33.7 106.9	67 25.5 +35.9 109.2	67 04.7 +37.9 111.4	66 41.8 +39.8 113.6	66 16.7 +41.7 115.7	65 49.8 +43.3 117.7	37	68 43.2 +26.9 99.7	68 31.8 +29.4 102.2	67 18.8 +31.9 104.7	68 01.4 +34.2 107.1	67 42.6 +36.4 109.4	67 21.6 +38.4 111.7	66 55.8 +40.3 113.9	66 33.1 +42.1 116.0	38	69 10.1 +24.7 97.2	69 01.2 +27.3 99.8	68 49.7 +29.9 102.3	68 35.6 +32.3 104.8	68 00.0 +36.8 107.3	67 38.7 +38.8 111.9	67 15.2 +40.8 114.2	67 39.0 +41.8 116.4	39
40	69 34.8 +22.2 94.6	68 28.5 +25.1 97.3	69 19.6 +27.7 99.9	69 07.9 +30.3 102.5	68 53.6 +32.8 105.0	68 36.8 +35.1 107.5	68 17.5 +37.3 109.9	67 56.0 +39.3 112.2	40	69 57.0 +19.8 91.9	69 53.6 +22.6 94.7	69 47.3 +25.4 97.4	69 38.2 +28.2 100.1	69 11.9 +32.3 105.3	68 54.8 +35.6 107.8	68 35.3 +37.8 110.2	67 43.5 +38.8 111.0	41	70 16.8 +17.2 89.2	70 16.2 +20.1 92.0	70 12.7 +23.1 94.7	70 06.4 +25.8 97.5	69 57.1 +28.6 100.2	69 45.1 +31.2 102.9	69 30.4 +33.7 105.5	69 13.1 +36.1 108.0	42	70 34.0 +14.3 86.3	70 36.3 +17.5 88.1	70 35.8 +20.4 90.7	70 32.2 +23.4 92.8	70 25.7 +26.3 97.6	70 16.3 +29.1 100.4	70 04.1 +31.7 103.1	69 49.2 +34.2 105.7	43	70 48.3 +11.5 83.4	70 53.8 +14.6 86.2	70 56.2 +17.7 89.1	70 55.6 +20.8 92.0	70 52.0 +23.8 94.9	70 45.4 +26.7 97.8	70 35.8 +29.5 100.6	70 23.4 +32.2 103.3	44
45	70 59.8 +8.6 80.4	71 08.4 +11.7 83.3	71 13.9 +14.9 86.2	71 16.4 +18.0 89.2	71 15.8 +21.1 92.1	71 12.1 +24.1 95.0	71 05.3 +27.1 97.9	70 55.6 +29.0 100.8	45	71 08.4 +5.5 77.3	71 20.1 +8.7 80.2	71 28.8 +11.9 83.1	71 34.4 +15.1 86.1	71 36.9 +18.3 89.1	71 32.4 +21.5 92.1	71 32.4 +24.6 95.1	71 25.5 +27.6 98.1	46	71 13.9 +2.5 74.2	71 28.8 +5.6 77.1	71 40.7 +8.8 80.0	71 49.5 +12.1 83.0	71 55.2 +15.4 86.1	71 57.7 +18.1 89.1	71 57.7 +21.8 92.2	71 53.1 +24.9 95.3	47	71 16.4 -0.6 71.1	71 34.4 +2.5 74.0	71 49.5 +5.7 76.9	72 01.6 +12.2 80.9	72 10.6 +12.2 82.9	72 16.3 +15.6 86.1	72 18.8 +18.9 89.2	72 18.0 +22.2 92.3	48	71 15.8 -3.7 68.0	71 36.9 -0.7 70.8	71 55.2 +2.5 73.7	72 10.6 -5.7 76.7	72 22.8 +9.1 79.7	72 31.9 +12.5 +8.29	72 37.7 +15.9 86.0	70 23.4 +29.0 100.8	49
50	71 12.1 -6.8 64.9	71 36.2 -3.8 67.6	71 57.7 -0.7 70.5	72 16.3 +2.5 73.4	72 31.9 +5.8 76.5	72 44.4 +9.2 79.6	72																																						

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $27^\circ$ ,  $333^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	39 03.2 -54.7	144.2	38 14.3 -55.0	144.7	37 25.3 -55.4	145.1	36 35.9 -55.6	145.6	35 46.3 -55.9	146.0	34 56.4 -56.1	146.4	34 06.4 -56.4	146.7	33 16.1 -56.6	147.1	33 23.8 -56.7	148.7	28 32.5 -56.9	149.0	5	0			
1	38 08.5 -54.9	144.7	37 19.3 -55.1	145.2	36 29.9 -55.4	145.6	35 40.3 -55.7	146.0	34 50.4 -55.9	146.4	34 00.3 -56.2	146.8	33 10.0 -56.4	147.2	32 19.5 -56.7	147.5	32 27.1 -56.8	149.1	27 35.6 -57.0	149.4	6	1			
2	37 13.6 -54.9	145.3	36 24.2 -55.2	145.7	35 34.5 -55.5	146.1	34 44.6 -55.8	146.5	33 54.5 -56.1	146.9	33 04.1 -56.3	147.2	32 13.6 -56.5	147.6	31 22.8 -56.7	147.9	31 30.7 -56.8	149.3	26 38.6 -57.0	149.7	7	3			
3	36 18.7 -55.1	145.8	35 28.9 -55.3	146.2	34 39.0 -55.7	146.6	33 48.8 -55.9	146.9	32 58.4 -56.1	147.3	32 07.8 -56.3	147.6	31 17.1 -56.6	148.0	30 26.1 -56.8	148.3	30 34.5 -57.0	148.6	24 44.5 -57.1	150.4	9	4			
4	35 23.6 -55.2	146.3	34 33.6 -55.5	146.7	33 43.3 -55.7	147.0	32 52.9 -56.0	147.4	31 02.3 -56.2	147.7	31 11.5 -56.5	148.0	30 20.5 -56.7	148.3	29 29.3 -56.8	148.6	28 37.1 -57.0	149.9	23 45.6 -57.3	150.8	10	5			
5	34 28.4 -55.4	146.7	33 38.1 -55.6	147.1	32 47.6 -55.8	147.5	31 56.9 -56.0	147.8	31 06.1 -56.3	148.1	30 15.0 -56.5	148.4	29 23.8 -56.7	148.7	28 32.5 -56.9	149.0	28 27.1 -56.8	149.1	27 35.6 -57.0	149.4	6	6			
6	33 33.0 -55.4	147.2	32 42.5 -55.7	147.5	31 51.8 -55.9	147.9	31 00.9 -56.2	148.2	30 09.8 -56.4	148.5	29 18.5 -56.5	148.8	27 30.3 -56.8	149.5	26 38.6 -57.0	149.7	25 44.5 -57.1	150.4	9	7					
7	32 37.6 -55.5	147.7	31 46.8 -55.7	148.0	30 55.9 -56.0	148.3	30 04.7 -56.2	148.6	29 13.4 -56.4	148.9	28 22.0 -56.7	149.2	27 30.3 -56.8	149.5	26 38.6 -57.0	149.7	25 44.5 -57.1	150.4	9	8					
8	31 42.1 -55.6	148.1	30 51.1 -55.9	148.4	29 59.5 -56.1	148.7	29 08.5 -56.3	149.0	28 17.0 -56.5	149.3	27 25.3 -56.7	149.6	26 23.6 -56.9	150.2	24 44.5 -57.1	150.4	9	10							
9	30 46.5 -55.7	148.5	29 55.2 -55.9	148.8	29 03.8 -56.2	149.1	28 12.2 -56.3	149.4	27 20.5 -56.6	149.7	26 28.6 -56.7	149.9	25 36.6 -56.9	150.2	24 44.5 -57.1	150.4	9	11							
10	29 50.8 -55.8	149.0	28 59.3 -56.0	149.3	28 07.6 -56.2	149.5	27 15.9 -56.3	149.8	26 23.9 -56.6	150.1	25 31.9 -56.8	150.3	24 39.7 -57.0	150.5	23 47.4 -57.1	150.8	10	12							
11	28 55.0 -55.9	149.4	28 03.3 -56.1	149.7	27 11.4 -56.2	149.9	26 19.4 -56.4	150.2	25 27.3 -56.6	150.4	24 35.1 -56.9	150.7	23 42.7 -57.0	150.9	22 50.3 -57.2	151.1	11	13							
12	27 59.1 -55.9	149.8	27 07.2 -56.1	150.1	26 15.2 -56.4	150.3	25 23.0 -56.6	150.6	24 30.7 -56.8	150.8	23 38.2 -56.9	151.0	22 45.7 -57.1	151.2	21 53.1 -57.3	151.4	12	14							
13	27 03.2 -56.0	150.2	26 11.1 -56.2	150.5	25 18.8 -56.4	150.7	24 26.4 -56.6	150.9	23 33.9 -56.7	151.1	22 41.3 -56.9	151.3	21 48.6 -57.1	151.5	20 55.8 -57.2	151.7	13	15							
14	26 07.2 -56.0	150.6	25 14.9 -56.3	150.9	24 22.4 -56.4	151.1	23 29.8 -56.6	151.3	22 37.2 -56.8	151.5	21 44.4 -57.0	151.7	20 51.5 -57.1	151.9	19 58.6 -57.3	152.0	14	16							
15	25 11.2 -56.2	151.0	24 18.6 -56.3	151.2	23 26.0 -56.5	151.4	22 33.2 -56.7	151.7	21 40.4 -56.9	151.8	20 47.4 -57.0	152.0	19 54.4 -57.2	152.2	19 01.3 -57.4	152.4	15	17							
16	24 15.0 -56.2	151.4	23 22.3 -56.4	151.6	22 29.5 -56.6	151.8	21 36.5 -56.7	152.0	20 43.5 -56.9	152.2	19 50.4 -57.1	152.4	18 57.2 -57.2	152.5	18 03.9 -57.3	152.7	16	18							
17	23 18.8 -56.2	151.8	22 25.9 -56.4	152.0	21 32.9 -56.6	152.2	20 39.8 -56.8	152.4	19 46.6 -56.9	152.5	18 53.3 -57.1	152.7	17 00.0 -57.3	152.8	17 06.6 -57.4	153.0	17	19							
18	22 22.6 -56.3	152.2	21 29.5 -56.5	152.4	20 36.3 -56.6	152.5	19 43.0 -56.8	152.7	18 49.7 -57.0	152.9	17 56.2 -57.1	153.0	16 52.7 -57.0	153.2	16 59.1 -57.1	153.3	18	20							
19	21 26.3 -56.3	152.5	20 33.0 -56.5	152.7	19 39.7 -56.7	152.9	18 46.2 -56.8	153.0	17 52.7 -57.0	153.2	16 59.1 -57.1	153.3	16 05.5 -57.3	153.5	15 11.8 -57.5	153.6	19	21							
20	20 30.0 -56.4	152.9	19 36.5 -56.6	153.1	18 43.0 -56.8	153.2	17 49.4 -56.9	153.4	16 55.7 -57.0	153.5	16 02.0 -57.2	153.6	15 08.2 -57.4	153.8	14 44.3 -57.4	153.9	20	22							
21	19 33.6 -56.5	153.3	18 39.9 -56.6	153.4	17 46.2 -56.7	153.6	16 52.5 -56.9	153.7	15 58.7 -57.1	153.8	15 04.8 -57.2	154.0	14 10.8 -57.3	154.1	13 16.9 -57.5	154.2	21	23							
22	18 37.1 -56.4	153.6	17 43.3 -56.6	153.8	16 49.5 -56.8	153.9	15 55.6 -57.0	154.0	15 01.6 -57.1	154.2	14 07.6 -57.3	154.3	13 13.5 -57.4	154.4	12 19.4 -57.5	154.5	22	24							
23	17 40.7 -56.5	154.0	16 46.7 -56.7	154.1	15 52.7 -56.8	154.2	14 58.6 -56.9	154.4	14 04.5 -57.1	154.5	13 10.3 -57.2	154.6	12 16.1 -57.4	154.7	11 21.9 -57.5	154.8	23	25							
24	16 44.2 -56.6	154.3	15 50.0 -56.7	154.5	14 55.9 -56.8	154.6	14 01.7 -57.0	154.7	13 07.4 -57.1	154.8	12 13.1 -57.3	154.9	11 18.7 -57.4	155.0	10 24.4 -57.6	155.1	24	26							
25	15 47.6 -56.6	154.7	14 53.3 -56.7	154.8	13 59.0 -56.8	154.9	13 04.7 -57.1	155.0	12 10.3 -57.2	155.1	11 15.8 -57.3	155.2	10 21.3 -57.4	155.3	9 26.8 -57.5	155.5	25	27							
26	14 51.0 -56.6	155.0	13 56.6 -56.7	155.1	13 02.2 -56.9	155.2	12 07.6 -57.0	155.3	11 13.1 -57.2	155.4	10 18.5 -57.3	155.5	9 23.9 -57.4	155.6	8 29.3 -57.6	155.8	26	28							
27	13 54.4 -56.6	155.4	12 59.9 -56.8	155.5	12 05.3 -57.0	155.6	11 10.6 -57.1	155.6	10 15.9 -57.2	155.7	9 21.2 -57.3	155.8	8 26.5 -57.5	155.9	7 31.7 -57.6	155.9	27	29							
28	12 57.8 -56.7	155.7	12 03.1 -56.8	155.8	11 08.3 -56.9	155.9	10 13.5 -57.0	156.0	9 18.7 -57.2	156.0	8 23.9 -57.3	156.1	7 29.0 -57.4	156.2	6 34.1 -57.5	156.2	28	30							
29	12 01.1 -56.7	156.0	11 06.3 -56.9	156.1	10 11.4 -57.0	156.2	9 16.5 -57.1	156.3	8 21.5 -57.2	156.3	7 26.6 -57.4	156.4	6 31.6 -57.5	156.4	5 36.6 -57.6	156.5	29	31							
30	11 04.4 -56.7	156.4	10 09.4 -56.8	156.5	9 14.4 -57.0	156.6	8 19.4 -57.1	156.6	7 24.3 -57.2	156.6	6 29.2 -57.3	156.7	5 34.1 -57.5	156.7	4 39.0 -57.6	156.8	30	32							
31	10 07.7 -56.7	156.7	9 12.6 -56.9	156.8	8 17.4 -57.0	156.8	7 22.3 -57.2	156.9	6 27.1 -57.3	156.9	5 31.9 -57.4	157.0	4 36.6 -57.5	157.0	3 41.4 -57.6	157.0	31	33							
32	9 11.0 -56.8	157.0	8 15.7 -56.8	157.1	7 20.4 -57.0	157.2	6 25.1 -57.1	157.2	5 29.8 -57.2	157.2	4 34.5 -57.4	157.3	3 39.1 -57.5	157.3	2 43.8 -57.6	157.3	32	34							
33	8 14.2 -56.7	157.4	7 18.9 -56.8	157.7	6 22.6 -57.0	157.8	5 26.4 -57.1	157.9	4 30.2 -57.2	157.9	3 35.3 -57.3	157.8	2 39.7 -57.4	157.9	1 41.4 -57.5	157.9	33	35							
34	7 17.5 -56.8	157.7	6 22.0 -56.8	157.7	5 26.4 -57.0	157.8	4 30.9 -57.2	157.8	3 38.0 -57.2	157.8	2 38.0 -57.2	158.1	1 42.3 -57.3	158.2	0 46.6 -57.4	158.2	34	36							
35	6 20.7 -56.8	158.0	5 25.1 -57.0	158.1	4 29.4 -57.2	158.1	3 33.7 -57.1	158.1	2 38.0 -57.2	158.1	1 04.0 -57.4	158.4	0 45.0 -57.4	158.4	0 46.6 -57.5	158.4	35	37							
36	5 23.9 -56.8	158.4	4 28.1 -56.9	158.4	3 32.4 -57.1	158.4	2 36.6 -57.2	158.4	1 04.8 -57.3	158.4	0 45.0 -57.4	158.4	0 46.6 -57.5	158.4	0 46.6 -57.5	158.4	36	38							
37	4 27.1 -56.8	158.7	3 31.2 -56.9	158.7	2 35.3 -57.0	158.7	1 39.4 -57.2	158.7	0 43.5 -57.3	158.7	0 12.8 -57.4	158.7	0 43.5 -57.5	158.7	0 43.5 -57.5	158.7	37	39							
38	3 30.3 -56.8	159.0	2 34.3 -56.9	159.0	1 38.3 -57.1	159.0	0 42.2 -57.1	159.0	0 42.2 -57.1	159.0	0 14.2 -57.2	159.0	0 42.2 -57.3	159.0	0 42.2 -57.3	159.0	38	40							
39	2 33.5 -56.8	159.3	1 37.4 -57.0	159																					

28°, 332° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	38	38.0	+54.3	143.1	37	49.9	+54.6	143.5	37	01.5	+54.9	144.0	36	12.9	+55.2	144.4	35	23.9	+55.5	144.8	34	34.8	+55.7	145.2	33	45.4	+56.0	145.6	32	55.7	+56.3	146.0	0
1	39	32.3	+54.0	142.5	38	44.5	+54.4	143.0	37	56.4	+54.8	143.5	37	08.1	+55.0	143.9	36	19.4	+55.4	144.4	35	30.5	+55.7	144.8	34	41.4	+55.9	145.2	33	52.0	+56.2	145.6	1
2	40	26.3	+53.9	141.9	39	38.9	+54.3	142.5	38	51.2	+54.6	143.0	38	03.1	+55.0	143.4	37	14.8	+55.3	143.9	36	26.2	+55.6	144.3	35	37.3	+55.9	144.7	34	48.2	+56.1	145.2	2
3	41	20.2	+53.8	141.4	40	33.2	+54.1	141.9	39	45.8	+54.5	142.4	38	58.1	+54.8	142.9	38	10.1	+55.1	143.4	37	21.8	+55.4	143.9	36	33.2	+55.7	144.3	35	44.3	+56.1	144.7	3
4	42	14.0	+53.5	140.8	41	27.3	+53.9	141.3	40	40.3	+54.3	141.9	39	52.9	+54.7	142.4	38	17.3	+55.3	143.4	37	28.9	+55.7	143.8	36	40.4	+55.9	144.3	34				
5	43	07.5	+53.3	140.1	42	21.2	+53.8	140.7	41	34.6	+54.1	141.3	40	47.6	+54.5	141.8	40	00.2	+54.9	142.4	39	12.5	+55.2	142.9	38	24.6	+55.5	143.4	37	36.3	+55.8	143.8	5
6	44	00.8	+53.1	139.5	43	15.0	+53.5	140.1	42	28.7	+54.0	140.7	41	42.1	+54.3	141.3	40	55.1	+54.7	141.8	40	07.7	+55.1	142.4	39	20.1	+55.4	142.9	38	32.1	+55.7	143.4	6
7	44	53.9	+52.9	138.9	44	08.5	+53.4	139.5	43	22.7	+53.8	140.1	42	36.4	+54.2	140.7	41	49.8	+54.6	141.3	41	02.8	+54.9	141.8	40	15.5	+55.2	142.4	39	27.8	+55.6	142.9	7
8	45	46.8	+52.7	138.2	45	01.9	+53.1	138.9	44	16.5	+53.5	139.5	43	30.6	+54.0	140.1	42	44.4	+54.3	140.7	41	57.7	+54.8	141.3	41	10.7	+55.1	141.9	40	23.4	+55.4	142.4	8
9	46	39.5	+52.4	137.5	45	55.0	+52.9	138.2	45	10.5	+53.4	138.9	44	24.6	+53.8	139.5	43	38.7	+54.2	140.1	42	52.5	+54.6	140.7	41	05.8	+55.0	141.3	41	18.8	+55.3	141.9	9
10	47	31.9	+52.1	136.8	46	47.9	+52.6	137.5	46	03.4	+53.1	138.2	45	18.4	+53.6	138.9	44	32.9	+54.1	139.6	43	47.1	+54.4	140.2	43	00.8	+54.8	140.8	42	14.1	+55.2	141.4	10
11	48	24.0	+51.8	136.0	47	40.5	+52.3	136.8	46	56.5	+52.8	137.5	46	12.0	+53.3	138.3	45	27.0	+53.8	138.9	44	41.5	+54.2	139.6	43	55.6	+54.6	140.2	43	09.3	+55.0	140.8	11
12	49	15.8	+51.5	135.3	48	32.8	+52.1	136.1	47	49.3	+52.6	136.8	47	05.3	+53.1	137.6	46	35.7	+54.0	139.0	44	50.2	+54.5	139.6	44	04.3	+54.8	140.3	12				
13	50	07.3	+51.1	134.5	49	24.9	+51.8	135.3	48	41.9	+52.4	136.1	47	58.4	+52.9	136.9	47	14.3	+53.4	137.6	46	29.7	+53.9	138.4	45	44.7	+54.2	139.0	44	59.1	+54.7	139.7	13
14	50	58.4	+50.8	133.7	50	16.7	+51.4	134.5	49	34.3	+52.0	135.4	48	51.3	+52.5	136.2	48	07.7	+53.1	137.0	47	23.6	+53.6	137.7	46	38.9	+54.1	138.4	45	53.8	+54.5	139.1	14
15	51	49.2	+50.4	132.8	51	08.1	+51.1	133.7	50	26.3	+51.7	134.6	49	43.8	+52.3	135.4	49	00.8	+52.8	136.3	48	17.2	+53.3	137.0	47	33.0	+53.8	137.8	46	48.3	+54.3	138.5	15
16	52	39.6	+50.0	131.9	51	58.2	+50.7	132.9	51	18.0	+51.4	133.8	50	36.1	+52.0	134.7	49	53.6	+52.6	135.5	49	10.5	+53.1	136.3	48	26.8	+53.6	137.1	47	42.6	+54.1	137.9	16
17	53	29.6	+49.6	131.0	52	49.9	+50.3	132.0	52	09.4	+51.0	133.0	51	28.1	+51.7	133.9	50	46.2	+52.2	134.8	49	20.6	+53.4	136.4	48	36.7	+53.8	137.2	17				
18	54	19.2	+49.1	130.0	53	40.2	+49.9	131.1	53	00.4	+50.6	132.1	52	19.8	+51.2	133.1	51	38.4	+52.0	134.0	50	13.8	+53.0	135.7	49	30.5	+53.6	136.6	18				
19	55	08.3	+48.6	129.1	54	30.1	+49.4	130.1	53	51.0	+50.1	131.2	53	11.0	+50.9	132.2	52	30.4	+51.5	133.2	51	48.9	+52.2	134.1	50	24.1	+53.3	135.9	19				
20	55	56.9	+48.0	128.0	55	19.5	+48.9	129.2	54	41.1	+49.8	130.3	54	21.9	+51.2	131.3	52	41.1	+51.3	132.3	51	59.6	+52.5	134.2	51	17.4	+53.1	135.1	20				
21	56	44.9	+47.5	126.9	56	08.4	+48.3	128.1	55	30.9	+49.2	129.3	54	52.4	+50.1	130.4	54	13.1	+50.8	131.4	53	33.0	+51.5	132.5	52	52.1	+52.2	134.4	21				
22	57	32.4	+46.8	125.8	56	56.7	+47.8	127.1	56	20.1	+48.7	128.3	55	42.5	+49.5	129.4	55	03.9	+50.4	130.5	54	24.5	+51.1	131.6	53	44.3	+51.8	132.6	22				
23	58	19.2	+46.1	124.6	57	44.5	+47.2	125.9	57	08.8	+48.1	127.2	56	32.0	+49.1	128.4	55	43.9	+49.9	129.6	55	15.6	+50.7	130.7	54	36.1	+51.4	131.8	23				
24	59	05.3	+45.5	123.4	58	31.7	+46.5	124.8	57	56.9	+47.4	126.1	57	21.1	+48.5	128.3	56	06.3	+50.2	129.7	55	27.5	+51.0	130.9	54	47.8	+51.7	131.9	24				
25	59	58.0	+44.6	122.1	58	18.2	+45.8	123.5	58	44.5	+46.9	124.9	58	09.6	+47.9	126.2	57	33.6	+48.8	127.5	56	56.5	+49.7	128.7	56	18.5	+50.5	129.9	55	39.5	+51.4	131.0	25
26	60	35.4	+43.8	120.8	60	04.0	+45.0	122.3	59	31.4	+46.1	123.7	59	57.5	+47.2	125.1	58	22.4	+48.3	126.4	57	46.2	+49.2	127.7	57	09.0	+50.1	128.9	56	30.9	+50.8	130.1	26
27	61	19.2	+42.8	119.4	60	49.0	+44.2	120.9	60	17.5	+45.4	122.4	59	44.7	+46.6	123.9	59	10.7	+47.6	125.3	58	35.4	+48.7	126.6	57	59.1	+49.6	127.9	27				
28	62	02.0	+41.9	117.9	61	33.2	+43.3	119.5	61	02.9	+44.6	121.1	60	31.3	+45.8	122.6	59	58.3	+46.9	124.1	59	24.1	+48.0	125.5	58	48.7	+48.9	126.8	58				
29	62	43.9	+40.8	116.3	62	16.5	+42.3	118.0	61	47.5	+43.7	119.7	61	21.1	+44.9	121.3	60	45.2	+46.2	122.8	60	12.1	+47.3	124.3	59	37.6	+48.4	125.7	58				
30	63	24.7	+39.7	114.7	62	58.8	+41.2	116.5	62	31.2	+42.7	118.2	62	02.0	+44.1	119.9	61	31.4	+45.4	121.5	60	59.4	+46.6	123.0	60	26.0	+47.7	124.5	59	51.4	+48.8	125.9	30
31	64	04.4	+38.4	113.0	63	40.0	+40.1	114.9	63	13.9	+41.7	116.7	62	46.1	+43.2	118.4	62	16.8	+45.5	120.1	61	46.0	+45.8	121.7	61	13.7	+47.0	123.3	60	40.2	+48.1	124.8	31
32	64	42.8	+37.0	111.2	64	20.1	+38.8	113.2	63	55.6	+40.5	115.1	63	29.3	+42.1	116.9	63	01.3	+43.6	118.6	62	31.8	+44.9	120.3	62	00.7	+46.3	122.0	61	28.3	+47.4	123.5	32
33	65	19.8	+35.7	109.4	64	58.9	+37.5	111.4	64	36.1	+39.3	113.4	64	11.4	+40.9	115.3	63	44.9	+42.5	117.1	63	16.7	+40.9	118.9	62	47.0	+43.2	120.6	62	15.7	+46.6	122.2	33
34	65	29.5	+32.																														

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 28°, 332°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	38 38.0	-54.4	143.1	37 49.9	-54.7	143.5	37 01.5	-55.0	144.0	36 12.9	-55.4	144.4	35 23.9	-55.6	144.8	34 34.8	-55.9	145.2	33 45.4	-56.2	145.6	32 55.7	-56.3	146.0	0
1	37 43.6	-54.5	143.6	36 55.2	-54.8	144.0	36 06.5	-55.1	144.5	35 17.5	-55.4	144.9	34 28.3	-55.7	145.3	33 38.9	-56.0	145.7	32 49.2	-56.2	146.0	31 59.4	-56.5	146.4	1
2	36 49.1	-54.7	144.1	36 00.4	-55.0	144.6	35 11.4	-55.3	145.0	34 22.1	-55.5	145.4	33 32.6	-55.8	145.7	32 42.9	-56.0	146.1	31 53.0	-56.3	146.5	31 02.9	-56.5	146.8	3
3	35 54.4	-54.8	144.6	35 05.4	-55.1	145.0	34 16.1	-55.4	145.4	33 26.6	-55.7	145.8	32 36.8	-55.9	146.2	31 46.9	-56.2	146.5	30 56.7	-56.3	146.9	30 06.4	-56.6	147.2	4
4	34 59.6	-54.9	145.1	34 10.3	-55.2	145.5	33 20.7	-55.4	145.9	32 30.9	-55.7	146.3	31 40.9	-56.0	146.6	30 50.7	-56.2	146.9	29 09.8	-56.6	147.7	28 09.8	-56.8	147.9	5
5	34 04.7	-55.0	145.6	33 15.1	-55.3	146.0	32 25.3	-55.6	146.4	31 35.2	-55.8	146.7	30 45.0	-56.1	147.0	29 54.5	-56.2	147.3	29 03.9	-56.5	147.7	28 13.2	-56.7	147.9	6
6	33 09.7	-55.1	146.1	32 19.8	-55.4	146.5	31 29.7	-55.7	146.8	30 39.4	-55.9	147.1	29 48.9	-56.1	147.4	28 58.3	-56.4	147.7	28 07.4	-56.5	148.0	27 16.5	-56.8	148.3	7
7	32 14.6	-55.3	146.6	31 24.4	-55.5	146.9	30 34.0	-55.7	147.2	29 43.5	-56.0	147.5	28 52.8	-56.2	147.8	28 01.9	-56.4	148.1	27 10.9	-56.7	148.4	26 19.7	-56.8	148.7	8
8	31 19.3	-55.3	147.0	30 28.9	-55.6	147.4	29 38.3	-55.8	147.7	28 47.5	-56.0	148.0	27 56.6	-56.3	148.2	27 05.5	-56.5	148.5	26 14.2	-56.6	148.8	25 22.9	-56.9	149.0	9
9	30 24.0	-55.4	147.5	29 33.3	-55.6	147.8	28 42.5	-55.9	148.1	27 51.5	-56.1	148.4	27 00.3	-56.3	148.6	26 09.0	-56.5	148.9	25 17.6	-56.8	149.1	24 26.0	-56.9	149.4	10
10	29 28.6	-55.5	147.9	28 37.7	-55.8	148.2	27 46.6	-56.0	148.5	26 55.4	-56.2	148.8	26 04.0	-56.4	149.0	25 12.5	-56.6	149.3	24 20.8	-56.7	149.5	23 29.1	-57.0	149.7	11
11	28 33.1	-55.6	148.4	27 41.9	-55.8	148.6	26 50.6	-56.0	148.9	25 59.2	-56.3	149.2	25 07.6	-56.5	149.4	24 15.9	-56.7	149.6	23 24.1	-56.9	149.9	22 32.1	-57.0	150.1	12
12	27 37.5	-55.7	148.8	26 46.1	-55.9	149.0	25 54.6	-56.1	149.3	24 02.9	-56.3	149.5	24 11.1	-56.5	149.8	23 19.2	-56.7	150.0	22 27.2	-56.9	150.2	21 35.1	-57.0	150.4	13
13	26 41.8	-55.7	149.2	25 50.2	-55.9	149.5	24 58.5	-56.2	149.7	24 06.6	-56.3	149.9	23 14.6	-56.5	150.0	22 22.5	-56.7	150.4	21 30.3	-56.9	150.5	20 38.1	-57.1	150.7	14
14	25 46.1	-55.8	149.6	24 54.3	-56.1	149.9	24 02.3	-56.2	150.1	23 10.3	-56.5	150.3	22 18.1	-56.6	150.5	21 25.8	-56.8	150.7	20 33.4	-56.9	150.9	19 41.0	-57.2	151.1	15
15	24 50.3	-55.9	150.0	23 58.2	-56.0	150.2	23 06.1	-56.3	150.5	22 13.8	-56.4	150.7	21 21.5	-56.7	150.9	20 29.0	-56.8	151.0	19 36.5	-57.0	151.2	18 43.8	-57.1	151.4	16
16	23 54.4	-55.9	150.4	23 02.2	-56.2	150.6	22 09.8	-56.3	150.8	21 17.4	-56.5	151.0	20 24.8	-56.7	151.2	19 32.2	-56.9	151.4	18 39.5	-57.0	151.6	17 46.7	-57.2	151.7	17
17	22 58.5	-56.0	150.8	22 06.0	-56.2	151.0	21 13.5	-56.4	151.2	20 20.9	-56.6	151.4	19 28.1	-56.7	151.6	18 35.3	-56.8	151.7	17 42.5	-57.1	151.9	16 49.5	-57.2	152.0	18
18	22 02.5	-56.1	151.2	21 09.8	-56.2	151.4	20 17.1	-56.4	151.6	19 24.3	-56.6	151.7	18 31.4	-56.7	151.9	17 38.5	-57.0	152.1	16 45.4	-57.1	152.2	15 52.3	-57.2	152.3	19
19	21 06.4	-56.1	151.6	20 13.6	-56.3	151.8	19 20.7	-56.5	151.9	18 27.7	-56.6	152.1	17 34.7	-56.8	152.2	16 41.5	-56.9	152.4	15 48.3	-57.1	152.5	14 55.1	-57.3	152.7	20
20	20 10.3	-56.1	152.0	19 17.3	-56.3	152.1	18 24.2	-56.5	152.3	17 31.1	-56.7	152.4	16 37.9	-56.9	152.6	15 44.6	-57.0	152.7	14 51.2	-57.1	152.8	13 57.8	-57.3	153.0	21
21	19 14.2	-56.2	152.3	18 21.0	-56.4	152.5	17 27.7	-56.5	152.6	16 34.4	-56.7	152.8	15 41.0	-56.8	152.9	14 47.6	-57.0	153.0	13 54.1	-57.2	153.2	13 00.5	-57.3	153.3	22
22	18 18.0	-56.2	152.7	17 24.6	-56.4	152.9	16 31.2	-56.6	153.0	15 37.7	-56.7	153.1	14 44.2	-56.8	153.3	13 50.6	-57.1	153.4	12 56.9	-57.2	153.5	12 03.2	-57.3	153.6	23
23	17 21.8	-56.3	153.1	16 28.2	-56.4	153.2	15 34.6	-56.6	153.3	14 41.0	-56.8	153.5	13 47.3	-56.9	153.6	12 53.5	-57.0	153.7	11 59.7	-57.2	153.8	11 05.9	-57.4	153.9	24
24	16 25.5	-56.3	153.4	15 31.8	-56.5	153.6	14 38.0	-56.8	153.7	13 44.2	-56.8	153.8	12 50.4	-57.0	153.9	11 56.5	-57.1	154.0	11 02.5	-57.2	154.1	10 08.5	-57.3	154.2	25
25	15 29.2	-56.4	153.8	14 35.3	-56.5	153.9	13 41.4	-56.7	154.0	12 47.4	-56.8	154.1	11 53.4	-56.9	154.2	10 59.4	-57.1	154.3	10 05.3	-57.3	154.4	9 11.2	-57.4	154.5	26
26	14 32.8	-56.3	154.2	13 38.8	-56.5	154.3	12 44.7	-56.7	154.4	11 50.6	-56.8	154.5	10 56.5	-57.0	154.5	10 02.3	-57.2	154.6	9 08.0	-57.2	154.7	8 13.8	-57.4	154.8	27
27	13 36.5	-56.5	154.5	12 42.3	-56.6	154.6	11 48.0	-56.7	154.7	10 53.8	-56.9	154.8	9 59.5	-57.0	154.9	9 05.1	-57.1	154.9	8 10.8	-57.3	155.0	7 18.4	-57.4	155.1	28
28	12 40.0	-56.4	154.9	11 45.7	-56.6	155.0	10 51.3	-56.7	155.0	9 56.9	-56.9	155.1	9 02.5	-57.0	155.2	8 08.0	-57.1	155.2	7 13.5	-57.3	155.3	6 19.0	-57.4	155.4	29
29	11 43.6	-56.4	155.2	10 49.1	-56.6	155.3	9 54.6	-56.8	155.4	9 00.0	-56.8	155.4	8 05.5	-57.1	155.5	7 10.9	-57.2	155.6	6 16.2	-57.3	155.6	5 21.6	-57.4	155.6	29
30	10 47.2	-56.5	155.6	9 52.5	-56.6	155.6	8 57.8	-56.7	155.7	8 03.2	-57.0	155.8	7 08.4	-57.0	155.8	6 13.7	-57.2	155.9	5 18.9	-57.3	155.9	4 24.2	-57.5	155.9	30
31	9 50.7	-56.5	155.9	8 55.9	-56.7	156.0	8 01.1	-56.8	156.0	7 06.2	-56.9	156.1	6 11.4	-57.1	156.1	5 16.5	-57.2	156.2	4 21.6	-57.3	156.2	3 26.7	-57.4	156.2	31
32	8 54.2	-56.5	156.2	7 59.2	-56.6	156.3	7 04.3	-56.8	156.3	6 09.3	-56.9	156.4	5 14.3	-57.0	156.4	4 19.3	-57.2	156.5	3 24.3	-57.3	156.5	2 29.3	-57.4	156.5	32
33	7 57.7	-56.6	156.6	6 02.6	-56.7	156.6	6 07.5	-56.8	156.7	5 12.4	-56.9	156.7	4 17.3	-57.1	156.7	3 22.1	-57.1	156.8	2 27.0	-57.3	156.8	1 31.9	-57.5	156.8	33
34	7 01.1	-56.6	156.9	6 05.9	-56.7	157.0	5 10.7	-56.8	157.0	4 15.7	-56.9	157.0	3 20.2	-57.1	157.1	2 25.0	-57.2	157.1	1 29.7	-57.3	157.1	0 34.4	-57.4	157.1	34
35	6 04.6	-56.6	157.2	5 09.2	-56.7	157.3	4 13.9	-56.9	157.3	3 18.5	-57.0	157.3	2 23.1	-57.0	157.4	1 27.8	-57.3	157.4	0 32.4	-57.4	157.4	0 23.0	+57.5	22.6	35
36	5 08.0	-56.6	157.6	4 12.5	-56.7	157.6	3 17.0	-56.8	157.6	2 21.5	-56.9	157.7	1 22.3	+57.1	21.1	3 17.3	+57.2	22.0	2 17.9	+57.4	22.0	1 22.3	+57.3	22.	

29°, 331° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	38	12.2	+53.9	141.9	37	24.8	+54.3	142.4	36	37.1	+54.6	142.8	35	49.2	+54.9	143.3	35	00.9	+55.3	143.7	34	12.5	+55.5	144.1	33	23.7	+55.8	144.5	32	34.8	+56.0	144.9	0
1	39	06.1	+53.7	141.3	38	19.1	+54.1	141.8	37	31.7	+54.5	142.3	36	44.1	+54.8	142.8	35	56.2	+55.1	143.2	35	08.0	+55.4	143.6	34	19.5	+55.7	144.1	33	30.8	+56.0	144.5	1
2	39	59.8	+53.6	140.8	39	13.2	+53.9	141.3	38	26.2	+54.3	141.8	37	38.9	+54.7	142.3	36	51.3	+55.0	142.7	36	03.4	+55.3	143.2	35	15.2	+55.6	143.6	34	26.8	+55.9	144.0	2
3	40	53.4	+53.4	140.2	40	07.1	+53.8	140.7	39	20.5	+54.2	141.2	38	33.6	+54.5	141.7	37	46.3	+54.9	142.2	36	58.7	+55.2	142.7	36	10.8	+55.5	143.1	35	22.7	+55.8	143.6	3
4	41	46.8	+53.2	139.6	41	00.9	+53.6	140.1	40	14.7	+54.0	140.7	39	28.1	+54.4	141.2	38	41.2	+54.7	141.7	37	53.9	+55.1	142.2	37	06.3	+55.4	142.7	36	18.5	+55.7	143.1	4
5	42	40.0	+52.9	138.9	41	54.5	+53.4	139.5	41	08.7	+53.8	140.1	40	22.5	+54.2	140.7	39	35.9	+54.5	141.2	38	49.0	+54.9	141.7	38	01.7	+55.3	142.2	37	14.2	+55.5	142.7	5
6	43	32.9	+52.8	138.3	42	47.9	+53.2	138.9	42	02.5	+53.6	139.5	41	16.7	+54.0	140.1	40	30.4	+54.5	140.6	39	43.9	+54.8	141.2	38	57.0	+55.1	141.7	38	09.7	+55.5	142.2	6
7	44	25.7	+52.5	137.6	43	41.1	+53.0	138.3	42	56.1	+53.5	138.9	42	10.7	+53.8	139.5	41	24.9	+54.2	140.1	40	38.7	+54.6	140.6	39	52.1	+55.0	141.2	38	05.2	+55.3	141.7	7
8	45	18.2	+52.3	137.0	44	34.1	+52.8	137.6	43	49.6	+53.2	138.3	43	04.5	+53.7	138.9	42	19.1	+54.1	139.5	41	33.3	+54.5	140.1	40	47.1	+54.8	140.6	40	00.5	+55.2	141.2	8
9	46	10.5	+52.0	136.3	45	26.9	+52.5	137.0	44	42.8	+53.0	137.6	43	58.2	+53.5	138.3	43	13.2	+53.9	138.9	42	27.8	+54.3	139.5	41	41.9	+54.7	140.1	40	55.7	+55.0	140.7	9
10	47	02.5	+51.7	135.5	46	19.4	+52.2	136.3	45	35.8	+52.7	137.0	44	51.7	+53.2	137.7	44	07.1	+53.7	138.3	43	22.1	+54.1	138.9	42	36.6	+54.5	139.6	41	50.7	+54.9	140.1	10
11	47	54.2	+51.4	134.8	47	11.6	+52.0	135.5	46	28.5	+52.5	136.3	45	44.9	+53.0	137.0	45	00.8	+53.4	137.7	44	16.2	+53.9	138.3	43	31.1	+54.4	139.0	42	45.6	+54.8	139.6	11
12	48	45.6	+51.1	134.0	48	03.6	+51.7	134.8	47	21.0	+52.3	135.6	46	37.9	+52.8	136.3	45	54.2	+53.3	137.0	45	10.1	+53.7	137.7	44	25.5	+54.1	138.4	43	40.4	+54.5	139.0	12
13	49	36.7	+50.7	133.2	48	55.3	+51.3	134.0	48	13.3	+51.9	134.8	47	30.7	+52.4	135.6	46	47.5	+53.0	136.4	46	03.8	+53.5	137.1	45	19.6	+54.0	137.8	44	34.9	+54.4	138.5	13
14	50	27.4	+50.4	132.4	49	46.6	+51.1	133.2	49	05.2	+51.6	134.1	48	23.1	+52.3	134.9	47	40.5	+52.8	135.7	46	57.3	+53.3	136.4	46	13.6	+53.7	137.2	45	29.3	+54.2	137.9	14
15	51	17.8	+50.0	131.5	50	37.7	+50.6	132.4	49	56.8	+51.3	133.3	49	15.4	+51.9	134.2	48	33.3	+52.4	135.0	47	50.6	+53.0	135.8	47	07.3	+53.5	136.5	46	23.5	+54.0	137.2	15
16	52	07.8	+49.5	130.6	51	28.3	+50.3	131.6	50	48.1	+51.0	132.5	50	07.3	+51.6	133.4	49	25.7	+52.2	134.2	48	43.6	+52.7	135.1	48	00.8	+53.3	135.8	47	17.5	+53.8	136.6	16
17	52	57.3	+49.1	129.7	52	18.6	+49.9	130.7	51	39.1	+50.6	131.6	50	58.9	+51.2	132.6	50	17.9	+51.9	133.5	49	36.3	+52.5	134.3	48	54.1	+53.0	135.1	48	11.3	+53.5	135.9	17
18	53	46.4	+48.6	128.7	53	08.5	+49.4	129.8	52	29.7	+50.1	130.8	51	50.1	+50.9	131.7	51	09.8	+51.5	132.7	50	28.8	+52.1	133.6	49	04.8	+53.3	135.3	18				
19	54	35.0	+48.2	127.7	53	57.9	+48.9	128.8	53	19.8	+49.8	129.9	52	41.0	+50.5	130.9	52	01.3	+51.2	131.8	51	20.9	+51.9	132.8	50	39.8	+52.5	133.7	49	58.1	+53.0	134.5	19
20	55	23.2	+47.5	126.7	54	46.8	+48.5	127.8	54	09.6	+49.3	128.9	53	31.5	+49.0	130.0	53	52.5	+50.8	131.0	52	12.8	+51.5	132.0	51	32.3	+52.1	132.9	50	51.1	+52.7	133.8	20
21	56	10.7	+47.0	125.6	55	35.3	+47.9	126.8	54	58.9	+48.8	127.9	54	21.5	+49.6	129.0	53	43.3	+50.4	130.1	53	04.3	+51.1	131.1	52	24.4	+51.8	132.1	51	43.8	+52.4	133.0	21
22	56	57.7	+46.3	124.5	56	23.2	+47.3	125.7	55	47.7	+48.2	126.9	55	11.1	+49.2	128.1	54	33.7	+49.9	129.2	53	55.4	+50.7	130.2	52	16.2	+51.4	131.3	52	36.2	+52.1	132.3	22
23	57	44.0	+45.7	123.3	57	10.5	+46.7	124.6	56	35.9	+47.7	125.8	56	00.3	+48.6	127.0	55	23.6	+49.5	128.2	54	07.6	+51.0	130.4	53	28.3	+51.7	131.4	23				
24	58	29.7	+44.9	122.1	57	57.2	+46.0	123.4	57	23.6	+47.1	124.7	56	48.9	+48.0	126.0	56	13.1	+49.0	127.2	55	36.3	+49.4	128.4	54	58.6	+50.6	129.5	24				
25	59	14.4	+44.1	120.8	58	43.2	+45.3	122.2	58	10.7	+46.4	123.6	57	36.9	+47.4	124.9	57	02.1	+48.4	126.1	56	26.1	+49.3	127.4	55	49.2	+50.2	128.5	55	11.4	+50.9	129.7	25
26	59	58.7	+43.3	119.4	59	28.5	+44.5	120.9	58	57.1	+45.6	122.3	58	24.3	+48.8	123.7	57	50.5	+47.8	125.1	57	15.4	+48.8	126.3	56	39.4	+49.6	127.6	26				
27	60	42.0	+42.3	118.0	60	13.0	+43.7	119.6	59	42.7	+44.9	121.1	59	11.1	+46.1	122.5	58	38.3	+47.1	123.9	58	04.2	+48.2	125.2	57	29.0	+49.2	126.5	27				
28	61	24.3	+41.4	116.6	60	56.7	+42.8	118.2	60	27.6	+44.1	119.7	59	57.2	+45.3	121.2	59	24.0	+46.0	122.6	58	52.4	+47.5	124.1	57	18.2	+48.5	125.4	28				
29	62	05.7	+40.3	115.0	61	39.5	+41.8	116.7	61	11.7	+43.2	118.4	61	40.5	+42.5	119.8	61	11.9	+45.7	121.4	61	39.9	+46.9	122.9	60	56.7	+47.6	123.5	29				
30	62	46.0	+39.1	113.4	62	21.3	+40.7	115.2	61	54.9	+42.2	116.9	61	27.0	+43.6	118.5	60	57.6	+44.9	120.1	60	26.8	+46.1	121.7	59	54.7	+47.2	123.1	59	21.2	+48.4	124.5	30
31	63	25.1	+38.0	111.8	63	02.0	+39.6	113.6	62	37.1	+41.2	115.4	62	10.6	+42.7	117.1	61	42.5	+44.0	118.7	61	12.9	+45.6	120.3	60	40.6	+47.6	123.4	31				
32	64	03.1	+36.6	110.0	63	41.6	+38.4	111.6	63	18.3	+40.0	113.8	63	53.3	+41.6	115.6	62	26.5	+43.1	117.3	61	58.3	+44.4	119.0	61	28.5	+45.7	120.6	62				
33	64	39.7	+35.2	108.2	64	20.0	+37.0	110.2	63	58.3	+38.9	112.1	63	34.9	+40.5	114.0	63	09.6	+42.1	115.8	62</td												

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $29^\circ$ ,  $331^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	38	12.2	-54.1	141.9	37	24.8	-54.4	142.4	36	37.1	-54.7	142.8	35	49.2	-55.1	143.3	35	00.9	-55.3	143.7	34	12.5	-55.7	144.1	33	23.7	-55.9	144.5	32	34.8	-56.2	144.9	0
1	37	18.1	-54.2	142.5	36	30.4	-54.6	142.9	35	42.4	-54.9	143.3	34	54.1	-55.1	143.8	34	05.6	-55.4	144.2	33	16.8	-55.7	144.6	32	27.8	-55.9	144.9	31	38.6	-56.2	145.3	1
2	36	23.9	-54.4	143.0	35	35.8	-54.6	143.4	34	47.5	-54.9	143.8	33	59.0	-55.3	144.2	33	10.2	-55.6	144.6	32	21.1	-55.8	145.0	31	31.9	-56.1	145.4	30	42.4	-56.3	145.7	3
3	35	29.5	-54.4	143.5	34	41.2	-54.8	143.9	33	52.6	-55.1	144.3	33	03.7	-55.4	144.7	32	14.6	-55.6	145.1	31	25.3	-55.9	145.4	30	35.8	-56.2	145.8	29	46.1	-56.4	146.1	4
4	34	35.1	-54.7	144.0	33	46.4	-54.9	144.4	32	57.5	-55.2	144.8	32	08.3	-55.5	145.2	31	19.0	-56.0	145.5	30	29.4	-56.4	145.9	29	39.6	-56.2	146.2	28	49.7	-56.4	146.5	9
5	33	40.4	-54.7	144.5	32	51.5	-55.1	144.9	32	02.3	-55.3	145.3	31	12.8	-55.5	145.6	30	23.2	-55.8	146.0	29	33.4	-56.0	146.3	28	43.4	-56.3	146.6	27	53.3	-56.5	146.9	5
6	32	45.7	-54.8	145.0	31	56.4	-55.1	145.4	31	07.0	-55.4	145.7	30	17.3	-55.7	146.1	29	27.4	-55.9	146.4	28	37.4	-56.2	146.7	27	47.1	-56.3	147.0	26	56.8	-56.6	147.3	6
7	31	50.9	-55.0	145.5	31	01.3	-55.2	145.8	30	11.6	-55.5	146.2	29	21.6	-55.7	146.5	28	31.5	-55.9	146.8	27	41.2	-56.2	147.1	26	50.8	-56.4	147.4	26	00.2	-56.6	147.6	7
8	30	55.9	-55.0	146.0	30	06.1	-55.3	146.3	29	16.1	-55.6	146.6	28	25.9	-55.8	146.9	27	35.6	-56.1	147.2	26	45.0	-56.2	147.5	25	54.4	-56.5	147.7	25	03.6	-56.7	148.0	8
9	30	00.9	-55.2	146.4	29	10.8	-55.4	146.7	28	20.5	-55.6	147.0	27	30.1	-55.9	147.3	26	39.5	-56.1	147.6	25	48.8	-56.3	147.9	24	57.9	-56.5	148.1	24	06.9	-56.7	148.4	9
10	29	05.7	-55.2	146.9	28	15.4	-55.5	147.2	27	24.9	-55.7	147.5	26	34.2	-55.9	147.7	25	43.4	-56.1	148.0	24	52.5	-56.4	148.2	23	01.4	-56.6	148.5	23	10.2	-56.8	148.7	10
11	28	10.5	-55.3	147.3	27	19.9	-55.6	147.6	26	29.2	-55.8	147.9	25	38.3	-56.0	148.1	24	47.3	-56.3	148.4	23	56.1	-56.4	148.6	22	13.4	-56.8	149.1	21	20.8	-57.0	149.5	11
12	27	15.2	-55.4	147.8	26	24.3	-55.6	148.0	25	33.4	-55.9	148.3	24	42.3	-56.1	148.5	23	51.0	-56.3	148.8	22	59.7	-56.5	149.0	21	16.6	-56.9	149.4	12				
13	26	19.8	-55.5	148.2	25	28.7	-55.7	148.4	24	37.5	-55.9	148.7	23	46.2	-56.1	148.9	22	54.7	-56.3	149.1	21	11.5	-56.7	149.6	20	19.7	-56.9	149.8	13				
14	25	24.3	-55.5	148.6	24	33.0	-55.8	148.9	23	41.6	-56.0	149.1	22	50.1	-56.2	149.3	21	58.4	-56.4	149.5	20	06.6	-56.5	149.7	20	14.8	-56.8	149.9	19	22.8	-56.8	150.1	14
15	24	28.8	-55.7	149.0	23	37.2	-55.8	149.3	22	45.6	-56.0	149.5	21	53.9	-56.3	149.7	20	02.0	-56.4	149.9	19	10.1	-56.6	150.1	19	18.0	-56.8	150.3	18	25.9	-57.0	150.4	15
16	23	33.1	-55.6	149.4	22	41.4	-55.9	149.7	21	49.6	-56.1	149.9	20	57.6	-56.3	150.1	19	13.5	-56.7	150.4	18	21.2	-56.8	150.6	17	28.9	-57.0	150.8	16				
17	22	37.5	-55.8	149.8	21	45.5	-55.9	150.1	20	53.5	-56.2	150.2	19	01.3	-56.3	150.4	18	19.1	-56.5	150.6	17	24.4	-56.9	150.9	16	31.9	-57.0	151.1	17				
18	21	41.7	-55.8	150.2	20	49.6	-56.0	150.4	19	57.3	-56.1	150.6	18	05.0	-56.4	150.8	17	20.1	-56.7	151.1	16	27.5	-56.9	151.3	15	34.9	-57.1	151.4	18				
19	20	45.9	-55.8	150.6	19	53.6	-56.1	150.8	19	01.2	-56.3	151.0	18	08.6	-56.4	151.2	17	16.0	-56.5	151.3	16	23.4	-56.8	151.5	15	30.6	-56.9	151.6	14	37.8	-57.1	151.7	19
20	19	50.1	-55.9	151.0	18	57.5	-56.0	151.2	17	08.4	-56.3	151.4	16	19.5	-56.6	151.7	15	26.6	-56.8	151.8	14	33.7	-57.0	151.9	13	40.7	-57.1	152.0	20				
21	18	54.2	-56.0	151.4	18	01.5	-56.2	151.6	17	08.6	-56.3	151.7	16	15.8	-56.5	151.9	15	22.8	-56.6	152.0	14	29.8	-56.8	152.1	13	36.7	-56.9	152.2	21				
22	17	58.2	-56.0	151.8	17	05.3	-56.1	151.9	16	12.3	-56.3	152.1	15	19.3	-56.5	152.2	14	26.2	-56.7	152.3	13	33.0	-56.9	152.5	12	39.8	-57.0	152.6	11	46.5	-57.2	152.7	22
23	17	02.2	-56.0	152.0	16	09.2	-56.3	152.3	15	16.0	-56.4	152.4	14	22.8	-56.6	152.6	13	29.5	-56.7	152.7	12	36.1	-56.8	152.8	10	45.7	-57.1	153.0	23				
24	16	06.2	-56.1	152.5	15	12.9	-56.2	152.7	14	19.6	-56.4	152.8	13	26.2	-56.6	152.9	11	39.3	-56.9	153.1	10	45.7	-57.0	153.2	9	52.2	-57.2	153.3	24				
25	15	10.1	-56.1	152.9	14	16.7	-56.3	153.0	13	23.2	-56.4	153.1	12	29.6	-56.6	153.3	11	36.0	-56.7	153.3	10	42.4	-56.9	153.4	9	48.7	-57.1	153.5	25				
26	14	14.0	-56.1	153.3	13	20.4	-56.3	153.4	12	26.8	-56.5	153.5	11	33.0	-56.6	153.6	10	39.3	-56.8	153.7	9	45.5	-57.0	153.8	8	51.6	-57.0	153.8	7	57.8	-57.2	153.9	26
27	13	17.9	-56.2	153.6	12	24.1	-56.3	153.7	11	30.3	-56.5	153.8	10	36.4	-56.6	153.9	9	42.5	-56.8	154.0	8	48.5	-56.9	154.1	7	54.6	-57.1	154.2	27				
28	12	21.7	-56.2	154.0	11	27.8	-56.4	154.1	10	33.8	-56.5	154.2	9	39.8	-56.7	154.3	8	45.7	-56.8	154.4	7	51.6	-57.0	154.5	6	6	-57.1	154.5	28				
29	11	25.5	-56.2	154.4	10	31.4	-56.4	154.5	9	37.3	-56.6	154.5	8	43.1	-56.7	154.6	7	48.9	-56.9	154.7	6	54.6	-56.9	154.7	5	60.4	-57.1	154.8	29				
30	10	29.3	-56.2	154.7	9	35.0	-56.4	154.8	8	40.7	-56.5	154.9	7	46.4	-56.6	155.0	6	52.0	-56.8	155.0	5	57.7	-57.0	155.0	4	63.3	-57.2	155.1	30				
31	9	33.1	-56.3	155.1	8	38.6	-56.4	155.1	7	44.2	-56.6	155.2	6	50.9	-56.7	155.3	5	57.7	-57.0	155.3	4	64.1	-57.1	155.4	31								
32	8	36.8	-56.3	155.4	7	42.4	-56.5	155.5	6	47.6	-56.6	155.6	5	54.3	-56.7	155.6	4	61.1	-57.1	155.4	3	11.6	-57.3	155.4	29								
33	7	40.5	-56.3	155.8	6	45.8	-56.5	155.8	5	51.0	-56.6	155.9	4	58.3	-56.8	155.9	3	60.9	-57.0	156.0	2	17.1	-57.3	156.0	33								
34	6	44.2	-56.3	156.1	5	47.8	-56.4	156.1	4	53.4	-56.6	156.2	3	60.8	-56.8	156.2	2	12.5	-57.0	156.3	1	17.1	-57.1	156.3	34								
35	5	47.9	-56.3	156.5	4	52.9	-56.5	156.5	3	57.8	-56.6	156.5	2	60.2	-56.8																		

30°, 330° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	37 45.7	+53.6	140.8	36 59.0	+54.0	141.2	36 12.1	+54.3	141.7	35 24.9	+54.6	142.2	34 37.3	+55.0	142.6	33 49.6	+55.2	143.0	33 01.5	+55.6	143.4	32 13.2	+55.9	143.8	0
1	38 39.3	+53.4	140.2	37 53.0	+53.8	140.7	37 06.4	+54.2	141.2	36 19.5	+54.5	141.6	35 32.3	+54.9	142.1	34 44.8	+55.2	142.5	33 57.1	+55.4	142.9	33 09.1	+55.7	143.3	1
2	39 32.7	+53.2	139.6	38 46.8	+53.6	140.1	38 00.6	+54.0	140.6	37 14.0	+54.4	141.1	36 27.2	+54.7	141.6	35 40.0	+55.0	142.0	34 52.5	+55.4	142.5	34 04.8	+55.7	142.9	2
3	40 25.9	+53.0	139.0	39 40.4	+53.5	139.6	38 54.6	+53.3	140.1	38 08.4	+54.2	140.6	37 21.9	+54.6	141.1	36 35.0	+55.0	141.6	35 47.9	+55.2	142.0	35 00.5	+55.5	142.4	3
4	41 18.9	+52.9	138.4	40 33.9	+53.2	139.0	39 48.4	+53.7	139.7	39 02.6	+54.1	140.0	38 16.5	+54.4	140.6	37 30.0	+54.7	141.0	36 43.1	+55.2	141.5	35 56.0	+55.5	142.0	4
5	42 11.8	+52.6	137.8	41 27.1	+53.1	138.4	40 42.1	+53.5	138.9	39 56.7	+53.9	139.5	39 10.9	+54.3	140.0	38 24.7	+54.7	140.5	37 38.3	+55.0	141.0	36 51.5	+55.3	141.5	5
6	43 04.4	+52.4	137.1	42 20.2	+52.9	137.7	41 35.6	+53.3	138.3	40 50.6	+53.7	138.9	40 05.2	+54.1	139.5	39 19.4	+54.5	140.0	38 33.3	+54.8	140.5	37 46.8	+55.2	141.0	6
7	43 56.8	+52.1	136.4	43 13.1	+52.6	137.1	42 28.9	+53.1	137.7	41 44.3	+53.5	138.3	40 59.3	+53.9	139.3	40 13.9	+54.3	139.5	39 28.1	+54.7	140.0	38 42.0	+55.1	140.5	7
8	44 48.9	+51.9	135.7	44 05.7	+52.4	136.4	43 22.0	+52.9	137.1	42 37.8	+53.4	137.7	41 53.2	+53.8	138.3	41 08.2	+54.2	138.9	40 22.8	+54.6	139.5	39 37.1	+54.9	140.0	8
9	45 40.8	+51.6	135.0	44 58.1	+52.1	135.7	44 14.9	+52.6	136.4	43 31.2	+53.1	137.1	42 47.0	+53.6	137.7	42 02.4	+54.0	138.3	41 17.4	+54.4	138.9	40 32.0	+54.8	139.5	9
10	46 32.4	+51.3	134.3	45 50.2	+51.9	135.0	45 07.5	+52.4	135.7	44 24.3	+52.9	136.4	43 40.6	+53.4	137.1	42 56.4	+53.8	137.7	42 11.8	+54.2	138.3	41 26.8	+54.6	138.9	10
11	47 23.7	+51.0	133.5	46 42.1	+51.6	134.3	45 59.9	+52.2	135.0	45 17.2	+52.7	135.8	44 34.0	+53.1	136.5	43 50.2	+53.6	137.1	43 06.0	+54.1	137.8	42 21.4	+54.5	138.4	11
12	48 14.7	+50.7	132.7	47 33.7	+51.3	133.6	46 52.1	+51.8	134.3	46 09.9	+52.4	135.1	45 27.1	+52.9	135.8	44 43.8	+53.2	136.5	44 00.1	+53.8	137.2	43 15.9	+54.2	137.8	12
13	49 05.4	+50.3	131.9	48 25.0	+51.0	132.8	47 43.9	+51.6	133.6	47 02.3	+52.1	134.4	46 20.0	+52.7	135.1	45 37.2	+53.2	135.8	44 53.9	+53.7	136.5	44 10.1	+54.1	137.2	13
14	49 55.7	+50.0	131.1	49 16.0	+50.6	132.0	48 35.5	+51.2	132.8	47 54.4	+51.8	133.6	47 12.7	+52.4	134.4	46 30.4	+53.0	135.2	45 47.6	+53.4	135.9	45 04.2	+53.9	136.6	14
15	50 45.7	+49.5	130.2	50 06.6	+50.2	131.1	49 26.7	+51.0	132.0	48 46.2	+51.6	132.8	48 05.1	+52.1	133.7	47 23.4	+52.6	134.5	46 41.0	+53.2	135.3	45 58.1	+53.7	136.0	15
16	51 35.2	+49.2	129.3	50 56.8	+49.9	130.3	50 17.7	+50.5	131.2	49 37.8	+51.2	132.1	48 57.2	+51.9	133.0	48 16.0	+52.4	133.8	47 34.2	+53.0	134.6	46 51.8	+53.5	135.3	16
17	52 24.4	+48.6	128.4	51 46.7	+49.4	129.4	51 08.2	+50.2	130.4	50 29.0	+50.8	131.3	49 49.1	+51.5	132.2	49 08.4	+52.1	133.0	48 27.2	+52.6	133.9	47 45.3	+53.2	134.7	17
18	53 13.0	+48.2	127.4	52 36.1	+49.0	128.5	51 58.4	+49.7	129.5	51 19.8	+50.5	130.4	50 40.6	+51.1	131.4	50 00.5	+51.8	132.3	49 19.8	+52.4	133.1	48 38.5	+53.0	134.0	18
19	54 01.2	+47.6	126.4	53 25.1	+48.5	127.5	52 48.1	+49.4	128.6	52 10.3	+50.1	129.6	51 31.7	+50.8	130.5	50 52.3	+51.5	131.5	50 12.2	+52.1	132.4	49 31.5	+52.6	133.3	19
20	54 48.8	+47.1	125.4	54 13.6	+48.0	126.5	53 37.5	+48.8	127.6	53 00.4	+49.7	128.7	52 22.5	+50.4	129.7	51 43.8	+51.1	130.7	51 04.3	+51.8	131.6	50 24.1	+52.4	132.5	20
21	55 35.9	+46.5	124.3	55 01.6	+47.5	125.5	54 26.3	+48.4	126.6	53 50.1	+50.2	127.7	53 12.9	+50.0	128.8	52 34.9	+50.7	129.8	51 56.1	+51.4	130.8	51 16.5	+52.1	131.7	21
22	56 22.4	+45.9	123.2	55 49.1	+46.8	124.4	55 14.7	+47.8	125.6	54 39.3	+48.6	126.7	54 02.9	+49.5	127.8	53 25.6	+51.2	129.9	52 08.6	+51.7	130.9	52 08.6	+51.7	130.9	22
23	57 08.3	+45.1	122.0	56 35.9	+46.3	123.3	56 02.5	+47.2	124.5	55 27.9	+48.2	125.7	54 52.4	+49.1	126.9	55 15.9	+49.7	128.0	53 38.6	+50.6	129.1	53 00.3	+51.4	130.1	23
24	57 53.4	+44.5	120.8	57 22.2	+45.5	122.1	56 49.7	+46.4	123.4	56 16.1	+47.6	124.7	55 41.5	+48.5	125.9	55 05.8	+49.4	127.0	54 29.2	+50.2	128.2	53 51.7	+51.0	129.2	24
25	58 37.9	+43.6	119.5	58 07.7	+44.8	120.9	57 36.3	+45.9	122.2	57 03.7	+47.0	123.5	56 30.0	+48.0	124.8	55 55.2	+48.4	126.0	55 19.4	+49.8	127.2	54 42.7	+50.5	128.3	25
26	59 21.5	+42.8	118.1	58 52.5	+44.1	119.6	58 22.2	+45.2	121.0	57 50.7	+46.3	122.4	57 18.0	+47.3	123.7	56 44.1	+48.3	125.0	56 09.2	+49.2	126.2	55 33.2	+50.1	127.4	26
27	60 04.3	+41.8	116.8	59 36.6	+43.2	118.3	59 07.4	+44.5	119.8	58 37.0	+45.6	121.2	58 05.3	+46.7	122.6	57 32.4	+47.8	123.9	56 58.4	+48.7	125.2	56 23.3	+49.7	126.4	27
28	60 46.1	+40.9	115.3	60 19.8	+42.2	116.9	59 51.9	+43.6	118.4	59 22.6	+44.9	119.9	58 52.0	+46.1	121.4	58 20.2	+47.1	122.8	57 47.1	+48.2	124.1	57 13.0	+49.0	125.4	28
29	61 27.0	+39.9	113.8	61 02.0	+41.4	115.4	60 35.5	+42.7	117.1	60 07.5	+44.0	118.6	58 38.1	+45.2	120.1	59 07.3	+46.4	121.6	58 35.3	+47.5	123.0	60 02.0	+48.6	124.3	29
30	62 06.9	+38.7	112.2	61 43.4	+40.2	113.9	61 18.2	+41.8	115.6	60 51.5	+43.2	117.2	60 23.3	+44.5	118.8	59 53.7	+45.7	120.3	59 22.8	+46.8	121.8	58 50.6	+47.9	123.2	30
31	62 45.6	+37.5	110.6	62 23.6	+39.2	112.3	62 00.0	+40.7	114.1	61 34.7	+42.1	115.8	61 07.8	+43.6	117.4	60 39.4	+44.9	119.0	60 09.6	+46.1	120.5	59 38.5	+47.2	122.0	31
32	63 23.1	+36.1	108.8	63 02.8	+37.9	110.7	62 40.7	+39.6	112.5	62 16.8	+41.2	114.3	61 51.4	+42.6	116.0	61 24.3	+44.0	117.6	60 55.7	+45.3	119.2	60 25.7	+46.6	120.8	32
33	63 59.2	+34.8	107.0	63 40.7	+36.6	109.0	63 20.3	+38.3	110.9	62 58.0	+40.0	112.7	62 34.0	+41.6	114.5	62 08.3	+43.1	116.2	61 41.0	+44.5	117.9	61 12.3	+45.7	119.5	33
34	64 34.0	+33.5	105.2	64 17.3	+35.1	107.2	63 58.6	+37.1	109.1	63 38.0	+38.9	111.0	63 15.6	+40.5	112.9	62 51.4	+42.1	114.7	62 25.5	+43.5	116.4	61 58.0	+44.9	118.1	34
35	65 07.3	+31.7	103.2	64 52.6	+33.7	105.3	64 35.7	+37.5	107.3	64 16.9	+37.5	109.3	63 56.1	+39.3	111.2	63 33.5	+40.9	113.1	63 09.0	+42.6	114.9	62 42.9	+44.0	116.7	35
36	66 39.0	+30.0	101.2	65 26.3	+32.2	103.3	65 11.4	+34.2	105.4	64 54.4	+36.2	107.5													

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $30^\circ$ ,  $330^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	37 45.7 -53.8 140.8	36 59.0 -54.1 141.2	36 12.1 -54.5 141.7	35 24.9 -54.8 142.2	34 37.3 -55.0 142.6	33 49.6 -55.4 143.0	33 01.5 -55.7 143.4	32 13.2 -55.9 143.8	0																
1	36 51.9 -53.9 141.3	36 04.9 -54.2 141.8	35 17.6 -54.5 142.2	34 30.1 -54.9 142.7	33 42.3 -55.2 143.1	32 54.2 -55.5 143.5	32 05.8 -55.7 143.8	31 17.3 -56.0 144.2	1																
2	35 58.0 -54.0 141.9	35 10.7 -54.4 142.3	34 23.1 -54.7 142.7	33 35.2 -55.0 143.1	32 47.1 -55.3 143.5	31 58.7 -55.6 143.9	31 10.1 -55.8 144.3	30 21.3 -56.1 144.6	2																
3	35 04.0 -54.2 142.4	34 16.3 -54.5 142.8	33 28.4 -54.8 143.2	32 40.2 -55.1 143.6	31 51.8 -55.4 144.0	31 03.1 -55.6 144.3	30 14.3 -56.0 144.7	29 25.2 -56.2 145.0	3																
4	34 09.8 -54.3 142.9	33 21.8 -54.6 143.3	32 33.6 -55.1 143.7	31 45.2 -55.2 144.1	30 56.4 -55.6 144.4	30 07.5 -55.8 144.8	29 18.3 -56.0 145.1	28 29.0 -56.2 145.4	4																
5	33 15.5 -54.4 143.4	32 27.2 -54.8 143.8	31 38.6 -55.0 144.2	30 49.9 -55.3 144.5	30 00.9 -55.6 144.9	29 11.7 -55.8 145.2	28 22.3 -56.0 145.5	27 32.8 -56.3 145.8	5																
6	32 21.1 -54.6 143.9	31 32.4 -54.8 144.3	30 43.6 -55.1 144.7	29 54.6 -55.4 145.0	29 05.3 -55.6 145.3	28 15.9 -55.9 145.6	27 26.3 -56.2 145.9	26 36.5 -56.4 146.2	6																
7	31 26.5 -54.6 144.4	30 37.6 -54.9 144.8	29 48.5 -55.2 145.1	28 59.2 -55.5 145.4	28 09.7 -55.8 145.7	27 20.0 -56.0 146.0	26 30.1 -56.2 146.3	25 40.1 -56.4 146.6	7																
8	30 31.9 -54.8 144.9	29 42.7 -55.1 145.2	28 53.3 -55.3 145.6	28 03.7 -55.6 145.9	27 13.9 -55.8 146.2	26 24.0 -56.0 146.4	25 33.9 -56.2 146.7	24 43.7 -56.5 147.0	8																
9	29 37.1 -54.9 145.4	28 47.6 -55.1 145.7	27 58.0 -55.4 146.0	27 08.1 -55.6 146.3	26 18.1 -55.8 146.6	25 28.0 -56.1 146.8	24 37.7 -56.3 147.1	23 47.2 -56.5 147.3	9																
10	28 42.2 -54.9 145.8	27 52.5 -55.2 146.1	27 02.6 -55.5 146.4	26 12.5 -55.7 146.7	25 22.3 -56.0 147.0	24 31.9 -56.2 147.2	23 41.4 -56.4 147.5	22 50.7 -56.6 147.7	10																
11	27 47.3 -55.1 146.3	26 57.3 -55.3 146.6	26 07.1 -55.5 146.9	25 16.8 -55.8 147.1	24 26.3 -56.0 147.4	23 35.7 -56.2 147.6	22 45.0 -56.4 147.8	21 54.1 -56.6 148.1	11																
12	26 52.9 -55.1 146.8	26 02.0 -55.4 147.0	25 11.6 -55.5 147.3	24 21.0 -55.8 147.5	23 30.3 -56.0 147.8	22 39.5 -56.3 148.0	21 48.6 -56.5 148.2	20 57.5 -56.7 148.4	12																
13	25 57.1 -55.2 147.2	25 06.6 -55.4 147.5	24 16.0 -55.7 147.7	23 25.2 -55.9 147.9	22 34.3 -56.1 148.2	21 43.2 -56.3 148.4	20 52.1 -56.5 148.6	20 00.8 -56.7 148.8	13																
14	25 01.9 -55.3 147.6	24 11.2 -55.6 147.9	23 20.3 -55.8 148.1	22 29.3 -56.0 148.3	21 38.2 -56.2 148.5	20 46.9 -56.4 148.7	19 55.6 -56.6 148.9	19 04.1 -56.7 149.1	14																
15	24 06.6 -55.3 148.1	23 15.6 -55.5 148.3	22 24.5 -55.8 148.5	21 33.3 -56.0 148.7	20 42.0 -56.2 148.9	19 50.5 -56.4 149.1	18 59.0 -56.6 149.3	18 07.4 -56.8 149.5	15																
16	23 11.3 -55.5 148.5	22 20.1 -55.7 148.7	21 28.7 -55.8 148.9	20 37.3 -56.1 149.1	19 45.8 -56.3 149.3	18 54.1 -56.4 149.5	18 02.4 -56.6 149.6	17 10.6 -56.8 149.8	16																
17	22 15.8 -55.4 148.9	21 24.4 -55.7 149.1	20 32.9 -55.9 149.3	19 41.2 -56.1 149.5	18 49.5 -56.3 149.7	17 57.7 -56.5 149.8	17 05.8 -56.7 150.0	16 13.8 -56.9 150.1	17																
18	21 20.4 -55.6 149.3	20 28.7 -55.7 149.5	19 37.0 -56.0 149.7	18 45.1 -56.1 149.9	17 53.2 -56.3 150.0	17 01.2 -56.5 150.2	16 09.1 -56.7 150.3	15 16.9 -56.8 150.5	18																
19	20 24.8 -55.6 149.7	19 33.0 -55.8 149.9	18 41.0 -56.0 150.1	17 49.0 -56.2 150.2	16 56.9 -56.4 150.4	16 04.7 -56.6 150.5	15 12.4 -56.7 150.7	14 20.1 -56.9 150.8	19																
20	19 29.2 -55.6 150.1	18 37.2 -55.9 150.3	17 45.0 -56.0 150.4	16 52.8 -56.2 150.6	15 59.5 -56.4 150.7	15 08.1 -56.6 150.9	14 15.7 -56.8 151.0	13 23.2 -57.0 151.1	20																
21	18 33.6 -55.7 150.5	17 41.3 -55.9 150.7	16 49.0 -56.1 150.8	15 56.6 -56.3 151.0	15 04.1 -56.5 151.1	14 11.5 -56.6 151.2	13 18.9 -56.8 151.3	12 26.2 -56.9 151.4	21																
22	17 37.9 -55.7 150.9	16 45.4 -55.9 151.0	15 52.9 -56.1 151.2	15 00.3 -56.3 151.3	14 07.6 -56.5 151.4	13 14.9 -56.7 151.6	12 22.1 -56.8 151.7	11 29.3 -57.0 151.8	22																
23	16 42.2 -55.8 151.3	15 49.5 -56.0 151.4	14 56.8 -56.2 151.6	14 04.0 -56.3 151.7	13 11.1 -56.5 151.8	12 18.2 -56.6 151.9	11 25.3 -56.8 152.0	10 32.3 -57.0 152.1	23																
24	15 46.4 -55.9 151.7	14 53.6 -56.0 151.8	13 40.6 -56.2 151.9	13 07.7 -56.4 152.0	12 14.6 -56.5 152.1	11 21.6 -56.7 152.2	10 28.5 -56.9 152.3	9 35.3 -57.0 152.4	24																
25	14 50.5 -55.8 152.0	13 57.5 -56.0 152.2	13 04.4 -56.2 152.3	12 11.3 -56.4 152.4	11 18.1 -56.5 152.5	10 24.4 -56.7 152.6	9 31.6 -56.9 152.6	8 38.3 -57.0 152.7	25																
26	13 54.7 -55.9 152.4	13 01.5 -56.1 152.5	12 08.2 -56.2 152.6	11 14.9 -56.4 152.7	10 21.6 -56.6 152.8	9 28.2 -56.8 152.9	8 34.7 -56.9 153.0	7 41.3 -57.1 153.0	26																
27	12 58.8 -55.9 152.8	12 05.4 -56.1 152.9	11 12.0 -56.3 153.0	10 18.5 -56.4 153.1	9 25.0 -56.6 153.2	8 31.4 -56.7 153.2	7 37.8 -56.9 153.3	6 44.2 -57.0 153.3	27																
28	12 02.9 -56.0 153.2	11 09.3 -56.1 153.3	10 15.7 -56.3 153.3	9 22.1 -56.5 153.4	8 28.4 -56.6 153.5	7 34.7 -56.8 153.6	6 40.9 -56.9 153.6	5 47.2 -57.1 153.7	28																
29	11 06.9 -56.0 153.5	10 13.2 -56.2 153.6	9 19.4 -56.3 153.7	8 25.6 -56.5 153.8	7 31.8 -56.7 153.8	6 37.9 -56.8 153.9	5 44.0 -56.9 153.9	4 50.1 -57.0 154.0	29																
30	10 10.9 -56.0 153.9	9 17.0 -56.1 154.0	8 23.1 -56.3 154.0	7 29.1 -56.5 154.1	6 35.1 -56.6 154.2	5 41.1 -56.8 154.2	4 47.1 -56.9 154.2	3 53.1 -57.1 154.3	30																
31	9 14.9 -56.0 154.3	8 20.9 -56.2 154.3	7 26.8 -56.4 154.4	6 32.6 -56.5 154.4	5 38.5 -56.6 154.5	4 44.3 -56.8 154.5	3 50.2 -57.0 154.6	2 56.0 -57.1 154.6	31																
32	8 18.9 -56.1 154.6	7 24.7 -56.2 154.7	6 30.4 -56.3 154.7	5 36.1 -56.5 154.8	4 41.9 -56.7 154.8	3 47.5 -56.8 154.9	2 53.2 -56.9 154.9	1 58.9 -57.1 154.9	32																
33	7 22.8 -56.0 155.0	6 28.5 -56.3 155.0	5 34.1 -56.4 155.1	4 39.6 -56.5 155.1	3 45.2 -56.7 155.2	2 50.7 -56.8 155.2	1 56.3 -57.0 155.2	0 10.8 -57.1 155.2	33																
34	6 26.8 -56.1 155.3	5 32.2 -56.2 155.4	4 37.7 -56.4 155.4	3 43.1 -56.5 155.5	2 48.5 -56.7 155.5	1 53.9 -56.8 155.5	0 59.3 -56.9 155.5	0 0.47 -57.1 155.5	34																
35	5 30.7 -56.1 155.7	4 36.0 -56.2 155.7	3 41.3 -56.4 155.8	2 46.6 -56.6 155.8	1 51.8 -56.6 155.8	0 57.1 -56.8 155.8	0 0.24 -57.0 155.8	0 52.4 -57.0 155.8	35																
36	4 34.6 -56.1 156.1	3 39.8 -56.2 156.1	2 44.9 -56.4 156.1	1 50.0 -56.5 156.1	0 55.2 -56.7 156.1	0 0.03 -56.8 156.1	0 54.6 +56.9 23.9	1 49.4 +57.1 23.9	36																
37	3 38.5 -56.1 156.4	2 43.5 -56.3 156.4	1 48.8 -56.4 156.5	0 53.5 -56.5 156.5	0 0.15 +56.7 23.5	0 56.5 +56.8 23.5	1 51.5 +57.0 23.5	2 46.5 +57.1 23.6	37																
38	2 42.4 -56.1 156.8	1 47.2 -56.2 156.8	0 52.1 -56.4 156.8	0 52.1 -56.6 156.8	0 58.2 +56.7 23.2	1 53.3 +56.8 23.2	2 48.5 +56.9 23.2	3 43.6 +57.1 23.3	38																
39	1 46.3 -56.2 157.1	0 51.0 -56.3 157.1	0 0.43 +56.6 22.9	0 59.6 +56.5 22.9	1 54.9 +56.6 22.9	2 50.1 +56.9 22.9	3 45.4 +56.9 22.9	4 40.7 +57.0 22.9	39																
40	0 50.1 -56.1 157.5	0 0.053 +56.2 22.5	1 0.077 +56.4 22.5	1 56.1 +56.6 22.5	2 51.5 +56.7 22.6	3 47.0 +56.8 22.6	4 42.3 +57.0 22.6	5 37.7 +57.1 22.6	40																
41	0 0.60 +56.1 22.2	1 0.15 +56.3 22.2	2 1.57 +56.4 22.2	2 52.7 +56.5 22.2	3 48.2 +56.7 22.2	4 43.8 +56.7 22.2	5 39.3 +56.9 22.3	6 34.8 +57.0 22.3	41																
42	1 0.21 +56.1 21.8	1 57.8 +56.3 21.8	2 53.5 +56.4 21.8	3 49.2 +56.5 21.9	4 44.9 +56.6 21.9	5 40.5 +56.8 21.9	6 36.2 +56.9 22.0	7 31.8 +57.1 22.0	42																
43	1 58.2 +56.1 21.5	2 54.1 +56.2 21.5	3 49.9 +56.4 21.5	4 45.7 +56.5 21.5	5 41.5 +56.7 21.6	6 37.3 +56.8 21.6	7 33.1 +56.9 21.6	8 28.9 +57.0 21.7	43																
44	2 54.3 +56.2 21.1	3 50.3 +56.3 21.1	4 46.3 +56.4 21.2	5 42.2 +56.5 21.2	6 38.2 +56.6 21.2	7 34.1 +56.7 21.3	8 30.0 +56.8 21.3	9 25.9 +57.0 21.4	44																
45	3 50.5 +56.1 20.8	4 46.6 +56.2 20.8	5 42.7 +56.3 20.8	6 38.7 +56.5 20.9	7 34.8 +56.6 20.9	8 30.8 +56.8 20.9	9 26.9 +56.8 21.0	10 22.9 +56.9 21.1	45																
46	4 46.6 +56.1 20.4	5 42.8 +56.2 20.4	6 39.0 +56.4 20.5	7 35.2 +56.5 20.5	8 31.4 +56.6 20.6	9 27.6 +56.7 20.6	10 23.7 +56.9 20.7	11 19.8 +57.0 20.7	46																
47	5 42.7 +56.0 20.0	6 39.0 +56.2 20.1	7 35.4 +56.3 20.1	8 31.7 +56.4 20.2	9 28.0 +56.6 20.2	10 24.3 +56.7 20.3	11 20.6 +56.8 20.4	12 16.8 +56.9 20.4	47																
48	6 38.7 +56.1 19.7	7 35.2 +56.2 19.7	8 31.7 +56.3 19.8	9 28.1 +56.5 19.8	10 24.6 +56.5 19.9	11 21.0 +56.7 20.0	12 17.4 +56.7 20.1	13 14.2 +56.7 20.1	48																
49	7 34.8 +56.0 19.3	8 31.4 +56.2 19.4	9 28.0 +56.3 19.4	10 24.6 +56.4 19.5																					

31°, 329° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	37 18.5	+53.3	139.6	36 32.6	+53.7	140.1	35 46.4	+54.0	140.6	34 59.9	+54.4	141.0	34 13.1	+54.7	141.5	33 26.0	+55.1	141.9	32 38.7	+55.3	142.3	31 51.1	+55.6	142.7	0
1	38 11.8	+53.1	139.1	37 26.3	+53.5	139.6	36 40.4	+53.9	140.1	35 54.3	+54.2	140.5	35 07.8	+54.6	141.0	34 21.1	+54.9	141.4	33 34.0	+55.2	141.8	32 46.7	+55.5	142.2	1
2	39 04.9	+52.8	138.5	38 19.8	+53.3	139.0	37 34.3	+53.7	139.5	36 48.5	+54.1	140.0	36 02.4	+54.4	140.5	35 16.0	+54.8	140.9	34 29.2	+55.2	141.4	33 42.2	+55.5	141.8	2
3	39 57.7	+52.7	137.9	39 13.1	+53.1	138.4	38 28.0	+53.5	138.9	37 42.6	+53.9	139.4	36 56.8	+54.3	139.9	36 10.8	+54.6	140.4	35 24.4	+55.0	140.9	34 37.7	+55.3	141.3	3
4	40 50.4	+52.5	137.2	40 06.2	+52.9	137.8	39 21.5	+53.3	138.4	38 36.5	+53.8	138.9	37 51.1	+54.2	139.4	37 05.4	+54.6	139.9	36 19.4	+54.8	140.4	35 33.0	+55.2	140.8	4
5	41 42.9	+52.3	136.6	40 59.1	+52.8	137.2	40 14.9	+53.2	137.8	39 30.3	+53.6	138.3	38 45.3	+54.0	138.9	37 59.9	+54.4	139.4	37 14.2	+54.8	139.9	36 28.2	+55.1	140.4	5
6	42 35.2	+52.0	135.9	41 51.9	+52.5	136.5	41 08.1	+53.0	137.1	40 23.9	+53.4	137.7	39 39.3	+53.8	138.3	38 54.3	+54.2	138.8	38 09.0	+54.5	139.4	37 23.3	+54.9	139.9	6
7	43 27.2	+51.8	135.2	42 44.4	+52.2	135.9	42 01.1	+52.7	136.5	41 17.3	+53.2	137.1	40 33.1	+53.7	137.7	39 48.5	+54.1	138.3	39 03.5	+54.5	138.8	38 18.2	+54.8	139.4	7
8	44 19.0	+51.5	134.5	43 36.6	+52.1	135.2	42 53.8	+52.6	135.9	40 10.5	+53.0	136.5	41 26.8	+53.4	137.1	40 42.6	+53.8	137.7	39 58.0	+54.3	138.3	39 13.0	+54.7	138.8	8
9	45 10.5	+51.2	133.8	44 28.7	+51.8	134.5	43 46.4	+52.3	135.2	43 03.5	+52.8	135.9	42 20.2	+53.3	136.5	41 36.5	+53.7	137.1	40 52.3	+54.1	137.7	40 07.7	+54.5	138.3	9
10	46 01.7	+51.0	133.1	45 20.5	+51.5	133.8	44 38.7	+52.0	134.5	43 56.3	+52.6	135.2	43 13.5	+53.0	135.9	42 30.2	+53.5	136.5	41 46.4	+54.0	137.1	41 02.2	+54.4	137.7	10
11	46 52.7	+50.6	132.3	46 12.0	+51.2	133.1	45 30.7	+51.8	133.8	44 48.9	+52.3	134.5	44 06.5	+52.9	135.2	43 23.7	+53.3	135.9	42 40.4	+53.7	136.6	41 56.6	+54.2	137.2	11
12	47 43.3	+50.2	131.5	47 03.2	+50.9	132.3	46 22.5	+51.5	133.1	45 41.2	+52.1	133.9	44 59.4	+52.6	134.6	44 17.0	+53.1	135.3	43 34.1	+53.6	135.9	42 50.8	+54.0	136.6	12
13	48 33.5	+50.0	130.7	47 54.1	+50.6	131.5	47 14.0	+51.2	132.3	46 33.3	+51.7	133.1	45 52.0	+52.3	133.9	45 10.1	+52.8	134.6	44 27.7	+53.3	135.3	43 44.8	+53.8	136.0	13
14	49 23.5	+49.5	129.8	48 44.7	+50.2	130.7	48 05.2	+50.9	131.6	47 25.0	+51.5	132.4	46 44.3	+52.0	133.2	46 02.9	+52.6	133.9	45 21.0	+53.1	134.7	44 38.6	+53.6	135.4	14
15	50 13.0	+49.1	129.0	49 34.9	+49.8	129.9	48 56.1	+50.5	130.8	48 16.5	+51.2	131.6	47 36.3	+51.8	132.5	46 55.5	+52.4	133.2	46 14.1	+52.9	134.0	45 32.2	+53.4	134.7	15
16	51 02.1	+48.7	128.1	50 24.7	+49.5	129.0	49 46.6	+50.1	129.8	49 07.7	+50.8	130.4	48 28.1	+51.5	131.7	47 47.9	+52.1	132.5	47 07.0	+52.7	133.3	46 25.6	+53.1	134.1	16
17	51 50.8	+48.2	127.1	51 14.2	+49.0	128.1	50 36.7	+49.8	129.1	49 58.5	+50.5	130.0	49 19.6	+51.1	130.9	48 40.0	+51.7	131.8	47 59.7	+52.3	132.6	47 18.7	+52.9	133.4	17
18	52 39.0	+47.8	126.2	52 03.2	+48.6	127.2	51 26.5	+49.4	128.2	50 49.0	+50.1	129.2	50 10.7	+50.8	130.1	49 31.7	+51.5	131.0	48 52.0	+52.1	131.9	48 11.6	+52.7	132.7	18
19	53 26.8	+47.2	125.1	52 51.8	+48.0	126.2	52 15.9	+48.9	127.3	51 39.1	+49.7	128.3	51 01.5	+50.4	129.3	50 23.2	+51.1	130.2	49 44.1	+51.7	131.1	49 04.3	+52.3	132.0	19
20	54 14.0	+46.6	124.1	53 39.8	+47.6	125.2	53 04.8	+48.4	126.3	52 28.8	+49.2	127.4	51 51.9	+50.1	128.4	51 14.3	+50.7	129.4	50 35.8	+51.4	130.3	49 56.6	+52.1	131.2	20
21	55 00.6	+46.1	123.0	54 27.4	+47.0	124.2	53 53.2	+47.9	125.3	53 18.0	+48.8	126.4	52 42.0	+49.5	127.5	52 05.0	+50.4	128.5	51 27.2	+51.1	129.5	50 48.7	+51.7	130.5	21
22	55 46.7	+45.3	121.9	55 14.4	+46.4	123.1	54 41.1	+47.4	124.3	54 06.8	+48.3	125.4	53 31.5	+49.2	126.6	52 55.4	+49.9	127.6	52 18.3	+50.7	128.6	51 40.4	+51.4	129.6	22
23	56 32.0	+44.7	120.7	56 00.8	+45.8	122.0	55 28.5	+46.8	123.2	54 55.1	+47.7	124.4	54 20.7	+48.6	125.6	53 09.0	+50.3	127.8	52 31.8	+51.0	128.8	53 09.0	+52.0	129.8	23
24	57 16.7	+44.0	119.5	56 46.6	+45.1	120.8	55 15.3	+46.1	122.1	55 48.2	+47.4	123.4	55 09.3	+48.1	124.6	53 59.3	+49.8	126.8	53 22.8	+50.6	127.9	53 22.8	+51.4	128.9	24
25	58 0.0	+43.2	118.2	57 31.7	+44.4	119.6	57 01.4	+45.5	121.0	56 30.0	+46.5	122.3	55 57.4	+47.6	123.5	55 23.8	+48.5	124.7	54 49.1	+49.4	125.9	54 13.4	+50.2	127.0	25
26	58 43.9	+42.3	116.9	58 16.1	+43.5	118.3	57 46.9	+44.8	119.7	57 16.5	+45.9	121.1	56 45.0	+46.9	122.4	56 12.3	+47.9	123.7	55 38.5	+48.8	124.9	55 03.6	+49.8	126.1	26
27	59 26.2	+41.4	115.5	58 59.6	+42.8	117.0	58 31.7	+44.0	118.5	58 04.2	+45.4	119.9	57 31.9	+46.3	121.3	57 00.2	+47.3	122.6	56 27.3	+48.3	123.9	55 53.4	+49.2	125.1	27
28	60 0.76	+40.4	114.1	59 42.4	+41.8	115.6	59 15.7	+43.2	117.2	58 47.6	+44.4	118.6	58 18.2	+45.6	120.1	57 47.5	+46.7	121.4	57 15.6	+47.8	122.8	56 42.6	+48.7	124.1	28
29	60 48.0	+39.4	112.6	60 24.2	+40.9	114.2	59 58.9	+42.2	115.8	59 32.0	+43.6	117.3	58 03.8	+44.8	118.8	58 34.2	+46.0	120.2	58 03.4	+47.1	121.6	57 31.3	+48.1	123.0	29
30	61 27.4	+38.3	111.0	61 05.1	+39.8	112.7	60 41.1	+41.3	114.4	60 15.6	+42.7	116.0	59 48.6	+44.0	117.5	59 20.2	+45.3	119.0	58 50.5	+46.4	120.5	58 19.4	+47.5	121.9	30
31	62 05.7	+37.1	109.4	61 44.9	+38.7	111.1	61 22.4	+40.3	112.9	60 58.3	+41.8	114.5	60 32.6	+43.2	116.1	61 05.5	+44.4	117.7	59 36.9	+45.7	119.2	59 06.9	+46.9	120.7	31
32	62 42.8	+35.8	107.7	62 23.6	+37.5	109.5	62 02.7	+39.2	111.3	61 40.1	+40.7	113.0	61 15.8	+42.2	114.7	60 49.9	+43.6	116.3	60 22.6	+44.9	117.9	59 53.8	+46.1	119.4	32
33	63 18.6	+34.4	105.9	63 01.1	+36.3	107.8	62 41.9	+37.9	109.7	62 20.8	+39.6	111.5	61 58.0	+41.2	113.2	61 33.5	+42.7	114.9	61 07.5	+44.0	116.6	60 39.9	+45.3	118.2	33
34	63 53.0	+32.9	104.1	63 37.4	+34.4	104.2	63 56.5	+35.4	106.2	63 38.9	+37.1	108.1	63 19.3	+38.9	110.0	62 57.8	+40.6	111.9	62 34.6	+42.1	113.6	62 09.7	+43.6	115.4	35
35	64 25.9	+31.4	102.2	64 12.3	+33.4	104.2	63 55.6	+35.4	106.2	63 38.9	+37.1	108.1	63 19.3	+38.9	110.0	62 57.8	+40.6	111.9	62 34.6	+42.1	113.6	62 09.7	+43.6	115.4	35
36	64 54.7	+30.3	100.2	64 45.7	+31.8	102.3	65 31.9	+33.8	104.3	64 16.0	+35.8	106.3													

# LATITUDE CONTRARY NAME TO DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	37	18.5	-53.4	139.6	36	32.6	-53.8	140.1	35	46.4	-54.1	140.6	34	59.9	-54.5	141.0	34	13.1	-54.8	141.5	33	26.0	-55.1	141.9	32	38.7	-55.4	142.3	31	51.1	-55.7	142.7	0
1	36	25.1	-53.6	140.2	35	38.8	-53.9	140.7	34	52.3	-54.3	141.1	34	05.4	-54.6	141.6	33	18.3	-54.9	142.0	32	30.9	-55.2	142.4	31	43.3	-55.5	142.7	30	55.4	-55.8	143.1	1
2	35	31.5	-53.7	140.8	34	44.9	-54.1	141.2	33	58.0	-54.4	141.6	33	10.8	-54.7	142.0	32	23.4	-55.1	142.4	31	35.7	-55.4	142.8	30	47.8	-55.7	143.2	29	59.6	-55.9	143.5	3
3	34	37.8	-53.9	141.3	33	50.8	-54.2	141.7	33	03.6	-54.6	142.1	32	16.1	-54.9	142.5	31	28.3	-55.1	142.9	30	40.3	-55.4	143.3	29	52.1	-55.6	143.6	29	03.7	-55.9	144.0	4
4	33	43.9	-54.0	141.8	33	56.6	-54.3	142.2	32	09.0	-54.6	142.6	31	33.2	-54.9	143.0	30	33.2	-55.2	143.4	29	44.9	-55.5	143.7	28	07.8	-56.0	144.0	28	27.0	-56.3	144.3	5
5	32	49.9	-54.1	142.4	32	02.3	-54.5	142.8	31	14.4	-54.8	143.1	30	26.3	-55.1	143.5	29	38.0	-55.4	143.8	28	49.4	-55.6	144.2	28	00.7	-55.9	144.5	27	11.8	-56.1	144.8	6
6	31	55.8	-54.3	142.9	31	07.8	-54.5	143.2	30	19.6	-54.8	143.6	29	31.2	-55.1	143.9	28	42.6	-55.4	144.3	27	53.8	-55.6	144.6	27	04.8	-55.9	144.9	26	15.7	-56.2	145.2	6
7	31	01.5	-54.4	143.4	30	13.3	-54.7	143.7	29	24.8	-55.0	144.1	28	36.1	-55.2	144.4	27	47.2	-55.5	144.7	26	58.2	-55.8	145.0	26	08.9	-56.0	145.3	25	19.5	-56.2	145.6	7
8	30	07.1	-54.4	143.9	29	18.6	-54.8	144.2	28	29.8	-55.1	144.5	27	40.9	-55.3	144.8	26	51.7	-55.5	145.1	26	02.4	-55.6	145.4	25	56.5	-55.8	145.6	24	23.3	-56.3	145.9	8
9	29	12.7	-54.6	144.4	28	23.8	-54.8	144.7	27	34.8	-55.2	145.0	26	45.6	-55.4	145.3	25	56.2	-55.7	145.6	25	06.6	-55.9	145.8	24	16.9	-56.1	146.1	23	27.0	-56.3	146.3	9
10	28	18.1	-54.7	144.8	27	29.0	-55.0	145.1	26	39.6	-55.2	145.4	25	50.2	-55.5	145.7	25	00.5	-55.7	146.0	24	10.7	-55.9	146.2	23	20.8	-56.2	146.5	22	30.7	-56.4	146.7	10
11	27	23.4	-54.7	145.3	26	34.0	-55.0	145.6	25	44.4	-55.3	145.9	24	54.7	-55.5	146.1	23	14.8	-56.0	146.6	22	24.6	-56.2	146.8	21	34.3	-56.4	147.1	21	11.5	-56.7	147.4	11
12	26	28.7	-54.9	145.7	25	39.0	-55.1	146.0	24	49.1	-55.3	146.3	23	09.0	-55.6	146.5	22	18.8	-56.1	147.0	21	28.4	-56.3	147.2	20	37.9	-56.5	147.4	12				
13	25	33.8	-54.9	146.2	24	43.9	-55.2	146.5	23	53.8	-55.4	146.7	23	03.6	-55.7	146.9	22	13.2	-55.9	147.2	21	22.7	-56.1	147.4	20	32.1	-56.3	147.6	19	41.4	-56.5	147.8	13
14	24	38.9	-55.0	146.6	23	48.7	-55.3	146.9	22	58.4	-55.5	147.1	22	07.9	-55.7	147.4	21	17.3	-55.9	147.6	20	26.6	-56.1	147.8	19	35.8	-56.3	148.0	18	44.9	-56.6	148.1	14
15	23	43.9	-55.1	147.1	22	53.4	-55.3	147.3	22	02.9	-55.6	147.5	21	12.2	-55.8	147.8	20	21.4	-56.0	148.0	19	30.5	-56.2	148.1	18	39.5	-56.4	148.3	17	48.3	-56.5	148.5	15
16	22	48.8	-55.2	147.5	21	58.1	-55.4	147.7	20	07.3	-55.6	147.9	20	16.4	-55.8	148.1	19	25.4	-56.1	148.3	18	34.3	-56.3	148.5	17	43.1	-56.5	148.7	16	51.8	-56.7	148.9	16
17	21	53.6	-55.2	147.9	21	02.7	-55.4	148.1	20	11.7	-55.7	148.3	19	20.6	-55.9	148.5	18	29.3	-56.0	148.7	17	38.0	-56.3	148.9	16	46.6	-56.5	149.0	15	55.1	-56.6	149.2	17
18	20	58.4	-55.3	148.4	20	07.3	-55.5	148.6	19	16.0	-55.7	148.7	18	24.7	-55.9	148.9	17	33.3	-56.2	149.1	16	41.7	-56.3	149.2	15	50.1	-56.5	149.4	18	58.5	-56.7	149.5	18
19	20	03.1	-55.3	148.8	19	11.8	-55.6	149.0	18	20.3	-55.7	149.1	17	28.8	-56.0	149.3	16	37.1	-56.1	149.5	15	45.4	-56.3	149.6	14	53.6	-56.5	149.7	14	01.8	-56.7	149.9	19
20	19	07.8	-55.4	149.2	18	16.2	-55.6	149.4	17	24.6	-55.9	149.5	16	32.8	-56.0	149.7	15	41.0	-56.2	149.8	14	49.1	-56.4	150.0	13	57.1	-56.6	150.1	13	05.1	-56.8	150.2	20
21	18	12.4	-55.4	149.6	17	20.6	-55.6	149.8	16	28.7	-55.8	149.9	15	36.8	-56.1	150.0	14	44.8	-56.3	150.2	13	52.7	-56.4	150.3	13	00.5	-56.6	150.4	21	10.7	-56.7	150.5	21
22	17	17.0	-55.5	150.0	16	25.0	-55.7	150.1	15	32.9	-55.9	150.3	14	40.7	-56.0	150.4	13	48.5	-56.2	150.5	12	52.3	-56.6	150.8	11	03.9	-56.6	150.9	22	11.5	-56.7	150.9	22
23	16	21.5	-55.6	150.4	15	29.3	-55.8	150.5	14	37.0	-55.9	150.7	13	44.7	-56.1	150.8	12	52.3	-56.3	150.9	11	07.3	-56.6	151.1	10	14.8	-56.9	151.2	23	22.7	-57.0	151.4	23
24	15	25.9	-55.6	150.8	14	33.5	-55.7	150.9	13	41.1	-56.0	151.0	12	48.6	-56.2	151.1	11	56.0	-56.3	151.3	10	10.7	-56.7	151.4	24	22.7	-56.8	151.5	24				
25	14	30.4	-55.6	151.2	13	37.8	-55.8	151.3	12	45.1	-56.0	151.4	11	52.4	-56.2	151.5	10	59.7	-56.4	151.6	9	14.0	-56.7	151.8	8	21.1	-56.8	151.8	25				
26	13	34.8	-55.7	151.6	12	42.0	-55.9	151.7	11	49.1	-56.0	151.8	10	56.2	-56.2	151.9	9	10.3	-56.5	152.0	8	17.3	-56.7	152.1	7	24.3	-56.9	152.2	27				
27	12	39.1	-55.7	151.9	11	46.1	-55.8	152.0	10	53.1	-56.0	152.1	9	10.0	-56.6	152.2	8	06.9	-56.3	152.3	7	20.6	-56.7	152.4	6	27.4	-56.9	152.5	27				
28	11	41.4	-55.7	152.3	10	50.3	-55.9	152.4	9	57.1	-56.1	152.5	8	03.8	-56.2	152.6	7	10.6	-56.4	152.7	6	23.9	-56.7	152.8	5	30.5	-56.8	152.8	28				
29	10	47.7	-55.7	152.7	9	54.5	-56.0	152.8	8	10.6	-56.4	152.9	7	14.2	-56.5	153.0	6	20.7	-56.6	153.0	5	27.2	-56.8	153.1	4	33.7	-56.9	153.1	29				
30	0	53.6	-55.8	156.8	0	20.4	-56.2	156.9	0	20.4	-56.2	157.0	1	15.4	-56.3	157.0	0	41.3	-56.5	155.0	0	43.4	-56.7	154.7	0	10.8	+56.9	25.3	34				
31	0	33.6	-55.8	156.8	0	21.5	-56.2	157.2	1	21.5	-56.2	157.3	2	11.7	-56.4	157.3	3	36.9	-56.4	157.3	2	31.3	+56.8	25.0	35								
32	0	22.2	+55.9	22.9	1	17.5	+56.0	22.9	2	12.8	+56.2	22.9	3	08.1	+56.3	22.9	4	40.3	+56.7	22.9	5	53.8	+56.7	23.0	6	49.0	+56.9	23.0	41				
33	0	18.1	+55.9	22.5	2	13.5	+56.1	22.5	3	09.0	+56.1	22.5	4	04.4	+56.3	22.6	5	45.8	+56.4	22.6	6	50.5	+56.7	22.7	7	45.9	+56.8	22.7	42				
34	0	3.9	+55.8	21.8	4	05.6	+56.0	21.8	5	01.3	+56																						

32°, 328° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	36 50.7	+53.0	138.5	36 05.6	+53.3	139.0	35 20.1	+53.8	139.5	34 34.4	+54.1	139.9	33 48.3	+54.4	140.4	33 02.0	+54.7	140.8	32 15.3	+55.1	141.2	31 28.4	+55.4	141.6	0
1	37 43.7	+52.7	137.9	36 58.9	+53.2	138.4	36 13.9	+53.5	138.9	35 28.5	+53.9	139.4	34 42.7	+54.3	139.9	33 56.7	+54.7	140.3	33 10.4	+55.0	140.7	32 23.8	+55.3	141.1	1
2	38 36.4	+52.6	137.3	37 52.1	+53.0	137.9	37 07.4	+53.4	138.4	36 22.4	+53.8	138.9	35 37.0	+54.2	139.3	34 51.4	+54.5	139.8	34 05.4	+54.8	140.2	33 19.1	+55.2	140.7	2
3	39 29.0	+52.3	136.7	38 45.1	+52.8	137.3	38 00.8	+53.3	137.8	37 16.2	+53.6	138.3	36 31.2	+54.0	138.8	35 45.9	+54.4	139.3	35 00.2	+54.8	139.8	34 14.3	+55.1	140.2	3
4	40 21.3	+52.1	136.1	39 37.9	+52.6	136.7	38 54.1	+53.0	137.2	38 09.8	+53.5	137.8	37 25.2	+53.9	138.3	36 40.3	+54.2	138.8	35 55.0	+54.6	139.3	35 09.4	+54.9	139.7	4
5	41 13.5	+51.9	135.4	40 30.5	+52.4	136.0	39 47.1	+52.9	136.6	39 03.3	+53.3	137.2	38 19.1	+53.7	137.7	37 34.5	+54.1	138.2	36 49.6	+54.5	138.7	36 04.3	+54.9	139.2	5
6	42 05.4	+51.6	134.8	41 22.9	+52.2	135.4	40 40.0	+52.6	136.0	39 56.6	+53.1	136.6	39 12.8	+53.5	137.1	38 28.6	+54.0	137.7	37 44.1	+54.3	138.2	36 59.2	+54.7	138.7	6
7	42 57.0	+51.4	134.1	42 15.1	+51.9	134.7	41 32.6	+52.4	135.4	40 49.7	+52.9	136.0	40 06.3	+53.4	136.6	39 22.6	+53.7	137.1	38 38.4	+54.2	137.7	37 53.9	+54.5	138.2	7
8	43 48.4	+51.2	133.4	43 07.0	+51.7	134.0	42 25.0	+52.2	134.7	41 42.6	+52.7	135.3	41 59.7	+53.1	136.0	40 16.3	+53.4	136.5	39 32.6	+54.0	137.1	38 48.4	+54.4	137.7	8
9	44 39.6	+50.8	132.6	43 58.7	+51.4	133.3	43 17.0	+52.0	134.0	42 35.3	+52.5	134.7	41 52.8	+53.0	135.3	41 09.9	+53.5	136.0	40 26.6	+53.8	136.5	39 42.8	+54.3	137.1	9
10	45 30.4	+50.6	131.9	44 50.1	+51.1	132.6	44 09.2	+51.7	133.3	43 27.8	+52.2	134.0	42 45.8	+52.7	134.7	42 03.4	+53.2	135.3	41 20.4	+53.7	136.0	40 37.1	+54.1	136.6	10
11	46 21.0	+50.2	131.1	45 41.2	+50.9	131.9	45 00.9	+51.4	132.6	44 20.0	+52.0	133.3	43 38.5	+52.5	134.0	42 56.6	+53.0	134.7	42 14.1	+53.5	135.4	41 31.2	+53.9	136.0	11
12	47 11.2	+49.9	130.3	46 32.1	+50.5	131.1	45 52.3	+51.2	131.7	45 12.0	+51.7	132.6	44 31.0	+52.3	133.4	43 49.6	+52.7	134.1	43 07.6	+53.2	134.7	42 25.1	+53.7	135.4	12
13	48 01.1	+49.5	129.5	47 22.6	+50.2	130.3	46 43.5	+50.8	131.1	46 03.7	+51.4	131.9	45 23.3	+52.0	132.7	44 42.3	+52.6	133.4	44 00.8	+53.1	134.1	43 18.8	+53.6	134.8	13
14	48 50.6	+49.1	128.6	48 12.8	+49.8	129.5	47 34.3	+50.5	130.3	46 55.1	+51.1	131.2	46 15.3	+51.7	132.0	45 34.9	+52.3	132.7	44 53.9	+52.8	133.5	44 12.4	+53.3	134.2	14
15	49 39.7	+48.7	127.7	49 02.6	+49.5	128.7	48 24.8	+50.1	129.5	47 46.2	+50.8	130.4	47 07.0	+51.4	131.2	46 27.2	+52.0	132.0	45 46.7	+52.6	132.8	45 05.7	+53.1	133.5	15
16	50 28.4	+48.3	126.8	49 52.1	+49.0	127.8	49 14.9	+49.8	128.7	48 37.0	+50.5	129.6	47 58.4	+51.2	130.5	47 19.2	+51.7	131.3	46 39.3	+52.3	132.1	45 58.8	+52.8	132.9	16
17	51 16.7	+47.8	125.9	50 41.1	+48.6	126.9	50 04.7	+49.4	127.8	49 27.5	+50.1	128.8	48 49.6	+50.7	129.7	48 10.9	+51.4	130.5	47 31.6	+52.0	131.4	46 51.6	+52.6	132.2	17
18	52 04.5	+47.3	124.9	51 29.7	+48.2	126.0	50 54.1	+48.9	127.0	50 17.6	+49.7	127.9	49 40.3	+50.5	128.9	49 02.3	+51.1	129.8	48 23.6	+51.8	130.6	47 44.2	+52.3	131.5	18
19	52 51.8	+46.8	123.9	52 17.9	+47.6	125.0	51 43.0	+48.5	126.0	51 07.3	+49.3	127.0	50 30.8	+50.0	128.0	49 53.4	+50.8	128.9	48 36.5	+52.1	130.7	48 36.5	+52.1	130.7	19
20	53 38.6	+46.2	122.9	53 05.5	+47.2	124.0	52 31.5	+48.1	125.1	51 56.6	+48.9	126.1	51 20.8	+49.7	127.1	50 44.2	+50.4	128.1	50 06.8	+51.0	129.1	49 28.6	+51.7	130.0	20
21	54 24.8	+45.6	121.8	53 52.7	+46.6	122.9	53 19.6	+47.5	124.1	52 45.5	+48.3	125.2	52 10.5	+49.2	126.2	51 34.6	+49.9	127.2	50 57.8	+50.8	128.2	50 20.3	+51.4	129.2	21
22	55 10.4	+44.9	120.6	54 39.3	+45.9	121.9	54 07.1	+46.9	123.0	53 33.8	+47.9	124.2	52 59.7	+48.7	125.3	52 24.5	+49.6	126.3	51 48.6	+50.3	127.4	51 11.7	+51.1	128.4	22
23	55 55.3	+44.3	119.5	55 25.2	+45.4	120.7	54 54.0	+46.4	122.0	54 21.7	+47.4	123.2	53 48.4	+48.2	124.3	53 14.1	+49.1	125.4	52 38.9	+49.9	126.5	52 02.8	+50.6	127.5	23
24	56 39.6	+43.5	118.3	56 10.6	+44.6	119.6	55 40.4	+45.7	120.9	55 09.1	+46.7	122.1	54 36.6	+47.8	123.3	54 03.2	+48.6	124.4	53 28.8	+49.5	125.6	52 53.4	+50.3	126.6	24
25	57 23.1	+42.7	117.0	56 55.2	+44.0	118.4	56 26.1	+45.1	119.7	55 55.8	+45.1	120.1	54 24.4	+47.1	122.2	54 51.8	+48.9	124.4	54 18.3	+48.9	124.6	53 43.7	+49.8	125.7	25
26	58 0.8	+41.9	115.7	57 39.2	+43.1	117.1	57 11.2	+44.3	118.5	56 41.9	+45.5	119.8	56 11.5	+46.5	121.1	55 39.9	+47.5	122.4	55 07.2	+48.5	123.6	54 33.5	+49.4	124.8	26
27	58 47.7	+41.0	114.3	58 22.3	+42.3	115.8	57 55.5	+43.6	117.2	57 24.7	+44.4	118.6	56 58.0	+45.9	120.0	56 27.5	+46.9	121.3	55 55.7	+48.0	122.6	55 22.9	+48.9	123.8	27
28	59 28.7	+40.0	112.9	58 04.6	+41.4	114.4	58 39.1	+42.7	115.9	58 12.2	+44.0	117.4	57 43.9	+45.2	118.8	57 14.4	+46.3	120.2	56 43.7	+47.3	121.5	56 11.8	+48.3	122.8	28
29	60 0.87	+39.0	111.4	58 46.0	+40.5	113.0	59 21.8	+41.9	114.6	58 56.2	+43.1	116.1	59 21.9	+44.4	117.5	58 00.7	+45.6	119.0	57 31.0	+46.7	120.3	57 0.01	+47.7	121.7	29
30	60 47.7	+37.8	109.9	60 26.5	+39.4	111.5	60 03.7	+40.9	113.1	59 39.3	+42.3	114.7	59 13.5	+43.6	116.2	58 46.3	+44.8	117.7	58 17.7	+46.0	119.2	57 47.8	+47.1	120.6	30
31	61 25.5	+36.7	108.3	61 05.9	+38.3	110.0	60 44.6	+39.8	111.7	60 21.6	+41.4	113.3	59 57.1	+42.8	114.9	59 31.1	+44.1	116.4	59 03.7	+45.3	117.9	58 34.9	+46.5	119.4	31
32	62 0.22	+35.4	106.6	61 44.2	+37.1	108.4	61 24.4	+38.8	110.1	60 03.0	+40.3	111.8	60 39.9	+41.7	113.5	60 15.2	+43.2	115.1	59 49.0	+44.5	116.6	59 21.4	+45.7	118.2	32
33	62 37.6	+34.1	104.8	62 21.3	+35.9	106.7	62 03.2	+37.6	108.5	61 43.3	+39.2	110.3	61 21.6	+40.8	112.0	60 58.4	+42.2	113.7	60 33.5	+43.6	115.3	60 07.1	+45.0	116.9	33
34	63 11.7	+32.7	103.0	62 57.2	+34.6	104.9	62 40.8	+36.4	106.8	62 22.5	+38.1	107.8	62 02.4	+39.7	110.4	61 40.6	+41.3	112.2	61 17.1	+42.8	113.9	60 52.1	+44.1	115.5	34
35	63 44.4	+31.1	101.2	63 31.8	+33.1	103.1	63 17.1	+35.0	105.1	63 00.6	+36.8	107.0	62 42.1	+38.6	108.8	62 21.9	+40.1	110.6	61 59.9	+41.7	112.4	61 36.2	+43.2	114.1	35
36	64 15.5	+29.5	99.2	64 04.9	+31.5	101.2	63 52.1	+33.6	103.2	63 37.4	+35.4	105.2													

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $32^\circ$ ,  $328^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	36	50.7	-53.1	138.5	36	05.6	-53.5	139.0	35	20.1	-53.8	139.5	34	34.4	-54.2	139.9	33	48.3	-54.5	140.4	33	02.0	-54.9	140.8	32	15.3	-55.2	141.2	31	28.4	-55.4	141.6	0
1	35	57.6	-53.2	139.1	35	12.1	-53.6	139.6	34	26.3	-54.0	140.0	33	40.2	-54.4	140.5	32	53.8	-54.7	140.9	32	07.1	-55.0	141.3	31	20.1	-55.3	141.7	30	33.0	-55.6	142.0	1
2	35	04.4	-53.4	139.7	34	18.5	-53.8	140.1	33	32.3	-54.1	140.6	32	45.8	-54.4	141.0	31	59.1	-54.8	141.4	31	12.1	-55.1	141.7	30	24.8	-55.3	142.1	29	37.4	-55.7	142.5	3
3	34	11.0	-53.6	140.2	33	24.7	-53.9	140.7	32	38.2	-54.3	141.1	31	51.4	-54.6	141.5	31	04.3	-54.9	141.8	30	17.0	-55.2	142.2	29	29.5	-55.5	142.6	28	41.7	-55.7	142.9	4
4	33	17.4	-53.7	140.8	32	30.8	-54.1	141.2	31	43.9	-54.4	141.6	30	56.8	-54.7	141.9	31	09.4	-55.0	142.3	29	21.8	-55.3	142.7	28	34.0	-55.5	143.0	27	46.0	-55.8	143.3	5
5	32	23.7	-53.8	141.3	31	36.7	-54.1	141.7	30	49.5	-54.5	142.1	30	02.1	-54.8	142.4	29	14.4	-55.1	142.8	28	26.5	-55.3	143.1	27	38.5	-55.7	143.4	26	50.2	-55.9	143.7	6
6	31	29.9	-54.0	141.8	30	42.6	-54.3	142.2	29	55.0	-54.5	142.6	29	07.3	-54.9	142.9	28	19.3	-55.1	143.2	27	31.2	-55.4	143.5	26	42.8	-55.7	143.8	25	54.3	-55.9	144.1	7
7	30	35.9	-54.1	142.3	29	48.3	-54.4	142.7	29	00.5	-54.7	143.0	28	12.4	-55.0	143.4	27	24.2	-55.3	143.7	26	35.8	-55.6	144.0	25	47.1	-55.7	144.3	24	58.4	-56.1	144.5	8
8	29	41.8	-54.2	142.8	28	53.9	-54.5	143.2	28	05.8	-54.8	143.5	27	17.4	-55.0	143.8	26	28.9	-55.3	144.1	25	40.2	-55.5	144.4	24	51.4	-55.9	144.7	24	02.3	-56.0	144.9	9
9	28	47.6	-54.3	143.3	27	59.4	-54.6	143.6	27	11.0	-54.9	144.0	26	22.4	-55.2	144.3	25	33.6	-55.4	144.5	24	44.7	-55.7	144.8	23	55.5	-55.9	145.1	23	06.3	-56.2	145.3	10
10	27	53.3	-54.3	143.8	27	04.8	-54.6	144.1	26	16.1	-54.9	144.4	25	27.2	-55.2	144.7	24	38.2	-55.5	145.0	23	49.0	-55.7	145.2	22	59.6	-55.9	145.5	22	10.1	-56.1	145.7	11
11	26	59.0	-54.5	144.3	26	10.2	-54.8	144.6	25	21.2	-55.1	144.9	24	32.0	-55.3	145.1	23	42.7	-55.5	145.4	22	53.3	-55.8	145.6	22	03.7	-56.0	145.9	21	14.0	-56.3	146.1	12
12	26	45.4	-54.6	144.8	25	15.4	-54.9	145.0	24	26.1	-55.1	145.3	23	36.7	-55.3	145.5	22	47.2	-55.6	145.8	21	57.5	-55.8	146.0	20	17.7	-56.2	146.2	20	77.7	-56.2	146.5	13
13	25	09.9	-54.7	145.2	24	20.5	-54.9	145.5	23	31.0	-55.1	145.7	22	41.4	-55.4	146.0	21	51.6	-55.7	146.2	20	11.6	-56.1	146.6	19	21.5	-56.4	146.8	18				
14	24	15.2	-54.7	145.7	23	25.6	-55.0	145.9	22	35.9	-55.3	146.2	21	46.0	-55.5	146.4	20	55.9	-55.7	146.6	19	15.5	-56.1	147.0	18	25.1	-56.3	147.2	17				
15	23	20.5	-54.8	146.1	22	30.6	-55.0	146.4	20	40.6	-55.3	146.6	19	00.2	-55.6	146.8	18	19.9	-55.9	147.2	17	19.4	-56.2	147.4	17	28.8	-56.4	147.5	16				
16	22	25.7	-54.9	146.6	21	35.6	-55.2	146.8	20	45.3	-55.4	147.0	19	54.9	-55.6	147.2	18	04.4	-55.8	147.4	17	23.2	-56.3	147.7	16	32.4	-56.5	147.9	15				
17	21	30.8	-54.9	147.0	20	40.4	-55.2	147.2	19	49.9	-55.4	147.4	18	59.3	-55.6	147.6	17	08.6	-55.8	147.8	17	17.8	-56.0	147.9	16	26.9	-56.2	148.1	15				
18	20	35.9	-55.1	147.4	19	45.2	-55.2	147.6	18	54.5	-55.5	147.8	17	03.7	-55.7	148.0	16	12.8	-55.9	148.2	16	21.8	-56.2	148.3	15	30.7	-56.4	148.5	14				
19	19	40.8	-55.0	147.9	18	50.0	-55.3	148.0	17	59.0	-55.5	148.2	17	08.0	-55.7	148.4	16	16.9	-56.0	148.5	15	25.6	-56.1	148.7	14	34.3	-56.3	148.8	13				
20	18	45.8	-55.2	148.3	17	54.7	-55.4	148.4	17	03.5	-55.6	148.6	16	12.3	-55.8	148.8	15	20.9	-56.0	149.0	14	29.5	-56.2	149.2	13	38.0	-56.4	149.3	12				
21	17	50.6	-55.1	148.7	16	59.3	-55.4	148.8	16	07.9	-55.6	149.0	15	16.5	-55.8	149.1	14	24.9	-56.0	149.3	13	33.3	-56.2	149.4	12	41.6	-56.4	149.5	11				
22	16	55.5	-55.3	149.1	16	03.9	-55.4	149.2	15	12.3	-55.6	149.4	14	20.7	-55.9	149.5	13	28.9	-56.0	149.7	12	37.1	-56.2	149.8	11	45.2	-56.4	149.9	10				
23	16	00.2	-55.2	149.5	15	08.5	-55.5	149.6	14	16.7	-55.7	149.8	13	24.8	-56.9	149.9	12	32.9	-56.1	150.0	11	40.9	-56.3	150.1	10	48.8	-56.4	150.2	9				
24	15	05.0	-55.4	149.9	14	13.0	-55.5	150.0	13	21.0	-55.7	150.2	12	28.9	-55.9	150.3	11	36.8	-56.1	150.4	10	44.6	-56.3	150.5	9	52.4	-56.5	150.6	8				
25	14	09.6	-55.3	150.3	13	17.5	-55.6	150.4	12	25.3	-55.8	150.5	11	33.0	-55.9	150.6	10	40.7	-56.2	150.7	9	48.3	-56.3	150.8	8	55.9	-56.5	150.9	7				
26	13	14.3	-55.4	150.7	12	21.9	-55.6	150.8	11	29.5	-55.8	150.9	10	37.1	-56.0	151.0	9	44.5	-56.1	151.1	8	52.0	-56.3	151.2	7	59.4	-56.5	151.3	6				
27	12	18.9	-55.4	151.1	11	26.3	-55.6	151.2	10	33.7	-55.8	151.3	9	41.1	-56.1	151.4	8	48.4	-56.2	151.5	7	55.7	-56.4	151.6	6	60.4	-56.5	151.7	5				
28	11	23.5	-55.5	151.5	10	30.7	-55.6	151.6	9	37.9	-55.8	151.7	8	45.1	-56.0	151.7	7	52.2	-56.2	151.8	6	59.3	-56.3	151.9	5	13.4	-56.7	152.0	4				
29	10	28.0	-55.5	151.9	9	35.1	-55.6	152.0	8	42.4	-56.1	152.0	7	49.1	-56.1	152.1	6	56.0	-56.2	152.2	5	65.0	-56.5	152.3	4	0.9	-56.7	152.3	3				
30	9	32.5	-55.5	152.3	8	39.4	-56.1	152.4	7	46.2	-56.4	152.4	6	53.0	-56.6	152.5	5	60.7	-56.8	152.6	4	68.7	-57.1	152.6	3	20.8	-56.7	152.6	2				
31	8	34.7	-55.6	152.4	7	40.0	-56.1	152.5	6	47.0	-56.4	152.5	5	50.9	-56.6	152.6	4	57.7	-56.8	152.6	3	65.7	-57.1	152.6	2	23.3	-56.7	153.0	1				
32	7	35.9	-55.6	152.5	6	39.2	-56.1	152.6	5	46.0	-56.4	152.6	4	50.0	-56.6	152.7	3	57.0	-56.8	152.7	2	62.0	-57.1	152.7	1	20.6	-56.7	153.3	0				
33	6	12.3	-55.6	152.5	5	17.6	-55.7	152.5	4	21.3	-55.7	152.5	3	25.8	-55.8	152.5	2	31.2	-56.0	152.5	1	37.7	-56.2	152.5	0	26.8	-56.7	152.6	34				
34	5	0.6	-55.6	152.6	4	17.0	-55.7	152.6	3	21.7	-55.8	152.6	2	27.2	-56.0	152.6	1	32.6	-56.2	152.6	0	29.5	-56.5	152.7	35								
35	4	54.7	-55.6	152.6	3	0.07	-55.7	152.6	2	10.7	-55.9	152.6	1	21.7	-56.1	152.6	0	22.0	-56.6	152.6	2</												

33°, 327° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	36	22.3	+52.6	137.4	35	38.0	+53.0	137.9	34	53.3	+53.4	138.4	34	08.2	+53.8	138.9	33	22.9	+54.2	139.3	32	37.3	+54.5	139.7	31	51.4	+54.8	140.1	31	05.2	+55.2	140.5	0
1	37	14.9	+52.5	136.8	36	31.0	+52.8	137.3	35	46.7	+53.3	137.8	35	02.0	+53.7	138.3	34	17.1	+54.0	138.8	33	31.8	+54.4	139.2	32	46.2	+54.8	139.6	32	00.4	+55.0	140.0	1
2	38	07.4	+52.2	136.2	37	23.8	+52.7	136.8	36	40.0	+53.0	137.3	35	55.7	+53.5	137.8	35	11.1	+53.9	138.2	34	26.2	+54.3	138.7	33	41.0	+54.6	139.1	32	55.4	+55.0	139.6	2
3	38	59.6	+52.0	135.6	38	16.5	+52.5	136.1	37	33.0	+53.0	136.7	36	49.2	+53.3	137.2	36	05.0	+53.7	137.7	35	20.5	+54.1	138.2	34	35.6	+54.5	138.6	33	50.4	+54.8	139.1	3
4	39	51.6	+51.8	134.9	39	09.0	+52.3	135.5	38	26.0	+52.7	136.1	37	42.5	+53.2	136.6	36	58.7	+53.6	137.1	36	14.6	+54.0	137.7	35	30.1	+54.3	138.1	34	45.2	+54.7	138.6	4
5	40	43.4	+51.5	134.3	40	01.3	+52.0	134.9	39	18.7	+52.5	135.5	38	35.7	+53.0	136.0	37	52.3	+53.4	136.6	37	08.6	+53.8	137.1	36	24.4	+54.2	137.6	35	39.9	+54.6	138.1	5
6	41	34.9	+51.3	133.6	40	53.3	+51.8	134.2	40	11.2	+52.4	134.8	39	28.7	+52.8	135.4	38	45.7	+53.3	136.0	38	02.4	+53.6	136.5	37	18.6	+54.1	137.1	36	34.5	+54.5	137.6	6
7	42	26.2	+51.1	132.9	41	45.1	+51.6	133.6	41	03.6	+52.1	134.2	40	21.5	+52.6	134.8	39	39.0	+53.0	135.4	38	56.0	+53.5	136.0	38	12.7	+53.9	136.5	37	29.0	+54.3	137.1	7
8	43	17.3	+50.8	132.2	42	36.7	+51.4	132.9	41	55.7	+51.1	133.5	41	14.1	+52.4	134.2	40	32.0	+52.9	134.8	39	49.5	+53.3	135.4	39	06.6	+53.8	136.0	38	23.3	+54.1	136.5	8
9	44	08.1	+50.4	131.5	43	28.1	+51.0	132.2	42	47.5	+51.6	132.9	42	06.5	+52.1	133.5	41	24.9	+52.6	134.2	40	42.8	+53.2	134.8	40	00.4	+53.5	135.4	39	17.4	+54.0	136.0	9
10	44	58.5	+50.2	130.7	44	19.1	+50.8	131.4	43	39.1	+51.4	132.2	42	58.6	+51.9	132.9	42	17.5	+52.5	133.5	41	36.0	+52.9	134.2	40	53.9	+53.4	134.8	40	11.4	+53.8	135.4	10
11	45	48.7	+49.9	129.9	45	09.9	+50.5	130.7	44	30.5	+51.1	131.4	43	50.5	+51.6	132.2	43	10.0	+52.1	132.9	42	28.9	+52.7	133.5	41	47.3	+53.2	134.2	41	05.2	+53.7	134.8	11
12	46	38.6	+49.5	129.1	46	00.4	+50.1	129.9	45	21.6	+49.2	125.7	44	42.1	+51.4	131.5	44	02.1	+52.0	132.2	43	21.6	+52.5	132.9	42	40.5	+53.0	133.6	41	58.9	+53.4	134.2	12
13	47	28.1	+49.1	128.3	46	50.5	+49.9	129.1	46	12.4	+50.4	129.9	45	33.5	+51.1	130.7	44	54.1	+51.7	131.5	44	14.1	+52.2	132.2	43	33.5	+52.7	132.9	42	52.3	+53.3	133.6	13
14	48	17.2	+48.7	127.4	47	40.4	+49.4	128.3	47	02.8	+50.1	129.1	46	24.6	+50.8	130.0	45	45.8	+51.3	130.8	45	06.3	+51.9	131.5	44	26.2	+52.5	132.3	43	45.6	+53.0	133.0	14
15	49	0.9	+48.3	126.5	48	29.8	+49.1	127.4	47	52.9	+49.8	128.3	47	15.4	+50.4	129.2	46	37.1	+51.1	130.0	45	58.2	+51.7	130.8	45	18.7	+52.3	131.6	44	38.6	+52.8	132.3	15
16	49	54.2	+47.9	125.6	49	18.9	+48.6	126.6	48	42.7	+49.4	127.5	48	45.8	+50.1	128.4	47	28.2	+50.8	129.2	46	49.9	+51.4	130.1	46	11.0	+52.0	130.9	45	31.4	+52.6	131.6	16
17	50	42.1	+47.4	124.7	50	07.5	+48.2	125.7	49	32.1	+49.0	126.6	48	55.9	+49.8	127.6	48	19.0	+50.4	128.4	47	41.3	+51.1	129.3	47	03.0	+51.7	130.1	46	24.0	+52.3	131.0	17
18	51	29.5	+46.9	123.7	50	55.7	+47.8	124.7	50	21.1	+48.6	125.7	49	45.7	+49.3	126.7	49	09.4	+50.1	127.6	48	32.4	+50.8	128.5	47	54.7	+51.4	129.4	47	16.3	+52.0	130.2	18
19	52	16.4	+46.3	122.7	51	43.5	+47.2	123.8	51	09.7	+48.1	124.8	50	35.0	+48.9	125.8	49	59.5	+49.7	126.8	49	23.2	+50.4	127.7	48	46.1	+51.1	128.6	48	08.3	+51.7	129.5	19
20	53	02.7	+45.8	121.6	52	30.7	+46.8	122.8	51	57.8	+47.6	123.8	51	23.9	+48.5	124.9	50	49.2	+49.2	125.9	50	13.6	+50.0	126.9	49	37.2	+50.7	127.8	49	00.0	+51.4	128.7	20
21	53	48.5	+45.2	120.6	53	17.5	+46.1	121.7	52	45.4	+47.1	122.8	52	12.4	+48.0	123.9	51	38.4	+48.9	125.0	51	03.6	+49.6	126.0	50	27.9	+50.4	127.0	49	51.4	+51.1	127.9	21
22	54	33.7	+44.5	119.4	54	03.6	+45.6	120.6	53	32.5	+46.6	121.8	53	00.4	+47.5	122.9	52	27.3	+48.3	124.0	51	53.2	+49.2	125.1	51	18.3	+50.0	126.1	50	42.5	+50.7	127.1	22
23	55	18.2	+43.8	118.3	54	49.2	+44.9	119.5	54	19.1	+45.4	120.7	53	47.9	+46.9	121.9	53	15.6	+47.4	123.1	52	42.4	+48.4	124.2	52	08.3	+49.5	125.2	51	33.2	+50.4	126.3	23
24	56	02.0	+43.1	117.1	55	34.1	+44.3	118.4	55	05.0	+45.4	119.6	54	34.8	+46.4	120.9	54	03.5	+47.3	122.0	53	31.2	+48.2	123.2	52	57.8	+49.1	124.3	52	23.6	+49.9	125.4	24
25	56	45.1	+42.3	115.8	56	18.4	+43.5	117.2	55	50.4	+44.6	118.5	55	21.2	+45.7	119.7	54	50.8	+46.8	121.0	54	19.4	+47.4	122.3	53	46.1	+48.7	123.3	53	13.5	+49.5	124.5	25
26	57	27.4	+41.5	114.5	57	01.9	+42.7	115.9	56	35.0	+43.9	117.3	56	06.9	+45.1	118.6	55	37.6	+46.1	119.9	55	07.1	+47.2	121.1	54	35.6	+48.1	122.3	54	03.0	+49.0	123.5	26
27	58	08.9	+40.5	113.1	57	44.6	+41.9	114.6	57	18.9	+43.2	116.0	56	52.0	+44.3	117.4	56	23.7	+45.5	118.7	55	54.3	+46.5	120.0	55	23.7	+47.5	121.3	54	52.0	+48.5	122.5	27
28	58	49.4	+39.6	111.7	58	26.5	+41.0	113.2	58	02.1	+42.3	114.7	57	36.3	+43.6	116.2	57	09.2	+44.8	117.5	56	40.8	+45.9	118.9	56	11.2	+47.0	120.2	55	40.5	+47.9	121.5	28
29	59	29.0	+38.6	110.3	58	07.5	+40.0	111.8	58	44.4	+45.1	113.4	58	19.9	+42.8	114.9	57	26.7	+45.3	117.7	56	58.2	+46.3	119.1	56	28.4	+47.4	120.4	55	4.4	+30.7	96.9	29
30	60	07.6	+37.5	108.7	62	51.1	+32.8	102.1	62	37.5	+34.7	104.0	62	22.1	+36.4	105.9	62	04.7	+38.2	107.7	61	45.6	+39.9	109.5	61	24.8	+41.4	111.2	61	02.3	+42.8	112.9	35
31	60	45.1	+36.3	107.2	60	26.6	+37.9	108.8	60	06.4	+39.5	110.5	59	44.6	+40.9	112.1	59	21.2	+42.4	113.7	58	56.4	+43.9	116.7	58	30.2	+44.9	116.7	58	02.6	+46.0	118.1	31
32	61	21.4	+35.1	105.5	61	04.5	+36.8	107.3	60	45.9	+38.4	109.0	60	25.0	+40.0	110.6	60	03.6	+41.4														

# LATITUDE CONTRARY NAME TO DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	36	22.3	-52.7	137.4	35	38.0	-53.2	137.9	34	53.3	-53.6	138.4	34	08.2	-53.9	138.9	33	22.9	-54.3	139.3	32	37.3	-54.6	139.7	31	51.4	-55.0	140.1	31	05.2	-55.2	140.5	0
1	35	29.6	-53.0	138.0	34	44.8	-53.3	138.5	33	59.7	-53.7	138.9	33	14.3	-54.1	139.4	32	28.6	-54.4	139.8	31	42.7	-54.8	140.2	30	56.4	-55.0	140.6	30	10.0	-55.4	141.0	1
2	34	36.6	-53.1	138.6	33	51.5	-53.5	139.0	33	06.0	-53.9	139.5	32	20.2	-54.2	139.9	31	34.2	-54.5	140.3	30	47.9	-54.8	140.7	30	01.4	-55.2	141.0	29	14.6	-55.4	141.4	3
3	33	43.5	-53.2	139.2	32	58.0	-53.7	139.6	32	12.1	-53.9	140.0	31	26.0	-54.3	140.4	30	39.7	-54.6	140.8	29	53.1	-55.0	141.1	29	06.2	-55.2	141.5	28	19.2	-55.5	141.8	4
4	32	50.3	-53.4	139.7	31	04.3	-53.7	140.1	31	18.2	-54.1	140.5	31	45.4	-54.4	140.9	29	45.1	-54.8	141.3	28	58.1	-55.1	141.6	28	11.0	-55.3	141.9	27	23.7	-55.6	142.3	4
5	31	56.9	-53.6	140.3	31	10.6	-53.9	140.6	30	24.1	-54.2	141.0	29	37.3	-54.5	141.4	28	50.3	-54.8	141.7	28	03.1	-55.1	142.1	27	15.7	-55.4	142.4	26	28.1	-55.7	142.7	5
6	31	03.3	-53.6	140.8	30	16.7	-54.0	141.2	29	29.9	-54.3	141.5	28	42.8	-54.6	141.9	27	55.5	-54.9	142.2	27	08.0	-55.2	142.5	26	20.3	-55.5	142.8	25	32.4	-55.7	143.1	6
7	30	09.7	-53.8	141.3	29	22.7	-54.1	141.7	28	35.6	-54.5	142.0	27	48.2	-54.7	142.3	27	06.0	-55.0	142.6	26	12.8	-55.3	142.9	25	24.8	-55.5	143.2	24	36.7	-55.8	143.5	7
8	29	15.9	-53.9	141.8	28	28.6	-54.2	142.2	27	41.4	-54.5	142.5	26	53.5	-54.9	142.8	26	05.6	-55.1	143.1	25	17.5	-55.4	143.4	24	29.3	-55.7	143.7	23	40.9	-55.9	143.9	8
9	28	22.0	-54.0	142.3	27	34.4	-54.3	142.6	26	46.6	-54.6	142.9	25	58.6	-54.8	143.2	25	10.5	-55.2	143.5	24	22.1	-55.4	143.8	23	33.6	-55.6	144.1	22	45.0	-55.9	144.3	9
10	27	28.0	-54.1	142.8	26	40.1	-54.4	143.1	25	52.0	-54.7	143.4	25	03.8	-55.0	143.7	24	15.3	-55.2	144.0	23	26.7	-55.5	144.2	22	38.0	-55.8	144.5	21	49.1	-56.0	144.7	10
11	26	33.9	-54.2	143.3	25	45.7	-54.5	143.6	24	57.3	-54.7	143.9	24	08.8	-55.1	144.1	23	20.1	-55.3	144.4	22	31.2	-55.5	144.6	21	42.2	-55.8	144.9	20	53.1	-56.0	145.1	11
12	25	39.7	-54.3	143.8	24	51.2	-54.6	144.0	24	02.6	-54.9	144.3	23	13.7	-55.1	144.6	22	24.8	-55.4	144.8	21	35.7	-55.6	145.0	20	46.4	-55.8	145.3	19	57.1	-56.1	145.5	12
13	24	45.4	-54.4	144.2	23	56.6	-54.6	144.5	23	07.7	-54.9	144.8	22	18.6	-55.2	145.0	21	29.4	-55.4	145.2	20	40.1	-55.7	145.4	19	50.6	-55.9	145.7	19	01.0	-56.1	145.9	13
14	23	51.0	-54.4	144.7	23	02.0	-54.8	145.0	22	12.8	-55.0	145.2	21	23.4	-55.2	145.4	20	34.0	-55.5	145.6	19	44.4	-55.7	145.8	18	54.7	-56.0	146.0	18	04.9	-56.2	146.2	14
15	22	56.6	-54.6	145.2	22	07.2	-54.8	145.4	21	17.8	-55.1	145.6	20	28.2	-55.3	145.8	19	38.5	-55.5	146.0	18	48.7	-55.8	146.2	17	58.7	-56.0	146.4	17	08.7	-56.2	146.6	15
16	22	02.0	-54.6	145.6	21	12.4	-54.8	145.8	20	22.7	-55.1	146.0	19	32.9	-55.4	146.3	18	43.0	-55.6	146.4	17	52.9	-55.8	146.6	16	02.7	-56.0	146.8	16	12.5	-56.2	147.0	16
17	21	07.4	-54.7	146.1	20	17.6	-55.0	146.3	19	27.6	-55.2	146.5	18	37.5	-55.4	146.7	17	47.4	-55.7	146.8	16	57.1	-55.9	147.0	15	06.7	-56.1	147.2	15	16.3	-56.3	147.3	17
18	20	12.7	-54.7	146.5	19	22.6	-55.0	146.7	18	32.4	-55.2	146.9	17	42.1	-55.4	147.1	16	51.7	-55.7	147.2	16	01.2	-55.9	147.4	15	10.6	-56.1	147.5	14	20.0	-56.3	147.7	18
19	19	18.0	-54.8	146.9	18	27.6	-55.0	147.1	17	37.2	-55.3	147.3	16	46.7	-55.5	147.5	15	56.0	-55.7	147.6	15	05.3	-55.9	147.8	14	14.5	-56.1	147.9	13	23.7	-56.4	148.0	19
20	18	23.2	-54.9	147.4	17	32.6	-55.1	147.7	16	41.9	-55.3	147.9	15	51.2	-55.6	148.7	14	00.3	-55.7	148.0	14	19.9	-56.0	148.1	13	18.4	-56.2	148.3	12	27.3	-56.3	148.4	20
21	17	28.3	-54.9	147.8	16	37.5	-55.2	148.0	15	46.6	-55.4	148.1	14	55.6	-55.6	148.2	14	04.6	-55.8	148.4	13	13.4	-56.0	148.5	12	22.2	-56.2	148.6	11	31.0	-56.4	148.7	21
22	16	33.4	-55.0	148.2	15	42.3	-55.1	148.4	14	51.2	-55.4	148.5	14	00.0	-55.6	148.6	13	08.8	-55.9	148.8	12	17.4	-56.0	148.9	11	26.0	-56.2	149.0	10	34.6	-56.4	149.1	22
23	15	38.4	-55.0	148.6	14	47.2	-55.3	148.8	13	55.8	-55.4	148.9	13	04.4	-55.7	149.0	12	08.7	-55.6	149.4	11	17.1	-55.9	149.5	10	25.3	-56.0	149.6	9	33.6	-56.3	149.7	24
24	14	43.4	-55.1	149.0	13	51.9	-55.3	149.2	13	00.4	-55.5	149.3	12	05.7	-55.7	149.4	11	17.1	-55.9	149.5	10	25.3	-56.0	149.6	9	13.6	-56.3	149.7	8	21.7	-56.4	149.8	24
25	13	48.3	-55.1	149.4	12	56.6	-55.3	149.6	12	04.9	-55.5	149.7	11	13.1	-55.8	149.8	10	21.2	-55.9	150.0	9	29.3	-56.1	150.0	8	37.3	-56.3	150.0	7	45.3	-56.5	150.1	25
26	12	53.2	-55.1	149.9	12	01.3	-55.3	150.0	11	09.4	-55.6	150.1	10	17.3	-55.7	150.2	9	25.3	-56.0	150.3	8	33.2	-56.2	150.3	7	41.0	-56.3	150.4	6	48.8	-56.5	150.5	26
27	11	58.1	-55.2	150.3	11	06.0	-55.4	150.4	10	13.8	-55.6	150.5	9	21.6	-55.8	150.5	8	29.3	-55.9	150.6	7	37.0	-56.1	150.7	6	44.7	-56.3	150.7	5	52.3	-56.5	150.8	27
28	11	02.9	-55.2	150.7	10	10.6	-55.4	150.8	9	18.2	-55.6	150.8	8	25.8	-55.8	150.9	7	33.4	-56.0	151.0	6	40.9	-56.2	151.0	5	48.4	-56.4	151.1	4	55.8	-56.5	151.1	28
29	5	31.3	-55.3	150.3	4	37.9	-55.6	150.3	3	44.4	-55.7	150.3	2	36.4	-55.8	150.4	1	05.4	+56.0	150.5	0	42.9	+56.0	150.5	2	42.9	+56.2	150.5	1	03.3	+56.5	152.8	33
30	4	0.0	+55.4	150.0	0	0.0	+55.5	150.0	0	0.54	+55.6	150.0	1	48.5	+55.9	150.1	0	0.076	-56.2	153.5	0	46.1	+56.4	153.5	0	26.3	+56.5	153.5	34				
31	0	0.08	+55.4	24.7	0	0.55	+55.6	24.7	2	44.4	+55.8	24.7	2	38.9	+56.0	24.7	4	33.4	+56.2	24.7	5	27.9	+56.3	24.8	6	22.3	+56.5	24.8	40				
32	0	0.56	+55.3	24.3	0	2.456	+55.6	24.3	2	45.6	+55.8	24.3	2	34.9	+56.0	24.4	5	29.6	+56.1	24.4	6	24.2	+56.3	24.4	7	18.8	+56.5	24.5	41				
33	1	51.5	+55.4	23.9	2	46.4	+55.6	23.9																									

34°, 326° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	35	53.3	+52.3	136.4	35	09.8	+52.7	136.8	34	25.8	+53.1	137.3	33	41.5	+53.6	137.8	32	57.0	+53.9	138.2	32	12.1	+54.2	138.6	31	26.9	+54.6	139.0	30	41.5	+54.9	139.4	0
1	36	45.6	+52.1	135.7	36	02.5	+52.5	136.3	35	18.9	+53.0	136.7	34	35.1	+53.3	137.2	33	50.9	+53.7	137.7	33	06.3	+54.2	138.1	32	21.5	+54.5	138.6	31	36.4	+54.8	139.0	1
2	37	37.7	+51.9	135.1	36	55.0	+52.3	135.7	36	11.9	+52.8	136.2	35	28.4	+52.3	136.7	34	44.6	+53.6	137.1	34	00.5	+54.0	137.6	33	16.0	+54.4	138.1	32	31.2	+54.7	138.5	2
3	38	29.6	+51.7	134.5	37	47.3	+52.2	135.0	37	04.7	+52.4	135.6	36	21.6	+53.1	136.1	35	38.2	+53.5	136.6	34	54.5	+53.8	137.1	34	10.4	+54.2	137.5	33	25.9	+54.6	138.0	3
4	39	21.3	+51.4	133.8	38	39.5	+51.9	134.4	37	57.3	+52.3	135.0	37	14.7	+52.9	135.5	36	31.7	+53.3	136.0	35	48.3	+53.7	136.5	34	20.5	+54.5	137.5	34				
5	40	12.7	+51.2	133.2	38	31.4	+51.8	133.8	38	49.7	+52.2	134.4	38	07.6	+52.6	134.9	37	25.0	+53.1	135.5	36	42.0	+53.6	136.0	35	58.7	+53.9	136.5	35	15.0	+54.3	137.0	5
6	41	03.9	+51.0	132.5	40	23.2	+51.5	133.1	39	41.9	+52.0	133.7	39	00.2	+52.5	134.3	38	18.1	+53.0	134.9	37	35.6	+53.4	135.4	36	52.6	+53.9	136.0	36	09.3	+54.2	136.5	6
7	41	54.9	+50.7	131.8	41	14.7	+51.2	132.4	40	33.9	+51.8	133.1	39	52.7	+52.3	133.7	38	11.1	+52.7	134.3	37	29.0	+53.2	134.8	37	46.5	+53.6	135.4	37	03.5	+54.1	135.9	7
8	42	45.6	+50.4	131.0	42	05.9	+51.0	131.7	41	25.7	+51.5	132.4	40	45.0	+52.1	133.0	39	03.8	+52.6	133.7	39	22.2	+53.3	134.2	38	40.1	+53.5	134.8	37	57.6	+53.9	135.4	8
9	43	36.0	+50.1	130.3	42	56.9	+50.7	131.0	42	17.2	+51.3	131.7	41	37.1	+51.8	132.4	40	56.4	+52.3	133.0	40	15.2	+52.8	133.6	39	33.6	+53.3	134.2	38	51.5	+53.7	134.8	9
10	44	26.1	+49.8	129.5	43	47.6	+50.4	130.3	43	08.5	+51.0	131.0	42	28.9	+51.6	131.7	41	48.7	+52.1	132.4	41	08.0	+52.7	133.0	40	26.9	+53.1	133.6	39	45.2	+53.6	134.2	10
11	45	15.9	+49.5	128.7	44	38.0	+50.1	129.5	43	59.5	+50.8	130.3	43	20.5	+51.3	131.0	42	40.8	+51.9	131.7	42	00.7	+52.4	132.4	41	20.0	+52.9	133.0	40	38.8	+53.4	133.7	11
12	46	05.4	+49.1	127.9	45	28.1	+49.8	128.7	44	50.3	+50.4	129.5	44	11.8	+51.0	130.3	43	32.7	+51.6	131.0	42	12.9	+52.6	132.4	41	32.2	+53.1	133.1	12				
13	46	54.5	+48.7	127.1	46	17.9	+49.5	127.9	45	40.7	+50.1	128.8	45	02.8	+50.8	129.5	44	24.3	+51.4	130.3	43	45.2	+51.9	131.0	43	05.5	+52.5	131.7	42	25.3	+53.0	132.4	13
14	47	43.2	+48.4	126.2	47	07.4	+49.1	127.1	46	30.8	+49.8	128.0	45	53.6	+50.4	128.8	45	15.7	+51.0	129.6	44	37.1	+51.7	130.3	43	58.0	+52.2	131.1	43	18.3	+52.8	131.8	14
15	48	31.6	+47.9	125.4	47	56.5	+48.6	126.3	47	20.6	+49.4	127.1	46	44.0	+50.1	128.0	46	06.7	+50.8	128.8	45	28.8	+51.4	129.6	44	50.2	+52.0	130.4	44	11.1	+52.5	131.1	15
16	49	19.5	+47.4	124.4	48	45.1	+48.3	125.4	48	10.0	+49.0	126.3	47	34.1	+49.8	127.2	46	57.5	+50.4	128.0	46	20.2	+51.0	128.9	45	42.2	+51.7	129.7	45	03.6	+52.2	130.4	16
17	50	69.6	+47.0	123.5	49	33.4	+47.8	124.5	48	59.0	+48.6	125.4	48	23.9	+49.3	126.4	47	47.9	+50.1	127.2	47	11.2	+52.8	128.1	46	33.9	+51.4	128.9	45	55.8	+52.0	129.7	17
18	50	53.9	+46.5	122.5	50	21.2	+47.4	123.5	49	47.6	+48.2	124.5	49	13.2	+49.0	125.5	48	38.0	+49.7	126.4	48	02.0	+50.4	127.3	47	25.3	+51.1	129.0	18				
19	51	40.4	+46.0	121.5	51	08.6	+46.9	122.6	50	35.8	+47.8	123.6	50	02.2	+48.6	124.6	49	27.7	+49.3	125.6	48	52.4	+50.1	126.5	48	16.4	+50.7	127.4	47	39.5	+51.5	128.3	19
20	52	26.4	+45.3	120.5	51	55.5	+46.3	121.6	51	23.6	+47.2	122.6	50	50.8	+48.1	123.7	50	17.0	+49.0	124.7	49	42.5	+49.7	125.7	48	31.0	+51.1	127.5	20				
21	53	11.7	+44.8	119.4	52	41.8	+45.7	120.5	52	10.8	+46.7	121.6	51	38.9	+47.6	122.7	51	06.0	+48.4	123.8	49	57.5	+50.1	125.8	49	22.1	+50.7	126.7	21				
22	53	56.5	+44.1	118.3	53	27.5	+45.2	119.4	52	57.5	+46.2	120.6	52	26.5	+47.1	121.7	51	54.4	+48.0	122.8	51	21.4	+48.9	123.9	50	47.6	+49.6	124.9	50	12.8	+50.4	125.9	22
23	54	40.6	+43.4	117.1	54	12.7	+44.5	118.3	53	43.7	+45.6	119.5	53	13.6	+46.5	120.7	52	42.4	+47.5	121.8	52	10.3	+48.4	122.0	51	37.2	+49.2	124.0	51	03.2	+50.0	125.0	23
24	55	24.0	+42.7	115.9	54	57.2	+43.9	117.2	54	29.3	+44.9	118.4	54	06.1	+40.0	119.6	53	29.9	+47.0	120.8	52	58.7	+47.4	122.0	52	26.4	+48.8	123.1	51	53.2	+49.6	124.1	24
25	56	60.7	+41.9	114.6	55	41.1	+43.1	116.0	55	14.2	+44.2	117.3	54	46.1	+45.4	118.5	53	16.9	+46.4	119.8	53	46.6	+47.3	121.0	53	15.2	+48.2	122.1	52	42.8	+49.1	123.2	25
26	56	48.6	+41.1	113.3	56	24.2	+42.3	114.7	55	58.4	+43.6	116.1	55	31.5	+44.6	117.4	55	03.3	+45.7	118.7	54	33.9	+46.8	119.9	54	03.4	+47.8	121.1	53	31.9	+48.7	122.3	26
27	57	29.7	+40.2	112.0	57	06.5	+41.5	113.4	56	42.0	+42.8	114.8	56	16.1	+44.0	116.2	55	49.0	+45.1	117.5	55	20.7	+46.2	118.8	54	51.2	+47.2	120.1	54	20.6	+48.2	121.3	27
28	58	09.9	+39.2	110.6	57	48.0	+40.6	112.1	57	24.8	+41.9	113.5	57	00.1	+43.2	115.0	56	34.1	+45.0	116.3	56	06.9	+46.9	117.7	55	38.4	+46.6	119.0	55	08.8	+47.6	120.2	28
29	58	49.1	+38.2	109.2	58	28.6	+39.7	110.7	58	06.7	+41.1	112.2	57	43.3	+42.4	113.7	57	18.5	+43.7	115.1	56	52.4	+44.9	116.5	56	25.0	+46.0	117.8	55	64.6	+47.0	119.5	55
30	59	27.3	+37.2	107.7	59	08.3	+38.7	109.3	58	47.8	+40.1	110.8	58	25.7	+41.5	112.3	58	02.2	+42.8	113.8	57	37.3	+44.0	115.3	57	11.0	+45.3	116.7	56	43.4	+46.4	118.0	56
31	60	04.5	+36.0	106.1	59	47.0	+37.6	107.7	59	27.9	+39.1	109.4	59	07.2	+40.6	110.9	58	45.0	+42.0	112.5	58	21.3	+43.3	114.0	57	56.3	+44.5	115.5	57	29.8	+45.7	116.9	56
32	60	40.5	+34.8	104.5	60	24.6	+36.5	106.2	60	07.0	+38.1	107.9	59	47.8	+39.6	109.5	59	27.0	+41.1	111.1	59	04.6	+42.5	112.7	58	40.8	+41.0	114.2	58	15.5	+45.0	115.7	52
33	61	15.3	-33.4	102.8	61</																												

# LATITUDE CONTRARY NAME TO DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	35	53.3	-52.4	136.4	35	09.8	-52.9	136.8	34	25.8	-53.3	137.3	33	41.5	-53.6	137.8	32	57.0	-54.1	138.2	32	12.1	-54.4	138.6	31	26.9	-54.7	139.0	30	41.5	-55.1	139.4	0
1	35	00.9	-52.6	136.9	34	16.9	-53.1	137.4	33	32.5	-53.4	137.9	32	47.9	-53.8	138.3	32	02.9	-54.1	138.7	31	17.7	-54.5	139.1	30	32.2	-54.8	139.5	29	46.4	-55.1	139.9	1
2	34	08.3	-52.8	137.5	33	23.8	-53.1	138.0	32	39.1	-53.5	138.4	31	54.1	-53.9	138.8	31	08.8	-54.3	139.2	30	23.2	-54.6	139.6	29	37.4	-54.9	140.0	28	51.3	-55.2	140.4	3
3	33	15.5	-53.0	138.1	32	30.7	-53.4	138.5	31	45.6	-53.7	138.9	31	00.2	-54.1	139.3	30	14.5	-54.4	139.7	29	28.6	-54.7	140.1	28	42.5	-55.0	140.5	27	56.1	-55.3	140.8	4
4	32	22.5	-53.1	138.7	31	37.3	-53.4	139.1	30	51.9	-53.3	139.5	30	06.1	-54.1	139.8	29	20.1	-54.4	140.2	28	33.9	-54.8	140.6	27	47.5	-55.1	140.9	27	00.8	-55.4	141.2	5
5	31	29.4	-53.2	139.2	30	43.9	-53.6	139.6	29	58.1	-54.0	140.0	28	12.0	-54.3	140.3	28	25.7	-54.6	140.7	27	39.1	-54.9	141.0	26	52.4	-55.2	141.4	26	05.4	-55.4	141.7	6
6	30	36.2	-53.3	139.7	29	50.3	-53.7	140.1	29	04.1	-54.0	140.5	28	17.7	-54.3	140.8	27	31.1	-54.7	141.2	26	44.2	-54.9	141.5	25	57.2	-55.3	141.8	25	10.0	-55.6	142.1	7
7	29	42.9	-53.5	140.3	28	56.6	-53.8	140.6	28	10.1	-54.2	141.0	27	23.4	-54.5	141.3	26	36.4	-54.7	141.6	25	49.3	-55.1	141.9	25	01.9	-55.3	142.2	24	14.4	-55.6	142.5	8
8	28	49.4	-53.6	140.8	28	02.8	-54.0	141.1	27	15.9	-54.2	141.5	26	28.9	-54.6	141.8	25	41.7	-54.9	142.1	24	54.2	-55.1	142.4	23	18.8	-55.6	142.9	23	23.2	-55.7	143.3	9
9	27	55.8	-53.7	141.3	27	08.8	-54.0	141.6	26	21.7	-54.4	141.9	25	34.3	-54.6	142.2	24	46.8	-54.9	142.5	23	59.1	-55.2	142.8	23	11.2	-55.4	143.1	22	23.2	-55.7	143.3	10
10	27	02.1	-53.9	141.8	26	14.8	-54.1	142.1	25	27.3	-54.4	142.4	24	39.7	-54.7	142.7	23	51.9	-55.0	143.0	22	03.9	-55.3	143.2	21	15.8	-55.6	143.5	21	27.5	-55.8	143.7	11
11	26	08.2	-53.9	142.3	25	20.7	-54.2	142.6	24	32.9	-54.5	142.9	23	45.0	-54.8	143.2	22	56.9	-55.1	143.4	22	08.6	-55.3	143.7	21	20.2	-55.5	143.9	20	31.7	-55.8	144.1	12
12	25	14.3	-54.0	142.8	24	26.5	-54.4	143.1	23	38.4	-54.6	143.3	22	50.2	-54.9	143.6	21	01.8	-55.1	143.8	20	24.7	-55.7	144.3	19	35.9	-55.9	144.5	13				
13	24	20.3	-54.1	143.3	23	32.1	-54.3	143.5	22	43.8	-54.7	143.8	21	55.3	-54.9	144.0	20	06.7	-55.2	144.3	19	29.0	-55.7	144.7	18	40.0	-55.9	144.9	13				
14	23	26.2	-54.2	143.7	22	37.8	-54.5	144.0	21	49.1	-54.7	144.2	20	00.4	-55.0	144.5	20	11.5	-55.3	144.7	19	22.5	-55.5	144.9	18	33.3	-55.7	145.1	17	44.1	-56.0	145.3	14
15	22	32.0	-54.2	144.2	21	43.3	-54.5	144.4	20	54.4	-54.8	144.7	20	05.4	-55.1	144.9	19	16.2	-55.3	145.1	18	27.0	-55.6	145.3	17	37.6	-55.8	145.5	16	48.1	-56.0	145.7	15
16	21	37.8	-54.4	144.7	20	48.8	-54.7	144.9	19	59.6	-54.9	145.1	19	10.3	-55.1	145.3	18	20.9	-55.3	145.5	17	31.4	-55.6	145.7	16	41.8	-55.8	145.9	15	52.1	-56.0	146.0	16
17	20	43.4	-54.4	145.1	19	54.1	-54.6	145.3	19	04.7	-54.9	145.5	18	15.2	-55.2	145.7	17	25.6	-55.4	145.9	16	35.8	-55.6	146.1	15	46.0	-55.9	146.2	14	56.1	-56.1	146.4	17
18	19	49.0	-54.5	145.6	18	59.5	-54.8	145.8	18	09.8	-55.0	146.0	17	20.0	-55.2	146.1	16	30.2	-55.5	146.3	15	40.2	-55.7	146.5	14	50.1	-55.9	146.6	13	54.2	-55.9	146.8	18
19	18	54.5	-54.5	146.0	18	04.7	-54.8	146.2	17	14.8	-55.0	146.4	16	24.8	-55.3	146.6	15	34.7	-55.5	146.7	14	44.5	-55.7	146.9	13	03.9	-56.2	147.1	19				
20	18	00.0	-54.6	146.5	17	09.9	-54.8	146.8	16	19.8	-55.1	147.0	15	29.5	-55.3	147.0	14	39.2	-55.5	147.1	13	48.8	-55.8	147.2	12	07.7	-56.1	147.4	20				
21	17	05.4	-54.6	146.9	16	15.1	-54.9	147.1	15	24.7	-55.1	147.2	14	34.2	-55.3	147.4	13	43.7	-55.6	147.5	12	53.0	-55.8	147.6	11	11.6	-56.2	147.8	21				
22	16	10.8	-54.7	147.3	15	20.2	-54.9	147.5	14	29.6	-55.2	147.6	13	38.9	-55.4	147.8	12	48.1	-55.6	147.9	11	57.2	-55.8	148.0	10	15.4	-56.3	148.2	22				
23	15	16.1	-54.8	147.8	14	25.3	-55.0	147.9	13	34.4	-55.2	148.0	12	43.5	-55.4	148.1	11	52.5	-55.7	148.3	10	01.4	-55.8	148.4	10	56.8	-55.6	148.6	23				
24	14	21.3	-54.8	148.2	13	30.3	-55.0	148.3	12	39.2	-55.2	148.4	11	48.1	-55.5	148.5	10	05.6	-55.9	148.7	9	14.3	-56.1	148.8	8	22.9	-56.3	148.9	24				
25	13	26.5	-54.8	148.6	12	35.3	-55.1	148.7	11	44.0	-55.3	148.8	10	52.6	-55.6	148.9	9	01.2	-55.7	149.0	8	18.2	-56.1	149.2	7	26.6	-56.2	149.3	25				
26	12	31.7	-54.9	149.0	11	40.2	-55.1	149.1	10	48.7	-55.3	149.2	9	57.1	-55.5	149.3	8	09.5	-55.7	149.4	7	22.1	-56.1	149.6	6	30.4	-56.3	149.6	26				
27	11	36.8	-54.9	149.4	10	45.1	-55.1	149.5	9	53.4	-55.3	149.6	8	01.6	-55.5	149.7	7	10.8	-55.8	149.8	6	26.0	-56.1	149.9	5	34.1	-56.3	150.0	27				
28	10	41.9	-55.0	149.8	9	50.0	-55.2	149.9	8	58.0	-55.3	150.0	7	8.6	-56.1	150.1	6	22.9	-55.7	150.2	5	29.9	-56.1	150.3	4	37.8	-56.3	150.3	28				
29	9	46.9	-55.1	150.2	8	54.8	-55.1	150.3	7	0.2	-55.7	150.4	6	7.105	-55.6	150.5	5	18.3	-55.8	150.6	4	33.8	-56.2	150.6	3	41.5	-56.4	150.7	29				
30	8	51.8	-55.1	150.5	7	14.0	-55.2	150.6	6	21.0	-55.4	151.0	5	19.3	-55.6	151.1	4	22.5	-55.8	151.2	3	30.9	-56.1	151.3	2	41.8	-56.3	151.3	30				
31	7	55.8	-55.1	150.8	6	14.0	-55.3	151.0	5	21.4	-55.5	151.2	4	20.7	-55.7	151.3	3	21.4	-56.1	151.4	2	41.5	-56.2	151.4	1	02.5	-56.3	151.7	32				
32	6	10.8	-55.1	151.2	5	13.0	-55.2	151.4	4	20.1	-55.4	151.6	3	17.1	-55.6	151.7	2	20.4	-55.7	151.8	1	03.0	-56.0	152.0	0	03.8	+56.4	28.0	33				
33	5	16.8	-55.1	151.5	4	13.9	-55.2	151.7	3	20.6	-55.4	151.9	2	17.3	-55.6	152.0	1	10.3	-56.0	152.3	0	07.0	+56.2	27.6	34								
34	4	24.2	-55.1	151.8	3	13.3	-55.3	152.0	2	20.2	-55.5	152.2	1	17.0	-55.7	152.3	0	12.3	-56.0	152.6	0	10.2	+56.2	27.6	35								
35	3	31.6	-55.1	152.2	2	30.5	-55.3	152.4</																									

35°, 325° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	35	23.8	+51.9	135.3	34	41.0	+52.4	135.8	33	57.8	+52.8	136.2	33	14.3	+53.2	136.7	32	30.5	+53.6	137.1	31	46.3	+54.0	137.6	31	01.9	+54.3	138.0	30	17.2	+54.7	138.4	0
1	36	15.7	+51.8	134.7	35	33.4	+52.2	135.2	34	50.6	+52.7	135.7	34	07.5	+53.1	136.1	33	24.1	+53.5	136.6	32	40.3	+53.9	137.1	31	56.2	+54.3	137.5	31	11.9	+54.6	137.9	1
2	37	07.5	+51.5	134.0	36	25.6	+52.0	134.6	35	43.3	+52.5	135.1	35	00.6	+52.9	135.6	34	17.6	+53.3	136.1	33	34.2	+53.7	136.5	32	50.5	+54.1	137.0	32	06.5	+54.4	137.4	2
3	37	59.0	+51.4	133.4	37	17.6	+51.8	133.9	36	35.8	+52.3	134.5	35	53.5	+52.8	135.0	35	10.9	+53.2	135.5	34	27.9	+53.6	136.0	33	44.6	+54.0	136.5	33	00.9	+54.4	136.9	3
4	38	50.4	+51.1	132.7	38	09.4	+51.7	133.3	37	28.1	+52.1	133.9	36	46.3	+52.6	134.4	34	04.1	+53.0	134.9	35	21.5	+53.3	135.4	34	38.6	+53.8	135.9	33	55.3	+54.2	136.4	4
5	39	41.5	+50.8	132.1	39	01.1	+51.4	132.7	38	20.2	+51.9	133.2	37	38.9	+52.3	133.8	36	57.1	+52.9	134.4	35	16.0	+53.2	134.9	35	32.4	+53.7	135.4	34	49.5	+54.1	135.9	5
6	40	32.3	+50.7	131.4	39	52.5	+51.1	132.0	39	12.1	+51.7	132.6	38	31.2	+52.2	133.2	37	50.0	+52.6	133.8	37	08.2	+53.2	134.3	36	26.1	+53.6	134.8	35	43.6	+54.0	135.4	6
7	41	23.0	+50.3	130.6	40	43.6	+50.9	131.3	40	03.8	+51.4	131.9	39	23.4	+52.0	132.6	38	42.6	+52.5	133.1	38	01.4	+52.9	133.7	37	19.7	+53.4	134.3	36	37.6	+53.8	134.8	7
8	42	13.3	+50.1	129.9	41	34.5	+50.7	130.6	40	55.2	+51.2	131.3	40	15.4	+51.7	131.9	39	35.1	+52.2	132.5	38	54.3	+52.7	133.1	37	31.4	+53.6	134.3	8				
9	43	03.4	+49.7	129.2	42	25.2	+50.3	129.9	41	46.4	+51.0	130.6	41	07.1	+51.5	131.2	40	27.3	+52.1	131.9	39	47.0	+52.6	132.5	39	06.3	+53.0	133.1	38	25.0	+53.5	133.7	9
10	43	53.1	+49.4	128.4	43	15.5	+50.1	129.1	42	37.4	+50.7	129.9	41	58.6	+51.3	130.6	41	19.4	+51.8	131.2	40	39.6	+52.3	131.9	39	59.3	+52.8	132.5	39	18.5	+53.3	133.1	10
11	44	42.5	+49.1	127.6	44	05.6	+49.8	128.4	43	28.1	+50.4	129.1	42	49.9	+51.0	129.8	42	11.2	+51.5	130.5	41	31.9	+52.1	131.2	40	52.1	+52.6	131.9	40	11.8	+53.1	132.5	11
12	45	31.6	+48.8	126.8	44	55.4	+49.4	127.6	44	18.5	+50.4	128.4	43	40.9	+50.7	129.1	43	02.7	+51.9	129.9	42	24.0	+52.4	131.2	41	04.9	+52.9	131.9	12				
13	46	20.4	+48.3	126.0	45	44.8	+49.1	126.8	45	08.5	+49.8	127.6	44	31.6	+50.4	128.4	43	54.0	+51.1	129.1	43	15.9	+51.6	129.9	42	37.1	+52.2	130.6	41				
14	47	08.7	+48.0	125.1	46	33.9	+48.7	126.0	45	58.3	+49.4	126.8	45	22.0	+50.1	127.6	44	45.1	+50.7	128.4	44	07.5	+51.3	129.2	43	29.3	+51.9	129.9	42	50.5	+52.5	130.6	14
15	47	56.7	+47.5	124.2	47	22.6	+48.3	125.1	46	47.7	+49.1	126.0	46	12.1	+49.8	126.8	45	35.8	+50.4	127.6	44	58.8	+51.1	128.4	44	21.2	+51.7	129.2	43	43.0	+52.2	130.0	15
16	48	44.2	+47.1	123.3	48	10.9	+47.9	124.2	47	36.8	+48.6	125.1	47	01.9	+49.4	126.0	46	26.2	+50.1	126.9	45	49.9	+50.7	127.7	45	12.9	+51.4	128.5	44	35.2	+52.0	129.3	16
17	49	31.3	+46.6	122.3	48	58.8	+47.5	123.3	48	25.4	+48.3	124.3	47	51.3	+49.0	125.2	46	18.3	+49.8	126.1	46	40.6	+50.5	126.9	46	04.3	+51.0	127.8	45	27.2	+51.7	128.6	17
18	50	17.9	+46.1	121.4	49	46.3	+46.9	122.4	49	13.7	+47.8	123.4	48	40.3	+48.6	124.3	48	06.1	+49.4	125.2	47	31.1	+50.1	126.1	46	55.3	+50.8	127.0	46	18.9	+51.4	127.8	18
19	51	04.0	+45.6	120.3	50	33.2	+46.5	121.4	50	01.5	+47.4	122.4	49	28.9	+48.2	123.4	48	55.5	+48.9	124.4	48	21.2	+49.7	125.3	47	46.1	+50.5	126.2	47	10.3	+51.1	127.1	19
20	51	49.6	+45.0	119.3	51	19.7	+46.0	120.4	50	48.9	+46.8	121.5	50	17.1	+47.8	122.5	49	44.4	+48.6	123.5	49	10.9	+49.4	124.5	48	36.6	+50.1	125.4	48	01.4	+50.8	126.3	20
21	52	34.6	+44.3	118.2	52	05.7	+45.3	119.4	51	35.7	+46.4	120.5	50	04.9	+47.2	121.5	50	33.0	+48.1	122.6	50	00.3	+48.9	123.6	49	26.7	+49.7	124.6	48	52.2	+50.5	125.5	21
22	53	18.9	+43.8	117.1	52	51.0	+44.8	118.3	52	22.1	+45.8	119.4	51	52.1	+46.7	120.5	51	21.1	+47.7	121.6	50	49.2	+48.5	122.7	49	42.7	+50.0	124.7	22				
23	54	02.7	+43.0	115.9	53	35.8	+44.2	117.2	53	07.9	+45.2	118.4	52	38.8	+46.2	119.5	52	08.8	+47.1	120.6	51	37.7	+48.9	121.8	50	32.7	+49.7	123.8	23				
24	54	45.7	+42.3	114.7	54	20.0	+43.4	116.0	53	53.1	+44.5	117.3	53	25.0	+45.6	118.5	52	55.9	+46.6	119.6	52	25.7	+47.4	120.8	51	54.6	+48.4	121.9	51				
25	55	28.0	+41.5	113.5	55	03.4	+42.8	114.8	54	37.6	+43.9	116.1	54	10.6	+45.0	117.4	53	42.5	+46.0	118.6	53	13.3	+47.0	119.7	52	43.0	+47.9	120.9	52	11.7	+48.8	122.0	25
26	56	09.5	+40.7	112.2	56	46.2	+41.9	113.6	55	21.5	+43.2	114.9	54	55.6	+44.3	116.2	54	28.5	+45.4	117.5	54	00.3	+46.4	118.7	53	30.9	+47.4	119.9	53	00.5	+48.3	121.0	26
27	56	50.2	+39.8	110.9	56	28.1	+41.2	112.3	56	04.7	+42.4	113.7	55	39.9	+43.6	115.0	55	13.9	+44.8	116.3	54	46.7	+45.8	117.6	54	18.3	+46.9	118.8	53	48.8	+47.8	120.0	27
28	57	30.0	+38.9	109.5	57	09.3	+40.2	111.0	56	47.1	+41.6	112.4	56	23.5	+42.9	113.8	55	58.7	+44.0	115.2	55	32.5	+45.2	116.5	55	05.2	+46.2	117.8	54	36.6	+47.3	119.0	28
29	58	08.9	+37.9	108.1	57	49.5	+39.3	109.6	57	28.7	+40.7	111.1	57	06.4	+42.0	112.5	56	42.7	+43.3	113.9	56	17.7	+44.5	115.3	55	51.4	+45.7	116.6	55	23.9	+46.7	117.9	29
30	58	46.8	+36.8	106.6	58	28.8	+38.4	108.2	58	09.4	+39.8	109.7	57	48.4	+41.2	111.2	57	26.0	+42.5	112.7	57	02.2	+43.8	114.1	56	37.1	+44.9	115.5	56	10.6	+46.1	116.8	30
31	59	23.6	+35.7	105.1	59	07.2	+37.3	106.7	58	49.2	+38.8	108.3	58	29.6	+40.2	109.8	58	08.5	+41.6	111.3	57	46.0	+42.2	114.3	56	56.7	+45.4	115.7	56	22.0	+44.2	114.3	31
32	59	59.3	+34.5	103.5	59	44.5	+36.1	105.1	59	28.0	+37.7	106.8	59	09.8	+39.3	108.4	58	50.1	+40.8	110.0	59	30.9	+39.7	108.5	58	28.9	+42.2	110.5	58				
33	60	33.8	+32.2	101.8	60	20.6	+35.0	103.5	60	05.7	+36.6	105.2	59</																				

# LATITUDE CONTRARY NAME TO DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	35	23.8	-52.2	135.3	34	41.0	-52.6	135.8	33	57.8	-53.0	136.2	33	14.3	-53.4	136.7	32	30.5	-53.8	137.1	31	46.3	-54.1	137.6	31	01.9	-54.5	138.0	30	17.2	-54.8	138.4	0
1	34	31.6	-52.3	135.9	33	48.4	-52.7	136.4	33	04.8	-53.1	136.8	32	20.9	-53.5	137.2	31	36.7	-53.9	137.7	30	52.2	-54.2	138.1	30	07.4	-54.6	138.5	29	22.4	-54.9	138.8	1
2	33	39.3	-52.4	136.5	32	55.7	-52.9	136.9	32	11.7	-53.3	137.4	31	27.4	-53.7	137.8	30	42.8	-54.0	138.2	29	58.0	-54.4	138.6	29	12.8	-54.6	138.9	28	27.5	-55.0	139.3	3
3	32	46.9	-52.7	137.1	32	02.8	-53.1	137.5	31	18.4	-53.4	137.9	30	33.7	-53.7	138.3	29	48.8	-54.1	138.7	29	03.6	-54.4	139.1	28	18.2	-54.8	139.4	27	32.5	-55.1	139.8	4
4	31	54.2	-52.8	137.6	31	09.7	-53.1	138.0	30	25.0	-53.3	138.4	29	33.9	-53.8	138.8	28	54.7	-54.2	139.2	28	09.2	-54.6	139.5	27	23.4	-54.9	139.9	26	37.4	-55.2	140.2	4
5	31	01.4	-52.9	138.2	30	16.6	-53.3	138.6	29	31.5	-53.7	139.0	28	46.1	-54.0	139.3	28	00.5	-54.4	139.7	27	14.6	-54.6	140.0	26	28.5	-54.9	140.3	25	42.2	-55.2	140.6	5
6	30	08.5	-53.0	138.7	29	23.3	-53.4	139.1	28	37.8	-53.8	139.5	27	52.1	-54.1	139.8	27	06.1	-54.4	140.1	26	20.0	-54.8	140.5	25	33.6	-55.0	140.8	24	47.0	-55.3	141.1	6
7	29	15.5	-53.2	139.3	28	29.9	-53.6	139.6	27	44.0	-53.8	140.0	26	58.0	-54.2	140.3	26	11.7	-54.5	140.6	25	25.2	-54.8	140.9	24	38.6	-55.1	141.2	23	51.7	-55.4	141.5	7
8	28	22.3	-53.3	139.8	27	36.3	-53.6	140.1	26	50.2	-54.0	140.5	26	33.8	-54.3	140.8	25	17.2	-54.6	141.1	24	30.4	-54.9	141.4	23	43.5	-55.2	141.7	22	56.3	-55.4	141.9	8
9	27	29.0	-53.5	140.3	26	42.7	-53.8	140.6	25	56.2	-54.1	141.0	25	09.5	-54.4	141.3	24	22.6	-54.7	141.5	23	35.5	-54.9	141.8	22	48.3	-55.3	142.1	21	00.9	-55.5	142.3	9
10	26	35.5	-53.5	140.8	25	48.9	-53.8	141.1	25	02.1	-54.2	141.4	24	15.1	-54.5	141.7	23	27.9	-54.7	142.0	22	40.6	-55.1	142.3	21	53.0	-55.3	142.5	21	05.4	-55.6	142.7	10
11	25	42.0	-53.6	141.3	24	55.1	-54.0	141.6	24	07.9	-54.2	141.9	23	20.6	-54.5	142.2	22	33.2	-54.9	142.4	21	45.5	-55.1	142.7	20	57.7	-55.3	142.9	20	09.8	-55.6	143.1	11
12	24	48.4	-53.7	141.8	24	01.1	-54.0	142.1	23	13.7	-54.3	142.4	22	36.1	-54.6	142.6	21	38.3	-54.9	142.9	20	50.4	-55.1	143.1	19	20.2	-55.5	143.3	19	14.2	-55.7	143.5	12
13	23	54.7	-53.9	142.3	23	07.1	-54.1	142.6	22	19.4	-54.4	142.8	21	31.5	-54.7	143.1	20	43.4	-54.9	143.3	19	06.9	-55.4	143.5	18	11.5	-55.6	144.1	17	22.8	-55.8	144.3	14
14	23	00.8	-53.9	142.8	22	13.0	-54.2	143.0	21	25.0	-54.5	143.3	20	36.8	-54.8	143.5	19	48.5	-55.0	143.7	19	00.0	-55.2	143.9	18	11.5	-55.6	144.1	17	27.0	-55.8	144.3	14
15	22	06.9	-53.9	143.3	21	18.8	-54.3	143.5	20	30.5	-54.6	143.7	19	42.0	-54.8	144.0	18	53.5	-55.1	144.2	18	04.8	-55.4	144.4	17	15.9	-55.5	144.5	16	27.0	-55.8	144.7	15
16	21	13.0	-54.1	143.7	20	24.5	-54.3	144.0	19	35.9	-54.6	144.2	18	47.2	-54.9	144.4	17	58.4	-55.2	144.6	17	09.4	-55.3	144.8	16	20.4	-55.6	144.9	15	31.2	-55.8	145.1	16
17	20	18.9	-54.1	144.2	19	30.2	-54.4	144.4	18	41.3	-54.7	144.6	17	52.3	-54.9	144.8	17	03.2	-55.1	145.0	16	14.1	-55.5	145.2	15	24.8	-55.7	145.3	14	35.4	-55.9	145.5	17
18	19	24.8	-54.2	144.7	18	35.8	-54.5	144.9	17	46.6	-54.7	145.1	16	57.4	-55.0	145.2	16	08.1	-55.3	145.4	15	18.6	-55.4	145.6	14	29.1	-55.7	145.7	13	39.5	-55.9	145.8	18
19	18	30.6	-54.3	145.1	17	41.3	-54.5	145.3	16	51.9	-54.8	145.5	16	02.4	-55.0	145.6	15	12.8	-55.2	145.8	14	23.2	-55.5	146.0	13	33.4	-55.7	146.1	12	43.6	-56.0	146.2	19
20	17	36.3	-54.3	145.6	16	46.8	-54.6	145.7	15	57.1	-54.8	145.9	15	07.4	-55.1	146.1	14	17.6	-55.3	146.2	13	27.7	-55.6	146.3	12	37.7	-55.8	146.5	11	47.6	-55.9	146.6	20
21	16	42.0	-54.4	146.0	15	52.2	-54.7	146.2	15	02.3	-54.9	146.3	14	12.3	-55.1	146.5	13	22.3	-55.4	146.6	12	32.1	-55.5	146.7	11	41.9	-55.8	146.8	10	51.7	-56.0	147.0	21
22	15	47.6	-54.5	146.4	14	57.5	-54.6	146.6	14	07.4	-54.9	146.7	13	17.2	-55.2	146.9	12	26.9	-55.4	147.0	11	36.6	-55.7	147.1	10	46.1	-55.8	147.2	9	55.7	-56.1	147.3	22
23	14	53.1	-54.4	146.9	14	02.9	-54.8	147.0	13	12.5	-55.0	147.2	12	22.0	-55.2	147.3	11	31.5	-55.4	147.4	10	40.9	-55.6	147.5	9	50.3	-55.8	147.6	8	59.6	-56.0	147.7	23
24	13	58.7	-54.6	147.3	13	08.1	-54.7	147.4	12	17.5	-55.2	147.6	10	36.1	-55.4	147.8	9	45.3	-55.6	147.9	8	54.5	-55.9	148.0	7	15.3	-56.1	148.0	24				
25	13	04.1	-54.5	147.7	12	13.4	-54.8	147.9	11	22.5	-55.0	148.0	10	31.6	-55.2	148.1	9	40.7	-55.5	148.2	8	19.7	-55.7	148.3	7	58.6	-55.9	148.4	25				
26	12	09.6	-54.6	148.2	11	18.6	-54.9	148.3	10	27.5	-55.1	148.4	9	36.4	-55.3	148.5	8	45.2	-55.5	148.6	7	54.0	-55.7	148.6	6	27.2	-55.9	148.7	6	11.4	-56.0	148.8	26
27	11	15.0	-54.7	148.6	10	23.7	-54.9	148.7	9	32.4	-55.1	148.8	8	41.1	-55.3	148.9	7	49.7	-55.5	148.9	6	60.8	-55.9	149.1	5	15.4	-56.2	149.1	27				
28	10	20.3	-54.7	149.0	9	28.8	-54.9	149.1	8	37.3	-55.1	149.2	7	45.8	-55.5	149.3	6	54.2	-55.5	149.3	5	10.9	-55.9	149.4	4	19.2	-56.1	149.5	28				
29	9	25.6	-54.7	149.4	8	33.9	-54.9	149.5	7	42.2	-55.1	149.6	6	50.5	-55.4	149.7	5	58.7	-55.6	149.7	4	15.0	-55.8	149.8	3	20.3	-56.1	149.8	29				
30	8	30.9	-54.7	149.8	7	39.0	-54.9	149.9	6	47.1	-55.2	150.0	5	55.1	-55.4	150.0	4	03.1	-55.5	150.1	3	11.1	-55.8	150.1	2	27.0	-56.1	150.2	30				
31	7	36.2	-54.8	150.3	6	44.1	-55.0	150.3	5	51.9	-55.2	150.4	4	49.7	-55.5	150.4	3	07.6	-56.0	150.5	2	23.1	-55.9	150.5	1	30.9	-56.2	150.5	31				
32	6	41.4	-54.8	150.7	5	49.1	-55.0	150.7	4	56.7	-55.3	150.8	3	12.0	-55.6	150.8	2	16.4	-55.8	151.2	1	21.2	-56.0	151.2	0	34.7	-56.1	151.2	32				
33	5	41.3	-54.9	151.1	4	60.1	-54.9	151.1	3	24.0	-55.2	151.2	2	18.8	-55.4	151.6	1	20.4	-56.0	152.0	0	24.7	-56.0	152.0	2	17.5	-56.2	15					

36°, 324° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	34	53.6	+51.7	134.2	34	11.6	+52.1	134.7	33	29.2	+52.6	135.2	32	46.5	+52.9	135.6	32	03.4	+53.4	136.1	31	20.0	+53.8	136.5	30	36.4	+54.1	136.9	29	52.4	+54.5	137.3	0
1	35	45.3	+51.4	133.6	35	03.7	+51.9	134.1	34	21.8	+52.3	134.6	33	39.4	+52.8	135.1	32	56.8	+53.2	135.5	32	13.8	+53.6	136.0	31	30.5	+54.0	136.4	30	46.9	+54.3	136.8	1
2	36	36.7	+51.2	133.0	35	55.6	+51.7	133.5	35	14.1	+52.2	134.0	34	32.2	+52.7	134.5	33	50.0	+53.1	135.0	33	07.4	+53.5	135.5	32	24.5	+53.8	135.9	31	41.2	+54.3	136.3	2
3	37	27.9	+51.0	132.3	36	47.3	+51.5	132.9	36	06.3	+52.0	133.4	35	24.9	+52.4	133.9	34	43.1	+52.9	134.4	34	00.9	+53.3	134.9	33	18.3	+53.8	135.4	32	35.5	+54.1	135.8	3
4	38	18.9	+50.8	131.6	37	38.8	+51.3	132.2	36	58.3	+51.4	132.8	36	17.3	+52.3	133.3	35	36.0	+52.7	133.9	34	12.1	+53.6	134.9	33	29.6	+54.0	135.3	4				
5	39	09.7	+50.5	131.0	38	30.1	+51.1	131.6	37	50.1	+51.6	132.1	37	09.6	+52.1	132.7	36	28.7	+52.6	133.3	35	47.4	+53.0	133.8	35	05.7	+53.4	134.3	34	23.6	+53.8	134.8	5
6	40	00.2	+50.3	130.3	39	21.2	+50.8	130.9	38	41.7	+51.4	131.5	38	01.7	+51.9	132.1	37	21.3	+52.3	132.7	36	40.4	+52.8	133.2	35	59.1	+53.3	133.7	35	17.4	+53.7	134.3	6
7	40	50.5	+50.0	129.5	40	12.0	+50.6	130.2	39	33.1	+51.1	130.8	38	53.6	+51.7	131.4	38	13.6	+52.2	132.0	37	33.2	+52.7	132.6	36	52.4	+53.1	133.2	36	11.1	+53.6	133.7	7
8	41	40.5	+49.7	128.8	41	02.6	+50.3	129.5	40	24.0	+50.8	130.1	39	45.3	+51.4	130.8	39	05.8	+52.0	131.4	38	25.9	+52.4	132.0	37	45.5	+52.9	132.6	37	04.7	+53.4	133.1	8
9	42	30.2	+49.4	128.1	41	52.9	+50.1	128.8	41	15.1	+50.6	129.4	40	36.7	+51.2	130.1	39	57.8	+51.7	130.8	39	18.3	+52.3	131.4	38	38.4	+52.8	132.0	37	58.1	+53.2	132.6	9
10	43	19.6	+49.1	127.3	42	43.0	+49.7	128.0	41	05.7	+50.4	128.7	41	27.9	+50.9	129.4	40	49.5	+51.5	130.1	40	10.6	+52.0	130.7	39	31.2	+52.5	131.4	38	51.3	+53.0	132.0	10
11	44	08.7	+48.7	126.5	43	32.7	+49.4	127.2	42	56.1	+50.0	128.0	42	18.8	+50.7	128.7	41	41.0	+51.3	129.4	41	02.6	+51.9	130.1	40	23.7	+52.4	130.7	39	44.3	+52.9	131.4	11
12	44	57.4	+48.4	125.7	44	22.1	+49.1	126.5	43	46.1	+49.8	127.0	43	09.5	+50.4	128.0	42	32.3	+51.0	128.7	41	54.5	+51.5	129.4	41	16.1	+52.1	130.1	40	37.2	+52.6	130.8	12
13	45	45.8	+48.0	124.8	45	11.2	+48.7	125.6	44	35.9	+49.4	126.5	43	59.9	+50.1	127.2	43	23.3	+50.7	128.0	42	46.0	+51.3	128.7	42	08.2	+51.9	129.4	41	29.8	+52.4	130.1	13
14	46	33.8	+47.6	124.0	45	59.9	+48.4	124.8	45	25.3	+49.1	125.7	44	50.0	+49.7	126.5	44	14.0	+50.4	127.3	43	37.3	+51.1	128.0	43	00.1	+51.6	128.8	42	22.2	+52.2	129.5	14
15	47	21.4	+47.1	123.1	46	48.3	+47.9	124.0	46	14.4	+48.7	124.8	45	39.7	+49.5	125.7	45	04.4	+50.1	126.5	44	28.4	+50.7	127.3	43	51.7	+51.4	128.1	43	14.4	+52.0	128.8	15
16	48	08.5	+46.8	122.1	47	36.2	+47.5	123.1	47	03.1	+48.3	124.0	46	29.2	+49.0	124.9	45	54.5	+49.8	125.7	45	19.1	+50.5	126.5	44	43.1	+51.1	127.3	44	06.4	+51.7	128.1	16
17	48	55.3	+46.2	122.1	48	23.7	+47.1	122.2	47	51.4	+47.9	123.1	47	18.2	+48.7	124.0	46	44.3	+49.4	124.9	46	09.6	+50.1	125.8	45	34.2	+50.8	126.6	44	58.1	+51.4	127.4	17
18	49	41.5	+45.7	120.2	49	10.8	+46.6	121.2	48	39.3	+47.5	122.2	48	06.9	+48.3	123.1	47	33.7	+49.0	124.1	46	59.7	+49.8	125.0	45	25.0	+50.4	125.8	44	49.5	+51.1	126.7	18
19	50	27.2	+45.2	119.2	49	57.4	+46.2	120.2	49	26.8	+47.0	121.3	48	55.2	+47.8	122.2	48	22.7	+48.7	123.2	47	49.5	+49.4	124.1	47	15.4	+50.2	125.0	46	40.6	+50.8	125.9	19
20	51	12.4	+44.6	118.2	50	43.6	+45.5	119.2	50	13.8	+46.5	120.3	49	43.0	+47.4	121.3	49	11.4	+48.2	122.3	48	38.9	+49.0	123.3	48	05.6	+49.7	124.2	47	31.4	+50.5	125.1	20
21	51	57.0	+44.0	117.1	51	29.1	+45.0	118.2	51	00.3	+46.0	119.3	50	30.4	+46.9	120.4	49	59.6	+47.8	121.4	49	27.9	+48.6	122.4	48	55.3	+49.4	123.4	48	21.9	+50.2	124.3	21
22	52	41.0	+43.3	116.0	52	14.1	+44.5	117.1	51	46.3	+45.4	118.3	51	17.3	+46.4	119.4	50	47.4	+47.3	120.4	50	16.5	+48.2	121.5	49	44.7	+49.0	122.5	49	12.1	+49.7	123.5	22
23	53	24.3	+42.7	114.8	52	58.6	+43.7	116.0	52	31.7	+44.8	117.2	52	03.7	+45.8	118.4	51	34.7	+46.8	119.5	52	21.5	+46.2	119.6	51	22.3	+48.1	120.7	50	51.2	+48.9	121.7	24
24	54	07.0	+41.9	113.6	53	42.3	+43.1	114.9	53	16.5	+44.2	116.1	52	49.5	+45.3	117.3	52	21.5	+46.2	118.4	51	52.4	+47.2	119.6	51	22.3	+48.1	120.7	50	51.2	+48.9	121.7	24
25	54	48.9	+41.2	112.4	54	25.4	+42.4	113.7	54	00.7	+43.5	115.0	53	34.8	+44.6	116.2	53	07.7	+45.7	117.4	52	39.6	+46.7	118.6	52	10.4	+47.6	119.7	51	40.1	+48.5	120.8	25
26	55	30.1	+40.3	111.1	55	07.8	+41.6	112.5	54	44.2	+42.8	113.8	54	19.4	+44.0	115.1	53	52.4	+45.1	116.3	53	26.3	+46.1	117.5	52	58.0	+47.1	118.7	52	28.6	+48.1	119.8	26
27	56	10.4	+39.5	109.8	55	49.4	+40.8	111.2	55	27.0	+42.1	112.6	55	03.4	+43.2	113.9	54	38.5	+44.4	115.2	54	12.4	+45.4	116.4	53	45.1	+46.5	117.7	53	16.7	+47.5	118.9	27
28	56	49.9	+38.5	108.4	56	30.2	+39.9	109.9	56	09.1	+41.2	111.3	55	46.6	+42.5	112.7	55	22.9	+43.7	114.0	54	57.8	+44.9	115.3	54	31.6	+45.9	116.6	53	42.4	+46.9	117.8	28
29	57	28.4	+37.6	107.0	57	10.1	+39.0	108.5	56	50.3	+40.4	110.0	56	29.1	+41.7	111.4	56	06.6	+42.9	112.8	55	42.7	+44.1	114.1	55	17.5	+45.3	116.7	54	20.3	+46.4	117.9	29
30	58	06.0	+36.5	105.6	57	49.1	+38.1	107.1	57	30.7	+39.5	108.6	57	10.8	+40.9	110.1	56	49.5	+42.2	111.5	56	26.8	+43.5	112.9	55	02.8	+44.6	114.3	55	37.5	+45.7	115.6	30
31	58	42.5	+35.5	104.1	58	27.2	+36.9	105.6	58	10.2	+38.5	107.2	57	51.7	+39.9	108.7	57	31.7	+41.3	110.2	57	10.3	+42.6	111.7	56	47.4	+43.9	113.1	56	23.2	+45.1	114.5	31
32	59	18.0	+34.2	102.5	59	04.1	+35.9	104.1	58	48.7	+37.4	105.7	58	31.6	+39.0	107.3	58	13.0	+40.4	108.8	57	52.9	+41.8</td										

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $36^\circ$ ,  $324^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	34	53.6	-51.8	134.2	34	11.6	-52.3	134.7	33	29.2	-52.7	135.2	32	46.5	-53.1	135.6	32	03.4	-53.5	136.1	31	20.0	-53.8	136.5	30	36.4	-54.3	136.9	29	52.4	-54.6	137.3	0
1	34	01.8	-52.0	134.8	33	19.3	-52.4	135.3	32	36.5	-52.8	135.8	31	53.4	-53.3	136.2	31	09.9	-53.6	136.6	30	26.2	-54.0	137.0	29	42.1	-54.3	137.4	28	57.8	-54.7	137.8	1
2	33	09.8	-52.1	135.4	32	26.9	-52.6	135.9	31	43.7	-53.0	136.3	31	00.1	-53.3	136.7	30	16.3	-53.7	137.1	29	32.2	-54.1	137.5	28	47.8	-54.5	137.9	28	03.1	-54.7	138.3	3
3	32	17.7	-52.4	136.0	31	34.3	-52.7	136.5	30	50.7	-53.1	136.9	30	06.8	-53.5	137.3	29	22.6	-53.9	137.7	28	38.1	-54.2	138.0	27	53.3	-54.5	138.4	27	08.4	-54.9	138.7	4
4	31	25.3	-52.4	136.6	31	41.6	-52.9	137.0	29	57.6	-53.3	137.4	29	13.3	-53.7	137.8	28	28.7	-54.0	138.2	27	43.9	-54.3	138.5	26	58.8	-54.6	138.9	26	13.5	-54.9	139.2	4
5	30	32.9	-52.7	137.2	29	48.7	-53.0	137.6	29	04.3	-53.4	137.9	28	19.6	-53.7	138.3	27	34.7	-54.1	138.7	26	49.6	-54.4	139.0	26	04.2	-54.8	139.3	25	18.6	-55.1	139.6	5
6	29	40.2	-52.7	137.7	28	55.7	-53.1	138.1	28	10.9	-53.5	138.5	27	25.9	-53.8	138.8	26	40.6	-54.1	139.1	25	55.2	-54.5	139.5	25	09.4	-54.8	139.8	24	23.5	-55.1	140.1	6
7	28	47.5	-52.9	138.3	28	02.6	-53.3	138.6	27	17.4	-53.6	139.0	26	32.1	-54.0	139.3	25	46.5	-54.3	139.6	25	00.7	-54.6	139.9	24	14.6	-54.8	140.2	23	28.4	-55.1	140.5	7
8	27	54.6	-53.0	138.8	27	09.3	-53.3	139.1	26	23.8	-53.7	139.5	25	38.1	-54.0	139.8	24	52.2	-54.3	140.1	23	06.1	-54.7	140.4	22	19.8	-55.0	140.7	22	33.3	-55.3	140.9	8
9	27	01.6	-53.1	139.3	26	16.0	-53.5	139.7	25	30.1	-53.8	140.0	24	44.1	-54.1	140.3	23	57.9	-54.5	140.6	23	11.4	-54.7	140.8	22	24.8	-55.0	141.1	21	38.0	-55.3	141.4	9
10	26	08.5	-53.3	139.8	25	22.5	-53.6	140.2	24	36.3	-53.9	140.5	23	50.0	-54.2	140.7	23	03.4	-54.5	141.0	22	16.7	-54.8	141.3	21	29.8	-55.1	141.5	20	42.7	-55.3	141.8	10
11	25	15.2	-53.3	140.4	24	28.9	-53.6	140.7	23	42.4	-54.0	140.9	22	55.8	-54.3	141.2	22	08.9	-54.6	141.5	21	21.9	-54.9	141.7	20	34.7	-55.1	142.0	19	47.4	-55.4	142.2	11
12	24	21.9	-53.5	140.9	23	35.3	-53.8	141.1	22	48.4	-54.0	141.4	21	14.3	-54.4	141.7	20	27.0	-54.9	142.1	19	39.6	-55.2	142.4	18	52.0	-55.5	142.6	12				
13	23	28.4	-53.5	141.4	22	41.5	-53.9	141.6	21	54.4	-54.2	141.9	21	07.1	-54.5	142.1	20	19.7	-54.8	142.4	19	32.1	-55.0	142.6	18	44.4	-55.3	142.8	17	56.5	-55.5	143.0	13
14	22	34.9	-53.6	141.9	21	47.6	-53.9	142.1	21	00.2	-54.2	142.3	20	12.6	-54.5	142.6	19	24.9	-54.8	142.8	18	37.1	-55.1	143.0	17	49.1	-55.3	143.2	17	01.0	-55.6	143.4	14
15	21	41.3	-53.7	142.3	20	53.7	-54.0	142.6	20	06.0	-54.3	142.8	19	18.1	-54.5	143.0	18	30.1	-54.8	143.2	17	42.0	-55.1	143.4	16	53.8	-55.4	143.6	16	05.4	-55.6	143.8	15
16	20	47.6	-53.8	142.8	19	59.7	-54.1	143.0	19	11.7	-54.4	143.3	18	23.6	-54.7	143.5	17	35.3	-54.9	143.6	16	46.9	-55.1	143.8	15	58.4	-55.4	144.0	15	09.8	-55.6	144.2	16
17	19	53.8	-53.8	143.3	19	05.6	-54.1	143.5	18	17.3	-54.4	143.7	17	28.9	-54.7	143.9	16	40.4	-54.9	144.1	15	51.8	-55.2	144.2	14	14.2	-55.7	144.6	17				
18	19	00.0	-54.0	143.8	18	11.5	-54.2	144.0	17	22.9	-54.5	144.1	16	34.2	-54.7	144.3	15	45.5	-55.0	144.5	14	07.6	-55.5	144.8	13	18.5	-55.7	144.9	18				
19	18	06.0	-54.0	144.2	17	17.3	-54.3	144.4	16	28.4	-54.5	144.6	15	39.5	-54.8	144.7	14	50.5	-55.1	144.9	14	01.3	-55.3	145.1	13	12.1	-55.5	145.2	12	22.8	-55.7	145.3	19
20	17	12.0	-54.0	144.6	16	23.0	-54.3	144.9	15	33.9	-54.6	145.0	14	44.7	-54.8	145.2	13	06.0	-55.3	145.5	13	55.4	-55.1	145.6	12	16.6	-55.6	145.7	11	27.1	-55.8	145.7	20
21	16	18.0	-54.1	145.1	15	28.7	-54.4	145.3	14	39.3	-54.6	145.4	13	49.9	-54.9	145.6	13	00.3	-55.1	145.7	12	10.7	-55.3	145.8	11	21.0	-55.6	146.0	10	31.3	-55.8	146.1	21
22	15	23.9	-54.2	145.6	14	34.3	-54.4	145.7	13	44.7	-54.7	145.9	12	55.0	-54.9	146.0	12	05.2	-55.1	146.1	11	15.4	-55.4	146.2	10	25.4	-55.6	146.3	9	35.5	-55.8	146.4	22
23	14	29.7	-54.2	146.0	13	39.9	-54.5	146.2	12	50.0	-54.7	146.3	12	00.1	-55.0	146.4	11	10.1	-55.2	146.5	10	20.0	-55.4	146.6	9	29.8	-55.6	146.8	23	39.7	-55.9	146.8	23
24	13	35.5	-54.3	146.5	12	45.4	-54.6	146.6	11	55.3	-54.7	146.7	11	05.1	-55.0	146.8	10	14.9	-55.2	146.9	9	24.6	-55.5	147.0	7	43.8	-55.9	147.2	24				
25	12	41.2	-54.3	146.9	11	50.9	-54.7	147.0	10	00.6	-54.8	147.1	10	10.1	-55.0	147.2	9	19.7	-55.3	147.3	8	29.1	-55.4	147.4	7	38.6	-55.7	147.5	25				
26	11	46.9	-54.3	147.3	10	56.4	-54.6	147.4	10	05.8	-54.8	147.5	9	15.1	-55.0	147.6	8	24.4	-55.2	147.7	7	33.7	-55.5	147.8	6	42.9	-55.7	147.9	5	52.1	-55.9	147.9	26
27	10	52.6	-54.4	147.8	10	01.8	-54.6	147.9	9	11.0	-54.9	148.0	8	20.1	-55.1	148.0	7	29.2	-55.3	148.1	6	38.2	-55.5	148.2	5	47.2	-55.7	148.2	4	56.2	-55.9	148.3	27
28	9	58.2	-54.4	148.2	9	07.2	-54.7	148.3	8	16.1	-54.8	148.4	7	25.0	-55.1	148.4	6	33.9	-55.3	148.5	5	42.7	-55.5	148.6	4	51.0	-55.7	148.7	28				
29	9	63.8	-54.4	148.6	8	12.5	-54.6	148.7	7	21.3	-54.9	148.8	6	29.9	-55.1	148.8	5	38.6	-55.4	148.9	4	47.2	-55.5	148.9	3	55.8	-55.6	149.0	29				
30	8	09.4	-54.5	149.1	7	17.9	-54.7	149.1	6	26.4	-55.0	149.2	5	34.8	-55.1	149.2	4	43.2	-55.3	149.3	3	51.7	-55.6	149.3	2	04.8	-55.9	149.4	30				
31	7	14.9	-54.5	149.5	6	23.2	-54.7	149.5	5	31.4	-54.9	149.6	4	39.7	-55.1	149.6	3	47.9	-55.3	149.7	2	56.1	-55.5	149.7	1	12.5	-55.9	149.7	31				
32	6	20.4	-54.5	150.0	5	28.2	-54.6	150.0	4	36.5	-54.5	150.0	3	44.6	-55.2	150.0	2	03.9	-55.3	151.1	1	08.6	-55.6	150.1	0	16.6	-56.0	150.1	32				
33	5	25.8	-54.5	150.4	4	33.7	-54.7	150.4	3	51.9	-54.7	150.5	2	00.1	-55.0	150.8	0	0.65	-55.4	151.2	0	42.9	+5.8	29.2	1	35.3	+5.9	29.2	34				
34	4	31.4	-54.6	150.7	3	39.0																											

37°, 323° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	34	23.0	+51.3	133.2	33	41.7	+51.8	133.7	33	00.1	+52.3	134.1	32	18.2	+52.6	134.6	31	35.9	+53.1	135.0	30	53.2	+53.5	135.5	29	27.1	+54.2	136.3	0
1	35	14.3	+51.1	132.5	34	33.5	+51.6	133.1	33	52.4	+52.0	133.6	33	10.8	+52.6	134.0	32	29.0	+52.9	134.5	31	46.7	+53.4	134.9	31	04.2	+53.7	135.4	1
2	36	05.4	+50.9	131.9	35	25.1	+51.4	132.4	34	44.4	+51.9	133.0	34	03.4	+52.3	133.5	33	21.9	+52.8	133.9	32	40.1	+53.2	134.4	31	57.9	+53.7	134.9	2
3	36	56.3	+50.7	131.2	36	16.5	+51.2	131.8	35	36.3	+51.7	132.3	34	55.7	+52.2	132.9	34	14.7	+52.6	133.4	33	33.3	+53.1	133.8	32	51.6	+53.5	134.3	3
4	37	47.0	+50.4	130.6	37	07.7	+51.0	131.1	36	28.0	+51.5	132.0	35	47.9	+52.0	132.5	35	07.3	+52.5	132.8	34	26.4	+52.8	133.3	33	45.1	+53.1	133.8	4
5	38	37.4	+50.2	129.9	37	58.7	+50.7	130.5	37	19.5	+51.3	131.1	36	39.9	+51.8	131.6	35	58.8	+52.3	132.2	35	19.3	+52.7	132.7	34	38.4	+53.2	133.2	5
6	39	27.6	+49.9	129.2	38	49.4	+50.6	129.8	38	10.8	+51.0	130.4	37	31.7	+51.5	131.0	36	52.1	+52.1	131.6	36	12.0	+52.6	132.1	35	31.6	+53.0	132.7	6
7	40	17.5	+49.7	128.5	39	40.0	+50.2	129.1	39	01.8	+50.9	129.7	38	23.2	+51.4	130.4	37	44.2	+51.8	130.9	37	04.6	+52.4	131.5	36	24.6	+52.9	132.1	7
8	41	07.2	+49.3	127.7	40	30.2	+50.0	128.4	39	52.7	+50.5	129.1	39	14.6	+51.1	129.7	38	36.0	+51.7	130.3	37	57.7	+52.2	131.5	36	37.5	+53.1	132.0	8
9	41	56.5	+49.1	127.0	41	20.2	+49.7	127.7	40	43.2	+50.3	128.3	40	05.7	+50.9	129.0	39	27.7	+51.5	129.7	38	49.2	+51.0	130.3	38	101.1	+52.5	130.9	9
10	42	45.6	+48.7	126.2	42	09.9	+49.4	126.9	41	33.5	+50.1	127.6	40	56.6	+50.7	128.3	40	19.2	+51.2	129.0	39	41.1	+51.8	129.6	39	02.6	+52.3	130.3	10
11	43	34.3	+48.4	125.4	42	59.3	+49.0	126.1	42	23.6	+49.7	126.9	41	47.3	+50.3	127.6	41	10.4	+50.9	128.3	40	32.9	+51.5	129.0	39	54.9	+52.1	129.6	11
12	44	22.7	+48.0	124.6	43	48.3	+48.8	125.3	43	13.3	+49.4	126.1	42	37.6	+50.1	126.9	41	24.4	+51.3	128.3	40	47.0	+51.8	129.0	40	09.0	+52.3	129.6	12
13	45	10.7	+47.7	123.7	44	37.1	+48.4	124.5	44	02.7	+49.1	125.3	43	27.7	+49.7	126.1	42	52.0	+50.4	126.9	42	15.7	+51.0	127.6	41	38.8	+51.6	128.3	13
14	45	58.4	+47.2	122.8	45	25.5	+48.0	123.7	44	51.8	+48.7	124.5	44	17.4	+49.5	125.3	43	42.4	+50.1	126.1	43	06.7	+50.8	126.9	42	30.4	+51.4	127.6	14
15	46	45.6	+46.8	121.9	46	13.5	+47.6	122.8	45	40.5	+48.4	123.7	45	06.9	+49.1	124.5	44	32.5	+49.8	125.4	43	57.5	+50.4	126.1	43	21.8	+51.0	126.9	15
16	47	32.4	+46.3	121.0	47	01.1	+47.1	121.9	46	28.9	+48.0	122.8	45	56.0	+48.7	123.7	45	22.3	+49.5	124.6	44	47.9	+50.2	125.4	43	37.1	+51.4	127.0	16
17	48	18.7	+45.9	120.1	47	48.2	+46.8	121.0	47	16.9	+47.6	121.8	46	44.7	+48.4	122.6	45	11.8	+49.1	123.3	45	38.1	+49.8	124.6	44	28.5	+51.1	126.2	17
18	49	04.6	+45.4	119.1	48	35.0	+46.2	120.1	48	04.5	+47.1	121.1	47	33.1	+47.9	122.0	47	00.9	+48.7	122.9	46	27.9	+49.4	123.8	45	54.1	+50.2	124.7	18
19	49	50.0	+44.8	118.1	49	21.2	+45.8	119.1	48	51.6	+46.6	120.1	48	21.0	+47.5	121.1	47	49.6	+48.3	122.1	47	17.3	+49.1	123.0	46	44.3	+49.8	123.9	19
20	50	34.8	+44.2	117.1	50	07.0	+45.2	118.1	49	38.2	+46.2	119.2	49	08.5	+47.1	120.2	48	37.9	+47.9	121.2	48	06.4	+48.7	122.1	47	34.1	+49.5	123.1	20
21	51	19.0	+43.7	116.0	50	52.2	+44.7	117.1	50	24.4	+45.6	118.2	49	55.6	+47.5	119.2	49	25.8	+47.5	120.2	48	55.1	+48.3	121.2	47	51.2	+49.8	123.1	21
22	52	02.7	+43.0	114.9	51	36.9	+44.0	116.0	51	10.0	+45.1	117.1	50	42.1	+46.1	118.2	50	13.3	+46.9	119.3	49	43.4	+47.9	120.3	49	12.7	+48.7	121.3	22
23	52	45.7	+42.3	113.7	52	20.9	+43.5	114.9	51	55.1	+44.5	116.1	51	28.2	+45.5	117.2	51	00.2	+46.5	118.3	50	31.3	+47.4	119.4	50	01.4	+48.2	120.4	23
24	53	28.0	+41.6	112.6	53	04.4	+42.7	113.8	52	39.6	+43.8	115.0	52	13.7	+44.7	116.2	51	46.7	+45.9	117.3	51	18.7	+46.4	118.4	50	49.6	+47.8	119.5	24
25	54	09.6	+40.8	111.3	53	47.1	+42.0	112.6	53	23.4	+43.2	113.9	52	58.6	+44.3	115.1	52	32.6	+45.4	116.3	52	05.5	+46.4	117.4	51	37.4	+47.3	118.5	25
26	54	50.4	+40.0	110.1	54	29.1	+41.3	111.4	54	06.6	+42.5	112.7	53	42.9	+43.6	113.9	53	18.0	+44.7	115.2	52	51.9	+45.7	116.4	51	56.4	+47.7	117.7	26
27	55	30.4	+39.1	108.8	55	10.4	+40.5	110.1	54	49.1	+41.7	111.5	54	26.5	+42.9	112.8	54	02.7	+44.1	114.0	53	37.6	+45.2	115.3	52	44.1	+47.2	117.7	27
28	56	09.5	+38.3	107.4	55	50.9	+39.6	108.8	55	30.8	+41.0	110.2	55	09.4	+42.2	111.6	54	46.8	+43.3	112.9	54	22.8	+44.5	114.2	53	57.7	+45.6	115.4	28
29	56	47.8	+37.2	106.0	56	30.5	+38.7	107.5	56	11.8	+40.0	108.9	55	51.6	+41.4	110.3	55	30.1	+42.7	111.7	55	07.3	+43.9	113.0	54	43.3	+44.9	114.3	29
30	57	25.0	+36.3	104.6	57	09.2	+37.7	106.1	56	51.8	+39.2	107.6	56	33.0	+40.6	109.0	56	12.8	+41.8	110.4	55	51.2	+43.1	111.8	55	08.2	+48.2	119.6	30
31	58	01.3	+35.2	103.1	57	46.9	+36.7	104.6	57	31.0	+38.2	106.2	57	13.6	+39.6	107.6	56	54.6	+41.0	109.1	56	34.3	+43.2	110.5	55	49.4	+44.8	113.3	31
32	58	36.5	+34.0	101.5	58	23.6	+35.7	103.1	58	09.2	+37.2	104.7	57	53.2	+38.7	106.2	57	35.6	+40.2	107.8	57	16.6	+41.5	109.2	56	34.2	+44.0	112.1	32
33	59	10.5	+32.8	99.9	58	59.3	+34.4	101.6	58	46.4	+36.1	103.2	58	31.9	+37.6	104.8	57	15.8	+39.1	106.4	57	58.1	+40.6	107.9	57	38.7	+42.0	109.4	33
34	59	43.3	+31.8	98.9	59	27.6	+34.4	102.6	58	42.6	+35.7	104.2	58	27.6	+36.2	105.0	59	18.3	+38.6	105.0	59	01.9	+40.2	106.7	58	43.9	+41.6	108.2	34
35	60	14.8	+30.2	96.6	60	07.0	+32.0	98.3	59	57.4	+38.3	100.0	59	46.1	+35.4	101.7	59	33.1	+37.0	103.4	59	18.3	+38.6	105.0	59	01.9	+40.2	106.7	35
36	60	45.0	+28.8	94.8	60	39.0	+30.6	96.6	60	31.2	+32.4	98.4	60	21.5	+34.3	100.1	60	10.1	+35.9	101.8	59	56.9	+36.7	103.5	59	42.1	+39.1		

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $37^{\circ}$ , 323°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	34 23.0	-51.5	133.2	33 41.7	-51.9	133.7	33 00.1	-52.4	134.1	32 18.2	-52.9	134.6	31 35.9	-53.3	135.0	30 53.2	-53.6	135.5	30 10.3	-54.0	135.9	29 27.1	-54.4	136.3	0				
1	33 31.5	-51.7	133.8	32 49.8	-52.2	134.3	32 07.7	-52.5	134.7	31 25.3	-52.9	135.2	30 42.6	-53.3	135.6	29 59.6	-53.7	136.0	29 16.3	-54.1	136.4	28 32.7	-54.4	136.8	1				
2	32 39.8	-51.9	134.4	31 57.6	-52.3	134.9	31 15.2	-52.7	135.3	30 32.4	-53.1	135.7	29 49.3	-53.5	136.1	29 05.9	-53.9	136.5	28 22.2	-54.2	136.9	27 38.3	-54.5	137.2	3				
3	31 47.9	-52.0	135.0	31 05.3	-52.4	135.4	30 22.5	-52.9	135.8	29 39.3	-53.3	136.2	28 55.8	-53.6	136.6	28 12.0	-53.9	137.0	27 28.0	-54.3	137.4	26 43.8	-54.7	137.7	4				
4	30 55.9	-52.2	135.6	30 12.9	-52.6	136.0	29 29.4	-53.3	136.4	28 46.0	-53.3	136.8	28 02.2	-53.7	137.1	27 18.1	-54.1	137.8	26 33.7	-54.4	137.8	25 49.1	-54.7	138.6	9				
5	30 03.7	-52.3	136.2	29 20.3	-52.7	136.5	28 36.6	-53.1	136.9	27 52.7	-53.5	137.3	27 08.5	-53.9	137.6	26 24.0	-54.2	138.0	25 39.3	-54.5	138.3	24 54.4	-54.8	138.6	5				
6	29 11.4	-52.4	136.7	28 27.6	-52.8	137.1	27 43.5	-53.2	137.5	26 59.2	-53.6	137.8	26 14.6	-53.9	138.1	25 29.8	-54.2	138.5	24 44.8	-54.6	138.8	23 59.6	-54.9	139.1	6				
7	28 19.0	-52.6	137.3	27 34.8	-53.0	137.6	26 50.3	-53.3	138.0	26 05.6	-53.7	138.3	25 20.7	-54.0	138.6	24 35.6	-54.4	138.9	23 50.2	-54.6	139.2	23 04.7	-55.0	139.5	7				
8	27 26.4	-52.7	137.8	26 41.8	-53.1	138.2	25 57.5	-53.5	138.5	25 11.9	-53.7	138.8	24 26.7	-54.1	139.1	23 41.2	-54.4	139.4	22 55.6	-54.7	139.7	22 09.7	-55.0	139.9	8				
9	26 33.7	-52.9	138.4	25 48.7	-53.2	138.7	25 03.5	-53.5	139.0	24 18.2	-53.9	139.3	23 32.6	-54.2	139.6	22 46.8	-54.5	139.9	22 00.9	-54.8	140.1	21 14.7	-55.1	140.4	9				
10	25 40.8	-53.0	138.9	24 55.5	-53.3	139.2	24 10.0	-53.6	139.5	23 24.3	-54.0	139.8	22 38.4	-54.3	140.0	21 52.3	-54.6	140.3	21 06.1	-54.9	140.6	20 19.6	-55.1	140.8	10				
11	24 47.9	-53.1	139.4	24 02.2	-53.4	139.7	23 16.4	-53.7	140.0	22 30.3	-54.0	140.2	21 44.1	-54.3	140.5	20 57.7	-54.6	140.8	20 11.2	-54.9	141.0	19 24.5	-55.2	141.2	11				
12	23 54.8	-53.1	139.9	23 08.8	-53.4	140.2	22 22.7	-53.9	140.5	21 36.3	-54.1	140.7	20 49.8	-54.4	141.0	20 03.1	-54.7	141.2	19 16.3	-55.0	141.4	18 29.3	-55.3	141.6	12				
13	23 01.7	-53.3	140.4	22 15.4	-53.6	140.7	21 28.8	-53.8	140.9	20 42.2	-54.2	141.2	19 55.4	-54.5	141.4	19 08.4	-54.8	141.6	18 21.3	-55.1	141.8	17 34.0	-55.3	142.0	13				
14	22 08.4	-53.3	140.9	21 21.8	-53.7	141.2	20 35.0	-54.0	141.4	19 48.0	-54.3	141.6	19 00.9	-54.6	141.9	18 13.6	-54.8	142.1	17 26.2	-55.1	142.3	16 38.7	-55.3	142.4	14				
15	21 15.1	-53.4	141.4	20 28.1	-53.7	141.6	19 41.0	-54.0	141.9	18 53.7	-54.3	142.1	18 06.3	-54.6	142.3	17 18.8	-54.9	142.5	16 31.1	-55.1	142.7	15 43.4	-55.4	142.8	15				
16	20 21.7	-53.5	141.9	19 34.4	-53.8	142.1	18 47.0	-54.1	142.3	17 59.4	-54.4	142.5	17 11.7	-54.6	142.7	16 23.9	-54.9	142.9	15 36.0	-55.2	143.1	14 48.0	-55.5	143.2	16				
17	19 28.2	-53.6	142.4	18 40.6	-53.9	142.6	17 52.9	-54.2	142.8	17 05.0	-54.4	143.0	16 17.1	-54.8	143.2	15 29.0	-55.0	143.3	13 40.8	-55.2	143.5	13 25.2	-55.4	143.6	17				
18	18 34.6	-53.6	142.9	17 46.7	-53.9	143.1	16 58.7	-54.2	143.2	16 10.6	-54.5	143.4	15 22.3	-54.7	143.6	14 34.0	-55.0	143.7	13 45.6	-55.3	143.9	12 57.1	-55.6	144.0	18				
19	17 41.0	-53.8	143.3	16 52.8	-54.0	143.5	16 04.5	-54.3	143.7	15 16.1	-54.6	143.9	14 27.6	-54.8	144.0	13 39.0	-55.1	144.2	12 50.3	-55.3	144.3	12 01.5	-55.5	144.4	19				
20	16 47.2	-53.7	143.8	15 58.8	-54.1	144.0	15 10.2	-54.3	144.1	14 21.5	-54.6	144.3	13 32.8	-54.9	144.4	12 43.9	-55.1	144.6	11 55.0	-55.3	144.7	11 06.0	-55.6	144.8	20				
21	15 53.5	-53.9	144.3	15 04.7	-54.1	144.4	14 15.9	-54.4	144.6	13 26.9	-54.6	144.7	12 37.9	-54.9	144.8	11 48.8	-55.1	145.0	10 59.7	-55.4	145.1	10 10.4	-55.6	145.2	21				
22	14 59.6	-53.9	144.7	14 10.6	-54.2	144.9	13 21.5	-54.4	145.0	12 32.3	-54.7	145.1	11 43.0	-54.9	145.3	10 53.7	-55.2	145.4	10 04.3	-55.4	145.5	9 14.8	-55.6	145.6	22				
23	14 05.7	-53.9	145.2	13 16.4	-54.2	145.3	12 27.1	-54.5	145.4	11 37.6	-54.7	145.6	10 48.1	-54.9	145.7	9 58.5	-55.2	145.8	8 09.8	-55.4	145.9	8 19.2	-55.6	146.0	23				
24	13 11.8	-54.0	145.6	12 22.2	-54.2	145.7	11 32.6	-54.5	145.9	10 42.9	-54.7	146.0	9 53.2	-55.0	146.1	9 03.3	-55.2	146.2	8 13.5	-55.4	146.3	7 23.6	-55.7	146.3	24				
25	12 17.8	-54.0	146.1	11 28.0	-54.3	146.2	10 38.1	-54.5	146.3	9 48.2	-54.8	146.4	8 58.2	-55.0	146.5	8 08.1	-55.2	146.6	7 18.0	-55.4	146.6	6 27.9	-55.7	146.7	25				
26	11 23.8	-54.1	146.5	10 33.7	-54.3	146.6	9 43.6	-54.6	146.7	8 53.4	-54.8	146.8	8 03.2	-55.1	146.9	7 12.9	-55.3	147.0	6 22.6	-55.5	147.0	5 32.2	-55.7	147.1	26				
27	10 29.7	-54.1	147.0	9 39.4	-54.4	147.0	8 49.0	-54.6	147.1	7 58.6	-54.8	147.2	7 08.1	-55.0	147.3	6 17.6	-55.3	147.4	5 27.1	-55.5	147.4	4 36.5	-55.7	147.5	27				
28	9 35.6	-54.1	147.4	8 45.0	-54.4	147.5	7 54.4	-54.6	147.6	7 03.8	-54.9	147.6	6 13.1	-55.1	147.7	5 22.3	-55.3	147.7	4 31.6	-55.5	147.8	3 40.8	-55.7	147.8	28				
29	8 41.5	-54.2	147.8	7 50.6	-54.4	147.9	6 59.8	-54.6	148.0	6 08.9	-54.9	148.0	5 18.0	-55.1	148.1	4 27.0	-55.3	148.2	3 36.1	-55.5	148.2	2 45.1	-55.7	148.2	29				
30	7 47.3	-54.2	148.3	6 56.2	-54.4	148.3	5 05.2	-54.7	148.4	5 14.0	-54.8	148.4	4 22.9	-55.1	148.5	3 31.7	-55.3	148.5	2 40.6	-55.6	148.5	1 49.4	-55.8	148.6	30				
31	6 53.1	-54.2	148.7	6 01.8	-54.4	148.8	5 10.5	-54.7	148.8	4 19.2	-54.9	148.8	3 27.8	-55.1	148.9	2 36.4	-55.3	148.9	1 45.0	-55.5	148.9	0 53.6	-55.7	148.9	31				
32	5 58.9	-54.3	149.1	5 07.4	-54.5	149.2	4 15.8	-54.8	149.2	3 24.5	-55.0	149.3	2 39.7	-55.2	149.3	1 41.1	-55.3	149.3	0 49.5	-55.7	149.3	0 02.1	-55.7	149.3	32				
33	4 21.1	-54.3	149.3	3 01.9	-54.5	149.3	2 14.1	-54.7	149.3	2 07.1	-54.7	149.3	1 30.0	-54.9	149.5	0 09.5	+5.4	149.5	0 06.0	+5.5	149.5	0 30.3	+5.7	149.5	33				
34	40	15.4	+54.2	27.5	2 08.6	+54.5	27.5	3 01.8	+54.7	27.5	3 55.0	+54.9	27.5	4 48.2	+55.1	27.6	5 41.4	+55.3	27.6	6 34.6	+55.4	27.6	7 30.0	+55.5	27.6	7 27.7	+55.7	27.6	40
35	41	20.9	+54.3	27.0	3 03.1	+54.5	27.1	3 56.5	+54.7	27.1	4 49.9	+54.9	27.1	5 43.3	+55.1	27.2	6 36.7	+55.2	27.2	7 30.3	+55.5	27.2	8 23.4	+55.6	27.3	7 27.7	+55.7	27.3	41
36	42	23.1	+54.2	26.6	3 57.6	+54.4	26.6	4 51.2	+54.7	26.7	5 44.8	+54.9	26.7	6 38.4	+55.0	26.8	7 31.9	+55.3	26.8	8 25.5	+55.4	2							

38°, 322° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	33 51.8 +51.0 132.1	33 11.3 +51.5 132.6	32 30.5 +51.9 133.1	31 49.3 +52.4 133.6	31 07.8 +52.8 134.0	30 26.0 +53.2 134.4	29 43.8 +53.6 134.8	29 01.3 +54.0 135.2	0	34 42.8 +50.8 131.5	34 02.8 +51.3 132.0	33 22.4 +51.8 132.5	32 41.7 +52.3 133.0	32 00.6 +52.7 133.5	31 19.2 +53.1 133.9	30 37.4 +53.5 134.3	29 55.3 +53.9 134.7	1	35 33.6 +50.5 130.9	34 54.1 +51.1 131.4	34 14.2 +51.6 131.9	33 34.0 +52.0 132.4	32 53.3 +52.5 132.9	32 12.3 +53.0 133.4	31 30.9 +53.4 133.8	30 49.2 +53.8 134.2	2	36 24.1 +50.4 130.2	35 45.2 +50.9 130.7	35 05.8 +51.4 131.3	34 26.0 +51.9 131.8	33 45.8 +52.4 132.3	33 05.3 +52.8 132.7	31 43.0 +53.7 133.7	31 43.0 +53.7 133.7	3	37 14.5 +50.1 129.5	36 36.1 +50.6 130.1	35 57.2 +51.2 129.7	35 17.9 +51.7 131.2	33 58.1 +52.1 132.7	33 17.6 +53.0 132.7	32 36.7 +53.5 133.2	32 36.7 +53.5 133.2	4
5	38 04.6 +49.9 128.8	37 26.7 +50.5 129.4	36 48.4 +51.0 130.0	36 09.6 +51.5 130.6	35 30.4 +52.0 131.1	34 50.7 +52.5 131.6	34 10.6 +53.0 132.2	33 30.2 +53.4 132.6	5	38 54.5 +49.6 128.1	38 17.2 +50.2 128.7	37 39.4 +50.7 129.3	37 01.1 +51.3 129.9	36 22.4 +51.8 130.5	35 43.2 +52.3 131.0	35 03.6 +52.7 131.6	34 23.6 +53.2 132.1	6	39 44.1 +49.3 127.4	39 07.4 +49.9 128.0	38 30.1 +50.5 128.7	37 52.4 +51.1 129.3	37 14.2 +51.6 129.9	36 35.5 +52.1 130.4	35 56.3 +52.6 131.0	35 16.8 +53.0 131.5	7	40 33.4 +49.0 126.6	39 57.3 +49.6 127.3	39 20.6 +50.8 128.0	38 43.5 +50.8 128.6	38 05.8 +51.4 129.2	37 27.6 +51.6 129.8	36 48.9 +52.5 130.4	36 09.8 +52.9 131.0	8	41 22.4 +48.7 125.9	40 46.9 +49.4 126.6	40 10.5 +50.0 127.3	39 34.3 +50.6 127.9	38 57.2 +51.1 128.6	38 19.5 +51.7 129.2	37 41.4 +52.2 129.8	37 02.7 +52.7 130.4	9
10	42 11.1 +48.4 125.1	41 36.3 +49.1 125.8	41 00.9 +49.7 126.5	40 24.9 +50.3 127.2	39 48.3 +50.9 127.9	39 11.2 +51.5 128.5	38 33.6 +52.0 129.2	37 55.4 +52.6 129.8	10	42 59.5 +48.0 124.3	42 25.4 +48.7 125.0	41 50.6 +49.4 125.8	41 15.2 +50.1 126.5	40 39.2 +50.7 127.2	40 02.7 +51.2 127.9	39 25.6 +51.8 128.5	38 48.0 +52.3 129.2	11	43 47.5 +47.7 123.5	43 14.1 +48.4 124.3	42 40.0 +49.1 125.0	42 05.3 +49.7 125.8	41 29.9 +50.4 126.5	40 53.9 +52.1 127.9	40 17.4 +51.5 127.9	39 40.3 +52.1 128.5	12	44 35.2 +47.3 122.6	44 02.5 +48.1 123.4	43 29.1 +48.8 124.2	42 55.0 +49.5 125.0	42 20.3 +50.1 125.8	41 44.9 +50.7 126.5	41 08.9 +51.4 127.2	40 32.4 +51.9 127.9	13	45 22.5 +46.9 121.7	44 50.6 +47.6 122.6	44 17.9 +48.4 123.4	43 44.5 +49.1 124.2	43 10.4 +49.8 125.0	42 35.6 +50.5 125.8	42 00.3 +51.0 126.5	41 24.3 +51.6 127.2	14
15	46 09.4 +46.4 120.9	45 38.2 +47.3 121.7	45 06.3 +48.0 122.6	44 33.6 +48.8 123.4	44 00.2 +49.5 124.2	43 26.1 +50.2 125.0	42 51.3 +50.8 125.8	42 15.9 +51.4 126.5	15	46 55.8 +46.0 119.9	46 25.5 +46.8 120.8	45 54.3 +47.7 121.7	45 22.4 +48.4 122.6	44 49.7 +49.1 123.4	44 16.3 +49.8 124.3	43 42.1 +50.5 125.1	43 07.3 +51.2 125.8	16	47 41.8 +45.5 119.0	47 12.3 +46.4 119.9	46 42.0 +47.2 120.9	46 10.8 +48.0 121.8	45 38.8 +48.6 122.8	45 06.1 +49.5 123.5	44 32.6 +50.2 124.3	43 58.5 +50.8 125.1	17	48 27.3 +45.1 118.0	47 58.7 +45.9 119.0	47 29.2 +46.8 119.9	46 58.7 +47.6 120.9	46 27.6 +48.4 121.8	45 55.6 +49.2 122.7	45 22.8 +49.9 123.5	44 49.3 +50.6 124.4	18	49 12.4 +44.4 117.0	48 44.6 +45.4 118.0	48 16.0 +46.3 119.0	47 46.4 +47.2 120.0	47 16.0 +48.0 120.9	46 44.8 +48.8 121.8	46 12.7 +49.6 122.7	45 39.9 +50.3 123.6	19
20	49 56.8 +43.9 116.0	49 30.0 +44.9 117.0	49 02.3 +45.8 118.1	48 33.6 +46.7 119.1	48 04.0 +47.6 120.0	47 33.6 +48.4 121.0	47 02.3 +49.1 121.9	46 30.2 +49.9 122.8	20	50 40.7 +43.3 114.9	50 14.9 +44.3 116.0	49 48.1 +45.3 117.1	49 20.3 +46.3 118.1	48 51.6 +47.1 119.1	48 22.0 +48.0 120.1	47 51.4 +48.8 121.1	47 20.1 +49.5 122.0	21	51 24.0 +42.7 113.8	50 59.2 +43.8 114.9	50 33.4 +44.8 116.0	50 06.6 +45.7 117.1	49 38.7 +46.7 118.2	49 10.0 +47.5 119.2	48 40.2 +48.4 120.2	48 09.6 +49.2 121.2	22	52 06.7 +41.9 112.7	51 43.0 +43.1 113.8	51 18.2 +44.1 115.0	50 52.3 +45.2 116.1	50 25.4 +46.1 117.2	49 57.5 +47.1 118.2	49 28.6 +48.0 119.3	48 58.8 +48.8 120.3	23	52 48.6 +41.3 111.5	52 26.1 +42.4 112.7	52 02.3 +43.6 113.9	51 37.5 +44.6 115.0	51 11.5 +45.6 116.2	50 44.6 +46.5 117.3	50 16.6 +47.4 118.4	49 47.6 +48.3 119.4	24
25	53 29.9 +40.5 110.3	53 08.5 +41.7 111.5	52 45.9 +42.8 112.8	52 22.1 +43.9 114.0	51 57.1 +45.1 115.1	51 31.1 +46.0 116.3	51 04.0 +47.0 117.4	50 35.9 +47.9 118.5	25	54 10.4 +39.7 109.0	53 50.2 +40.9 110.3	53 28.7 +42.2 111.6	53 06.0 +43.4 112.8	52 42.2 +44.4 114.0	52 17.1 +45.5 115.2	51 51.0 +46.5 116.4	51 23.8 +47.4 117.5	26	55 28.9 +38.0 106.4	55 11.3 +39.3 107.8	54 52.3 +40.4 109.1	54 32.0 +41.8 110.5	53 10.3 +41.1 111.8	53 47.5 +44.2 113.0	53 23.4 +45.3 114.3	52 58.1 +46.4 115.5	27	56 66.9 +37.0 105.0	55 50.6 +38.4 106.5	55 32.3 +39.8 107.9	55 13.8 +41.1 109.2	54 53.4 +42.4 110.6	54 31.7 +43.5 111.9	54 08.7 +44.7 113.2	53 44.5 +45.7 114.4	28									
30	56 43.9 +36.0 103.6	56 29.0 +37.5 105.1	56 12.7 +38.9 106.5	55 54.9 +40.3 107.9	55 35.8 +41.5 109.3	55 15.2 +42.8 110.7	54 53.4 +44.0 112.0	54 30.2 +45.2 113.3	30	57 19.9 +34.9 102.1	57 06.5 +36.5 103.6	56 51.6 +37.9 105.1	56 35.2 +39.3 106.6	56 17.3 +40.7 108.0	55 58.0 +42.1 109.5	55 37.4 +43.2 110.8	55 15.4 +44.4 112.2	31	57 54.8 +33.8 100.6	57 43.0 +35.4 102.2	57 29.5 +37.7 103.7	57 14.5 +38.5 105.2	56 58.0 +39.9 106.7	56 40.1 +41.2 108.2	56 20.6 +42.6 109.6	55 58.9 +43.8 111.0	32	58 28.6 +32.7 99.0	58 18.4 +34.2 100.6	58 06.5 +35.8 102.2	57 53.0 +37.4 103.8	57 37.9 +38.9 105.3	57 21.3 +40.3 106.8	57 03.2 +41.6 108.3	56 43.6 +43.0 109.8	33	59 01.3 +31.3 97.4	58 52.6 +33.1 99.1	58 42.3 +34.8 100.7	58 30.4 +36.3 102.3	58 16.8 +37.9 103.9	58 01.6 +39.4 105.4	57 44.8 +40.9 107.0	57 26.6 +42.2 108.5	34
35	59 32.6 +30.1 95.8	59 25.7 +31.9 97.4	59 17.1 +33.6 99.1	59 06.7 +35.3 100.8	58 54.7 +36.8 102.4	58 41.0 +38.4 104.0	58 25.7 +39.8 105.6	58 08.8 +41.3 107.1	35	60 02.7 +28.7 94.0	59 57.6 +30.5 95.8	59 50.7 +32.2 97.5	59 42.0 +34.0 99.2	59 31.5 +35.7 100.9	59 19.4 +37.3 102.5	59 55.9 +38.9 104.1	58 50.1 +40.3 105.8	36	60 31.4 +27.2 92.3	60 28.1 +29.1 94.0	60 22.9 +31.0 95.8	60 16.0 +32.8 97.5	60 07.2 +34.5 99.3	59 56.7 +36.2 101.0	59 44.4 +37.8 102.6	59 30.4 +39.4 104.3	37	60 58.6 +25.7 90.4	60 57.2 +27.7 92.2	60 53.9 +29.6 94.0	60 48.8 +31.4 95.8	60 41.7 +33.3 97.6	60 32.9 +35.9 99.4	60 22.2 +36.7 101.1	60 09.8 +38.3 102.8	38	61 24.3 +24.2 88.6	61 24.9 +26.1 90.4	61 23.5 +28.1 92.2	61 20.2 +30.0 94.1	61 15.0 +31.9 95.9	61 07.9 +33.7 97.7	60 58.9 +35.5 99.5	60 48.1 +37.2 101.2	39
40	61 48.5 +22.4 86.6	61 51.0 +24.5 88.5	61 51.6 +26.5 90.4	61 50.2 +28.5 92.2	61 46.9 +30.4 94.1	61 41.6 +32.4 96.0	61 34.4 +34.2 97.8	61 25.3 +36.0 99.6	40	62 10.9 +20.8 84.7	62 15.5 +22.8 86.6	62 18.1 +24.9 88.5	62 18.7 +27.0 90.4	62 17.3 +29.0 92.3	62 14.0 +30.9 94.2	62 08.6 +32.9 96.1	62 01.3 +34.7 97.9	41	62 31.7 +18.9 82.6	62 38.3 +21.1 84.6	62 43.0 +23.2 86.5	62 45.7 +25.3 88.4	62 46.3 +27.4 90.4	62 44.9 +29.4 92.3	62 36.0 +33.3 96.2	62 36.0 +33.3 96.2	42	63 50.6 +17.1 80.6	63 43.0 +19.3 82.5	63 06.2 +21.5 84.5	63 11.0 +23.6 86.4	63 13.7 +25.7 88.4	63 14.3 +27.8 90.4	63 12.9 +29.8 92.4	63 09.3 +31.9 94.4	43	63 07.7 +15.2 78.5	63 18.7 +17.4 80.4	63 27.7 +19.5 82.4	63 34.6 +21.7 84.4	63 34.9 +23.6 86.4	63 42.1 +26.1 88.4	63 42.7 +28.3 90.4	63 41.2 +30.3 92.5	44
45	63 22.9 +13.2* 76.3	63 36.1 +15.4* 78.3	63 47.2 +17.7 80.3	63 56.3 +19.9 82.3	63 64.3 +21.9 84.3	63 04.3 +22.4 84.3	64 08.2 +24.4 86.4	64 11.6 +26.5 88.4	45	63 36.1 +11.1* 74.1	63 51.5 +13.4* 76.1	64 04.9 +15.7* 78.1	64 16.2 +18.0* 80.1	64 25.5 +20.2 82.2	64 32.6 +22.4 84.3	64 37.5 +24.7 86.3	64 40.2 +26.9 88.5	46	63 47.2 +9.1* 71.9	64 04.9 +11.3* 73.9	64 20.6 +13.6* 75.9	64 34.2 +15.9* 77.9	64 45.7 +17.8* 79.4	60 55.0 +20.6 82.1	65 02.2 +22.8 84.2	65 07.1 +25.2 86.4	47	63 56.3 +7.1* 69.7	64 16.2 +9.3* 71.6	64 34.2 +11.7* 73.6	64 50.1 +13.8* 75.6	65 03.9 +16.1* 77.7	65 15.6 +18.5* 79.8	65 25.0 +20.9* 82.0	65 32.3 +23.1* 84.2	48	64 03.4 +4.8* 67.4	64 25.5 +7.1* 69.3	64 45.7 +9.3* 71.3	65 03.9 +11.7* 73.5	65 20.1 +14.1* 75.4	65 34.1 +16.3* 77.6	65 45.9 +18.7* 79.7	65 55.4 +21.2* 81.9	49
50	64 08.2 +2.8* 65.1	64 32.6 +4.9* 67.0	64 55.0 +7.2* 69.0	65 15.6 +9.4* 71.0	65 34.1 +11.8* 73.1	65 50.4 +14.2* 75.2	66 04.6 +16.4* 77.4	66 16.6 +19.0* 79.6	50	64 11.0 +0.5* 62.8	64 37.5 +2.7* 64.7	65 02.2 +4.9* 66.6	65 25.0 +7.3* 68.6	65 45.9 +9.5* 70.7	66 04.6 +12.																														

# LATITUDE CONTRARY NAME TO DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	33	51.8	-51.2	132.1	33	11.3	-51.6	132.6	32	30.5	-52.1	133.1	31	49.3	-52.5	133.6	31	07.8	-53.0	134.0	30	26.0	-53.4	134.4	29	43.8	-53.8	134.8	29	01.3	-54.1	135.2	0
1	33	00.6	-51.4	132.8	32	19.7	-51.9	133.2	31	38.4	-52.3	133.7	30	56.8	-52.7	134.1	30	14.8	-53.1	134.6	29	32.6	-53.5	135.0	28	50.0	-53.8	135.4	28	07.2	-54.2	135.7	1
2	32	09.2	-51.5	133.4	31	27.8	-52.0	133.8	30	46.1	-52.4	134.3	30	04.1	-52.9	134.7	29	21.7	-53.2	135.1	28	39.1	-53.6	135.5	27	56.2	-54.0	135.9	27	13.0	-54.3	136.2	3
3	31	17.7	-51.7	134.0	30	35.8	-52.1	134.4	29	53.7	-52.6	134.8	29	11.2	-52.9	135.2	28	28.5	-53.4	135.6	27	45.5	-53.7	136.0	27	02.2	-54.1	136.4	26	18.7	-54.5	136.7	4
4	30	26.0	-51.9	134.6	29	43.7	-52.3	135.0	29	01.1	-52.7	135.4	28	18.3	-53.1	135.8	27	35.1	-53.4	136.1	26	51.8	-53.9	136.5	26	08.1	-54.2	136.8	25	24.2	-54.5	137.2	4
5	29	34.1	-52.0	135.2	28	51.4	-52.4	135.6	28	08.4	-52.8	135.9	27	25.2	-53.2	136.3	26	41.7	-53.6	136.6	25	57.9	-53.9	137.0	25	13.9	-54.2	137.3	24	29.7	-54.6	137.6	5
6	28	42.1	-52.2	135.7	27	59.0	-52.6	136.1	27	15.6	-52.9	136.5	26	32.0	-53.3	136.8	25	48.1	-53.7	137.1	25	04.0	-54.0	137.5	24	19.7	-54.4	137.8	23	35.1	-54.6	138.1	6
7	27	49.9	-52.3	136.3	27	06.4	-52.7	136.6	26	22.7	-53.1	137.0	25	38.7	-53.5	137.3	24	54.4	-54.3	137.6	24	10.0	-54.1	138.0	23	25.3	-54.4	138.2	22	40.5	-54.8	138.5	7
8	26	57.6	-52.4	136.8	26	13.7	-52.8	137.2	25	29.6	-53.2	137.5	24	45.2	-54.2	137.8	24	00.7	-53.9	138.1	23	15.9	-54.2	138.4	22	30.9	-54.5	138.7	21	45.7	-54.8	139.0	8
9	26	05.2	-52.5	137.4	25	20.9	-52.9	137.7	24	36.4	-53.2	138.0	23	51.7	-53.6	138.3	23	06.8	-53.9	138.6	22	21.7	-54.3	138.9	21	36.4	-54.6	139.2	20	50.9	-54.8	139.4	9
10	25	12.7	-52.7	137.9	24	28.0	-53.0	138.2	23	43.2	-53.4	138.5	22	58.1	-53.7	138.8	22	12.9	-54.1	139.1	21	27.4	-54.3	139.3	20	41.8	-54.6	139.6	19	56.1	-55.0	139.8	10
11	24	20.0	-52.7	138.4	23	35.0	-53.1	138.7	22	49.8	-53.5	139.0	22	04.4	-54.3	139.3	21	18.8	-54.1	139.6	20	33.1	-54.4	139.8	19	47.2	-54.7	140.0	19	01.1	-55.0	140.3	11
12	23	27.3	-52.9	139.0	22	41.9	-53.2	139.2	21	56.3	-53.5	139.5	20	10.6	-53.8	139.8	20	24.7	-54.1	140.0	19	38.7	-54.5	140.3	18	52.5	-54.8	140.5	18	06.1	-55.0	140.7	12
13	22	34.4	-53.0	139.5	21	48.7	-53.3	139.7	21	02.8	-53.6	140.0	20	16.8	-54.0	140.2	19	30.6	-54.3	140.5	18	44.2	-54.5	140.7	17	57.7	-54.8	140.9	17	11.1	-55.1	141.1	13
14	21	41.4	-53.0	140.0	20	55.4	-53.4	140.2	20	09.2	-53.7	140.5	19	22.8	-54.0	140.7	18	36.3	-54.3	140.9	17	49.7	-54.6	141.1	17	02.9	-54.9	141.3	16	16.0	-55.2	141.5	14
15	20	48.4	-53.2	140.5	20	02.0	-53.5	140.7	19	15.5	-53.8	141.0	18	28.8	-54.1	141.2	17	42.0	-54.4	141.4	16	55.1	-54.7	141.6	16	08.0	-54.9	141.8	15	20.8	-55.2	142.0	15
16	19	55.2	-53.2	141.0	19	08.5	-53.5	141.2	18	21.7	-53.8	141.4	17	34.7	-54.1	141.6	16	47.6	-54.4	141.8	16	00.4	-54.7	142.0	15	13.1	-55.0	142.2	14	25.6	-55.2	142.3	16
17	19	02.0	-53.3	141.5	18	15.0	-53.6	141.7	17	27.9	-53.9	141.9	16	40.6	-54.2	142.1	15	53.2	-54.5	142.3	15	05.7	-54.7	142.4	14	18.1	-55.0	142.6	13	30.4	-55.3	142.7	17
18	18	08.7	-53.3	142.0	17	21.4	-53.7	142.2	16	34.0	-54.0	142.3	15	46.4	-54.3	142.5	14	58.7	-54.5	142.7	14	11.0	-54.8	142.8	13	23.1	-55.1	143.0	12	35.1	-55.3	143.1	18
19	17	15.4	-53.5	142.4	16	27.7	-53.7	142.6	15	40.0	-54.0	142.8	14	52.1	-54.3	143.0	14	04.2	-54.6	143.1	13	16.2	-54.9	143.3	12	28.0	-55.1	143.4	11	39.8	-55.3	143.5	19
20	16	21.9	-53.5	142.9	15	34.0	-53.8	143.1	14	46.0	-54.1	143.3	13	57.8	-54.3	143.4	13	09.6	-54.6	143.5	12	21.3	-54.9	143.7	11	32.9	-55.1	143.8	10	44.5	-55.4	143.9	20
21	15	28.4	-53.5	143.4	14	40.2	-53.8	143.5	13	51.9	-54.1	143.7	13	03.5	-54.4	143.8	12	15.0	-54.6	144.0	11	26.4	-54.9	144.1	10	37.8	-55.1	144.2	9	49.1	-55.4	144.3	21
22	14	34.9	-53.7	143.9	13	46.4	-53.9	144.0	12	57.8	-54.2	144.1	11	20.4	-54.7	144.4	10	31.5	-54.9	144.5	9	42.7	-55.2	144.6	8	53.7	-55.4	144.7	22				
23	13	41.2	-53.6	144.3	12	52.5	-54.0	144.5	12	03.6	-54.2	144.6	11	14.7	-54.5	144.7	10	25.7	-54.8	144.8	9	36.6	-55.0	144.9	8	47.5	-55.2	145.0	7	58.3	-55.5	145.1	23
24	12	47.6	-53.7	144.8	11	58.5	-54.0	144.9	11	09.4	-54.3	145.0	10	20.2	-54.5	145.1	9	30.9	-54.7	145.2	8	41.6	-55.0	145.3	7	52.3	-55.3	145.4	7	02.8	-55.4	145.5	24
25	11	53.9	-53.8	145.2	11	04.5	-54.0	145.3	10	15.1	-54.2	145.5	9	25.7	-54.5	145.6	8	36.2	-54.8	145.6	6	57.0	-55.2	145.8	6	07.4	-55.5	145.9	25				
26	11	00.1	-53.8	145.7	10	10.5	-54.0	145.8	9	20.9	-54.3	145.9	8	31.2	-54.6	146.0	7	41.4	-54.8	146.1	6	51.6	-55.0	146.1	6	01.8	-55.3	146.2	5	11.9	-55.5	146.2	26
27	10	06.3	-53.8	146.1	9	16.5	-54.1	146.2	8	26.6	-54.4	146.3	7	36.6	-54.6	146.4	6	46.6	-54.8	146.5	5	06.5	-55.3	146.6	4	18.4	-55.5	146.6	27				
28	9	12.5	-53.9	146.6	8	22.4	-54.1	146.7	7	32.2	-54.3	146.7	6	42.0	-54.6	146.8	5	15.8	-54.9	146.9	4	01.5	-55.0	146.9	3	20.9	-55.5	147.0	28				
29	8	18.6	-53.9	147.0	7	28.3	-54.2	147.1	6	37.9	-54.4	147.2	5	47.4	-54.6	147.2	4	56.9	-54.8	147.3	3	15.9	-55.3	147.4	2	25.4	-55.5	147.4	29				
30	7	24.7	-53.9	147.5	6	34.1	-54.2	147.5	5	43.5	-54.4	147.6	4	52.8	-54.6	147.6	4	02.1	-54.9	147.7	3	11.4	-55.1	147.7	2	20.6	-55.3	147.8	30				
31	6	30.8	-53.9	147.9	5	39.9	-54.1	148.0	4	49.1	-54.5	148.0	3	58.2	-54.7	148.1	3	07.2	-54.8	148.1	2	16.3	-55.1	148.1	1	25.3	-55.3	148.1	31				
32	5	36.9	-54.0	148.4	4	45.8	-54.2	148.4	3	36.5	-54.4	148.5	2	40.8	-54.6	148.5	2	0	-54.8	148.5	0	30.0	-54.5	148.5	0	21.2	-55.5	148.5	32				
33	4	34.8	-54.0	149.2	3	27.3	-54.2	149.3	2	05.8	-54.4	149.3	1	26.5	-54.6	149.3	0	29.0	-54.1	149.3	0	25.3	-55.3	149.3	1	16.7	-55.5	149.3	33</				

39°, 321° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	33 20.1 +50.6 131.1	32 40.4 +51.2 131.6	32 00.4 +51.6 132.1	31 20.0 +52.1 132.5	30 39.2 +52.6 133.0	29 58.2 +53.0 133.4	29 16.8 +53.4 133.8	28 35.1 +53.8 134.2	0	34 10.7 +50.5 130.5	33 31.6 +51.0 131.0	32 52.0 +51.5 131.5	32 12.1 +52.0 132.0	31 31.8 +52.4 132.4	30 51.2 +52.8 132.9	30 10.2 +53.2 133.3	29 28.9 +53.6 133.7	1	35 01.2 +50.3 129.8	34 22.6 +50.8 130.4	33 43.5 +51.3 130.9	33 04.1 +51.8 131.4	32 24.2 +52.3 131.8	31 44.0 +52.7 132.3	31 03.4 +53.2 132.8	30 22.5 +53.6 133.2	2	35 51.5 +50.0 129.2	35 13.4 +50.6 129.7	34 34.8 +51.1 130.2	33 55.9 +51.6 130.8	33 16.5 +52.1 131.3	32 36.7 +52.6 131.7	31 56.6 +53.0 132.2	31 16.1 +53.4 132.7	3	36 41.5 +49.8 128.5	36 04.0 +50.3 129.0	35 25.9 +50.9 129.6	34 47.5 +51.4 130.1	33 08.6 +51.9 130.7	33 29.3 +52.4 131.2	32 49.6 +52.8 131.7	33 09.5 +53.3 132.1	4
5	37 31.3 +49.5 127.8	36 54.3 +50.1 128.4	36 16.8 +50.7 128.9	35 38.9 +51.2 129.5	35 00.5 +51.7 130.1	34 21.7 +52.2 130.6	33 42.4 +52.7 131.1	33 02.8 +53.1 131.6	5	38 20.8 +49.3 127.1	37 44.4 +49.9 127.7	37 07.5 +50.4 128.3	36 30.1 +51.0 128.9	35 52.2 +51.5 129.4	35 13.9 +52.0 130.0	34 35.1 +52.5 130.5	33 55.9 +53.0 131.0	6	39 10.1 +49.0 126.3	38 34.3 +49.6 127.0	37 57.9 +50.3 127.6	37 21.1 +50.8 128.2	36 43.7 +51.4 128.8	36 05.9 +51.8 129.4	35 27.6 +52.4 129.9	34 48.9 +52.8 130.5	7	39 59.1 +48.7 125.6	39 23.9 +49.3 126.2	38 48.2 +49.9 126.9	38 11.9 +50.5 127.5	37 35.1 +51.1 128.1	36 57.7 +51.7 128.7	36 20.0 +52.1 129.3	35 41.7 +52.7 129.9	8	40 47.8 +48.4 124.8	40 13.2 +49.1 125.5	39 38.1 +49.7 126.2	39 02.4 +50.3 126.8	37 49.4 +51.4 128.1	37 12.1 +52.0 128.7	36 34.4 +52.4 129.3	39	
10	41 36.2 +48.0 124.0	41 02.3 +48.7 124.7	40 27.8 +49.4 125.5	39 52.7 +50.0 126.1	39 17.0 +50.7 126.8	38 40.8 +51.2 127.4	38 04.1 +51.7 128.1	37 26.8 +52.3 128.7	10	42 24.2 +47.7 123.2	41 51.0 +48.4 124.0	41 17.2 +49.1 124.7	40 42.7 +49.8 125.4	40 07.7 +50.3 126.1	39 32.0 +51.0 126.8	38 55.8 +51.5 127.4	38 19.1 +52.1 128.1	11	43 11.9 +47.4 122.4	42 39.4 +48.1 123.2	42 06.3 +49.1 124.9	41 32.5 +49.4 124.7	40 58.0 +50.1 125.4	40 23.0 +50.7 126.1	39 47.3 +51.3 126.8	39 11.2 +51.8 127.4	12	43 59.3 +46.9 121.5	43 27.5 +47.7 122.4	42 55.1 +48.4 123.1	42 21.9 +49.2 123.9	41 48.1 +49.8 124.7	41 13.7 +50.4 125.4	40 38.6 +51.1 126.1	40 03.0 +51.6 126.8	13	44 46.2 +46.6 120.7	44 15.2 +47.4 121.5	43 43.5 +48.1 122.3	43 11.1 +48.8 123.1	42 37.9 +49.5 123.9	42 04.1 +50.2 124.7	41 29.7 +50.8 125.4	40 54.6 +51.4 126.1	14
15	45 32.8 +46.1 119.8	45 02.6 +46.9 120.6	44 31.6 +47.7 121.5	43 59.9 +48.4 122.3	43 27.4 +49.2 123.1	42 54.3 +49.9 123.9	42 20.5 +50.5 124.7	41 46.0 +51.2 125.4	15	46 18.9 +45.6 118.9	45 49.5 +46.5 119.8	45 19.3 +47.3 120.6	44 48.3 +48.2 121.5	44 16.6 +48.9 122.3	43 44.2 +49.5 123.1	43 11.0 +50.2 123.9	42 37.2 +50.9 124.7	16	47 04.5 +45.2 117.9	46 36.0 +46.1 118.8	46 06.6 +46.9 119.8	45 36.5 +47.7 120.7	45 05.5 +48.5 121.5	44 33.7 +49.2 122.4	44 01.2 +50.0 123.2	43 28.1 +50.5 124.0	17	47 49.7 +44.7 116.9	47 22.1 +45.6 117.9	46 53.5 +46.5 118.9	46 24.2 +47.3 119.8	45 50.4 +48.1 120.7	45 22.9 +48.9 121.6	44 51.2 +49.6 122.4	44 18.6 +50.3 123.2	18	48 34.4 +44.1 115.9	48 07.7 +45.0 116.9	47 40.0 +46.0 117.9	47 11.5 +46.8 118.9	46 42.1 +47.7 119.8	46 11.8 +48.5 120.7	45 40.8 +49.2 121.6	45 08.9 +50.0 122.5	19
20	49 18.5 +43.6 114.9	49 52.7 +44.6 115.9	48 26.0 +45.5 117.0	47 58.3 +46.5 118.0	47 29.8 +47.2 118.9	47 00.3 +48.1 119.9	46 30.0 +48.9 120.8	45 58.9 +49.6 121.7	20	50 02.1 +42.9 113.8	49 37.3 +44.0 114.9	49 11.5 +45.0 116.0	48 44.8 +45.9 117.0	48 17.0 +46.9 118.0	47 48.4 +47.7 119.0	47 18.9 +48.5 119.9	46 48.5 +49.3 120.9	21	50 45.0 +42.4 112.7	50 21.3 +43.4 113.9	49 56.5 +44.4 115.0	49 30.7 +45.4 116.0	49 03.9 +46.3 117.1	48 36.1 +47.2 118.1	48 07.4 +48.1 119.1	47 37.8 +48.9 120.0	22	51 27.4 +41.6 111.6	51 04.7 +42.8 112.8	50 40.9 +43.9 113.9	50 16.1 +44.8 115.0	50 50.2 +45.8 116.1	49 23.3 +46.8 117.1	48 55.5 +47.7 118.2	48 26.7 +48.5 119.2	23	52 09.0 +41.0 110.5	51 47.5 +42.1 111.6	51 24.8 +43.2 112.8	51 09.9 +44.3 114.0	50 36.0 +45.3 115.1	50 10.1 +46.3 116.2	49 43.2 +47.1 117.2	49 15.2 +48.1 118.3	24
25	52 50.0 +40.2 109.3	52 29.6 +41.4 110.5	52 08.0 +42.5 111.7	51 45.2 +43.7 112.9	51 21.3 +44.8 114.0	50 56.4 +45.7 115.2	50 30.3 +46.7 116.3	50 03.3 +47.6 117.3	25	53 30.2 +39.4 108.0	53 11.0 +40.6 109.3	52 50.5 +41.9 110.5	52 28.9 +43.0 111.8	52 06.1 +44.1 113.0	51 42.1 +45.2 114.1	51 17.0 +46.2 115.3	50 50.9 +47.1 116.4	26	54 09.6 +38.5 106.7	53 51.6 +39.9 108.1	53 32.4 +41.1 109.3	53 11.9 +42.3 110.6	52 50.2 +43.5 111.8	52 27.3 +44.5 113.1	52 03.2 +45.6 114.2	51 38.0 +46.6 115.4	27	54 48.1 +37.7 105.4	54 31.5 +39.0 106.8	54 13.5 +40.4 108.1	53 54.2 +41.6 109.4	53 33.7 +42.7 110.7	53 11.8 +44.4 111.9	52 48.8 +45.0 113.2	52 24.6 +46.1 114.4	28	55 25.8 +36.8 104.1	55 10.5 +38.2 105.5	54 53.3 +39.5 106.8	54 35.8 +40.8 108.2	54 16.4 +42.1 109.5	53 55.8 +43.2 110.8	53 10.7 +45.5 113.3	29	
30	56 02.6 +35.7 102.7	55 48.7 +37.2 104.1	55 33.4 +38.6 105.5	55 16.6 +40.0 106.9	54 58.5 +41.3 108.3	54 39.0 +42.5 109.6	54 18.2 +43.8 110.9	53 56.2 +44.8 112.2	30	56 38.3 +34.8 101.2	56 25.9 +36.3 102.7	56 12.0 +37.7 104.1	55 56.6 +39.1 105.6	55 39.8 +40.4 107.0	55 21.5 +41.8 108.4	55 02.0 +43.0 109.7	54 01.0 +44.2 111.1	31	57 13.1 +33.6 99.7	57 02.2 +35.1 101.2	56 49.7 +36.7 102.7	56 35.7 +38.2 104.2	56 20.2 +39.6 105.7	56 03.3 +41.0 107.1	55 45.0 +42.2 108.5	55 25.2 +43.5 109.9	32	57 46.7 +32.4 98.2	57 37.3 +34.1 99.7	57 26.4 +35.7 101.3	57 13.9 +37.2 102.8	56 59.8 +38.7 104.3	56 44.3 +40.0 105.8	56 27.2 +41.4 107.2	56 08.7 +42.7 108.7	33	58 19.1 +31.3 96.6	58 11.4 +33.0 98.2	58 02.1 +34.5 99.8	57 51.1 +36.1 101.3	57 38.5 +37.7 102.9	57 24.3 +39.2 104.4	57 08.6 +40.6 105.9	56 51.4 +42.0 107.4	34
35	58 50.4 +30.0 94.9	58 44.4 +31.7 96.6	58 36.6 +33.4 98.2	58 27.2 +35.1 99.8	58 16.2 +36.6 101.4	58 03.5 +38.1 103.0	57 49.2 +39.6 104.5	57 33.4 +41.0 106.1	35	59 20.4 +28.6 93.3	59 16.1 +30.4 94.9	59 10.0 +32.2 96.6	59 02.3 +33.9 98.3	58 52.8 +35.5 99.9	58 41.6 +37.2 101.5	58 28.8 +38.7 103.1	58 14.4 +40.2 104.7	36	59 49.0 +27.2 91.5	59 46.5 +29.0 93.2	59 42.2 +30.9 94.9	59 36.2 +32.6 96.6	59 28.3 +34.4 98.3	59 18.8 +36.0 100.0	59 07.5 +37.6 101.6	58 54.6 +39.1 103.3	37	60 16.2 +25.7 89.7	60 15.5 +27.7 91.5	60 13.1 +29.5 93.2	60 08.8 +31.3 95.0	60 02.7 +33.1 96.7	60 54.8 +34.8 98.4	59 45.1 +36.5 100.1	59 33.7 +38.1 101.8	38	60 41.9 +24.2 87.9	60 43.2 +26.1 89.7	60 42.6 +28.1 91.5	60 40.1 +30.0 93.2	60 35.8 +31.8 95.0	60 29.6 +33.6 96.8	60 21.6 +35.4 98.5	60 11.8 +37.1 100.3	39
40	61 06.1 +22.6 86.0	61 09.3 +24.6 87.8	61 10.7 +26.5 89.6	61 10.1 +28.5 91.5	61 07.6 +30.4 93.3	61 03.2 +32.3 95.1	60 57.0 +34.0 96.9	60 48.9 +35.8 98.7	40	61 28.7 +20.9 84.1	61 33.9 +23.0 85.9	61 37.2 +25.0 87.8	61 38.6 +27.0 89.6	61 38.0 +28.9 91.5	61 35.5 +30.9 93.3	61 31.0 +32.8 95.2	61 24.7 +34.6 97.0	41	61 49.6 +19.2 82.1	61 56.9 +21.2 84.0	62 02.2 +23.3 85.8	62 05.6 +25.3 87.7	62 06.9 +27.4 89.6	62 06.4 +29.3 91.5	62 03.8 +31.3 93.4	61 59.3 +33.2 95.3	42	62 08.8 +17.3 80.1	62 18.1 +19.5 82.0	62 25.5 +21.6 83.9	62 30.9 +23.7 85.8	62 34.3 +26.0 87.7	62 30.2 +29.2 89.6	62 35.1 +29.9 91.6	62 32.5 +31.8 93.5	43	62 26.1 +15.6 78.0	62 37.6 +17.7 79.9	62 47.1 +19.8 81.8	62 54.6 +22.0 83.8	63 00.1 +24.1 85.7	63 03.6 +26.2 87.7	63 05.0 +28.2 89.7	63 05.0 +28.2 90.7	44
45	62 41.7 +13.6° 75.9	62 55.3 +15.8° 77.8	63 06.9 +18.0° 79.8	63 16.6 +20.1° 81.7	63 24.2 +22.3° 83.7	63 29.8 +24.4° 85.7	63 32.3 +26.6° 87.7	63 41.7 +28.7° 89.7	45	62 55.3 +11.6° 73.8	63 11.1 +13.8° 75.7	63 24.9 +16.0° 77.6	63 36.7 +18.3° 79.6	63 46.5 +20.5° 81.6	63 54.2 +22.7° 83.6	63 59.8 +24.9° 85.7	64 03.3 +27.0° 87.7	46	63 06.9 +9.7° 71.6	63 24.9 +11.8° 73.5	63 40.9 +14.1° 75.5	63 55.0 +16.2° 77.5	64 07.0 +18.5° 79.5	64 16.9 +20.7° 81.5	64 24.7 +23.0° 83.6	64 30.3 +25.2° 85.7	47	63 16.6 +7.6° 69.5	63 36.7 +9.8° 71.3	63 55.0 +12.0° 73.3	64 11.2 +14.3° 75.3	64 25.6 +16.5° 77.3	64 37.6 +18.4° 79.3	64 47.7 +21.1° 81.4	64 55.5 +23.4° 83.5	48	63 42.4 +5.6° 67.2	63 46.5 +7.7° 69.1	64 07.0 +9.9° 71.0	64 25.5 +12.1° 73.0	64 42.0 +14.4° 75.0	64 56.4 +16.4° 77.1	65 08.8 +19.0° 79.2	65 18.9 +21.4° 81.3	49
50	63 29.8 +3.4° 65.0	63 54.2 +5.6° 66.9	64 16.9 +7.8° 68.8	64 37.6 +10.1° 70.7	64 56.4 +12.4° 72.8	65 13.2 +14.6° 74.8	65 27.8 +17.0° 76.9</																																						

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $39^\circ$ ,  $321^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	33	20.1	-50.9	131.1	32	40.4	-51.4	131.6	32	00.4	-51.9	132.1	31	20.0	-52.3	132.5	30	39.2	-52.7	133.0	29	58.2	-53.1	133.4	29	16.8	-53.5	133.8	28	35.1	-53.9	134.2	0
1	32	29.2	-51.1	131.8	31	49.0	-51.5	132.2	31	08.5	-51.9	132.7	30	27.7	-52.4	133.1	29	46.5	-52.8	133.5	29	05.1	-53.3	133.9	28	23.3	-53.7	134.3	27	41.2	-54.0	134.7	1
2	31	38.1	-51.2	132.4	30	57.5	-51.7	132.8	30	16.6	-52.2	133.3	29	35.3	-52.6	133.7	28	53.7	-53.0	134.1	28	11.8	-53.4	134.5	27	29.6	-53.7	134.8	26	47.2	-54.1	135.2	3
3	30	46.9	-51.4	133.0	30	05.8	-51.8	133.4	29	24.4	-52.3	133.8	28	42.7	-52.7	134.2	28	00.7	-53.1	134.6	27	18.4	-53.4	135.0	26	35.9	-53.9	135.3	25	53.1	-54.2	135.7	4
4	29	55.5	-51.6	133.6	28	14.0	-52.0	134.0	28	32.1	-52.4	134.4	27	08.8	-52.8	134.8	27	07.6	-53.2	135.1	26	25.0	-53.4	135.5	25	42.0	-53.9	135.8	24	58.9	-54.3	136.2	4
5	29	03.9	-51.7	134.2	28	22.0	-52.2	134.6	27	39.7	-52.5	134.9	26	57.2	-52.9	135.3	26	14.4	-53.3	135.7	25	31.4	-53.7	136.0	24	48.1	-54.0	136.3	24	04.6	-54.4	136.6	5
6	28	12.2	-51.9	134.7	27	29.8	-52.3	135.1	26	47.2	-52.7	135.5	26	04.3	-53.1	135.8	25	21.1	-53.4	136.2	24	37.7	-53.8	136.5	23	54.1	-54.1	136.8	23	10.2	-54.4	137.1	6
7	27	20.3	-52.0	135.3	26	37.5	-52.4	135.7	25	54.5	-52.8	136.0	25	11.2	-53.2	136.3	24	27.7	-53.5	136.7	23	43.9	-53.8	137.0	23	00.0	-54.3	137.3	22	15.8	-54.5	137.6	7
8	26	28.3	-52.1	135.9	25	45.1	-52.5	136.2	25	01.7	-52.7	136.5	24	18.0	-53.2	136.9	23	34.2	-53.7	137.2	22	50.1	-54.1	137.5	22	05.7	-54.2	137.7	21	21.3	-54.6	138.0	8
9	25	36.2	-52.2	136.4	24	52.6	-52.6	136.8	24	08.8	-53.0	137.1	23	24.8	-53.4	137.4	22	40.5	-53.7	137.7	21	56.1	-54.0	137.9	20	26.7	-54.7	138.4	9				
10	24	44.0	-52.4	137.0	24	00.0	-52.7	137.3	23	15.8	-53.1	137.6	22	31.4	-53.4	137.9	21	46.8	-53.7	138.1	21	02.1	-54.1	138.4	20	17.1	-54.4	138.6	19	32.0	-54.7	138.9	10
11	23	51.6	-52.5	137.5	23	07.3	-52.9	137.8	22	22.7	-53.2	138.1	21	38.0	-53.6	138.4	20	53.1	-53.9	138.6	19	22.7	-54.5	139.1	18	37.3	-54.8	139.3	11				
12	22	59.1	-52.5	138.0	21	44.4	-52.9	138.3	21	29.5	-53.3	138.6	20	44.4	-53.6	138.8	19	59.2	-53.9	139.1	19	13.8	-54.3	139.3	17	42.5	-54.9	139.7	12				
13	22	06.6	-52.7	138.6	21	21.5	-53.0	138.8	20	36.2	-53.3	139.1	19	50.8	-53.7	139.3	19	05.3	-54.0	139.5	17	33.7	-54.7	140.0	16	47.6	-54.8	140.2	13				
14	21	13.9	-52.8	139.1	20	28.5	-53.1	139.3	19	42.9	-53.5	139.6	18	57.1	-53.7	140.0	17	25.2	-54.4	140.2	16	39.0	-54.6	140.4	15	52.8	-55.0	140.6	14				
15	20	21.1	-52.8	139.6	19	35.4	-53.2	139.8	18	49.4	-53.5	140.0	18	03.4	-53.8	140.3	17	17.2	-54.1	140.5	16	30.8	-54.4	140.7	15	44.4	-54.7	140.8	14	57.8	-55.0	141.0	15
16	19	28.3	-53.0	140.1	18	42.2	-53.3	140.3	17	55.9	-53.5	140.5	17	09.6	-53.9	140.7	16	23.1	-54.2	140.9	15	36.4	-54.5	141.1	14	49.7	-54.8	141.3	14	02.8	-55.0	141.4	16
17	18	35.3	-53.0	140.6	17	48.9	-53.3	140.8	17	02.4	-53.7	141.0	16	15.7	-54.0	141.2	15	28.9	-54.3	141.4	14	41.9	-54.5	141.5	13	54.9	-54.8	141.7	13	07.8	-55.1	141.8	17
18	17	42.3	-53.1	141.1	16	55.6	-53.4	141.3	16	08.7	-53.7	141.5	15	21.7	-54.0	141.6	14	34.6	-54.3	141.8	13	47.4	-54.5	142.0	12	00.1	-54.8	142.1	12	12.7	-55.1	142.2	18
19	16	49.2	-53.1	141.6	16	02.2	-53.5	141.7	15	15.0	-53.8	141.9	14	27.7	-54.0	142.1	13	40.3	-54.3	142.2	12	52.9	-54.7	142.4	12	05.3	-54.9	142.5	11	17.6	-55.1	142.6	19
20	15	56.1	-53.2	142.0	15	08.7	-53.5	142.2	14	21.2	-53.8	142.4	13	33.7	-54.1	142.5	12	46.0	-54.4	142.7	11	58.2	-54.6	142.8	10	22.5	-55.2	143.0	20				
21	15	02.9	-53.3	142.5	14	15.2	-53.6	142.7	13	27.4	-53.8	142.8	12	39.6	-54.2	143.0	11	51.6	-54.4	143.1	10	13.6	-54.7	143.2	10	15.5	-54.9	143.3	21				
22	14	09.6	-53.4	143.0	13	21.6	-53.6	143.1	12	33.6	-54.0	143.3	11	45.4	-54.2	143.4	10	57.2	-54.5	143.5	10	08.9	-54.7	143.6	9	20.6	-55.0	143.7	8	32.1	-55.2	143.8	22
23	13	16.2	-53.3	143.5	12	28.0	-53.7	143.6	11	39.6	-53.9	143.7	10	02.7	-54.4	144.0	9	14.2	-54.7	144.1	8	25.6	-55.0	144.2	7	36.9	-55.2	144.2	23				
24	12	22.9	-53.5	143.9	11	34.3	-53.7	144.1	10	45.7	-54.0	144.2	9	57.0	-54.3	144.3	9	08.3	-54.6	144.4	8	19.5	-54.8	144.5	7	30.6	-55.0	144.6	24				
25	11	29.4	-53.5	144.4	10	40.6	-53.8	144.5	9	51.7	-54.0	144.6	9	02.7	-54.2	144.7	8	13.7	-54.5	144.8	7	24.7	-54.8	144.9	6	35.6	-55.1	145.0	5	46.4	-55.2	145.0	25
26	10	35.9	-53.5	144.9	9	46.8	-53.8	145.0	8	57.7	-54.1	145.1	8	08.5	-54.4	145.2	7	19.2	-54.8	145.2	6	29.9	-54.8	145.3	5	40.5	-55.0	145.4	4	51.2	-55.3	145.4	26
27	9	42.4	-53.5	145.3	8	53.0	-53.8	145.4	8	03.6	-54.1	145.5	7	14.1	-54.3	145.6	6	24.6	-54.6	145.6	5	35.1	-54.8	145.7	4	45.5	-55.1	145.8	3	55.9	-55.3	145.8	27
28	8	48.9	-53.6	145.8	7	59.2	-53.8	145.9	7	09.5	-54.1	145.9	6	19.8	-54.3	146.0	5	30.0	-54.6	146.1	4	40.3	-54.9	146.1	3	50.4	-55.0	146.2	2	3	-55.2	146.2	28
29	7	55.3	-53.6	146.2	7	05.4	-53.9	146.3	6	15.4	-54.1	146.4	5	25.5	-54.4	146.4	4	35.4	-54.8	146.5	3	45.4	-54.8	146.5	2	05.5	-55.1	146.6	29				
30	6	11.7	-53.7	146.7	6	11.5	-53.9	146.8	5	21.3	-54.1	146.8	4	31.1	-54.4	146.9	3	40.8	-54.6	146.9	2	50.6	-54.9	147.0	1	10.0	-55.3	147.0	30				
31	6	0.8	-53.6	147.1	5	17.6	-53.9	147.2	4	27.2	-54.2	147.2	3	36.7	-54.4	147.3	2	46.2	-54.6	147.3	1	5.5	-54.9	147.3	0	14.7	-55.4	147.4	31				
32	5	14.4	-53.7	147.6	4	23.7	-53.9	147.6	3	33.0	-54.2	147.7	2	42.3	-54.4	147.7	1	51.6	-54.7	147.7	0	10.1	-55.1	147.7	0	40.7	-55.3	147.8	32				
33	4	0.7	-53.8	148.2	3	29.8	-54.0	148.1	2	38.8	-54.2	148.1	1	47.9	-54.4	148.1	0	0.2	-54.7	148.6	0	48.9	-54.9	148.7	31	35.1	-55.1	148.8	33				
34	3	23.3	-53.8	148.9	2	1.1	-54.1	149.0	1	0.0	-54.4	149.0	0	0.0	-54.4	149.0	0	0.0	-54.4	149.0	0</												

40°, 320° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	32 47.9 +50.3 130.1	32 09.0 +50.9 130.6	31 29.8 +51.3 131.1	30 50.2 +51.8 131.5	30 10.2 +52.3 132.0	29 29.9 +52.8 132.4	28 49.3 +53.2 132.8	28 08.4 +53.5 133.2	0	33 38.2 +50.2 129.5	32 59.9 +50.7 130.0	31 21.1 +51.2 130.5	31 42.0 +51.7 130.9	31 02.5 +52.2 131.4	30 22.7 +52.6 131.8	29 42.5 +53.0 132.3	29 01.9 +53.5 132.7	1	34 28.4 +49.9 128.8	33 50.6 +50.5 129.3	33 12.3 +51.1 129.8	32 33.7 +51.5 130.3	31 54.7 +52.0 130.8	31 15.3 +52.4 131.3	30 35.5 +52.9 131.7	29 55.4 +53.3 132.2	2	35 18.3 +49.8 128.1	34 41.1 +50.2 128.7	34 03.4 +50.8 129.2	33 25.2 +51.3 129.7	32 46.7 +51.8 130.2	32 07.7 +52.3 130.7	31 28.4 +52.7 131.2	30 48.7 +53.2 131.6	3	36 08.1 +49.4 127.4	35 31.3 +50.1 128.0	34 54.2 +50.8 128.6	34 16.5 +51.2 129.1	33 38.5 +51.6 129.6	33 00.4 +52.1 130.1	32 21.1 +52.6 130.6	31 41.9 +53.0 131.1	4
5	36 57.5 +49.3 126.7	36 21.4 +49.8 127.3	35 44.8 +50.3 127.9	35 07.7 +50.9 128.5	34 30.1 +51.5 129.0	33 52.1 +52.0 129.5	33 13.7 +52.5 130.0	33 34.9 +52.9 130.5	5	37 46.8 +48.9 126.0	37 11.2 +48.6 126.6	36 35.1 +50.2 127.2	35 58.6 +50.7 127.8	35 21.6 +51.2 128.4	34 44.1 +51.8 128.9	34 06.2 +52.2 129.5	33 27.8 +52.8 130.0	6	38 35.7 +48.7 125.3	38 00.8 +49.3 125.9	37 25.3 +49.9 126.6	36 49.3 +50.5 127.2	36 12.8 +51.1 127.7	35 35.9 +51.5 128.3	34 58.4 +52.1 128.9	34 20.6 +52.5 129.4	7	39 24.4 +48.3 124.5	38 50.1 +49.0 125.2	38 15.2 +49.7 125.8	37 39.8 +50.3 126.5	37 03.9 +50.8 127.1	36 27.4 +51.4 127.7	35 50.5 +51.9 128.3	35 13.1 +52.4 128.8	8	40 12.7 +48.1 123.8	39 39.1 +48.7 124.5	39 04.5 +49.3 125.1	38 30.1 +50.0 125.8	37 54.7 +50.6 126.4	37 18.8 +51.2 127.0	36 42.4 +51.7 127.6	36 05.5 +52.3 128.2	9
10	41 00.8 +47.7 123.0	40 27.8 +48.4 123.7	39 54.2 +49.1 124.4	39 20.1 +49.7 125.1	38 45.3 +50.3 125.7	38 10.0 +50.9 126.4	37 34.1 +51.1 127.0	36 57.8 +52.0 127.6	10	41 48.5 +47.4 122.2	41 16.2 +48.1 122.9	40 43.3 +48.8 123.6	40 09.8 +49.4 124.3	39 35.6 +50.1 125.0	39 00.9 +50.7 125.7	38 25.6 +51.3 126.3	37 49.8 +51.8 127.0	11	42 35.9 +47.0 121.3	42 04.3 +47.8 121.1	41 32.1 +48.5 122.9	40 59.2 +49.2 123.6	40 25.7 +49.8 124.3	39 51.6 +50.4 125.0	39 16.9 +51.0 125.7	38 41.6 +51.6 126.3	12	43 22.9 +46.6 120.5	42 52.1 +47.4 121.3	42 20.6 +48.1 122.1	41 48.4 +48.8 122.8	41 15.5 +49.6 123.6	40 42.0 +50.2 124.3	40 07.9 +50.8 125.0	38 33.2 +51.4 125.7	13	44 09.5 +46.2 119.6	43 39.5 +47.0 120.4	43 08.7 +47.8 121.3	42 37.2 +48.6 122.1	42 05.1 +49.2 122.8	41 32.2 +49.9 123.6	40 58.7 +50.5 124.3	40 24.6 +51.1 125.0	14
15	44 55.7 +45.8 118.7	44 26.5 +46.6 119.6	43 56.5 +47.4 120.4	43 25.8 +48.1 121.2	42 54.3 +48.9 122.0	42 22.1 +49.6 122.8	41 49.2 +50.3 123.6	40 57.8 +52.0 127.6	15	45 41.5 +45.4 117.8	45 13.1 +46.2 118.7	44 33.9 +47.0 119.6	44 13.8 +47.9 120.4	43 43.2 +48.5 121.2	43 11.7 +49.3 122.1	42 39.5 +49.9 122.8	42 06.6 +50.6 123.6	16	46 26.9 +44.8 116.9	45 59.3 +45.8 117.8	45 30.9 +46.6 118.7	45 01.7 +47.4 119.6	44 31.7 +48.2 120.4	44 01.0 +48.9 121.3	43 29.4 +49.7 122.1	42 57.2 +50.4 122.9	17	47 11.7 +44.3 115.9	46 45.1 +45.2 116.8	46 17.5 +46.2 117.8	45 49.1 +47.0 118.7	45 19.9 +47.8 119.6	44 49.9 +48.6 120.5	44 19.1 +49.3 121.3	43 47.6 +50.0 122.1	18	47 56.0 +43.9 114.9	47 30.3 +44.8 115.9	47 03.7 +45.7 116.9	46 36.1 +46.6 117.8	46 07.7 +47.4 118.7	45 38.5 +48.2 119.6	45 08.4 +49.0 120.5	44 37.6 +49.7 121.4	19
20	48 39.9 +43.2 113.9	48 15.1 +44.2 114.9	47 49.4 +45.2 115.9	47 22.7 +46.1 116.9	46 55.1 +46.0 117.8	46 26.7 +47.8 118.8	45 57.4 +48.6 119.7	45 27.3 +49.4 120.6	20	49 23.1 +42.7 112.8	48 59.3 +43.7 113.9	48 34.6 +44.6 114.9	48 08.8 +45.6 115.9	47 42.1 +46.5 116.9	47 14.5 +47.4 117.9	46 46.0 +48.2 118.8	46 16.7 +49.0 119.7	21	50 05.8 +42.0 111.7	49 43.0 +43.1 112.8	49 19.2 +44.2 113.9	48 54.4 +45.1 114.9	48 28.6 +46.1 116.0	48 01.9 +46.9 117.0	47 34.2 +47.8 118.0	47 05.7 +48.6 118.9	22	50 47.8 +41.3 110.6	50 26.1 +42.5 111.7	50 03.4 +43.5 112.8	49 39.5 +44.6 113.9	49 14.7 +45.5 115.0	48 48.8 +46.5 116.0	48 22.0 +47.4 117.0	47 54.3 +48.2 118.0	23	51 29.1 +40.7 109.4	51 08.6 +41.8 110.6	50 46.9 +42.9 111.8	50 24.1 +44.0 112.9	50 00.2 +45.0 114.0	49 35.3 +46.4 115.1	49 09.4 +46.9 116.1	48 42.5 +47.8 117.1	24
25	52 09.8 +39.9 108.2	51 50.4 +41.1 109.5	51 29.8 +42.3 110.6	51 08.1 +43.4 111.8	50 45.2 +44.5 111.0	50 21.3 +45.5 111.4	49 56.3 +46.4 111.2	49 33.6 +47.3 111.6	25	52 49.7 +39.1 107.0	52 31.5 +40.4 108.3	52 12.1 +41.6 109.5	51 51.5 +42.7 110.7	51 29.7 +43.8 111.9	51 06.8 +44.8 113.0	50 42.7 +45.9 114.2	50 17.6 +46.9 115.3	26	53 28.8 +38.3 105.8	53 11.9 +39.6 107.0	52 53.7 +40.8 108.3	52 34.2 +42.0 109.6	52 13.5 +43.2 110.8	51 51.6 +44.3 112.0	51 28.6 +45.4 113.1	51 04.5 +46.3 114.3	27	54 07.1 +37.5 104.5	53 51.5 +38.8 105.8	53 34.5 +40.1 107.1	53 16.2 +41.4 108.4	52 56.7 +42.5 109.6	52 35.9 +43.7 110.9	52 14.0 +44.7 112.1	51 50.8 +45.8 113.3	28	54 44.6 +36.5 103.1	54 30.3 +37.9 104.5	54 14.6 +39.2 105.8	53 57.6 +40.5 107.2	53 39.2 +41.8 108.5	53 19.6 +43.0 109.7	52 58.7 +44.1 111.0	52 36.6 +45.2 112.2	29
30	55 21.1 +35.6 101.7	55 08.2 +37.0 103.1	54 53.8 +38.4 104.5	54 38.1 +39.7 105.9	54 21.0 +41.0 107.2	54 02.6 +42.2 108.6	53 42.8 +43.5 109.8	53 21.8 +44.6 111.1	30	55 56.7 +34.5 100.3	55 45.2 +36.0 101.7	55 32.2 +37.5 103.2	55 17.8 +38.9 104.6	55 02.0 +40.2 106.0	54 44.8 +41.5 107.3	54 26.3 +42.7 108.7	54 06.4 +44.0 110.0	31	56 31.2 +33.4 98.8	56 21.2 +35.0 100.3	56 09.7 +36.5 101.8	55 56.7 +38.0 103.2	55 42.2 +39.4 104.7	55 26.3 +40.7 106.1	55 09.0 +42.0 107.5	54 50.4 +43.2 108.8	32	57 04.6 +32.4 97.3	56 56.2 +33.9 98.8	56 46.2 +35.5 100.3	56 34.7 +37.0 102.3	56 21.6 +38.4 103.3	56 07.0 +39.9 104.8	55 51.0 +41.2 106.2	55 33.6 +42.5 107.6	33	57 37.0 +31.1 95.8	57 30.1 +32.8 97.3	57 21.7 +34.4 98.9	57 11.5 +35.9 100.4	57 00.0 +37.5 101.9	56 46.9 +38.9 103.4	56 32.2 +40.4 104.9	56 16.1 +41.7 106.3	34
35	58 08.1 +29.9 94.1	58 02.9 +31.6 95.7	57 56.1 +33.3 97.3	57 47.6 +34.9 98.9	57 37.5 +36.5 100.5	57 25.8 +38.0 102.0	57 12.6 +39.4 103.5	56 57.8 +40.8 105.0	35	58 38.0 +28.6 92.5	58 34.5 +30.4 94.1	58 29.4 +32.0 95.8	58 22.5 +33.7 97.4	58 14.0 +35.3 99.0	58 03.8 +36.9 100.6	57 52.0 +38.5 102.1	57 38.6 +39.9 103.7	36	59 06.6 +27.2 90.8	59 04.9 +29.0 92.5	59 01.4 +30.8 94.1	58 56.2 +32.6 95.8	58 49.3 +34.3 97.4	58 40.7 +35.9 99.1	58 30.5 +37.4 100.7	58 18.5 +39.0 102.3	37	59 33.8 +25.7 89.0	59 33.9 +27.6 90.7	59 32.2 +29.5 92.4	59 28.8 +31.2 94.1	59 23.6 +33.0 95.8	59 16.6 +34.7 97.5	59 07.9 +36.4 99.2	58 57.5 +37.9 100.8	38	59 59.5 +24.3 87.2	60 01.5 +26.2 89.0	60 01.7 +28.0 90.7	60 00.0 +29.9 92.4	59 56.6 +31.7 94.2	59 51.3 +33.5 95.9	59 44.3 +35.1 97.6	59 35.4 +36.9 99.3	39
40	60 23.8 +22.7 85.4	60 27.7 +24.7 87.2	60 29.7 +26.6 88.9	60 29.8 +28.5 90.7	60 28.3 +30.3 92.5	60 24.8 +32.2 94.2	60 19.4 +34.0 96.0	60 12.3 +35.7 97.7	40	60 46.5 +21.1 83.5	60 52.4 +23.0 85.3	60 56.3 +25.1 87.1	60 58.4 +27.1 88.9	60 58.6 +29.0 90.7	60 57.0 +30.8 92.5	60 53.4 +32.7 94.3	60 48.0 +34.5 96.1	41	61 07.6 +19.4 81.6	61 15.4 +21.5 83.4	61 21.4 +23.5 85.2	61 25.5 +25.4 87.0	61 27.6 +27.4 88.9	61 27.8 +29.4 90.7	61 26.1 +31.3 92.6	61 22.5 +33.1 94.4	42	61 27.0 +17.7 79.6	61 36.9 +19.7 81.4	61 44.9 +21.7 83.3	61 50.9 +23.8 85.1	61 55.0 +25.9 87.0	61 57.2 +27.8 88.9	61 57.4 +29.8 90.8	61 55.6 +31.8 92.6	43	61 44.7 +15.8 77.6	61 56.6 +18.0 79.4	62 06.6 +20.1 81.3	62 14.7 +22.2 83.2	62 20.9 +24.2 85.1	62 25.0 +26.3 87.0	62 27.4 +28.3 88.9	62 27.4 +30.3 90.8	44
45	62 00.5 +14.1 75.6	62 14.6 +16.1 77.4	62 26.7 +18.2 79.3	62 36.9 +20.4 81.2	62 45.1 +22.5 83.1	62 51.3 +24.6 85.0	62 55.5 +26.7 87.0	62 57.7 +28.7 88.9	45	62 14.6 +12.1 73.5	62 30.7 +14.2 75.3	62 44.9 +16.4 77.2	62 57.3 +18.5 79.1	63 07.6 +20.7 81.1	63 15.9 +22.9 83.0	63 22.2 +25.0 85.0	63 26.4 +27.1 87.0	46	62 26.7 +10.2 71.4	62 44.9 +12.4 73.2	63 01.3 +14.5 75.1	63 15.8 +16.6 77.0	63 28.3 +21.8 79.0	63 38.8 +21.0 80.9	63 47.2 +23.2 82.9	63 53.5 +25.4 85.0	47	62 36.9 +8.2* 69.2	62 57.3 +10.3* 71.1	63 15.8 +12.5* 72.9	63 32.4 +14.7* 74.9	63 47.1 +16.9* 76.8	63 59.3 +19.1* 78.8	64 10.4 +21.3* 80.8	64 18.9 +23.5* 82.9	48	62 45.1 +6.2* 67.1	63 07.6 +8.3* 68.9	63 28.3 +10.5* 70.8	63 47.1 +12.7* 72.7	64 04.0 +14.9* 74.6	64 18.9 +17.1* 76.7	64 31.7 +19.4* 78.7	64 22.4 +21.7 80.8	49
50	62 51.3 +4.2* 64.9	63 15.9 +6.3* 66.7	63 38.8 +8.4* 68.6	63 59.8 +10.6* 70.5	64 18.9 +12.8* 72.4	64 36.0 +15.1* 74.4																																							

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $40^\circ$ ,  $320^\circ$

Dec.	$45^\circ$			$46^\circ$			$47^\circ$			$48^\circ$			$49^\circ$			$50^\circ$			$51^\circ$			$52^\circ$			Dec.
	Hc	d	Z																						
0	32 47.9	-50.6	130.1	32 09.0	-51.1	130.6	31 29.8	-51.6	131.1	30 50.2	-52.0	131.5	30 10.2	-52.4	132.0	29 29.9	-52.9	132.4	28 49.3	-53.3	132.8	28 08.4	-53.7	133.2	0
1	31 57.3	-50.8	130.8	31 17.9	-51.2	131.2	30 38.2	-51.7	131.7	29 58.2	-52.2	132.1	29 17.8	-52.6	132.5	28 37.0	-53.0	132.9	27 56.0	-53.4	133.3	27 14.7	-53.8	133.7	1
2	31 06.5	-50.9	131.4	30 26.7	-51.4	131.8	29 46.5	-51.8	132.3	29 06.0	-52.3	132.7	28 25.2	-52.7	133.1	27 44.0	-53.1	133.5	27 02.6	-53.5	133.8	26 20.9	-53.8	134.2	3
3	30 15.6	-51.1	132.0	29 35.3	-51.6	132.4	28 54.7	-52.1	132.8	28 13.7	-52.4	133.2	27 32.5	-52.9	133.6	26 50.9	-53.2	134.0	26 09.1	-53.6	134.3	25 27.1	-54.0	134.7	4
4	29 24.5	-51.3	132.6	28 43.7	-51.7	133.0	28 02.6	-52.1	133.4	27 21.3	-52.6	133.8	26 39.6	-53.9	134.2	25 57.7	-53.3	134.5	25 15.5	-53.7	134.8	24 33.1	-54.1	135.2	9
5	28 33.2	-51.4	133.2	27 52.0	-51.8	133.6	27 10.5	-52.3	134.0	26 28.7	-52.7	134.3	25 46.7	-53.1	134.7	25 04.4	-53.5	135.0	24 21.8	-53.8	135.3	23 39.0	-54.1	135.6	5
6	27 41.8	-51.5	133.8	27 00.2	-52.0	134.2	26 18.2	-52.4	134.5	25 26.0	-52.8	134.9	24 53.6	-53.2	135.2	24 10.9	-53.5	135.5	23 28.0	-53.9	135.8	22 44.9	-54.3	136.1	6
7	26 50.3	-51.7	134.4	26 08.2	-52.1	134.7	25 25.8	-52.5	135.1	24 43.2	-52.9	135.4	24 00.4	-53.3	135.7	23 17.4	-53.7	136.0	22 34.1	-54.0	136.3	21 50.6	-54.3	136.6	7
8	25 58.6	-51.9	134.9	25 16.1	-52.3	135.3	24 33.3	-52.7	135.6	23 50.3	-53.0	135.9	23 07.1	-53.3	136.2	22 23.7	-53.7	136.5	21 40.1	-54.0	136.8	20 56.3	-54.4	137.0	8
9	25 26.7	-51.9	135.5	24 23.8	-52.3	135.8	23 40.7	-52.7	136.1	22 57.3	-53.1	136.4	22 13.8	-53.5	136.7	21 30.0	-53.8	137.0	20 46.1	-54.2	137.2	20 01.9	-54.4	137.5	9
10	24 14.8	-52.1	136.0	23 31.5	-52.5	136.3	22 48.0	-52.9	136.6	22 04.2	-53.1	136.9	21 20.3	-53.5	137.2	20 36.2	-53.9	137.4	19 51.9	-54.2	137.7	19 07.5	-54.5	137.9	10
11	23 22.7	-52.2	136.6	22 39.0	-52.5	136.9	21 55.1	-52.9	137.1	21 11.1	-53.3	137.4	20 26.8	-53.6	137.7	19 42.3	-53.9	137.9	18 57.7	-54.2	138.1	18 13.0	-54.6	138.4	11
12	22 30.5	-52.3	137.1	21 46.5	-52.7	137.4	21 02.2	-53.1	137.7	20 17.8	-53.4	137.9	19 33.2	-53.7	138.1	18 48.4	-54.0	138.4	18 03.5	-54.4	138.6	17 18.4	-54.6	138.8	12
13	21 38.2	-52.4	137.6	20 53.8	-52.7	137.9	20 09.2	-53.1	138.2	19 24.4	-53.4	138.4	18 39.5	-53.8	138.6	17 54.4	-54.1	138.8	17 09.1	-54.4	139.0	16 23.8	-54.7	139.2	13
14	20 45.8	-52.4	138.2	20 01.1	-52.9	138.4	19 16.1	-53.2	138.6	18 31.0	-53.5	138.9	17 45.7	-53.8	139.1	17 00.3	-54.1	139.3	16 14.7	-54.4	139.5	15 29.1	-54.8	139.7	14
15	19 53.4	-52.6	138.7	19 08.2	-52.9	138.9	18 22.9	-53.2	139.1	17 37.5	-53.6	139.3	16 51.9	-53.9	139.5	16 06.2	-54.2	139.7	15 20.3	-54.5	139.9	14 34.3	-54.7	140.1	15
16	19 00.8	-52.7	139.2	18 15.3	-53.0	139.4	17 29.7	-53.4	139.6	16 43.9	-53.6	139.8	15 58.0	-54.0	140.0	15 12.0	-54.3	140.2	14 25.8	-54.5	140.4	13 39.6	-54.9	140.5	16
17	18 08.1	-52.7	139.7	17 22.3	-53.0	139.9	16 36.3	-53.4	140.1	15 50.3	-53.7	140.3	15 04.0	-54.0	140.5	14 17.7	-54.3	140.6	13 31.3	-54.6	140.8	12 44.7	-54.8	140.9	17
18	17 15.4	-52.8	140.2	16 29.3	-53.2	140.4	15 43.0	-53.5	140.6	14 56.6	-53.8	140.7	14 10.0	-54.0	140.9	13 23.4	-54.3	141.1	12 36.7	-54.6	141.2	11 49.9	-54.9	141.3	18
19	16 22.6	-52.9	140.7	15 36.1	-53.2	140.9	14 49.5	-53.5	141.0	14 02.8	-53.8	141.2	13 16.0	-54.1	141.4	12 29.1	-54.4	141.5	11 42.1	-54.7	141.6	10 55.0	-54.9	141.8	19
20	15 29.7	-52.9	141.2	14 42.9	-53.2	141.4	13 56.0	-53.5	141.5	13 09.0	-53.9	141.7	12 21.9	-54.2	141.8	11 34.7	-54.4	141.9	10 47.4	-54.7	142.1	10 00.1	-55.0	142.2	20
21	14 36.8	-53.0	141.7	13 49.7	-53.3	141.8	12 03.5	-52.7	142.0	12 15.1	-53.9	142.1	11 27.7	-54.1	142.2	10 40.3	-54.5	142.4	9 52.7	-54.7	142.5	9 05.1	-55.0	142.6	21
22	13 43.8	-53.1	142.2	12 56.4	-53.4	142.3	12 08.8	-53.6	142.4	11 21.2	-53.9	142.6	10 33.6	-54.2	142.7	9 45.8	-54.5	142.8	8 58.0	-54.8	142.9	8 10.1	-55.0	143.0	22
23	12 50.7	-53.1	142.6	12 03.0	-53.4	142.8	11 15.2	-53.7	142.9	10 27.3	-54.0	143.0	9 39.4	-54.3	143.1	8 03.2	-54.7	143.3	7 15.1	-55.0	143.4	23			
24	11 57.6	-53.1	143.1	11 09.6	-53.4	143.2	10 21.5	-53.7	143.3	9 33.3	-54.0	143.5	8 45.1	-54.3	143.5	7 08.5	-54.8	143.7	6 20.1	-55.1	143.8	24			
25	11 04.5	-53.2	143.6	10 16.2	-53.5	143.7	9 27.8	-53.8	143.8	8 39.3	-54.0	143.9	7 50.8	-54.3	144.0	7 02.3	-54.6	144.1	6 13.7	-54.8	144.1	5 25.0	-55.0	144.2	25
26	10 11.3	-53.3	144.1	9 22.7	-53.5	144.2	8 34.0	-53.8	144.2	7 45.3	-54.1	144.3	6 56.5	-54.3	144.4	6 07.7	-54.6	144.5	5 18.9	-54.9	144.5	4 30.0	-55.1	144.6	26
27	9 18.0	-53.2	144.5	8 29.2	-53.6	144.6	7 40.2	-53.8	144.7	6 51.2	-54.1	144.8	6 02.2	-54.4	144.8	5 13.1	-54.6	144.9	4 24.0	-54.8	144.9	3 34.9	-55.1	145.0	27
28	8 24.8	-53.3	145.0	7 35.6	-53.6	145.1	6 46.4	-53.9	145.1	5 57.1	-54.1	145.2	5 07.8	-54.3	145.3	4 18.5	-54.6	145.3	3 29.2	-54.9	145.3	2 39.8	-55.1	145.4	28
29	7 31.5	-53.4	145.5	6 42.0	-53.6	145.5	5 52.5	-53.8	145.6	5 03.0	-54.1	145.6	4 13.5	-54.4	145.7	3 23.9	-54.6	145.7	2 34.3	-54.8	145.8	1 44.7	-55.1	145.8	29
30	6 38.1	-53.3	145.9	5 48.4	-53.6	146.0	4 58.7	-53.9	146.0	4 08.9	-54.1	146.1	3 19.1	-54.4	146.1	2 29.3	-54.6	146.1	1 39.5	-54.9	146.2	0 49.6	-55.1	146.2	30
31	5 44.8	-53.4	146.4	4 54.8	-53.7	146.4	4 04.8	-53.9	146.5	3 14.8	-54.1	146.5	2 24.7	-54.4	146.6	1 04.6	-54.9	146.6	0 05.5	+55.1	33.4	31			
32	4 51.4	-53.4	146.8	4 01.1	-53.6	146.9	3 10.9	-53.9	146.9	2 20.6	-54.2	146.9	1 30.3	-54.4	147.0	0 40.0	-54.6	147.0	0 10.3	+54.9	33.0	32			
33	3 58.0	-53.4	147.3	3 07.5	-53.7	147.3	2 17.0	-54.0	147.3	1 27.0	-54.3	147.8	0 29.4	-54.7	147.8	0 14.7	+54.7	32.2	3 05.9	+55.1	33.0	33			
34	3 04.6	-53.4	147.7	2 13.8	-53.7	147.8	1 27.0	-54.0	147.9	0 21.9	-54.3	147.9	0 18.7	+54.7	30.9	2 10.2	+54.2	30.9	3 01.7	+54.4	30.9	37			
35	2 11.1	-53.4	148.2	0 29.1	-53.9	148.2	0 21.9	-54.2	148.2	0 17.8	-54.5	148.2	0 12.0	-54.8	148.2	0 12.0	-54.8	148.2	1 27.0	+54.8	148.2	1 29.0	+54.8	148.2	35
36	1 17.7	-53.5	148.7	0 26.4	-53.4	148.7	0 24.8	-53.9	148.7	0 20.4	-54.3	148.7	0 17.0	-54.6	148.7	0 17.0	-54.6	148.7	1 27.0	+54.8	148.7	1 29.0	+54.8	148.7	36
37	0 24.2	-53.4	149.1	0 27.2	-53.7	149.1	0 27.2	-53.7	149.1	0 21.0	-														

41°, 319° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	32 15.2 +50.1 129.1	31 37.1 +50.6 129.6	30 58.7 +51.1 130.1	30 19.9 +51.6 130.5	29 40.7 +52.1 131.0	29 01.2 +52.5 131.4	28 21.4 +52.9 131.8	27 41.2 +53.4 132.2	0	33 05.3 +49.8 128.5	32 27.7 +50.4 129.0	31 49.8 +50.9 129.5	31 11.5 +51.4 129.9	30 32.8 +51.9 130.4	29 53.7 +52.4 130.8	29 14.3 +52.8 131.3	28 34.6 +53.2 131.7	1	33 55.1 +49.6 127.8	33 18.1 +50.2 128.3	32 40.7 +50.7 128.8	32 02.9 +51.2 129.3	31 24.7 +51.7 129.8	30 46.1 +52.2 130.3	30 07.1 +52.7 130.7	29 27.8 +53.1 131.1	2	34 44.7 +49.5 127.1	34 08.3 +50.0 127.7	33 31.4 +50.5 128.2	32 54.1 +51.1 128.7	32 16.4 +51.5 129.2	31 38.3 +52.0 129.7	30 59.8 +52.5 130.2	30 20.9 +52.9 130.6	3	35 34.2 +49.1 126.4	34 58.3 +49.7 127.0	34 21.9 +50.4 128.3	33 45.2 +50.8 128.1	33 07.9 +51.4 128.6	32 30.3 +52.3 129.6	31 51.3 +52.3 130.1	31 13.8 +52.8 130.1	4									
5	36 23.3 +48.9 125.7	35 48.0 +49.5 126.3	35 12.3 +50.1 126.9	34 36.0 +50.7 127.4	33 59.3 +51.2 128.0	33 22.2 +51.7 128.5	32 44.6 +52.2 129.0	32 06.6 +52.7 129.5	5	37 12.2 +48.7 125.0	36 37.5 +49.3 125.6	36 02.4 +49.8 126.2	35 26.7 +50.4 126.8	34 50.5 +51.0 127.3	34 13.9 +51.5 127.9	33 36.8 +52.0 128.4	32 59.3 +52.5 128.9	6	38 00.9 +48.3 124.3	37 26.8 +49.0 124.9	36 52.2 +49.4 125.5	36 17.1 +50.2 126.1	35 41.5 +50.8 126.7	35 05.4 +51.3 127.3	34 28.8 +51.9 127.8	33 51.8 +52.4 128.4	7	38 49.2 +48.1 123.5	38 15.8 +48.7 124.2	37 41.8 +49.4 124.8	37 07.3 +50.0 125.4	36 32.3 +50.5 126.0	35 56.7 +51.1 126.6	35 20.7 +51.6 127.2	34 44.2 +52.1 127.8	8	39 37.3 +47.7 122.7	39 04.5 +48.4 123.4	38 31.2 +49.1 124.1	37 57.3 +49.7 124.7	37 22.8 +50.3 125.4	36 47.8 +50.9 126.0	36 12.3 +51.5 126.6	35 36.3 +52.0 127.2	9									
10	40 25.0 +47.4 121.9	39 52.9 +48.2 122.7	39 20.3 +48.8 123.3	38 47.0 +49.4 124.0	38 13.1 +50.1 124.7	37 38.7 +50.7 125.3	37 03.8 +51.2 125.9	36 28.3 +51.8 126.5	10	41 12.4 +47.1 121.1	40 41.1 +47.7 121.9	40 09.1 +48.4 122.6	39 36.4 +49.2 123.3	39 03.2 +49.8 124.0	38 29.4 +50.4 124.6	37 55.0 +51.0 125.3	37 20.1 +51.6 125.9	11	41 59.5 +46.7 120.3	41 28.8 +47.5 121.1	40 57.5 +48.2 121.8	40 25.6 +48.9 122.5	39 53.0 +49.5 123.3	39 19.8 +50.2 123.9	38 46.0 +50.8 124.6	38 11.7 +51.3 125.3	12	42 46.2 +46.3 119.4	42 16.3 +47.1 120.2	41 45.7 +47.9 121.0	41 14.5 +48.5 121.8	40 42.5 +49.3 122.5	40 10.0 +49.9 123.2	39 36.8 +50.5 123.9	38 03.0 +51.1 124.6	13	43 32.5 +45.9 118.6	43 03.4 +46.7 119.4	42 33.6 +47.4 120.2	42 03.0 +48.2 121.0	41 31.8 +48.9 121.8	40 59.9 +49.6 122.5	40 27.3 +50.3 123.2	39 54.1 +50.9 123.9	14									
15	44 18.4 +45.4 117.7	43 50.1 +46.3 118.5	43 21.0 +47.1 119.4	42 51.2 +47.9 120.2	42 20.7 +48.6 121.0	41 49.5 +49.3 121.7	41 17.6 +50.0 122.5	40 45.0 +50.7 123.2	15	45 03.8 +45.0 116.8	46 36.4 +45.9 117.6	44 08.1 +46.8 118.5	43 39.1 +47.5 119.4	43 09.3 +48.3 120.2	42 38.8 +49.0 121.0	42 07.6 +49.7 121.8	41 35.7 +50.3 122.5	16	45 48.8 +44.6 115.8	45 22.3 +45.4 116.7	44 54.9 +46.2 117.6	44 26.6 +47.1 118.5	43 57.6 +47.9 119.4	43 27.8 +48.7 120.2	42 57.3 +49.3 121.0	42 26.0 +50.1 121.8	17	46 33.4 +44.0 114.9	46 07.7 +45.0 115.8	45 41.1 +45.9 116.7	45 13.7 +46.7 117.6	44 45.5 +47.5 118.5	44 16.5 +48.3 119.4	43 46.6 +49.1 120.2	43 16.1 +49.8 121.0	18	47 17.4 +43.5 113.9	46 52.7 +44.4 114.8	46 27.0 +45.4 115.8	46 00.4 +46.3 116.7	45 33.0 +47.2 117.6	45 04.8 +47.9 118.5	44 35.7 +48.7 119.4	44 05.9 +49.4 120.3	19									
20	48 00.9 +42.9 112.8	47 37.1 +44.0 113.9	47 12.4 +44.9 114.8	46 46.7 +45.8 115.6	46 20.2 +46.6 116.8	45 52.7 +47.5 117.7	45 24.4 +48.4 118.6	44 55.3 +49.3 119.5	20	48 43.8 +42.4 111.8	48 21.1 +43.4 112.8	47 57.3 +44.4 113.9	47 32.5 +45.4 114.9	47 06.8 +46.3 115.8	46 40.2 +47.2 116.8	46 12.8 +47.9 117.7	45 44.4 +48.8 118.6	21	49 26.2 +41.7 110.7	49 04.5 +42.8 111.8	48 41.7 +43.8 112.8	48 17.9 +44.8 113.9	47 53.1 +45.8 114.9	47 27.4 +46.6 115.9	47 00.7 +47.5 116.9	46 33.2 +48.3 117.8	22	50 07.9 +41.1 109.6	49 47.3 +42.1 110.7	49 25.5 +43.3 111.8	48 39.0 +44.3 112.9	48 14.0 +46.2 113.9	47 48.2 +47.1 116.0	47 21.5 +48.0 116.9	23	50 49.0 +40.4 108.4	50 29.4 +41.6 109.5	50 08.8 +42.6 110.7	49 47.0 +43.7 111.8	50 01.8 +41.3 106.1	50 31.5 +44.4 110.9	48 35.3 +46.7 115.0	48 09.5 +47.5 116.0	24										
25	51 29.4 +39.6 107.3	51 11.0 +40.8 108.5	50 51.4 +42.0 109.6	50 30.7 +43.1 110.8	50 08.9 +44.1 111.9	49 45.9 +45.2 112.0	49 22.0 +46.1 114.1	48 57.0 +47.1 115.1	25	52 09.0 +38.9 106.1	51 51.8 +40.1 107.3	51 33.4 +41.3 108.5	51 13.8 +42.4 109.7	50 53.0 +43.6 110.8	50 31.1 +44.6 112.0	50 08.1 +45.7 113.1	49 44.1 +46.6 114.2	26	52 47.9 +38.1 104.8	52 31.9 +39.4 106.1	52 14.7 +40.6 107.3	51 56.2 +41.8 108.5	51 36.6 +42.9 109.7	51 15.7 +44.1 110.9	50 53.8 +45.0 112.1	50 30.7 +46.1 113.2	27	53 26.0 +37.2 103.5	53 11.3 +38.5 104.8	52 55.3 +39.9 106.1	52 38.0 +41.1 107.4	52 19.5 +42.3 108.6	51 59.8 +43.4 109.8	51 38.8 +44.5 111.0	51 16.8 +45.5 112.2	28	54 03.2 +36.3 102.2	53 49.8 +37.7 103.5	53 35.1 +39.0 104.8	53 19.1 +40.3 106.1	53 01.8 +41.5 107.4	52 43.2 +42.7 108.7	52 23.3 +43.9 109.9	52 02.3 +45.0 111.1	29									
30	54 39.5 +35.4 100.8	54 27.5 +36.8 102.2	54 14.1 +38.2 103.6	53 59.4 +39.5 104.9	53 43.3 +40.8 106.2	53 25.9 +42.0 107.5	53 07.2 +43.2 108.8	52 47.3 +44.3 110.0	30	55 14.9 +34.3 99.4	55 04.3 +35.8 100.8	54 52.3 +37.3 102.2	54 38.9 +38.7 103.6	54 24.1 +40.0 105.0	54 07.9 +41.3 106.3	53 50.4 +42.5 107.6	53 31.6 +43.7 108.9	31	55 49.2 +33.3 98.0	55 40.1 +34.9 99.4	55 29.6 +36.3 100.9	55 17.6 +37.7 102.3	55 04.1 +39.1 103.7	54 49.2 +40.5 105.1	54 32.9 +41.8 106.4	54 15.3 +43.0 107.8	32	56 22.5 +32.2 96.5	56 15.0 +33.8 98.0	56 05.9 +35.3 99.4	55 55.3 +36.8 100.9	55 43.2 +38.3 102.3	55 29.7 +39.6 103.8	55 14.7 +41.0 105.2	54 58.3 +42.2 106.5	33	56 54.7 +31.1 94.9	56 48.8 +32.6 96.5	56 41.2 +34.3 98.0	56 31.2 +35.8 99.5	56 21.5 +37.3 101.0	56 09.3 +38.7 102.4	55 55.7 +40.1 103.9	55 40.5 +41.5 105.3	34									
35	57 25.8 +29.8 93.4	57 21.4 +31.5 94.9	57 15.5 +33.1 96.5	57 07.9 +34.7 98.0	56 58.8 +36.2 99.5	56 48.0 +37.8 101.0	56 35.8 +39.2 102.5	56 22.0 +40.6 104.0	35	57 55.6 +28.5 91.7	57 52.9 +30.3 93.3	57 48.6 +32.0 94.9	57 42.6 +33.7 96.5	57 35.0 +35.3 98.1	57 25.8 +36.8 99.6	57 15.0 +38.3 101.1	57 02.6 +39.8 102.7	36	58 24.1 +27.2 90.1	58 23.2 +29.0 91.7	58 20.6 +30.7 93.3	58 16.3 +32.4 94.9	58 10.3 +34.1 96.5	58 02.6 +35.7 98.1	57 53.3 +37.3 99.7	57 42.4 +38.8 101.3	37	58 51.3 +25.9 88.4	58 52.2 +27.6 90.0	58 51.3 +29.5 91.7	58 48.7 +31.2 93.3	58 44.4 +32.9 95.0	58 38.3 +34.6 96.6	58 30.6 +36.2 98.2	58 21.2 +37.7 99.8	38	59 17.2 +24.3 86.6	59 19.8 +26.3 88.3	59 20.8 +28.0 90.0	59 19.9 +29.9 91.7	59 17.3 +31.6 93.3	59 12.9 +33.4 95.0	59 06.8 +35.1 96.7	58 58.9 +36.8 98.3	39									
40	59 41.5 +22.9 84.8	58 46.1 +24.7 86.5	59 48.8 +26.7 88.2	59 49.8 +28.5 89.9	59 48.9 +30.4 91.7	59 46.3 +32.1 93.4	59 41.9 +33.8 95.1	58 35.7 +35.5 96.8	40	60 04.2 +21.3 83.0	60 10.8 +23.3 84.7	60 15.5 +25.1 86.4	60 18.3 +27.1 88.2	60 19.3 +28.9 89.9	60 18.4 +30.8 91.7	60 15.7 +32.7 93.4	60 11.2 +34.4 95.2	41	60 25.7 +19.6 81.1	60 34.1 +21.6 82.8	60 40.6 +23.6 84.6	60 45.4 +25.5 86.4	60 48.2 +27.5 88.2	60 49.2 +29.4 89.9	60 48.4 +31.2 91.7	60 45.6 +33.1 93.5	42	60 45.3 +18.0 79.2	60 55.7 +20.0 80.9	61 04.2 +22.0 82.7	61 10.9 +24.0 84.5	61 15.7 +26.0 86.3	61 18.6 +27.9 88.1	61 19.6 +29.9 90.0	61 18.7 +31.7 91.8	43	61 03.3 +16.2 77.2	61 15.7 +18.2 79.0	61 26.2 +20.3 80.8	61 34.9 +22.3 82.6	61 41.7 +24.4 84.4	61 46.5 +26.3 86.3	61 49.5 +28.3 88.1	61 50.4 +30.3 90.0	44	61 19.5 +14.4 75.2	61 33.9 +16.5 77.0	61 46.5 +18.6 78.8	61 57.2 +20.7 80.6	62 06.1 +22.6 82.5	62 12.9 +24.8 84.4	62 17.8 +26.8 86.3	62 20.7 +28.8 88.2	45
45	61 33.9 +12.6 73.2	61 50.4 +14.7 74.9	62 05.1 +16.7 76.8	62 17.9 +18.8 78.6	62 28.7 +21.0 80.5	62 37.7 +23.0 82.4	62 44.6 +24.1 84.3	62 20.7 +28.8 88.2	45	61 25.7 +10.7 71.1	62 05.1 +12.8 72.9	62 21.8 +14.9 74.7	62 36.7 +17.0 76.6	62 49.7 +19.1 78.5	63 00.7 +21.3 80.4	63 09.7 +23.4 82.3	63 16.7 +25.5 84.3	63 16.7 +25.5 84.3	46	61 57.2 +8.9 69.0	62 17.9 +10.8 70.8	62 36.7 +13.4 72.6	62 53.7 +15.1 74.5	63 08.8 +17.3 76.4	63 22.0 +19.4 78.3	63 33.1 +21.6 80.3	63 42.2 +23.8 82.3	47	61 62.1 +6.8 66.9	62 28.7 +9.0 68.7	62 49.7 +11.0+ 70.5	63 08.8 +13.2+ 72.3	63 41.4 +17.5+ 74.2	63 54.7 +19.7+ 76.2	63 54.7 +19.7+ 78.2	64 06.0 +21.9+ 80.2	48	64 19.5 +4.9 64.8	62 37.7 +6.9+ 66.5	63 00.7 +9.0+ 68.3	63 22.0 +11.1+ 70.2	63 41.4 +13.3+ 72.1	63 58.9 +15.5+ 74.0	64 14.4 +17.7+ 76.0	64 27.									

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 41°, 319°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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0	32 15.2 -50.3 129.1	31 37.1 -50.7 129.6	30 58.7 -51.3 130.1	30 19.9 -51.8 130.5	29 40.7 -52.2 131.0	29 01.2 -52.6 131.4	28 21.4 -53.1 131.8	27 41.2 -53.4 132.2	0	31 24.9 -50.4 129.8	30 46.4 -51.0 130.2	30 07.4 -51.4 130.7	29 28.1 -51.8 131.1	28 48.5 -52.3 131.5	28 08.6 -52.8 131.9	27 28.3 -53.1 132.3	26 47.8 -53.6 132.7	1	30 34.5 -50.7 130.4	29 55.4 -51.1 130.8	29 16.0 -51.6 131.3	28 36.3 -52.1 131.7	27 56.2 -52.5 132.1	27 15.8 -52.9 132.5	26 35.2 -53.3 132.8	25 54.2 -53.6 133.2	3	29 43.8 -50.8 131.0	29 04.3 -51.3 131.4	28 24.4 -51.7 131.9	27 44.2 -52.1 132.3	27 03.7 -52.6 132.6	26 22.9 -52.9 133.0	25 41.9 -53.4 133.4	25 00.6 -53.8 133.7	4	28 53.0 -50.9 131.6	28 13.0 -51.4 132.0	27 32.7 -51.8 132.4	26 11.1 -52.1 132.8	25 30.0 -53.1 133.5	24 48.5 -53.5 133.9	24 06.8 -53.8 134.2	23 25.0 -54.1 135.6	5	28 02.1 -51.2 132.2	27 21.6 -51.6 132.6	26 40.8 -52.0 133.0	25 59.8 -52.5 133.4	25 18.4 -52.8 133.7	24 36.9 -53.3 134.0	23 55.0 -53.6 134.4	23 13.0 -54.0 134.7	6	27 10.9 -51.2 132.8	26 30.0 -51.7 133.2	25 48.8 -52.1 133.5	25 07.3 -52.5 133.9	24 25.6 -52.9 134.2	23 43.6 -53.3 134.5	23 01.4 -53.6 134.9	22 19.0 -54.0 135.1	7	26 19.7 -51.4 133.4	25 38.3 -51.8 133.8	24 56.7 -52.3 134.1	24 14.8 -52.6 134.4	23 32.7 -53.0 134.7	22 50.3 -53.3 135.0	22 07.8 -53.8 135.3	21 25.0 -54.1 135.6	8	25 28.3 -51.6 134.0	24 46.5 -52.0 134.3	24 04.4 -52.4 134.6	23 22.2 -52.8 134.9	22 39.7 -53.2 135.2	21 57.0 -53.5 135.5	21 14.0 -53.8 135.8	20 30.9 -54.2 136.1	9	24 36.7 -51.6 134.5	23 54.5 -52.0 134.9	23 12.1 -52.5 135.2	22 29.4 -52.8 135.5	21 46.5 -53.2 135.8	21 03.5 -53.6 136.0	20 20.2 -53.9 136.3	19 36.7 -54.2 136.5	10	23 45.1 -51.8 135.1	23 02.5 -52.2 135.4	22 19.6 -52.5 135.7	21 36.6 -53.0 136.0	20 53.3 -53.3 136.2	20 09.9 -53.6 136.5	19 26.3 -54.0 136.8	18 42.5 -54.3 137.0	11	22 53.3 -51.9 135.6	22 10.3 -52.3 135.9	21 27.1 -52.7 136.2	20 43.6 -53.0 136.5	20 00.0 -53.3 136.7	19 16.3 -53.8 137.0	18 32.3 -54.0 137.2	17 48.2 -54.4 137.4	12	21 01.4 -52.0 136.2	21 18.0 -52.4 136.5	20 34.4 -52.7 136.7	19 50.6 -53.1 137.0	19 06.7 -53.5 137.2	18 22.5 -53.7 137.5	17 38.3 -54.1 137.7	16 53.8 -54.4 137.9	13	21 09.4 -52.1 136.7	20 25.6 -52.5 137.0	19 41.7 -52.9 137.2	18 57.5 -53.2 137.5	18 13.2 -53.5 137.7	17 28.8 -53.9 137.9	16 44.2 -54.2 138.1	15 59.4 -54.5 138.3	14	20 17.3 -52.2 137.3	19 33.1 -52.5 137.5	18 48.8 -52.9 137.7	18 04.3 -53.2 138.0	17 19.7 -53.6 138.2	16 34.9 -53.9 138.4	15 50.0 -54.2 138.6	15 04.9 -54.5 138.8	15	19 25.1 -52.3 137.8	18 40.6 -52.7 138.0	17 55.9 -53.0 138.2	17 11.1 -53.3 138.4	16 26.1 -53.6 138.6	15 41.0 -54.0 138.8	14 55.8 -54.3 139.0	14 10.4 -54.6 139.2	16	18 32.8 -52.3 138.3	17 47.9 -52.7 138.5	17 02.9 -53.0 138.7	16 17.8 -53.4 138.9	15 32.5 -53.8 139.1	14 47.0 -54.0 139.3	13 01.5 -54.3 139.5	13 15.8 -54.6 139.6	17	17 40.5 -52.5 138.8	16 55.2 -52.8 139.0	16 09.9 -53.2 139.2	15 24.4 -53.5 139.4	14 38.7 -53.7 139.6	13 53.0 -54.0 139.7	13 07.2 -54.4 139.9	12 21.2 -54.6 140.0	18	16 48.0 -52.5 139.3	16 02.4 -52.8 139.5	15 16.7 -53.2 139.7	14 30.9 -53.5 139.9	13 45.0 -53.8 140.0	12 59.0 -54.2 140.2	12 12.8 -54.4 140.3	11 26.6 -54.7 140.5	19	15 55.5 -52.6 139.8	15 09.6 -52.9 140.0	14 23.5 -53.2 140.2	13 37.4 -53.5 140.3	12 51.2 -53.9 140.5	12 04.8 -54.1 140.6	11 18.4 -54.4 140.8	10 31.9 -54.7 140.9	20	15 02.9 -52.7 140.3	14 16.7 -53.0 140.5	13 30.3 -53.3 140.7	12 43.9 -53.6 140.8	11 57.3 -53.9 140.9	11 10.7 -54.2 141.1	10 24.0 -54.5 141.2	9 37.2 -54.8 141.3	21	14 10.2 -52.7 140.8	13 23.7 -53.1 141.0	12 37.0 -53.5 141.1	11 50.3 -53.7 141.3	11 03.4 -53.9 141.4	10 16.5 -54.2 141.5	9 29.5 -54.5 141.6	8 42.4 -54.7 141.7	22	13 17.5 -52.8 141.3	12 30.6 -53.0 141.5	11 43.7 -53.4 141.6	10 56.6 -53.7 141.7	10 09.5 -54.0 141.8	9 22.3 -54.3 141.9	8 35.0 -54.5 142.0	7 47.7 -54.8 142.1	23	12 24.7 -52.8 141.8	11 37.6 -53.2 141.9	10 50.3 -53.5 142.1	10 02.9 -53.7 142.2	9 15.5 -54.0 142.3	8 28.0 -54.3 142.4	7 40.5 -54.6 142.5	6 52.9 -54.9 142.5	24	11 31.9 -52.8 142.3	10 44.4 -53.2 142.4	9 56.8 -53.4 142.5	8 21.5 -54.1 142.7	7 33.7 -54.3 142.8	5 45.9 -54.6 142.9	5 58.0 -54.8 142.9	4 04.9 -54.7 143.0	25	10 39.1 -53.0 142.8	9 51.2 -53.2 142.9	9 03.4 -53.5 143.0	8 15.4 -53.8 143.1	7 27.4 -54.0 143.2	6 39.4 -54.3 143.2	5 51.3 -54.6 143.3	5 03.2 -54.8 143.4	26	9 46.1 -52.9 143.2	8 58.0 -53.2 143.3	8 09.9 -53.6 143.4	7 21.6 -53.8 143.5	6 33.4 -54.1 143.6	5 45.1 -54.4 143.7	4 56.7 -54.6 143.7	4 08.4 -54.9 143.8	27	8 53.2 -53.0 143.7	8 04.8 -53.3 143.8	7 16.3 -53.5 143.9	6 27.8 -53.8 144.0	5 39.3 -54.1 144.0	4 50.7 -54.3 144.1	4 02.1 -54.6 144.1	3 13.5 -54.9 144.2	28	8 00.2 -53.0 144.2	7 11.5 -53.3 144.3	6 22.8 -53.6 144.3	5 34.0 -53.9 144.4	4 45.2 -54.1 144.5	3 56.4 -54.4 144.5	3 07.5 -54.6 144.5	2 18.6 -54.9 144.6	29	7 07.2 -53.1 144.7	6 18.2 -53.2 144.7	5 29.2 -53.6 144.8	4 40.1 -53.8 144.9	3 51.1 -54.2 144.9	3 02.0 -54.4 144.9	2 12.9 -54.7 145.0	1 23.7 -54.9 145.0	30	6 14.1 -53.1 145.1	5 24.9 -53.4 145.2	4 35.6 -53.6 145.3	3 46.3 -53.9 145.3	2 15.7 -54.2 145.3	2 07.6 -54.4 145.4	1 18.2 -54.6 145.4	0 28.8 -54.8 145.4	31	5 21.0 -53.1 145.6	4 31.5 -53.4 145.7	3 42.0 -53.7 145.7	2 52.4 -53.9 145.7	2 02.8 -54.2 145.8	1 13.2 -54.4 145.8	0 23.6 -54.7 145.8	0 26.0 -54.9 145.8	32	4 27.9 -53.1 146.1	3 38.1 -53.4 146.1	2 48.3 -53.6 146.1	1 58.5 -53.9 146.2	1 08.6 -54.1 146.2	0 18.8 -54.4 146.2	0 31.1 -54.6 146.2	0 33.8 -54.7 146.2	33	3 34.8 -53.1 146.5	2 44.7 -53.3 146.6	1 54.7 -53.7 146.6	1 04.6 -53.9 146.6	0 35.6 -54.4 146.6	0 35.6 -54.4 146.6	0 31.1 -54.6 146.6	0 33.8 -54.7 146.6	34	2 41.7 -53.2 147.0	1 51.4 -53.4 147.0	0 10.0 -53.6 147.0	0 10.7 -53.9 147.1	0 39.7 -54.1 147.1	0 39.7 -54.1 147.1	0 30.0 -54.4 147.1	0 33.0 -54.7 147.1	35	1 48.5 -53.1 147.5	0 58.0 -53.5 147.5	0 07.4 -53.7 147.5	0 43.2 +54.0 32.5	1 33.8 +54.2 32.5	2 24.4 +54.4 32.5	3 15.0 +54.6 32.6	4 05.6 +54.8 32.6	36	0 55.4 -53.2 147.9	0 04.5 -53.4 147.9	0 46.3 +53.7 32.1	2 28.0 +53.9 32.1	3 18.8 +54.4 32.1	4 09.6 +54.6 32.2	5 00.4 +54.9 32.2	6 15.8 +54.9 32.2	37	0 02.2 -53.1 148.4	0 48.9 +53.4 31.6	1 40.0 +53.6 31.6	2 31.1 +53.8 31.6	3 22.1 +54.2 31.7	4 13.2 +54.4 31.7	5 04.2 +54.6 31.7	5 55.3 +54.8 31.8	38	0 50.9 +53.2 149.1	1 42.3 +53.4 31.1	2 33.6 +53.7 31.2	3 24.9 +53.9 31.2	4 16.3 +54.1 31.2	5 07.6 +54.3 31.3	6 50.8 +54.6 31.3	6 50.1 +54.8 31.4	39	1 44.1 +53.1 30.7	2 35.7 +53.4 30.7	3 27.3 +53.6 30.7	4 18.8 +53.9 30.8	5 10.4 +54.1 30.8	6 01.9 +54.3 30.8	6 53.4 +54.6 30.9	7 44.9 +54.7 31.0	40	3 29.0 +53.4 30.2	4 20.9 +53.6 30.3	5 12.7 +53.8 30.3	6 04.5 +54.1 30.4	6 56.2 +54.3 30.4	7 48.0 +54.5 30.5	8 39.6 +54.8 30.6	9 06.6 +54.7 30.6	41	3 30.3 +53.2 29.7	4 22.4 +53.4 29.8	5 14.5 +53.6 29.8	6 06.5 +53.9 29.9	6 58.6 +54.0 29.9	7 50.5 +54.3 30.0	8 42.5 +54.5 30.1	9 34.4 +54.7 30.1	42	4 23.5 +53.1 29.3	5 15.8 +53.3 29.3	6 08.1 +53.6 29.4	7 00.4 +53.8 29.4	7 52.6 +54.0 29.5	8 44.8 +54.3 29.6	9 37.0 +54.5 29.6	10 29.1 +54.7 29.7	43	5 16.6 +53.0 28.8	6 09.1 +53.3 28.9	7 01.7 +53.5 28.9	8 54.2 +53.7 29.0	8 46.6 +54.0 29.0	9 39.1 +54.2 29.1	10 31.5 +54.4 29.2	11 23.8 +54.7 29.3	44	6 09.6 +53.1 28.3	7 02.4 +53.3 28.4	7 55.2 +53.5 28.5	8 47.9 +53.8 28.5	9 40.6 +54.0 28.6	10 33.3 +54.2 28.7	11 25.9 +54.4 28.8	12 18.5 +54.6 28.9	45	7 02.7 +53.0 27.9	7 55.7 +53.3 27.9	8 48.7 +53.5 28.0	9 41.7 +53.7 28.1	10 34.6 +53.9 28.2	11 27.5 +54.1 28.3	12 20.3 +54.3 28.4	13 13.1 +54.5 28.5	46	7 55.7 +53.0 27.4	8 49.0 +53.2 27.5	9 42.2 +53.4 27.5	10 35.4 +53.6 27.6	11 28.5 +53.9 27.7	12 22.4 +53.6 27.7	13 14.6 +54.4 27.8	14 07.6 +54.6 28.0	47	8 48.7 +53.0 26.9	9 42.2 +52.7 27.0	10 35.6 +53.4 27.1	11 29.0 +53.7 27.2	12 22.7 +53.5 27.2	13 15.7 +54.1 27.4	14 09.0 +54.2 27.5	15 02.2 +54.4 27.6	48	9 41.7 +52.9 26.4	10 35.4 +53.1 26.5	11 29.0 +53.4 26.6	12 22.7 +53.5 26.7	13 16.2 +53.6 26.8	14 09.8 +54.0 26.9	15 03.2 +54.2 27.0	15 53.6 +54.5 27.2	49	10 34.6 +52.9 26.0	11 28.5 +52.5 26.1	12 22.4 +53.3 26.1	13 16.2 +53.6 26.2	14 10.0 +53.8 26.4	15 03.8 +53.9 26.5	16 20.1 +54.1 26.6	17 45.1 +54.3 26.8	50	11 27.5 +52.8 25.5	12 21.6 +53.0 25.6	13 15.7 +53.3 25.7	14 09.8 +53.4 25.8	15 03.8 +53.6 25.9	15 57.7 +53.9 26.0	16 51.6 +54.3 26.1	17 45.7 +54.0 26.7	51	12 20.3 +52.8 25.0	13 14.6 +53.0 25.1	14 09.0 +53.2 25.2	15 03.2 +53.4 25.3	15 57.4 +53.7 25.4	15 57.4 +53.7 25.4	16 51.6 +53.8 25.6	17 45.7 +54.0 25.7	52	13 13.1 +52.7 24.5	14 07.6 +53.0 24.6	15 02.2 +53.1 24.7	15 56.6 +53.4 24.8	16 51.1 +53.5 25.0</td

42°, 318° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	31 42.0 +49.8 128.1	31 04.8 +50.3 128.6	30 27.1 +50.9 129.1	29 49.1 +51.3 129.5	29 10.8 +51.8 130.0	28 32.1 +52.2 130.4	27 53.0 +52.7 130.8	27 13.7 +53.1 131.2	0	32 31.8 +49.6 127.5	31 55.1 +50.1 128.0	31 18.0 +50.6 128.5	30 40.4 +51.2 128.9	30 02.6 +51.6 129.4	29 24.3 +52.1 129.8	28 45.7 +52.6 130.3	28 06.8 +53.0 130.7	1	33 21.4 +49.3 126.8	32 45.2 +49.9 127.3	32 08.6 +50.4 127.8	31 31.6 +51.0 128.3	30 54.2 +51.5 128.8	30 16.4 +52.0 129.3	29 38.3 +52.4 129.7	28 59.8 +52.8 130.1	2	34 10.7 +49.1 126.1	33 35.1 +49.7 126.7	32 59.0 +50.3 127.2	32 22.6 +50.7 127.7	31 45.7 +51.3 128.2	31 08.4 +51.8 128.7	30 30.7 +52.2 129.1	29 52.6 +52.7 129.6	3	34 59.8 +48.9 125.4	34 24.8 +49.4 126.0	33 49.3 +50.0 126.5	33 13.3 +50.6 127.1	32 37.0 +51.1 127.6	32 00.2 +51.6 128.1	31 22.9 +52.2 128.6	30 45.3 +52.6 129.0	4									
5	35 48.7 +48.6 124.7	35 14.2 +49.2 125.3	34 39.3 +49.8 125.9	34 03.9 +50.4 126.4	33 28.1 +50.9 127.0	32 51.8 +51.4 127.5	32 15.1 +51.9 128.0	31 37.9 +52.5 128.5	5	36 37.3 +48.3 124.0	36 03.4 +49.0 124.6	35 29.1 +49.6 125.2	34 54.3 +50.2 125.8	34 19.0 +50.7 126.3	33 43.2 +51.3 126.9	33 07.0 +51.8 127.4	32 30.4 +52.2 127.9	6	37 25.6 +48.0 123.2	36 52.4 +48.7 123.9	36 18.7 +49.3 124.5	35 44.5 +49.9 125.1	35 09.7 +50.5 125.7	34 34.5 +51.0 126.2	33 58.8 +51.6 126.8	33 22.6 +52.1 127.3	7	38 13.6 +47.8 122.5	37 41.1 +48.4 123.1	37 08.0 +49.1 123.8	36 34.4 +49.7 124.4	36 00.2 +50.3 125.0	35 25.5 +50.4 125.6	34 50.4 +51.4 126.2	34 14.7 +52.0 126.7	8	39 01.4 +47.4 121.7	38 29.5 +48.1 122.4	37 57.1 +48.8 123.1	37 24.1 +49.4 123.7	36 50.5 +50.1 124.3	36 16.4 +50.6 124.9	35 41.8 +51.2 125.5	35 06.7 +51.7 126.1	9									
10	39 48.8 +47.1 120.9	39 17.6 +47.9 121.6	38 45.9 +48.5 122.3	38 13.5 +49.2 123.0	37 40.6 +49.8 123.6	37 07.0 +50.4 124.3	36 33.0 +50.0 124.9	35 58.4 +51.6 125.5	10	40 35.9 +46.7 120.1	40 05.5 +47.5 120.8	39 34.4 +48.2 121.6	39 02.7 +48.9 122.3	38 30.4 +49.5 122.9	37 57.4 +50.2 123.6	37 24.0 +50.7 124.2	36 50.0 +51.3 124.9	11	41 22.6 +46.4 119.3	40 53.0 +47.1 120.0	40 22.6 +47.9 120.8	39 51.6 +48.5 121.5	39 19.9 +49.2 122.2	38 47.6 +49.9 122.9	38 14.7 +50.6 123.6	37 41.3 +51.1 124.2	12	42 09.0 +46.0 118.4	41 40.1 +46.8 119.2	41 10.5 +47.5 120.0	40 40.1 +48.3 120.7	40 09.1 +49.0 121.5	39 37.5 +49.7 122.2	39 05.3 +50.2 122.9	38 32.4 +50.9 123.5	13	42 55.0 +45.6 117.6	42 26.9 +46.4 118.4	41 58.0 +47.2 119.2	41 28.4 +47.9 119.9	40 58.1 +48.7 120.7	40 27.2 +49.3 121.4	39 55.5 +50.0 122.2	39 23.3 +50.6 122.9	14									
15	43 40.6 +45.2 116.7	43 13.3 +46.0 117.5	42 45.2 +46.8 118.3	42 16.3 +47.6 119.1	41 46.8 +48.3 119.9	41 16.5 +49.1 120.7	40 45.5 +49.8 121.4	40 13.9 +50.4 122.2	15	44 25.8 +44.7 115.7	43 59.3 +45.6 116.6	43 32.0 +46.4 117.5	43 03.9 +47.3 118.3	43 35.1 +48.0 119.1	42 05.6 +48.7 119.9	41 35.3 +49.4 120.7	41 04.3 +50.1 121.4	16	45 10.5 +44.2 114.8	44 44.9 +45.1 115.7	44 18.4 +46.0 116.6	43 51.2 +46.8 117.3	43 23.1 +47.6 118.3	42 54.3 +48.4 119.1	42 24.7 +49.1 119.9	41 54.4 +49.9 120.7	17	45 54.7 +43.8 113.8	45 30.0 +44.7 114.8	45 04.4 +45.6 115.7	44 38.0 +46.4 116.6	44 10.7 +47.3 117.5	43 42.7 +48.0 118.3	43 13.8 +48.8 119.1	42 44.3 +49.5 120.0	18	46 38.5 +43.2 112.9	46 14.7 +44.2 113.8	45 50.0 +45.1 114.8	45 24.4 +46.0 115.7	44 58.0 +46.8 116.6	44 30.7 +47.7 117.5	44 02.6 +48.5 118.3	43 33.8 +49.2 119.2	19									
20	47 21.7 +42.6 111.8	46 58.9 +43.6 112.8	46 35.1 +44.6 113.8	46 10.4 +45.6 114.8	45 44.8 +45.6 115.7	45 18.4 +47.3 116.6	44 51.1 +48.1 117.5	44 23.0 +48.8 118.4	20	47 42.5 +42.1 110.8	47 42.5 +43.1 111.8	47 19.7 +44.1 112.8	46 56.0 +45.0 113.8	46 31.3 +45.9 114.8	46 05.7 +46.8 115.7	45 39.2 +47.7 116.7	45 11.8 +48.5 117.6	21	48 46.4 +41.4 109.7	48 25.6 +42.5 110.8	48 03.8 +43.6 111.8	47 41.0 +44.6 112.8	47 17.2 +45.5 113.8	46 52.5 +46.4 114.8	46 26.9 +47.2 115.8	46 00.3 +48.1 116.7	22	49 27.8 +40.8 108.6	49 08.1 +42.0 109.7	48 47.4 +43.0 110.8	48 25.6 +44.0 111.8	48 02.7 +45.0 112.9	47 14.1 +46.9 114.9	46 48.4 +47.7 115.9	47 1.1 +48.1 116.0	23	50 08.6 +40.2 107.5	49 50.1 +41.2 108.6	49 30.4 +42.3 109.7	49 09.6 +43.4 110.8	48 47.7 +44.5 111.9	48 24.9 +45.4 112.9	48 01.0 +46.4 114.0	47 36.1 +47.3 115.0	24									
25	50 48.8 +39.4 106.3	50 31.3 +40.6 107.5	50 12.7 +41.8 108.6	49 53.0 +42.9 109.8	49 32.2 +43.9 110.9	49 10.3 +44.9 111.9	48 47.4 +45.9 113.0	48 23.4 +46.8 114.0	25	51 28.2 +38.6 105.1	51 11.9 +39.9 106.3	50 54.5 +41.0 107.5	50 35.9 +42.2 108.7	50 16.1 +43.3 109.8	49 55.2 +44.4 110.9	49 33.3 +45.3 112.0	49 10.3 +46.3 113.1	26	52 06.8 +37.8 103.9	51 51.8 +39.1 105.1	51 35.5 +40.4 106.3	51 18.1 +41.5 107.5	50 59.4 +42.7 108.7	50 39.6 +43.8 109.9	50 18.6 +44.9 111.0	49 56.6 +45.8 112.1	27	52 44.6 +37.1 102.6	52 30.9 +38.3 103.9	52 15.9 +39.6 105.1	51 59.6 +40.8 106.4	51 42.1 +42.0 107.6	51 23.4 +43.1 108.8	51 03.5 +44.2 110.0	50 42.4 +45.3 111.1	28	53 21.7 +36.1 101.3	53 09.2 +37.5 102.6	52 55.5 +38.3 103.9	52 40.4 +40.1 105.2	52 24.1 +41.3 106.4	52 06.5 +42.5 107.7	51 47.7 +43.7 108.9	51 27.7 +44.7 110.1	29									
30	53 57.8 +35.2 99.9	53 46.7 +36.6 101.3	53 34.3 +38.0 102.6	53 20.5 +39.3 103.9	53 05.4 +40.6 105.2	52 49.0 +41.8 106.5	52 31.4 +42.9 107.8	52 12.4 +44.2 109.0	30	54 33.0 +34.2 98.6	54 23.3 +35.7 99.9	54 12.3 +37.0 101.3	53 59.8 +38.5 102.7	53 46.0 +38.9 104.0	53 30.8 +41.1 105.3	53 14.3 +42.3 106.6	52 56.6 +43.4 107.9	31	55 07.2 +33.1 97.1	54 59.0 +34.7 98.5	54 49.3 +36.2 99.9	54 38.3 +37.5 101.3	54 25.8 +38.9 102.7	54 11.9 +40.2 104.1	53 56.6 +41.6 105.4	53 40.0 +42.8 106.7	32	55 40.3 +32.1 95.7	55 33.7 +33.6 97.1	55 25.5 +35.2 98.6	55 22.8 +36.7 100.0	55 04.7 +38.1 101.4	54 52.1 +39.5 102.8	54 38.2 +40.7 104.2	54 22.8 +42.0 105.5	33	56 12.4 +31.0 94.1	56 07.3 +32.6 95.6	56 00.7 +34.1 97.1	55 52.5 +35.6 98.6	55 42.8 +37.1 100.0	55 31.6 +38.5 101.5	55 18.9 +40.0 102.9	55 04.8 +41.3 104.3	34									
35	56 43.4 +29.8 92.6	56 39.9 +31.4 94.1	56 34.8 +33.0 95.6	56 28.1 +34.6 97.1	56 19.9 +36.1 98.6	56 10.1 +37.6 100.1	55 58.9 +39.0 101.6	55 46.1 +40.4 103.0	35	57 13.2 +28.5 91.0	57 11.3 +30.2 92.6	57 07.8 +31.9 94.1	57 02.7 +33.5 95.6	56 56.0 +35.1 97.2	56 47.7 +36.7 98.7	56 37.9 +38.1 100.2	56 26.5 +39.6 101.7	36	57 41.7 +27.2 89.4	57 41.5 +29.0 91.0	57 39.7 +30.7 92.5	57 36.2 +32.4 94.1	57 31.1 +34.0 95.7	57 24.4 +35.6 97.2	57 16.0 +37.2 98.8	57 06.1 +38.6 100.3	37	58 08.9 +25.9 87.7	58 10.5 +27.7 89.3	58 10.4 +29.4 90.9	58 08.6 +31.2 92.5	58 05.1 +32.9 94.1	58 00.0 +34.5 95.7	57 53.2 +36.1 97.3	57 44.7 +37.7 98.9	38	58 34.8 +24.5 86.0	58 38.2 +26.3 87.6	58 39.8 +28.1 89.2	58 39.8 +29.8 90.9	58 30.8 +31.6 92.5	58 34.5 +33.3 94.2	58 29.3 +34.9 95.8	58 22.4 +36.5 97.4	39									
40	58 59.3 +23.0 84.2	59 04.5 +24.9 85.9	59 07.9 +26.8 87.5	59 09.6 +28.6 89.2	59 09.6 +30.3 90.9	59 07.8 +32.1 92.6	59 04.2 +33.8 94.2	58 59.9 +35.5 95.9	40	59 22.3 +21.5 82.4	59 29.4 +23.3 84.1	59 34.7 +25.2 85.8	59 38.2 +27.1 87.5	59 39.9 +29.0 89.2	59 39.9 +30.8 90.9	59 38.0 +32.6 92.6	59 34.4 +34.3 94.3	41	59 43.8 +19.9 80.6	59 52.7 +21.9 82.3	59 59.9 +23.8 84.0	60 05.3 +25.5 85.7	60 08.9 +27.6 87.4	60 10.7 +29.4 89.2	60 10.6 +31.3 90.9	60 08.7 +33.1 92.7	42	60 03.7 +18.2 78.7	60 14.6 +20.2 80.4	60 23.7 +22.2 82.1	60 31.0 +24.1 83.9	60 36.5 +26.0 85.6	60 40.1 +28.0 87.4	60 41.9 +29.8 89.2	60 41.8 +31.7 91.0	43	60 21.9 +16.6 76.8	60 34.8 +18.6 78.5	60 45.0 +20.5 80.2	60 55.1 +22.6 82.0	60 25.5 +24.6 83.8	61 08.1 +26.5 85.6	61 11.7 +28.5 87.4	61 13.5 +30.3 89.2	44	60 38.5 +14.9 74.8	60 53.4 +16.8 76.5	61 06.4 +18.9 78.3	61 17.7 +20.8 80.1	61 21.1 +22.8 81.9	61 34.6 +24.9 83.7	61 40.2 +26.8 85.6	61 43.8 +28.9 87.4	45
45	61 34.6 +13.5 74.7	61 46.4 -12.0 45.0	62 28.3 -10.5 46.4	63 09.2 -8.9 -47.8	63 09.6 -28.9 47.3	63 04.0 -13.8 -71.7	63 21.8 -16.0 73.6	63 37.8 -18.1 75.5	50	61 40.2 +3.6 72.5	62 32.3 +7.7* 64.2	62 55.9 +9.7* 67.7	63 17.8 +11.8* 69.6	63 37.8 +14.0* 71.5	63 55.9 +16.2* 73.4	64 12.1 +18.4* 75.4	64 30.5 +16.3* 73.2	51	61 45.5 -0.2 58.3	62 16.3 +1.7 59.9	62 45.6 -3.6* 61.6	63 13.3 +5.7* 63.4	63 39.4 +7.7* 65.2	64 03.7 +9.9* 67.0	64 26.2 +12.1* 68.9	64 46.8 +14.3* 70.9	52	61 45.3 -2.2 56.2	62 18.0 -0.3* 57.8	62 49.2 +1.6* 59.4	63 19.0 +3.6* 61.1	63 47.1 +5.6* 62.9	64 13.6 +7.7* 64.8	64 38.3 +9.9* 66.7	65 01.1 +12.1* 68.6	53	61 43.1 -4.1 54.1	62 17.7 -2.4* 55.6	62 50.8 -0.4* 57.3	62 22.6 +1.4* 58.9	63 52.7 +3.6* 60.7	64 21.3 +5.6* 62.5	64 48.2 +7.7* 64.4	65 13.2 +10.0*										

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 42°, 318°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	31 42.0 -49.9 128.1	31 04.8 -50.5 128.6	30 27.1 -50.9 129.1	29 49.1 -51.4 129.5	29 10.8 -52.0 130.0	28 32.1 -52.4 130.4	27 53.0 -52.8 130.8	27 13.7 -53.3 131.2	0																
1	30 52.1 -50.2 128.8	30 14.3 -50.7 129.2	29 36.2 -51.2 129.7	28 57.7 -51.7 130.1	28 18.8 -52.0 130.5	27 39.7 -52.5 130.9	27 00.2 -52.9 131.3	26 20.4 -53.3 131.7	1																
2	30 01.9 -50.3 129.4	29 23.6 -50.8 129.9	28 45.0 -51.3 130.3	28 06.0 -51.7 130.7	27 26.8 -52.3 131.1	26 47.2 -52.7 131.5	26 07.3 -53.1 131.9	25 27.1 -53.5 132.2	3																
3	29 11.6 -50.5 130.1	28 32.8 -51.0 130.5	27 53.7 -51.5 130.9	27 14.3 -51.9 131.3	26 34.5 -52.3 131.7	25 54.5 -52.7 132.0	25 14.2 -53.1 132.4	24 33.6 -53.5 132.7	4																
4	28 21.1 -50.7 130.7	27 41.8 -51.1 131.1	27 02.2 -51.4 131.5	26 22.4 -52.1 131.8	25 42.2 -52.4 132.2	24 01.8 -52.8 132.6	24 21.1 -53.3 132.9	23 40.1 -53.6 133.6	9																
5	27 30.4 -50.8 131.3	26 50.7 -51.3 131.7	26 10.6 -51.7 132.0	25 30.3 -52.1 132.4	24 49.8 -52.6 132.7	24 08.9 -53.0 133.1	23 27.8 -53.3 133.4	22 46.5 -53.8 133.7	5																
6	26 39.6 -51.0 131.9	25 59.4 -51.4 132.2	25 18.9 -51.8 132.6	24 38.2 -52.3 132.9	23 57.2 -52.7 133.3	23 15.9 -53.0 133.6	22 34.5 -53.5 133.9	21 52.7 -53.8 134.2	6																
7	25 48.6 -51.1 132.5	25 08.0 -51.6 132.8	24 27.1 -52.0 133.1	23 45.9 -52.4 133.5	23 04.5 -52.8 133.8	22 22.9 -53.2 134.1	21 41.0 -53.5 134.4	20 58.9 -53.8 134.7	7																
8	24 57.5 -51.2 133.0	24 16.4 -51.7 133.4	23 35.1 -52.1 133.7	22 53.5 -52.5 134.0	22 11.7 -52.8 134.3	21 29.7 -53.2 134.6	20 47.5 -53.6 134.9	20 05.1 -54.0 135.1	8																
9	24 06.3 -51.4 133.6	23 24.7 -51.7 133.9	22 43.0 -52.2 134.2	22 01.0 -52.6 134.5	21 18.9 -53.0 134.8	20 36.5 -53.4 135.1	19 53.9 -53.7 135.3	19 11.1 -54.0 135.6	9																
10	23 14.9 -51.5 134.2	22 33.0 -51.9 134.5	21 50.8 -52.3 134.8	21 08.4 -52.6 135.0	20 25.9 -53.1 135.3	19 43.1 -53.4 135.6	19 00.2 -53.8 135.8	18 17.1 -54.1 136.1	10																
11	22 23.4 -51.6 134.7	21 41.1 -52.1 135.0	20 58.5 -52.4 135.3	20 15.8 -52.8 135.6	19 32.8 -53.1 135.8	18 49.7 -53.5 136.1	18 06.4 -53.8 136.3	17 23.0 -54.2 136.5	11																
12	21 31.8 -51.7 135.3	20 49.0 -52.1 135.6	20 06.1 -52.5 135.8	19 52.9 -52.9 136.1	18 39.7 -53.2 136.3	17 56.2 -53.5 136.5	17 12.6 -53.9 136.7	16 28.8 -54.2 137.0	12																
13	20 40.1 -51.8 135.8	19 56.9 -52.2 136.1	19 13.6 -52.5 136.3	18 30.1 -52.9 136.6	17 46.5 -53.3 136.8	17 02.7 -53.6 137.0	16 18.7 -53.9 137.2	15 34.6 -54.2 137.4	13																
14	19 48.3 -51.9 136.4	19 04.7 -52.2 136.6	18 21.1 -52.7 136.8	17 37.2 -53.0 137.1	16 53.2 -53.3 137.3	16 09.1 -53.7 137.5	15 24.8 -54.0 137.7	14 40.4 -54.3 137.8	14																
15	18 56.4 -52.0 136.9	18 12.5 -52.4 137.1	17 28.4 -52.7 137.3	16 44.2 -53.1 137.6	15 59.9 -53.4 137.7	15 15.4 -53.7 137.9	14 30.8 -54.1 138.1	13 46.1 -54.4 138.3	15																
16	18 04.4 -52.1 137.4	17 20.1 -52.4 137.6	16 35.7 -52.8 137.8	15 51.1 -53.1 138.0	15 06.5 -53.5 138.2	14 21.7 -53.8 138.4	13 36.7 -54.1 138.6	12 51.7 -54.4 138.7	16																
17	17 12.3 -52.2 137.9	16 27.7 -52.6 138.1	15 42.9 -52.9 138.3	14 58.0 -53.2 138.5	14 13.0 -53.5 138.7	13 27.9 -53.9 138.9	12 42.6 -54.1 139.0	11 57.3 -54.4 139.2	17																
18	16 20.1 -52.2 138.5	15 35.1 -52.6 138.6	14 50.0 -52.9 138.8	14 04.8 -53.2 139.0	13 19.5 -53.6 139.2	12 34.0 -53.9 139.3	11 48.5 -54.2 139.4	11 02.9 -54.5 139.6	18																
19	15 27.9 -52.3 139.0	14 42.5 -52.6 139.1	13 57.1 -53.0 139.3	13 11.6 -53.3 139.5	12 25.9 -53.6 139.6	11 40.1 -53.9 139.8	10 54.3 -54.2 139.9	10 08.4 -54.5 140.0	19																
20	14 35.6 -52.4 139.5	13 49.9 -52.7 139.6	13 04.1 -53.0 139.8	12 18.3 -53.4 139.9	11 42.3 -53.7 140.1	10 46.6 -53.9 140.2	9 00.1 -54.3 140.3	9 13.9 -54.6 140.4	20																
21	13 43.2 -52.4 140.0	12 57.2 -52.8 140.1	12 11.1 -53.1 140.3	11 24.9 -53.4 140.4	10 38.6 -53.7 140.5	9 52.3 -54.0 140.6	9 05.8 -54.3 140.8	8 19.3 -54.5 140.9	21																
22	12 50.8 -52.5 140.5	12 04.4 -52.8 140.6	11 18.0 -53.1 140.8	10 31.5 -53.4 140.9	9 44.9 -53.7 141.0	8 58.3 -54.1 141.1	8 11.5 -54.3 141.2	7 24.8 -54.6 141.3	22																
23	11 58.3 -52.6 141.0	11 11.6 -52.8 141.1	10 24.9 -53.2 141.2	9 38.1 -53.5 141.3	8 51.2 -53.8 141.4	8 04.2 -54.0 141.5	7 17.2 -54.3 141.6	6 30.2 -54.6 141.7	23																
24	11 05.7 -52.6 141.5	10 18.8 -52.9 141.6	9 31.7 -53.2 141.7	8 44.6 -53.5 141.8	7 57.4 -53.8 141.9	7 10.2 -54.1 142.0	6 22.9 -54.4 142.0	5 35.6 -54.7 142.1	24																
25	10 13.1 -52.6 142.0	9 25.9 -53.0 142.1	8 38.5 -53.2 142.2	7 51.1 -53.6 142.3	7 03.6 -53.8 142.3	6 16.1 -54.1 142.4	5 28.5 -54.3 142.5	4 40.9 -54.6 142.5	25																
26	9 20.5 -52.7 142.4	8 32.9 -53.0 142.5	7 45.3 -53.3 142.6	6 57.5 -53.5 142.7	6 09.8 -53.8 142.8	5 22.0 -54.1 142.8	4 34.2 -54.4 142.9	3 46.3 -54.7 142.9	26																
27	8 27.8 -52.7 142.9	7 39.9 -53.0 143.0	6 52.0 -53.3 143.1	6 04.0 -53.6 143.2	5 15.9 -53.8 143.2	4 27.9 -54.2 143.3	3 39.8 -54.4 143.3	2 51.6 -54.6 143.3	27																
28	7 35.1 -52.7 143.4	6 46.9 -53.0 143.5	5 58.7 -53.3 143.6	5 10.4 -53.6 143.6	4 22.1 -53.9 143.7	3 33.7 -54.1 143.7	2 45.4 -54.4 143.7	1 57.0 -54.7 143.8	28																
29	6 42.4 -52.8 143.9	5 53.9 -53.1 144.0	5 05.4 -53.4 144.0	4 16.8 -53.6 144.1	3 28.2 -53.9 144.1	2 39.6 -54.2 144.1	1 51.0 -54.5 144.2	1 02.3 -54.7 144.2	29																
30	5 49.6 -52.8 144.4	5 00.8 -53.0 144.4	4 12.0 -53.3 144.5	3 23.2 -53.7 144.5	2 34.3 -53.9 144.5	1 45.4 -54.1 144.6	0 56.5 -54.4 144.6	0 07.6 -54.6 144.6	30																
31	4 56.8 -52.8 144.9	4 07.8 -53.1 144.9	3 18.7 -53.4 144.9	2 29.5 -53.6 145.0	1 40.4 -53.9 145.0	0 51.3 -54.2 145.0	0 02.1 -54.4 145.0	0 47.0 -54.7 35.0	31																
32	4 04.0 -52.8 145.3	3 14.7 -53.1 145.4	2 25.3 -53.4 145.4	1 35.9 -53.6 145.4	0 46.5 -53.9 145.4	0 02.9 +54.2 34.6	0 52.3 +54.4 34.6	1 41.7 +54.7 34.6	32																
33	3 11.2 -52.8 145.8	2 21.6 -53.2 145.8	1 31.9 -53.4 145.8	0 42.3 -53.7 145.9	0 11.4 +53.6 33.7	0 07.4 +54.9 34.1	1 05.1 +54.1 34.1	1 46.7 +54.4 34.2	33																
34	2 18.4 -52.9 146.3	1 28.4 -53.1 146.3	0 38.5 -53.4 146.3	0 35.8 -53.6 146.3	0 11.1 +53.9 33.7	1 51.2 +54.2 33.7	2 41.1 +54.4 33.7	3 31.0 +54.7 33.8	34																
35	1 25.5 -52.8 146.8	0 35.3 -53.1 146.8	0 14.9 +53.3 33.2	1 05.0 +53.7 33.2	1 55.2 +53.9 33.3	2 45.4 +54.1 33.3	3 35.5 +54.4 33.3	4 25.7 +54.6 33.4	35																
36	0 32.7 -52.9 147.2	0 17.8 +52.9 32.8	1 08.2 +53.4 32.8	1 58.7 +53.6 32.8	2 49.1 +53.9 32.8	3 39.5 +54.2 32.9	4 29.9 +54.4 32.9	5 20.3 +54.6 32.9	36																
37	0 20.2 +52.9 32.3	1 10.9 +53.1 32.3	2 01.6 +53.4 32.3	2 52.3 +53.6 32.3	3 43.0 +53.9 32.4	4 33.7 +54.1 32.4	5 24.3 +54.4 32.5	6 14.9 +54.6 32.5	37																
38	1 13.1 +52.8 31.8	2 04.0 +53.1 31.8	2 55.0 +53.4 31.9	3 45.9 +53.7 31.9	4 36.9 +53.8 31.9	5 27.8 +54.1 32.0	6 18.7 +54.3 32.0	7 09.5 +54.6 32.1	38																
39	2 05.9 +52.9 31.4	2 57.1 +53.1 31.4	3 48.4 +53.6 31.4	4 39.6 +53.6 31.4	5 30.7 +53.9 31.5	6 21.9 +54.1 31.5	7 13.0 +54.3 31.6	8 04.1 +54.5 31.7	39																
40	2 58.8 +52.8 30.9	3 50.2 +53.1 30.9	4 41.7 +53.3 31.0	5 33.2 +53.5 31.0	6 24.6 +53.8 31.1	7 16.0 +54.0 31.1	8 07.3 +54.3 31.2	8 58.6 +54.5 31.3	40																
41	3 51.6 +52.8 30.4	4 43.3 +53.1 30.4	5 35.0 +53.4 30.5	6 26.7 +53.6 30.5	7 18.4 +53.8 30.6	8 10.0 +54.0 30.7	9 01.6 +54.3 30.8	9 53.1 +54.5 30.8	41																
42	4 44.4 +52.8 29.9	5 36.4 +53.0 30.0	6 28.4 +53.2 30.0	7 20.3 +53.5 30.1	8 12.2 +53.7 30.2	9 04.0 +54.0 30.2	9 55.9 +54.2 30.3	10 47.6 +54.5 30.4	42																
43	5 37.2 +52.8 29.5	6 29.4 +53.1 29.5	7 21.6 +53.3 29.6	8 13.8 +53.5 29.6	9 05.9 +53.8 29.7	9 58.0 +54.0 29.8	10 50.1 +54.2 29.9	11 42.1 +54.4 30.0	43																
44	6 30.0 +52.7 29.0	7 22.5 +52.9 29.0	8 14.9 +53.2 29.1	9 07.3 +53.5 29.2	9 59.7 +53.7 29.3	10 52.0 +53.9 29.3	11 44.3 +54.1 29.4	12 36.5 +54.4 29.6	44																
45	7 22.7 +52.8 28.5	8 15.4 +53.0 28.6	9 08.1 +53.8 28.6	10 00.8 +53.4 28.7	10 54.2 +53.4 28.8	11 46.4 +53.6 28.9	12 38.4 +54.1 29.0	13 30.9 +54.3 29.1	45																
46	8 15.4 +52.7 28.0	9 08.4 +52.9 28.1	10 01.3 +53.2 28.2	10 54.2 +53.4 28.3	11 44.2 +53.6 28.3	12 39.8 +53.8 28.5	13 32.5 +54.1 28.6	14 25.2 +54.3 28.7	46																
47	9 08.1 +52.7 27.5	10 01.3 +52.9 27.6	10 54.5 +53.1 27.7	11 47.6 +53.3 27.8	12 40.6 +53.6 27.8	13 33.6 +53.8 28.0	14 26.6 +54.0 28.1	15 19.5 +54.2 28.2	47																
48	10 00.8 +52.6 27.0	10 45.2 +52.8 27.1	11 47.6 +53.3 27.2	12 40.9 +53.3 27.3	13 34.2 +53.5 27.4	14 27.4 +53.7 27.5	15 20.6 +53.9 27.7	16 13.7 +54.2 27.8	48																
49	11 45.9 +52.5 26.1	12 45.2 +52.7 26.2	13 33.6 +53.0 26.3	14 27.4 +53.2 26.4	15 21.1 +53.4 26.5	16 14.8 +53.6 26.6	17 08.4 +53.																		

43°, 317° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	31 08.5	+49.4	127.2	30 32.0	+50.0	127.6	29 55.2	+50.5	128.1	29 18.0	+51.0	128.6	28 40.4	+51.5	129.0	28 02.5	+52.0	129.4	27 24.2	+52.5	129.8	26 45.6	+52.9	130.2	0
1	31 57.9	+49.3	126.5	31 22.0	+49.8	127.0	30 45.7	+50.4	127.5	30 09.0	+50.9	127.9	29 31.9	+51.4	128.4	28 54.5	+51.8	128.8	28 16.7	+52.3	129.3	27 38.5	+52.8	129.7	1
2	32 47.2	+49.0	125.8	32 11.8	+49.6	126.3	31 36.1	+50.1	126.8	30 59.9	+50.7	127.3	30 23.3	+51.2	127.8	29 46.3	+51.7	128.3	29 09.0	+52.2	128.7	28 31.3	+52.6	129.1	2
3	33 36.2	+48.8	125.1	33 01.4	+49.4	125.7	32 26.2	+50.0	126.2	31 50.6	+50.5	126.7	31 14.5	+51.1	127.2	30 38.0	+51.6	127.7	30 01.2	+52.0	128.1	29 23.9	+52.6	128.6	3
4	34 25.0	+48.6	124.4	33 50.8	+49.2	125.0	33 16.2	+49.7	123.5	32 41.1	+50.3	126.1	31 05.6	+50.8	126.6	31 29.6	+51.4	127.1	30 53.2	+51.9	127.6	30 16.5	+52.3	128.0	4
5	35 13.6	+48.3	123.7	34 40.0	+48.9	124.3	34 05.9	+49.6	124.9	33 31.4	+50.1	125.4	32 56.4	+50.7	125.9	32 21.0	+51.2	126.5	31 45.1	+51.7	127.0	31 08.8	+52.2	127.5	5
6	36 01.9	+48.0	123.0	35 28.9	+48.7	123.6	34 55.5	+49.3	124.2	34 21.5	+49.9	124.8	33 47.1	+50.4	125.3	33 12.2	+51.0	125.8	32 36.8	+51.5	126.4	32 01.0	+52.1	126.9	6
7	36 49.9	+47.7	122.3	36 17.6	+48.4	122.9	35 44.8	+49.0	123.5	35 11.4	+49.7	124.1	34 37.5	+50.3	124.7	34 03.0	+50.8	125.2	33 28.3	+51.4	125.8	32 53.1	+51.8	126.3	7
8	37 37.6	+47.5	121.5	37 06.0	+48.1	122.1	36 33.8	+48.4	122.8	36 01.1	+49.4	123.4	35 27.8	+50.0	124.0	34 54.0	+50.4	124.6	34 19.7	+51.2	125.1	33 44.9	+51.7	125.7	8
9	38 25.1	+47.1	120.7	37 54.1	+47.9	121.4	37 22.6	+48.5	122.0	36 50.5	+49.1	122.7	36 17.8	+49.8	123.3	35 44.6	+50.4	123.9	35 10.9	+50.9	124.5	34 36.6	+51.5	125.1	9
10	39 12.2	+46.8	119.9	38 42.0	+47.5	120.6	38 11.1	+48.2	121.3	37 39.6	+48.9	122.0	37 07.6	+49.5	122.6	36 35.0	+50.1	123.2	36 01.8	+50.8	123.8	35 28.1	+51.4	124.4	10
11	39 59.0	+46.5	119.1	39 29.5	+47.2	119.8	38 59.3	+47.9	120.5	38 28.5	+48.6	121.2	37 57.1	+49.3	121.9	37 25.1	+49.9	122.5	36 52.6	+50.5	123.2	36 19.5	+51.1	123.8	11
12	40 45.5	+46.0	118.3	40 16.7	+46.8	119.0	39 47.2	+47.6	119.8	39 17.1	+48.3	120.5	38 15.0	+49.4	121.2	37 43.1	+50.3	122.5	37 10.6	+50.8	123.2	36 42.5	+50.1	121.1	12
13	41 31.5	+45.7	117.4	41 03.5	+46.5	118.2	40 34.8	+47.3	119.0	40 05.4	+48.0	119.7	39 35.4	+48.7	120.4	39 04.7	+49.4	121.1	38 33.4	+50.0	121.8	38 01.4	+50.7	122.5	13
14	42 17.2	+45.3	116.6	41 50.0	+46.2	117.4	41 22.1	+46.9	118.1	40 53.4	+47.7	118.9	40 24.1	+48.4	119.7	39 54.1	+49.1	120.4	39 23.4	+49.7	121.1	38 52.1	+50.4	121.8	14
15	43 02.5	+44.9	115.7	42 36.2	+45.7	116.5	42 09.0	+46.5	117.3	41 41.1	+47.3	118.1	41 12.5	+48.1	118.9	40 43.2	+48.7	119.6	40 13.1	+49.5	120.4	39 42.5	+50.1	121.1	15
16	43 47.4	+44.4	114.7	43 21.9	+45.3	115.6	42 55.5	+46.2	116.5	42 28.4	+47.0	117.3	42 00.6	+47.7	118.1	41 31.9	+48.5	118.9	41 02.6	+49.2	119.6	40 32.6	+49.9	120.4	16
17	44 31.8	+44.0	113.8	44 07.2	+44.8	114.7	43 41.7	+45.7	115.6	43 15.4	+46.5	116.4	42 48.3	+47.3	117.3	42 20.4	+48.2	118.1	41 51.8	+48.9	118.9	41 22.5	+49.6	119.6	17
18	45 15.8	+43.4	112.9	44 52.0	+44.4	113.8	44 27.4	+45.3	114.7	44 01.9	+46.2	115.6	43 35.6	+47.0	116.4	43 08.6	+47.7	117.3	42 40.7	+48.5	118.1	42 12.1	+49.3	118.9	18
19	45 59.2	+42.9	111.9	45 36.4	+43.9	112.8	45 12.7	+44.8	113.7	44 48.1	+45.7	114.7	44 22.6	+46.6	115.6	43 56.3	+47.5	116.4	43 29.2	+48.2	117.3	43 01.4	+48.9	118.1	19
20	46 42.1	+42.4	110.9	46 20.3	+43.4	111.8	45 57.5	+44.4	112.8	45 33.8	+45.3	113.7	45 09.2	+46.2	114.7	44 34.8	+47.0	115.6	44 17.4	+47.9	116.5	43 50.3	+48.6	117.3	20
21	47 24.5	+41.8	109.8	47 03.7	+42.8	110.8	46 41.9	+43.8	111.8	46 19.4	+44.8	112.8	45 55.4	+45.7	113.8	45 30.8	+46.6	114.7	45 05.3	+47.4	115.6	44 38.9	+48.3	116.5	21
22	48 06.3	+41.2	108.7	47 46.5	+42.3	109.8	47 25.7	+43.3	110.8	47 03.9	+44.3	111.8	46 41.1	+45.2	112.8	46 17.4	+46.1	113.8	45 52.7	+47.0	114.7	45 27.2	+47.8	115.7	22
23	48 47.5	+40.6	107.6	48 28.8	+41.7	108.7	48 09.0	+42.7	109.8	47 48.2	+43.7	110.8	47 26.3	+44.8	111.9	47 03.5	+45.7	112.9	46 39.7	+46.6	113.8	46 15.0	+47.5	114.8	23
24	49 28.1	+39.9	106.5	49 10.5	+41.0	107.6	49 51.7	+42.2	108.7	48 31.9	+43.2	109.8	48 11.1	+44.2	110.9	47 49.2	+45.2	111.9	47 26.3	+46.2	112.9	47 02.5	+47.1	113.9	24
25	50 08.0	+39.1	105.4	49 51.5	+40.3	106.5	49 33.9	+41.4	107.6	49 15.1	+42.6	108.7	48 55.3	+43.7	109.8	48 34.4	+44.7	110.9	48 12.5	+45.6	112.0	47 49.6	+46.5	113.0	25
26	50 47.1	+38.4	104.2	50 31.8	+39.7	105.4	50 15.3	+40.9	106.5	49 57.7	+42.0	107.7	49 39.0	+43.0	108.8	49 19.1	+44.1	109.8	48 58.1	+45.2	111.0	48 36.1	+46.1	112.0	26
27	51 25.5	+37.7	103.0	51 11.5	+38.9	104.2	50 56.2	+40.1	105.4	50 39.7	+41.3	106.5	50 22.0	+42.5	107.7	50 03.2	+43.5	108.8	49 43.3	+44.6	110.0	49 22.2	+45.6	111.1	27
28	52 03.2	+36.8	101.7	51 50.4	+38.1	102.9	51 36.3	+39.4	104.2	51 21.0	+40.6	105.4	51 04.5	+41.8	106.6	50 46.7	+43.0	107.8	50 27.9	+44.0	108.9	50 07.8	+45.1	110.1	28
29	52 40.0	+35.9	100.4	52 28.5	+37.3	101.7	52 15.7	+38.6	103.0	52 01.6	+39.9	104.2	51 46.3	+41.0	105.4	51 29.7	+42.2	106.6	51 11.1	+43.4	107.8	50 52.9	+44.5	109.0	29
30	53 15.9	+35.1	99.1	53 05.8	+36.4	100.4	52 54.3	+37.8	101.7	52 41.5	+39.1	103.0	52 27.3	+40.4	104.2	52 11.9	+41.6	105.5	51 55.3	+42.7	106.7	51 37.4	+43.9	107.9	30
31	53 51.0	+34.0	97.7	53 42.2	+35.5	99.1	53 32.1	+36.9	100.4	53 20.6	+38.2	101.7	53 07.7	+39.6	103.0	52 53.5	+40.9	104.3	52 38.0	+42.1	105.6	52 21.3	+43.2	106.8	31
32	54 25.0	+33.1	96.3	54 17.7	+34.6	97.7	54 09.0	+36.0	99.1	53 58.8	+37.4	100.4	54 37.3	+38.8	101.8	53 34.4	+40.1	103.1	53 20.1	+41.4	104.4	53 04.5	+42.6	105.7	32
33	54 58.1	+32.0	94.9	54 52.3	+33.5	96.3	54 45.0	+35.0	97.0	54 36.2	+36.5	99.1	54 26.1	+37.4	100.8	54 14.5	+39.2	101.8	54 01.5	+40.5	103.2	53 47.1	+41.8	104.5	33
34	55 30.1	+30.9	93.4	55 25.8	+32.5	94.8	55 20.0	+33.0	93.4	55 48.2	+34.5	96.3	55 40.9	+36.0	97.7	55 32.1	+37.5	99.2	55 21.8	+38.9	100.6	55 10.0	+40.3	102.0	34
35	56 01.0	+29.7	91.8	55 58.3	+31.4	93.3	55 54.0	+33.0	94.8	55 48.2	+34.5	96.3	55 40.9	+36.0	97.7	55 32.1	+37.5	99.2	55 21.8	+38.9	100.6	55 10.0	+40.3	102.0	35
36	56 30.7	+28.6	90.3	56 29.7	+30.2	91.8	56 27.0	+31.8	93.3	56 22.7	+33.5	94.8	56 18.6	+35.0	96.										

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 43°, 317°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	31 08.5 -49.7	127.2	30 32.0 -50.2	127.6	29 55.2 -50.7	128.1	29 18.0 -51.3	128.6	28 40.4 -51.7	129.0	28 02.5 -52.2	129.4	27 24.2 -52.6	129.8	26 45.6 -53.0	130.2	25 31.6 -52.7	130.3	25 52.6 -53.1	130.7	24 38.9 -52.8	130.9	24 59.5 -53.2	131.2	0
1	30 18.8 -49.9	127.8	29 41.8 -50.4	128.3	29 04.5 -50.9	128.7	28 26.7 -51.3	129.1	27 48.7 -51.8	129.6	27 10.3 -52.3	130.0	26 31.6 -52.7	130.3	25 52.6 -53.1	130.7	24 46.1 -52.9	131.4	24 06.3 -53.3	131.7	23 53.2 -53.0	131.9	23 13.0 -53.5	132.2	4
2	29 28.9 -50.0	128.5	28 51.4 -50.5	128.9	28 13.6 -51.1	129.3	27 35.4 -51.5	129.7	26 56.9 -52.0	130.1	26 18.0 -52.3	130.5	25 25.7 -52.6	131.1	24 46.1 -52.9	131.4	24 06.3 -53.3	131.7	23 53.2 -53.0	131.9	23 13.0 -53.5	132.2	3		
3	28 38.9 -50.2	129.1	28 00.9 -50.7	129.5	27 22.5 -51.1	129.9	26 43.9 -51.7	130.3	26 04.9 -52.1	130.7	25 25.7 -52.6	131.1	25 12.8 -52.2	131.2	24 33.1 -52.6	131.6	23 21.7 -53.4	134.4	18 45.0 -53.8	134.7	9				
4	27 48.7 -50.4	129.7	27 10.2 -50.9	130.1	26 31.4 -51.4	130.5	27 50.2 -51.7	130.9	26 20.6 -52.3	131.3	23 09.0 -53.1	134.1	22 40.2 -53.2	132.4	22 19.5 -53.5	132.7	21 27.1 -53.3	133.4	20 32.5 -53.7	133.7	7				
5	26 58.3 -50.5	130.3	26 19.3 -51.0	130.7	25 40.0 -51.4	131.1	25 00.5 -51.9	131.4	24 20.6 -52.3	131.8	23 40.5 -52.7	132.1	22 47.8 -52.9	132.6	21 27.0 -53.2	132.9	21 26.0 -53.5	133.2	20 20.5 -53.4	133.9	19 38.8 -53.8	134.2	8		
6	26 07.8 -50.7	130.9	25 28.3 -51.1	131.3	24 48.6 -51.6	131.6	24 08.6 -52.1	132.0	23 28.3 -52.4	132.3	22 35.9 -52.6	132.8	21 54.9 -52.9	133.1	20 13.8 -53.3	134.4	19 37.7 -53.6	134.9	18 45.0 -53.8	134.7	9				
7	25 17.1 -50.8	131.5	24 37.2 -51.3	131.9	23 57.0 -51.7	132.2	23 16.5 -52.1	132.5	22 35.9 -52.6	132.8	21 54.9 -52.9	133.1	20 13.8 -53.3	134.4	19 37.7 -53.6	134.9	18 45.0 -53.8	134.7	9						
8	24 26.3 -51.0	132.1	23 45.9 -51.4	132.4	23 05.3 -51.8	132.8	22 24.4 -52.2	133.1	21 43.3 -52.6	133.4	21 02.0 -53.0	133.6	20 50.7 -52.7	133.9	20 09.0 -53.1	134.1	19 27.1 -53.4	134.4	18 45.0 -53.8	134.7	9				
9	23 35.3 -51.1	132.7	22 54.5 -51.5	133.0	22 13.5 -52.0	133.3	21 32.2 -52.3	133.6	20 50.7 -52.7	133.9	20 09.0 -53.1	134.1	19 27.1 -53.4	134.4	18 45.0 -53.8	134.7	9								
10	22 44.2 -51.2	133.3	22 03.0 -51.6	133.6	21 21.5 -52.0	133.8	20 39.9 -52.5	134.1	19 58.0 -52.8	134.4	19 15.9 -53.2	134.6	18 33.7 -53.6	134.9	17 51.2 -53.9	135.1	16 40.1 -53.6	135.4	15 52.9 -53.8	136.3	15 09.4 -54.0	136.5	13		
11	21 53.0 -51.3	133.8	21 11.4 -51.8	134.1	20 29.5 -52.1	134.4	19 47.4 -52.5	134.6	19 05.2 -52.9	134.9	18 22.7 -53.2	135.1	17 40.1 -53.6	135.4	16 57.3 -53.9	135.6	15 52.9 -53.8	136.3	15 09.4 -54.0	136.5	13				
12	21 01.7 -51.4	134.4	20 19.6 -51.8	134.7	19 37.4 -52.3	134.9	18 12.3 -52.6	135.2	17 25.0 -53.3	135.4	17 29.5 -53.3	135.6	16 46.5 -53.6	135.8	16 03.4 -54.0	136.0	15 52.9 -53.8	136.3	15 09.4 -54.0	136.5	13				
13	20 10.3 -51.6	134.9	19 27.8 -51.9	135.2	18 45.1 -52.3	135.4	18 02.3 -52.7	135.7	17 19.3 -53.0	135.9	16 36.2 -53.4	136.1	15 52.9 -53.8	136.3	15 09.4 -54.0	136.5	14 59.1 -53.7	136.8	14 15.4 -54.1	136.9	14				
14	19 18.7 -51.6	135.5	18 35.9 -52.0	135.7	17 52.8 -52.3	135.9	17 09.6 -52.7	136.2	16 26.3 -53.1	136.4	15 42.8 -53.5	136.6	14 55.1 -53.7	136.8	14 15.4 -54.1	136.9	14 59.1 -53.7	136.8	14 15.4 -54.1	136.9	14				
15	18 27.1 -51.7	136.0	17 43.9 -52.1	136.2	17 00.5 -52.5	136.5	16 16.9 -52.8	136.7	15 33.2 -53.2	136.9	14 49.3 -53.5	137.0	14 05.4 -53.9	137.2	13 21.3 -54.2	137.4	13 11.5 -53.9	137.7	12 27.1 -54.2	137.8	16				
16	17 35.4 -51.8	136.5	16 51.8 -52.2	136.8	16 08.0 -52.5	137.0	15 24.1 -52.9	137.2	14 40.0 -53.2	137.3	13 55.8 -53.5	137.5	12 17.6 -53.9	138.1	11 32.9 -54.2	138.3	11 23.7 -53.9	138.6	10 38.7 -54.3	138.7	18				
17	16 43.6 -51.9	137.1	15 59.6 -52.2	137.3	15 15.5 -52.6	137.6	14 31.2 -53.0	137.8	13 46.8 -53.3	137.8	13 02.3 -53.6	138.0	12 11.3 -53.7	138.4	10 29.8 -54.0	139.0	9 44.4 -54.3	139.1	9						
18	15 51.7 -51.9	137.6	15 07.4 -52.3	137.8	14 22.9 -52.7	138.0	13 38.2 -53.0	138.1	12 45.2 -53.0	138.6	12 00.2 -53.4	138.8	11 15.0 -53.7	138.9	10 29.8 -54.0	139.0	9 44.4 -54.3	139.1	9						
19	14 59.8 -52.0	138.1	14 15.1 -52.4	138.3	13 30.2 -52.7	138.5	12 45.2 -53.0	138.6	11 20.0 -53.4	138.8	10 11.3 -53.7	139.3	9 21.1 -53.7	139.9	8 35.8 -54.1	139.5	8 50.1 -54.3	139.6	8 04.0 -54.4	139.7	20				
20	14 07.8 -52.1	138.6	13 22.7 -52.5	138.8	12 37.5 -52.8	138.9	11 52.2 -53.1	139.1	10 21.3 -53.7	139.3	9 10.8 -54.0	139.5	8 41.7 -54.0	139.9	7 55.8 -54.4	140.0	7 04.0 -54.4	140.2	6 07.1 -54.4	140.8	22				
21	13 15.7 -52.2	139.1	12 30.2 -52.4	139.3	11 44.7 -52.8	139.4	10 59.1 -53.2	139.6	9 27.6 -53.6	139.8	8 13.4 -53.5	139.7	7 41.7 -54.0	140.3	7 01.4 -54.3	140.4	6 53.6 -54.1	140.8	6 07.1 -54.4	140.8	23				
22	12 23.5 -52.2	139.7	11 37.8 -52.6	139.8	10 51.9 -52.9	139.9	10 05.9 -53.1	140.0	9 19.9 -53.5	140.1	8 33.8 -53.8	140.2	7 47.7 -54.1	140.3	7 01.4 -54.3	140.4	6 53.6 -54.1	140.8	6 07.1 -54.4	140.8	23				
23	11 31.3 -52.2	140.2	10 45.2 -52.6	140.3	9 59.0 -52.9	140.4	9 18.6 -53.1	140.9	8 26.4 -53.5	140.6	7 40.0 -53.8	140.7	6 59.5 -54.2	141.2	5 12.7 -54.4	141.3	5 22.6 -54.2	141.4	5 04.5 -54.5	141.4	24				
24	10 39.1 -52.3	140.7	9 52.6 -52.6	140.8	9 06.1 -52.9	140.9	8 19.5 -53.2	141.0	7 32.9 -53.6	141.1	6 46.2 -53.8	141.1	5 12.7 -54.4	141.3	5 22.6 -54.2	141.4	5 04.5 -54.5	141.4	5 04.5 -54.5	141.4	24				
25	9 46.8 -52.4	141.2	9 00.0 -52.7	141.3	8 13.2 -53.0	141.4	7 26.3 -53.3	141.4	6 39.3 -53.5	141.5	5 52.4 -53.9	141.6	5 05.3 -54.1	141.6	4 18.3 -54.5	141.7	4 55.1 -54.5	141.7	4 55.1 -54.5	141.7	25				
26	8 54.4 -52.4	141.7	8 07.3 -52.7	141.7	7 20.2 -53.0	141.8	6 33.0 -53.3	141.9	5 45.8 -53.6	142.0	4 58.5 -53.9	142.0	4 11.2 -54.2	142.1	3 23.8 -54.4	142.1	3 17.0 -54.2	142.5	2 29.4 -54.5	142.5	27				
27	8 02.0 -52.4	142.1	7 14.6 -52.7	142.2	6 27.2 -53.0	142.3	5 39.7 -53.3	142.4	4 52.2 -53.7	142.4	4 04.6 -53.9	142.5	2 22.8 -54.2	142.9	1 34.9 -54.4	143.0	1 04.5 -54.5	143.4	0 40.5 -54.5	143.4	29				
28	7 09.6 -52.4	142.6	6 21.9 -52.7	142.7	5 34.2 -53.1	142.8	4 46.4 -53.4	142.8	3 58.5 -53.6	142.9	3 10.7 -53.9	142.9	2 22.8 -54.2	142.9	1 34.9 -54.4	143.0	1 04.5 -54.5	143.4	0 40.5 -54.5	143.4	29				
29	6 17.2 -52.5	143.1	5 29.2 -52.8	143.2	4 09.9 -53.2	143.1	5 00.7 -53.3	143.2	5 15.5 -53.6	143.2	6 42.3 -53.8	143.2	7 33.0 -54.1	143.4	8 23.7 -54.3	143.4	8 23.7 -54.3	143.4	8 23.7 -54.3	143.4	39				
30	5 43.1 +52.6	143.5	4 10.6 +52.3	143.6	3 13.4 +52.8	143.6	2 20.6 +53.4	143.6	1 30.3 +53.5	143.6	1 27.3 +53.3	143.6	2 17.0 +53.7	143.6	3 06.8 +53.9	143.6	3 02.9 +54.2	143.6	3 02.9 +54.2	143.6	32				
31	4 33.4 +52.6	143.6	3 13.4 +52.8	143.6	2 20.6 +53.4	143.6	1 30.3 +53.5	143.6	1 27.3 +53.3	143.6	1 20.6 +53.7	143.6	1 13.9 +54.2	143.6	2 02.9 +54.4	143.6	2 02.9 +54.4	143.6	2 02.9 +54.4	143.6	32				
32	3 37.5 +52.6	143.6	2 26.2 +52.9	143.6	1 30.3 +53.0	143.6	1 27.3 +53.1	143.6	1 20.6 +53.7	143.6	1 13.9 +54.2	143.6	1 13.9 +54.2	143.6	0 24.0 +54.3	143.6	0 19.7 +54.2	143.6	0 19.7 +54.2	143.6	30				
33	2 30.8 +52.6	143.6	1 33.4 +52.8	143.6	1 20.8 +52.9	143.6	1 20.8 +52.9	143.6	1 13.4 +53.1	143.6	1 13.4 +53.1	143.6	8 27.1 +54.0	143.6	9 18.0 +54.3	143.6	9 18.0 +54.3	143.6	9 18.0 +54.3	143.6	40				
34	1 30.8 +52.6	143.6	1																						

44°, 316° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	30 34.4 +49.2 126.2	29 58.8 +49.7 126.7	29 22.8 +50.2 127.1	28 46.3 +50.8 127.6	28 09.6 +51.3 128.0	27 32.5 +51.7 128.4	26 55.0 +52.2 128.8	26 17.2 +52.7 129.2	0	31 23.6 +49.0 125.5	30 48.5 +49.6 126.0	29 13.0 +50.1 126.5	29 37.1 +50.7 127.0	29 00.9 +51.1 127.4	28 24.2 +51.6 127.9	27 47.2 +52.1 128.3	27 09.9 +52.6 128.7	1	32 12.6 +48.7 124.9	31 38.1 +49.3 125.4	31 03.1 +49.9 125.9	30 27.8 +50.4 126.3	29 52.0 +51.0 126.8	29 15.8 +51.5 127.3	28 39.3 +52.0 127.7	28 02.5 +52.4 128.1	2	33 01.3 +48.5 124.2	32 27.4 +49.1 124.7	31 53.0 +49.7 125.2	31 18.2 +50.2 125.7	30 43.0 +50.7 126.2	30 07.3 +51.3 126.7	29 31.3 +51.8 127.1	28 54.9 +52.3 127.6	3	34 49.8 +48.3 123.5	33 16.5 +48.9 124.0	32 42.7 +49.5 124.6	32 08.4 +50.1 125.1	31 33.7 +50.6 125.6	30 58.6 +51.1 126.1	30 23.1 +51.6 126.6	29 47.2 +52.1 127.0	4										
5	34 38.1 +48.0 122.7	34 05.4 +48.6 123.3	33 32.2 +49.2 123.9	32 58.5 +49.8 124.4	32 24.3 +50.5 124.9	31 49.7 +51.0 125.5	31 14.7 +51.5 126.0	30 39.3 +52.0 126.4	5	35 26.1 +47.7 122.0	34 54.0 +48.4 122.6	34 21.4 +49.0 123.2	33 48.3 +49.7 123.8	33 14.8 +50.2 124.3	32 40.7 +50.8 124.8	32 06.2 +51.3 125.4	31 31.3 +51.8 125.9	6	36 13.8 +47.5 121.3	35 42.4 +48.1 121.9	35 10.4 +48.8 122.5	34 38.0 +49.3 123.1	34 05.0 +49.9 123.6	33 31.5 +50.5 124.2	32 57.5 +51.1 124.7	32 23.1 +51.6 125.3	7	37 01.3 +47.1 120.5	36 30.5 +47.9 121.1	35 59.2 +48.5 121.8	35 27.3 +49.2 122.4	34 54.9 +49.8 123.0	34 22.0 +50.4 123.6	33 48.6 +51.0 124.1	33 14.7 +51.5 124.7	8	37 48.4 +46.9 119.7	37 18.4 +47.5 120.4	36 47.7 +48.3 121.0	36 16.5 +48.9 121.7	35 44.7 +49.5 122.3	35 12.4 +50.1 122.9	34 39.6 +50.7 123.5	34 06.2 +51.3 124.0	9										
10	38 35.3 +46.5 118.9	38 05.9 +47.3 119.6	37 36.0 +47.9 120.3	37 05.4 +48.6 121.0	36 34.2 +49.3 121.6	36 02.5 +49.9 122.2	35 30.3 +50.5 122.8	34 57.5 +51.1 123.4	10	39 21.8 +46.1 118.1	38 53.2 +46.9 118.8	38 23.9 +47.6 119.5	37 54.0 +48.4 120.2	37 23.5 +49.0 120.9	36 52.4 +49.7 121.5	36 20.8 +50.3 122.2	35 48.6 +50.8 122.8	11	40 07.9 +45.8 117.3	39 40.1 +46.5 118.0	39 11.5 +46.9 118.8	38 42.4 +47.0 119.5	38 12.5 +48.0 120.1	37 42.1 +48.4 120.8	37 11.1 +50.0 121.5	36 39.4 +50.7 122.1	12	40 53.7 +45.4 116.4	40 26.6 +46.3 117.2	39 58.9 +46.9 118.0	39 30.4 +47.7 118.7	39 01.3 +48.4 119.4	38 31.5 +49.1 120.1	38 01.1 +49.8 120.8	37 30.1 +50.4 121.4	13	41 39.1 +45.0 115.6	41 12.9 +45.8 116.4	40 45.8 +46.7 117.1	40 18.1 +47.4 117.9	39 49.7 +48.1 118.6	39 20.6 +48.9 119.4	38 50.9 +49.5 120.1	38 20.5 +50.2 120.8	14										
15	42 24.1 +44.6 114.7	41 58.7 +45.4 115.5	41 32.5 +46.2 116.3	41 05.5 +47.1 117.1	40 37.8 +47.9 117.9	40 09.5 +48.5 118.6	39 40.4 +49.2 119.3	39 10.7 +49.9 120.1	15	43 08.7 +44.2 113.8	42 44.1 +45.1 114.6	42 18.7 +45.9 115.4	42 54.6 +46.7 116.3	41 25.7 +47.4 117.1	40 58.0 +48.2 117.8	40 29.6 +49.0 118.6	40 00.6 +49.6 119.3	16	43 52.9 +43.6 112.8	43 29.2 +44.5 113.7	43 04.6 +45.5 114.6	42 39.3 +46.3 115.4	42 13.1 +47.4 116.2	41 46.2 +47.9 117.0	41 18.6 +48.6 117.8	40 50.2 +49.4 118.6	17	44 36.5 +43.2 111.9	44 13.7 +44.2 112.8	43 50.1 +45.0 113.7	43 25.6 +45.9 114.5	43 00.2 +46.8 115.4	42 34.1 +47.6 116.2	42 07.2 +48.3 117.0	41 39.6 +49.0 117.8	18	45 19.7 +42.7 110.9	44 57.9 +43.6 111.8	44 35.1 +44.6 112.7	44 11.5 +45.4 113.6	43 47.0 +46.3 114.5	43 21.7 +47.1 115.4	42 55.5 +48.0 116.2	42 28.6 +48.7 117.1	19										
20	46 02.4 +42.1 109.9	45 41.5 +43.1 110.9	45 19.7 +44.1 111.8	44 56.9 +45.0 112.7	44 33.3 +45.9 113.6	44 08.8 +46.8 114.5	43 43.5 +47.6 115.4	43 17.3 +48.4 116.3	20	46 44.5 +41.5 108.9	46 24.6 +42.6 109.9	46 03.8 +43.5 110.8	45 41.9 +44.6 111.8	45 19.2 +45.5 112.7	44 55.6 +46.3 113.7	44 31.1 +47.2 114.6	44 05.7 +48.0 115.4	21	47 26.0 +41.0 107.8	47 07.2 +42.0 108.8	46 47.3 +43.1 109.8	46 26.5 +44.0 110.8	46 04.7 +45.0 111.8	45 41.9 +45.9 112.8	45 18.3 +46.8 113.7	44 53.7 +47.7 114.6	22	48 07.0 +40.3 106.7	47 49.2 +41.4 107.8	47 30.4 +42.5 108.8	47 10.5 +43.5 109.8	46 49.7 +44.5 110.8	46 27.8 +45.5 111.8	46 05.1 +46.3 112.8	45 41.4 +47.2 113.7	23	48 47.3 +39.7 105.6	48 30.6 +40.8 106.7	48 12.9 +41.9 107.8	47 45.0 +43.0 108.8	47 34.2 +44.0 109.9	47 13.3 +45.4 110.9	46 51.4 +45.9 111.9	46 28.6 +46.8 112.9	24										
25	49 27.0 +38.9 104.4	49 11.4 +40.1 105.6	48 54.8 +41.2 106.7	48 37.0 +42.4 107.8	48 18.2 +43.4 108.8	47 58.3 +44.4 109.9	47 37.3 +45.5 110.9	47 15.4 +46.4 111.9	25	50 05.9 +38.2 103.3	49 51.5 +39.5 104.4	49 36.0 +40.5 105.6	49 19.4 +41.7 106.7	49 01.6 +42.8 107.8	48 42.7 +43.9 108.9	48 22.8 +44.9 109.9	48 01.8 +45.9 110.0	26	50 44.1 +37.5 102.1	50 31.0 +38.7 103.2	50 16.6 +39.9 104.4	50 01.1 +41.1 105.6	49 44.4 +42.2 106.7	49 26.6 +43.3 107.8	49 07.7 +44.3 108.9	48 47.7 +45.3 110.0	27	51 21.6 +36.6 100.8	51 09.7 +37.9 102.0	50 56.5 +39.2 103.2	50 42.2 +40.4 104.5	50 26.6 +41.6 105.6	50 09.4 +42.7 106.8	49 52.0 +43.8 107.9	49 33.0 +44.9 109.0	28	51 58.2 +35.8 99.5	51 47.6 +37.1 100.8	51 35.7 +38.5 102.0	51 22.6 +39.7 103.3	51 08.2 +40.9 104.5	50 52.6 +42.1 105.7	50 35.8 +43.2 106.8	50 17.9 +44.3 108.0	29										
30	52 34.0 +34.9 98.2	52 24.7 +36.3 99.5	52 14.2 +37.6 100.8	52 02.3 +38.9 102.0	51 49.1 +40.2 103.3	51 34.7 +41.4 104.5	51 19.0 +42.6 105.7	51 02.2 +43.6 106.9	30	53 08.9 +33.9 96.9	53 01.0 +35.4 97.2	52 51.8 +36.7 99.5	52 41.2 +38.1 100.8	52 29.3 +39.4 101.2	52 16.1 +40.6 103.3	52 01.6 +41.9 104.6	51 45.8 +43.1 105.8	31	53 42.8 +33.0 95.5	53 36.4 +34.4 96.8	53 28.5 +35.9 98.2	53 19.3 +37.2 99.5	53 08.7 +38.6 100.8	52 56.7 +39.9 102.1	52 43.5 +41.1 103.4	52 28.9 +42.4 104.7	32	54 54.8 +31.9 94.1	54 10.8 +33.5 95.5	54 04.4 +34.9 96.8	53 56.5 +36.4 98.2	53 47.3 +37.7 99.5	53 36.6 +39.1 100.9	53 24.6 +40.4 102.2	53 11.3 +41.6 103.5	33	54 47.7 +30.9 92.6	54 44.3 +32.4 94.0	54 39.3 +33.9 95.4	54 32.5 +35.4 96.8	54 25.0 +36.9 98.2	54 15.7 +38.3 99.6	54 05.0 +39.6 101.0	53 52.9 +40.9 102.3	34										
35	55 18.6 +29.7 91.1	55 16.7 +31.3 92.6	55 13.2 +32.9 94.0	55 08.3 +34.4 95.4	55 01.9 +35.9 96.9	54 54.0 +37.3 98.3	54 44.6 +38.8 99.7	54 33.8 +40.1 101.1	35	55 48.3 +28.6 89.6	55 48.0 +30.2 91.1	55 46.1 +31.8 92.5	55 42.7 +33.4 94.0	55 37.8 +34.9 95.4	55 31.3 +36.4 96.9	55 23.4 +37.8 98.3	55 13.9 +39.3 99.8	36	56 16.9 +27.3 88.0	56 18.2 +29.0 89.5	56 17.9 +30.7 91.0	56 16.1 +31.3 92.5	56 12.7 +33.8 94.0	56 07.7 +35.4 95.5	56 01.2 +36.9 97.0	55 53.2 +38.3 98.4	37	56 44.2 +26.1 86.4	56 47.2 +27.8 87.9	56 48.6 +29.4 89.4	56 48.4 +31.1 90.6	56 45.3 +32.8 92.5	56 43.4 +34.1 94.0	56 38.1 +35.9 95.5	56 31.5 +37.5 97.0	38	57 10.3 +24.7 84.7	57 15.0 +26.4 86.3	57 18.0 +28.2 87.8	57 19.5 +29.9 89.4	57 13.3 +31.6 91.0	57 17.5 +33.2 92.5	57 14.0 +34.8 94.1	57 09.0 +36.3 95.6	39										
40	57 35.0 +23.3 83.0	57 41.4 +25.1 84.6	57 46.2 +26.9 86.2	57 49.4 +28.6 87.8	57 50.9 +30.3 89.4	57 50.7 +32.0 91.0	57 48.8 +33.8 92.6	57 45.3 +35.4 94.1	40	57 58.3 +21.9 81.3	58 06.5 +23.8 82.9	58 13.1 +25.5 84.5	58 18.0 +27.3 86.1	58 21.2 +29.1 87.7	58 22.7 +30.9 89.4	58 22.6 +32.5 91.0	58 20.7 +34.2 92.6	41	58 20.2 +20.4 79.6	58 30.3 +22.2 81.2	58 38.6 +24.1 82.8	58 45.3 +25.9 84.4	58 50.3 +27.7 86.1	58 53.6 +29.5 87.7	58 55.1 +31.3 89.4	58 54.9 +33.0 91.0	42	58 40.6 +18.9 77.8	58 52.5 +20.8 79.4	59 02.7 +22.6 81.0	59 11.2 +24.5 82.7	59 18.0 +26.4 84.3	59 23.1 +28.1 86.0	59 26.4 +29.9 87.7	59 27.9 +31.7 89.4	43	58 59.5 +17.3 75.9	59 13.3 +19.1 77.5	59 25.3 +21.1 79.2	59 35.7 +22.2 80.9	59 44.4 +24.8 82.6	59 51.2 +26.8 84.3	59 56.3 +28.6 86.0	59 59.6 +30.5 87.7	44										
45	59 16.8 +15.6 74.1	59 32.4 +17.6 75.7	59 46.4 +19.5 77.4	59 58.7 +21.4 79.0	60 09.2 +23.4 80.7	60 18.0 +25.2 82.5	60 24.9 +27.2 84.2	60 30.1 +29.0 86.0	45	59 32.4 +14.0 72.2	60 43.2 +17.0 73.8	60 05.9 +17.8 75.5	60 20.1 +19.8 77.2	60 32.6 +21.7 78.9	60 43.2 +23.7 80.6	60 52.1 +25.6 82.4	60 59.1 +27.5 84.2	46	59 46.4 +12.3 70.2	60 05.9 +14.2 71.9	60 23.7 +16.2 73.5	60 39.9 +18.1 75.2	60 54.3 +20.1 +7.0	60 21.0 +20.1 +7.0	60 54.9 +22.7 +8.0	60 20.7 +24.1 80.5	47	59 58.7 +10.5 68.3	60 20.1 +12.5 69.9	60 39.9 +14.4 71.6	60 58.0 +16.4 73.3	61 14.4 +18.4 75.0	61 29.0 +20.4 76.8	61 41.8 +22.4 78.6	61 52.7 +24.4 80.4	48	60 18.0 +6.9 64.3	60 43.2 +8.9 65.9	61 06.9 +10.8 67.6	61 29.0 +12.8 69.3	61 49.4 +14.8 71.0	62 08.0 +16.8 72.8	62 24.8 +18.9 74.6	62 39.8 +21.0 76.5	49	60 24.9 +5.2 62.3	60 52.1 +7.0 63.9	61 17.7 +8.9 65.5	61 41.8 +10.9 67.2	62 04.2 +12.9 69.0	62 24.8 +15.0 70.7	62 43.7 +17.1 72.6	63 00.8 +19.1 74.4	50	60 30

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $44^\circ$ ,  $316^\circ$

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	30 34.4 -49.3	126.2		29 58.8 -49.9	126.7		29 22.8 -50.5	127.1		28 46.3 -50.9	127.6		28 09.6 -51.5	128.0		27 32.5 -51.9	128.4		26 55.0 -52.4	128.8		26 17.2 -52.8	129.2		0
1	29 45.1 -49.6	126.9		29 08.9 -50.1	127.3		28 32.3 -50.6	127.8		27 55.4 -51.1	128.2		27 18.1 -51.5	128.6		26 40.6 -52.1	129.0		26 02.6 -52.4	129.4		25 24.4 -52.9	129.7		1
2	28 55.5 -49.8	127.5		28 18.8 -50.3	127.9		27 41.7 -50.8	128.4		27 04.3 -51.3	128.8		26 26.6 -51.7	129.2		25 48.5 -52.1	129.5		25 10.2 -52.6	129.9		24 31.5 -53.0	130.3		3
3	28 05.7 -49.9	128.2		27 28.5 -50.4	128.6		26 50.9 -50.9	129.0		26 13.0 -51.3	129.4		25 34.9 -51.9	129.7		24 56.4 -52.3	130.1		24 17.6 -52.7	130.4		23 38.5 -53.1	130.8		4
4	27 15.8 -50.1	128.8		26 38.1 -50.6	129.6		26 00.4 -51.6	129.9		24 21.7 -51.6	129.9		24 43.0 -52.0	130.3		24 04.1 -52.4	130.6		23 24.9 -52.8	131.0		22 45.4 -53.2	131.3		5
5	26 25.7 -50.2	129.4		25 47.5 -50.7	129.8		25 09.0 -51.2	130.1		24 30.1 -51.6	130.5		23 51.0 -52.0	130.8		23 11.7 -52.5	131.2		22 32.1 -52.9	131.5		21 52.2 -53.3	131.8		5
6	25 35.5 -50.4	130.0		24 56.8 -50.9	130.4		24 17.8 -51.3	130.7		23 38.5 -51.8	131.0		22 59.0 -52.2	131.4		22 19.2 -52.6	131.7		21 39.2 -53.0	132.0		20 58.9 -53.4	132.3		6
7	24 45.1 -50.5	130.6		24 05.9 -51.0	130.9		23 26.5 -51.5	131.3		22 46.7 -51.8	131.6		22 06.8 -52.3	131.9		21 26.6 -52.7	132.2		20 46.2 -53.1	132.5		20 05.5 -53.4	132.8		7
8	23 54.6 -50.7	131.2		23 14.9 -51.1	131.5		22 35.4 -51.5	131.8		21 54.9 -52.0	132.1		21 14.5 -52.4	132.4		20 33.9 -52.8	132.7		19 53.1 -53.2	133.0		19 12.1 -53.5	133.2		8
9	23 03.9 -50.8	131.8		22 23.8 -51.2	132.1		21 43.5 -51.7	132.4		21 02.9 -52.1	132.7		20 22.1 -52.5	133.0		19 41.1 -52.8	133.2		18 59.9 -53.2	133.5		18 18.6 -53.6	133.7		9
10	22 13.1 -50.9	132.4		21 32.6 -51.4	132.7		20 51.8 -51.8	132.9		20 10.8 -52.2	133.2		19 29.6 -52.5	133.5		18 48.3 -53.0	133.7		18 06.7 -53.3	134.0		17 25.0 -53.7	134.2		10
11	21 22.2 -51.1	132.9		20 41.2 -51.5	133.2		20 00.0 -51.8	133.5		19 18.6 -52.2	133.7		18 37.1 -52.7	134.0		17 55.3 -53.0	134.2		17 13.4 -53.4	134.4		16 31.3 -53.7	134.7		11
12	20 31.1 -51.1	133.5		19 49.7 -51.5	133.8		19 08.2 -52.0	134.0		18 26.4 -52.4	134.3		17 44.4 -52.7	134.5		17 02.3 -53.1	134.7		16 20.0 -53.4	134.9		15 37.6 -53.8	135.1		12
13	19 40.0 -51.2	134.0		18 58.2 -51.7	134.3		17 16.2 -52.0	134.5		17 34.0 -52.4	134.8		16 51.7 -52.8	135.0		16 09.2 -53.2	135.2		15 26.6 -53.5	135.4		14 43.8 -53.9	135.6		13
14	18 48.8 -51.4	134.6		18 06.5 -51.7	134.8		17 24.2 -52.2	135.1		16 41.6 -52.5	135.3		15 58.9 -52.9	135.5		15 16.0 -53.2	135.7		14 33.1 -53.6	135.9		13 49.9 -53.9	136.0		14
15	17 57.4 -51.4	135.1		17 14.8 -51.8	135.4		16 32.0 -52.2	135.6		15 49.1 -52.6	135.8		15 06.0 -52.9	136.0		14 22.8 -53.2	136.2		13 39.5 -53.6	136.3		12 56.0 -53.9	136.5		15
16	17 06.0 -51.5	135.7		16 23.0 -51.9	135.9		15 39.8 -52.6	136.1		14 56.5 -52.6	136.3		14 13.1 -53.0	136.5		13 29.6 -53.4	136.6		12 45.9 -53.7	136.8		12 02.1 -54.0	136.9		16
17	16 44.5 -51.6	136.2		15 31.1 -52.0	136.4		14 47.6 -52.4	136.6		13 03.9 -52.7	136.8		13 20.1 -53.0	136.9		12 36.2 -53.2	137.1		11 52.2 -53.7	137.2		11 08.1 -54.0	137.4		17
18	15 22.9 -51.7	136.7		14 39.1 -52.0	136.9		13 55.2 -52.4	137.1		13 11.2 -52.7	137.3		12 27.1 -53.1	137.4		11 42.9 -53.5	137.6		10 58.5 -53.7	137.7		10 14.1 -54.1	137.8		18
19	14 31.2 -51.7	137.3		13 47.1 -52.1	137.4		13 02.8 -52.4	137.6		12 18.5 -52.8	137.8		11 34.0 -53.1	137.9		10 49.4 -53.4	138.0		9 04.8 -53.8	138.2		9 20.0 -54.0	138.3		19
20	13 39.5 -51.8	137.8		12 55.0 -52.2	138.0		12 10.4 -52.5	138.1		12 25.7 -52.9	138.2		10 40.9 -53.2	138.4		9 56.0 -53.5	138.5		9 11.0 -53.8	138.6		8 26.0 -54.2	138.7		20
21	12 47.7 -51.9	138.3		12 02.8 -52.2	138.5		11 17.9 -52.6	138.6		10 32.8 -52.9	138.7		9 47.7 -53.2	138.8		9 02.5 -53.6	139.0		8 17.2 -54.0	139.1		7 31.8 -54.1	139.2		21
22	11 55.8 -51.9	138.8		11 10.6 -52.2	139.0		10 25.3 -52.6	139.1		9 39.9 -52.9	139.2		8 54.5 -53.3	139.3		8 08.9 -53.5	139.4		7 23.3 -53.8	139.5		6 37.7 -54.2	139.6		22
23	11 03.9 -52.0	139.3		10 18.4 -52.4	139.5		9 32.7 -52.6	139.6		8 47.0 -53.0	139.7		8 01.2 -53.3	139.8		7 15.4 -53.6	139.9		6 29.5 -53.9	140.0		5 43.5 -54.2	140.0		23
24	10 11.9 -52.0	139.9		9 26.0 -52.3	140.0		8 40.1 -52.7	140.1		7 54.0 -53.0	140.2		7 07.9 -53.3	140.2		6 21.8 -53.6	140.3		5 35.6 -53.9	140.4		4 49.3 -54.2	140.4		24
25	9 19.9 -52.0	140.4		8 33.7 -52.4	140.5		7 47.4 -52.7	140.5		7 01.0 -53.0	140.6		6 14.6 -53.3	140.7		5 28.2 -53.7	140.8		4 41.7 -53.9	140.8		3 55.1 -54.2	140.9		25
26	8 27.9 -52.1	140.9		7 41.3 -52.4	140.9		6 54.7 -52.8	141.0		6 08.0 -53.0	141.1		5 21.3 -53.4	141.2		4 34.5 -53.6	141.2		3 47.8 -54.0	141.3		3 00.9 -54.2	141.3		26
27	7 35.8 -52.1	141.4		6 48.9 -52.5	141.4		6 01.9 -52.7	141.5		5 15.0 -53.1	141.6		4 27.9 -53.3	141.6		3 40.9 -53.7	141.7		2 53.8 -54.1	141.7		2 06.7 -54.2	141.7		27
28	6 43.6 -52.1	141.9		5 56.4 -52.4	141.9		5 09.2 -52.8	142.0		4 21.9 -53.1	142.0		3 34.6 -53.4	142.1		2 47.2 -53.7	142.1		1 59.9 -54.0	142.1		1 12.5 -54.3	142.2		28
29	5 51.5 -52.2	142.4		4 04.0 -52.5	142.4		4 16.4 -52.8	142.5		3 28.8 -53.1	142.5		2 41.2 -53.4	142.5		1 53.5 -53.6	142.6		1 05.9 -54.0	142.6		0 18.2 -54.2	142.6		29
30	4 59.3 -52.2	142.9		4 11.5 -52.6	142.9		3 23.6 -52.8	142.9		2 35.7 -53.1	143.0		1 47.8 -53.4	143.0		0 59.9 -53.7	143.0		0 11.9 -53.9	143.0		0 36.0 +54.2	37.0		30
31	4 07.1 -52.2	143.3		3 18.9 -52.5	143.4		2 30.8 -52.9	143.4		1 42.6 -53.1	143.4		0 54.4 -53.4	143.5		0 06.2 -53.7	143.5		0 42.0 +54.0	36.5		1 30.2 +54.3	36.6		31
32	3 14.9 -52.3	143.8		2 26.4 -52.5	143.9		1 37.9 -52.8	143.9		0 49.5 -53.2	143.9		0 01.0 -53.4	143.9		0 47.5 +53.7	36.1		1 36.0 +53.9	36.1		2 24.5 +54.2	36.1		32
33	2 22.6 -52.2	144.3		1 33.9 -52.4	144.4		0 45.1 -52.8	144.4		0 03.7 +53.1	35.6		0 52.4 +53.4	35.6		1 41.2 +53.7	35.7		2 29.9 +54.0	35.7		3 18.7 +54.2	35.7		33
34	1 30.4 -52.3	144.8		0 41.3 -52.5	144.8		0 07.7 +52.9	35.2		0 56.8 +53.1	35.2		1 45.8 +53.4	35.2		2 34.9 +53.6	35.2		3 23.9 +53.9	35.2		4 12.9 +54.2	35.3		34
35	0 38.1 -52.3	145.3		0 11.2 +52.6	34.7		1 00.6 +52.8	34.7		1 49.9 +53.1	34.7		2 39.2 +53.4	34.7		3 28.5 +53.7	34.8		4 17.8 +53.9	34.8		5 07.1 +54.2	34.8		35
36	0 14.2 +52.2	34.2		1 03.8 +52.8	34.2		1 53.4 +52.8	34.2		2 43.0 +53.1	34.2		3 32.6 +53.4	34.3		4 22.2 +53.6	34.3		5 11.7 +53.9	34.4		6 01.3 +54.1	34.4		36
37	1 06.4 +52.3	33.7		1 56.3 +52.8																					

45°, 315° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

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

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			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	30 00.0 +48.9 125.3	29 25.2 +49.4 125.7	28 49.9 +50.0 126.2	28 14.3 +50.6 126.6	27 38.4 +51.0 127.0	27 02.0 +51.6 127.5	26 25.4 +52.0 127.9	25 48.4 +52.5 128.2	0	30 48.9 +48.7 124.6	30 14.6 +49.3 125.1	29 39.9 +49.9 125.5	29 04.9 +50.3 126.0	28 29.4 +50.9 126.4	27 53.6 +51.4 126.9	27 17.4 +51.9 127.3	26 40.9 +52.3 127.7	1	30 49.9 +48.7 124.0	31 03.9 +49.0 124.4	30 29.8 +49.6 124.9	29 55.2 +50.2 125.4	29 20.3 +50.7 125.8	28 45.0 +51.2 126.3	28 09.3 +51.7 126.7	27 33.2 +52.2 127.1	2
1	30 48.9 +48.7 124.6	30 14.6 +49.3 125.1	29 39.9 +49.9 125.5	29 04.9 +50.3 126.0	28 29.4 +50.9 126.4	27 53.6 +51.4 126.9	27 17.4 +51.9 127.3	26 40.9 +52.3 127.7	1	31 37.6 +48.4 123.9	31 03.9 +49.0 124.4	30 29.8 +49.6 124.9	29 55.2 +50.2 125.4	29 20.3 +50.7 125.8	28 45.0 +51.2 126.3	28 09.3 +51.7 126.7	27 33.2 +52.2 127.1	2	32 26.0 +48.2 123.2	31 52.9 +48.9 123.7	31 19.4 +49.4 124.2	30 45.4 +50.0 124.7	30 11.0 +50.5 125.2	29 36.2 +51.0 125.7	29 01.0 +51.6 126.1	28 25.4 +52.1 126.6	3
2	33 14.2 +48.0 122.5	33 41.8 +48.6 123.0	32 08.8 +49.2 123.6	31 35.4 +49.8 124.1	31 01.5 +50.4 124.6	30 37.3 +50.9 125.1	29 52.6 +51.4 125.6	29 17.5 +51.9 126.0	4	34 02.2 +47.7 121.8	33 30.4 +48.3 122.3	32 58.0 +49.0 122.9	32 25.2 +49.6 123.4	31 51.9 +50.1 124.0	31 18.1 +50.8 124.5	30 44.0 +51.2 125.0	30 09.4 +51.7 125.4	5	34 49.9 +47.5 121.0	34 18.7 +48.1 121.6	33 47.0 +48.7 122.2	33 14.8 +49.3 122.8	32 42.0 +50.0 123.3	32 08.9 +50.5 123.8	31 35.2 +51.1 124.4	31 01.1 +51.6 124.9	6
3	35 37.4 +47.1 120.3	35 06.8 +47.9 120.9	34 35.7 +48.5 121.5	34 04.1 +49.2 122.1	33 32.0 +49.7 122.7	32 59.4 +50.3 123.2	32 26.3 +50.9 123.7	31 52.7 +51.5 124.3	7	36 24.5 +46.9 119.5	35 54.7 +47.5 120.2	35 24.2 +48.3 120.8	35 53.3 +48.8 121.4	34 21.7 +49.6 122.0	33 49.7 +50.1 122.5	33 17.2 +50.7 123.1	32 44.2 +51.2 123.6	8	37 11.4 +46.6 118.8	36 42.2 +47.3 119.4	36 12.5 +47.9 120.1	35 42.1 +48.7 120.7	35 11.3 +49.2 121.3	34 39.8 +49.9 121.9	34 07.9 +50.5 122.5	33 35.4 +51.1 123.0	9
4	37 58.0 +46.2 118.0	37 29.5 +47.0 118.6	37 00.4 +47.7 119.3	36 30.8 +48.3 120.0	36 00.5 +49.1 120.6	35 29.7 +49.7 121.2	34 58.4 +50.2 121.8	34 26.5 +50.8 122.4	10	38 44.2 +45.9 117.1	38 16.5 +46.6 117.9	37 48.1 +47.4 118.5	37 19.1 +48.1 119.2	36 49.6 +48.7 119.9	36 19.4 +49.4 120.5	35 48.6 +50.1 121.1	35 17.3 +50.7 121.7	11	39 30.1 +45.1 116.3	39 03.1 +46.3 117.0	38 35.5 +47.4 117.8	38 07.2 +47.8 118.5	37 38.3 +48.5 119.1	37 08.8 +49.2 119.8	36 38.7 +49.8 120.5	36 08.0 +50.4 121.1	12
5	40 15.6 +45.1 115.5	39 49.4 +46.0 116.2	39 22.5 +46.8 117.0	38 55.0 +47.5 117.7	38 26.8 +48.2 118.4	37 58.0 +48.8 119.1	38 46.8 +48.6 119.3	38 18.0 +49.3 119.0	13	41 00.7 +44.7 114.6	40 35.4 +45.5 115.4	40 09.3 +46.3 116.1	39 42.5 +47.1 116.9	39 15.0 +47.9 117.6	38 46.8 +48.6 118.3	38 09.4 +49.3 119.0	37 48.6 +49.9 119.7	14	41 45.4 +44.3 113.7	41 20.9 +45.2 114.5	40 55.6 +46.0 115.3	40 29.6 +46.8 116.1	40 02.9 +47.5 116.6	39 35.4 +48.3 117.6	39 07.3 +49.0 118.3	38 38.5 +49.7 119.0	15
6	42 29.7 +43.9 112.8	42 06.1 +44.7 113.6	41 41.6 +45.7 114.5	41 16.4 +46.5 115.3	40 50.4 +47.3 116.0	40 23.7 +48.0 116.8	39 56.3 +48.7 117.6	39 28.2 +49.4 118.3	16	43 13.6 +43.4 111.9	42 50.8 +44.4 112.7	42 27.3 +45.2 113.6	42 02.9 +46.0 114.4	41 37.7 +46.8 115.2	40 45.0 +48.4 116.8	40 17.6 +49.2 117.6	38 38.7 +49.8 118.0	17	43 57.0 +43.0 110.9	43 35.2 +43.8 111.8	43 12.5 +44.7 112.7	42 48.9 +45.6 113.5	42 24.5 +46.5 114.4	41 59.4 +47.3 115.2	41 06.8 +48.8 116.8	41 55.6 +48.5 116.0	18
7	44 40.0 +42.4 109.9	44 19.0 +43.4 110.9	43 57.2 +44.3 111.8	43 34.5 +45.3 112.7	43 11.0 +46.1 113.5	42 46.7 +46.9 114.4	42 21.5 +47.7 115.2	41 55.6 +48.5 116.0	19	45 22.4 +41.8 108.9	45 02.4 +42.9 109.9	44 41.5 +43.9 110.8	44 19.8 +44.7 111.7	43 57.1 +45.7 112.6	43 33.6 +46.5 113.5	43 09.2 +47.4 114.4	42 44.1 +48.1 115.2	20	46 04.2 +41.3 107.9	45 45.3 +42.3 108.9	45 25.4 +43.3 109.9	45 04.5 +44.3 110.8	44 42.8 +45.2 111.7	44 20.1 +46.1 112.6	43 56.6 +47.0 113.5	43 32.2 +47.8 114.4	21
8	46 26.5 +40.8 106.9	46 27.6 +41.8 107.9	46 08.7 +42.8 108.9	45 48.8 +43.8 109.8	45 28.0 +44.8 110.8	45 06.2 +45.7 111.7	44 43.6 +46.5 112.7	44 20.0 +47.4 113.6	22	47 26.3 +40.0 105.8	47 09.4 +41.2 106.8	46 51.5 +42.3 107.8	46 32.6 +43.3 108.9	46 12.8 +44.2 109.8	45 51.9 +45.2 110.8	45 30.1 +46.2 111.8	45 07.4 +47.0 112.7	23	48 06.3 +39.5 104.7	47 50.6 +40.6 105.7	47 33.8 +41.7 106.8	47 15.9 +42.8 107.8	46 57.0 +43.8 108.9	46 37.1 +44.8 109.9	46 16.3 +45.6 110.9	45 54.4 +46.6 111.8	24
9	48 45.8 +38.7 103.5	48 31.2 +39.9 104.6	48 15.5 +41.0 105.7	47 58.7 +42.1 106.8	47 40.8 +43.2 107.9	47 21.9 +43.2 108.9	47 01.9 +45.3 109.9	46 41.0 +46.2 110.9	25	49 24.5 +38.1 102.4	49 11.1 +39.2 103.5	48 56.5 +40.4 104.6	48 40.8 +41.5 105.7	48 24.0 +42.6 106.8	48 06.1 +43.7 107.9	47 47.2 +44.6 108.9	47 27.2 +45.6 110.0	26	50 02.6 +37.2 101.2	49 50.3 +38.5 102.3	49 36.9 +39.7 103.5	49 22.3 +40.9 104.6	49 06.6 +42.0 105.7	48 49.8 +43.3 106.8	48 31.8 +44.2 107.9	48 12.8 +45.2 109.0	27
10	50 39.8 +36.5 99.9	50 28.8 +37.8 101.1	50 16.6 +39.0 102.3	50 03.2 +40.2 103.5	49 48.6 +41.4 104.6	49 32.9 +42.5 105.8	49 16.0 +43.6 106.9	49 38.9 +43.6 107.5	28	51 51.9 +34.8 97.4	51 43.6 +36.1 98.7	51 33.9 +37.5 99.9	51 22.9 +38.8 101.1	51 10.7 +40.0 102.4	50 57.3 +41.2 103.6	50 42.6 +42.4 104.8	50 26.7 +43.5 105.9	30	52 26.7 +33.9 96.1	52 19.7 +35.3 97.4	52 11.4 +36.6 98.6	52 01.7 +37.9 99.9	51 50.7 +38.3 101.2	51 38.5 +40.5 102.4	51 25.0 +41.7 103.6	51 10.2 +42.9 104.8	31
11	53 00.6 +32.8 94.7	52 55.0 +34.3 96.0	52 48.0 +35.7 97.3	52 39.6 +37.2 98.6	52 30.0 +38.4 99.9	52 0.0 +39.3 102.3	50 30.0 +40.7 103.5	50 30.0 +40.7 103.5	32	53 33.4 +31.9 93.3	53 29.3 +33.4 94.7	53 23.7 +34.8 96.0	53 16.8 +36.2 97.3	53 08.4 +37.6 98.7	52 58.7 +39.0 100.0	52 47.7 +40.2 101.3	52 35.3 +41.5 102.5	33	54 05.3 +30.9 91.9	54 02.7 +32.3 93.2	53 58.5 +33.9 94.6	53 53.0 +35.3 96.0	53 46.0 +36.8 97.3	53 37.7 +38.1 98.7	53 27.9 +39.5 100.0	53 16.8 +40.7 101.4	34
12	54 36.2 +29.7 90.4	54 35.0 +31.3 91.8	54 32.4 +32.8 93.2	54 28.3 +34.3 94.6	54 22.8 +35.8 96.0	54 15.8 +37.2 97.4	54 07.4 +38.6 98.8	53 57.5 +40.3 100.1	35	55 05.9 +28.6 88.9	55 06.3 +30.2 90.3	55 05.2 +31.8 91.8	55 02.6 +33.4 93.2	54 58.6 +34.8 94.6	54 53.0 +36.3 96.0	54 46.0 +37.7 97.4	54 37.5 +39.1 98.8	36	55 34.5 +27.4 87.3	55 36.5 +29.0 88.8	55 37.0 +30.7 90.3	55 36.0 +32.2 91.7	55 33.4 +33.8 93.2	55 29.3 +35.3 94.6	55 23.7 +36.8 96.1	55 16.6 +38.3 97.5	37
13	56 01.9 +26.1 85.8	56 05.6 +25.9 86.7	56 07.7 +29.4 88.7	56 07.7 +29.4 88.7	56 08.2 +31.0 90.2	56 07.2 +32.7 91.7	56 04.6 +34.3 92.2	56 32.9 +35.8 95.5	38	57 53.2 +22.9 82.8	57 49.1 +22.5 83.5	57 32.4 +23.9 83.7	57 21.0 +24.5 84.6	57 19.0 +25.1 85.4	57 0.0 +25.8 86.3	56 52.5 +32.5 87.0	56 0.0 +35.8 87.4	39	58 19.3 +21.9 82.5	58 11.6 +21.0 82.9	58 22.3 +22.9 83.0	58 16.6 +23.6 84.2	58 11.0 +24.6 85.2	58 0.0 +25.2 86.3	57 22.7 +30.5 87.0	57 0.0 +32.2 +40.3 87.0	40
14	58 18.4 +17.6 75.5	58 32.6 +19.5 75.6	58 37.1 +23.8 77.2	58 39.3 +30.0 80.7	58 39.3 +31.0 80.7	58 39.3 +31.7 81.9	58 39.8 +25.4 81.9	58 47.4 +27.3 83.6	41	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	42	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	59 52.9 +23.5 82.5	43
15	59 36.0 +16.1 73.7	58 52.1 +17.9 75.3	59 06.5 +18.9 73.4	59 29.1 +11.4 73.6	59 29.1 +11.4 73.6	59 29.1 +11.4 73.6	59 29.1 +11.4 73.6	59 29.1 +11.4 73.6	44	59 26.5 +14.4 71.8	59 10.0 +16.3 73.4	59 26.5 +14.4 71.8	59 10.0 +16.3 73.4	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	45	59 21.2 +14.4 71.8	59 10.0 +16.3 73.4	59 21.2 +14.4 71.8	59 10.0 +16.3 73.4	59 21.2 +14.4 71.8	59 21.2 +14.4 71.8	59 21.2 +14.4 71.8	59 21.2 +14.4 71.8	46
16	59 26.5 +14.4 71.8	59 10.0 +16.3 73.4	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	59 26.5 +14.4 71.8	47	59 06.5 +12.8 69.9	59 26.3 +14.7 71.5	59 44.5 +16.6 73.1	60 01.1 +18.5 74.8	60 16.0 +20.4 76.5	60 29.1 +22.4 78.2	60 40.5 +24.3 79.9	60 50.1 +26.2 81.7	48	59 19.3 +11.1 68.0	59 41.0 +13.0 69.6	60 01.1 +14.9 71.2	60 19.6 +16.8 72.9	60 36.4 +18.7 74.6				

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 45°, 315°

Dec.	45°			46°			47°			48°			49°			50°			51°			52°			Dec.
	Hc	d	Z																						
0	30 00.0	-49.1	125.3	29 25.2	-49.7	125.7	28 49.9	-50.1	126.2	28 14.3	-50.7	126.6	27 38.4	-51.2	127.0	27 02.0	-51.6	127.5	26 25.4	-52.1	127.9	25 48.4	-52.6	128.2	0
1	29 10.9	-49.3	125.9	28 35.5	-49.8	126.4	27 59.8	-50.4	126.8	27 23.6	-50.8	127.2	26 47.2	-51.4	127.6	26 10.4	-51.8	128.0	25 33.3	-52.3	128.4	24 55.8	-52.7	128.8	1
2	28 21.6	-49.4	126.6	27 45.7	-50.0	127.0	27 09.4	-50.5	127.4	26 32.8	-51.0	127.8	25 55.8	-51.4	128.2	25 18.6	-52.0	128.6	24 41.0	-52.4	128.9	24 03.1	-52.8	129.3	3
3	27 32.2	-49.7	127.2	26 55.7	-50.1	127.6	26 18.9	-50.6	128.0	25 41.8	-51.1	128.4	25 04.4	-51.6	128.8	24 26.6	-52.0	129.1	23 48.6	-52.4	129.5	23 10.3	-52.8	129.8	4
4	26 42.5	-49.8	127.8	25 05.6	-50.4	128.4	25 28.3	-50.8	128.6	24 50.7	-51.3	129.0	24 12.8	-51.7	129.3	23 34.6	-52.2	129.7	22 56.2	-52.6	130.0	22 17.5	-53.0	130.3	5
5	25 52.7	-49.9	128.5	25 15.2	-50.4	128.8	24 37.5	-51.0	129.2	23 59.4	-51.4	129.6	23 21.1	-51.9	129.9	22 42.4	-52.2	130.2	21 39.3	-52.7	130.5	21 24.5	-53.1	130.8	6
6	25 02.8	-50.1	129.1	24 24.8	-50.6	129.4	23 46.5	-51.0	129.8	23 08.0	-51.5	130.1	22 29.2	-51.9	130.4	21 50.2	-52.4	130.7	21 10.9	-52.8	131.0	20 31.4	-53.2	131.3	7
7	24 12.7	-50.3	129.7	23 34.2	-50.7	130.0	22 55.5	-51.2	130.4	22 16.5	-51.6	130.7	21 37.3	-52.1	131.0	20 57.8	-52.4	131.3	20 18.1	-52.8	131.6	19 38.2	-53.2	131.8	8
8	23 22.4	-50.4	130.3	22 43.5	-50.9	130.6	22 04.3	-51.9	130.9	21 24.9	-51.7	131.2	20 45.2	-52.1	131.5	20 05.4	-52.6	131.8	19 25.3	-53.0	132.1	18 45.0	-53.3	132.3	9
9	22 32.0	-50.5	130.9	21 52.6	-50.9	131.2	21 13.0	-51.4	131.5	20 33.2	-51.9	131.8	19 53.1	-52.2	132.0	19 12.8	-52.6	132.3	18 32.3	-53.0	132.6	17 51.7	-53.4	132.8	10
10	21 41.5	-50.6	131.5	21 01.7	-51.1	131.8	20 21.6	-51.5	132.0	19 41.3	-51.9	132.3	19 00.9	-52.4	132.6	18 20.2	-52.7	132.8	17 39.3	-53.1	133.0	16 58.3	-53.5	133.3	11
11	20 50.9	-50.8	132.0	20 10.6	-51.2	132.3	19 30.1	-51.6	132.6	18 49.4	-52.0	132.8	18 08.5	-52.4	133.1	17 27.5	-52.8	133.3	16 46.2	-53.1	133.5	16 04.8	-53.5	133.7	12
12	20 00.1	-50.8	132.6	19 19.4	-51.3	132.9	18 38.5	-51.7	133.1	17 57.4	-52.1	133.4	17 16.1	-52.5	133.6	16 34.7	-52.9	133.8	15 53.1	-53.3	134.0	15 11.3	-53.6	134.2	13
13	19 09.3	-51.0	133.2	18 28.1	-51.3	133.4	17 46.8	-51.8	133.7	17 05.3	-52.2	133.9	16 23.6	-52.5	134.1	15 41.8	-52.9	134.3	14 59.8	-53.3	134.5	14 17.7	-53.6	134.7	14
14	18 18.3	-51.0	133.7	17 36.8	-51.5	134.0	16 55.0	-51.8	134.2	16 13.1	-52.2	134.4	15 31.1	-52.6	134.6	14 48.9	-53.0	134.8	14 06.5	-53.3	135.0	13 24.1	-53.7	135.1	15
15	17 27.3	-51.2	134.3	16 45.3	-51.5	134.5	16 03.2	-52.0	134.7	15 20.9	-52.3	134.9	14 38.5	-52.7	135.1	13 55.9	-53.0	135.3	13 13.2	-53.4	135.4	12 30.4	-53.7	135.6	16
16	16 36.1	-51.2	134.8	15 53.8	-51.7	135.0	15 11.2	-52.0	135.2	14 28.6	-52.4	135.4	13 45.8	-52.8	135.6	13 02.9	-53.1	135.8	12 19.8	-53.4	135.9	11 36.7	-53.8	136.1	17
17	15 44.9	-51.3	135.4	15 02.1	-51.7	135.6	14 19.2	-52.0	135.7	13 36.2	-52.4	135.9	12 53.0	-52.8	136.1	12 09.8	-53.2	136.2	11 26.4	-53.5	136.4	10 42.9	-53.8	136.5	18
18	14 53.6	-51.4	135.9	14 10.4	-51.7	136.1	13 27.2	-52.2	136.3	12 43.8	-52.5	136.4	12 00.2	-52.8	136.6	11 16.6	-53.2	136.7	10 32.9	-53.5	136.8	9 49.1	-53.9	137.0	19
19	14 02.2	-51.4	136.4	13 18.7	-51.8	136.6	12 35.0	-52.2	136.8	11 51.3	-52.6	136.9	11 07.4	-52.9	137.0	10 23.4	-53.2	137.2	9 39.4	-53.6	137.3	8 55.2	-53.8	137.4	20
20	13 10.8	-51.5	137.0	12 26.9	-51.9	137.1	11 42.8	-52.2	137.3	10 58.7	-52.6	137.4	10 14.5	-52.9	137.5	9 30.2	-53.3	137.6	8 45.8	-53.6	137.8	8 01.4	-53.9	137.9	21
21	12 19.3	-51.6	137.5	11 35.0	-52.0	137.6	10 50.6	-52.3	137.8	10 06.1	-52.6	137.9	9 21.6	-53.0	138.0	8 36.9	-53.3	138.1	7 52.2	-53.6	138.2	7 07.5	-54.0	138.3	21
22	11 27.7	-51.7	138.0	10 43.0	-52.0	138.1	9 58.3	-52.3	138.3	9 13.5	-52.7	138.4	8 28.6	-53.0	138.5	7 43.6	-53.3	138.6	6 58.6	-53.6	138.7	6 13.5	-53.9	138.8	22
23	10 36.0	-51.6	138.5	9 51.0	-52.0	138.7	9 06.0	-52.4	138.8	8 20.8	-52.7	138.9	7 35.6	-53.1	139.0	6 50.3	-53.4	139.1	6 05.0	-53.7	139.1	5 19.6	-54.0	139.2	23
24	9 44.4	-51.6	139.0	8 59.0	-52.1	139.2	8 13.6	-52.4	139.3	7 28.1	-52.7	139.3	6 42.5	-53.0	139.4	5 56.9	-53.3	139.5	5 11.3	-53.7	139.6	4 25.6	-54.0	139.6	24
25	8 52.6	-51.7	139.6	8 06.9	-52.1	139.7	7 21.2	-52.5	139.7	6 35.4	-52.8	139.8	5 49.5	-53.1	139.9	5 03.6	-53.4	140.0	4 17.6	-53.7	140.0	3 31.6	-54.0	140.1	25
26	8 00.9	-51.8	140.1	7 14.8	-52.1	140.2	6 28.7	-52.4	140.2	5 42.6	-52.8	140.3	4 56.4	-53.1	140.4	4 10.2	-53.4	140.4	3 23.9	-53.7	140.5	2 37.6	-54.0	140.5	27
27	7 09.1	-51.9	140.6	6 22.7	-52.2	140.7	5 36.3	-52.5	140.7	4 49.8	-52.8	140.8	4 03.3	-53.1	140.8	3 16.8	-53.5	140.9	2 30.2	-53.7	140.9	1 43.6	-54.0	140.9	28
28	6 17.2	-51.9	141.1	5 30.5	-52.2	141.2	4 43.8	-52.5	141.2	3 57.0	-52.9	141.3	3 10.2	-53.2	141.3	2 23.3	-53.4	141.3	1 36.5	-53.8	141.3	0 49.6	-54.0	141.4	29
29	5 25.3	-51.9	141.6	4 38.3	-52.2	141.6	3 51.2	-52.5	141.7	3 04.1	-52.8	141.7	2 17.0	-53.1	141.8	0 42.7	-53.7	141.8	0 04.4	+54.0	38.2	29			
30	4 33.4	-51.9	142.1	3 46.1	-52.2	142.1	2 58.7	-52.5	142.2	2 11.3	-52.9	142.2	1 23.9	-53.2	142.2	0 36.5	-53.5	142.2	0 11.0	+53.7	37.8	30			
31	3 41.5	-51.9	142.6	2 53.9	-52.3	142.6	2 06.2	-52.6	142.7	1 18.4	-52.8	142.7	0 30.7	-53.1	142.7	0 17.0	+53.4	37.3	1 04.7	+53.7	37.3	31			
32	2 49.6	-51.9	143.1	2 01.6	-52.0	143.1	1 13.6	-52.6	143.1	0 25.6	-52.9	143.2	0 22.4	+53.2	36.8	1 10.4	+53.5	36.9	1 58.4	+53.8	36.9	2 46.4	+54.0	36.9	32
33	1 57.7	-52.0	143.6	1 09.4	-52.3	143.6	0 21.0	-52.6	143.6	0 27.3	-52.8	143.6	0 15.6	+53.1	36.4	1 20.9	+53.4	36.4	4 39.3	+53.3	33.7	9 04.0	+53.9	33.8	39
34	1 05.7	-52.0	144.1	0 17.1	-52.3	144.1	0 31.5	-52.6	144.1	0 20.8	-52.8	144.1	0 28.7	-53.1	35.9	1 24.3	-53.2	35.9	4 14.1	+53.6	35.9	4 39.6	+53.6	35.9	40
35	0 13.7	-51.9	144.6	0 35.2	+52.2	35.4	1 24.1	+52.5	35.4	2 13.0	+52.8	35.4	3 01.9	+53.1	35.5	3 50.7	+53.4	35.5	4 39.6	+53.6	35.5	5 28.4	+53.9	35.6	35
36	0 38.2	+52.0	34.9	1 27.4	+52.3	34.9	2 16.6	+52.6	34.9	3 05.8	+52.8	35.0	3 55.0	+53.1	35.0	4 44.1	+53.4	35.0	5 33.2	+53.7	35.1	6 22.3	+54.0	35.1	36
37	1 30.2	+51.9	34.9	2 19.7	+52.2	34.4	3 09.2	+52.5	34.4	3 58.6	+52.9	34.5	4 48.1	+53.1	34.5	5									