

69°, 291° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	12	27.3	+49.0	107.0	12	09.6	+49.6	107.3	11	51.7	+50.2	107.5	11	33.6	+50.8	107.7	11	15.3	+51.3	107.8	10	56.8	+51.8	108.0	10	19.3	+52.8	108.4	0				
1	13	16.3	+49.0	106.5	12	59.2	+49.6	106.7	12	41.9	+50.1	106.9	12	24.4	+50.6	107.1	12	06.6	+51.2	107.3	11	48.6	+51.8	107.5	11	30.5	+52.2	107.7	11	12.1	+52.8	107.9	1
2	14	05.3	+48.8	105.9	13	48.8	+49.4	106.1	13	32.0	+50.1	106.3	13	15.0	+50.6	106.6	12	57.8	+51.2	106.8	12	40.4	+51.7	107.0	12	22.7	+52.2	107.2	12	04.9	+52.7	107.4	2
3	14	54.1	+48.8	105.3	14	38.2	+49.4	105.5	14	22.1	+49.9	105.8	14	05.6	+50.6	106.0	13	49.0	+51.0	106.2	13	32.1	+51.6	106.5	13	14.9	+52.2	106.7	12	57.6	+52.6	106.9	3
4	15	42.9	+48.7	104.7	15	27.6	+49.3	104.9	15	12.0	+49.9	105.2	14	56.2	+50.4	105.4	14	23.7	+51.1	105.7	14	07.1	+52.0	106.2	13	50.2	+52.6	106.4	4				
5	16	31.6	+48.5	104.0	16	16.9	+49.2	104.3	16	01.9	+49.8	104.6	15	46.6	+50.4	104.9	15	31.1	+50.9	105.2	15	15.2	+51.5	105.4	14	59.1	+52.0	105.7	14	42.8	+52.5	105.9	5
6	17	20.1	+48.5	103.4	17	06.1	+49.0	103.7	16	51.7	+49.6	104.0	16	37.0	+50.2	104.3	16	22.0	+50.8	104.6	16	06.7	+51.4	104.9	15	51.1	+52.0	105.2	15	35.3	+52.5	105.4	6
7	18	08.6	+48.3	102.8	17	55.1	+49.0	103.1	17	41.3	+49.5	103.4	17	27.2	+50.2	103.7	17	12.8	+50.8	104.1	16	58.1	+51.3	104.4	16	43.1	+51.8	104.6	16	27.8	+52.3	104.9	7
8	18	56.9	+48.2	102.2	18	44.1	+48.8	102.5	18	30.9	+49.5	102.8	18	17.4	+50.1	103.2	18	03.6	+50.6	103.5	17	49.4	+51.2	103.8	17	34.9	+51.8	104.1	17	20.1	+52.3	104.4	8
9	19	45.1	+48.1	101.6	18	32.9	+48.7	101.9	19	20.4	+49.3	102.3	19	07.5	+49.9	102.6	18	54.2	+50.6	102.9	18	40.6	+51.1	103.3	18	26.7	+51.7	103.6	18	12.4	+52.2	103.9	9
10	20	33.2	+47.9	100.9	20	21.6	+48.6	101.3	20	09.7	+49.2	101.6	19	57.4	+49.8	102.0	19	44.8	+50.4	102.4	19	31.7	+51.1	102.7	19	18.4	+51.5	103.0	19	04.6	+52.2	103.4	10
11	21	21.1	+47.8	100.3	21	10.2	+48.5	100.7	20	58.9	+49.1	101.0	20	47.2	+49.8	101.4	20	35.2	+50.3	101.8	20	22.8	+50.9	102.1	20	0.9	+51.5	102.5	19	56.8	+52.0	102.9	11
12	22	08.9	+47.6	99.6	21	58.7	+48.2	100.0	21	48.0	+49.0	100.4	21	37.0	+49.5	100.8	21	25.5	+50.2	101.2	21	13.7	+50.8	101.6	21	01.4	+51.4	102.0	20	48.8	+51.9	102.3	12
13	22	56.5	+47.5	99.0	22	46.9	+48.2	99.4	22	37.0	+48.8	99.8	22	26.5	+49.5	100.2	22	15.7	+50.1	100.6	22	04.5	+50.6	101.0	21	52.8	+51.3	101.4	21	40.7	+51.9	101.8	13
14	23	44.0	+47.3	98.3	23	35.1	+48.0	98.7	23	25.8	+48.6	99.2	23	16.0	+49.3	99.6	23	05.8	+49.9	100.0	22	55.1	+50.6	100.4	22	44.1	+51.1	100.8	22	32.6	+51.7	101.2	14
15	24	31.3	+47.1	97.6	24	23.1	+47.8	98.1	24	14.4	+48.5	98.5	24	05.3	+49.1	99.0	23	55.7	+49.8	99.4	23	45.7	+50.4	99.8	23	35.2	+51.0	100.3	23	24.3	+51.6	100.7	15
16	25	18.4	+46.9	96.9	25	10.9	+47.6	97.4	25	02.9	+48.3	97.9	24	54.4	+49.0	98.3	24	45.5	+49.6	98.8	24	36.1	+50.3	99.2	24	26.2	+50.9	99.7	24	15.9	+51.5	100.1	16
17	26	05.3	+46.7	96.2	25	58.5	+47.4	96.7	25	51.2	+48.1	97.2	25	43.4	+48.8	97.5	25	35.1	+49.5	98.2	25	26.4	+50.1	98.6	25	17.1	+50.7	99.1	25	07.4	+51.3	99.6	17
18	26	52.0	+46.5	95.5	26	45.9	+47.2	96.0	26	39.3	+48.0	96.5	26	32.2	+48.7	97.0	26	24.6	+49.3	97.5	26	16.5	+49.9	98.0	26	07.8	+50.6	98.5	25	58.7	+51.2	99.0	18
19	27	38.5	+46.2	94.8	27	33.1	+47.1	95.4	27	27.3	+47.7	95.9	27	20.9	+48.4	96.4	27	13.9	+49.1	96.9	27	06.4	+49.8	97.4	26	58.4	+50.5	97.9	26	49.9	+51.1	98.4	19
20	28	24.7	+46.1	94.1	28	20.2	+46.8	94.7	28	15.0	+47.5	95.2	28	09.3	+48.3	95.7	28	03.0	+49.0	96.3	27	56.2	+49.7	96.8	27	41.0	+50.9	97.8	20				
21	29	10.8	+45.8	93.4	29	07.0	+46.5	93.9	29	02.5	+47.4	94.5	28	57.6	+48.0	95.0	28	52.0	+48.7	95.6	28	45.9	+49.4	96.1	28	31.9	+50.7	97.2	21				
22	29	56.6	+45.5	92.6	29	53.5	+46.4	93.2	29	49.9	+47.1	93.8	29	45.6	+47.8	94.4	29	40.7	+48.6	94.9	29	35.3	+49.2	95.5	29	22.6	+50.6	96.6	22				
23	30	42.1	+45.3	91.9	30	39.9	+46.0	92.5	30	37.0	+46.8	93.1	30	33.4	+47.6	93.7	30	29.3	+48.3	94.2	30	19.2	+49.7	95.4	30	13.2	+50.4	96.0	23				
24	31	27.4	+45.0	91.1	31	25.9	+45.8	91.7	31	23.8	+46.6	92.3	31	21.0	+47.4	93.0	31	17.6	+48.1	93.6	31	13.6	+48.8	94.2	31	08.9	+49.5	94.8	31				
25	32	12.4	+44.7	90.3	32	11.7	+45.6	91.0	32	10.4	+46.3	91.6	32	8.4	+47.1	92.2	32	05.7	+47.9	92.9	32	02.4	+48.6	93.5	31	58.4	+49.4	94.1	31	53.8	+50.0	94.7	25
26	32	57.1	+44.5	89.6	32	57.3	+45.2	90.2	32	56.7	+46.1	90.8	32	55.5	+46.9	91.5	32	53.6	+47.6	92.1	32	51.0	+48.4	92.8	32	47.8	+49.1	93.4	32	43.8	+49.8	94.1	26
27	33	41.6	+44.1	88.7	33	42.5	+45.0	89.4	33	42.8	+45.8	90.1	33	42.4	+46.5	90.7	33	41.2	+47.4	91.4	33	39.4	+48.1	92.1	33	36.9	+48.8	93.4	27				
28	34	25.7	+43.7	87.9	34	27.5	+44.6	88.6	34	28.6	+45.4	89.3	34	28.9	+46.3	90.0	34	28.6	+47.1	90.7	34	27.5	+47.7	91.4	34	23.2	+49.4	92.7	28				
29	35	09.4	+43.4	87.1	35	12.1	+44.3	87.8	35	14.0	+45.2	88.5	35	14.2	+45.8	88.5	35	15.4	+47.6	89.6	35	14.4	+48.3	91.3	35	12.6	+49.1	92.0	29				
30	35	52.8	+43.1	86.2	35	56.4	+43.9	87.0	35	59.2	+44.8	87.7	36	01.2	+45.7	88.4	36	02.5	+46.5	89.1	36	03.0	+47.3	89.9	36	02.7	+48.1	90.6	36	01.7	+48.9	91.3	30
31	36	35.9	+42.6	85.4	36	40.3	+43.6	86.1	36	44.0	+44.4	86.9	36	46.9	+45.3	87.6	36	49.0	+46.2	88.4	36	50.3	+47.0	89.9	36	50.6	+48.6	90.6	31				
32	37	18.5	+42.3	84.5	37	23.9	+43.2	85.3	37	28.4	+44.0	86.0	37	32.2	+45.0	86.8	37	37.3	+46.7	87.6	37	37.3	+47.5	89.1	37	39.2	+48.3	89.9	32				
33	38	08.8	+41.9	83.6	38	07.1	+42.8	84.4	38	12.5	+43.8	85.2	38	17.2	+44.6	86.0	38	21.0	+45.5	86.7	38	24.0	+46.4	87.5	38	26.2	+47.2	88.3	38	27.5	+48.0	89.1	33
34	39	24.1	+40.9	81.8	39	32.2	+42.0	82.6	39	39.6	+42.9	83.4	39	46.0	+43.9	84.2																	

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $69^\circ$ ,  $291^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			Dec.											
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z												
0	12	27.3	-49.1	107.0	12	09.6	-49.7	107.3	11	51.7	-50.2	107.5	11	33.6	-50.8	107.7	11	15.3	-51.3	107.8	10	56.8	-51.8	108.0	10	19.3	-52.8	108.4	0				
1	11	38.2	-49.2	107.6	11	19.9	-49.7	107.8	11	01.5	-50.4	108.0	10	42.8	-50.8	108.2	10	24.0	-51.4	108.4	10	05.0	-51.9	108.5	9	45.8	-52.4	108.7	1				
2	10	49.0	-49.2	108.2	10	30.2	-49.9	108.4	10	11.1	-50.3	108.6	9	52.0	-51.0	108.7	9	32.6	-51.4	108.9	9	13.1	-52.0	109.1	8	53.4	-52.4	109.2	8	33.6	-52.9	109.3	3
3	9	59.8	-49.4	108.8	9	40.3	-49.8	109.0	9	20.8	-50.5	109.1	9	01.0	-50.9	109.3	8	41.2	-51.5	109.4	8	21.1	-51.9	109.6	8	01.0	-52.5	109.7	7	40.7	-52.9	109.8	3
4	9	10.4	-49.3	109.4	8	50.5	-50.0	109.5	8	30.3	-50.4	109.7	8	10.1	-50.2	109.8	7	49.7	-51.2	109.9	7	29.2	-52.0	110.1	7	08.5	-52.5	110.2	6	47.8	-53.0	110.3	4
5	8	21.1	-49.4	109.9	8	00.5	-49.9	110.1	7	39.9	-50.5	110.2	7	19.1	-51.0	110.3	6	58.2	-51.6	110.5	6	37.2	-52.1	110.6	6	16.0	-52.5	110.7	5	54.8	-53.0	110.8	5
6	7	31.7	-49.5	110.5	7	10.6	-50.0	110.6	6	49.4	-50.6	110.8	6	28.1	-51.1	110.9	6	06.6	-51.5	111.0	5	45.1	-52.1	111.1	5	23.5	-52.5	111.2	5	01.8	-53.0	111.2	6
7	6	42.2	-49.5	111.1	6	20.6	-50.1	111.2	5	58.8	-50.5	111.3	5	37.0	-51.1	111.4	5	15.1	-51.6	111.5	4	53.0	-52.0	111.6	4	31.0	-52.6	111.6	4	08.8	-53.0	111.7	7
8	5	52.7	-49.5	111.7	5	30.5	-50.0	111.8	5	08.3	-50.7	111.8	4	45.9	-51.1	111.9	4	23.5	-51.7	112.0	4	01.0	-52.2	112.1	3	38.4	-52.6	112.1	3	15.8	-53.1	112.2	8
9	5	03.2	-49.6	112.2	4	40.5	-50.1	112.3	4	17.6	-50.6	112.4	3	54.8	-51.2	112.4	3	31.8	-51.6	112.5	3	08.8	-52.1	112.6	2	22.7	-53.0	112.6	9				
10	4	13.6	-49.5	112.8	3	50.4	-50.2	112.9	3	27.0	-50.6	112.9	3	03.6	-51.1	113.0	2	40.2	-51.7	113.0	2	16.7	-52.1	113.1	1	53.2	-52.6	113.1	10				
11	3	24.1	-49.6	113.4	3	00.2	-50.1	113.4	2	36.4	-50.7	113.5	2	12.5	-51.2	113.5	1	48.5	-51.6	113.5	1	24.6	-52.2	113.6	0	06.6	-52.6	113.6	11				
13	1	44.8	-49.6	114.5	1	20.0	-50.2	114.5	0	55.1	-50.7	114.5	0	30.1	-51.1	114.5	0	05.2	-51.6	114.5	0	19.7	+52.1	65.5	0	44.6	+52.6	65.5	13				
14	0	55.2	-49.6	115.0	0	29.8	-50.2	115.1	0	04.4	-50.7	115.1	0	21.0	+51.2	64.9	0	46.4	+51.7	64.9	1	11.8	+52.2	65.0	1	37.2	+52.6	65.0	14				
15	0	05.6	-49.7	115.6	0	20.4	+50.1	64.4	0	46.3	+50.7	64.4	1	12.2	+51.2	64.4	1	38.1	+51.7	64.4	2	04.0	+52.1	64.5	2	29.8	+52.6	64.5	15				
16	0	44.1	+49.6	63.8	1	10.5	+50.2	63.8	1	37.0	+50.6	63.9	2	03.4	+51.1	63.9	2	29.8	+51.6	63.9	2	56.1	+52.1	64.0	3	22.4	+52.6	64.0	16				
17	1	33.7	+49.6	63.3	2	00.7	+50.1	63.3	2	27.6	+50.7	63.3	2	54.5	+51.2	63.4	3	21.4	+51.6	63.4	3	48.2	+52.1	63.5	4	15.0	+52.5	63.5	17				
18	2	23.3	+49.6	62.7	2	50.8	+50.1	62.7	2	18.3	+50.6	62.8	3	45.7	+51.2	62.8	4	13.0	+51.6	62.9	5	07.5	+52.6	63.1	5	34.7	+53.0	63.1	18				
19	3	12.9	+49.6	62.1	3	40.9	+50.1	62.2	4	08.9	+50.6	62.3	4	36.8	+51.1	62.3	5	04.6	+51.6	62.4	5	32.4	+52.0	62.5	6	20.1	+52.5	62.6	19				
20	4	02.5	+49.6	61.6	4	31.0	+50.1	61.6	4	59.5	+50.6	61.7	5	27.9	+51.1	61.8	5	56.2	+51.6	61.9	6	24.4	+52.1	62.0	6	52.6	+52.5	62.1	20				
21	5	52.1	+49.5	61.0	5	21.1	+50.1	61.1	5	50.5	+50.6	61.2	6	19.0	+51.0	61.3	6	47.8	+51.5	61.4	7	16.5	+51.9	61.5	7	45.1	+52.4	61.6	21				
22	6	41.6	+49.5	60.4	6	11.2	+50.0	60.5	6	40.6	+50.5	60.6	7	10.0	+51.0	60.7	7	39.3	+51.5	60.9	8	08.4	+52.0	61.0	8	37.5	+52.4	61.1	22				
23	7	31.1	+49.5	59.9	7	01.2	+50.0	60.0	7	31.1	+50.5	60.1	8	01.0	+51.0	60.2	8	30.8	+51.4	60.3	9	00.4	+51.9	60.5	9	29.9	+52.4	60.6	23				
24	7	20.6	+49.4	59.3	7	51.2	+49.9	59.4	8	21.6	+50.6	59.5	8	52.0	+50.9	59.7	9	22.2	+51.4	59.8	9	52.3	+51.9	60.0	10	22.3	+52.3	60.1	24				
25	8	10.0	+49.4	58.7	8	41.1	+49.9	58.9	9	12.1	+50.3	59.0	9	42.9	+50.9	59.1	10	13.6	+51.3	59.3	10	44.2	+51.8	59.5	11	14.6	+52.3	59.6	25				
26	8	59.4	+49.3	58.2	9	31.0	+49.8	58.3	10	02.4	+50.4	58.4	10	33.8	+50.8	58.6	11	04.9	+51.3	58.8	11	36.0	+51.7	58.9	12	06.9	+52.2	59.3	26				
27	9	48.7	+49.3	57.6	10	20.8	+49.8	57.7	10	52.8	+50.2	57.9	11	24.6	+50.7	58.1	11	56.2	+51.3	58.2	12	27.7	+51.7	58.4	12	59.1	+52.1	58.6	27				
28	10	38.0	+49.2	57.0	11	10.6	+49.7	57.2	11	43.0	+50.2	57.3	12	15.3	+50.7	57.5	12	47.5	+51.1	57.7	13	19.4	+51.7	57.9	13	51.2	+52.1	58.1	28				
29	11	27.2	+49.1	56.4	12	0.3	+49.6	56.6	12	33.2	+50.1	56.8	13	06.0	+50.6	57.0	13	38.6	+51.1	57.2	14	11.1	+51.5	57.4	14	43.3	+52.1	57.6	29				
30	12	16.3	+49.0	55.8	12	49.9	+49.6	56.0	13	23.3	+50.1	56.2	13	56.6	+50.6	56.4	14	29.7	+51.0	56.6	15	02.6	+51.5	56.8	15	35.4	+51.9	57.1	30				
31	13	05.3	+49.0	55.2	13	39.5	+49.4	55.4	14	13.4	+50.0	55.6	14	47.2	+50.4	55.9	15	20.7	+51.0	56.1	15	54.1	+51.4	56.3	16	27.3	+51.9	56.6	31				
32	13	54.3	+48.9	54.6	14	28.9	+49.4	54.9	15	03.4	+49.4	55.1	15	37.6	+50.4	55.3	16	11.7	+50.8	55.5	16	45.5	+51.4	55.8	17	19.2	+51.8	56.0	32				
33	14	43.2	+48.8	54.1	15	18.3	+49.3	54.3	15	53.3	+50.3	54.5	16	28.0	+50.7	54.7	17	02.5	+50.8	55.0	17	36.9	+51.7	55.5	18	14.4	+52.2	55.8	33				
34	15	32.0	+48.7	53.4	16	07.6	+49.2	53.7	16	41.3	+49.6	53.9	17	21.8	+49.7	54.8	17	22.2	+50.5	55.1	17	22.4	+50.5	55.2	19	19.7	+51.0	55.2	39				
35	16	20.7	+48.6	52.8	16	56.8	+49.1	53.1	17	32.7	+49.6	53.3	18	08.5	+50.1	53.6	18	44.0	+50.5	53.9	19	19.3	+51.0	54.1	19	54.3	+51.5	54.4	35				
36	17	09.3	+48.4	52.2	17	45.9	+49.5	52.5	18	22.3	+49.5	52.7	18	58.6	+49.9	53.0	19	34.5	+50.5	53.3	20	10.3	+50.9	53.6	20	45.8	+51.4	53.9	21				
37	17	57.7	+48.4	51.6	18	34.9	+48.8	51.9	19	11.8	+49.4	52.1	19	48.5	+49.9	52.4	20	25.0	+50.3	52.7	21	01.2	+50.9	53.0	21	37.2	+51.3	53.3	37				
38	18	46.1	+48.2	51.0	19	23.7	+48.8	51.3	20	01.2	+49.2	51.5	20	38.4	+49.7	51.8	2																

70°, 290° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	11	52.7	+48.9	106.2	11	35.8	+49.6	106.4	11	18.8	+50.1	106.6	11	01.6	+50.6	106.8	10	44.1	+51.2	107.0	10	08.7	+52.3	107.3	9	50.8	+52.7	107.5
1	12	41.6	+48.9	105.6	12	25.4	+49.4	105.8	12	08.9	+50.0	106.0	11	52.2	+50.6	106.2	11	35.3	+51.2	106.4	11	18.2	+51.7	106.6	11	01.0	+52.1	106.8
2	13	30.5	+48.7	105.0	13	14.8	+49.4	105.2	12	58.9	+50.0	105.5	12	42.8	+50.5	105.7	12	26.5	+51.0	105.9	12	09.9	+51.6	106.1	11	53.1	+52.2	106.3
3	14	19.2	+48.7	104.4	14	04.2	+49.3	104.7	13	48.9	+49.1	104.9	13	33.3	+50.5	105.1	13	17.5	+51.0	105.4	13	01.5	+51.5	105.6	12	45.3	+52.0	105.8
4	15	0.9	+48.6	103.8	14	53.5	+49.1	104.1	14	38.7	+49.4	104.3	14	23.8	+50.3	104.6	14	08.5	+50.9	104.8	13	53.0	+52.0	105.1	13	37.3	+52.0	105.5
5	15	56.5	+48.5	103.2	15	42.6	+49.1	103.5	15	28.5	+49.7	103.8	15	14.1	+50.3	104.0	14	59.4	+50.9	104.3	14	44.5	+51.4	104.5	14	29.3	+52.0	104.8
6	16	45.0	+48.3	102.6	16	31.7	+49.0	102.9	16	18.2	+49.6	103.2	16	04.4	+50.2	103.5	15	50.3	+50.8	103.7	15	35.9	+51.3	104.0	15	21.3	+51.8	104.3
7	17	33.3	+48.3	102.0	17	20.7	+48.9	102.3	17	07.8	+49.5	102.6	16	54.6	+50.1	102.9	16	41.1	+50.6	103.2	16	27.2	+51.3	103.5	16	13.1	+51.8	103.7
8	18	21.6	+48.1	101.3	18	09.6	+48.8	101.7	17	57.3	+49.4	102.0	17	47.4	+50.0	102.3	17	31.7	+50.6	102.6	17	18.5	+51.1	102.9	17	04.9	+51.7	103.2
9	19	09.7	+48.0	100.7	18	58.4	+48.6	101.1	18	46.7	+49.3	101.4	18	34.7	+49.8	101.7	18	22.3	+50.5	102.0	18	09.6	+51.1	102.4	17	56.6	+51.6	102.7
10	19	57.7	+47.8	100.1	19	47.0	+48.5	100.4	19	36.0	+49.1	100.8	19	24.5	+49.8	101.1	19	12.8	+50.3	101.5	19	0.7	+50.9	101.8	18	48.2	+51.5	102.2
11	20	45.5	+47.7	99.4	20	35.5	+48.4	99.8	20	25.1	+49.0	100.2	20	14.3	+49.7	100.5	20	03.1	+50.3	100.9	19	51.6	+50.9	101.3	19	39.7	+51.4	101.6
12	21	33.2	+47.6	98.8	21	23.9	+48.2	99.2	21	14.1	+48.9	99.6	21	04.0	+49.5	99.9	20	53.4	+50.1	100.3	20	42.5	+50.7	100.7	20	31.1	+51.4	101.1
13	22	20.8	+47.4	98.1	22	12.1	+48.1	98.5	22	03.0	+48.7	98.9	21	53.5	+49.4	99.3	21	43.5	+50.0	99.7	21	33.2	+50.6	100.1	21	11.3	+51.8	100.9
14	23	08.2	+47.2	97.5	23	00.2	+47.9	97.9	22	51.7	+48.6	98.3	22	42.9	+49.2	98.7	22	33.5	+49.9	99.1	22	23.8	+50.5	99.5	22	13.7	+51.0	99.9
15	23	55.4	+47.1	96.8	23	48.1	+47.8	97.2	23	40.3	+48.5	97.7	23	32.1	+49.1	98.1	23	23.4	+49.8	98.5	23	14.3	+50.4	99.0	23	04.7	+51.0	99.4
16	24	42.5	+46.8	96.1	24	35.9	+47.5	96.6	24	28.8	+48.2	97.0	24	21.2	+48.9	97.5	24	13.2	+49.5	97.9	24	04.7	+50.2	98.4	23	55.7	+50.8	98.8
17	25	29.3	+46.7	95.4	25	23.4	+47.4	95.9	25	17.0	+48.1	96.4	25	10.1	+48.8	96.8	25	02.7	+49.5	97.3	25	54.9	+50.1	97.8	24	37.7	+51.3	98.7
18	26	16.0	+46.5	94.7	26	10.8	+47.2	95.2	26	05.1	+47.9	95.7	25	58.9	+48.6	96.2	25	52.2	+49.2	96.7	25	45.0	+49.9	97.1	25	29.0	+51.2	98.1
19	27	02.5	+46.2	94.0	26	58.0	+47.0	94.5	26	53.0	+47.7	95.0	26	47.5	+48.4	95.5	26	41.4	+49.1	96.0	26	34.9	+49.7	96.5	26	27.8	+50.4	97.0
20	27	48.7	+46.0	93.3	27	45.0	+46.8	93.8	27	40.7	+47.5	94.3	27	35.9	+48.2	94.9	27	30.5	+48.9	95.4	27	24.6	+49.6	95.9	27	18.2	+50.2	96.4
21	28	34.7	+45.8	92.6	28	31.8	+46.5	93.1	28	28.2	+47.3	93.7	28	24.1	+48.0	94.2	28	19.4	+48.8	94.7	28	14.2	+49.4	95.3	28	8.8	+50.1	95.8
22	29	20.5	+45.5	91.8	29	18.3	+46.3	92.4	29	15.5	+47.1	93.0	29	12.1	+47.8	93.5	29	8.8	+48.5	94.1	29	0.3	+49.2	94.6	28	58.5	+49.9	95.2
23	30	06.0	+45.3	91.1	30	04.6	+46.1	91.7	30	02.6	+46.8	92.3	29	59.9	+47.6	92.8	29	56.7	+48.3	93.4	29	52.8	+49.1	94.0	29	48.4	+49.7	94.5
24	30	51.3	+45.0	90.3	30	50.7	+45.8	90.9	30	49.4	+46.4	91.5	30	47.5	+47.4	92.1	30	41.0	+48.1	92.7	30	38.1	+49.5	93.3	30	33.7	+50.2	94.5
25	31	36.3	+44.7	89.5	31	36.5	+45.5	90.2	31	36.0	+46.3	90.8	31	34.9	+47.1	91.4	31	33.1	+47.8	92.0	31	30.7	+48.4	92.6	31	27.6	+49.3	93.2
26	32	21.0	+44.5	88.8	32	22.0	+45.3	89.4	32	22.3	+46.1	90.0	32	22.0	+46.8	90.7	32	20.9	+47.9	91.3	32	19.3	+48.3	91.9	32	16.9	+49.1	92.6
27	33	05.5	+44.1	88.0	33	07.3	+44.9	88.6	33	08.4	+45.7	89.3	33	08.8	+46.8	89.9	33	08.5	+47.4	90.6	33	07.6	+48.1	91.2	33	06.0	+48.8	91.9
28	33	49.6	+43.8	87.1	33	52.2	+44.7	87.8	33	54.1	+45.5	88.5	33	55.4	+46.3	89.2	33	55.9	+47.1	89.8	33	55.7	+47.9	90.5	33	54.8	+48.7	91.8
29	34	33.4	+43.4	86.3	34	36.9	+44.3	87.0	34	39.6	+45.2	87.7	34	41.7	+46.0	88.4	34	43.0	+46.8	89.1	34	43.6	+47.6	89.8	34	43.5	+48.3	90.5
30	35	16.8	+43.1	85.5	35	21.2	+43.9	86.2	35	24.8	+44.8	86.9	35	27.7	+45.7	87.6	35	29.8	+46.5	88.3	35	31.2	+47.3	89.0	35	31.8	+48.1	89.7
31	35	59.9	+42.7	84.6	36	05.1	+43.7	85.3	36	09.6	+44.5	86.1	36	13.4	+45.3	86.8	36	16.3	+46.2	87.5	36	18.5	+47.9	88.0	36	20.6	+48.6	89.7
32	36	42.6	+42.3	83.8	36	48.8	+43.2	84.5	36	54.1	+44.2	85.2	36	58.7	+45.0	86.0	37	02.5	+45.9	86.7	37	05.5	+46.7	87.5	37	07.8	+47.5	88.0
33	37	24.9	+42.0	82.9	37	32.0	+42.9	83.6	37	38.3	+43.7	84.4	37	43.7	+44.7	85.2	37	48.4	+45.5	85.9	37	52.2	+46.2	86.7	37	57.5	+48.1	88.3
34	38	14.9	+41.5	82.0	38	14.9	+42.4	82.7	38	22.0	+43.4	83.5	38	28.4	+44.3	84.3	38	33.9	+45.2	85.1	38	38.6	+46.1	85.9	38	42.5	+47.7	87.5
35	38	48.4	+41.0	81.0	38	57.3	+42.0	81.8	39	05.4	+43.0	82.6	39	12.7	+43.9	83.4	39	19.1	+44.8	84.3	39	24.7	+45.7	85.1	39	29.4	+46.6	86.7
36	39	29.4	+40.6	80.1	39	39.3	+41.6	80.9	39	48.4	+42.5	81.7	39	56.6	+43.5	82.6	40	03.9	+44.4	83.4	40	10.4	+45.3	84.2	40	16.0	+46.2	85.1
37	40	10.0	+40.1	79.1	40	20.9	+41.1	80.0	40	30.9	+42.1	80.8	40	40.1	+43.0	81.7	40	48.3	+44.0	82.5	40	55.7	+44.9	83.4	41	60.7	+45.8	84.5
38	40	50.1	+39.6	78.2	41	02.0	+40.6	79.0	41	13.0	+41.6	79.9	41	23.1	+42.6	80.7	41	32										

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $70^\circ$ ,  $290^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	11	52.7	-49.0	106.2	11	35.8	-49.5	106.4	11	18.8	-50.2	106.6	11	01.6	-50.7	106.8	10	44.1	-51.2	107.0	10	26.5	-51.7	107.2	10	08.7	-52.2	107.3	9	50.8	-52.8	107.5	0
1	11	03.7	-49.1	106.8	10	46.3	-49.7	107.0	10	28.6	-50.2	107.2	10	10.9	-50.8	107.3	9	52.9	-51.3	107.5	9	34.8	-51.8	107.7	9	16.5	-52.3	107.8	8	58.0	-52.8	108.0	1
2	10	14.6	-49.1	107.4	9	56.6	-49.7	107.6	9	38.4	-50.2	107.7	9	20.1	-50.8	107.9	9	01.6	-51.3	108.0	8	43.0	-51.9	108.2	8	24.2	-52.4	108.3	8	05.2	-52.8	108.5	3
3	9	25.5	-49.2	108.0	9	06.9	-49.8	108.1	8	48.2	-50.3	108.3	8	29.3	-50.9	108.4	8	10.3	-51.4	108.6	7	51.1	-51.9	108.7	7	31.8	-52.4	108.8	7	12.4	-52.8	108.9	3
4	8	36.3	-49.2	108.5	8	17.1	-49.8	108.7	7	57.9	-50.0	108.8	7	38.4	-50.9	109.0	7	18.9	-51.4	109.1	6	59.2	-51.9	109.2	6	39.4	-52.4	109.3	6	19.6	-52.9	109.4	4
5	7	47.1	-49.3	109.1	7	27.3	-49.8	109.2	7	07.5	-50.4	109.4	6	47.5	-50.9	109.5	6	27.5	-51.5	109.6	6	07.3	-51.9	109.7	5	47.0	-52.4	109.8	5	26.7	-52.9	109.9	5
6	6	57.8	-49.4	109.7	6	37.5	-49.9	109.8	6	17.1	-50.4	109.9	5	56.6	-50.9	110.0	5	36.0	-51.4	110.1	5	15.4	-52.0	110.2	4	54.6	-52.5	110.3	4	33.8	-53.0	110.4	6
7	6	08.4	-49.3	110.3	5	47.6	-49.9	110.4	5	26.7	-50.5	110.5	5	05.7	-51.0	110.5	4	44.6	-51.5	110.6	4	23.4	-52.0	110.7	4	02.1	-52.4	110.8	3	40.8	-52.9	110.8	7
8	5	19.1	-49.4	110.8	4	57.7	-50.0	110.9	4	36.2	-50.5	111.0	4	14.7	-51.0	111.1	3	53.1	-51.5	111.1	3	31.4	-52.0	111.2	3	09.7	-52.5	111.3	2	47.9	-53.0	111.3	8
9	4	29.7	-49.5	111.4	4	07.7	-49.9	111.5	3	45.7	-50.5	111.5	3	23.7	-51.1	111.6	3	01.6	-51.6	111.7	2	39.4	-52.0	111.7	2	17.2	-52.5	111.7	1	54.9	-52.9	111.8	9
10	3	40.2	-49.4	112.0	3	17.8	-50.0	112.0	2	55.2	-50.5	112.1	2	32.6	-51.0	112.1	2	10.0	-51.5	112.2	1	47.4	-52.1	112.2	1	24.7	-52.5	112.2	1	02.0	-53.0	112.2	10
11	2	50.8	-49.5	112.5	2	27.8	-50.0	112.6	2	04.7	-50.5	112.6	1	41.6	-51.0	112.7	1	18.5	-51.6	112.7	0	55.3	-52.0	112.7	0	32.2	-52.5	112.7	0	09.0	-52.9	112.7	11
12	2	01.3	-49.4	113.1	1	37.8	-50.0	113.1	1	14.2	-50.5	113.2	0	50.6	-51.0	113.2	0	26.9	-51.5	113.2	0	03.3	-52.0	113.2	0	20.3	+52.5	66.8	0	43.9	+53.0	66.8	12
13	1	11.9	-49.5	113.7	0	47.8	-50.1	113.7	0	23.6	-50.5	113.7	0	00.5	+51.0	66.3	0	24.6	+51.5	66.3	0	48.7	+52.0	66.3	1	12.8	+52.5	66.3	1	36.9	+53.0	66.3	13
14	0	22.4	-49.5	114.2	0	02.3	+50.0	65.8	0	26.9	+50.5	65.8	0	51.5	+51.1	65.8	1	16.1	+51.6	65.8	1	40.7	+52.1	65.8	2	05.3	+52.5	65.8	2	29.9	+52.9	65.9	14
15	0	27.1	+49.5	65.2	0	52.3	+50.0	65.2	1	17.4	+50.6	65.2	1	42.6	+51.0	65.2	2	07.7	+51.5	65.3	2	32.8	+52.0	65.3	2	57.8	+52.5	65.4	3	22.8	+52.9	65.4	15
16	1	16.6	+49.5	64.6	1	42.3	+50.0	64.6	2	08.0	+50.5	64.7	2	33.6	+51.0	64.7	2	59.2	+51.5	64.8	3	24.8	+52.0	64.8	3	50.3	+52.4	64.9	4	15.7	+53.0	64.9	16
17	2	06.1	+49.4	64.1	2	32.3	+50.0	64.1	2	58.5	+50.5	64.2	3	24.6	+51.0	64.2	3	50.7	+51.5	64.2	4	16.8	+51.9	64.3	4	42.7	+52.5	64.4	5	08.7	+52.8	64.5	17
18	3	55.5	+49.5	63.5	3	23.3	+49.9	63.5	3	49.0	+50.5	63.6	4	15.6	+51.0	63.7	4	42.2	+51.5	63.7	5	08.7	+52.0	63.8	5	35.2	+52.4	63.9	6	01.5	+52.9	64.0	18
19	4	34.0	+49.4	62.9	4	12.2	+50.0	63.0	4	39.5	+50.4	63.1	5	06.6	+51.0	63.1	5	33.7	+51.4	63.2	6	00.7	+51.9	63.3	6	27.6	+52.4	63.4	6	54.4	+52.9	63.5	19
20	5	34.4	+49.4	62.4	5	02.2	+49.9	62.4	5	29.9	+50.4	62.5	6	57.6	+50.9	62.6	6	25.1	+51.5	62.7	6	52.6	+51.9	62.8	7	20.0	+52.3	62.9	7	47.3	+52.8	63.0	20
21	5	23.8	+49.3	61.8	5	52.1	+51.9	61.9	6	20.3	+50.4	62.0	6	48.5	+50.9	62.1	7	16.6	+51.3	62.2	7	44.5	+51.9	62.3	8	12.3	+52.4	62.4	8	40.1	+52.7	62.6	21
22	6	13.1	+49.4	61.2	6	42.0	+49.8	61.3	7	10.7	+50.4	61.4	7	39.4	+50.8	61.5	8	07.9	+51.4	61.7	8	36.4	+51.8	61.8	9	04.7	+52.2	61.9	9	32.8	+52.8	62.1	22
23	7	02.5	+49.3	60.6	7	31.8	+49.8	60.8	8	01.1	+50.3	60.9	8	30.2	+50.9	61.0	8	59.3	+51.3	61.1	9	28.2	+51.7	61.3	9	56.9	+52.3	61.4	10	25.6	+52.7	61.6	23
24	8	51.8	+49.2	60.1	8	21.6	+49.6	60.2	8	51.4	+50.3	60.3	9	21.1	+50.7	60.5	9	50.6	+51.2	60.6	10	49.2	+52.2	60.9	11	18.3	+52.6	61.1	24				
25	9	41.0	+49.2	59.5	9	11.4	+49.7	59.6	9	41.7	+50.2	59.8	10	11.8	+50.7	59.9	10	41.8	+51.2	60.1	11	11.7	+51.6	60.2	11	41.4	+52.1	60.4	12	10.9	+52.6	60.6	25
26	10	30.2	+49.1	58.9	10	01.1	+49.6	59.1	10	31.9	+50.1	59.2	11	02.5	+50.7	59.4	11	33.0	+51.1	59.5	12	03.3	+51.6	59.7	12	33.5	+52.1	59.9	13	03.5	+52.5	60.1	26
27	10	19.3	+49.1	58.3	10	50.7	+50.9	58.5	11	22.0	+50.1	58.7	11	53.2	+50.5	58.8	12	24.1	+51.1	59.0	12	54.9	+51.6	59.2	13	25.6	+52.0	59.4	13	56.0	+52.5	59.6	27
28	11	08.4	+49.0	57.7	11	40.3	+49.5	57.9	12	12.1	+50.8	58.1	12	43.7	+50.6	58.3	13	15.2	+51.0	58.5	13	46.5	+51.5	58.7	14	17.6	+51.9	58.9	14	48.5	+52.4	59.1	28
29	11	57.4	+48.9	57.2	12	29.8	+49.5	57.3	13	02.1	+50.0	57.5	13	34.3	+50.4	57.7	14	06.2	+50.9	57.9	14	38.0	+51.4	58.1	15	09.5	+51.9	58.4	15	40.9	+52.3	58.6	29
30	12	46.3	+48.8	56.6	13	19.3	+49.3	56.8	13	41.9	+49.8	57.0	14	24.7	+50.4	57.2	14	57.1	+50.9	57.4	15	29.4	+51.3	57.6	16	01.4	+51.8	57.9	16	33.2	+52.3	58.1	30
31	13	35.1	+48.6	56.0	14	08.6	+49.3	56.2	14	41.9	+49.8	56.4	15	15.1	+50.2	56.6	15	48.0	+50.8	56.8	16	20.7	+51.3	57.1	16	53.2	+51.7	57.3	17	25.5	+52.2	57.6	31
32	14	23.9	+48.6	55.4	14	57.9	+47.9	55.6	15	31.7	+49.7	55.8	16	05.3	+50.2	56.0	16	38.8	+50.6	56.3	17	12.0	+51.1	56.5	17	44.9	+51.7	56.8	18	36.6	+51.9	57.3	32
33	15	12.5	+48.6	54.8	15	47.1	+49.1	55.0	16	21.4	+49.6	55.2	16	55.5	+51.1	55.5	17	29.4	+50.4	55.7	18	03.1	+51.1	56.0	18	36.6	+51.9	56.5	33				
34	16	01.1	+48.5																														

71°, 289° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	11 17.9 +48.9 105.4	11 01.9 +49.5 105.6	10 45.7 +50.0 105.8	10 29.4 +50.5 105.9	10 12.8 +51.1 106.1	9 56.1 +51.6 106.3	9 39.2 +52.1 106.4	9 22.1 +52.7 106.6	0	12 06.8 +48.7 104.8	11 51.4 +49.3 105.0	11 35.7 +50.0 105.2	11 19.9 +50.5 105.4	11 03.9 +51.1 105.6	10 47.7 +51.6 105.8	10 31.3 +52.1 105.9	10 14.8 +52.6 106.1	1	12 55.5 +48.7 104.2	12 40.7 +49.3 104.4	12 25.7 +49.8 104.6	12 10.4 +50.5 104.8	11 55.0 +50.9 105.0	11 39.3 +51.5 105.2	11 23.4 +52.1 105.4	11 07.4 +52.5 105.6	2
1	12 06.8 +48.7 104.8	11 51.4 +49.3 105.0	11 35.7 +50.0 105.2	11 19.9 +50.5 105.4	11 03.9 +51.1 105.6	10 47.7 +51.6 105.8	10 31.3 +52.1 105.9	10 14.8 +52.6 106.1	1	13 44.2 +48.6 103.6	13 30.0 +49.2 103.8	13 15.5 +49.8 104.1	13 00.9 +50.3 104.3	12 45.9 +51.0 104.5	12 30.8 +51.5 104.7	12 15.5 +52.0 104.9	11 59.9 +52.5 105.1	3	14 32.8 +48.5 103.0	14 19.2 +49.1 103.2	14 05.3 +49.7 103.5	13 51.2 +50.3 103.7	13 36.9 +50.8 104.0	13 22.3 +51.9 104.2	13 07.5 +51.9 104.4	12 52.4 +52.5 104.6	4
5	15 21.3 +48.4 102.4	15 08.3 +49.0 102.6	14 55.0 +49.6 102.9	14 41.5 +50.2 103.2	14 27.7 +50.8 103.4	14 13.7 +51.3 103.7	13 59.4 +51.9 103.9	13 44.9 +52.3 104.1	5	16 09.7 +48.2 101.8	15 57.3 +48.9 102.0	15 44.6 +49.6 102.3	15 31.7 +50.1 102.6	15 18.5 +50.7 102.9	15 05.0 +51.3 103.1	14 51.3 +51.7 103.4	14 37.2 +52.4 103.6	6	16 57.9 +48.2 101.1	16 46.2 +48.8 101.4	16 34.2 +49.4 101.7	16 21.8 +50.0 102.0	16 09.2 +50.6 102.3	15 56.3 +51.1 102.6	15 43.0 +51.8 102.9	15 29.6 +52.2 103.1	7
8	17 46.1 +48.1 100.5	17 35.0 +48.7 100.8	17 23.6 +49.3 101.1	17 11.8 +50.0 101.4	16 58.9 +50.5 101.7	16 47.4 +51.1 102.0	16 34.8 +51.6 102.3	16 21.8 +52.2 102.6	8	18 34.2 +47.9 99.9	18 23.7 +48.6 100.2	18 12.9 +49.2 100.5	18 01.8 +49.8 100.9	17 50.3 +50.4 101.2	17 38.5 +51.0 101.5	17 26.4 +51.5 101.8	17 14.0 +52.1 102.1	9									
10	19 22.1 +47.8 99.2	19 12.3 +48.4 99.6	19 02.1 +49.1 99.9	18 51.6 +49.7 100.3	18 40.7 +50.3 100.6	18 29.5 +50.9 100.9	18 17.9 +51.5 101.3	18 06.1 +52.0 101.6	10	20 09.9 +47.6 98.6	20 00.7 +48.3 99.0	19 51.2 +48.9 99.3	19 41.3 +49.6 99.7	19 31.0 +50.2 100.0	19 20.4 +50.8 100.4	19 09.4 +51.4 100.7	18 58.1 +51.9 101.1	11									
12	20 57.5 +47.5 98.0	20 49.0 +48.2 98.3	20 40.1 +48.7 98.7	20 30.9 +49.4 99.1	20 21.2 +50.1 99.4	20 11.2 +50.7 99.8	20 00.8 +51.2 100.2	19 50.0 +51.8 100.5	12	21 45.0 +47.4 97.3	21 37.2 +48.0 97.7	21 29.0 +48.7 98.1	21 20.3 +49.4 98.5	21 11.3 +49.9 98.9	21 01.9 +50.5 99.2	20 52.0 +51.2 99.6	20 41.8 +51.7 100.0	13									
14	22 32.4 +47.1 96.6	22 25.2 +47.9 97.0	22 17.7 +48.5 97.5	22 09.7 +49.1 97.9	22 01.2 +49.9 98.3	21 52.4 +50.5 98.7	21 43.2 +51.0 99.1	21 33.5 +51.7 99.4	14	23 19.5 +47.0 96.0	23 13.1 +47.7 96.4	23 06.2 +48.4 96.8	22 58.8 +49.1 97.2	22 51.1 +49.7 97.7	22 42.9 +50.3 98.1	22 34.2 +50.9 98.5	22 25.2 +51.5 98.9	15									
16	24 06.5 +46.9 95.3	24 00.8 +47.5 95.7	23 54.6 +48.2 96.2	23 47.9 +48.9 96.6	23 40.8 +49.5 97.0	23 33.2 +50.1 97.5	23 25.1 +50.8 97.9	23 16.7 +51.3 98.3	16	24 53.4 +46.6 94.6	24 48.3 +47.4 95.1	24 42.8 +48.0 95.5	24 36.8 +48.7 96.0	24 30.3 +49.4 96.4	24 23.3 +50.1 96.9	24 15.9 +50.7 97.3	24 08.0 +51.3 97.8	17									
18	25 40.0 +46.4 93.9	25 35.7 +47.1 94.4	25 30.8 +47.9 94.9	25 25.4 +48.6 95.3	25 19.7 +49.2 95.8	25 13.4 +49.9 96.3	25 06.6 +50.5 96.7	25 59.3 +51.1 97.2	18	26 26.4 +46.2 93.2	26 22.8 +47.0 93.7	26 18.7 +47.7 94.2	26 14.1 +48.3 94.7	26 08.9 +49.1 95.2	26 03.3 +49.7 95.7	26 50.4 +51.0 96.6	26 41.4 +50.8 96.0	19									
20	27 12.6 +46.0 92.5	27 09.8 +46.7 93.0	27 06.4 +47.5 93.5	27 02.4 +48.2 94.0	26 58.0 +48.9 94.5	26 53.0 +49.5 95.0	26 47.5 +50.2 95.5	26 41.4 +50.8 96.0	20	27 58.6 +45.8 91.8	27 56.5 +46.6 92.3	27 53.9 +47.2 92.8	27 50.6 +48.0 93.3	27 46.9 +48.7 93.9	27 42.5 +49.4 94.4	27 37.7 +50.0 94.9	27 32.2 +50.7 95.4	21									
22	28 44.4 +45.5 91.0	28 43.1 +46.3 91.6	28 41.1 +47.1 92.1	28 38.6 +47.8 92.7	28 35.6 +48.4 93.2	28 31.9 +49.2 93.8	28 27.7 +49.9 94.3	28 22.9 +50.5 94.8	22	29 29.9 +45.3 90.3	29 29.4 +46.0 90.8	29 28.2 +46.8 91.4	29 26.4 +47.6 92.0	29 24.0 +48.3 92.5	29 21.1 +49.0 93.1	29 17.6 +49.6 93.7	29 13.4 +50.4 94.2	23									
24	30 15.2 +45.0 89.5	30 15.4 +45.8 90.1	30 15.0 +46.6 90.7	30 14.0 +47.3 91.3	30 12.3 +48.1 91.9	30 10.1 +48.8 92.4	30 07.2 +49.5 93.0	30 03.8 +50.2 93.6	24	31 00.2 +44.7 88.8	31 01.2 +45.5 89.4	31 01.6 +46.3 90.0	31 01.3 +47.1 90.6	31 00.4 +47.9 91.2	30 58.9 +48.6 91.8	30 56.7 +49.3 92.4	30 54.0 +49.9 93.0	25									
26	31 44.9 +44.5 88.0	31 46.7 +45.3 88.6	31 47.9 +46.1 89.2	31 48.4 +46.9 89.8	31 48.3 +47.6 90.4	31 47.5 +48.3 91.1	31 46.0 +49.1 91.7	31 43.9 +49.8 92.3	26	32 29.4 +44.1 87.2	32 32.0 +45.0 87.8	32 34.0 +45.8 88.5	32 35.3 +46.5 89.1	32 35.9 +47.3 89.7	32 35.8 +48.1 90.4	32 35.1 +48.8 91.0	32 33.7 +49.6 91.6	27									
28	33 13.5 +43.8 86.4	33 17.0 +44.6 87.0	33 19.8 +45.4 87.7	33 21.8 +46.3 88.3	33 23.2 +47.1 89.0	33 23.9 +47.9 89.7	33 23.9 +48.7 90.3	33 23.3 +49.3 91.0	28	34 01.2 +44.7 88.8	34 01.9 +45.3 89.4	34 01.6 +46.3 89.6	34 01.4 +46.1 89.8	34 01.2 +45.8 90.4	34 12.6 +48.3 90.6	34 12.6 +49.1 90.3	34 12.6 +49.1 90.3	29									
29	35 00.2 +44.7 88.8	35 01.2 +45.5 89.4	35 01.6 +46.3 89.4	35 01.3 +47.1 89.6	35 01.0 +47.9 91.2	35 58.9 +48.6 91.8	35 56.7 +49.3 92.4	35 54.0 +49.9 93.0	30	35 24.9 +44.8 88.0	35 27.7 +45.6 88.6	35 30.4 +46.4 89.2	35 33.2 +47.2 89.8	35 36.9 +47.8 90.3	35 36.9 +48.3 90.8	35 36.9 +48.3 90.8	35 36.9 +48.3 90.8	31									
30	36 40.8 +43.2 84.7	34 46.0 +44.0 85.4	34 50.4 +44.9 86.1	34 54.2 +45.7 86.8	34 57.1 +46.6 87.5	34 59.4 +47.3 88.2	34 59.0 +48.1 88.9	34 58.6 +48.8 89.5	30	37 12.7 +41.2 80.3	38 22.4 +42.1 81.1	38 31.3 +43.1 81.9	38 39.4 +43.9 82.7	38 46.6 +44.9 83.5	38 53.0 +45.8 84.3	38 58.6 +46.6 85.1	39 03.3 +47.5 85.9	35									
31	35 24.0 +42.7 83.9	35 30.0 +43.7 84.6	35 35.3 +44.6 85.3	35 39.9 +45.4 86.0	35 43.7 +46.2 86.7	35 46.7 +47.1 87.4	35 49.0 +47.9 88.2	35 50.8 +48.6 88.9	31	36 06.7 +42.4 83.0	36 13.7 +43.3 83.7	36 19.9 +44.1 84.5	36 25.3 +45.0 85.2	36 29.9 +45.9 85.9	36 33.8 +46.7 86.7	36 36.9 +47.5 87.4	36 39.2 +48.3 88.2	32									
32	37 46.9 +41.2 82.1	37 39.9 +42.5 82.0	37 47.9 +43.4 82.8	37 55.0 +44.4 83.5	38 01.4 +45.2 84.3	38 06.9 +46.1 85.1	38 11.7 +46.9 85.9	38 15.6 +47.7 86.7	34	38 12.7 +41.2 80.3	38 22.4 +42.1 81.1	38 31.3 +43.1 81.9	38 39.4 +43.9 82.7	38 46.6 +44.9 83.5	38 53.0 +45.8 84.3	38 58.6 +46.6 85.1	39 03.3 +47.5 85.9	35									
33	38 53.9 +40.7 79.4	39 04.5 +41.7 80.2	39 14.4 +42.6 81.0	39 23.3 +43.6 81.8	39 31.5 +44.5 82.6	39 38.8 +45.3 83.4	39 45.2 +46.3 84.3	39 50.8 +47.1 85.1	33	39 34.6 +40.2 78.4	39 46.2 +41.2 79.2	39 57.0 +42.2 80.1	40 06.9 +43.1 80.9	40 16.0 +44.0 81.7	40 24.1 +45.0 82.6	40 31.5 +45.8 83.4	40 37.9 +46.8 84.3	37									
34	40 14.8 +39.8 77.5	40 27.4 +40.8 78.3	40 39.2 +41.7 79.1	40 50.0 +42.7 80.0	40 61.0 +43.7 80.8	41 09.1 +44.6 81.7	41 17.3 +45.5 82.6	41 24.7 +46.3 83.4	39	40 54.6 +39.2 76.5	41 08.2 +40.2 77.3	41 20.9 +41.2 78.2	41 32.7 +42.3 79.1	41 43.7 +43.2 79.9	41 53.7 +44.2 80.8	42 02.8 +45.1 81.7	42 11.0 +46.0 82.6	39									
40	41 33.8 +38.7 75.5	41 48.4 +39.7 76.3	42 02.1 +40.8 77.2	42 15.0 +41.7 78.1	42 26.9 +42.7 79.0	42 37.9 +43.7 79.9	42 47.9 +44.7 80.8	42 57.0 +45.6 81.7	37	42 12.5 +38.1 74.4	42 28.1 +39.2 75.3	42 42.9 +40.2 76.2	42 56.7 +41.2 77.1	43 09.6 +42.3 78.0	43 21.6 +42.2 79.0	43 32.2 +44.2 79.9	43 42.6 +45.2 80.8	41									
42	42 50.6 +37.5 73.4	43 07.3 +38.6 74.3	43 23.1 +39.6 75.2	43 37.9 +40.7 76.1	43 51.9 +41.7 77.1	44 04.8 +42.8 78.0	44 16.8 +43.8 78.9	44 27.8 +44.7 79.9	42	43 28.1 +37.0 72.3	43 45.9 +38.0 73.2	44 02.7 +39.1 74.2	44 18.6 +40.2 75.1	44 33.6 +41.2 76.1	44 47.6 +42.2 77.0	45 00.6 +43.2 78.0	45 12.5 +44.3 79.0	43									
44	44 41.4 +35.6 70.1	45 01.3 +36.8 71.1	45 20.3 +37.9 72.0	45 38.3 +39.0 73.0	45 55.4 +44.0 74.0	46 11.5 +41.1 75.0	46 26.5 +42.2 76.0	46 46.5 +42.2 77.0	45	45 32.3 +31.9 64.2	45 58.0 +33.0 65.2	46 22.7 +34.2 66.2	46 46.4 +35.4 67.2	47 21.5 +37.4 68.5	48 08.5 +37.4 69.5	49 58.2 +38.4 70.5	50 10.7 +40.2 71.6	50									
45	45 17.0 +34.9 69.0	45 38.1 +36.0 69.9	45 58.2 +37.2 70.9	46 17.3 +38.3 71.9	46 35.4 +39.5 72.9	46 52.6 +40.5 73.9	47 08.7 +41.6 74.9	47 23.7 +42.7 76.0	46	45 51.9 +34.3 67.8	46 35.4 +36.5 68.8	46 35.4 +36.5 69.8	46 35.4 +36.5 70.8	47 33.3 +39.5 72.8	47 50.3 +41.0 73.9	48 06.4 +42.1 75.0	47 29.9 +40.8 72.8	49									
47																											

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $71^\circ$ ,  $289^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			Dec.
	Hc	d	Z																						
0	11 17.9	-48.8	105.4	11 01.9	-49.4	105.6	10 45.7	-50.0	105.8	10 29.4	-50.6	105.9	10 12.8	-51.1	106.1	9 56.1	-51.7	106.3	9 39.2	-52.2	106.4	9 22.1	-52.7	106.6	0
1	10 29.1	-49.0	106.0	10 12.5	-49.6	106.1	9 55.7	-50.1	106.3	9 38.8	-50.7	106.5	9 21.7	-51.2	106.6	9 04.4	-51.7	106.8	8 47.0	-52.2	106.9	8 29.4	-52.7	107.1	1
2	9 40.1	-49.0	106.6	9 22.9	-49.6	106.7	9 05.6	-50.2	106.9	8 48.1	-50.7	107.0	8 30.5	-51.3	107.2	8 12.7	-51.8	107.3	7 54.8	-52.3	107.4	7 36.7	-52.7	107.6	3
3	8 51.1	-49.1	107.1	8 33.3	-49.6	107.3	8 15.4	-50.2	107.4	7 57.4	-50.8	107.6	7 39.2	-51.3	107.7	7 20.9	-51.8	107.8	7 02.5	-52.3	107.9	6 44.0	-52.8	108.1	3
4	8 02.0	-49.1	107.7	7 43.7	-49.7	107.9	7 25.2	-50.2	108.0	7 06.6	-50.8	108.1	6 47.9	-51.3	108.2	6 29.1	-51.8	108.3	6 10.2	-52.3	108.4	5 51.2	-52.8	108.5	4
5	7 12.9	-49.2	108.3	6 54.0	-49.8	108.4	6 35.0	-50.3	108.5	6 15.8	-50.8	108.6	5 56.6	-51.3	108.7	5 37.3	-51.9	108.8	5 17.9	-52.4	108.9	4 58.4	-52.8	109.0	5
6	6 23.7	-49.2	108.9	6 04.2	-49.7	109.0	5 44.7	-50.4	109.1	5 25.0	-50.8	109.2	5 05.3	-51.4	109.3	4 45.4	-51.8	109.3	4 25.5	-52.3	109.4	4 05.6	-52.9	109.5	6
7	5 34.5	-49.3	109.5	5 14.5	-49.8	109.5	4 54.3	-50.3	109.6	4 34.2	-50.9	109.7	4 13.9	-51.4	109.8	3 53.6	-51.9	109.8	3 33.2	-52.4	109.9	3 12.7	-52.8	110.0	7
8	4 45.2	-49.2	110.0	4 24.7	-49.9	110.1	4 04.0	-50.4	110.2	3 43.3	-50.9	110.2	3 22.5	-51.4	110.3	3 01.7	-51.9	110.3	2 40.8	-52.4	110.4	2 19.9	-52.9	110.4	8
9	3 56.0	-49.3	110.6	3 34.8	-49.8	110.7	3 13.6	-50.4	110.7	2 52.4	-50.9	110.8	2 31.1	-51.4	110.8	2 09.8	-52.0	110.8	1 48.4	-52.4	110.9	1 27.0	-52.9	110.9	9
10	3 06.7	-49.3	111.2	2 45.0	-49.9	111.2	2 23.2	-50.3	111.3	2 01.5	-50.9	111.3	1 39.7	-51.5	111.3	1 17.8	-51.9	111.3	0 56.0	-52.4	111.4	0 34.1	-52.8	111.4	10
11	2 17.4	-49.4	111.7	1 55.1	-49.9	111.8	1 32.9	-50.5	111.8	1 10.6	-51.0	111.8	0 48.2	-51.4	111.8	0 25.9	-51.9	111.8	0 03.6	-52.4	111.9	0 18.7	-52.8	111.9	11
12	1 28.0	-49.3	112.3	1 05.2	-49.8	112.3	0 42.4	-50.4	112.3	0 19.9	-50.9	112.4	0 03.2	-51.4	112.4	0 26.0	+51.9	112.7	1 11.6	+52.9	112.7	1 27.0	+52.9	112.7	12
13	0 38.7	-49.3	112.9	0 15.4	-49.9	112.9	0 08.0	+50.4	67.1	0 31.3	+50.9	67.1	0 54.6	+51.4	67.1	1 17.9	+51.9	67.1	1 41.2	+52.4	67.2	2 04.5	+52.8	67.2	13
14	0 10.6	+49.4	66.6	0 34.5	+49.9	66.6	0 58.4	+50.4	66.6	1 22.2	+50.9	66.6	1 46.0	+51.5	66.6	2 09.8	+52.0	66.6	2 33.6	+52.4	66.7	2 57.3	+52.9	66.7	14
15	1 00.0	+49.3	66.0	1 24.4	+49.9	66.0	1 48.8	+50.4	66.0	2 13.1	+50.9	66.1	2 37.5	+51.4	66.1	3 01.8	+51.8	66.1	3 26.0	+52.4	66.2	3 50.2	+52.8	66.3	15
16	1 49.3	+49.3	65.4	1 23.4	+49.8	65.4	2 39.2	+50.4	65.5	3 04.0	+50.9	65.5	3 28.9	+51.4	65.6	4 18.4	+52.3	65.6	4 43.0	+52.8	65.8	5 35.8	+52.8	65.3	16
17	2 38.6	+49.3	64.8	3 04.1	+49.9	64.9	3 29.6	+50.3	64.9	3 54.9	+50.9	65.0	4 20.3	+51.3	65.1	5 10.7	+52.3	65.2	10 24.2	+52.1	62.2	10 52.1	+52.5	62.4	17
18	3 27.9	+49.3	64.3	3 54.0	+49.8	64.3	4 19.9	+50.3	64.4	4 45.8	+50.9	64.5	5 11.6	+51.4	64.5	6 03.0	+52.3	64.7	6 28.6	+52.8	64.8	18			
19	4 17.2	+49.3	63.7	4 43.8	+49.8	63.8	5 10.2	+50.4	63.9	5 36.7	+50.8	63.9	6 03.0	+51.3	64.0	6 29.2	+51.8	64.1	6 55.3	+52.3	64.2	7 21.4	+52.7	64.3	19
20	5 06.5	+49.2	63.1	5 33.6	+49.7	63.2	6 00.6	+50.2	63.3	6 27.5	+50.8	63.4	6 54.3	+51.3	63.5	7 21.0	+51.8	63.6	7 47.6	+52.2	63.7	8 14.1	+52.7	63.9	20
21	5 55.7	+49.2	62.6	6 23.3	+49.7	62.7	6 50.8	+50.3	62.8	7 18.3	+50.7	62.9	7 45.6	+51.2	63.0	8 12.8	+51.7	63.1	8 39.8	+52.2	63.2	9 06.8	+52.6	63.4	21
22	6 44.9	+49.2	62.0	7 13.0	+49.7	62.1	7 41.1	+50.2	62.2	8 09.0	+50.7	62.3	8 36.8	+51.2	62.5	9 04.5	+51.7	62.6	9 32.0	+52.2	62.7	9 59.4	+52.7	62.9	22
23	7 34.1	+49.1	61.4	8 02.7	+49.7	61.5	8 31.3	+50.1	61.7	8 59.7	+50.7	61.8	9 28.0	+51.1	61.9	9 56.2	+51.6	62.1	10 24.2	+52.1	62.2	10 52.1	+52.5	62.4	23
24	8 23.2	+49.0	60.8	8 52.4	+49.5	61.0	9 21.4	+50.1	61.1	9 50.4	+50.6	61.2	10 19.1	+51.1	61.4	10 47.8	+51.6	61.6	11 16.3	+52.0	61.7	11 44.6	+52.8	61.9	24
25	9 12.2	+49.0	60.2	9 41.9	+49.6	60.4	10 11.5	+50.1	60.5	10 41.0	+50.5	60.7	11 10.2	+51.1	60.9	11 39.4	+51.5	61.0	12 08.3	+52.0	61.2	12 37.1	+52.5	61.4	25
26	10 01.2	+49.0	59.7	10 31.5	+49.4	59.8	11 01.6	+49.9	60.0	11 31.5	+50.5	60.1	12 01.3	+51.0	60.3	12 30.9	+51.5	60.5	13 00.3	+52.0	60.7	13 29.6	+52.4	60.9	26
27	10 50.2	+48.8	59.1	11 20.9	+49.4	59.2	11 51.5	+49.9	59.4	12 22.0	+50.4	59.6	12 52.3	+50.9	59.8	13 22.4	+51.4	60.0	13 52.3	+51.9	60.2	14 22.0	+52.3	60.4	27
28	11 39.0	+48.8	58.5	12 10.3	+49.3	58.7	12 41.4	+49.8	58.8	13 12.4	+50.3	59.0	13 43.2	+49.6	59.2	14 13.8	+51.3	59.5	14 44.2	+51.8	59.7	15 14.3	+52.3	59.9	28
29	12 27.8	+48.7	57.9	12 56.9	+49.3	58.1	13 31.3	+49.7	58.3	14 02.7	+50.3	58.5	14 34.0	+50.8	58.7	15 05.1	+51.2	58.9	15 36.0	+51.7	59.2	16 06.6	+52.2	59.4	29
30	13 16.5	+48.7	57.3	13 48.9	+49.1	57.5	14 21.0	+49.7	57.7	14 53.0	+50.2	57.9	15 24.8	+50.7	58.1	15 56.3	+51.2	58.4	16 27.7	+51.6	58.6	16 58.8	+52.1	58.9	30
31	14 05.2	+48.5	56.7	14 38.0	+49.1	56.9	15 10.7	+49.6	57.1	15 43.2	+50.1	57.3	16 15.5	+50.5	57.6	16 47.5	+51.1	57.8	17 19.3	+51.6	58.1	17 50.9	+52.1	58.4	31
32	14 53.7	+48.5	56.1	15 27.1	+49.6	56.3	16 03.0	+49.3	56.5	16 33.3	+50.0	56.8	17 06.1	+50.4	57.0	17 38.6	+51.0	57.3	18 10.9	+51.5	57.6	18 43.0	+51.9	57.8	32
33	15 42.2	+48.3	55.5	16 16.1	+48.9	55.7	16 49.8	+49.4	55.9	17 23.3	+49.9	56.2	17 56.5	+50.4	56.5	18 29.6	+50.9	56.7	19 02.4	+51.3	57.0	19 34.9	+51.8	57.3	33
34	16 30.5	+48.2	54.8	17 05.0	+48.7	55.1	17 39.2	+49.3	55.3	18 13.2	+49.8	55.6	18 46.9	+50.3	55.9	19 20.5	+50.8	56.2	19 53.7	+51.3	56.5	20 26.7	+51.8	56.8	34
35	17 18.7	+48.2	54.2	17 53.7	+48.7	54.5	18 28.5	+49.1	54.7	19 03.0	+49.6	55.0	19 37.2	+50.2	55.3	20 11.3	+50.6	55.6	20 45.0	+51.2	55.9	21 18.5	+51.6	56.2	35
36	18 06.9	+48.0	53.6	18 42.4	+48.5	53.9	19 17.6	+49.1	54.1	19 52.6	+49.6	54.4	20 27.4	+49.1	54.7	21 01.9	+50.6	55.0	21 36.2	+51.0	55.4	22 10.1	+51.6	55.7	36
37	18 54.9	+47.8	53.0	19 30.9	+48.4	53.2	20 06.7	+48.9	53.5	20 42.2	+49.4	53.8	21 17.5	+49.9	54.1	21 52.5	+50.4	54.5	22 27.2	+51.0	54.8	23 01.7	+51.4	55.1	37
38	19 42.7	+47.8	52.3	20 19																					

72°, 288° 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.	53°			54°			55°			56°			57°			58°			59°			Dec.											
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z									
0	10	43.1	+48.7	104.5	10	27.9	+49.3	104.7	10	12.6	+49.9	104.9	9	57.0	+50.5	105.1	9	41.3	+51.1	105.2	9	25.5	+51.5	105.4	8	53.3	+52.6	105.7	0				
1	11	31.8	+48.7	104.0	11	17.2	+49.3	104.1	11	02.5	+49.8	104.3	10	47.5	+50.4	104.5	10	32.4	+50.9	104.7	10	17.0	+51.6	104.9	10	01.5	+52.1	105.1	1				
2	12	20.5	+48.5	103.4	12	06.5	+49.2	103.6	11	52.3	+49.8	103.8	11	37.9	+50.4	104.0	11	23.3	+51.0	104.2	11	08.6	+51.4	104.4	10	38.4	+52.5	104.7	2				
3	13	09.0	+48.5	102.8	12	55.7	+49.1	103.0	12	42.1	+49.7	103.2	12	28.3	+50.3	103.4	12	14.3	+50.8	103.6	12	00.0	+51.4	103.8	11	45.5	+52.0	104.0	3				
4	13	57.5	+48.4	102.1	13	44.8	+49.0	102.4	13	31.8	+49.6	102.6	13	18.6	+50.2	102.9	13	05.1	+50.8	103.1	12	51.4	+51.8	103.3	12	23.3	+52.4	103.7	4				
5	14	45.9	+48.4	101.5	14	33.8	+49.0	101.8	14	21.4	+49.6	102.0	14	08.8	+50.1	102.3	13	55.9	+50.7	102.5	13	42.7	+51.3	102.8	13	29.3	+51.8	103.0	5				
6	15	34.3	+48.2	100.9	15	22.8	+48.8	101.2	15	11.0	+49.4	101.5	14	58.9	+50.1	101.7	14	46.6	+50.6	102.0	14	34.0	+51.2	102.2	14	08.0	+52.3	102.7	6				
7	16	22.5	+48.1	100.3	16	11.6	+48.7	100.6	16	00.4	+49.4	100.9	15	49.0	+49.9	101.2	15	37.2	+50.5	101.4	15	25.2	+51.1	101.7	15	12.9	+51.6	102.0	7				
8	17	10.6	+47.9	99.7	17	00.3	+48.6	100.0	16	49.8	+49.2	100.3	16	38.9	+49.9	100.6	16	27.7	+50.5	100.9	16	16.3	+51.0	101.2	16	04.5	+51.6	101.4	15	52.5	+52.1	101.7	8
9	17	58.5	+47.9	99.0	17	48.9	+48.6	99.4	17	39.0	+49.2	99.7	17	28.8	+49.7	100.0	17	18.2	+50.3	100.3	17	07.3	+50.9	100.6	16	56.1	+51.5	100.9	16	44.6	+52.0	101.2	9
10	18	46.4	+47.7	98.4	18	37.5	+48.3	98.7	18	28.2	+49.0	99.1	18	18.5	+49.7	99.4	18	08.5	+50.3	99.7	17	58.2	+50.9	100.1	17	36.6	+52.0	100.7	10				
11	19	34.1	+47.6	97.8	19	25.8	+48.3	98.1	19	17.2	+48.9	98.5	19	08.2	+49.5	98.8	18	58.8	+50.1	99.2	18	39.0	+51.3	99.8	18	28.6	+51.9	100.2	11				
12	20	21.7	+47.5	97.1	20	14.1	+48.1	97.5	20	06.1	+48.8	97.9	19	57.7	+49.4	98.2	19	48.9	+50.1	98.5	19	30.3	+51.2	99.3	19	20.5	+51.7	99.6	12				
13	21	09.2	+47.3	96.5	21	02.2	+48.0	96.9	20	54.9	+48.6	97.2	20	47.1	+49.3	97.6	20	39.0	+49.9	98.0	20	30.4	+50.6	98.4	20	12.2	+51.7	99.1	13				
14	21	56.5	+47.1	95.8	21	50.2	+47.8	96.2	21	43.5	+48.5	96.6	21	36.4	+49.1	97.0	21	28.9	+49.8	97.4	21	21.0	+50.3	97.8	21	12.6	+51.0	98.2	14				
15	22	43.6	+47.0	95.1	22	38.0	+47.7	95.6	22	32.0	+48.3	96.0	22	25.5	+49.0	96.4	22	18.7	+49.6	96.8	22	11.3	+50.3	97.2	22	03.6	+50.9	97.6	15				
16	23	30.6	+46.8	94.5	23	25.7	+47.5	94.9	23	20.3	+48.2	95.3	23	14.5	+48.9	95.8	23	08.3	+49.5	96.2	23	01.6	+50.2	96.6	22	54.5	+50.7	97.0	16				
17	24	17.4	+46.6	93.8	24	13.2	+47.3	94.2	24	08.5	+48.0	94.7	24	03.4	+48.7	95.1	23	57.8	+49.4	95.6	23	51.8	+50.7	96.4	23	38.3	+51.2	96.9	17				
18	25	04.0	+46.4	93.1	25	00.5	+47.1	93.6	25	56.5	+47.9	94.0	24	52.1	+48.5	94.5	24	47.2	+49.2	94.9	24	41.7	+49.9	95.4	24	35.9	+50.4	95.9	18				
19	25	50.4	+46.2	92.4	25	47.6	+46.9	92.9	25	44.4	+47.6	93.3	25	40.6	+48.4	93.8	25	36.4	+49.0	94.3	25	31.6	+49.7	94.8	25	20.6	+51.0	95.7	19				
20	26	36.6	+45.9	91.7	26	34.5	+46.8	92.2	26	32.0	+47.5	92.7	26	29.0	+48.1	93.2	26	25.4	+48.8	93.7	26	21.3	+49.5	94.2	26	11.6	+50.8	95.1	20				
21	27	22.5	+45.8	91.0	27	21.3	+46.5	91.5	27	19.5	+47.2	92.0	27	17.1	+48.0	92.5	27	14.2	+48.7	93.0	27	10.8	+49.4	93.5	27	0.6	+50.0	94.0	21				
22	28	08.3	+45.5	90.2	28	07.8	+46.3	90.8	28	06.7	+47.1	91.3	28	05.1	+47.8	91.8	28	02.9	+48.5	92.4	28	00.2	+49.1	92.9	27	56.9	+49.8	93.4	22				
23	28	53.8	+45.3	89.5	28	54.1	+46.0	90.0	28	53.8	+46.8	90.6	28	52.9	+47.5	91.1	28	51.4	+48.3	91.7	28	46.7	+49.7	92.8	28	43.5	+50.3	93.3	23				
24	29	39.1	+45.0	88.7	29	40.1	+45.9	89.3	29	40.6	+46.4	89.9	29	39.4	+47.0	90.4	29	38.7	+48.0	91.6	29	36.4	+49.5	92.1	29	33.8	+50.2	92.7	24				
25	30	24.1	+44.8	88.0	30	26.0	+45.5	88.5	30	27.2	+46.3	89.1	30	27.8	+47.1	89.3	30	27.1	+48.6	89.9	30	25.0	+49.2	91.5	30	24.0	+49.9	92.1	25				
26	31	08.9	+44.4	87.2	31	11.5	+45.3	87.8	31	13.5	+46.1	88.4	31	14.9	+46.8	89.0	31	15.6	+47.6	89.6	31	15.7	+48.3	90.2	31	13.9	+49.8	91.4	26				
27	31	53.3	+44.2	86.4	31	56.8	+45.0	87.0	31	59.6	+45.8	87.6	32	01.7	+46.6	88.3	32	03.2	+47.4	88.9	32	04.0	+48.1	89.5	32	03.7	+49.6	90.8	27				
28	32	37.5	+43.9	85.6	32	41.8	+44.7	86.2	32	45.4	+45.5	86.9	32	48.3	+46.3	87.5	32	50.6	+47.1	88.2	32	52.1	+47.9	88.8	32	53.0	+48.7	89.5	28				
29	33	21.4	+43.5	84.8	33	26.5	+44.4	85.4	33	30.9	+45.2	86.1	33	34.6	+46.1	86.8	33	37.7	+46.8	87.4	33	40.0	+47.6	88.1	33	41.7	+48.3	88.8	29				
30	34	04.9	+43.2	84.0	34	10.9	+44.0	84.6	34	16.1	+44.9	85.3	34	20.7	+45.7	86.0	34	24.5	+46.6	86.7	34	27.6	+47.4	87.4	34	30.0	+48.2	88.0	34				
31	34	48.1	+42.8	83.1	34	54.9	+43.7	83.8	35	01.0	+44.6	84.5	35	06.4	+45.5	85.2	35	11.4	+46.2	85.9	35	15.0	+47.1	86.6	35	18.2	+47.8	87.3	31				
32	35	30.9	+42.5	82.3	35	38.6	+43.4	83.0	35	45.6	+45.3	83.7	35	51.9	+45.1	84.4	35	57.3	+46.0	85.1	36	02.1	+46.7	86.6	36	09.2	+48.4	87.3	32				
33	36	13.4	+42.1	81.4	36	22.0	+43.0	82.1	36	29.9	+43.9	82.8	36	37.0	+44.7	83.6	36	43.3	+45.6	84.3	36	48.8	+46.5	85.1	36	57.6	+48.1	86.6	33				
34	36	55.5	+41.7	80.5	37	05.0	+42.6	81.2	37	13.8	+43.5	82.0	37	21.7	+44.2	82.7	37	28.9	+45.3	83.5	37	35.3	+46.1	84.3	37	45.7	+47.7	85.8	34				
35	37	37.2	+41.2	79.6	37	47.6	+42.2	80.4	37	57.3	+43.1	81.1	38	06.1	+44.1	81.9	38	14.2	+44.9	82.7	38	21.4	+45.8	83.5	38	27.8	+46.7	84.3	35				
36	38	18.4	+40.9	78.7	38	29.8	+41.8	79.5	38	40.4	+42.7	80.2	38	50.2	+43.6	81.0	38	59.1	+44.6	81.8	38	07.2	+45.4	82.6	38	39.5	+46.3	83.4	36				
37	38	59.3	+40.3	77.7	39	11.6	+41.3	78.5	39	23.1	+42.3	79.3	39	33.8	+43.2	80.1	39																

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $72^\circ$ ,  $288^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	10	43.1	-48.8	104.5	10	27.9	-49.4	104.7	10	12.6	-50.0	104.9	9	57.0	-50.5	105.1	9	41.3	-51.0	105.2	9	25.5	-51.6	105.4	9	09.5	-52.1	105.6	8	53.3	-52.6	105.7	0
1	9	54.3	-48.9	105.1	9	38.5	-49.4	105.3	9	22.6	-50.0	105.5	9	06.5	-50.6	105.6	8	50.3	-51.1	105.8	8	33.9	-51.7	105.9	8	17.4	-52.2	106.1	8	00.7	-52.7	106.2	1
2	9	05.4	-48.9	105.7	8	49.1	-49.5	105.9	8	32.6	-50.1	106.0	8	15.9	-50.6	106.2	7	59.2	-51.2	106.3	7	42.2	-51.6	106.4	7	25.2	-52.2	106.6	7	08.0	-52.6	106.7	3
3	8	16.5	-49.0	106.3	7	59.6	-49.6	106.4	7	42.5	-50.1	106.6	7	25.3	-50.6	106.7	7	08.0	-51.2	106.8	6	50.6	-51.7	106.9	6	33.0	-52.2	107.1	6	15.4	-52.7	107.2	4
4	7	27.5	-49.0	106.9	7	10.0	-49.6	107.1	6	52.4	-50.7	107.1	6	16.8	-51.7	107.2	5	58.9	-51.4	107.5	5	40.8	-52.2	107.6	5	22.7	-52.8	107.8	4				
5	6	38.5	-49.1	107.5	6	20.4	-49.6	107.6	6	02.2	-50.1	107.7	5	44.0	-50.8	107.8	5	25.6	-51.3	107.9	5	07.1	-51.7	108.0	4	48.6	-52.3	108.1	4	29.9	-52.7	108.1	5
6	5	49.4	-49.1	108.1	5	30.8	-49.7	108.2	5	12.1	-50.3	108.2	4	53.2	-50.7	108.3	4	34.3	-51.2	108.4	4	15.4	-51.8	108.5	3	56.3	-52.3	108.5	3	37.2	-52.8	108.6	6
7	5	00.3	-49.1	108.6	4	41.1	-49.7	108.7	4	21.8	-50.2	108.8	4	02.5	-50.8	108.9	3	43.1	-51.3	108.9	3	23.6	-51.8	109.0	3	04.0	-52.3	109.0	2	44.4	-52.7	109.1	7
8	4	11.2	-49.1	109.2	3	51.4	-49.7	109.3	3	31.6	-50.2	109.3	3	11.7	-50.8	109.4	2	51.8	-51.3	109.4	2	31.8	-51.8	109.5	2	11.7	-52.3	109.5	1	51.7	-52.8	109.6	8
9	3	22.1	-49.2	109.8	3	01.7	-49.7	109.8	2	41.4	-50.3	109.9	2	02.9	-50.8	109.9	2	00.5	-51.4	110.0	1	40.0	-51.9	110.0	0	58.9	-52.8	110.0	9				
10	2	32.9	-49.2	110.4	2	12.0	-49.7	110.4	1	51.1	-50.3	110.4	1	30.1	-50.8	110.5	1	09.1	-51.3	110.5	0	48.1	-51.8	110.5	0	27.1	-52.3	110.5	0	06.1	-52.8	110.5	10
11	1	43.7	-49.2	110.9	1	22.3	-49.8	111.0	1	00.8	-50.3	111.0	0	39.3	-50.8	111.0	0	17.8	-51.3	111.0	0	03.7	+51.8	69.0	0	25.2	+52.3	69.0	0	46.7	+52.7	69.0	11
12	0	54.5	-49.2	111.5	0	32.5	-49.7	111.5	0	10.5	-50.3	111.5	0	33.5	-50.8	111.5	0	33.5	-51.8	68.5	0	55.5	-52.1	68.5	1	17.5	-52.3	68.5	1	39.4	+52.8	68.5	12
13	0	05.3	-49.2	112.1	0	17.2	+49.8	67.9	0	39.8	+50.2	67.9	1	02.3	+50.8	67.9	1	24.8	+51.3	68.0	1	47.3	+51.8	68.0	2	09.8	+52.3	68.0	2	32.2	+52.8	68.1	13
14	0	43.9	+49.2	67.4	1	07.0	+49.7	67.4	1	30.0	+50.3	67.4	1	53.1	+50.8	67.4	2	16.1	+51.3	67.4	2	39.1	+51.8	67.5	3	02.1	+52.3	67.5	3	25.0	+52.7	67.6	14
15	1	33.1	+49.1	66.8	1	56.7	+49.7	66.8	2	20.3	+50.3	66.8	2	43.9	+50.8	66.8	3	07.4	+51.3	66.9	3	30.9	+51.8	67.0	3	54.4	+52.2	67.0	4	17.7	+52.8	67.1	15
16	2	22.2	+49.2	66.2	2	46.4	+49.8	66.2	3	10.6	+50.2	66.3	3	34.7	+50.7	66.3	3	58.7	+51.3	66.4	4	22.7	+51.8	66.5	4	46.6	+52.3	66.5	5	10.5	+52.7	66.6	16
17	3	11.4	+49.2	65.6	3	36.2	+49.8	65.7	4	00.8	+50.3	65.7	4	25.4	+50.8	65.8	4	50.0	+51.2	65.9	5	14.5	+51.7	66.0	5	38.9	+52.2	66.1	6	03.2	+52.6	66.1	17
18	4	00.6	+49.1	65.1	4	25.8	+49.7	65.1	4	51.1	+50.1	65.2	5	16.2	+50.7	65.3	5	41.2	+51.2	65.4	6	06.2	+51.7	65.5	6	31.1	+52.2	65.6	7	55.8	+52.7	65.7	18
19	4	49.7	+49.1	64.5	5	15.5	+49.7	64.6	5	41.2	+50.2	64.6	6	06.9	+50.7	64.7	6	32.4	+51.2	64.8	6	57.9	+51.7	64.9	7	23.3	+52.1	65.1	7	48.5	+52.6	65.2	19
20	5	38.8	+49.1	63.9	6	05.2	+49.6	64.0	6	31.4	+50.1	64.1	6	57.6	+50.6	64.2	7	23.6	+51.2	64.3	7	49.6	+51.6	64.4	8	15.4	+52.1	64.5	8	81.1	+52.6	64.7	20
21	6	27.9	+49.0	63.3	6	54.8	+49.5	63.4	7	21.5	+50.1	63.5	7	48.2	+50.6	63.7	8	14.8	+51.1	63.8	8	41.2	+51.6	63.9	9	07.5	+52.1	64.1	9	33.7	+52.5	64.2	21
22	7	16.9	+49.0	62.7	7	44.3	+49.5	62.9	8	11.6	+50.1	63.0	8	38.8	+50.6	63.1	9	05.9	+51.0	63.3	9	32.8	+51.6	63.4	9	59.6	+52.0	63.6	10	26.2	+52.5	63.7	22
23	8	05.9	+48.9	62.2	8	33.8	+49.5	62.3	9	01.7	+50.0	62.4	9	29.4	+50.5	62.6	9	56.9	+51.0	62.7	10	24.4	+51.5	62.9	10	51.6	+52.0	63.1	11	18.7	+52.5	63.2	23
24	8	54.8	+48.9	61.6	9	23.3	+49.4	61.7	9	51.7	+49.9	61.9	10	19.9	+50.4	62.0	10	47.9	+51.0	62.2	11	15.9	+51.4	62.4	11	43.6	+51.9	62.5	12	11.2	+52.4	62.7	24
25	9	43.7	+48.8	61.0	10	12.7	+49.4	61.1	10	41.6	+49.9	61.3	11	10.3	+50.4	61.5	11	38.9	+50.9	61.7	12	07.3	+51.4	61.8	12	35.5	+51.9	62.0	13	03.6	+52.3	62.2	25
26	10	32.5	+48.7	60.4	11	02.1	+49.2	60.6	11	31.5	+49.8	60.7	12	00.7	+50.3	60.9	12	29.8	+50.8	61.1	12	58.7	+51.3	61.3	13	27.4	+51.8	61.5	13	55.9	+52.3	61.7	26
27	11	21.2	+48.7	59.8	11	51.3	+49.3	60.0	12	21.3	+49.7	60.2	12	51.0	+50.3	60.4	13	20.6	+50.8	60.6	14	19.2	+51.7	61.0	14	48.2	+52.2	61.2	15	21.7	+52.4	61.4	27
28	12	09.9	+48.6	59.2	12	40.6	+49.1	59.4	13	11.0	+49.7	59.6	13	41.3	+50.2	59.8	14	11.4	+50.6	60.0	14	41.3	+51.1	60.2	15	10.9	+51.7	60.5	16	40.4	+52.1	60.7	28
29	12	58.5	+48.5	58.6	13	29.7	+49.0	58.8	14	00.7	+49.5	59.0	14	31.5	+50.1	59.2	15	02.0	+50.6	59.5	15	32.4	+51.1	59.7	16	26.2	+51.6	59.9	16	32.5	+52.5	60.2	29
30	13	47.0	+48.5	58.0	14	18.7	+49.0	58.2	14	50.2	+49.5	58.4	15	21.6	+50.0	58.7	15	52.6	+50.6	58.9	16	23.5	+51.0	59.2	16	54.2	+51.5	59.4	17	24.6	+52.0	59.7	30
31	14	35.5	+48.3	57.4	15	07.7	+48.9	57.6	15	39.7	+49.4	57.8	16	11.6	+49.9	58.1	16	43.2	+50.4	58.3	17	45.7	+51.4	58.6	17	21.7	+51.5	58.9	18	31.5	+51.9	59.2	31
32	15	23.8	+48.2	56.8	16	56.6	+48.7	57.0	16	24.3	+49.3	57.3	17	01.5	+49.8	57.5	17	33.6	+50.3	57.8	18	37.1	+51.3	58.0	19	08.5	+51.8	58.6	22				
33	16	12.0	+48.2	56.2	16	45.3	+48.7	56.4	17	18.4	+49.2	56.7	17	51.3	+49.7	56.9	18	23.9	+50.2	57.2	19	28.4	+51.2	57.5	20	18.6	+50.5	57.7	23				
34	17	0.0	+48.1	55.7	16	20.1	+46.8	56.8	16	59.6	+47.4	57.3</td																					

73°, 287° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	10 08.0 +48.7	103.7	9 53.7 +49.3	103.9	9 39.2 +49.9	104.1	9 24.6 +50.4	104.2	9 09.8 +50.9	104.4	8 54.8 +51.5	104.5	8 39.6 +52.0	104.7	8 24.4 +52.5	104.8	0	10 08.0 +48.7	103.7	9 53.7 +49.3	103.9	9 39.2 +49.9	104.1	9 24.6 +50.4	104.2	9 09.8 +50.9	104.4	8 54.8 +51.5	104.5	8 39.6 +52.0	104.7	8 24.4 +52.5	104.8	0
1	10 56.7 +48.6	103.1	10 43.0 +49.2	103.3	10 29.1 +49.7	103.5	10 15.0 +50.3	103.7	10 00.7 +50.9	103.8	9 46.3 +51.4	104.0	9 31.6 +52.0	104.2	9 16.9 +52.4	104.3	1	10 56.7 +48.6	103.1	10 43.0 +49.2	103.3	10 29.1 +49.7	103.5	10 15.0 +50.3	103.7	10 00.7 +50.9	103.8	9 46.3 +51.4	104.0	9 31.6 +52.0	104.2	9 16.9 +52.4	104.3	1
2	11 45.3 +48.5	102.5	11 32.2 +49.1	102.7	11 18.8 +49.7	102.9	11 05.3 +50.3	103.1	10 51.6 +50.8	103.3	10 37.7 +51.4	103.5	10 23.6 +51.9	103.7	10 09.3 +52.5	103.8	2	11 45.3 +48.5	102.5	11 32.2 +49.1	102.7	11 18.8 +49.7	102.9	11 05.3 +50.3	103.1	10 51.6 +50.8	103.3	10 37.7 +51.4	103.5	10 23.6 +51.9	103.7	10 09.3 +52.5	103.8	2
3	12 33.8 +48.4	101.9	12 21.3 +49.0	102.1	12 08.5 +49.7	102.4	11 55.6 +50.2	102.6	11 42.4 +50.8	102.8	11 29.1 +51.3	103.0	11 15.5 +51.9	103.2	11 01.8 +52.3	103.4	3	12 33.8 +48.4	101.9	12 21.3 +49.0	102.1	12 08.5 +49.7	102.4	11 55.6 +50.2	102.6	11 42.4 +50.8	102.8	11 29.1 +51.3	103.0	11 15.5 +51.9	103.2	11 01.8 +52.3	103.4	3
4	13 22.2 +48.3	101.3	13 10.3 +48.9	101.6	12 58.2 +49.4	101.8	12 45.8 +50.1	102.0	12 33.2 +50.7	102.2	12 20.4 +51.3	102.4	12 07.4 +51.8	102.6	11 54.1 +52.3	102.9	4	13 22.2 +48.3	101.3	13 10.3 +48.9	101.6	12 58.2 +49.4	101.8	12 45.8 +50.1	102.0	12 33.2 +50.7	102.2	12 20.4 +51.3	102.4	12 07.4 +51.8	102.6	11 54.1 +52.3	102.9	4
5	14 10.5 +48.3	100.7	13 59.2 +48.9	101.0	13 47.7 +49.5	101.2	13 35.9 +50.1	101.4	13 23.9 +50.7	101.7	13 11.7 +51.2	101.9	12 59.2 +51.7	102.1	12 46.4 +52.3	102.4	5	14 10.5 +48.3	100.7	13 59.2 +48.9	101.0	13 47.7 +49.5	101.2	13 35.9 +50.1	101.4	13 23.9 +50.7	101.7	13 11.7 +51.2	101.9	12 59.2 +51.7	102.1	12 46.4 +52.3	102.4	5
6	14 58.8 +48.1	100.1	14 48.1 +48.8	100.4	14 37.2 +49.4	100.6	14 26.0 +50.0	100.9	14 14.6 +50.5	101.1	14 02.9 +51.1	101.4	13 50.9 +51.7	101.6	13 38.7 +52.2	101.8	6	14 58.8 +48.1	100.1	14 48.1 +48.8	100.4	14 37.2 +49.4	100.6	14 26.0 +50.0	100.9	14 14.6 +50.5	101.1	14 02.9 +51.1	101.4	13 50.9 +51.7	101.6	13 38.7 +52.2	101.8	6
7	15 46.9 +48.0	99.5	15 36.9 +48.6	99.8	15 26.6 +49.3	100.0	15 16.0 +49.9	100.3	15 05.1 +50.5	100.6	14 54.0 +51.0	100.8	14 42.6 +51.6	101.1	14 30.9 +52.2	101.3	7	15 46.9 +48.0	99.5	15 36.9 +48.6	99.8	15 26.6 +49.3	100.0	15 16.0 +49.9	100.3	15 05.1 +50.5	100.6	14 54.0 +51.0	100.8	14 42.6 +51.6	101.1	14 30.9 +52.2	101.3	7
8	16 34.9 +47.9	98.9	16 25.5 +48.6	99.1	16 15.9 +49.2	99.4	16 05.9 +49.8	99.7	15 55.6 +50.4	100.0	15 45.0 +51.0	100.3	15 34.2 +51.5	100.6	15 23.1 +52.0	100.8	8	16 34.9 +47.9	98.9	16 25.5 +48.6	99.1	16 15.9 +49.2	99.4	16 05.9 +49.8	99.7	15 55.6 +50.4	100.0	15 45.0 +51.0	100.3	15 34.2 +51.5	100.6	15 23.1 +52.0	100.8	8
9	17 22.8 +47.9	98.2	17 14.1 +48.5	98.5	17 05.1 +49.0	98.8	16 55.7 +49.7	99.1	16 46.0 +50.3	99.4	16 36.0 +50.9	99.7	16 25.7 +51.5	100.0	16 15.1 +52.0	100.3	9	17 22.8 +47.9	98.2	17 14.1 +48.5	98.5	17 05.1 +49.0	98.8	16 55.7 +49.7	99.1	16 46.0 +50.3	99.4	16 36.0 +50.9	99.7	16 25.7 +51.5	100.0	16 15.1 +52.0	100.3	9
10	18 10.7 +47.6	97.6	18 02.6 +48.3	97.9	17 54.1 +49.0	98.2	17 45.4 +49.6	98.6	17 36.3 +50.2	98.9	17 26.9 +50.8	99.2	17 17.2 +51.3	99.5	17 07.1 +51.9	99.8	10	18 10.7 +47.6	97.6	18 02.6 +48.3	97.9	17 54.1 +49.0	98.2	17 45.4 +49.6	98.6	17 36.3 +50.2	98.9	17 26.9 +50.8	99.2	17 17.2 +51.3	99.5	17 07.1 +51.9	99.8	10
11	18 58.3 +47.6	96.9	18 50.9 +48.2	97.3	18 43.1 +48.9	97.6	18 35.0 +49.5	98.0	18 26.5 +50.1	98.3	18 17.7 +50.7	98.6	18 08.5 +51.3	98.9	17 59.0 +51.8	99.3	11	18 58.3 +47.6	96.9	18 50.9 +48.2	97.3	18 43.1 +48.9	97.6	18 35.0 +49.5	98.0	18 26.5 +50.1	98.3	18 17.7 +50.7	98.6	18 08.5 +51.3	98.9	17 59.0 +51.8	99.3	11
12	19 45.9 +47.4	96.3	19 39.1 +48.1	96.7	19 32.0 +48.7	97.0	19 24.5 +49.3	97.4	19 16.6 +50.0	97.7	19 08.4 +50.5	98.1	18 59.8 +51.1	98.4	18 50.8 +51.8	98.7	12	19 45.9 +47.4	96.3	19 39.1 +48.1	96.7	19 32.0 +48.7	97.0	19 24.5 +49.3	97.4	19 16.6 +50.0	97.7	19 08.4 +50.5	98.1	18 59.8 +51.1	98.4	18 50.8 +51.8	98.7	12
13	20 33.3 +47.2	95.6	20 27.2 +47.9	96.0	20 20.7 +48.6	96.4	20 13.8 +49.3	96.8	20 06.6 +49.8	97.1	19 58.9 +50.5	97.5	19 50.9 +51.1	97.8	19 42.6 +51.6	98.2	19	20 33.3 +47.2	95.6	20 27.2 +47.9	96.0	20 20.7 +48.6	96.4	20 13.8 +49.3	96.8	20 06.6 +49.8	97.1	19 58.9 +50.5	97.5	19 50.9 +51.1	97.8	19 42.6 +51.6	98.2	19
14	21 20.5 +47.1	95.0	21 15.1 +47.8	95.4	21 09.3 +48.4	95.8	21 03.1 +49.1	96.1	20 56.4 +49.8	96.5	20 49.4 +50.4	96.9	20 42.0 +51.0	97.3	20 34.2 +51.5	97.7	14	21 20.5 +47.1	95.0	21 15.1 +47.8	95.4	21 09.3 +48.4	95.8	21 03.1 +49.1	96.1	20 56.4 +49.8	96.5	20 49.4 +50.4	96.9	20 42.0 +51.0	97.3	20 34.2 +51.5	97.7	14
15	22 07.6 +46.9	94.3	22 02.9 +47.6	94.7	21 57.7 +48.3	95.1	21 52.2 +48.9	95.5	21 46.2 +49.6	95.9	21 39.8 +50.2	96.3	21 33.0 +50.8	96.7	21 25.7 +51.5	97.1	15	22 07.6 +46.9	94.3	22 02.9 +47.6	94.7	21 57.7 +48.3	95.1	21 52.2 +48.9	95.5	21 46.2 +49.6	95.9	21 39.8 +50.2	96.3	21 33.0 +50.8	96.7	21 25.7 +51.5	97.1	15
16	22 54.5 +46.8	93.6	22 50.5 +47.5	94.1	22 46.0 +48.2	94.5	22 41.1 +48.8	94.9	22 35.8 +49.5	95.3	22 30.0 +50.1	95.7	22 23.8 +50.7	96.1	22 17.2 +51.3	96.6	22	22 54.5 +46.8	93.6	22 50.5 +47.5	94.1	22 46.0 +48.2	94.5	22 41.1 +48.8	94.9	22 35.8 +49.5	95.3	22 30.0 +50.1	95.7	22 23.8 +50.7	96.1	22 17.2 +51.3	96.6	22
17	23 41.3 +46.6	93.0	23 38.0 +47.3	93.4	23 34.2 +48.0	93.8	23 29.9 +48.7	94.3	23 25.3 +49.3	94.7	23 20.1 +50.0	95.1	23 14.5 +50.6	95.6	23 08.5 +51.2	96.0	23	23 41.3 +46.6	93.0	23 38.0 +47.3	93.4	23 34.2 +48.0	93.8	23 29.9 +48.7	94.3	23 25.3 +49.3	94.7	23 20.1 +50.0	95.1	23 14.5 +50.6	95.6	23 08.5 +51.2	96.0	23
18	24 27.9 +46.4	92.3	24 25.3 +47.3	92.7	24 22.2 +47.8	93.2	24 18.6 +48.5	93.6	24 14.6 +49.1	94.1	24 10.1 +49.8	94.5	24 06.1 +50.5	95.0	24 03.9 +51.5	95.4	24	24 27.9 +46.4	92.3	24 25.3 +47.3	92.7	24 22.2 +47.8	93.2	24 18.6 +48.5	93.6	24 14.6 +49.1	94.1	24 06.1 +50.5	95.0	24 03.9 +51.5	95.4	24		
19	25 14.3 +46.2	91.6	25 12.4 +46.9	92.0	25 10.0 +47.6	92.5	25 07.1 +48.3	93.0	25 03.7 +48.9	93.5	25 01.3 +49.5	94.0	25 00.0 +50.1	94.5	25 00.0 +50.3	94.8	25	25 14.3 +46.2	91.6	25 12.4 +46.9	92.0	25 10.0 +47.6	92.5	25 07.1 +48.3	93.0	25 03.7 +48.9	93.5	25 01.3 +49.5	94.0	25 00.0 +50.1	94.5	25 00.0 +50.3	94.8	25
20	26 00.5 +45.9	90.9	25 59.3 +46.7	91.4	25 57.6 +47.5	91.8	25 55.4 +48.2	92.3	25 52.8 +48.8	92.8	25 49.6 +49.5	93.3	25 45.9 +50.1	93.8	25 41.7 +50.6	94.2	25	26 00.5 +45.9	90.9	25 59.3 +46.7	91.4	25 57.6 +47.5	91.8	25 55.4 +48.2	92.3	25 52.8 +48.8	92.8	25 49.6 +49.5	93.3	25 45.9 +50.1	93.8	25 41.7 +50.6	94.2	25
21	26 46.4 +45.8	90.1	26 46.0 +46.5	90.7	26 45.1 +47.2	91.2	26 43.6 +48.0	91.7	26 41.6 +48.7	92.2	26 39.1 +49.3	92.7	26 36.0 +50.0	93.2	26 32.4 +50.7	93.7	26	26 46.4 +45.8	90.1	26 46.0 +46.5	90.7	26 45.1 +47.2	91.2	26 43.6 +48.0	91.7	26 41.6 +48.7	92.2	26 39.1 +49.3						

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $73^\circ$ ,  $287^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	10 08.0 -48.7	103.7	9 53.7 -49.3	103.9	9 39.2 -49.8	104.1	9 24.6 -50.5	104.2	9 09.8 -51.0	104.4	8 54.8 -51.5	104.5	8 39.6 -52.0	104.7	8 24.4 -52.6	104.8	0	0	0	0	0	0	0	0	0
1	9 19.3 -48.7	104.3	9 04.4 -49.3	104.5	8 49.4 -50.0	104.6	8 34.1 -50.5	104.8	8 18.8 -51.1	104.9	8 03.3 -51.6	105.1	7 47.6 -52.1	105.2	7 31.8 -52.6	105.3	1	1	1	1	1	1	1	1	1
2	8 30.6 -48.8	104.9	8 15.1 -49.4	105.0	7 59.4 -50.0	105.2	7 43.6 -50.5	105.3	7 27.7 -51.0	105.4	7 11.7 -51.6	105.6	6 55.5 -52.1	105.7	6 39.2 -52.6	105.8	2	2	2	2	2	2	2	2	2
3	7 41.8 -48.9	105.5	7 25.7 -49.5	105.6	7 09.4 -50.0	105.7	6 53.1 -50.6	105.9	6 36.7 -51.2	106.0	6 20.1 -51.6	106.1	6 03.4 -52.1	106.2	5 46.6 -52.6	106.3	3	3	3	3	3	3	3	3	3
4	6 52.9 -48.9	106.1	36.2 -49.5	106.2	6 19.4 -50.0	106.3	6 02.5 -50.6	106.4	5 28.5 -51.7	106.6	5 11.3 -52.2	106.7	4 54.0 -52.6	106.8	4	4	4	4	4	4	4	4	4		
5	6 04.0 -49.0	106.7	5 46.7 -49.5	106.8	5 29.4 -50.1	106.9	5 11.9 -50.6	106.9	4 54.4 -51.1	107.0	4 36.8 -51.7	107.1	4 19.1 -52.2	107.2	4 01.4 -52.7	107.3	5	5	5	5	5	5	5	5	5
6	5 15.0 -49.0	107.2	4 57.2 -49.5	107.3	4 39.3 -50.1	107.4	4 21.3 -50.6	107.5	4 03.3 -51.2	107.6	3 45.1 -51.7	107.6	3 26.9 -52.2	107.7	3 08.7 -52.7	107.7	6	6	6	6	6	6	6	6	6
7	4 26.0 -49.0	107.8	4 07.7 -49.6	107.9	3 49.2 -50.1	108.0	3 30.7 -50.7	108.0	3 12.1 -51.2	108.1	2 53.4 -51.7	108.1	2 34.7 -52.2	108.2	2 16.0 -52.7	108.2	7	7	7	7	7	7	7	7	7
8	3 37.0 -49.0	108.4	3 18.1 -49.6	108.5	2 59.1 -50.2	108.5	2 40.0 -50.7	108.6	2 20.9 -51.2	108.6	2 01.7 -51.7	108.6	1 29.7 -51.3	109.1	1 10.0 -51.7	109.1	8	8	8	8	8	8	8	8	8
9	2 48.0 -49.0	109.0	2 28.5 -49.6	109.0	2 08.9 -50.1	109.1	1 49.3 -50.7	109.1	0 38.4 -51.2	109.6	0 18.3 -51.7	109.6	0 01.9 +52.2	107.4	0 22.1 +52.7	107.4	10	10	10	10	10	10	10	10	10
10	1 59.0 -49.1	109.6	1 38.9 -49.6	109.6	1 18.8 -50.2	109.6	0 58.6 -50.7	109.6	0 01.2 +51.2	109.6	0 33.4 +51.8	109.8	0 54.1 +52.2	109.9	1 14.8 +52.7	109.9	11	11	11	11	11	11	11	11	11
11	1 09.9 -49.1	110.1	0 49.3 -49.7	110.1	0 28.6 -50.2	110.2	0 07.9 -50.7	110.2	0 12.8 +51.2	110.2	0 34.5 +51.8	110.2	0 54.1 +52.2	110.2	1 27.5 +52.6	110.2	12	12	12	12	12	12	12	12	12
12	0 20.8 -49.0	110.7	0 00.4 +49.6	110.7	0 50.0 +49.6	110.7	1 11.7 +50.2	110.7	1 33.5 +50.7	110.7	1 55.2 +51.2	110.7	2 38.5 +52.2	110.7	3 30.7 +52.2	110.7	13	13	13	13	13	13	13	13	13
13	0 28.2 +49.1	110.7	0 50.0 +49.6	110.7	1 11.7 +50.2	110.7	1 33.5 +50.7	110.7	1 55.2 +51.2	110.7	2 38.5 +52.2	110.7	3 30.7 +52.2	110.7	4 34.3 +52.0	110.7	20	20	20	20	20	20	20	20	20
14	1 17.3 +49.0	110.7	1 39.6 +49.6	110.7	2 01.9 +50.2	110.7	2 24.2 +50.7	110.7	2 46.4 +51.2	110.7	3 08.6 +51.7	110.7	4 22.9 +52.2	110.7	5 45.5 +52.6	110.7	15	15	15	15	15	15	15	15	15
15	2 06.3 +49.1	110.7	2 29.2 +49.6	110.7	2 52.1 +50.1	110.7	3 14.9 +50.6	110.7	3 37.6 +51.2	110.7	4 00.3 +51.6	110.7	5 15.1 +52.1	110.7	6 30.7 +52.6	110.7	17	17	17	17	17	17	17	17	17
16	2 55.4 +49.0	110.7	3 18.8 +49.6	110.7	3 42.2 +50.1	110.7	4 05.5 +50.6	110.7	4 28.8 +51.1	110.7	5 19.9 +51.7	110.7	6 35.9 +52.6	110.7	7 30.7 +52.6	110.7	17	17	17	17	17	17	17	17	17
17	3 44.4 +49.0	110.7	4 08.4 +49.5	110.7	4 32.3 +50.1	110.7	4 56.1 +50.7	110.7	5 19.9 +51.7	110.7	6 43.6 +51.6	110.7	7 59.3 +52.1	110.7	8 23.3 +52.5	110.7	18	18	18	18	18	18	18	18	18
18	4 33.4 +49.0	110.7	4 57.9 +49.6	110.7	5 17.9 +49.6	110.7	5 22.4 +50.0	110.7	5 46.8 +50.5	110.7	6 11.0 +51.1	110.7	6 35.2 +51.6	110.7	7 51.4 +52.0	110.7	19	19	19	19	19	19	19	19	19
19	5 22.4 +48.9	110.7	5 47.5 +49.5	110.7	6 12.4 +50.1	110.7	6 37.3 +50.6	110.7	7 02.1 +51.1	110.7	7 26.8 +51.6	110.7	7 51.4 +52.0	110.7	8 15.8 +52.5	110.7	19	19	19	19	19	19	19	19	19
20	6 11.3 +48.9	110.7	6 37.0 +49.4	110.7	7 02.5 +50.0	110.7	7 27.9 +50.5	110.7	7 53.2 +51.0	110.7	8 18.4 +51.5	110.7	8 43.4 +52.0	110.7	9 08.3 +52.5	110.7	20	20	20	20	20	20	20	20	20
21	7 00.2 +48.9	110.7	7 26.4 +49.4	110.7	7 52.5 +49.9	110.7	8 18.4 +50.4	110.7	8 44.2 +51.0	110.7	9 09.9 +51.4	110.7	9 35.4 +52.0	110.7	10 00.8 +52.4	110.7	21	21	21	21	21	21	21	21	21
22	7 49.1 +48.8	110.7	8 15.8 +49.4	110.7	8 42.4 +49.9	110.7	9 08.8 +50.5	110.7	9 35.2 +50.9	110.7	10 01.3 +51.5	110.7	10 27.4 +51.9	110.7	11 19.3 +51.8	110.7	22	22	22	22	22	22	22	22	22
23	8 37.9 +48.8	110.7	9 05.2 +49.3	110.7	9 32.3 +49.8	110.7	9 59.3 +50.3	110.7	10 26.1 +50.9	110.7	10 52.8 +51.3	110.7	11 19.0 +51.8	110.7	12 11.1 +51.8	110.7	23	23	23	23	23	23	23	23	23
24	9 26.7 +48.7	110.7	9 54.5 +49.2	110.7	10 22.1 +49.8	110.7	10 49.6 +50.3	110.7	11 17.0 +50.8	110.7	11 44.1 +51.3	110.7	12 11.1 +51.8	110.7	12 38.0 +52.2	110.7	24	24	24	24	24	24	24	24	24
25	10 15.4 +48.6	110.7	10 43.7 +49.2	110.7	11 11.9 +49.7	110.7	11 39.9 +50.2	110.7	12 07.8 +50.7	110.7	12 35.4 +51.3	110.7	13 02.9 +51.8	110.7	13 30.2 +52.2	110.7	25	25	25	25	25	25	25	25	25
26	11 04.0 +48.6	110.7	11 32.9 +49.1	110.7	12 01.6 +49.6	110.7	12 30.1 +50.2	110.7	12 58.5 +50.7	110.7	13 26.7 +51.2	110.7	13 54.7 +51.6	110.7	14 22.4 +52.2	110.7	26	26	26	26	26	26	26	26	26
27	11 52.6 +48.5	110.7	12 22.0 +49.0	110.7	12 51.2 +49.6	110.7	13 20.3 +50.1	110.7	13 49.2 +50.6	110.7	14 17.9 +51.1	110.7	14 46.3 +51.6	110.7	15 14.6 +52.1	110.7	27	27	27	27	27	27	27	27	27
28	12 41.1 +48.4	110.7	12 31.0 +49.0	110.7	13 40.8 +49.5	110.7	14 10.4 +50.0	110.7	14 39.8 +50.5	110.7	15 09.0 +51.0	110.7	15 37.9 +51.5	110.7	16 06.7 +52.0	110.7	28	28	28	28	28	28	28	28	28
29	13 29.5 +48.3	110.7	13 00.0 +48.8	110.7	13 30.4 +49.3	110.7	13 30.3 +49.8	110.7	15 03.0 +49.4	110.7	15 30.3 +50.4	110.7	16 29.4 +50.5	110.7	17 59.2 +50.3	110.7	29	29	29	29	29	29	29	29	29
30	14 17.8 +48.2	110.7	14 48.8 +48.8	110.7	15 19.7 +49.3	110.7	15 50.3 +49.9	110.7	16 20.7 +50.4	110.7	16 50.9 +50.9	110.7	17 20.9 +51.3	110.7	17 50.6 +51.8	110.7	30	30	30	30	30	30	30	30	30
31	15 06.0 +48.1	110.7	15 37.6 +48.1	110.7	16 09.0 +49.2	110.7	16 40.2 +49.7	110.7	17 11.1 +50.2	110.7	17 41.8 +50.7	110.7	18 12.2 +51.3	110.7	18 42.4 +51.8	110.7	31	31	31	31	31	31	31	31	31
32	15 54.1 +48.0	110.7	16 26.3 +48.5	110.7	17 03.0 +48.5	110.7	17 45.2 +49.7	110.7	18 10.3 +50.2	110.7	18 32.5 +50.7	110.7	19 03.5 +51.2	110.7	19 34.2 +51.6	110.7	32	32	32	32	32	32	32	32	32
33	16 42.1 +47.9	110.7	17 14.8 +48.5	110.7	17 47.3 +49.7	110.7	18 19.5 +49.7	110.7	19 24.7 +50.4	110.7	19 51.5 +50.9	110.7	20 14.5 +51.5	110.7	20 45.7 +51.0	110.7	33	33	33	33	33	33	33	33	33
34	17 30.0 +47.8	110.7	18 30.8 +47.8	110.7	19 30.8 +47.9	110.7	20 32.7 +48.4	110.7	21 13.6 +48.7	110.7	21 36.9 +49.5	1													

74°, 286° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	9	32.9	+48.6	102.9	9	19.4	+49.2	103.1	9	05.8	+49.7	103.2	8	52.0	+50.3	103.4	8	38.0	+50.9	103.5	8	23.9	+51.5	103.7	8	09.7	+51.9	103.8	7	55.3	+52.4	103.9	0
1	10	21.5	+48.5	102.3	10	08.6	+49.1	102.5	9	55.5	+49.7	102.7	9	42.3	+50.3	102.8	9	28.9	+50.8	103.0	9	15.4	+51.3	103.1	9	01.6	+51.9	103.3	8	47.7	+52.4	103.5	1
2	11	10.0	+48.4	101.7	10	57.7	+49.0	101.9	10	45.2	+49.7	102.1	10	32.6	+50.2	102.3	10	19.7	+50.8	102.4	10	06.7	+51.3	102.6	9	53.5	+51.9	102.8	9	40.1	+52.4	103.0	2
3	11	58.4	+48.3	101.1	11	46.7	+49.0	101.3	11	34.9	+49.5	101.5	11	22.8	+50.1	101.7	11	10.5	+50.7	101.9	10	58.0	+51.3	102.1	10	45.4	+51.8	102.3	10	32.5	+52.3	102.5	3
4	12	46.7	+48.3	100.5	12	35.7	+48.9	100.7	12	24.4	+49.5	100.9	12	12.9	+50.1	101.1	11	49.3	+51.2	101.6	11	37.2	+51.7	101.8	11	24.8	+52.3	102.0	4				
5	13	35.0	+48.2	99.9	13	24.6	+48.8	100.1	13	13.9	+49.4	100.4	13	03.0	+50.0	100.6	12	51.9	+50.6	100.8	12	40.5	+51.1	101.0	12	28.9	+51.7	101.3	12	17.1	+52.2	101.5	5
6	14	23.2	+48.0	99.3	14	13.4	+48.7	99.5	14	03.3	+49.3	99.8	13	53.0	+49.9	100.0	13	42.5	+50.5	100.3	13	31.6	+51.1	100.5	13	20.6	+51.6	100.7	13	09.3	+52.2	101.0	6
7	15	11.2	+48.0	98.7	15	02.1	+48.6	98.9	14	52.6	+49.3	99.2	14	42.9	+49.9	99.4	14	33.0	+50.4	99.7	14	22.7	+51.0	100.0	14	12.2	+51.6	100.2	14	01.5	+52.0	100.5	7
8	15	59.2	+47.9	98.0	15	50.7	+48.5	98.3	15	41.9	+49.1	98.6	15	32.8	+49.7	98.9	15	23.4	+50.3	99.1	15	13.7	+50.9	99.4	15	03.8	+51.4	99.7	14	53.5	+52.1	99.9	8
9	16	47.1	+47.7	97.4	16	39.2	+48.4	97.7	16	31.0	+49.0	98.0	16	22.5	+49.7	98.3	16	13.7	+50.3	98.6	16	04.6	+50.9	98.9	15	55.2	+51.4	99.1	15	45.6	+51.9	99.4	9
10	17	34.8	+47.7	96.8	17	27.6	+48.3	97.1	17	20.0	+49.0	97.4	17	12.2	+49.5	97.7	17	04.0	+50.1	98.0	16	55.5	+50.7	98.3	16	37.5	+51.9	98.6	16	27.5	+52.2	101.5	10
11	18	22.5	+47.4	96.1	18	15.9	+48.1	96.5	18	09.0	+48.8	96.8	18	01.7	+49.4	97.1	17	54.1	+50.1	97.4	17	46.2	+50.6	97.7	17	28.0	+51.2	98.1	17	29.4	+51.8	98.4	11
12	19	09.9	+47.4	95.5	19	04.0	+48.1	95.8	18	57.8	+48.7	96.1	18	51.1	+49.4	96.5	18	44.2	+49.9	96.8	18	36.8	+50.6	97.2	18	29.2	+51.1	97.5	18	21.2	+51.6	97.8	12
13	19	57.3	+47.2	94.8	19	52.1	+47.9	95.2	19	46.5	+48.5	95.5	19	40.5	+49.2	95.9	19	34.1	+49.8	96.3	19	27.4	+50.4	96.6	19	20.3	+51.0	97.0	19	12.8	+51.6	97.3	13
14	20	44.5	+47.1	94.2	20	40.0	+47.7	94.5	20	35.0	+48.4	94.9	20	29.7	+49.0	95.3	20	23.9	+49.7	95.7	20	17.8	+50.3	96.0	20	11.3	+50.9	96.4	20	04.4	+51.5	96.8	14
15	21	31.6	+46.9	93.5	21	27.7	+47.6	93.9	21	23.4	+48.3	94.3	21	18.7	+49.0	94.7	21	13.6	+49.6	95.1	21	08.1	+50.2	95.5	21	02.2	+50.9	95.8	20	55.9	+51.4	96.2	15
16	22	18.5	+46.7	92.8	22	15.3	+47.5	93.2	22	11.7	+48.1	93.6	22	07.7	+48.8	94.1	22	03.2	+49.5	94.5	21	58.3	+50.1	94.9	21	53.1	+50.6	95.3	21	47.3	+51.3	95.7	16
17	23	05.2	+46.6	92.2	23	02.8	+47.2	92.6	22	59.8	+48.0	93.0	22	56.5	+48.6	93.4	22	52.7	+49.3	93.8	22	48.4	+50.6	94.7	22	38.6	+51.2	95.1	17				
18	23	51.8	+46.4	91.5	23	50.0	+47.1	91.9	23	47.8	+47.8	92.3	23	45.1	+48.5	92.8	23	42.0	+49.1	93.2	23	38.4	+49.8	93.7	23	34.3	+50.4	94.1	18				
19	24	38.2	+46.2	90.8	24	37.1	+46.9	91.2	24	35.6	+47.6	91.7	24	33.6	+48.3	92.1	24	31.1	+49.0	92.6	24	28.2	+49.6	93.1	24	24.7	+50.3	93.5	24	20.8	+50.9	94.0	19
20	25	24.4	+45.9	90.1	25	24.0	+46.8	90.5	25	23.2	+47.5	91.0	25	21.9	+48.2	91.5	25	20.1	+48.8	92.0	25	17.8	+49.5	92.4	25	15.0	+50.1	92.9	25	11.7	+50.8	93.4	20
21	26	10.3	+45.8	89.4	26	10.8	+46.5	89.8	26	10.7	+47.2	90.3	26	10.1	+47.9	90.8	26	0.89	+48.7	91.3	26	0.73	+49.3	91.8	26	0.51	+50.0	92.3	26	0.25	+50.6	92.8	21
22	26	56.1	+45.5	88.6	26	57.3	+46.3	89.1	26	57.9	+47.0	89.6	26	58.0	+47.8	90.2	26	57.6	+48.4	90.7	26	56.6	+49.2	91.2	26	55.1	+49.8	91.7	26	53.1	+50.5	92.2	22
23	27	41.6	+45.3	87.9	27	43.6	+46.0	88.4	27	44.9	+46.9	88.9	27	45.8	+47.5	89.5	27	46.0	+48.3	90.0	27	44.8	+49.7	91.1	27	43.6	+50.3	91.6	23				
24	28	26.9	+45.1	87.2	28	29.6	+45.9	87.7	28	31.8	+46.6	88.2	28	33.3	+47.4	88.8	28	34.3	+48.1	89.3	28	34.7	+48.8	89.9	28	33.9	+49.1	90.4	24				
25	29	12.0	+44.8	86.4	29	15.5	+45.6	87.0	29	18.4	+46.3	87.5	29	20.7	+47.1	88.1	29	22.4	+47.8	88.6	29	23.5	+48.2	89.2	29	24.0	+50.0	90.3	25				
26	29	56.8	+44.5	85.6	30	01.1	+45.3	86.2	30	04.7	+46.1	86.8	30	07.8	+46.9	87.4	30	10.2	+47.7	87.9	30	12.1	+48.4	88.5	30	13.3	+49.1	89.1	30	14.0	+49.7	89.7	26
27	30	41.3	+44.3	84.9	30	46.4	+45.1	85.5	30	50.8	+45.9	86.0	30	54.7	+46.6	86.6	30	57.9	+47.4	87.2	31	00.5	+48.1	87.8	31	02.4	+48.9	88.4	31	03.7	+49.6	89.0	27
28	31	25.6	+43.9	84.1	31	31.5	+44.7	84.7	31	36.7	+45.6	85.3	31	41.3	+46.4	85.9	31	45.3	+47.1	86.5	31	48.6	+47.9	87.1	31	51.3	+48.6	88.4	31	53.3	+49.3	89.8	28
29	32	09.5	+43.7	83.3	32	16.2	+44.5	83.9	32	23.0	+45.3	84.5	32	27.7	+46.1	85.2	32	32.4	+46.9	85.8	32	36.5	+47.7	86.4	32	39.9	+48.4	87.1	32	42.6	+49.2	87.7	29
30	32	53.2	+43.3	82.5	33	00.7	+44.2	83.1	33	07.6	+45.0	83.7	33	13.8	+45.8	84.4	33	19.3	+46.7	85.0	33	24.2	+47.4	85.7	33	31.8	+48.9	87.0	30				
31	33	36.5	+43.0	81.6	33	44.9	+43.9	82.3	33	52.6	+44.7	83.0	33	59.6	+45.6	83.6	34	06.0	+46.3	84.3	34	11.6	+47.1	85.0	34	16.5	+47.9	85.6	34	20.7	+48.6	86.3	31
32	34	19.5	+42.7	80.8	34	28.8	+43.5	81.5	34	37.3	+44.1	82.1	34	45.2	+45.2	82.8	34	52.3	+46.0	83.5	34	58.7	+46.9	84.2	35	54.0	+47.6	85.6	34	57.8	+48.1	86.9	34
33	35	26.3	+41.5	78.2	36	38.2	+42.5	78.9	36	49.4	+43.3	79.6	36	59.8	+44.2	80.4	37	09.5	+45.0	81.1	37	18.4	+45.9	81.9	37	26.4	+46.8	82.6	37	33.7	+47.6	83.4	35
34	36	37.8	+41.1	77.3	37</																												

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $74^\circ$ ,  $286^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			Dec.											
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z												
0	9	32.9	-48.6	102.9	9	19.4	-49.2	103.1	9	05.8	-49.8	103.2	8	52.0	-50.4	103.4	8	38.0	-50.9	103.5	8	23.9	-51.4	103.7	8	09.7	-52.0	103.8	7	55.3	-52.5	103.9	0
1	8	44.3	-48.7	103.5	8	30.2	-49.3	103.6	8	16.0	-49.9	103.8	8	01.6	-50.4	103.9	7	47.1	-50.9	104.1	7	32.5	-51.5	104.2	7	17.7	-52.0	104.3	7	02.8	-52.5	104.4	1
2	7	55.6	-48.7	104.1	7	40.9	-49.3	104.2	7	26.1	-49.8	104.3	7	11.2	-50.4	104.5	6	56.2	-51.0	104.6	6	41.0	-51.5	104.7	6	25.7	-52.0	104.8	6	10.3	-52.5	104.9	3
3	7	60.9	-48.8	104.7	6	51.6	-49.3	104.8	6	36.3	-50.0	104.9	6	20.8	-50.5	105.0	6	05.2	-51.1	105.1	5	49.5	-51.6	105.2	5	33.7	-52.1	105.3	5	17.8	-52.6	105.4	3
4	6	18.1	-48.8	105.3	02.3	-49.4	105.4	5	46.3	-49.5	105.5	5	30.3	-50.5	105.6	5	14.1	-51.0	105.6	4	57.9	-51.6	105.7	4	41.6	-52.1	105.8	4	25.2	-52.6	105.9	4	
5	5	29.3	-48.8	105.8	5	12.9	-49.4	105.9	4	56.4	-50.0	106.0	4	39.8	-50.6	106.1	4	23.1	-51.1	106.2	4	06.3	-51.5	106.2	3	49.5	-52.1	106.3	3	32.6	-52.6	106.4	5
6	4	40.5	-48.9	106.4	4	23.5	-49.5	106.5	4	06.4	-50.0	106.6	3	49.2	-50.5	106.6	3	32.0	-51.1	106.7	3	14.8	-51.7	106.8	2	57.4	-52.1	106.8	2	40.0	-52.6	106.9	6
7	3	51.6	-48.9	107.0	3	34.0	-49.5	107.1	3	16.4	-50.1	107.1	2	58.7	-50.6	107.2	2	40.9	-51.1	107.2	2	23.1	-51.6	107.3	2	05.3	-52.1	107.3	7	47.4	-52.6	107.3	7
8	3	02.7	-48.9	107.6	2	44.5	-49.4	107.6	2	08.1	-50.6	107.7	1	49.8	-51.1	107.8	1	31.5	-51.6	107.8	0	54.8	-52.6	107.8	8	21.1	-52.2	108.3	0	02.2	-52.6	108.3	9
9	2	13.8	-48.9	108.2	1	55.1	-49.5	108.2	1	36.3	-50.1	108.2	1	17.5	-50.6	108.3	0	58.7	-51.1	108.3	0	39.9	-51.6	108.3	0	21.1	-52.2	108.3	0				
10	1	24.9	-49.0	108.7	1	05.6	-49.5	108.8	0	46.2	-50.0	108.8	0	26.9	-50.6	108.8	0	07.6	-51.1	108.8	0	11.7	+51.7	11.2	0	50.4	+52.6	71.2	10				
11	0	35.9	-48.9	109.3	0	16.1	-49.5	109.3	0	03.8	+50.1	70.7	0	23.7	+50.6	70.7	0	43.5	+51.1	70.7	1	03.4	+51.6	70.7	1	23.2	+52.1	70.7	1	43.0	+52.6	70.7	11
12	0	13.0	+49.0	70.1	0	33.4	+49.5	70.1	0	53.9	+50.0	70.1	1	14.3	+50.5	70.1	1	34.6	+51.2	70.2	1	55.0	+51.6	70.2	2	15.3	+52.1	70.2	2	35.6	+52.6	70.3	12
13	1	02.0	+48.9	69.5	1	22.9	+49.5	69.5	1	43.9	+50.1	69.6	2	04.8	+50.6	69.6	2	25.8	+51.0	69.6	2	46.6	+51.6	69.7	3	07.4	+52.1	69.7	3	28.2	+52.6	69.8	13
14	1	50.9	+48.9	68.9	2	12.4	+49.5	69.0	2	34.0	+50.0	69.0	2	55.4	+50.6	69.1	3	16.8	+51.1	69.1	3	38.2	+51.6	69.2	3	59.5	+52.1	69.2	4	20.8	+52.5	69.3	14
15	2	39.8	+48.9	68.4	3	01.9	+49.5	68.4	3	24.0	+50.0	68.5	3	46.0	+50.5	68.5	4	07.9	+51.1	68.6	4	29.8	+51.6	68.7	4	51.6	+52.1	68.7	5	13.3	+52.6	68.8	15
16	3	28.7	+48.9	67.8	3	51.4	+49.4	67.8	4	14.0	+50.0	67.9	4	36.5	+50.5	68.0	4	59.0	+51.0	68.1	5	21.4	+51.5	68.1	5	43.7	+52.0	68.2	6	05.9	+52.5	68.3	16
17	4	17.6	+48.9	67.2	4	40.8	+49.4	67.3	5	04.0	+49.9	67.3	5	27.0	+50.5	67.4	5	50.0	+51.0	67.5	6	12.9	+51.5	67.6	6	35.7	+52.0	67.7	7	12.7	+52.2	67.8	17
18	5	06.5	+48.8	66.6	5	30.2	+49.4	66.7	5	53.9	+49.9	66.8	6	17.5	+50.5	66.9	6	41.0	+51.0	67.0	7	04.4	+51.5	67.1	7	27.7	+52.0	67.2	7	50.9	+52.4	67.3	18
19	5	55.3	+48.8	66.0	6	19.6	+49.4	66.1	6	43.8	+49.9	66.2	7	08.0	+50.4	66.3	7	32.0	+50.9	66.5	8	19.7	+51.9	66.7	8	43.3	+52.4	66.9	19				
20	6	44.1	+48.7	65.4	7	09.0	+49.3	65.6	7	33.7	+49.9	65.7	7	58.4	+50.4	65.8	8	22.9	+50.9	65.9	8	47.3	+51.4	66.1	9	11.6	+51.9	66.2	9	35.7	+52.4	66.4	20
21	7	32.8	+48.7	64.9	7	58.3	+49.2	65.0	8	23.6	+49.8	65.1	8	48.8	+50.3	65.2	9	13.8	+50.8	65.4	9	38.7	+51.4	65.5	10	03.5	+51.8	65.7	10	28.1	+52.3	65.9	21
22	8	21.5	+48.7	64.3	8	47.5	+49.2	64.4	9	13.4	+49.7	64.5	9	39.1	+50.2	64.7	10	04.6	+50.6	64.9	10	30.1	+51.3	65.0	10	55.3	+51.8	65.2	11	20.4	+52.3	65.4	22
23	9	10.2	+48.6	63.7	9	36.7	+49.1	63.8	10	03.1	+49.7	64.0	10	29.3	+50.3	64.1	10	55.4	+50.8	64.3	11	21.4	+51.7	64.5	12	12.7	+52.2	64.9	23				
24	9	58.8	+48.5	63.1	10	25.8	+49.1	63.2	10	52.8	+49.4	63.4	11	19.6	+50.1	63.6	11	46.2	+50.6	63.8	12	12.6	+51.2	64.0	12	38.8	+51.7	64.2	13	04.9	+52.4	64.4	24
25	10	47.3	+48.4	62.5	11	14.9	+49.0	62.7	11	42.4	+49.6	62.8	12	09.7	+50.1	63.0	12	36.8	+50.6	63.2	13	03.8	+51.1	63.4	13	30.5	+51.6	63.6	13	57.1	+52.1	63.9	25
26	11	35.7	+48.4	61.9	12	03.9	+49.0	62.1	12	32.0	+49.4	62.3	12	59.8	+50.0	62.5	13	27.4	+50.6	62.7	13	54.9	+51.0	62.9	14	22.1	+51.6	63.1	14	49.2	+52.0	63.3	26
27	12	24.1	+48.3	61.3	12	52.9	+48.8	61.5	13	21.4	+49.4	61.7	13	49.8	+49.9	61.9	14	18.0	+50.4	62.1	14	45.9	+51.0	62.3	15	13.7	+51.4	62.6	15	41.2	+52.0	62.8	27
28	13	12.4	+48.2	60.7	13	41.7	+48.8	60.9	14	10.8	+49.3	61.1	14	39.7	+49.9	61.3	15	08.4	+50.4	61.6	15	36.9	+50.9	61.8	16	05.1	+51.4	62.0	16	33.1	+51.9	62.3	28
29	14	00.6	+48.2	60.1	14	30.9	+48.7	60.3	15	20.3	+48.8	60.5	15	25.3	+49.7	60.7	15	58.8	+50.3	61.0	16	27.8	+50.7	61.2	16	56.5	+51.3	61.5	17	25.0	+51.8	61.8	29
30	14	48.8	+48.0	59.4	15	19.2	+48.5	59.7	15	49.4	+49.1	59.9	16	19.3	+49.7	60.2	16	49.1	+50.1	60.4	17	18.5	+50.7	60.7	17	47.8	+51.2	61.0	18	16.8	+51.7	61.2	30
31	15	36.8	+47.9	58.8	16	07.7	+48.5	59.1	16	38.5	+49.0	59.3	17	09.0	+50.2	59.5	18	09.2	+50.6	60.1	18	39.0	+51.1	60.4	19	08.5	+51.6	60.7	31				
32	16	24.7	+47.8	58.2	16	56.2	+48.4	58.4	17	27.5	+48.9	58.7	17	58.5	+49.5	59.0	18	29.3	+50.0	59.3	19	30.1	+51.0	59.9	20	00.1	+51.5	60.2	32				
33	17	12.5	+47.7	57.6	17	44.6	+48.2	57.8	18	16.4	+48.8	58.1	19	48.0	+49.3	58.4	19	19.3	+49.8	58.7	19	50.3	+50.4	59.0	20	21.1	+50.9	59.3	21	20.6	+51.6	59.6	33
34	18	00.2	+47.5	56.9	18	32.8	+48.1	57.2	19	05.2	+48.7	57.5	19	37.3	+49.2	57.8	20	09.2	+49.7	58.1	20	40.7	+50.3	58.4	21	12.0	+5						

75°, 285° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	8	57.7	+48.4	102.1	8	45.0	+49.1	102.2	8	32.2	+49.7	102.4	8	19.3	+50.2	102.5	8	06.2	+50.8	102.7	7	53.0	+51.3	102.8	7	26.1	+52.4	103.1
1	9	46.1	+48.5	101.5	9	34.1	+49.0	101.6	9	21.9	+49.6	101.8	9	09.5	+50.2	102.0	8	57.0	+50.8	102.1	8	44.3	+51.3	102.3	8	18.5	+52.4	102.6
2	10	34.6	+48.3	100.9	10	23.1	+49.0	101.1	10	11.5	+49.6	101.2	9	59.7	+50.2	101.4	9	47.8	+50.7	101.6	9	35.6	+51.3	101.8	9	10.9	+52.3	102.1
3	11	22.9	+48.3	100.3	11	12.1	+48.9	100.5	11	01.1	+49.5	100.7	10	49.9	+50.1	100.9	10	38.5	+50.6	101.0	10	26.9	+51.2	101.2	10	0.3	+52.2	101.6
4	12	11.2	+48.2	99.7	12	01.0	+48.8	99.9	11	50.6	+49.4	100.1	11	40.0	+50.0	100.3	11	29.1	+50.6	100.5	11	18.1	+51.0	100.7	11	0.6	+51.7	100.9
5	12	59.4	+48.1	99.1	12	49.8	+48.7	99.3	12	40.0	+49.4	99.5	12	30.0	+49.9	99.7	12	19.7	+50.6	99.9	12	09.3	+51.0	100.2	11	58.6	+51.6	100.4
6	13	47.5	+48.0	98.4	13	38.5	+48.7	98.7	13	29.4	+49.2	98.9	13	19.9	+49.9	99.2	13	10.3	+50.4	99.4	13	00.3	+51.1	99.6	12	39.8	+52.1	100.1
7	14	35.5	+47.9	97.8	14	27.2	+48.6	98.1	14	18.6	+49.2	98.3	14	9.8	+49.8	98.6	14	00.7	+50.4	98.8	13	51.4	+50.9	99.1	13	41.8	+51.5	99.3
8	15	23.4	+47.8	97.2	15	15.8	+48.4	97.5	15	07.8	+49.1	97.7	14	59.6	+49.7	98.0	14	51.1	+50.3	98.3	14	42.3	+50.4	98.5	14	24.0	+51.9	99.1
9	16	11.2	+47.7	96.6	16	04.2	+48.4	96.9	15	56.6	+49.0	97.1	15	49.3	+49.6	97.4	15	41.4	+50.2	97.7	15	33.2	+50.8	98.0	15	24.7	+51.3	98.3
10	16	58.9	+47.6	95.9	16	52.6	+48.2	96.2	16	45.9	+48.9	96.5	16	38.9	+49.5	96.8	16	31.6	+50.1	97.1	16	24.0	+50.7	97.4	16	07.8	+51.9	98.0
11	17	46.5	+47.5	95.3	17	40.8	+48.1	95.6	17	34.8	+48.7	95.9	17	28.4	+49.4	96.3	17	21.7	+50.0	96.6	17	14.7	+50.6	96.9	17	07.3	+51.2	97.5
12	18	34.0	+47.3	94.7	18	28.9	+48.0	95.0	18	23.5	+48.7	95.3	18	17.8	+49.3	95.7	18	11.7	+49.9	96.0	18	05.3	+50.6	96.3	17	51.4	+51.7	97.0
13	19	21.3	+47.2	94.0	19	16.9	+47.9	94.4	19	12.2	+48.5	94.7	19	07.1	+49.1	95.1	19	01.6	+49.8	95.4	18	55.8	+50.4	95.7	18	43.1	+51.5	96.4
14	20	08.5	+47.0	93.4	20	04.8	+47.7	93.7	20	00.7	+48.4	94.1	19	56.2	+49.1	94.4	19	51.4	+49.7	94.8	19	46.2	+50.3	95.2	19	34.6	+51.5	95.9
15	20	55.5	+46.9	92.7	20	52.5	+47.6	93.1	20	49.1	+48.3	93.5	20	45.3	+48.9	93.8	20	41.1	+49.5	94.1	20	36.5	+50.1	94.6	20	26.1	+51.4	95.3
16	21	42.4	+46.7	92.0	21	40.1	+47.4	92.4	21	37.4	+48.1	92.8	21	32.4	+48.2	93.2	21	26.0	+49.4	93.6	21	26.6	+50.1	94.0	21	22.3	+50.6	94.4
17	22	29.1	+46.6	91.3	22	27.5	+47.3	91.8	22	25.5	+47.9	92.2	22	23.0	+48.6	92.6	22	20.0	+49.3	93.0	22	16.7	+49.9	93.4	22	12.9	+50.6	93.8
18	23	15.7	+46.4	90.7	23	14.8	+47.1	91.1	23	13.4	+47.8	91.5	23	11.6	+48.5	91.9	23	09.3	+49.2	92.4	23	06.6	+49.8	92.8	23	03.5	+50.4	93.2
19	24	02.1	+46.1	90.0	24	01.9	+46.9	90.4	24	01.2	+47.6	90.9	24	00.1	+48.3	91.3	23	58.5	+48.9	91.8	23	53.9	+50.2	92.6	23	50.9	+50.9	93.1
20	24	48.2	+46.0	89.3	24	48.8	+46.7	89.7	24	48.8	+47.4	90.7	24	48.4	+48.1	90.7	24	47.4	+48.9	91.1	24	46.0	+49.5	91.6	24	44.1	+50.2	92.0
21	25	34.2	+45.8	88.6	25	35.5	+46.5	89.0	25	36.2	+47.3	89.5	25	36.5	+48.0	90.0	25	36.3	+48.8	90.5	25	35.5	+49.3	91.0	25	32.5	+50.6	91.9
22	26	20.0	+45.6	87.8	26	22.0	+46.3	88.3	26	23.5	+47.0	88.8	26	24.5	+47.7	89.3	26	24.8	+48.2	89.8	26	24.2	+49.8	90.8	26	23.1	+50.5	91.3
23	27	05.6	+45.3	87.1	27	08.3	+46.1	87.6	27	10.5	+46.9	88.1	27	12.2	+47.6	88.6	27	14.0	+48.2	89.7	27	14.0	+49.7	90.2	27	13.6	+50.3	90.7
24	27	50.9	+45.1	86.4	27	54.4	+45.9	86.9	27	57.4	+46.6	87.4	28	01.6	+48.1	88.5	28	02.9	+48.4	89.0	28	03.7	+49.5	89.6	28	03.9	+50.1	90.1
25	28	36.0	+44.8	85.6	28	40.3	+45.6	86.2	28	44.0	+46.4	86.7	28	47.1	+47.2	87.3	28	49.7	+47.9	87.8	28	51.7	+48.6	88.4	28	53.2	+49.2	88.9
26	29	20.8	+44.6	84.9	29	25.9	+45.4	85.4	29	30.4	+46.1	86.0	29	34.3	+46.9	86.6	29	37.6	+47.7	87.1	29	40.3	+48.4	87.7	29	42.4	+49.1	88.3
27	30	05.4	+44.3	84.1	30	11.3	+45.1	84.7	30	16.5	+45.9	85.3	30	21.2	+46.7	85.8	30	25.3	+47.4	86.4	30	28.7	+48.2	87.0	30	31.5	+48.9	87.6
28	30	49.7	+44.0	83.3	30	56.4	+44.8	83.9	31	02.4	+45.7	84.5	31	07.9	+46.4	85.1	31	12.7	+47.2	85.7	31	16.9	+47.9	86.3	31	20.4	+48.7	87.5
29	31	33.7	+43.7	82.5	31	41.2	+44.6	83.1	31	48.1	+45.3	83.7	31	54.3	+46.1	84.4	31	59.9	+46.9	85.0	32	04.8	+47.7	85.6	32	12.7	+49.1	86.9
30	32	17.4	+43.4	81.7	32	25.8	+44.2	82.3	32	33.4	+45.1	83.0	32	40.4	+45.9	83.6	32	46.8	+46.7	84.2	32	52.5	+47.4	84.9	32	57.5	+48.2	85.5
31	33	00.8	+43.1	80.9	33	10.0	+43.9	81.5	33	18.5	+44.8	82.2	33	26.3	+45.6	82.8	33	33.5	+46.4	83.5	33	39.9	+47.2	84.2	33	45.4	+47.9	85.5
32	33	43.9	+42.7	80.1	33	53.9	+43.6	80.7	34	03.3	+44.4	81.4	34	11.9	+45.3	82.1	34	19.9	+46.1	82.7	34	27.1	+46.9	83.3	34	33.6	+48.2	84.3
33	34	26.6	+42.4	79.2	34	37.5	+43.3	79.9	34	47.7	+44.1	80.6	34	57.2	+45.0	81.3	34	65.9	+45.8	81.9	35	21.5	+47.4	82.3	35	27.9	+48.2	84.1
34	35	09.0	+42.0	78.3	35	20.8	+42.9	79.0	35	31.8	+43.8	79.7	35	42.2	+44.6	80.4	35	51.8	+45.4	81.2	36	06.8	+46.3	81.9	36	16.1	+47.9	82.3
35	35	51.0	+41.6	77.5	36	03.7	+42.5	78.2	36	15.6	+43.4	78.9	36	26.8	+44.3	79.6	36	37.2	+45.2	80.3	36	46.9	+46.0	81.0	37	04.0	+47.6	82.6
36	36	32.6	+41.2	76.6	36	46.2	+42.1	77.3	36	59.0	+43.0	78.0	37	11.1	+43.9	78.7	37	22.4	+44.8	79.5	37	32.9	+45.6	80.3	37	42.6	+46.5	81.8
37	37	13.8	+40.8	75.7	37	28.3	+41.7	76.4	37	42.0	+42.7	77.2	37	55.0	+45.3	77.9	38	07.2	+44.4	78.7	38	18.5	+45.3	79.5	38	30.9	+47.0	81.0
38	37	54.6	+40.4	74.7	38	10.0	+41.3	75.5	38	24.7	+42.2	76.3	38	38.5	+43.2	77.0	38	51.6	+44.0	78.6	39	15.3	+45.8	79.4	39			

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $75^\circ$ ,  $285^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	8 55.7	-48.6	102.1	8 45.0	-49.1	102.2	8 32.2	-49.7	102.4	8 19.3	-50.3	102.5	8 06.2	-50.8	102.7	7 53.0	-51.4	102.8	7 39.6	-51.9	102.9	7 26.1	-52.4	103.1	0
1	8 09.1	-48.6	102.7	7 55.9	-49.2	102.8	7 42.5	-49.8	102.9	7 29.0	-50.3	103.1	7 15.4	-50.9	103.2	7 01.6	-51.4	103.3	6 47.7	-51.9	103.4	6 33.7	-52.4	103.6	1
2	7 20.5	-48.6	103.3	7 06.7	-49.2	103.4	6 52.7	-49.8	103.5	6 38.7	-50.4	103.6	6 24.5	-50.9	103.7	6 10.2	-51.5	103.8	5 55.8	-52.0	103.9	5 41.3	-52.5	104.0	2
3	6 31.9	-48.7	103.9	6 17.5	-49.3	104.0	6 02.9	-49.8	104.1	5 48.3	-50.4	104.2	5 33.6	-51.0	104.3	5 18.7	-51.4	104.4	5 03.8	-52.0	104.4	4 48.8	-52.5	104.5	3
4	5 43.2	-48.7	104.4	28.2	-49.3	104.5	5 13.1	-49.9	104.6	4 57.9	-50.4	104.7	4 42.6	-51.0	104.8	4 27.3	-51.5	104.9	4 11.8	-52.0	104.9	3 56.3	-52.5	105.0	4
5	4 54.5	-48.7	105.0	4 38.9	-49.3	105.1	4 23.2	-49.9	105.2	4 07.5	-50.5	105.3	3 51.6	-50.9	105.3	3 35.8	-51.6	105.4	3 19.8	-52.0	105.4	3 03.8	-52.5	105.5	5
6	4 05.8	-48.8	105.6	3 49.6	-49.4	105.7	3 33.3	-49.9	105.7	3 17.0	-50.5	105.8	3 00.7	-51.1	105.9	2 44.2	-51.5	105.9	2 27.8	-52.1	105.9	2 11.3	-52.6	106.0	6
7	3 17.0	-48.8	106.2	3 00.2	-49.3	106.3	2 43.4	-49.9	106.3	2 26.5	-50.4	106.3	2 09.6	-51.0	106.4	1 52.7	-51.5	106.4	1 35.7	-52.0	106.4	1 18.7	-52.5	106.5	7
8	2 28.2	-48.8	106.8	2 10.9	-49.4	106.8	1 53.5	-50.5	106.9	1 36.1	-50.5	106.9	1 01.2	-51.0	106.9	0 43.7	-52.1	106.9	0 26.2	-52.5	107.0	0 9			
9	1 39.4	-48.8	107.4	1 21.5	-49.4	107.4	1 03.5	-49.9	107.4	0 45.6	-50.5	107.4	0 27.6	-51.0	107.4	0 09.6	-51.5	107.4	0 08.4	-52.0	107.2	0 26.3	-52.6	107.2	9
10	0 50.6	-48.8	107.9	0 32.1	-49.4	108.0	0 13.6	-50.5	108.0	0 04.9	+50.5	72.0	0 23.4	+51.0	72.0	0 41.9	+51.6	72.0	1 00.4	+52.0	72.1	1 18.9	+52.5	72.1	10
11	0 01.8	-48.9	108.5	0 17.3	+4.9	71.5	0 36.4	+49.9	71.5	0 55.4	+50.5	71.5	1 14.4	+51.1	71.5	1 33.5	+51.5	71.5	1 52.4	+52.1	71.6	2 11.4	+52.5	71.6	11
12	0 47.1	+48.8	70.9	1 06.7	+49.4	70.9	1 26.3	+49.9	70.9	2 05.5	+50.5	71.0	2 25.0	+51.5	71.0	2 44.5	+52.0	71.1	3 03.9	+52.5	71.1	12			
13	1 35.9	+48.8	70.3	1 56.1	+49.3	70.3	2 16.2	+50.0	70.4	2 36.4	+50.4	70.4	2 56.5	+51.0	70.5	3 16.5	+51.5	70.5	3 36.5	+52.0	70.6	3 56.4	+52.5	70.6	13
14	2 24.7	+48.8	69.7	2 45.4	+49.4	69.8	3 06.2	+49.9	69.8	3 26.8	+50.5	69.9	3 47.5	+50.9	69.9	4 08.0	+51.5	70.0	4 28.5	+52.0	70.1	4 48.9	+52.5	70.1	14
15	3 13.5	+48.7	69.1	3 34.8	+49.3	69.2	3 56.1	+49.9	69.3	4 17.3	+50.4	69.3	4 38.4	+51.0	69.4	4 59.5	+51.5	69.5	5 20.5	+52.0	69.6	5 41.4	+52.4	69.7	15
16	4 02.2	+48.8	68.6	4 24.1	+49.3	68.6	4 46.0	+49.8	68.7	5 07.7	+50.4	68.8	5 29.4	+50.9	68.9	5 51.0	+51.4	69.0	6 12.5	+51.9	69.1	6 33.8	+52.5	69.2	16
17	4 51.0	+48.7	68.0	5 13.4	+49.3	68.1	5 35.8	+49.8	68.1	5 58.1	+50.4	68.2	6 20.3	+50.9	68.3	6 42.4	+51.4	68.4	7 04.4	+51.9	68.6	7 26.3	+52.3	68.7	17
18	5 39.7	+48.7	67.4	6 02.7	+49.3	67.5	6 25.6	+49.8	67.6	6 48.5	+50.3	67.7	7 11.2	+50.8	67.8	7 33.8	+51.4	67.9	7 56.3	+51.8	68.1	8 18.6	+52.4	68.2	18
19	6 28.4	+48.6	66.8	6 52.0	+49.2	66.9	7 15.4	+49.8	67.0	7 38.8	+50.3	67.1	8 02.0	+50.9	67.3	8 25.2	+51.3	67.4	8 48.1	+51.9	67.5	9 11.0	+52.3	67.7	19
20	7 17.0	+48.6	66.2	7 41.2	+49.1	66.3	8 05.2	+49.7	66.5	8 29.1	+50.2	66.6	8 52.9	+50.7	66.7	9 16.5	+51.3	66.9	9 40.0	+51.7	67.0	10 03.3	+52.3	67.2	20
21	8 05.6	+48.6	65.6	8 30.3	+49.1	65.8	8 54.9	+49.6	65.9	9 19.3	+50.2	66.0	9 43.6	+50.7	66.2	10 07.8	+51.2	66.4	10 31.7	+51.8	66.5	10 55.6	+52.2	66.7	21
22	8 54.2	+48.4	65.0	9 19.4	+49.1	65.2	9 44.5	+49.6	65.3	10 09.5	+50.1	65.5	10 34.3	+50.7	65.7	10 59.0	+51.2	65.8	11 23.5	+51.6	66.0	11 47.8	+52.1	66.2	22
23	9 42.6	+48.5	64.4	10 08.5	+48.9	64.6	10 34.1	+49.6	64.8	10 59.6	+50.1	64.9	11 25.0	+50.6	65.1	12 15.1	+51.7	65.3	12 39.9	+52.1	65.7	13 08.6	+51.5	65.9	23
24	10 31.1	+48.3	63.8	10 57.4	+49.0	64.0	11 23.7	+49.4	64.2	11 49.7	+50.0	64.4	12 15.6	+50.5	64.6	12 41.3	+51.0	64.8	13 08.6	+51.5	65.0	13 32.0	+52.1	65.2	24
25	11 19.4	+48.3	63.2	11 46.4	+48.8	63.4	12 13.1	+49.4	63.6	12 39.7	+49.9	63.8	13 06.1	+50.5	64.0	13 32.3	+51.0	64.2	13 58.3	+51.5	64.4	14 24.1	+52.0	64.7	25
26	12 07.7	+48.2	62.6	12 35.2	+48.8	62.8	13 02.5	+49.3	63.0	13 29.6	+49.9	63.2	13 56.6	+50.3	63.4	14 23.3	+50.9	63.7	14 49.8	+51.4	63.9	15 16.1	+51.9	64.1	26
27	12 55.9	+48.1	62.0	13 24.0	+48.6	62.2	13 51.8	+49.3	62.4	14 19.5	+49.7	62.7	14 46.9	+50.3	62.9	15 14.2	+50.8	63.1	15 41.2	+51.3	63.4	16 08.0	+51.8	63.6	27
28	13 44.0	+48.0	61.4	14 12.6	+48.6	61.6	14 41.1	+49.1	61.8	15 09.3	+49.6	62.1	15 37.2	+50.3	62.3	16 05.0	+50.7	62.6	16 32.5	+51.3	62.8	16 19.8	+51.7	63.1	28
29	14 32.0	+48.0	60.8	15 01.2	+48.5	61.0	15 30.2	+49.0	61.2	15 58.9	+49.6	61.5	16 27.5	+50.1	61.8	17 23.8	+51.1	62.3	17 51.5	+51.7	62.6	18 23.8	+52.3	62.9	29
30	15 20.0	+47.8	60.2	15 49.7	+48.4	60.4	16 19.2	+49.0	60.6	16 48.5	+49.5	60.9	17 17.6	+50.0	61.2	17 46.4	+50.5	61.4	18 14.9	+51.1	61.7	18 43.2	+51.6	62.0	30
31	16 07.8	+47.7	59.5	16 38.1	+48.3	59.8	17 08.2	+48.8	60.0	17 38.0	+49.4	60.3	18 07.6	+49.9	60.6	18 36.9	+50.5	60.9	19 06.0	+50.9	61.2	19 34.8	+51.4	61.5	31
32	16 55.5	+47.6	58.9	17 26.4	+48.1	59.2	17 57.0	+47.7	59.4	18 27.4	+49.3	59.7	18 57.5	+49.8	60.0	19 27.4	+50.3	60.3	19 56.9	+50.9	60.6	20 26.2	+51.4	60.9	32
33	17 43.1	+47.5	58.3	18 14.5	+48.1	58.5	18 45.7	+48.6	58.8	19 16.7	+49.1	59.1	19 47.3	+49.7	59.4	20 17.7	+50.2	59.7	20 47.8	+50.7	60.1	21 17.6	+51.2	60.4	33
34	18 30.6	+47.3	57.6	19 02.6	+47.9	57.9	19 34.3	+48.5	58.2	20 05.8	+49.0	58.5	20 37.0	+49.6	58.8	21 07.9	+50.1	59.2	21 38.5	+50.7	59.5	22 08.8	+51.2	59.8	34
35	19 17.9	+47.2	57.0	19 50.5	+47.7	57.3	20 22.8	+48.3	57.6	20 54.8	+48.9	57.9	21 26.6	+49.4	58.2	21 58.0	+50.0	58.6	22 29.2	+50.5	58.9	23 00.0	+51.0	59.3	35
36	20 05.1	+47.0	56.3	20 38.2	+47.7	56.6	21 11.1	+48.2	56.9	21 43.7	+48.7	57.3	22 16.0	+49.3	57.6	22 48.0	+49.8	58.0	23 19.7	+50.3	58.3	23 51.0	+50.9	58.7	36
37	20 52.1	+46.9	55.6	21 25.9	+47.4	56.0	21 59.3	+48.0	56.3	22 32.4	+48.6	56.6	23 05.3	+49.1	57.0	23 37.8	+49.7	57.4	24 10.0	+50.2	57.7	24 41.9	+50.7	58.1	37
38	21 39.0	+46.8	55.0	22 13.3	+47.3	55.3	22 47.3	+47.9</																	

76°, 284° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	8	22.3	+48.4	101.3	8	10.5	+49.0	101.4	7	58.6	+49.6	101.5	7	46.5	+50.2	101.7	7	34.3	+50.7	101.8	7	21.9	+51.3	101.9	7	09.5	+51.8	102.1	6	56.9	+52.3	102.2	0
1	9	10.7	+48.3	100.7	8	59.5	+49.0	100.8	8	48.2	+49.5	101.0	8	36.7	+50.1	101.1	8	25.0	+50.7	101.3	8	13.2	+51.3	101.4	8	01.3	+51.8	101.6	7	49.2	+52.3	101.7	1
2	9	59.0	+48.3	100.1	9	48.5	+48.9	100.2	9	37.7	+49.5	100.4	9	26.8	+50.1	100.6	9	15.7	+50.7	100.7	9	04.5	+51.2	100.9	8	41.5	+52.2	101.2	2				
3	10	47.3	+48.2	99.5	10	37.4	+48.6	99.6	10	27.2	+49.5	99.8	10	16.9	+50.0	100.0	10	06.4	+50.6	100.2	9	55.7	+51.1	100.4	9	33.7	+52.3	100.7	3				
4	11	35.5	+48.2	98.9	11	26.2	+48.8	99.1	11	16.7	+49.3	99.3	11	06.9	+50.9	99.4	10	57.0	+50.5	99.6	10	46.8	+51.1	99.8	10	36.5	+51.6	100.0	10	26.0	+52.1	100.2	4
5	12	23.7	+48.0	98.2	12	15.0	+48.6	98.5	12	06.0	+49.3	98.7	11	56.9	+49.9	98.9	11	47.5	+50.5	99.1	11	37.9	+51.1	99.3	11	28.1	+51.6	99.5	11	18.1	+52.1	99.7	5
6	13	11.7	+48.0	97.6	13	03.6	+48.6	97.9	12	55.3	+49.2	98.1	12	46.8	+49.8	98.3	12	38.0	+50.4	98.5	12	29.0	+50.9	98.8	12	19.7	+51.5	99.0	12	10.2	+52.1	99.2	6
7	13	59.7	+47.9	97.0	13	52.2	+48.6	97.3	13	44.5	+49.2	97.5	13	36.6	+49.7	97.7	13	28.4	+50.3	97.9	13	19.9	+50.9	98.2	13	11.2	+51.5	98.4	13	02.3	+52.0	98.7	7
8	14	47.6	+47.7	96.4	14	40.8	+48.6	96.6	14	33.7	+49.3	96.9	14	26.3	+49.7	97.2	14	18.7	+50.3	97.4	14	10.8	+50.9	97.7	14	02.7	+51.4	97.9	13	54.3	+51.9	98.2	8
9	15	35.3	+47.7	95.8	15	29.2	+48.3	96.0	15	22.7	+49.0	96.3	15	16.0	+49.5	96.6	15	09.0	+50.1	96.9	15	01.7	+50.7	97.1	14	54.1	+51.3	97.4	14	46.2	+51.9	97.6	9
10	16	23.0	+47.5	95.1	16	17.5	+48.2	95.4	16	11.7	+48.8	95.7	16	05.5	+49.5	96.0	15	59.1	+50.1	96.3	15	52.4	+50.7	96.6	15	45.4	+51.2	96.8	15	38.1	+51.8	97.1	10
11	17	10.5	+47.5	94.5	17	05.7	+48.1	94.8	17	00.5	+48.7	95.1	16	55.0	+49.4	95.4	16	49.2	+50.0	95.7	16	43.1	+50.5	96.0	16	36.6	+51.2	96.3	16	29.9	+51.7	96.6	11
12	17	58.0	+47.3	93.8	17	53.8	+47.9	94.2	17	49.2	+48.7	94.5	17	44.4	+49.2	94.8	17	39.2	+49.9	95.1	17	33.6	+50.5	95.4	17	27.8	+51.0	95.8	17	21.6	+51.6	96.1	12
13	18	45.3	+47.1	93.2	18	41.7	+47.9	93.5	18	37.9	+48.5	93.9	18	33.6	+49.2	94.2	18	29.1	+49.7	94.5	18	24.1	+50.4	94.9	18	18.8	+51.0	95.2	18	13.2	+51.6	95.5	13
14	19	32.4	+47.1	92.5	19	29.6	+47.7	92.9	19	26.4	+48.3	93.3	19	22.8	+49.0	93.6	19	18.8	+49.7	94.0	19	14.5	+50.3	94.3	19	09.8	+50.9	94.7	19	04.8	+51.4	95.0	14
15	20	19.5	+46.8	91.9	20	17.3	+47.6	92.3	20	14.7	+48.3	92.6	20	11.8	+48.9	93.0	20	08.5	+49.5	93.4	20	04.8	+50.1	93.7	20	00.7	+50.7	94.1	19	56.2	+51.3	94.5	15
16	21	06.3	+46.7	91.2	21	04.9	+47.4	91.6	21	03.0	+48.1	92.0	21	00.7	+48.7	92.4	20	58.0	+49.4	92.8	20	54.9	+50.0	93.1	20	51.4	+50.7	93.5	20	47.5	+51.3	93.9	16
17	21	53.0	+46.6	90.5	21	52.3	+47.2	90.9	21	51.1	+47.9	91.3	21	49.4	+48.7	91.7	21	47.4	+49.3	92.1	21	44.9	+49.9	92.5	21	42.1	+50.5	92.9	21	38.8	+51.1	93.3	17
18	22	39.6	+46.4	89.9	22	39.5	+47.1	90.3	22	39.0	+47.8	90.7	22	38.1	+48.4	91.1	22	36.7	+49.1	91.5	22	34.8	+49.8	91.9	22	32.6	+50.4	92.4	22	29.9	+51.0	92.8	18
19	23	26.0	+46.1	89.2	23	26.6	+46.9	89.6	23	26.8	+47.6	90.0	23	26.5	+48.3	90.5	23	25.8	+49.0	90.9	23	24.6	+49.6	91.3	23	23.0	+50.2	91.8	23	20.9	+50.9	92.2	19
20	24	12.1	+46.0	88.5	24	13.5	+46.7	88.9	24	14.4	+47.4	89.4	24	14.8	+48.2	89.8	24	14.8	+48.8	90.3	24	14.2	+49.5	90.7	24	13.2	+50.2	91.2	24	11.8	+50.7	91.6	20
21	24	58.1	+45.8	87.8	25	00.2	+46.6	88.2	25	01.8	+47.3	88.7	25	03.0	+47.9	89.2	25	03.6	+48.6	89.6	25	03.7	+49.3	90.1	25	03.4	+49.9	90.6	25	02.5	+50.6	91.0	21
22	25	43.9	+45.6	87.1	25	46.8	+46.3	87.5	25	49.1	+47.0	88.0	25	50.9	+47.8	88.5	25	52.2	+48.5	89.0	25	53.0	+49.2	89.5	25	53.3	+49.8	90.0	25	53.1	+50.5	90.4	22
23	26	29.5	+45.4	86.3	26	33.1	+46.1	86.8	26	36.1	+46.4	87.3	26	38.7	+47.6	87.8	26	40.7	+48.3	88.3	26	42.2	+49.0	88.8	26	43.1	+49.7	89.3	26	43.6	+50.3	89.8	23
24	27	14.9	+45.1	85.6	27	19.2	+45.9	86.1	27	23.0	+46.7	86.6	27	26.3	+47.3	87.1	27	29.0	+48.1	88.2	27	31.2	+48.8	88.7	27	33.9	+50.1	89.2	24				
25	28	00.0	+44.9	84.9	28	05.1	+45.7	85.4	28	09.7	+46.4	85.9	28	13.6	+47.2	86.5	28	17.1	+47.9	87.0	28	20.0	+48.6	87.5	28	22.3	+49.3	88.1	28	24.0	+50.0	88.6	25
26	28	44.9	+44.6	84.1	28	50.8	+45.4	84.6	28	56.1	+46.2	85.2	29	00.8	+47.0	85.7	29	05.0	+47.7	86.3	29	08.6	+48.4	86.9	29	11.6	+49.1	87.4	29	14.0	+49.7	88.0	26
27	29	29.5	+44.4	83.3	29	36.2	+45.1	83.9	29	42.3	+45.9	84.5	29	47.8	+46.7	85.0	29	52.7	+47.4	85.6	29	57.0	+48.1	86.2	30	00.7	+48.8	86.8	30	03.7	+49.6	87.3	27
28	30	13.9	+44.0	82.6	30	21.3	+44.9	83.1	30	28.2	+45.7	83.7	30	34.5	+46.4	84.3	30	40.1	+47.2	84.9	30	45.1	+48.0	85.5	30	49.5	+48.7	86.1	30	53.3	+49.4	86.7	28
29	30	57.9	+43.8	81.8	31	06.2	+44.6	82.4	31	13.0	+45.4	83.0	31	20.9	+46.2	83.6	31	27.3	+47.0	84.2	31	33.1	+47.7	84.8	31	38.2	+48.5	85.4	31	42.7	+49.2	86.0	29
30	31	41.7	+43.5	81.0	31	50.8	+44.3	81.6	31	59.3	+45.1	82.2	32	07.1	+46.0	82.8	32	14.3	+46.7	83.4	32	20.8	+47.5	84.1	32	26.7	+48.2	84.7	32	31.9	+49.0	85.3	30
31	32	25.2	+43.2	80.2	32	35.1	+44.1	80.8	32	44.4	+44.9	81.4	32	53.1	+45.6	82.1	33	01.0	+46.5	82.7	33	08.3	+47.2	83.3	33	14.9	+48.0	84.0	33	20.9	+48.7	84.6	31
32	33	08.4	+42.8	79.3	33	19.2	+43.6	80.0	33	29.3	+45.4	80.6	33	37.8	+45.4	81.3	33	47.5	+46.1	81.9	33	55.5	+47.0	82.6	34	02.9	+47.7	83.3	34	09.6	+48.5	83.9	33
33	33	51.2	+42.5	78.5	34	32.8	+43.4	79.1	34	38.4	+43.9	79.8	34	42.4	+45.0	80.5	34	33.6	+45.9	81.2	34	45.2	+46.7	81.8	34	50.6	+47.5</td						

## LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $76^\circ$ ,  $284^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			Dec.											
	H	d	Z	H	d	Z	H	d	Z	H	d	Z	H	d	Z	H	d	Z	H	d	Z												
0	8	22.3	-48.5	101.3	8	10.5	-49.1	101.4	7	58.6	-49.7	101.5	7	46.5	-50.2	101.7	7	34.3	-50.8	101.8	7	21.9	-51.3	101.9	7	09.5	-51.9	102.1	6	56.9	-52.4	102.2	0
1	7	33.8	-48.5	101.9	7	21.4	-49.1	102.0	7	08.9	-49.7	102.1	6	56.3	-50.3	102.2	6	43.5	-50.8	102.3	6	30.6	-51.3	102.5	6	17.6	-51.9	102.6	6	0.45	-52.4	102.7	1
2	6	45.3	-48.5	102.5	6	32.3	-49.1	102.6	6	19.2	-49.7	102.7	6	0.60	-50.3	102.8	5	52.7	-50.9	102.9	5	39.3	-51.4	103.0	5	25.7	-51.9	103.1	5	12.1	-52.4	103.2	2
3	5	56.8	-48.6	103.0	5	43.2	-49.2	103.1	5	29.5	-49.8	103.2	5	15.7	-50.3	103.3	5	01.8	-50.8	103.4	4	47.9	-51.4	103.5	4	33.8	-51.9	103.6	4	19.7	-52.4	103.7	3
4	5	58.2	-48.6	103.6	4	54.0	-49.2	103.7	4	39.7	-49.8	103.8	4	25.4	-50.4	103.9	4	11.0	-50.9	103.9	3	56.5	-51.5	104.0	3	41.9	-51.9	104.1	3	27.3	-52.5	104.1	4
5	4	19.6	-48.7	104.2	4	04.8	-49.2	104.3	3	49.9	-49.8	104.4	3	35.0	-50.3	104.4	3	20.1	-50.9	104.5	3	05.0	-51.4	104.5	2	50.0	-52.0	104.6	2	34.8	-52.4	104.6	5
6	3	30.9	-48.7	104.8	3	15.6	-49.3	104.9	3	00.1	-49.8	104.9	2	44.7	-50.4	105.0	2	29.2	-51.0	105.0	2	13.6	-51.5	105.0	1	58.0	-52.0	105.1	1	42.4	-52.5	105.1	6
7	2	42.2	-48.6	105.4	2	26.3	-49.3	105.4	2	10.3	-49.8	105.5	1	54.3	-50.4	105.5	1	38.2	-50.9	105.5	1	22.1	-51.4	105.6	1	06.0	-51.9	105.6	0	49.9	-52.5	105.6	7
8	1	53.6	-48.7	106.0	1	37.0	-49.3	106.0	1	20.5	-49.9	106.0	1	03.9	-50.4	106.1	0	47.3	-50.9	106.1	0	30.7	-51.5	106.1	0	14.1	-52.0	106.1	0	0.26	+52.4	73.9	8
9	1	04.9	-48.7	106.6	0	47.7	-49.2	106.6	0	30.6	-49.8	106.6	0	13.5	-50.4	106.6	0	0.36	+51.0	73.4	0	20.8	+51.4	73.4	0	37.9	+52.0	73.4	0	55.0	+52.5	73.4	9
10	0	16.2	-48.8	107.1	0	01.5	+49.3	72.9	0	19.2	+49.9	72.9	0	36.9	+50.4	72.9	0	54.6	+50.9	72.9	1	12.2	+51.5	72.9	1	29.9	+51.9	72.9	1	47.5	+52.4	72.9	10
11	0	32.6	+48.7	72.3	0	50.8	+49.3	72.3	1	09.1	+49.8	72.3	1	27.3	+50.4	72.3	1	45.5	+50.9	72.3	2	03.7	+51.4	72.4	2	21.8	+52.0	72.4	2	39.9	+52.5	72.5	11
12	1	21.3	+48.7	71.7	1	40.1	+49.3	71.7	1	58.9	+49.8	71.7	2	17.7	+50.4	71.7	2	36.4	+50.9	71.8	2	55.1	+51.5	71.9	3	13.8	+51.9	71.9	3	32.4	+52.4	72.0	12
13	2	10.0	+48.6	71.1	2	29.4	+49.2	71.1	2	48.7	+49.9	71.2	3	08.1	+50.3	71.2	3	27.3	+50.9	71.3	3	46.6	+51.4	71.3	4	05.7	+51.9	71.4	4	24.8	+52.4	71.5	13
14	2	58.6	+48.7	70.5	3	18.6	+49.3	70.6	3	38.6	+49.7	70.6	3	58.4	+50.4	70.7	4	18.2	+50.9	70.8	4	38.0	+51.4	70.8	4	57.6	+51.9	70.9	5	17.2	+52.4	71.0	14
15	3	47.3	+48.8	69.9	4	07.9	+49.2	70.0	4	28.3	+49.8	70.1	4	48.8	+50.3	70.1	5	09.1	+50.8	70.2	5	29.4	+51.3	70.3	5	49.5	+51.9	70.4	6	0.96	+52.4	70.5	15
16	4	35.9	+48.7	69.3	4	57.1	+49.1	69.4	5	18.1	+49.8	69.5	5	39.1	+50.3	69.6	5	58.9	+50.9	69.7	6	20.7	+51.4	69.8	6	41.4	+51.8	69.9	7	0.20	+52.3	70.0	16
17	5	24.6	+48.5	68.8	5	46.2	+49.2	68.8	6	0.79	+49.7	68.9	6	29.4	+50.2	69.0	6	60.8	+50.7	69.2	7	12.1	+51.2	69.3	7	33.2	+51.8	69.4	7	54.3	+52.3	69.5	17
18	6	13.1	+48.6	68.2	6	35.4	+49.1	68.3	6	57.6	+49.6	68.4	7	19.6	+50.2	68.5	7	41.5	+50.8	68.6	8	0.03	+53.3	68.7	8	25.0	+51.8	68.9	8	46.6	+52.2	69.0	18
19	7	0.17	+48.5	67.6	7	24.5	+49.1	67.7	7	47.2	+49.6	67.8	8	0.98	+50.2	67.9	8	32.3	+50.7	68.1	8	54.6	+51.2	68.2	9	16.8	+51.7	68.4	9	38.8	+52.2	68.5	19
20	7	50.2	+48.4	67.0	8	13.6	+49.0	67.1	8	36.8	+49.6	67.2	9	0.00	+50.1	67.4	9	23.0	+50.6	67.5	9	45.8	+51.2	67.7	10	0.85	+51.7	67.9	10	31.0	+52.2	68.0	20
21	8	38.6	+48.4	66.4	9	0.26	+48.9	66.5	9	26.4	+49.5	66.7	9	50.1	+50.0	66.8	10	13.6	+50.6	67.0	10	37.0	+51.1	67.2	11	0.02	+51.6	67.3	11	23.2	+52.1	67.5	21
22	9	27.0	+48.3	65.8	9	51.5	+48.9	65.9	10	15.9	+49.5	66.1	10	40.1	+50.0	66.3	11	04.2	+50.5	66.4	11	28.1	+51.0	66.6	11	51.8	+51.5	66.8	12	15.3	+52.1	67.0	22
23	10	15.3	+48.3	65.2	10	40.4	+48.8	65.4	11	05.4	+49.3	65.5	11	30.1	+50.0	65.7	11	54.7	+50.5	65.9	12	19.1	+51.0	66.1	12	43.3	+51.5	66.3	13	0.74	+52.0	66.5	23
24	11	03.6	+48.2	64.6	11	29.2	+48.8	64.8	11	54.7	+49.4	64.9	12	20.1	+49.8	65.1	12	45.2	+50.4	65.3	13	10.1	+50.9	65.5	13	24.8	+51.5	65.8	13	59.4	+51.9	66.0	24
25	11	51.8	+48.1	64.0	12	18.0	+48.7	64.2	12	44.1	+49.2	64.4	13	0.99	+49.8	64.6	13	35.6	+50.3	64.8	14	0.10	+50.9	65.0	14	26.3	+51.3	65.2	14	51.3	+51.8	65.5	25
26	12	39.9	+48.0	63.4	13	06.7	+48.6	63.6	13	33.3	+49.1	63.8	13	59.7	+49.7	64.0	14	25.9	+50.2	64.2	14	15.9	+50.7	64.5	15	17.6	+51.3	64.7	15	43.1	+51.8	65.0	26
27	13	27.9	+47.9	62.7	13	55.3	+48.5	63.0	14	22.4	+49.1	63.2	14	49.4	+49.6	63.4	15	16.1	+50.2	63.7	16	08.9	+51.2	64.2	16	34.9	+51.7	64.4	17				
28	14	15.8	+47.9	62.1	14	43.8	+48.4	62.4	15	11.5	+49.0	62.6	15	39.0	+49.5	62.8	16	28.6	+50.3	63.1	16	13.3	+50.6	63.4	17	00.1	+51.1	63.7	17	26.6	+51.7	63.9	28
29	15	03.7	+47.7	61.5	15	32.2	+48.3	61.7	16	00.5	+48.8	62.0	16	28.5	+49.5	62.2	16	56.3	+50.0	62.5	17	51.2	+51.0	62.8	17	32.3	+51.5	63.4	29				
30	15	51.4	+47.6	60.9	16	20.5	+48.2	61.1	16	49.3	+48.8	61.4	17	18.0	+49.3	61.7	17	46.3	+49.9	61.9	18	14.4	+50.4	62.2	18	42.2	+51.0	62.5	19				
31	15	51.4	+47.6	60.9	17	08.7	+48.1	60.5	17	38.1	+48.7	60.8	18	0.73	+49.2	61.2	18	36.2	+49.7	61.3	19	13.3	+50.8	61.6	20	24.0	+50.7	61.4	20				
32	16	39.0	+47.5	60.2	17	22.9	+48.4	59.5	17	56.8	+47.9	59.9	18	26.8	+48.5	60.2	18	55.9	+49.7	60.8	19	55.1	+50.2	61.1	21	20.4	+50.7	61.3	21				
33	17	39.8	+43.0	59.2	18	31.9	+47.3	57.5	18	0.36	+44.3	56.1	19	45.0	+44.9	56.6	19	26.0	+45.5	57.2	20	14.6	+47.3	57.5	20	33.1	+48.8	58.0	21				
34	18	22.8	+42.8	44.4	19	04.6	+43.3	44.8	19	47.9	+44.0	45.3	20	39.9	+44.6	45.8	20	11.5	+45.2	46.3	21	32.7	+45.7	46.8	21	33.5	+46.5	47.4	21				
35	14	05.6	+42.3	43.5	20	31.9	+43.6	43.1	20	16.5	+43.2	43.6	21	23.4	+43.9	43.6	21	41.6	+44.4	44.7	22	38.0	+45.0	45.2	22	35.5	+46.3	47.4	22				
36	15	47.9	+42.0	42.7	21	31.9	+42.6	42.3	21	56.8	+42.9	42.8	22	37.6	+43.4	43.3	22	38.0	+44.1	43.8	23	39.0	+44.7	44.4	23	34.4	+45.3	45.0	23				
37	16	11.5	+41.2	40.9	22	36.5	+41.8	41.4	22	41.6	+42.4	41.9	23	26.0	+43.1	42.4	23	10.1	+43.7	43.0	24	39.8	+44.3	43.5	24	37.1	+45.0	44.1	24				
38	17	36.2	+40.8	40.0	23	37.8	+41.5	40.5	23	34.0	+42.0	41.0	24	39.0	+41.1	42.7	24	21.8	+43.9	42.7	24	41.1	+44.5	43.2	24	42.6	+45.6	43.9	25				
39	17	33.5	+40.4	39.1	24	20.0	+40.9	39.6	24	36.0	+41.6	40.1	25	39.1	+42.4	40.6	24	37.1	+42.9	41.2	24	22.1	+43.5	41.8	24	42.6	+46.4	47.2	24				
40	18	33.9	+39.3	37.2	25	41.4	+40.1	37.7	25	40.8	+40.6	38.2	26	41.5	+41.3	41.3	26	37.7	+41.9	41.7	27	38.0	+42.4	41.4	27	33.0	+43.8	41.6	27				
41	19	53.8	+39.4	37.2	26	41.4	+40.1	37.7	26	40.8	+40.6	38.2	27	41.5	+41.3	41.3	27	38.7	+42.4	41.7	28	39.0	+43.4</td										

S. Lat. { L.H.A. greater than  $180^{\circ}$  ....Zn=  $180^{\circ}$ -Z  
| H.A less than  $180^{\circ}$  ...Zn=  $180^{\circ}$ +7 LATITUDE SAME NAME AS DECLINATION

L.H.A.  $104^\circ$ ,  $256^\circ$

77°, 283° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	7	46.8	+48.4	100.4	7	35.9	+48.9	100.6	7	24.8	+49.5	100.7	7	13.6	+50.1	100.8	7	02.2	+50.7	101.0	6	50.8	+51.2	101.1	6	39.2	+51.8	101.2	6	27.5	+52.3	101.3	0
1	8	35.2	+48.3	99.8	8	24.8	+48.9	100.0	8	14.3	+49.5	100.1	8	03.7	+50.1	100.3	7	52.9	+50.7	100.4	7	42.0	+51.2	100.6	7	31.0	+51.7	100.7	7	19.8	+52.2	100.8	1
2	9	23.5	+48.2	99.2	9	13.7	+48.9	99.4	9	03.8	+49.5	99.6	8	53.8	+50.0	99.7	8	43.6	+50.6	99.9	8	33.2	+51.1	100.0	8	22.7	+51.7	100.2	8	12.0	+52.2	100.3	2
3	10	11.7	+48.1	98.6	10	02.6	+48.7	98.8	9	53.3	+49.4	99.0	9	43.8	+50.0	99.2	9	34.2	+50.5	99.3	9	24.3	+51.2	99.5	9	14.4	+51.6	99.7	9	04.2	+52.2	99.8	3
4	10	59.8	+48.1	98.0	10	51.3	+48.7	98.2	10	42.7	+49.3	98.4	10	33.8	+49.9	98.6	10	24.7	+50.5	98.8	10	15.5	+51.6	99.1	9	56.4	+52.1	99.3	4				
5	11	47.9	+48.0	97.4	11	40.0	+48.7	97.6	11	32.0	+49.2	97.8	11	23.7	+49.8	98.0	11	15.2	+50.4	98.2	11	06.5	+51.0	98.4	10	57.6	+51.5	98.6	10	48.5	+52.1	98.8	5
6	12	35.9	+47.9	96.8	12	28.7	+48.5	97.0	12	21.2	+49.2	97.3	12	13.5	+49.8	97.5	12	05.6	+50.4	97.7	11	57.5	+50.9	97.9	11	49.1	+51.5	98.1	11	40.6	+52.0	98.3	6
7	13	23.8	+47.9	96.2	13	17.2	+48.5	96.4	13	10.4	+49.1	96.7	13	03.3	+49.7	96.9	12	56.0	+50.3	97.1	12	48.4	+50.9	97.4	12	40.6	+51.5	97.6	12	32.6	+52.0	97.8	7
8	14	11.7	+47.7	95.6	14	05.7	+48.4	95.8	13	59.5	+49.0	96.1	13	53.0	+49.6	96.3	13	46.3	+50.2	96.6	13	39.3	+50.4	96.8	13	32.1	+51.3	97.0	13	24.6	+51.9	97.3	8
9	14	59.4	+47.6	94.9	14	54.1	+48.3	95.2	14	48.5	+48.9	95.5	14	42.6	+49.5	95.7	14	36.5	+50.1	96.0	14	30.1	+50.7	96.3	14	23.4	+51.3	96.5	14	16.5	+51.8	96.8	9
10	15	47.0	+47.5	94.3	15	42.4	+48.1	94.6	15	37.4	+48.8	94.9	15	32.1	+49.5	95.2	15	26.6	+50.1	95.4	15	20.8	+50.6	95.7	15	14.7	+51.2	96.0	15	08.3	+51.8	96.2	10
11	16	34.5	+47.4	93.7	16	30.5	+48.1	94.0	16	26.2	+48.7	94.3	16	21.6	+49.3	94.6	16	16.7	+49.9	94.9	16	11.4	+50.6	95.1	16	05.9	+51.1	95.4	16	00.1	+51.6	95.7	11
12	17	21.9	+47.3	93.0	17	18.6	+47.9	93.4	17	14.9	+48.6	93.7	17	10.9	+49.3	94.0	17	06.6	+49.9	94.6	17	02.0	+50.4	95.2	16	51.7	+51.6	95.2	12				
13	18	09.2	+47.2	92.4	18	06.5	+47.9	92.7	18	03.5	+48.5	93.0	18	00.2	+49.1	93.4	17	56.5	+49.7	93.7	17	52.4	+50.4	94.0	17	48.1	+50.9	94.3	17	43.3	+51.6	94.7	13
14	18	56.4	+47.0	91.7	18	54.4	+47.6	92.1	18	52.0	+48.3	92.4	18	49.3	+49.0	92.8	18	46.2	+49.6	93.1	18	42.8	+50.2	93.4	18	39.0	+50.8	93.8	18	34.9	+51.4	94.1	14
15	19	43.4	+46.8	91.1	19	42.0	+47.6	91.4	19	40.3	+48.3	91.8	19	38.3	+48.9	92.2	19	35.8	+49.5	92.5	19	33.0	+50.2	92.9	19	29.8	+50.8	93.2	19	26.3	+51.3	93.6	15
16	20	30.2	+46.7	90.4	20	29.6	+47.4	90.8	20	28.6	+48.1	91.2	20	27.2	+47.8	91.5	20	25.3	+49.4	91.9	20	23.2	+50.0	92.3	20	20.6	+50.6	92.7	20	17.6	+51.2	93.0	20
17	21	16.9	+46.6	89.7	21	17.0	+47.2	90.1	21	16.7	+47.9	90.5	21	15.9	+48.6	90.9	21	14.7	+49.3	91.3	21	13.2	+49.9	91.7	21	11.2	+50.5	92.1	21	08.8	+51.1	92.5	17
18	22	03.5	+46.4	89.1	22	04.2	+47.1	89.5	22	04.6	+47.8	89.9	22	04.5	+48.5	90.3	22	04.0	+49.1	90.7	22	03.1	+49.7	91.1	22	01.7	+50.4	91.5	22	05.9	+51.0	91.9	18
19	22	49.9	+46.2	88.4	22	51.3	+47.0	88.8	22	52.4	+47.6	89.2	22	53.0	+48.3	89.6	22	53.1	+49.0	90.1	22	52.8	+49.6	90.5	22	52.1	+50.2	90.9	22	50.9	+50.9	91.3	19
20	23	36.1	+46.0	87.7	23	38.3	+46.7	88.1	23	40.0	+47.4	88.6	23	41.3	+48.1	89.0	23	42.1	+48.8	89.4	23	42.4	+49.5	89.9	23	42.3	+50.2	90.3	23	41.8	+50.7	90.8	20
21	24	22.1	+45.8	87.0	24	25.0	+46.5	87.4	24	27.4	+47.3	87.9	24	29.4	+48.0	88.3	24	30.9	+48.7	88.8	24	31.9	+49.3	89.3	24	32.5	+49.9	89.7	24	32.5	+50.6	90.2	21
22	25	07.9	+45.6	86.3	25	11.5	+46.4	86.7	25	14.7	+47.1	87.2	25	17.4	+47.8	87.7	25	19.6	+48.4	88.2	25	21.2	+49.2	88.6	25	22.4	+49.8	89.1	25	23.1	+50.5	89.6	22
23	25	53.5	+45.4	85.6	25	57.9	+46.1	86.0	26	01.8	+46.6	86.5	26	05.2	+47.6	87.0	26	08.0	+48.3	87.5	26	10.4	+49.0	88.0	26	12.2	+49.7	88.5	26	13.6	+50.3	89.0	23
24	26	38.9	+45.2	84.8	26	44.0	+46.0	85.3	26	48.7	+46.6	85.8	26	52.8	+47.4	86.3	26	56.3	+48.2	86.8	26	59.4	+48.8	87.3	27	01.9	+49.5	87.9	27	03.9	+50.1	88.4	24
25	27	24.1	+44.9	84.1	27	30.0	+45.7	84.6	27	35.3	+46.5	85.1	27	40.2	+47.2	85.6	27	44.5	+47.9	86.2	27	48.2	+48.6	86.7	27	51.4	+49.3	87.2	27	54.0	+50.0	87.7	25
26	28	09.0	+44.7	83.3	28	15.7	+45.4	83.9	28	21.8	+46.2	84.4	28	27.4	+46.9	84.9	28	32.4	+47.7	85.3	28	36.8	+48.4	86.0	28	40.7	+49.1	86.6	28	44.0	+49.8	87.1	26
27	28	53.7	+44.4	82.6	29	01.1	+45.2	83.1	29	08.0	+46.0	83.7	29	14.3	+46.8	84.2	29	20.1	+47.5	84.8	29	25.2	+48.3	85.4	29	29.8	+48.9	85.9	29	33.8	+49.6	86.5	27
28	29	38.1	+44.1	81.8	29	46.3	+45.0	82.4	29	54.0	+45.8	82.9	30	01.1	+46.5	83.5	30	07.6	+47.4	84.1	30	13.5	+48.0	84.7	30	18.7	+48.8	85.2	30	23.4	+49.4	85.8	28
29	30	22.2	+43.9	81.0	30	31.3	+44.7	81.6	30	39.4	+45.2	82.3	30	46.3	+46.8	82.8	30	54.8	+47.1	83.4	31	01.5	+47.7	84.0	31	07.5	+48.5	84.6	31	12.8	+49.2	85.2	29
30	31	06.1	+43.6	80.2	31	16.0	+44.4	80.8	31	25.2	+45.2	81.4	31	33.9	+46.0	82.0	31	41.9	+46.7	82.6	31	49.2	+47.6	83.3	32	02.0	+49.0	84.5	30	42.0	+49.8	85.0	30
31	31	49.7	+43.2	79.4	32	00.4	+44.1	80.0	32	10.4	+45.0	80.7	32	19.9	+45.7	81.3	32	28.6	+46.5	81.9	32	36.8	+47.2	82.5	32	44.2	+48.1	83.2	32	51.0	+48.8	83.8	31
32	32	32.9	+43.0	78.6	32	44.5	+43.8	79.2	32	55.4	+44.6	79.9	33	55.6	+45.4	80.5	33	51.5	+46.3	81.2	33	34.0	+47.0	81.8	33	32.3	+47.7	82.5	33	39.8	+48.5	83.1	32
33	33	15.9	+42.6	77.8	33	28.3	+43.4	78.4	33	40.0	+44.3	79.1	33	51.0	+45.1	79.7	34	01.4	+45.9	80.4	34	11.0	+46.8	81.1	34								

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $77^\circ$ ,  $283^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	7	46.8	-48.4	100.4	7	35.9	-49.0	100.6	7	24.8	-49.6	100.7	7	13.6	-50.2	100.8	7	02.2	-50.7	101.0	6	50.8	-51.3	101.1	6	39.2	-51.8	101.2	6	27.5	-52.3	101.3	0
1	6	58.4	-48.4	101.0	6	46.9	-49.0	101.2	6	35.2	-49.6	101.3	6	23.4	-50.2	101.4	6	11.5	-50.7	101.5	5	59.5	-51.3	101.6	5	47.4	-51.8	101.7	5	35.2	-52.4	101.8	1
2	6	10.0	-48.5	101.6	5	57.9	-49.1	101.7	5	45.6	-49.7	101.8	5	33.2	-50.2	101.9	5	20.8	-50.8	102.0	5	08.2	-51.3	102.1	4	55.6	-51.9	102.2	4	42.8	-52.3	102.3	3
3	5	21.5	-48.5	102.2	5	08.8	-49.1	102.3	4	55.9	-49.6	102.4	4	43.0	-50.2	102.5	4	30.0	-50.8	102.6	4	16.9	-51.3	102.6	4	03.7	-51.8	102.7	3	50.5	-52.4	102.8	3
4	4	33.0	-48.5	102.8	4	19.7	-49.1	102.9	4	06.3	-49.7	103.0	3	52.8	-50.3	103.0	3	39.2	-50.8	103.1	3	25.6	-51.4	103.2	3	11.9	-51.9	103.2	2	58.1	-52.4	103.3	4
5	3	44.5	-48.6	103.4	3	30.6	-49.2	103.5	3	16.5	-49.7	103.5	3	02.5	-50.3	103.6	2	48.4	-50.9	103.6	2	34.2	-51.4	103.7	2	20.0	-51.9	103.7	2	05.7	-52.3	103.8	5
6	2	55.9	-48.5	104.0	2	41.4	-49.2	104.0	2	26.8	-49.7	104.1	2	12.2	-50.3	104.1	1	57.5	-50.8	104.2	1	42.8	-51.3	104.2	1	28.1	-51.9	104.2	1	13.4	-52.4	104.2	6
7	2	07.4	-48.6	104.6	1	52.2	-49.1	104.6	1	37.1	-49.8	104.6	1	21.9	-50.3	104.7	1	06.7	-50.9	104.7	0	51.5	-51.4	104.7	0	36.2	-51.9	104.7	0	21.0	-52.4	104.7	7
8	1	18.8	-48.6	105.2	1	03.1	-49.2	105.2	0	47.3	-49.7	105.2	0	31.6	-50.3	105.2	0	15.8	-50.8	105.2	0	00.1	-51.4	105.2	0	15.7	+51.9	74.8	0	31.4	+52.4	74.8	8
9	0	30.2	-48.6	105.8	0	13.9	-49.2	105.8	0	02.4	+49.8	74.2	0	18.7	+50.3	74.2	0	35.0	+50.9	74.2	0	51.3	+51.4	74.3	1	07.6	+51.9	74.3	1	23.8	+52.4	74.3	9
10	0	18.4	+48.6	67.7	0	35.3	+49.2	73.7	0	52.2	+49.7	73.7	1	09.0	+50.3	73.7	1	25.9	+50.8	73.7	1	42.7	+51.4	73.7	1	59.5	+51.9	73.8	2	16.2	+52.4	73.8	10
11	1	07.0	+48.6	73.1	1	24.5	+49.2	73.1	1	41.9	+49.8	73.1	1	59.3	+50.3	73.1	2	16.7	+50.9	73.2	2	34.1	+51.3	73.2	2	51.4	+51.8	73.3	11				
12	1	55.6	+48.6	72.5	2	13.7	+49.1	72.5	2	31.7	+49.7	72.6	2	49.6	+50.3	72.6	3	07.6	+50.8	72.6	3	25.4	+51.4	72.7	3	43.2	+51.9	72.8	12				
13	2	44.2	+48.6	71.9	3	02.8	+49.2	71.9	3	21.4	+49.7	72.0	3	39.9	+50.3	72.1	3	58.4	+50.8	72.1	4	16.8	+51.3	72.2	4	35.1	+51.8	72.3	13				
14	3	32.8	+48.5	71.3	3	52.0	+49.1	71.4	4	11.1	+49.7	71.4	4	30.2	+50.2	71.5	4	49.2	+50.7	71.6	5	08.1	+51.3	71.7	5	26.9	+51.8	71.8	5	45.6	+52.4	71.8	14
15	4	21.3	+48.5	70.7	4	41.1	+49.1	70.8	5	00.8	+49.6	70.9	5	20.4	+50.2	71.0	5	39.9	+50.8	71.0	5	59.4	+51.2	71.1	6	18.7	+51.8	71.2	6	38.0	+52.2	71.4	15
16	5	09.8	+48.5	70.1	5	30.2	+49.0	70.2	5	50.4	+49.7	70.3	6	10.6	+50.2	70.4	6	30.7	+50.7	70.5	6	50.6	+51.3	70.6	7	10.5	+51.7	70.7	7	30.2	+52.3	70.9	16
17	6	58.3	+48.4	69.5	6	19.2	+49.0	69.6	6	40.1	+49.5	69.7	7	00.8	+50.1	69.8	7	21.4	+50.6	70.0	7	41.9	+51.2	70.1	8	02.2	+51.7	70.2	8	22.5	+52.2	70.4	17
18	6	46.7	+48.4	68.9	7	08.2	+49.0	69.1	7	29.6	+49.6	69.2	7	50.9	+50.1	69.3	8	12.0	+50.7	69.4	8	33.1	+51.1	69.6	9	8.5	+51.7	69.7	9	14.7	+52.1	69.9	18
19	7	35.1	+48.4	68.3	7	57.2	+48.9	68.5	8	19.2	+49.5	68.6	8	41.0	+50.0	68.7	9	02.7	+50.5	68.9	9	24.2	+51.1	69.0	9	45.6	+51.6	69.2	10	06.8	+52.1	69.4	19
20	8	23.5	+48.3	67.7	8	46.1	+48.9	67.9	9	08.7	+49.4	68.0	9	31.0	+50.0	68.0	9	53.2	+50.6	68.3	10	15.3	+51.1	68.5	10	37.2	+51.6	68.7	10	10.8	+52.1	68.9	20
21	9	11.8	+48.2	67.1	9	35.0	+48.8	67.3	9	58.1	+54.9	67.4	10	21.0	+49.9	67.6	10	43.8	+50.4	67.8	11	06.4	+51.0	68.0	11	28.8	+51.5	68.2	11	51.0	+52.0	68.4	21
22	10	00.0	+48.2	66.5	10	23.8	+48.8	66.7	10	47.5	+49.3	66.9	11	10.9	+49.9	67.1	11	34.2	+50.4	67.2	11	57.4	+50.9	67.4	12	20.3	+51.4	67.6	12	43.0	+52.0	67.8	22
23	10	48.2	+48.1	65.9	11	12.6	+48.6	66.1	11	36.8	+49.2	66.3	12	0.0	+49.8	66.5	12	24.6	+50.4	66.7	13	48.3	+51.8	67.1	13	35.0	+51.8	67.3	23				
24	11	36.3	+48.0	65.3	12	0.1	+48.6	65.5	12	26.0	+49.2	65.7	12	50.6	+49.7	65.9	13	15.0	+50.2	66.1	13	39.1	+50.8	66.4	14	03.1	+51.3	66.6	14	26.8	+51.9	66.8	24
25	12	24.3	+47.9	64.7	12	49.8	+48.6	64.9	13	15.2	+49.1	65.1	13	40.3	+49.6	65.3	14	05.2	+50.2	65.6	14	54.4	+51.3	66.0	15	18.7	+51.7	66.3	25				
26	13	12.2	+47.9	64.1	13	38.4	+48.4	64.3	14	04.3	+49.0	64.5	14	29.9	+49.6	64.8	14	55.4	+50.1	65.0	15	20.7	+50.6	65.2	15	45.7	+51.1	65.5	16	10.4	+51.7	65.8	26
27	14	00.1	+47.8	63.5	14	26.8	+48.3	63.7	14	53.3	+48.9	63.9	15	19.5	+49.5	64.2	15	45.5	+50.0	64.4	16	11.3	+50.5	64.7	16	36.8	+51.1	65.0	17	02.1	+51.6	65.2	27
28	14	47.9	+47.6	62.9	15	15.1	+48.3	63.1	15	42.2	+48.8	63.3	16	09.0	+49.3	63.6	16	35.5	+49.5	63.9	17	01.8	+50.5	64.1	17	27.9	+51.7	64.4	18				
29	15	35.5	+47.5	62.6	16	03.4	+48.2	62.5	16	31.0	+48.7	62.7	16	58.3	+49.3	63.0	17	25.4	+49.8	63.3	17	52.3	+50.3	63.6	18	18.9	+50.8	63.9	18	45.2	+51.4	64.2	19
30	16	23.0	+47.5	61.6	16	51.5	+48.0	61.9	17	19.7	+48.5	62.1	17	47.6	+49.1	62.4	18	15.2	+49.8	62.7	18	42.6	+50.3	63.0	19	09.7	+50.8	63.3	19	36.6	+51.3	63.6	30
31	17	10.5	+47.3	60.9	17	39.5	+47.9	61.2	18	08.2	+48.5	61.5	18	36.7	+49.1	61.8	19	05.0	+49.5	62.1	19	32.9	+50.1	62.4	20	00.5	+50.7	62.7	20	27.9	+51.2	63.1	31
32	17	57.8	+47.2	60.3	18	27.4	+47.7	60.6	18	56.7	+48.4	60.9	19	25.8	+48.9	61.2	19	54.5	+49.5	61.5	20	23.0	+50.0	61.8	20	51.2	+50.6	62.2	21	19.1	+51.0	62.5	32
33	18	45.0	+47.2	59.7	19	15.1	+47.7	59.9	19	45.1	+48.2	60.3	20	14.7	+48.6	60.6	20	44.0	+49.3	60.9	21	13.0	+49.9	61.2	21	41.8	+50.4	61.6	21	10.1	+51.0	61.9	33
34	19	32.0	+46.9	59.0	20	0.28	+47.5	59.3	20	33.9	+47.4	59.6	21	39.7	+45.4	60.0	22	22.6	+49.0	59.7													

78°, 282° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	7	11.3	+48.2	99.6	7	01.2	+48.9	99.8	6	50.9	+49.5	99.9	6	40.6	+50.1	100.0	6	30.1	+50.6	100.1	6	19.5	+51.2	100.2	6	08.8	+51.7	100.3	5	58.0	+52.3	100.4	0
1	7	59.5	+48.3	99.0	7	50.1	+48.8	99.2	7	40.4	+49.5	99.3	7	30.7	+50.0	99.4	7	20.7	+50.6	99.6	7	10.7	+51.1	99.7	7	00.5	+51.7	99.8	6	50.3	+52.2	99.9	1
2	8	47.8	+48.1	98.4	8	38.9	+48.8	98.6	8	29.9	+49.3	98.7	8	20.7	+49.9	98.9	8	11.3	+50.6	99.0	8	01.8	+51.2	99.2	7	52.2	+51.7	99.3	2				
3	9	35.9	+48.1	97.8	9	27.7	+48.7	98.0	9	19.2	+49.4	98.2	9	10.6	+50.0	98.3	9	01.9	+50.5	98.5	8	53.0	+51.0	98.6	8	43.9	+51.6	98.8	3				
4	10	24.0	+48.1	97.2	10	16.4	+48.7	97.4	10	08.6	+49.2	97.6	10	00.6	+49.8	97.8	9	52.4	+50.4	97.9	9	44.0	+51.5	98.1	9	35.5	+51.5	98.3	4				
5	11	12.1	+47.9	96.6	11	05.1	+48.5	96.8	10	57.8	+49.2	97.0	10	40.4	+49.8	97.2	10	42.8	+50.4	97.4	10	35.0	+51.0	97.6	10	27.0	+51.5	97.8	10	18.8	+52.1	97.9	5
6	12	00.0	+47.9	96.0	11	53.6	+48.6	96.2	11	47.0	+49.2	96.4	11	40.2	+49.8	96.6	11	33.2	+50.3	96.8	11	26.0	+50.9	97.0	11	18.5	+51.5	97.2	11	10.9	+52.0	97.4	6
7	12	47.9	+47.8	95.4	12	42.2	+48.4	95.6	12	36.2	+49.0	95.8	12	30.0	+49.6	96.1	12	23.5	+50.3	96.3	12	16.9	+50.8	96.5	12	10.0	+51.4	96.7	12	0.29	+51.9	96.9	7
8	13	35.7	+47.7	94.8	13	30.6	+48.3	95.0	13	25.2	+49.0	95.2	13	19.6	+49.6	95.5	13	13.8	+50.2	95.7	13	07.7	+50.7	95.9	13	01.4	+51.3	96.2	12	54.8	+51.9	96.4	8
9	14	23.4	+47.6	94.1	14	18.9	+48.3	94.4	14	14.2	+48.9	94.6	14	9.2	+49.5	94.9	14	0.40	+50.1	95.1	13	58.4	+50.7	95.4	13	52.7	+51.2	95.6	13	46.7	+51.8	95.9	9
10	15	11.0	+47.5	93.5	15	07.2	+48.1	93.8	15	03.1	+48.8	94.0	14	58.7	+49.4	94.3	14	54.1	+50.0	94.6	14	49.1	+50.6	94.8	14	43.9	+51.2	95.1	14	38.5	+51.7	95.4	10
11	15	58.5	+47.4	92.9	15	55.3	+48.1	93.2	15	51.9	+48.7	93.4	15	48.1	+49.3	93.7	15	44.1	+49.9	94.0	15	39.7	+50.6	94.3	15	35.1	+51.1	94.6	15	30.2	+51.6	94.8	11
12	16	45.9	+47.2	92.2	16	43.4	+47.9	92.5	16	40.6	+48.5	92.8	16	37.4	+49.2	93.1	16	34.0	+49.8	93.4	16	30.3	+50.4	93.7	16	26.2	+51.0	94.0	16	21.8	+51.6	94.3	12
13	17	33.1	+47.2	91.6	17	31.3	+47.8	91.9	17	29.1	+48.5	92.2	17	26.6	+49.2	92.5	17	23.8	+49.8	92.8	17	20.7	+50.3	93.2	17	17.2	+50.9	93.5	17	13.4	+51.5	93.8	13
14	18	20.3	+47.0	90.9	18	19.1	+47.7	91.3	18	17.6	+48.3	91.6	18	15.8	+48.9	91.9	18	13.6	+49.6	92.3	18	11.0	+50.3	92.6	18	08.1	+50.9	92.9	18	04.9	+51.4	93.2	14
15	19	07.3	+46.8	90.3	19	06.8	+47.5	90.6	19	05.9	+48.3	91.0	19	04.7	+48.9	91.3	19	03.2	+49.5	91.7	19	01.3	+50.1	92.0	18	59.0	+50.7	92.4	18	56.3	+51.3	92.7	15
16	19	54.1	+46.7	89.6	19	54.3	+47.4	90.0	19	54.2	+48.0	90.3	19	53.6	+48.7	90.7	19	52.7	+49.4	91.1	19	51.4	+50.0	91.4	19	49.7	+50.6	91.8	19	47.6	+51.2	92.1	16
17	20	40.6	+46.6	88.9	20	41.7	+47.3	89.3	20	42.2	+48.0	89.7	20	42.3	+48.7	90.1	20	42.1	+49.2	90.5	20	41.4	+49.9	90.8	20	40.3	+50.5	91.2	20	38.8	+51.1	91.6	17
18	21	27.4	+46.4	88.3	21	29.0	+47.1	88.7	21	30.2	+47.8	89.1	21	31.0	+48.4	89.5	21	31.3	+49.1	89.8	21	31.3	+49.7	90.2	21	30.8	+50.4	90.6	21	29.9	+51.0	91.0	18
19	22	13.8	+46.2	87.6	22	16.1	+46.9	88.0	22	18.0	+47.6	88.4	22	19.4	+48.3	88.8	22	20.4	+49.0	89.2	22	21.0	+49.7	89.6	22	21.2	+50.2	90.1	22	20.9	+50.9	90.5	19
20	23	00.0	+46.0	86.9	23	03.0	+46.8	87.3	23	05.6	+47.5	87.7	23	07.7	+48.2	88.2	23	09.4	+48.8	88.6	23	10.7	+49.4	89.0	23	11.8	+50.7	89.9	23	11.8	+50.7	89.9	20
21	23	46.0	+45.9	86.2	23	49.8	+46.5	86.6	23	53.1	+47.2	87.1	23	55.9	+48.0	87.5	23	58.2	+48.7	88.0	24	00.1	+49.4	88.4	24	01.6	+49.9	88.9	24	02.5	+50.6	89.3	21
22	24	31.9	+45.6	85.5	24	36.3	+46.4	85.9	24	40.3	+47.1	86.4	24	43.9	+47.8	86.9	24	46.9	+48.5	87.3	24	49.5	+49.1	87.8	24	51.5	+49.9	88.3	24	53.1	+50.5	88.7	22
23	25	17.5	+45.4	84.8	25	22.7	+46.2	85.2	25	27.4	+47.0	85.7	25	31.7	+47.6	86.2	25	35.4	+48.3	86.7	25	41.4	+49.6	87.2	25	43.6	+50.3	88.1	24	46.7	+50.7	88.5	24
24	26	02.9	+45.3	84.1	26	08.9	+46.0	84.5	26	14.4	+46.7	85.0	26	19.3	+47.4	85.5	26	23.7	+48.2	86.0	26	27.6	+48.4	86.5	26	31.0	+49.5	87.0	26	33.9	+50.2	87.5	24
25	26	48.2	+44.9	83.3	26	54.9	+45.7	83.8	27	01.1	+46.5	84.3	27	06.7	+47.3	84.8	27	11.9	+47.9	85.3	27	16.5	+48.6	85.9	27	20.5	+49.4	86.4	27	24.1	+49.9	86.9	25
26	27	33.1	+44.8	82.6	27	40.6	+45.5	83.1	27	47.6	+46.3	83.6	27	54.0	+47.0	84.1	27	59.8	+47.8	84.7	28	05.1	+48.5	85.2	28	09.9	+49.1	85.7	28	14.0	+49.9	86.3	26
27	28	17.9	+44.5	81.8	28	26.1	+45.3	82.4	28	33.9	+46.0	82.9	28	41.0	+46.8	83.4	28	47.6	+47.5	84.0	28	53.6	+48.2	84.5	28	59.0	+49.0	85.1	29	03.9	+49.6	85.6	27
28	29	02.4	+44.2	81.1	29	11.4	+45.0	81.6	29	19.9	+45.8	82.2	29	27.8	+46.6	82.7	29	35.1	+47.3	83.3	29	41.8	+48.1	83.8	29	48.0	+48.7	84.4	29	53.5	+49.4	85.0	28
29	29	46.6	+44.0	80.3	29	56.4	+44.8	80.8	30	05.7	+45.5	81.4	30	14.4	+46.3	82.0	30	22.4	+47.1	82.6	30	29.9	+47.8	83.2	30	36.7	+48.5	83.7	30	42.9	+49.3	84.3	29
30	30	30.6	+43.6	79.5	30	41.2	+44.5	80.1	30	51.2	+45.3	80.7	31	00.7	+46.0	81.3	31	09.5	+46.8	81.9	31	17.7	+47.6	82.5	31	25.2	+48.4	83.1	31	32.2	+49.0	83.7	30
31	31	42.4	+43.4	78.7	31	25.7	+44.2	79.3	31	36.5	+45.0	79.9	31	46.7	+45.8	80.5	31	56.3	+46.6	81.1	31	50.3	+53.4	81.7	32	13.6	+48.0	82.4	32	21.2	+48.8	83.0	31
32	31	57.6	+43.0	77.9	32	39.9	+43.9	78.5	32	21.5	+44.7	79.1	32	32.5	+45.5	79.7	32	42.9	+46.3	79.6	33	39.7	+47.6	80.4	33	58.6	+48.3	81.6	33	46.6	+48.1	82.3	32
33	32	40.6	+42.8	77.1	33	06.2	+44.4	78.3	33	18.0	+45.3	79.0	33	29.2	+46.0	79.6	33	39.7	+46.8	80.3	34	43.5	+47.6	80.9	33	58.6	+48.3	81.6	33	46.6	+48.1		

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $78^\circ$ ,  $282^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	7	11.3	-48.3	99.6	7	01.2	-49.0	99.8	6	50.9	-49.5	99.9	6	40.6	-50.1	100.0	6	30.1	-50.6	100.1	6	19.5	-51.2	100.2	6	08.8	-51.7	100.3	5	58.0	-52.2	100.4	0	
1	6	23.0	-48.4	100.2	6	12.2	-48.9	100.3	6	01.4	-49.5	100.4	5	50.5	-50.1	100.5	5	39.5	-50.7	100.6	5	28.3	-51.2	100.7	5	17.1	-51.8	100.8	5	05.8	-52.3	100.9	1	
2	5	34.6	-48.4	100.8	5	23.3	-49.0	100.9	5	11.9	-49.6	101.0	5	00.4	-50.2	101.1	4	48.8	-50.8	101.2	4	37.1	-51.3	101.3	4	25.3	-51.8	101.4	4	13.5	-52.3	101.5	3	
3	4	46.2	-48.4	101.4	4	34.3	-49.1	101.5	4	22.3	-49.6	101.6	4	10.2	-50.2	101.6	3	58.0	-50.7	101.7	3	45.8	-51.3	101.8	3	33.5	-51.8	101.8	3	21.2	-52.3	101.9	3	
4	3	57.8	-48.5	102.0	3	45.2	-49.0	102.1	3	32.7	-49.7	102.1	3	20.1	-50.2	102.2	3	07.3	-50.7	102.3	2	54.5	-51.2	102.3	2	41.7	-51.8	102.4	2	28.9	-52.4	102.4	4	
5	3	09.3	-48.5	102.6	2	56.2	-49.1	102.7	2	43.0	-49.6	102.7	2	29.8	-50.2	102.7	2	16.6	-50.8	102.8	2	03.3	-51.4	102.8	1	49.9	-51.8	102.9	1	36.5	-52.3	102.9	5	
6	2	20.8	-48.4	103.2	2	07.1	-49.0	103.2	1	53.4	-49.7	103.3	1	39.6	-50.2	103.3	1	25.8	-50.8	103.3	1	11.9	-51.3	103.3	0	58.1	-51.8	103.4	0	44.2	-52.3	103.4	6	
7	1	32.4	-48.5	103.8	1	18.1	-49.1	103.8	1	03.7	-49.6	103.8	0	49.4	-50.3	103.8	0	35.0	-50.8	103.9	0	20.6	-51.3	103.9	0	06.3	-51.9	103.9	0	08.1	-52.4	103.9	7	
8	0	43.9	-48.5	104.4	0	29.0	-49.1	104.4	0	14.1	-49.7	104.4	0	00.9	+50.2	75.6	0	15.8	+50.7	75.6	0	30.7	+51.3	75.6	0	45.6	+51.8	75.6	0	10.5	+52.3	75.6	8	
9	0	04.6	+48.5	75.0	0	20.1	+49.1	75.0	0	35.6	+49.7	75.1	0	51.1	+50.2	75.1	1	06.5	+50.8	75.1	1	22.0	+51.3	75.1	1	37.4	+51.8	75.1	1	52.8	+52.3	75.2	9	
10	0	53.1	+48.5	74.5	1	09.2	+49.1	74.5	1	25.3	+49.6	74.5	1	41.3	+50.2	74.5	1	57.3	+50.8	74.5	2	13.3	+51.3	74.6	2	29.2	+51.8	74.6	2	45.1	+52.3	74.7	10	
11	1	41.6	+48.5	73.9	1	58.3	+49.1	73.9	2	14.9	+49.7	73.9	2	31.5	+50.2	74.0	2	48.1	+50.7	74.0	3	04.6	+51.2	74.1	3	21.0	+51.8	74.1	3	37.4	+52.3	74.2	11	
12	2	30.1	+48.5	73.3	2	47.4	+49.0	73.3	3	04.6	+49.6	73.4	3	21.7	+50.2	73.4	3	38.8	+50.7	73.5	3	55.8	+51.3	73.5	4	12.8	+51.8	73.6	4	29.7	+52.3	73.7	12	
13	3	18.6	+48.4	72.7	3	36.4	+49.1	72.7	3	54.2	+49.6	72.8	4	11.9	+50.2	72.9	4	29.5	+50.7	72.9	4	47.1	+51.2	73.0	5	04.6	+51.7	73.1	5	22.0	+52.2	73.2	13	
14	4	07.0	+48.5	72.1	4	25.5	+49.0	72.2	4	43.8	+49.6	72.2	5	02.1	+50.1	72.3	5	20.2	+50.7	72.4	5	38.3	+51.2	72.5	5	56.3	+51.7	72.6	6	14.2	+52.2	72.7	14	
15	4	55.5	+48.4	71.5	5	14.5	+48.9	71.6	5	33.4	+49.5	71.7	5	52.2	+50.1	71.8	6	10.9	+50.7	71.9	6	29.5	+51.2	72.0	6	48.0	+51.7	72.1	7	06.4	+52.2	72.2	15	
16	5	43.9	+48.3	70.9	6	03.4	+49.0	71.0	6	22.9	+49.5	71.1	6	42.3	+50.1	71.2	7	01.6	+50.6	71.3	7	20.7	+51.1	71.4	7	58.6	+52.2	71.5	7	16				
17	6	32.2	+48.3	70.3	6	52.4	+48.9	70.4	7	12.4	+49.5	70.5	7	32.4	+50.0	70.7	7	52.2	+50.5	70.8	8	11.8	+51.1	70.9	8	31.4	+51.6	71.1	8	50.8	+52.1	71.2	17	
18	7	20.5	+48.3	69.7	7	41.3	+48.8	69.8	8	01.9	+49.4	70.0	8	22.4	+49.9	70.1	8	42.7	+50.5	70.2	9	02.9	+51.1	70.4	9	23.0	+51.6	70.5	9	42.9	+52.1	70.7	18	
19	8	08.8	+48.2	69.1	8	30.1	+48.8	69.2	8	51.3	+49.4	69.4	9	12.3	+50.0	69.5	9	33.2	+50.5	69.7	9	54.0	+51.0	69.9	10	14.6	+51.5	70.0	10	35.0	+52.0	70.2	19	
20	8	57.0	+48.1	68.5	9	18.9	+48.7	68.7	9	40.7	+49.3	68.8	10	02.3	+49.8	69.0	10	23.7	+50.4	69.1	10	45.0	+50.9	69.3	11	06.1	+51.4	69.5	11	27.0	+52.0	69.7	20	
21	9	45.1	+48.1	67.9	10	07.6	+48.7	68.1	10	30.0	+49.2	68.2	10	52.1	+49.8	68.4	11	14.1	+50.4	68.6	11	35.9	+50.9	68.8	11	57.5	+51.4	69.0	12	19.0	+51.9	69.2	21	
22	10	33.2	+48.1	67.3	10	56.3	+48.6	67.5	11	19.2	+49.2	67.7	11	41.9	+49.8	67.8	12	04.5	+50.2	68.0	12	26.8	+50.8	68.2	12	48.9	+51.4	68.4	13	10.9	+51.8	68.7	22	
23	11	21.3	+47.9	66.7	11	44.9	+48.5	66.9	12	08.4	+49.1	67.1	12	31.7	+49.6	67.3	12	54.7	+50.2	67.5	13	17.6	+50.8	67.7	13	40.3	+51.3	67.9	14	02.7	+51.8	68.1	23	
24	12	09.2	+47.9	66.1	12	33.4	+48.5	66.3	12	57.5	+49.0	66.5	13	21.3	+49.6	66.7	13	44.9	+50.2	66.9	14	08.4	+50.6	67.1	14	31.6	+51.1	67.4	14	54.5	+51.7	67.6	24	
25	12	57.1	+47.7	65.5	13	21.9	+48.3	65.7	13	46.5	+48.9	65.9	14	10.9	+49.5	66.1	14	35.1	+50.0	66.4	15	22.7	+51.2	66.8	15	46.2	+51.7	67.1	15					
26	13	44.8	+47.7	64.8	14	10.2	+48.3	65.1	14	35.4	+48.9	65.3	15	00.4	+49.4	65.5	15	25.1	+50.0	65.8	15	49.6	+50.5	66.0	16	13.9	+51.0	66.3	16	37.9	+51.5	66.6	25	
27	14	32.5	+47.6	64.2	14	58.5	+48.7	64.4	15	24.3	+48.7	64.7	15	49.8	+49.3	64.9	16	15.1	+49.9	65.2	17	04.9	+50.9	65.7	17	29.4	+51.5	66.0	17					
28	15	20.1	+47.5	63.6	15	46.7	+48.0	63.8	16	13.0	+48.1	64.1	16	39.1	+49.2	64.4	17	05.0	+49.7	64.6	17	30.5	+50.3	64.9	18	55.8	+50.9	65.2	18	20.9	+51.4	65.5	28	
29	16	07.6	+47.3	62.9	17	34.7	+48.3	63.0	17	01.7	+48.7	63.5	17	28.3	+49.1	63.8	17	54.7	+49.7	64.0	18	20.8	+50.3	64.3	19	08.6	+49.4	64.7	19	34.8	+50.9	65.1	29	
30	16	54.9	+47.3	62.3	17	22.7	+47.8	62.6	17	50.2	+48.4	62.9	18	21.4	+48.3	63.1	18	44.4	+49.5	63.4	19	11.1	+50.1	63.8	19	37.4	+50.7	64.4	19	03.5	+51.2	64.4	30	
31	17	42.2	+47.1	61.7	18	10.5	+47.7	61.9	18	38.6	+48.3	62.2	19	06.4	+48.9	62.5	19	33.9	+49.5	62.8	20	01.2	+49.9	63.2	20	28.1	+50.5	63.5	20	54.7	+51.1	63.8	31	
32	18	29.3	+46.9	61.0	18	58.2	+47.6	61.3	19	26.9	+48.1	61.6	19	55.3	+48.7	61.9	20	23.4	+49.3	62.2	20	51.1	+49.9	62.6	21	18.6	+50.4	63.0	21	45.8	+50.8	63.3	32	
33	19	16.2	+46.9	60.3	19	45.8	+47.4	60.7	20	15.0	+48.1	61.0	20	44.0	+48.6	61.3	21	12.7	+49.1	61.6	21	41.0	+49.7	62.0	22	09.0	+50.3	62.3	22	36.7	+50.8	62.7	33	
34	20	03.1	+46.6	59.7	20	33.2</																												

79°, 281° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	6 35.6 +48.3	98.8	6 26.4 +48.8	98.9	6 17.0 +49.4	99.0	6 07.5 +50.0	99.2	5 57.9 +50.6	99.3	5 48.2 +51.1	99.4	5 38.4 +51.7	99.5	5 28.5 +52.2	99.6	0	6 23.9 +48.1	98.2	7 15.2 +48.8	98.4	7 06.4 +49.4	98.5	6 57.5 +50.0	98.6	6 48.5 +50.5	98.7	6 39.3 +51.1	98.8	6 30.1 +51.6	98.9	6 20.7 +52.1	99.1	1
1	11 24.1 +47.8	95.2	11 18.6 +48.4	95.4	11 12.8 +49.1	95.6	11 06.9 +49.7	95.8	11 00.7 +50.3	96.0	10 54.4 +50.8	96.2	10 47.8 +51.4	96.4	10 41.1 +51.9	96.5	6	12 11.9 +47.8	94.6	12 07.0 +48.4	94.8	12 01.9 +49.0	95.0	11 56.6 +49.6	95.2	11 51.0 +50.2	95.4	11 45.2 +50.8	95.6	11 39.2 +51.4	95.8	11 33.0 +51.9	96.0	7
2	12 59.7 +47.7	94.0	12 55.4 +48.3	94.2	12 50.9 +49.0	94.4	12 46.2 +49.6	94.6	12 41.2 +50.2	94.9	12 36.0 +50.4	95.1	12 30.6 +51.3	95.3	12 24.9 +51.9	95.5	8	9 00.1 +48.1	97.0	8 52.7 +48.7	97.2	8 45.1 +49.3	97.3	8 37.4 +49.9	97.5	8 29.5 +50.5	97.6	8 21.5 +51.0	97.8	8 13.3 +51.5	97.9	8 04.9 +52.1	98.1	3
3	9 48.2 +48.0	96.4	9 41.4 +48.6	96.6	9 34.4 +49.3	96.8	9 27.3 +49.8	96.9	9 20.0 +50.4	97.2	9 12.5 +51.6	97.2	9 04.8 +51.6	97.4	8 57.0 +52.1	97.6	4	10 36.2 +47.9	95.8	10 30.0 +48.6	96.0	10 23.7 +49.1	96.2	10 17.1 +49.8	96.4	10 10.4 +50.3	96.5	10 03.5 +50.9	96.7	9 56.4 +51.4	96.9	9 49.1 +52.0	97.1	5
4	11 22.4 +47.4	92.1	11 20.1 +48.0	92.3	11 17.5 +48.7	92.6	11 14.6 +49.3	92.9	11 11.5 +49.9	93.2	11 08.0 +50.5	93.4	11 04.3 +51.1	93.7	11 00.3 +51.6	94.0	11	13 47.4 +47.5	93.3	13 43.7 +48.3	93.6	13 39.9 +48.8	93.8	13 35.8 +49.4	94.1	13 31.4 +50.1	94.3	13 26.8 +50.6	94.5	13 21.9 +51.2	94.8	13 16.8 +51.8	95.0	9
5	14 34.9 +47.5	92.7	14 32.0 +48.1	93.0	14 28.7 +48.8	93.2	14 25.2 +49.4	93.5	14 21.5 +50.0	93.7	14 17.4 +50.6	94.0	14 13.1 +51.2	94.2	14 08.6 +51.7	94.5	10	16 09.8 +47.2	91.4	16 08.1 +47.9	91.7	16 06.2 +48.5	92.0	16 03.9 +49.2	92.3	16 01.4 +49.8	92.6	15 58.5 +50.4	92.9	15 55.4 +51.0	93.2	15 51.9 +51.6	93.4	12
6	15 22.4 +47.4	89.5	15 20.1 +48.0	89.2	15 17.5 +48.7	89.6	15 14.6 +49.3	89.9	15 11.5 +49.9	90.2	15 08.0 +50.5	90.4	15 04.3 +51.1	90.7	15 00.3 +51.6	91.0	15	17 11.9 +47.8	89.4	17 10.1 +48.4	89.7	17 07.0 +48.9	90.0	17 03.9 +49.6	90.3	17 00.9 +50.4	90.6	17 04.6 +50.8	90.8	17 01.3 +51.2	91.3	16		
7	18 31.1 +46.9	89.5	18 31.5 +47.6	89.8	18 31.5 +48.2	90.2	18 31.2 +48.9	90.5	18 30.5 +49.5	90.8	18 29.5 +50.1	91.2	18 28.1 +50.7	91.5	18 26.3 +51.3	91.8	18	20 40.7 +46.6	88.2	20 06.5 +47.2	88.5	20 07.8 +48.0	88.9	20 08.8 +48.6	89.3	20 09.4 +49.2	89.6	20 09.6 +49.9	90.0	20 08.8 +51.1	90.7	17		
8	20 51.3 +46.4	87.5	20 53.7 +47.1	87.9	20 55.8 +47.8	88.2	20 57.4 +48.5	88.6	20 58.6 +49.2	89.0	20 59.5 +49.7	89.4	20 59.9 +50.4	89.8	21 05.0 +50.2	89.2	21 37.7 +46.2	86.8	21 40.8 +47.0	87.2	21 43.6 +47.6	87.6	21 45.9 +48.3	88.0	21 47.8 +49.0	88.4	21 49.2 +49.7	88.8	21 50.3 +50.2	89.2	21 50.9 +50.9	89.6	19	
9	22 23.9 +46.1	86.1	22 27.8 +46.8	86.5	22 31.2 +47.5	86.9	22 34.2 +48.2	87.4	22 36.8 +48.8	87.8	22 38.9 +49.5	88.2	22 40.5 +50.2	88.6	22 41.8 +50.7	89.0	22	25 55.9 +45.7	84.7	24 01.2 +46.4	85.2	24 06.0 +47.1	85.6	24 10.4 +47.8	86.1	24 14.3 +48.5	86.5	24 17.7 +49.2	87.0	24 20.7 +49.8	87.4	24 23.1 +50.5	87.9	22
10	26 57.4 +44.8	81.8	27 05.6 +45.6	82.3	27 13.4 +46.3	82.8	27 20.6 +47.1	83.3	27 27.3 +47.8	83.9	27 33.5 +48.4	84.4	27 39.1 +49.1	84.9	27 44.1 +49.8	85.4	27	29 11.1 +44.0	79.5	29 21.7 +44.8	80.1	29 31.7 +45.6	80.6	29 41.2 +46.3	81.2	29 50.0 +47.2	81.8	29 58.3 +47.9	82.3	30 06.0 +48.6	82.9	30 13.1 +49.3	83.5	29
11	30 55.1 +43.8	78.8	30 06.5 +44.6	79.3	30 17.3 +45.4	79.9	30 27.5 +46.2	80.5	30 37.2 +46.9	81.1	30 46.2 +47.6	81.6	30 54.6 +48.4	82.2	31 02.4 +49.1	82.8	31	30 38.9 +43.4	78.0	30 51.1 +44.3	78.6	31 02.7 +45.1	79.1	31 24.1 +46.6	80.3	31 33.8 +47.4	80.9	31 43.0 +48.1	81.5	31 51.5 +48.8	82.2	31		
12	32 11.1 +43.2	77.2	31 35.4 +43.9	77.8	31 47.8 +44.8	78.4	31 59.6 +45.6	79.0	32 10.7 +46.4	79.6	32 21.2 +47.2	80.2	32 31.1 +47.9	80.8	32 40.3 +48.7	81.5	32	34 48.3 +42.6	75.5	34 53.0 +43.4	76.1	34 59.1 +44.2	76.7	34 55.9 +45.0	77.4	34 51.1 +45.8	78.2	34 00.2 +49.5	80.2	34 03.9 +50.2	80.8	34 21.7 +51.2	81.5	24
13	36 23.3 +41.5	82.6	36 19.8 +42.2	83.0	36 12.6 +44.5	83.5	36 32.6 +45.5	84.7	36 33.3 +47.3	85.5	36 39.3 +48.0	85.4	36 44.8 +48.7	85.0	36 49.7 +49.4	85.5	36	42 41.6 +39.5	76.3	42 39.3 +40.1	77.0	42 32.6 +41.7	77.7	42 23.0 +42.4	78.3	42 14.8 +43.1	79.2	42 05.0 +44.8	79.8	42 05.0 +44.8	79.8	42 05.0 +44.8	79.8	42
14	46 57.9 +40.1	70.2	37 17.8 +41.1	71.0	37 37.0 +42.0	71.7	37 55.5 +42.9	72.4	38 30.3 +44.6	73.9	38 46.5 +45.5	74.7	38 01.9 +46.4	75.5	38 29.0 +47.6	76.2	38	40 13.0 +41.8	73.8	40 29.4 +42.7	74.5	40 21.7 +43.4	75.2	40 14.3 +44.2	76.0	40 07.0 +45.0	76.7	40 03.7 +45.7	77.4	40 02.4 +46.4	78.2	39 29.0 +48.3	80.8	39
15	48 57.2 +39.8	68.4	48 39.5 +40.2	69.1	48 30.6 +41.1	69.9	48 39.2 +41.9	70.6	48 30.4 +42.6	71.4	48 34.7 +43.5	72.4	48 30.9 +44.5	73.0	48 39.1 +45.3	73.7	48	51 55.9 +39.2	67.4	51 47.7 +40.1	68.9	51 40.9 +41.6	69.7	51 32.3 +42.6	70.5	50 43.0 +43.4	71.3	50 31.4 +44.2	72.1	50 20.7 +45.0	72.9	50 09.4 +45.8	73.6	49
16	52 55.9 +38.8	67.4	52 19.7 +39.8	68.1	52 41.7 +40.7	68.9	52 02.9 +41.6	69.7	52 30.2 +42.6	70.5	52 45.4 +43.7	71.5	52 45.4 +44.5	72.5	52 45.4 +45.3	73.5	52	55 52.8 +38.3	64.4	55 45.7 +39.3	65.3	55 45.7 +40.1	66.3	55 45.7 +41.0	67.4	55 06.9 +46.9	68.3	55 10.9 +47.7	69.3	55 15.1 +48.5	70.3	55 21.7 +49.5	71.3	55
17	56 57.8 +38.3	66.4	56 39.5 +39.3	67.2	56 22.4 +40.1	68.0	56 04.9 +41.4	68.7	56 40.4 +42.6	69.6	56 24.3 +43.4	70.5	56 33.8 +44.3	71.4	56 33.8 +45.2	72.4	56	59 55.8 +38.3	64.4	59 45.4 +39.3	65.3	59 45.4 +40.1	66.3	59 45.4 +41.0	67.3	59 20.9 +42.6	68.3	59 06.0 +43.9	69.3	59 15.2 +46.7	70.3	59		
18	60 57.9 +40.1	70.2	61 30.7 +41.1	71.0	61 12.3 +42.0	71.7	61 05.5 +42.9	72.4	61 45.3 +43.7	73.2	61 33.3 +44.6	74.0	61 20.5 +45.3	74.8	61 05.5 +46.8	75.6	61	64 41.5 +39.1	67.0	64 32.2 +40.1	67.9	64 23.0 +41.1	68.8	64 13.5 +42.9	69.4	64 03.2 +43.9	70.2	64 02.5 +44.9	71.0	64 02.5 +44.9	71.0	64		
19	64 57.0 +37.2	64.4	64 17.4 +38.1	65.2	64 42.2 +39.1	66.0	64 20.6 +40.1	66.8	64 29.5 +41.0	67.6	64 25.7 +42.0	68.5	64 10.5 +40.6	69.4	64 33.9 +41.6	70.2	64	68 41.5 +37.3	64.1	68 32.2 +38.6	65.0	68 23.2 +39.6	66.3	68 12.1 +40.6	67.4	68 07.0 +41.2	68.5	68 07.0 +41.2	68.5	68				
20	72 49.7 +37.5	64.4	72 21.3 +38.6	64.1	72 21.3 +38.6	64.1	72 21.3 +38.6	64.1	72 21.3 +38.6	64.1	72 21.3 +38.6	64.1	72 21.3 +38.6	64.1	72 21.3 +38.6	64.1	72	73 45.7 +37.2	64.1	73 35.7 +38.6	65.0	73 25.4 +39.6	66.3	73 15.3 +40.6	67.4	73 05.2 +41.6	68.4	73 05.2 +41.6	68.4	73				
21	76 49.7 +37.5	64.4	76 17.4 +38.6	64.1	76 17.4 +38.6	64.1	76 17.4 +38.6	64.1	76 17.4 +38.6	64.1	76 17.4 +38.6	64.1	76 17.4 +38.6	64.1	76 17.4 +38.6	64.1	76	84 45.7 +37.2	64.1	84 35.7 +38.6	65.0	84 25.4 +39.6	66.3	84 15.3 +40.6	67.4	84 05.2 +41.6	68.4	84 05.2 +41.6	68.4	84				
22	88 49.7 +37.5	64.4	88 17.4 +38.6	64.1	88 17.4 +38.6	64.1	88 17.4 +38.6	64.1	88 17.4 +38.6	64.1	88 17.4 +38.6	64.1	88 17.4 +38.6	64.1	88 17.4 +38.6	64.1	88	92 45.7 +37.2	64.1	92 35.7 +38.6	65.0	92 25.4 +39.6	66.3	92 15.3 +40.6	67.4	92								

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $79^{\circ}$ ,  $281^{\circ}$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	6	35.6	-48.2	98.8	6	26.4	-48.9	98.9	6	17.0	-49.5	99.0	6	07.5	-50.0	99.2	5	57.9	-50.6	99.3	5	48.2	-51.2	99.4	5	38.4	-51.7	99.5	5	28.5	-52.2	99.6	0
1	5	47.4	-48.3	99.4	5	37.5	-48.9	99.5	5	27.5	-49.5	99.6	5	17.5	-50.1	99.7	5	07.3	-50.6	99.8	4	57.0	-51.1	99.9	4	46.7	-51.7	100.0	4	36.3	-52.3	100.1	1
2	4	59.1	-48.3	100.0	4	48.6	-48.9	100.1	4	38.0	-49.5	100.2	4	27.4	-50.1	100.3	4	16.7	-50.7	100.3	4	05.9	-51.2	100.4	3	55.0	-51.8	100.5	3	44.0	-52.2	100.5	3
3	4	10.8	-48.4	100.6	3	59.7	-49.0	100.7	3	48.5	-49.5	100.7	3	37.3	-50.1	100.8	3	26.0	-50.7	100.9	3	14.7	-51.3	100.9	3	03.2	-51.7	101.0	2	51.8	-52.3	101.0	3
4	3	22.4	-48.4	101.2	3	10.7	-49.0	101.3	2	59.0	-49.5	101.3	2	47.2	-50.2	101.4	2	23.4	-51.2	101.4	2	11.5	-51.8	101.5	1	59.5	-52.2	101.5	4				
5	2	34.0	-48.4	101.8	2	21.7	-49.0	101.8	2	09.4	-49.6	101.9	1	57.0	-50.1	101.9	1	44.6	-50.7	101.9	1	32.2	-51.2	102.0	1	19.7	-51.7	102.0	1	07.3	-52.3	102.0	5
6	1	45.6	-48.4	102.4	1	32.7	-49.0	102.4	1	19.8	-49.6	102.4	1	06.9	-50.2	102.5	0	53.9	-50.7	102.5	0	41.0	-51.3	102.5	0	15.0	-52.3	102.5	6				
7	0	57.2	-48.4	103.0	0	43.7	-49.0	103.0	0	30.2	-49.5	103.0	0	16.7	-50.1	103.0	0	03.2	-50.7	103.0	0	10.3	+51.2	103.0	0	23.8	+51.8	103.0	7				
8	0	08.8	-48.4	103.6	0	05.3	-49.0	76.4	0	19.3	+49.6	76.4	0	33.4	+50.2	76.4	0	47.5	+50.7	76.5	1	01.5	+51.3	76.5	1	15.6	+51.7	76.5	1	29.6	+52.2	76.5	8
9	0	39.6	+48.4	75.8	0	54.3	+49.0	75.9	1	08.9	+49.6	75.9	1	23.6	+50.1	75.9	1	38.2	+50.7	75.9	1	52.8	+51.2	75.9	2	07.3	+51.8	76.0	2	21.8	+52.3	76.0	9
10	1	28.0	+48.4	75.2	1	43.3	+49.0	75.3	1	58.5	+49.6	75.3	2	13.7	+50.1	75.3	2	28.9	+50.6	75.4	2	44.0	+51.2	75.4	2	59.1	+51.7	75.5	3	14.1	+52.2	75.5	10
11	2	16.4	+48.4	74.7	2	32.3	+48.9	74.7	2	48.1	+49.5	74.7	3	03.8	+50.1	74.8	3	19.5	+50.7	74.8	3	35.2	+51.2	74.9	3	50.8	+51.7	75.0	4	06.3	+52.3	75.0	11
12	3	04.8	+48.3	74.1	3	21.2	+49.5	74.2	3	37.6	+49.5	74.2	4	10.2	+50.1	74.3	4	42.6	+51.2	74.4	4	42.5	+51.7	74.5	4	58.6	+52.2	74.5	12				
13	3	53.1	+48.4	73.5	4	10.2	+48.9	73.5	4	27.1	+49.5	73.6	4	44.0	+50.1	73.7	5	00.8	+50.7	73.8	5	17.6	+51.1	73.9	5	34.2	+51.7	74.0	13				
14	4	41.5	+48.3	72.9	4	59.1	+48.9	73.0	5	16.6	+49.5	73.0	5	34.1	+50.0	73.1	5	51.5	+50.5	73.2	6	08.7	+51.1	73.3	6	25.9	+51.6	73.4	6	42.9	+52.2	73.5	14
15	5	29.8	+48.3	72.3	5	48.0	+48.9	72.4	6	06.1	+49.5	72.5	6	24.1	+50.0	72.6	6	42.0	+50.6	72.7	6	59.8	+51.1	72.8	7	17.5	+51.6	72.9	7	35.1	+52.1	73.0	15
16	6	18.1	+48.2	71.7	6	36.9	+48.8	71.8	6	55.6	+49.3	71.9	7	14.1	+50.0	72.0	7	32.6	+50.5	72.1	7	50.9	+51.6	72.3	8	09.1	+51.6	72.4	8	27.2	+52.1	72.5	16
17	7	06.3	+48.2	71.1	7	25.7	+48.8	71.2	7	44.9	+49.4	71.3	8	04.1	+49.9	71.5	8	23.1	+50.5	71.6	8	42.0	+51.0	71.7	9	00.7	+51.5	71.9	9	19.3	+52.0	72.0	17
18	7	54.5	+48.1	70.5	8	14.5	+48.7	70.6	8	34.3	+49.3	70.8	8	54.0	+49.9	70.9	9	13.6	+50.4	71.1	9	33.0	+50.9	71.2	9	52.2	+51.5	71.4	10	11.3	+52.0	71.5	18
19	8	42.6	+48.1	69.9	9	03.2	+48.6	70.0	9	23.6	+49.2	70.2	9	43.9	+49.8	70.3	10	04.0	+50.3	70.5	10	23.9	+50.9	70.7	10	43.7	+51.4	70.8	11	03.3	+51.9	71.0	19
20	9	30.7	+48.0	69.3	9	51.8	+48.6	69.4	10	12.8	+49.2	69.6	10	33.7	+49.7	69.8	10	54.3	+50.3	69.9	11	14.8	+50.8	70.1	11	35.1	+51.4	70.3	11	15.5	+52.1	70.5	20
21	10	18.7	+47.9	68.7	10	40.4	+48.6	68.8	11	02.0	+49.1	69.0	11	21.3	+49.7	69.2	11	44.6	+50.2	69.4	12	05.6	+50.8	69.6	12	26.5	+51.3	69.8	12	47.1	+51.8	70.0	21
22	11	06.6	+47.9	68.1	11	29.0	+48.4	68.2	11	51.1	+49.1	68.4	12	13.1	+49.6	68.6	12	34.8	+50.2	68.8	12	56.4	+50.7	69.0	13	17.8	+51.2	69.3	13	38.9	+51.7	69.5	22
23	11	54.5	+47.8	67.4	12	17.4	+48.4	67.6	12	40.2	+48.9	67.8	13	02.7	+49.5	68.1	13	25.0	+50.1	68.3	13	47.1	+50.6	68.5	14	09.0	+51.2	68.7	14	30.6	+51.7	69.0	23
24	12	42.3	+47.7	66.8	13	05.8	+48.3	67.0	13	29.1	+48.9	67.2	13	15.2	+49.5	67.5	14	15.1	+50.0	67.7	14	37.7	+50.6	67.9	15	00.2	+51.0	68.2	15	22.3	+51.6	68.4	24
25	13	30.0	+47.6	66.2	13	54.1	+48.2	66.4	14	18.0	+48.8	66.7	14	41.7	+49.3	66.9	15	05.1	+49.9	67.1	15	28.3	+50.5	67.4	15	51.2	+51.0	67.6	15	13.9	+51.6	67.9	25
26	14	17.6	+47.5	65.6	14	42.3	+48.1	65.8	15	06.8	+48.7	66.0	15	31.0	+49.3	66.3	15	55.0	+49.8	66.6	16	18.8	+50.3	66.8	16	42.2	+51.0	67.1	17	05.5	+51.4	67.4	26
27	15	05.1	+47.4	64.9	15	30.4	+48.0	65.2	15	55.5	+48.6	65.4	16	20.3	+49.2	65.7	16	44.8	+49.8	66.0	17	09.1	+50.3	66.3	17	33.2	+50.8	66.5	17	56.9	+51.4	66.8	27
28	15	52.5	+47.3	64.3	16	18.4	+47.9	64.6	16	44.1	+48.4	64.8	17	09.5	+49.0	65.1	17	34.6	+49.6	65.4	18	24.0	+50.7	65.7	18	52.0	+51.0	66.0	18	48.3	+51.2	66.3	28
29	16	39.8	+47.2	63.7	17	06.3	+47.8	63.9	17	32.5	+48.4	64.2	17	58.5	+49.0	64.5	18	24.2	+49.5	64.8	19	14.7	+49.6	65.1	19	34.2	+49.8	65.4	19	35.9	+51.2	65.7	29
30	17	27.0	+47.0	63.0	17	54.1	+47.6	63.3	18	20.9	+48.2	63.6	18	47.5	+48.8	63.9	19	13.7	+49.4	64.2	19	39.7	+49.9	64.5	20	05.3	+50.5	64.8	20	30.7	+51.0	65.2	30
31	18	14.0	+47.0	62.4	18	41.7	+47.5	62.7	19	09.1	+48.2	63.0	19	36.3	+48.7	63.3	20	03.1	+49.3	63.6	20	29.6	+49.9	63.9	20	55.8	+50.4	64.3	21	21.7	+51.0	64.6	31
32	19	01.0	+46.7	61.7	19	29.2	+47.4	62.0	19	57.3	+47.9	62.3	20	25.0	+48.5	62.7	20	52.4	+49.1	63.0	21	19.5	+49.7	63.3	21	46.2	+50.3	63.7	22	12.7	+50.8	64.1	32
33	19	47.7	+46.8	61.0	20	16.6	+47.3	61.4	20	45.2	+47.2	61.7	21	13.5	+48.5	62.0	21	41.5	+49.0	62.4	22	09.2	+49.5	62.7	22	36.5	+50.1	63.1	23	03.5	+50.6	63.5	33
34	20	34.9	+46.6	60.4	21	30.1	+45.5	60.7	21	22.0	+48.2	61.0	21	29.0	+45.7	61.3	22																

80°, 280° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	5	59.9	+48.2	98.0	5	51.5	+48.8	98.1	5	43.0	+49.3	98.2	5	34.3	+50.0	98.3	5	25.6	+50.5	98.4	5	16.8	+51.1	98.5	5	07.9	+51.6	98.6	4	58.9	+52.1	98.7	0
1	6	48.1	+48.1	97.4	6	40.3	+48.7	97.5	6	32.3	+49.4	97.6	6	24.3	+49.9	97.8	6	16.1	+50.5	97.9	6	07.9	+51.0	98.0	5	59.5	+51.6	98.1	5	51.0	+52.1	98.2	1
2	7	36.2	+48.1	96.8	7	29.0	+48.7	96.9	7	21.7	+49.3	97.1	7	14.2	+49.9	97.2	7	06.6	+50.5	97.3	6	58.9	+51.0	97.4	6	51.1	+51.5	97.6	6	43.1	+52.1	97.7	2
3	8	24.3	+48.0	96.2	8	17.7	+48.6	96.4	8	11.0	+49.2	96.5	8	04.1	+49.9	96.6	7	57.1	+50.4	96.8	7	49.9	+51.0	96.9	7	42.6	+51.6	97.1	7	35.2	+52.1	97.2	3
4	9	12.3	+47.9	95.6	9	06.3	+48.6	95.8	9	00.2	+49.2	95.9	8	54.0	+49.7	96.1	8	47.5	+50.4	96.2	8	40.9	+51.5	96.4	8	34.2	+51.5	96.5	8	27.3	+52.0	96.7	4
5	10	00.2	+47.9	95.0	9	54.9	+48.5	95.2	9	49.4	+49.1	95.3	9	43.7	+49.8	95.5	9	37.9	+50.3	95.7	9	31.9	+50.8	95.8	9	25.7	+51.4	96.0	9	19.3	+52.0	96.2	5
6	10	48.1	+47.8	94.4	10	43.4	+48.5	94.6	10	38.5	+49.1	94.8	10	33.5	+49.6	94.9	10	28.2	+50.3	95.1	10	22.7	+50.9	95.3	10	17.1	+51.4	95.5	10	11.3	+51.9	95.7	6
7	11	35.9	+47.7	93.8	11	31.9	+48.3	94.0	11	27.6	+49.0	94.2	11	23.1	+49.6	94.4	11	18.5	+50.2	94.6	11	13.6	+50.8	94.8	11	08.5	+51.3	95.0	11	03.2	+51.9	95.2	7
8	12	23.6	+47.7	93.1	12	20.2	+48.3	93.4	12	16.6	+48.6	93.6	12	12.7	+49.6	93.8	12	08.7	+50.1	94.0	12	04.4	+50.7	94.2	11	59.8	+51.3	94.4	11	55.1	+51.8	94.7	8
9	13	11.3	+47.6	92.5	13	08.5	+48.2	92.8	13	05.5	+48.9	93.0	13	02.3	+49.4	93.2	12	58.8	+50.0	93.5	12	55.1	+51.2	93.9	12	46.9	+51.7	94.1	9				
10	13	58.9	+47.4	91.9	13	56.7	+48.2	92.1	13	54.4	+48.7	92.4	13	51.7	+49.4	92.6	13	48.8	+50.0	92.9	13	45.7	+50.6	93.1	13	42.3	+51.1	93.4	13	38.6	+51.7	93.6	10
11	14	46.3	+47.4	91.3	14	44.9	+48.0	91.5	14	43.1	+48.7	91.8	14	41.1	+49.3	92.1	14	38.8	+49.9	92.3	14	36.3	+50.5	92.6	14	33.4	+51.1	92.8	14	30.3	+51.7	93.1	11
12	15	33.7	+47.2	90.6	15	32.9	+47.9	90.9	15	31.8	+48.5	91.2	15	30.4	+49.2	91.5	15	28.7	+49.8	91.7	15	26.8	+50.4	92.0	15	24.5	+51.0	92.3	15	22.0	+51.5	92.6	12
13	16	20.9	+47.1	90.0	16	20.8	+47.8	90.3	16	20.3	+48.5	90.6	16	19.6	+49.1	90.9	16	18.5	+49.7	91.2	16	17.2	+50.3	91.4	16	15.5	+50.9	91.7	16	13.5	+51.5	92.0	13
14	17	08.0	+47.0	89.3	17	08.6	+47.6	89.6	17	08.8	+48.3	90.0	17	08.7	+48.9	90.3	17	08.2	+49.6	90.6	17	07.5	+50.2	90.9	17	06.4	+50.8	91.2	17	05.0	+51.4	91.5	14
15	17	55.0	+46.9	88.7	17	56.2	+47.6	89.0	17	57.1	+48.2	89.3	17	57.6	+48.9	89.7	17	57.8	+49.5	90.0	17	57.7	+50.1	90.3	17	57.2	+50.7	90.6	17	56.4	+51.3	91.0	15
16	18	41.9	+46.7	88.0	18	43.8	+47.4	88.4	18	45.3	+48.1	88.7	18	46.8	+48.5	89.0	18	47.3	+49.4	89.4	18	47.8	+50.0	89.7	18	47.9	+50.6	90.1	18	47.7	+51.1	90.4	16
17	19	28.6	+46.6	87.4	19	31.2	+47.3	87.7	19	33.4	+48.0	88.1	19	35.3	+48.6	88.4	19	36.7	+49.3	88.8	19	37.8	+49.9	89.1	19	38.5	+50.5	89.5	19	38.8	+51.1	89.9	17
18	20	15.2	+46.5	86.7	20	18.5	+47.1	87.1	20	21.4	+47.8	87.4	20	23.9	+48.5	87.8	20	26.0	+49.1	88.2	20	27.7	+49.8	88.6	20	29.0	+50.4	88.9	20	29.9	+51.0	89.3	18
19	21	01.7	+46.2	86.0	21	05.6	+47.0	86.4	21	09.2	+47.7	86.8	21	12.4	+48.3	87.2	21	15.1	+49.0	87.6	21	17.5	+49.6	88.0	21	19.4	+50.3	88.3	21	20.9	+50.9	88.7	19
20	21	47.9	+46.1	85.3	21	52.6	+46.8	85.7	21	56.9	+47.5	86.1	21	60.7	+47.2	86.5	21	64.1	+48.2	86.8	21	67.1	+49.1	87.3	21	71.8	+50.7	88.0	21	76.2	+51.7	88.2	20
21	22	34.0	+46.0	84.6	22	39.4	+46.7	85.1	22	44.4	+47.3	85.5	22	48.9	+48.0	85.9	22	53.0	+48.7	86.3	22	56.6	+49.4	86.7	22	60.5	+50.7	87.0	21	65.2	+50.7	87.6	21
22	23	20.0	+45.7	83.9	23	26.1	+46.4	84.4	23	31.7	+47.2	84.8	23	36.9	+47.9	85.2	23	41.7	+48.5	85.7	23	46.0	+49.2	86.1	23	49.8	+49.9	86.6	23	53.2	+50.5	87.0	22
23	24	05.7	+45.5	83.2	24	12.5	+46.3	83.7	24	18.9	+47.0	84.1	24	24.8	+47.7	84.6	24	30.2	+48.4	85.0	24	35.2	+49.0	85.5	24	39.7	+49.7	85.9	24	43.7	+50.3	86.4	23
24	25	51.2	+45.4	82.5	24	58.8	+46.1	83.0	25	05.9	+46.8	83.4	25	12.5	+47.5	83.9	25	18.6	+48.2	84.4	25	24.2	+48.9	84.9	25	29.4	+49.5	85.3	25	34.0	+50.2	85.8	24
25	26	36.6	+45.1	81.8	25	44.9	+45.8	82.3	25	52.7	+46.6	82.8	26	60.0	+47.3	83.2	26	68.8	+48.0	83.6	26	13.1	+48.7	84.2	26	24.8	+50.0	85.2	25				
26	26	21.7	+44.8	81.1	26	30.7	+45.7	81.6	26	39.3	+46.4	82.1	26	47.3	+47.1	82.6	26	54.8	+47.9	83.1	27	01.8	+48.6	83.6	27	14.2	+49.9	84.6	26				
27	27	06.5	+44.7	80.3	27	16.4	+45.4	80.8	27	25.7	+46.1	81.3	27	34.4	+47.0	81.9	27	42.7	+47.6	82.4	27	50.4	+48.3	82.9	27	57.5	+49.0	83.4	28				
28	27	51.2	+44.4	79.6	28	01.8	+45.2	80.1	28	11.8	+46.0	80.6	28	21.4	+46.6	81.1	28	30.3	+47.4	81.7	28	38.7	+48.1	82.2	28	46.5	+48.9	82.8	28				
29	28	35.6	+44.1	78.8	28	47.0	+44.9	79.3	28	57.5	+45.7	79.9	29	60.8	+46.5	80.4	29	17.7	+47.2	81.0	29	26.8	+48.0	81.5	29	35.4	+48.6	82.1	28				
30	29	19.7	+43.9	78.0	29	31.9	+44.7	78.6	29	43.5	+45.4	79.1	29	54.5	+46.2	79.7	30	04.9	+47.0	80.3	30	14.8	+47.7	80.8	30	24.0	+48.4	81.4	30				
31	30	03.6	+43.6	77.2	30	16.6	+44.3	77.8	30	28.9	+45.2	78.4	30	40.7	+46.0	79.0	30	51.9	+46.7	79.6	31	02.5	+47.4	80.1	31	12.4	+48.2	80.7	31				
32	30	47.2	+43.3	76.4	31	00.9	+44.1	77.0	31	14.1	+44.9	77.6	31	26.7	+45.7	78.2	31	38.6	+46.5	78.8	31	49.9	+47.3	79.4	32	00.6	+48.0	80.0	32				
33	31	30.5	+42.9	75.6	31	45.0	+43.8	76.2	31	59.0	+44.6	76.8	32	12.4	+45.4	77.5	32	25.1	+46.2	78.1	32	37.2	+46.7	78.7	32	48.4	+48.4	80.0	33				
34	32	13.4	+42.7	74.8	32	28.8	+43.5	75.4	32	43.6	+44.3	76.0	33	14.6	+45.1	76.7	33	24.1	+46.7	77.3	33	34.1	+47.3	77.9	33	47.8	+48.2</						

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $80^\circ$ ,  $280^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			Dec.
	Hc	d	Z																						
0	5 59.9	-48.2	98.0	5 51.5	-48.8	98.1	5 43.0	-49.4	98.2	5 34.3	-50.0	98.3	5 25.6	-50.5	98.4	5 16.8	-51.1	98.5	5 07.9	-51.7	98.6	4 58.9	-52.2	98.7	0
1	5 11.7	-48.2	98.6	5 02.7	-48.9	98.7	4 53.6	-49.5	98.8	4 44.3	-50.0	98.9	4 35.1	-50.6	99.0	4 25.7	-51.2	99.0	4 16.2	-51.6	99.1	4 06.7	-52.2	99.2	1
2	4 23.5	-48.3	99.2	4 13.8	-48.8	99.3	4 04.1	-49.4	99.4	3 54.3	-50.0	99.4	3 44.5	-50.6	99.5	3 34.5	-51.1	99.6	3 24.6	-51.7	99.6	3 14.5	-52.2	99.7	2
3	3 35.2	-48.3	99.8	3 25.0	-48.9	99.9	3 14.7	-49.5	99.9	3 04.3	-50.1	100.0	2 53.9	-50.7	100.0	2 43.4	-51.2	100.1	2 32.9	-51.7	100.1	2 22.3	-52.2	100.2	3
4	2 46.9	-48.3	100.4	2 36.1	-48.9	100.4	2 25.2	-49.5	100.5	2 14.2	-50.0	100.5	2 03.2	-51.6	100.6	1 52.2	-51.2	100.6	1 41.2	-51.7	100.6	1 30.1	-52.2	100.7	4
5	1 58.6	-48.3	101.0	1 47.2	-49.0	101.0	1 35.7	-49.5	101.1	1 24.2	-50.1	101.1	1 12.6	-50.6	101.1	1 01.0	-51.1	101.1	0 49.5	-51.7	101.1	0 37.9	-52.3	101.2	5
6	1 10.3	-48.3	101.6	0 58.2	-48.9	101.6	0 46.2	-49.5	101.6	0 34.1	-50.1	101.6	0 22.0	-50.7	101.6	0 09.9	-51.2	101.6	0 02.2	+51.8	78.4	0 14.4	+52.2	78.4	6
7	0 22.0	-48.3	102.2	0 09.3	-48.9	102.2	0 03.3	+49.5	77.8	0 16.0	+50.1	77.8	0 28.7	+50.6	77.8	0 41.3	+51.2	77.8	0 54.0	+51.7	77.8	1 06.6	+52.2	77.9	7
8	0 26.3	+48.4	77.2	0 39.6	+48.9	77.2	0 52.8	+49.6	77.2	1 06.1	+50.1	77.3	1 19.3	+50.6	77.3	1 32.5	+51.2	77.3	1 45.7	+51.7	77.3	1 58.8	+52.2	77.4	8
9	1 14.7	+48.3	76.6	1 28.5	+48.9	76.7	1 42.4	+49.4	76.7	1 56.2	+50.0	76.7	2 09.9	+50.6	76.7	2 23.7	+51.1	76.8	2 37.4	+51.6	76.8	2 51.0	+52.2	76.9	9
10	2 03.0	+48.3	76.0	2 17.4	+48.9	76.1	2 31.8	+49.5	76.1	2 46.2	+50.1	76.2	3 00.5	+50.6	76.2	3 14.8	+51.2	76.3	3 29.0	+51.7	76.3	3 43.2	+52.2	76.4	10
11	2 51.3	+48.3	75.4	3 06.3	+48.9	75.5	3 21.3	+49.5	75.6	3 36.3	+50.0	75.6	3 51.1	+50.6	75.7	4 06.0	+51.1	75.7	4 20.7	+51.7	75.8	4 35.4	+52.1	75.9	11
12	3 39.6	+48.2	74.9	3 55.2	+48.9	74.9	4 10.8	+49.4	75.0	4 26.3	+50.0	75.1	4 41.7	+49.7	75.1	5 12.4	+51.6	75.3	5 27.5	+52.2	75.4	12			
13	4 27.8	+48.3	74.3	4 44.1	+48.8	74.3	5 00.2	+49.4	74.4	5 16.3	+50.0	74.5	5 32.3	+50.5	74.6	5 48.2	+51.0	74.7	6 04.0	+51.6	74.8	6 19.7	+52.1	74.9	13
14	5 16.1	+48.2	73.7	5 32.9	+48.8	73.8	5 49.6	+49.4	73.8	6 06.3	+49.9	73.9	6 22.8	+50.5	74.1	6 39.2	+51.1	74.2	6 55.6	+51.5	74.3	7 11.8	+52.0	74.4	14
15	6 04.3	+48.1	73.1	6 21.7	+48.7	73.2	6 39.0	+49.3	73.3	6 56.2	+49.7	73.4	7 13.3	+50.5	73.5	7 30.3	+51.0	73.6	7 47.1	+51.5	73.8	8 03.8	+52.1	73.9	15
16	6 52.4	+48.1	72.5	7 10.4	+48.7	72.6	7 28.3	+49.3	72.7	7 46.1	+49.9	72.8	8 03.8	+50.4	73.0	8 21.3	+50.9	73.1	8 38.6	+51.5	73.2	8 55.9	+52.0	73.4	16
17	7 40.5	+48.1	71.9	7 59.1	+48.7	72.0	8 17.6	+49.3	72.1	8 36.0	+49.8	72.3	8 54.2	+50.3	72.4	9 12.2	+50.9	72.6	9 30.1	+51.5	72.7	9 47.9	+51.9	72.9	17
18	8 28.6	+48.0	71.3	8 47.8	+48.6	71.4	9 06.9	+49.1	71.5	9 25.8	+49.7	71.7	9 44.5	+50.3	71.9	10 03.1	+50.9	72.0	10 21.6	+51.3	72.2	10 39.8	+51.9	72.4	18
19	9 16.6	+47.9	70.6	9 36.4	+48.5	70.8	9 56.0	+49.2	71.0	10 15.5	+49.7	71.1	10 34.8	+50.3	71.3	10 54.0	+50.8	71.5	11 12.9	+51.4	71.7	11 31.7	+51.9	71.9	19
20	10 04.5	+47.9	70.0	10 24.9	+48.5	70.2	10 45.2	+49.0	70.4	11 05.2	+49.7	70.6	11 25.1	+50.2	70.8	11 44.8	+50.7	70.9	12 04.3	+51.2	71.1	12 23.6	+51.7	71.4	20
21	10 52.4	+47.8	69.4	11 13.4	+48.4	69.6	11 34.2	+49.0	69.8	11 54.9	+49.5	70.0	12 15.3	+50.1	70.2	12 35.5	+50.7	70.4	12 55.5	+51.2	70.6	13 15.3	+51.8	70.8	21
22	11 40.2	+47.7	68.8	12 01.8	+48.3	69.0	12 23.2	+48.9	69.2	12 44.4	+49.5	69.4	13 05.4	+50.0	69.6	13 26.2	+50.6	69.9	13 46.7	+51.2	70.1	14 07.1	+51.6	70.3	22
23	12 27.9	+47.7	68.2	12 50.1	+48.3	68.4	13 12.1	+48.8	68.6	13 33.9	+49.4	68.8	13 55.4	+50.0	69.1	14 16.8	+50.5	69.3	14 37.9	+51.0	69.5	14 58.7	+51.6	69.8	23
24	13 15.6	+47.5	67.6	13 38.4	+48.1	67.8	14 00.9	+48.8	68.0	14 23.3	+49.3	68.2	14 45.4	+49.5	68.5	15 07.3	+50.4	68.7	15 28.9	+51.0	69.0	15 50.3	+51.5	69.3	24
25	14 03.1	+47.5	66.9	14 26.5	+48.1	67.2	14 49.7	+48.6	67.4	15 12.6	+49.2	67.7	15 35.3	+49.8	67.9	15 57.7	+50.4	68.2	16 19.9	+50.9	68.4	16 41.8	+51.4	68.7	25
26	14 50.6	+47.3	66.3	15 14.6	+47.9	66.6	15 38.3	+48.6	66.8	16 01.8	+49.2	67.1	16 25.1	+49.7	67.3	16 48.1	+50.2	67.6	17 10.8	+50.8	67.9	17 33.2	+51.4	68.2	26
27	15 37.9	+47.3	65.7	16 02.5	+47.9	65.9	16 26.9	+48.4	66.2	16 51.0	+49.0	66.5	17 14.8	+49.6	66.7	17 38.3	+50.2	67.0	18 01.6	+50.7	67.3	18 24.6	+51.2	67.6	27
28	16 25.2	+47.1	65.0	16 50.4	+47.7	65.3	17 15.3	+48.3	65.6	17 40.0	+48.9	65.9	18 04.4	+49.5	66.2	18 28.5	+50.0	66.5	18 52.3	+50.6	66.8	19 15.8	+51.2	67.1	28
29	17 12.3	+47.0	64.4	17 38.1	+47.6	64.7	18 03.6	+48.2	65.0	18 28.9	+48.8	65.3	18 53.9	+49.3	65.6	19 18.5	+50.0	65.9	19 42.9	+50.5	66.2	20 07.0	+51.0	66.5	29
30	17 59.3	+46.8	63.7	18 25.7	+47.5	64.0	18 51.8	+48.1	64.3	19 17.7	+48.6	64.6	19 43.2	+49.3	65.0	20 08.5	+49.8	65.3	20 33.4	+50.4	65.6	20 58.0	+50.0	65.6	30
31	18 46.1	+46.7	63.1	19 13.2	+47.3	63.4	19 39.9	+47.9	63.7	20 06.3	+48.6	64.0	20 32.5	+49.1	64.4	20 58.3	+49.7	64.7	21 23.8	+50.2	65.0	21 48.9	+50.8	65.4	31
32	19 32.8	+46.6	62.4	20 00.5	+47.2	62.7	20 27.8	+47.8	63.1	20 54.9	+48.4	63.4	21 21.6	+49.0	63.7	21 48.0	+49.5	64.1	22 14.0	+50.1	64.5	22 39.7	+50.7	64.8	32
33	20 19.4	+46.4	61.7	20 47.7	+47.0	62.1	21 15.6	+47.7	62.4	21 43.3	+48.2	62.8	22 10.6	+48.8	63.1	22 37.5	+49.4	63.5	23 04.1	+50.0	63.9	23 30.4	+50.5	64.2	33
34	21 52.1	+46.1	60.4	22 21.6	+46.7	60.7	22 50.8	+47.3	61.1	23 19.6	+47.9	61.5	23 48.1	+48.5	61.8	24 16.2	+49.1	62.2	24 44.0	+49.7	62.6	25 11.4	+50.2	63.1	35
35	22 38.2	+45.9	59.7	23 08.3	+46.0	60.0	23 38.1	+47.1	60.4	24 07.5	+47.8	60.8	24 36.6	+48.4	61.2	25 05.3	+49.0	61.6	25 33.7	+49.5	62.0	26 01.6	+50.1	62.5	36
36	23 05.7	+45.6	59.4	24 54.8	+46.4	59.4	24 25.2	+47.0	59.7	24 55.3	+47.6	60.1	25 25.0	+48.2	60.5	26 23.2	+49.4	61.0	26 23.2	+49.4	61.4	26 51.7	+50.0	61.8	37
37	24 21.4	+45.3	58.8	25 04.6	+45.9	59.4	26 36.2	+47.3	59.8	27 03.6	+48.3	60.4	27 37.9	+48.8	60.8	28 11.9	+49.4	61.2	28 41.4	+49.8	61.6	29 37.8	+47.2	62.3	36
38	25 27.6	+45.0	58.3	26 31.7	+45.4	58.7	27 31.9	+45.2																	

81°, 279° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	5 24.1 +48.1	97.2	5 16.5 +48.8	97.3	5 08.9 +49.3	97.4	5 01.1 +49.9	97.5	4 53.3 +50.4	97.6	4 45.3 +51.1	97.7	4 37.3 +51.6	97.7	4 29.2 +52.1	97.8	0	5 24.2 +47.9	94.2	9 19.8 +48.5	94.4	9 15.1 +49.1	94.5	9 10.3 +49.7	94.7	8 54.9 +51.4	95.2	8 49.4 +52.0	95.3	5 21.3 +52.1	97.3	1															
1	6 12.2 +48.1	96.6	6 05.3 +48.7	96.7	5 58.2 +49.3	96.8	5 51.0 +49.9	96.9	5 43.7 +50.5	97.0	5 36.4 +51.0	97.1	5 28.9 +51.5	97.2	5 21.3 +52.1	97.3	1	6 12.1 +47.8	93.6	10 08.3 +48.4	93.8	10 04.2 +49.1	93.9	10 00.0 +49.7	94.1	9 55.6 +50.3	94.3	9 46.3 +51.4	94.6	9 41.4 +51.9	94.8	6															
2	7 00.3 +48.0	96.0	6 54.0 +48.6	96.1	6 47.5 +49.3	96.2	6 40.9 +49.9	96.4	6 34.2 +50.4	96.5	6 27.4 +51.0	96.6	6 20.4 +51.6	96.7	6 13.4 +52.0	96.8	2	7 48.3 +48.0	95.4	7 42.6 +48.6	95.5	7 36.8 +49.2	95.7	7 30.8 +49.8	95.8	7 24.6 +50.4	95.9	7 18.4 +50.9	96.1	7 12.0 +51.4	96.2	7 05.4 +52.0	96.3	3													
3	8 36.3 +47.9	94.8	8 31.2 +48.6	94.9	8 26.0 +49.1	95.1	8 20.6 +49.7	95.2	8 15.0 +50.3	95.4	8 09.3 +51.4	95.5	8 03.4 +51.5	95.7	7 57.4 +52.0	95.8	4	9 24.2 +47.9	94.2	9 19.8 +48.5	94.4	9 15.1 +49.1	94.5	9 10.3 +49.7	94.7	9 00.2 +50.9	95.0	8 54.9 +51.4	95.2	8 49.4 +52.0	95.3	5 21.3 +52.1	97.3	1													
4	10 12.1 +47.8	93.6	10 08.3 +48.4	93.8	10 04.2 +49.1	93.9	10 00.0 +49.7	94.1	9 55.6 +50.3	94.3	9 51.1 +50.8	94.5	9 46.3 +51.4	94.6	9 41.4 +51.9	94.8	6	10 59.9 +47.7	93.0	10 56.7 +48.3	93.2	10 53.3 +48.9	93.3	10 49.7 +49.6	93.5	10 45.9 +50.1	93.7	10 41.9 +50.7	93.9	10 37.7 +51.3	94.1	10 33.3 +51.8	94.3	7													
5	11 47.6 +47.6	92.3	11 45.0 +48.3	92.5	11 42.2 +48.9	92.8	11 39.3 +49.5	93.0	11 36.0 +50.2	93.2	11 32.6 +50.7	93.4	11 29.0 +51.2	93.6	11 25.1 +51.8	93.8	8	12 35.2 +47.6	91.7	12 33.3 +48.2	91.9	12 31.1 +48.9	92.2	12 28.8 +49.4	92.4	12 26.2 +50.0	92.6	12 23.3 +50.6	92.8	12 20.2 +51.2	93.0	12 16.9 +51.8	93.3	9													
10	13 22.8 +47.4	91.1	13 21.5 +48.1	91.3	13 20.0 +48.7	91.6	13 18.2 +49.4	91.8	13 16.2 +50.0	92.0	13 13.9 +50.6	92.3	13 11.4 +51.2	92.5	13 08.7 +51.7	92.7	10	14 10.2 +47.4	90.5	14 09.6 +48.0	90.7	14 08.7 +48.7	91.0	14 07.6 +49.2	91.2	14 06.2 +49.8	91.5	14 04.5 +50.5	91.7	14 02.6 +51.0	92.0	14 00.4 +51.6	92.2	11													
11	14 57.6 +47.2	89.8	14 57.6 +47.9	90.1	14 57.4 +48.5	90.4	14 56.8 +49.2	90.6	14 56.0 +49.8	90.9	14 55.0 +50.1	91.2	14 53.6 +51.0	91.4	14 52.0 +51.5	91.7	12	15 44.8 +47.1	89.2	15 45.5 +47.8	89.5	15 45.9 +48.6	89.8	15 45.4 +49.7	90.3	15 44.6 +50.9	90.9	15 43.5 +51.5	91.2	13	16 31.9 +47.1	88.5	16 33.3 +47.7	88.8	16 34.4 +48.3	89.1	16 35.1 +49.0	89.4	16 35.5 +50.8	90.3	16 35.0 +51.4	90.6	14				
15	17 19.0 +46.8	87.9	17 21.0 +47.6	88.2	17 22.7 +48.2	88.5	17 24.1 +48.9	88.8	17 25.2 +49.5	89.1	17 25.9 +50.1	89.5	17 26.3 +50.7	89.8	17 26.4 +51.3	90.1	15	18 05.8 +46.8	87.2	18 08.6 +47.4	87.6	18 10.9 +48.1	87.9	18 13.0 +48.7	88.2	18 14.7 +49.3	88.6	18 16.0 +50.0	88.9	18 17.7 +50.6	89.2	18 17.7 +51.1	89.5	16													
16	18 52.6 +46.6	86.6	18 58.0 +47.3	86.9	18 59.0 +48.0	87.3	19 01.7 +48.7	87.6	19 04.0 +49.3	88.0	19 06.0 +49.9	88.3	19 07.6 +50.5	88.6	19 08.8 +51.1	89.0	17	19 39.2 +46.5	85.9	19 43.3 +47.2	86.3	19 53.3 +49.2	87.3	19 55.9 +49.8	87.7	19 58.1 +50.4	88.1	19 58.9 +51.0	88.4	18	20 25.7 +46.3	85.2	20 30.5 +47.0	85.6	20 34.8 +47.7	86.0	20 38.9 +48.3	86.4	20 42.5 +49.0	87.7	20 45.7 +49.6	87.1	20 48.5 +50.3	87.5	20 50.9 +50.9	87.9	19
20	21 12.0 +46.1	84.6	21 17.5 +46.8	84.9	21 22.5 +47.6	85.3	21 27.2 +48.2	85.7	21 31.5 +48.9	86.5	21 35.3 +49.6	86.5	21 38.8 +50.1	86.9	21 41.8 +50.8	87.3	20	21 58.1 +46.0	83.9	22 04.3 +46.7	84.3	22 10.1 +47.4	84.7	22 15.4 +48.1	85.1	22 20.4 +48.7	85.5	22 24.9 +49.4	85.9	22 28.9 +50.1	86.3	22 32.6 +50.6	86.7	21													
21	22 44.1 +45.8	83.2	22 51.0 +46.5	83.6	22 57.5 +47.2	84.0	23 03.5 +47.9	84.4	23 09.1 +48.6	84.9	23 14.3 +49.2	85.3	23 19.0 +49.8	85.7	23 23.2 +50.5	86.1	22	23 29.9 +45.6	82.5	23 37.5 +46.3	82.9	23 44.7 +47.0	83.3	23 51.4 +47.8	83.8	23 57.7 +48.4	84.2	24 03.5 +49.1	84.7	24 08.8 +49.8	85.1	24 13.7 +50.4	85.6	23													
24	24 15.5 +45.3	81.8	24 23.8 +46.2	82.2	24 31.7 +46.9	82.7	24 39.2 +47.3	83.1	24 46.1 +48.3	83.6	24 52.6 +48.9	84.0	24 58.6 +49.6	84.5	25 04.1 +50.3	85.0	25	25 00.8 +45.2	81.0	25 10.0 +45.9	81.5	25 18.6 +46.6	82.0	25 26.7 +47.4	82.4	25 34.4 +48.0	82.9	25 41.5 +48.8	83.4	25 48.2 +49.4	83.9	25 54.3 +50.1	84.4	25													
25	25 46.0 +45.0	80.3	25 55.9 +45.7	80.8	26 05.2 +46.5	81.3	26 14.1 +47.2	81.8	26 22.4 +47.4	82.7	26 30.3 +48.5	82.7	26 37.6 +49.2	83.2	26 44.4 +49.9	83.7	26	26 46.0 +45.1	79.3	26 51.7 +45.2	79.7	26 57.7 +46.2	80.1	27 03.6 +47.7	80.6	27 10.3 +47.7	81.6	27 18.8 +48.4	82.1	27 26.8 +49.1	82.6	27 34.3 +49.7	83.1	27													
27	27 15.7 +44.5	78.8	27 27.1 +45.2	79.3	27 37.9 +46.0	79.8	27 48.2 +46.8	80.4	27 58.0 +47.5	80.9	28 07.2 +48.2	81.4	28 15.9 +48.9	81.9	28 24.0 +49.6	82.5	28	28 29.4 +43.7	75.5	29 01.3 +44.5	76.0	29 10.9 +45.3	76.5	29 21.7 +46.0	77.0	29 32.8 +46.7	77.5	29 42.4 +47.3	78.1	29 52.9 +48.5	79.2	29															
29	29 00.2 +44.3	78.1	28 12.3 +45.1	78.6	28 23.3 +45.8	79.1	28 33.0 +45.6	79.7	28 45.4 +47.3	80.2	28 55.4 +48.0	80.7	29 04.8 +48.7	81.3	29 13.7 +49.3	81.8	29	29 25.5 +41.9	69.9	29 39.5 +41.9	70.5	29 49.2 +42.7	71.2	29 58.2 +43.6	71.9	29 66.5 +44.4	72.6	29 73.0 +45.0	73.7	29 01.0 +46.1	74.0	29 17.2 +46.8	74.7	29													
30	28 44.5 +43.9	77.3	28 57.4 +44.7	77.8	29 09.7 +45.6	78.4	29 21.5 +46.3	78.9	29 32.8 +47.0	79.5	29 43.4 +47.8	80.0	29 53.5 +48.5	80.6	30 03.0 +49.2	81.2	30	29 28.4 +43.7	76.5	29 42.1 +44.5	77.1	29 55.3 +45.2	77.6	29 67.4 +46.0	78.3	29 77.3 +46.7	79.2	29 13.7 +47.8	79.8	29 29.9 +48.5	79.2	30															
31	30 29.4 +43.7	76.5	29 42.1 +44.5	77.1	29 55.3 +45.2	77.6	30 07.8 +46.1	78.2	30 19.8 +46.8	78.8	30 31.2 +47.5	79.3	30 40.2 +48.2	79.9	30 52.2 +48.9	80.5	31	30 12.1 +43.4	75.7	30 26.6 +44.2	76.3	30 40.5 +45.6	76.9	30 53.9 +45.9	77.5	31 06.6 +46.5	78.0	31 18.7 +47.3	78.6	31 30.2 +48.1	79.2	31 41.1 +48.8	79.8	32													
32	30 55.5 +43.1	74.9	31 10.8 +44.0	75.5	31 25.5 +44.8	76.1	31 31.9 +45.7	76.7	31 39.7 +46.3	77.3	32 06.0 +47.1	77.9	32 13.7 +47.8	77.7	32 06.0 +47.1	77.9	32	32 18.4 +43.7	73.3	32 31.7 +44.3	74.7	32 35.3 +45.2	75.3	32 42.7 +46.2	76.3	32 49.7 +47.2	77.3	32 56.7 +48.2	78.3	32 63.7 +49.2	79.3	32															
33	32 21.4 +42.5	73.3	32 38.4 +43.3	73.9	32 54.7 +44.1	74.5	33 10.4 +44.9	75.2	33 25.5 +45.7	75.8	33 39.9 +46.5	76.4	33 53.6 +47.3	77.1	34 06.7 +48.0	77.7	34	32 21.4 +42.5	72.5	32 38.4 +43.3	73.1	32 55.2 +44.7	73.7	33 13.7 +45.4	74.3	33 22.7 +46.2	75.3	33 31.2 +47.2	76.3	33 38.7 +48.0	77.7	34															
34	33 03.9 +42.1	72.5	33 21.7 +42.9	73.1	33 38.8 +43.8	73.7	33 55.3 +44.7	74.4	34 11.2 +45.4	75.0	34 26.4 +46.2	75.7	34 40.9 +47.0	76.3	34 54.7 +47.8	77.0	34	32 21.4 +42.5	71.5	32 38.4 +43.2	72.2	32 56.2 +44.6	73.2	33 12.7 +45.4	74.2	33 22.2 +46.3	75.2	33 31.7 +47.1	76.2	33 38.6 +48.2	77.2	34															
44	38 29.9 +38.8	65.2	38 54.8 +39.7	65.9	39 18.9 +40.6	66.7	39 00.3 +41.1	67.6	39 22.0 +42.9	69.1	39 43.0 +44.6	69.9	39 43.0 +44.6	70.7	40 04.9 +46.4	68.2	40 26.8 +43.4	69.0	40 47.0 +44.2	69.8	41 08.2 +45.1	70.6	41	45 08.7 +38.3	61.0	45 27.0 +38.0	61.8	45 40.2 +38.0	62.5	45 58.8 +39.3	63.4	46 44.1 +4															

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 81°, 279°

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	5	24.1	-48.1	97.2	5	16.5	-48.7	97.3	5	08.9	-49.4	97.4	5	01.1	-49.9	97.5	4	53.3	-50.6	97.6	4	45.3	-51.1	97.7	4	29.2	-52.2	97.8	0
1	4	36.0	-48.2	97.8	4	27.8	-48.8	97.9	4	19.5	-49.4	98.0	4	11.2	-50.0	98.0	4	02.7	-50.5	98.1	3	54.2	-51.1	98.2	3	37.0	-52.1	98.3	1
2	3	47.8	-48.2	98.4	3	39.0	-48.8	98.5	3	30.1	-49.4	98.5	3	21.2	-50.0	98.6	3	12.2	-50.6	98.6	3	03.1	-51.1	98.7	2	54.0	-51.6	98.8	2
3	2	59.6	-48.2	99.0	2	50.2	-48.9	99.1	2	40.7	-49.4	99.1	2	31.2	-50.0	99.1	2	21.6	-50.5	99.2	2	12.0	-51.1	99.2	2	02.4	-51.6	99.3	3
4	2	11.4	-48.3	99.6	2	01.3	-48.8	99.6	1	51.3	-49.4	99.7	1	41.2	-50.0	99.7	1	31.1	-49.6	99.7	1	10.8	-51.1	99.8	1	00.6	-52.2	99.8	4
5	1	23.1	-48.2	100.2	1	12.5	-48.8	100.2	1	01.9	-49.5	100.2	0	51.2	-50.0	100.3	0	40.5	-50.6	100.3	0	29.8	-51.1	100.3	0	19.1	-51.7	100.3	5
6	0	34.9	-48.3	100.8	0	23.7	-48.9	100.8	0	12.4	-49.4	100.8	0	01.2	-50.0	100.8	0	10.1	-50.6	79.2	0	21.3	+51.1	79.2	0	32.6	+51.6	79.2	6
7	0	13.4	+48.2	78.6	0	25.2	+48.8	78.6	0	37.0	+49.5	78.6	0	48.8	+50.1	78.6	1	00.7	+50.5	78.7	1	12.4	+51.2	78.7	1	24.2	+51.7	78.7	7
8	1	01.6	+48.2	78.0	1	14.0	+48.9	78.0	1	26.5	+49.4	78.1	1	38.9	+50.0	78.1	1	51.2	+50.6	78.1	2	03.6	+51.1	78.2	2	28.1	+52.2	78.2	8
9	1	49.8	+48.3	77.4	2	02.9	+48.8	77.5	2	15.9	+49.4	77.5	2	28.9	+50.0	77.5	2	41.8	+50.5	77.6	2	54.7	+51.1	77.6	3	07.5	+51.6	77.7	9
10	2	38.1	+48.2	76.8	2	51.7	+48.8	76.9	3	05.3	+49.4	76.9	3	18.9	+49.9	77.0	3	32.3	+50.6	77.0	3	45.8	+51.0	77.1	4	59.1	+51.6	77.2	10
11	3	26.3	+48.2	76.2	3	40.5	+48.8	76.3	3	54.7	+49.4	76.4	4	08.8	+50.0	76.4	4	22.9	+50.5	76.5	4	36.8	+51.1	76.6	5	50.7	+51.6	76.7	11
12	4	14.5	+48.1	75.6	4	29.3	+48.8	75.7	4	44.1	+49.3	75.8	4	58.8	+49.9	75.9	5	13.4	+50.5	76.0	5	27.9	+51.0	76.1	5	42.3	+51.6	76.2	12
13	5	02.6	+48.2	75.0	5	18.1	+48.7	75.1	5	33.4	+49.4	75.2	5	48.7	+49.9	75.3	6	03.9	+50.4	75.4	6	18.9	+51.0	75.5	6	33.9	+51.5	75.6	13
14	5	50.8	+48.1	74.4	6	06.8	+48.7	74.5	6	22.8	+49.2	74.6	6	38.6	+49.8	74.8	6	54.3	+50.4	74.9	7	09.9	+51.0	75.0	7	25.4	+51.5	75.1	14
15	6	38.9	+48.0	73.8	6	55.5	+48.7	74.0	7	12.0	+49.3	74.1	7	28.4	+49.8	74.2	7	44.7	+50.4	74.3	8	00.9	+50.9	74.5	8	16.9	+51.4	74.6	15
16	7	26.9	+48.0	73.2	7	44.2	+48.6	73.4	8	01.3	+49.2	73.5	8	18.2	+49.8	73.6	8	35.1	+50.3	73.8	8	51.8	+50.8	73.9	9	08.3	+51.4	74.1	16
17	8	14.9	+48.0	72.6	8	32.8	+48.5	72.8	8	50.5	+49.1	72.9	9	08.0	+49.7	73.1	9	25.4	+50.3	73.2	9	42.6	+50.8	73.4	10	16.6	+51.9	73.7	17
18	9	02.9	+47.8	72.0	9	21.3	+48.5	72.2	9	39.6	+49.1	72.3	9	57.7	+49.7	72.5	10	15.7	+50.2	72.7	10	33.4	+50.8	72.8	11	51.1	+51.2	73.0	18
19	9	50.7	+47.9	71.4	10	09.8	+48.4	71.6	10	28.7	+49.0	71.8	10	47.4	+49.5	71.9	11	05.9	+50.1	72.1	11	24.2	+50.7	72.3	11	42.3	+51.3	72.5	19
20	10	38.6	+47.7	70.8	10	58.2	+48.4	71.0	11	17.7	+48.9	71.2	11	36.9	+49.6	71.4	11	56.0	+50.1	71.6	12	14.9	+50.6	71.8	12	33.6	+51.2	72.0	20
21	11	26.3	+47.7	70.2	11	46.6	+48.2	70.4	12	06.6	+48.9	70.6	12	26.5	+49.4	70.8	12	46.1	+50.0	71.0	13	05.5	+50.6	71.2	13	24.8	+51.1	71.4	21
22	12	14.0	+47.6	69.6	12	34.8	+48.2	69.8	12	55.5	+48.7	70.0	13	15.9	+49.4	70.2	13	36.1	+49.9	70.4	13	56.1	+50.5	70.7	14	15.9	+51.0	70.9	22
23	13	01.6	+47.4	68.9	13	23.0	+48.1	69.2	13	44.2	+48.7	69.4	14	05.3	+49.2	69.6	14	26.0	+49.9	69.9	14	46.6	+50.4	70.1	15	06.9	+51.0	70.3	23
24	13	49.0	+47.4	68.3	13	11.1	+48.0	68.5	14	32.9	+48.4	68.8	14	54.5	+49.2	69.0	15	15.9	+49.8	69.3	15	37.0	+50.3	69.5	15	57.9	+50.8	69.8	24
25	14	36.4	+47.3	67.7	14	59.1	+47.9	67.9	15	21.5	+48.6	68.2	15	43.7	+49.1	68.4	16	05.7	+49.4	68.7	16	27.3	+50.3	69.0	16	48.7	+50.8	69.2	25
26	15	23.7	+47.2	67.0	15	47.0	+47.8	67.3	16	10.1	+48.3	67.6	16	32.8	+49.0	67.8	16	55.3	+49.6	68.1	17	17.6	+50.1	68.4	17	39.5	+50.7	68.7	18
27	16	10.9	+47.1	66.4	16	34.8	+47.7	66.7	16	58.4	+48.3	66.9	17	21.8	+48.9	67.2	17	44.9	+49.5	67.5	18	07.7	+50.0	67.8	18	30.2	+50.6	68.1	18
28	16	58.0	+46.9	65.7	17	22.5	+47.6	66.0	17	46.7	+48.2	66.3	18	10.7	+48.7	66.6	18	34.4	+49.3	66.9	18	57.7	+49.9	67.2	19	20.8	+50.5	67.6	28
29	17	44.9	+46.8	65.1	18	10.1	+47.4	65.4	18	34.9	+48.0	65.7	19	59.4	+48.7	66.0	19	23.7	+49.2	66.3	19	47.6	+49.8	66.6	20	11.3	+50.3	67.0	29
30	18	31.7	+46.7	64.4	18	57.5	+47.3	64.7	19	22.9	+47.9	65.1	19	48.1	+48.5	65.4	20	12.9	+49.1	65.7	20	37.4	+49.7	66.1	21	01.6	+50.3	66.4	30
31	19	18.4	+46.6	63.8	19	44.8	+47.1	64.1	20	10.8	+47.8	64.4	20	36.6	+48.4	64.8	21	02.0	+49.0	65.1	21	27.1	+49.6	65.5	21	51.9	+50.1	65.8	31
32	20	05.0	+46.3	63.1	20	31.9	+47.0	63.4	20	58.6	+47.6	63.8	21	25.0	+48.2	64.1	21	51.0	+48.8	64.5	22	42.0	+50.0	65.2	23	07.0	+50.5	65.6	32
33	20	51.3	+46.2	62.4	21	18.9	+46.9	62.8	21	46.2	+47.5	63.1	22	13.2	+48.1	63.5	22	39.8	+48.7	63.9	23	06.1	+49.2	64.2	24	23.0	+49.8	64.6	33
34	21	37.5	+46.1	61.7	22	05.8	+46.7	62.1	22	33.7	+47.1	62.5	23	21.2	+47.6	62.9	23	40.7	+48.4	63.3	24	28.5	+48.5	63.6	25	11.5	+49.7	64.0	34
35	22	23.6	+45.9	61.1	22	52.5	+46.5	61.4	23	21.0	+47.1	61.8	23	49.2	+47.7	62.2	24	17.0	+48.4	62.6	24	44.5	+48.9	63.0	25	11.5	+49.6	63.4	35
36	23	09.5	+45.6	60.4	23	28.0	+46.3	60.7	24	08.1	+47.0	61.1	24	36.9	+47.6	61.5	25	05.4	+45.6	61.9	25	33.4	+48.8	62.3	26	01.1	+49.3	62.8	36
37	24	20.4	+45.3	60.0	24	13.8	+45.0	60.4	25	54.5	+46.7	60.4	25	24.5	+47.4	60.8	26	53.5	+48.0	61.3	26	22.2	+48.6	61.7	27	20.8	+49.8	62.6	37
38	25	12.1	+45.0	59.3	25	41.8	+44.9	59.7	26	11.9	+45.2	60.2	27	41.5	+44.8	60.6</													

82°, 278° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	4 48.3 +48.0	96.4	4 41.5 +48.7	96.5	4 34.7 +49.3	96.6	4 27.8 +49.9	96.6	4 20.8 +50.5	96.7	4 13.8 +51.0	96.8	4 06.6 +51.6	96.9	3 59.4 +52.1	96.9	0	4 51.5 +52.0	96.4	4 51.5 +52.0	96.4	4 51.5 +52.0	96.4	0		
1	5 36.3 +48.1	95.8	5 30.2 +48.7	95.9	5 24.0 +49.3	96.0	5 17.7 +49.8	96.1	5 11.3 +50.4	96.2	5 04.8 +51.0	96.3	4 58.2 +51.5	96.4	4 51.5 +52.0	96.4	1	5 43.5 +52.1	95.9	5 43.5 +52.1	95.9	5 43.5 +52.1	95.9	1		
2	6 24.4 +48.0	95.2	6 18.9 +48.6	95.3	6 13.3 +49.2	95.4	6 07.5 +49.9	95.5	6 01.7 +50.4	95.6	5 55.8 +50.9	95.7	5 49.7 +51.5	95.8	5 43.5 +52.1	95.9	2	6 41.2 +51.5	95.3	6 35.6 +52.0	95.4	6 35.6 +52.0	95.4	3		
3	7 12.4 +47.9	94.6	7 07.5 +48.6	94.7	7 02.5 +49.2	94.8	6 57.4 +49.7	95.0	6 52.1 +50.4	95.1	6 46.7 +50.9	95.2	6 41.2 +51.5	95.3	6 35.6 +52.0	95.4	3	7 27.6 +51.9	94.9	7 27.6 +51.9	94.9	7 27.6 +51.9	94.9	4		
4	8 00.3 +47.9	94.0	7 56.1 +48.5	94.1	7 51.7 +49.1	94.3	7 47.1 +49.8	94.4	7 42.5 +50.3	94.5	7 37.6 +50.9	94.7	7 32.7 +51.4	94.8	7 27.6 +51.9	94.9	4	8 19.5 +52.0	94.4	8 19.5 +52.0	94.4	8 19.5 +52.0	94.4	5		
5	8 48.2 +47.8	93.4	8 44.6 +48.4	93.5	8 40.8 +49.1	93.7	8 36.9 +49.6	93.8	8 32.8 +50.2	94.0	8 28.5 +50.9	94.1	8 24.1 +51.4	94.3	8 19.5 +52.0	94.4	5	9 15.5 +51.3	93.8	9 11.5 +51.9	93.9	9 11.5 +51.9	93.9	6		
6	9 36.0 +47.8	92.8	9 33.0 +48.4	92.9	9 29.9 +49.0	93.1	9 26.5 +49.7	93.3	9 23.0 +50.2	93.4	9 19.4 +50.7	93.6	9 15.5 +51.3	93.8	9 11.5 +51.9	93.9	6	10 03.4 +51.8	93.4	10 03.4 +51.8	93.4	10 03.4 +51.8	93.4	7		
7	10 23.8 +47.7	92.2	10 21.4 +48.4	92.3	10 18.9 +49.0	92.5	10 16.2 +49.5	92.7	10 13.2 +50.2	92.9	10 10.1 +50.8	93.1	10 06.8 +51.3	93.2	10 03.4 +51.8	93.4	7	11 47.0 +51.7	92.4	11 47.0 +51.7	92.4	11 47.0 +51.7	92.4	9		
8	11 11.5 +47.6	91.5	11 09.8 +48.2	91.7	11 07.9 +48.6	91.9	11 05.7 +49.5	92.1	11 03.4 +50.1	92.3	11 00.9 +50.4	92.5	10 58.1 +51.3	92.7	10 55.2 +51.8	92.9	8	11 47.0 +51.7	92.4	11 47.0 +51.7	92.4	11 47.0 +51.7	92.4	9		
9	11 59.1 +47.6	90.9	11 58.0 +48.2	91.1	11 56.6 +48.8	91.3	11 55.2 +49.5	91.6	11 53.5 +50.0	91.8	11 51.5 +50.7	92.0	11 49.4 +51.2	92.2	11 47.0 +51.7	92.4	9	12 38.7 +51.7	91.9	12 38.7 +51.7	91.9	12 38.7 +51.7	91.9	10		
10	12 46.7 +47.4	90.3	12 46.2 +48.1	90.5	12 45.6 +48.7	90.7	12 44.7 +49.3	91.0	12 43.5 +50.0	91.2	12 42.2 +50.5	91.4	12 40.6 +51.1	91.6	12 38.7 +51.7	91.9	10	13 34.1 +51.6	91.1	13 34.1 +51.6	91.1	13 34.1 +51.6	91.1	11		
11	13 34.1 +47.4	89.7	13 34.3 +48.0	89.9	13 34.3 +48.6	90.1	13 34.0 +49.3	90.4	13 33.5 +49.9	90.6	13 32.7 +50.5	90.9	13 31.7 +51.0	91.1	13 30.4 +51.6	91.4	11	14 22.0 +51.5	90.8	14 22.0 +51.5	90.8	14 22.0 +51.5	90.8	12		
12	14 21.5 +47.2	89.0	14 22.3 +47.9	89.3	14 22.9 +48.6	89.5	14 23.3 +49.2	89.8	14 23.4 +49.8	90.1	14 23.2 +50.4	90.3	14 22.7 +51.0	90.6	14 22.0 +51.5	90.8	12	15 08.7 +47.1	88.4	15 13.6 +50.3	89.8	15 13.7 +50.9	90.0	13		
13	15 55.8 +47.1	88.4	15 10.2 +47.9	88.7	15 11.5 +48.5	88.9	15 12.5 +49.1	89.2	15 13.2 +49.7	89.5	15 13.6 +50.3	89.8	15 13.7 +50.9	90.0	15 13.5 +51.5	90.3	13	16 04.6 +50.8	89.5	16 05.0 +51.4	89.8	16 05.0 +51.4	89.8	14		
14	16 42.9 +46.9	87.1	16 45.8 +47.5	87.4	16 48.3 +48.3	87.7	16 50.6 +48.8	88.0	16 52.5 +49.5	88.3	16 54.1 +50.1	88.6	16 55.4 +50.7	88.9	16 56.4 +51.3	89.2	15	17 29.8 +46.8	86.5	17 33.3 +47.5	87.1	17 44.2 +50.0	88.0	17 47.7 +51.2	88.7	
15	17 18.6 +46.6	85.8	18 20.8 +47.3	86.1	18 24.7 +48.0	86.5	18 28.2 +48.7	86.8	18 31.4 +49.3	87.1	18 34.2 +49.9	87.5	18 36.7 +50.5	87.8	18 38.9 +51.1	88.1	17	19 03.2 +46.5	85.1	19 08.1 +47.2	85.5	19 12.7 +47.8	85.8	19 27.2 +50.5	87.2	18
16	19 49.7 +46.3	84.5	19 55.3 +47.1	84.8	20 00.5 +47.8	85.2	20 05.4 +48.4	85.5	20 09.9 +49.0	85.9	20 13.9 +49.7	86.3	20 17.7 +50.2	86.6	20 21.0 +50.9	87.0	19	20 36.0 +46.2	83.8	20 42.4 +46.8	84.2	20 48.3 +47.5	84.5	21 03.6 +49.2	85.7	20
20	21 22.2 +46.1	83.1	21 29.2 +46.8	83.5	21 35.8 +47.5	83.9	21 42.0 +48.1	84.3	21 47.8 +48.8	84.7	21 53.2 +49.4	85.1	21 58.1 +50.1	85.5	22 02.6 +50.7	85.9	21	22 08.3 +45.8	82.4	22 16.0 +46.5	82.8	22 23.3 +47.2	83.2	22 42.6 +49.3	84.5	22
21	22 08.3 +45.8	82.4	22 16.0 +46.5	82.8	22 23.3 +47.2	83.2	22 30.1 +48.0	83.6	22 36.6 +48.6	84.0	22 42.6 +49.3	84.5	22 48.2 +49.9	84.9	22 53.3 +50.5	85.3	22	23 39.8 +45.4	81.0	23 48.9 +46.2	81.4	23 51.9 +46.7	81.8	23 53.8 +47.4	82.3	23
22	23 51.4 +45.7	81.7	23 02.5 +46.4	82.1	23 10.5 +47.1	82.6	23 18.1 +47.8	83.0	23 25.2 +48.5	83.4	23 31.9 +49.7	83.8	23 38.1 +49.7	84.3	23 43.8 +50.4	84.7	23	24 39.8 +44.4	81.0	24 47.4 +48.0	81.4	24 54.7 +48.6	81.8	24 59.4 +49.5	82.1	24
23	24 25.2 +45.3	80.3	24 35.1 +46.0	80.7	24 44.5 +46.8	81.2	24 53.5 +47.4	81.6	25 02.0 +48.1	82.1	25 10.8 +48.8	82.6	25 17.5 +49.4	83.0	25 24.5 +50.1	83.5	25	25 10.3 +46.2	80.7	25 16.8 +46.8	81.1	25 23.6 +47.1	81.5	25 29.0 +50.2	82.1	25
24	25 10.5 +45.0	79.6	25 21.1 +45.8	80.0	25 31.3 +46.5	80.5	25 40.9 +47.3	81.0	25 50.1 +47.9	81.4	25 58.8 +48.6	81.9	26 06.9 +49.3	82.4	26 14.6 +49.9	82.9	26	26 22.5 +44.8	79.3	26 30.9 +45.3	80.7	26 38.9 +46.0	81.1	26 45.4 +49.6	81.5	26
25	26 29.5 +44.8	78.8	26 06.9 +45.6	79.3	26 17.8 +46.3	79.8	26 28.2 +47.0	80.3	26 38.0 +47.8	80.8	26 47.4 +48.4	81.3	26 56.2 +49.2	81.8	27 04.5 +49.8	82.3	27	27 35.8 +44.6	78.0	27 43.1 +45.7	80.6	27 48.7 +49.1	81.1	27 54.3 +49.6	81.7	27
26	27 24.9 +44.4	77.3	27 37.8 +45.1	77.8	27 50.2 +45.9	78.4	28 0.2 +46.0	78.9	28 13.3 +47.4	79.4	28 24.1 +48.0	79.9	28 34.3 +48.7	80.5	28 43.9 +49.5	81.0	28	29 09.3 +44.1	76.6	29 12.1 +47.9	79.3	29 23.0 +48.6	79.8	29 33.4 +49.2	80.4	29
27	29 58.3 +44.1	76.6	29 22.9 +44.9	77.1	29 36.1 +45.6	77.6	29 48.6 +46.4	78.2	29 00.7 +47.1	78.7	29 12.1 +47.9	79.3	29 23.0 +48.6	79.8	29 33.4 +49.2	80.4	29	30 21.4 +46.3	76.7	30 22.6 +46.9	77.1	30 22.6 +46.9	77.1	30		
28	30 20.7 +43.3	74.2	30 36.7 +44.1	74.8	30 52.2 +44.8	75.4	31 07.1 +45.6	76.0	31 21.3 +46.4	76.6	31 35.0 +47.1	77.1	31 48.0 +47.9	77.7	32 00.5 +48.6	78.3	32	32 09.7 +44.3	73.0	32 17.7 +45.3	73.6	32 25.7 +46.3	74.1	32 33.4 +47.3	74.9	32
29	31 04.0 +42.9	73.4	31 20.8 +43.8	74.0	31 37.0 +44.6	74.6	31 52.7 +45.3	75.2	32 07.7 +46.1	75.8	32 22.1 +46.9	76.4	32 35.9 +47.6	77.0	32 49.1 +48.3	77.7	32	34 29.4 +44.2	73.4	34 37.4 +45.1	74.0	34 45.4 +46.1	74.7	34 53.4 +47.3	75.3	34
30	34 29.6 +42.3	72.6	32 04.6 +43.4	73.2	32 21.6 +44.3	73.8	32 38.0 +45.1	74.4	32 53.8 +45.9	75.0	33 09.0 +46.6	75.7	33 23.5 +47.4	76.3	33 37.4 +48.1	76.9	33	34 29.5 +44.2	71.7	34 37.4 +44.2	72.3	34 45.4 +45.1	73.0	34 53.4 +45.9	73.6	34
31	34 29.4 +42.6	72.6	32 04.6 +43.4	73.2	32 21.6 +44.3	73.8	32 38.0 +45.1	74.4	32 53.8 +45.9	75.0	33 09.0 +46.6	75.7	33 23.5 +47.4	76.3	33 37.4 +48.1	76.9	33	35 29.5 +44.2	71.7	35 34.7 +45.1	72.3	35 42.5 +45.9	73.0	35 50.5 +46.6	73.6	35
32	35 16.6 +40.8	70.7	36 20.1 +41.3	69.1	36 42.1 +42.2	68.8	37 03.5 +43.0	69.5	37 24.2 +44.7	70.9	37 44.2 +44.7	70.9	38 03.4 +45.6	71.7	38 22.0 +46.3	72.4	38	36 29.5 +44.2	69.7	36 37.8 +45.3	70.3	36 45.7 +46.0	71.0	36 53.5 +46.7	71.6	36
33	36 29.5 +42.3	69.7	37 01.4 +40.8	67.2	37 24.3 +41.7																					

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $82^\circ$ ,  $278^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	4 48.3 -48.1	96.4	0	4 41.5 -48.7	96.5	0	4 34.7 -49.3	96.6	0	4 27.8 -49.9	96.6	0	4 20.8 -50.4	96.7	0	4 13.8 -51.1	96.8	0	4 06.6 -51.5	96.9	0	3 59.4 -52.1	96.9	0	
1	4 00.2 -48.2	97.0	3	52.8 -48.7	97.1	3	45.4 -49.3	97.1	3	37.9 -49.9	97.2	3	30.4 -50.5	97.3	3	22.7 -51.0	97.3	3	15.1 -51.6	97.4	1	3 07.3 -52.1	97.4	1	
2	3 12.0 -48.1	97.6	3	04.1 -48.8	97.7	2	56.1 -49.4	97.7	2	48.0 -50.0	97.8	2	39.9 -50.6	97.8	2	31.7 -51.1	97.9	2	23.5 -51.6	97.9	2	15.2 -52.1	97.9	2	
3	2 23.9 -48.2	98.2	2	15.3 -48.8	98.2	2	06.7 -49.4	98.3	1	58.0 -49.9	98.3	1	49.3 -50.5	98.3	1	40.6 -51.0	98.4	1	31.9 -51.6	98.4	3	1 23.1 -52.1	98.4	3	
4	1 35.7 -48.1	98.8	1	26.5 -48.7	98.8	1	17.3 -49.4	98.8	1	08.1 -50.0	98.9	0	58.8 -50.9	98.9	0	49.6 -51.1	98.9	0	40.3 -51.6	98.9	4	0 31.0 -52.2	98.9	4	
5	0 47.6 -48.2	99.4	0	37.8 -48.8	99.4	0	27.9 -49.3	99.4	0	18.1 -49.9	99.4	0	08.3 -50.5	99.4	0	0 01.5 +51.1	80.6	0	11.3 +51.7	80.6	5	0 21.2 +52.1	80.6	5	
6	0 00.6 +48.2	80.0	0	11.0 +48.8	80.0	0	21.4 +49.4	80.0	0	31.8 +50.0	80.0	0	42.2 +50.5	80.0	0	52.6 +51.1	80.0	1	03.0 +51.6	80.1	6	1 13.3 +52.1	80.1	6	
7	0 48.8 +48.2	79.4	0	59.8 +48.8	79.4	1	10.8 +49.4	79.4	1	21.8 +49.9	79.5	1	32.7 +50.6	79.5	1	43.7 +51.0	79.5	1	54.6 +51.6	79.6	7	2 05.4 +52.1	79.6	7	
8	1 37.0 +48.1	78.8	1	48.6 +48.8	78.8	2	00.2 +49.3	78.9	2	11.7 +50.0	78.9	2	23.3 +50.5	79.0	2	34.7 +51.1	79.0	2	46.2 +51.5	79.0	8	2 57.5 +52.1	79.1	8	
9	2 25.1 +48.2	78.2	2	37.4 +48.7	78.3	2	49.5 +49.4	78.3	3	01.7 +49.9	78.4	3	13.8 +50.4	78.4	3	25.8 +51.0	78.5	3	37.7 +51.6	78.5	9	3 49.6 +52.1	78.6	9	
10	3 13.3 +48.1	77.6	3	26.1 +48.8	77.7	3	38.9 +49.3	77.7	3	51.6 +49.9	77.8	4	04.2 +50.5	77.9	4	16.8 +51.0	77.9	4	29.3 +51.5	78.0	10	4 41.7 +52.1	78.1	10	
11	4 01.4 +48.1	77.0	4	14.9 +48.7	77.1	4	28.2 +49.3	77.2	4	41.5 +49.9	77.2	4	54.7 +50.4	77.3	5	07.8 +51.0	77.4	5	20.8 +51.6	77.5	11	5 33.8 +52.0	77.6	11	
12	4 49.5 +48.1	76.4	5	03.6 +48.6	76.5	5	17.5 +49.3	76.5	5	31.4 +49.8	76.7	5	45.1 +50.4	76.8	5	58.8 +50.9	76.9	6	12.4 +51.4	77.0	12	6 25.8 +52.0	77.1	12	
13	5 37.6 +48.0	75.8	5	52.2 +48.7	75.9	6	06.8 +49.2	76.0	6	21.2 +49.8	76.1	6	35.5 +50.4	76.2	6	49.7 +51.0	76.4	7	03.8 +51.5	76.5	13	7 17.8 +52.0	76.6	13	
14	6 25.6 +48.0	75.2	6	40.9 +48.6	75.3	6	56.0 +49.2	75.5	7	11.0 +49.8	75.6	7	25.9 +50.3	75.7	7	40.7 +50.8	75.8	7	55.3 +51.4	76.0	14	8 09.8 +51.9	76.1	14	
15	7 13.6 +48.0	74.6	7	29.5 +48.5	74.7	7	45.2 +49.1	74.9	8	00.8 +49.7	75.0	8	16.2 +50.3	75.1	8	31.5 +50.9	75.3	9	46.7 +51.4	75.4	15	9 01.7 +51.9	75.6	15	
16	8 01.6 +47.8	74.0	8	18.0 +48.5	74.2	8	34.3 +49.1	74.3	8	50.5 +49.7	74.4	9	06.5 +50.2	74.6	9	22.4 +50.8	74.8	9	38.1 +51.3	74.9	16	9 53.6 +51.9	75.1	16	
17	8 49.4 +47.9	73.4	9	06.5 +48.4	73.6	9	23.4 +49.0	73.7	9	40.2 +49.6	73.9	9	56.7 +50.2	74.0	10	13.2 +50.7	74.2	10	29.4 +51.3	74.4	17	10 45.5 +51.8	74.6	17	
18	9 37.3 +47.7	72.8	9	54.9 +48.4	73.0	10	12.4 +49.0	73.1	10	29.8 +49.5	73.3	10	46.9 +50.1	73.5	11	03.9 +50.7	73.7	11	20.7 +51.2	73.9	18	11 37.3 +51.7	74.1	18	
19	10 25.0 +47.7	72.2	10	43.3 +48.3	72.4	11	01.4 +48.9	72.5	11	19.3 +49.5	72.7	11	37.0 +50.1	72.9	11	54.6 +50.6	73.1	12	11.9 +51.1	73.3	19	12 29.0 +51.7	73.5	19	
20	11 12.7 +47.7	71.6	11	31.6 +48.2	71.8	11	50.3 +48.8	71.9	12	08.8 +49.4	72.1	12	27.1 +50.5	72.4	12	45.2 +50.5	72.6	13	0.0 +51.1	72.8	20	13 20.7 +51.6	73.0	20	
21	12 00.4 +47.5	70.9	12	19.8 +48.2	71.1	12	39.1 +48.8	71.4	12	52.8 +49.3	71.6	13	17.1 +49.5	71.8	13	35.7 +50.5	72.0	13	54.1 +51.0	72.2	21	14 12.3 +51.5	72.5	21	
22	12 47.9 +47.4	70.3	13	08.0 +48.1	70.5	13	27.9 +48.6	70.8	13	47.5 +49.3	71.0	14	07.0 +49.7	71.2	14	26.2 +50.4	71.5	14	45.1 +51.0	71.7	22	15 03.8 +51.5	72.0	22	
23	13 35.3 +47.4	69.7	13	56.1 +47.9	69.9	14	16.5 +48.6	70.2	14	36.8 +49.2	70.4	14	56.8 +49.7	70.6	15	16.6 +50.3	70.9	15	36.1 +50.8	71.2	23	15 55.3 +51.4	71.4	23	
24	14 22.7 +47.2	69.1	14	44.0 +47.9	69.3	15	05.1 +48.5	69.5	15	26.0 +49.0	69.8	15	46.5 +49.7	70.1	16	06.9 +50.2	70.3	16	26.9 +50.8	70.6	24	16 46.7 +51.3	70.9	24	
25	15 09.9 +47.2	68.4	15	31.9 +47.7	68.7	15	53.6 +48.3	68.9	16	15.0 +49.0	69.2	16	36.2 +49.5	69.5	16	57.1 +50.1	69.8	17	17.7 +50.7	70.0	25	17 38.0 +51.2	70.3	25	
26	15 57.1 +47.0	67.8	16	19.6 +47.7	68.0	16	41.9 +48.3	68.3	17	04.0 +48.8	68.6	17	25.7 +49.5	68.9	17	47.2 +50.0	69.2	18	08.4 +50.5	69.5	26	18 29.2 +51.2	69.8	26	
27	16 44.1 +46.9	67.1	17	07.3 +47.6	67.4	17	30.2 +48.1	67.7	17	52.8 +48.8	68.0	18	15.2 +49.3	68.3	18	37.2 +49.9	68.6	18	58.9 +50.5	68.9	19	20.4 +51.0	69.2	27	
28	17 31.0 +46.8	66.5	17	54.8 +47.4	66.8	18	18.3 +48.1	67.1	18	41.6 +48.6	67.4	19	04.5 +49.2	67.7	19	27.1 +49.8	68.0	19	49.4 +50.4	68.3	20	11.4 +50.8	68.7	28	
29	18 17.8 +46.6	65.8	18	42.2 +47.3	66.1	19	06.4 +47.6	66.4	19	30.2 +48.5	66.8	19	53.7 +49.1	67.1	20	16.9 +49.7	67.4	20	39.8 +50.2	67.8	21	20.3 +50.8	68.1	29	
30	19 04.4 +46.5	65.2	19	29.5 +47.1	65.5	19	54.2 +47.8	65.8	20	18.7 +48.3	66.1	20	42.8 +48.9	66.5	21	06.6 +49.5	66.8	21	30.0 +50.1	67.2	21	21 53.1 +50.7	67.5	30	
31	19 50.9 +46.4	64.5	20	16.6 +47.0	64.8	20	42.0 +47.6	65.1	21	07.0 +48.2	65.5	21	31.7 +48.5	65.9	22	20.1 +50.0	66.6	22	24.8 +50.6	67.0	31	25.5 +52.1	67.3	31	
32	20 37.3 +46.1	63.8	21	03.6 +46.8	64.1	21	29.6 +47.4	64.5	21	55.2 +48.1	64.9	22	20.6 +48.6	65.2	23	10.1 +49.2	65.6	23	31.0 +49.9	66.0	23	34.4 +50.4	66.4	32	
33	21 23.4 +46.1	63.1	21	50.4 +46.7	63.5	22	17.0 +47.3	63.8	22	43.3 +47.9	64.2	23	09.2 +48.5	64.6	23	34.4 +49.1	65.0	24	00.0 +49.7	65.4	24	24.8 +50.3	65.8	33	
34	22 09.5 +45.8	62.4	22	37.1 +46.4	62.8	23	04.3 +47.1	63.2	23	31.2 +47.8	63.6	23	57.7 +48.4	64.3	24	33.4 +49.1	65.0	25	15.1 +50.1	65.2	34	25.5 +48.7	65.6	34	
35	22 55.3 +45.6	61.7	23	23.5 +46.3	62.1	23	51.4 +47.0	62.5	24	19.0 +47.5	62.9	24	46.1 +48.2	63.3	25	12.9 +48.8	63.7	25	39.2 +49.4	64.1	35	26.5 +50.2	64.6	35	
36	23 40.9 +45.5	61.0	24	09.8 +46.1	61.4	24	38.4 +46.7	61.8	25	06.5 +47.4	62.2	25	34.3 +48.5	62.6	26	01.7 +48.6	63.1	26	28.6 +49.2	63.5	36	25.5 +52.2	64.0	36	
37	24 26.4 +45.3	60.3	24	55.9 +45.9	60.7	25	25.1 +46.6	61.1	25	53.9 +47.2	61.5	26	22.3 +47.8	62.0	26	50.3 +48.4	62.4	27	17.8 +49.1	62.9	37	27.5 +49.6	63.3	37	
38	25 11.7 +45.0	59.6	25	41.8 +45.7	60.0	26	11.7 +46.3	60.4	26	41.1 +47.0	60.9	27	10.1 +47.6												

83°, 277° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	4	12.4	+48.0	95.6	4	06.5	+48.6	95.7	4	00.5	+49.3	95.7	3	54.5	+49.8	95.8	3	48.3	+50.5	95.9	3	42.2	+50.9	95.9	3	35.9	+51.5	96.0	3	29.6	+52.1	96.1	0
1	5	00.4	+48.0	95.0	4	55.1	+48.6	95.1	4	49.8	+49.2	95.2	4	44.3	+49.8	95.3	4	38.8	+50.4	95.3	4	33.1	+51.0	95.4	4	27.4	+51.5	95.5	4	21.7	+52.0	95.6	1
2	5	48.4	+48.0	94.4	5	43.7	+48.6	94.5	5	39.0	+49.2	94.6	5	34.1	+49.8	94.7	5	29.2	+50.3	94.8	5	24.1	+50.9	94.9	5	18.9	+51.5	95.0	5	13.7	+52.0	95.1	2
3	6	36.4	+47.9	93.8	6	32.3	+48.6	93.9	6	28.2	+49.1	94.0	6	23.9	+49.8	94.1	6	19.5	+50.4	94.2	6	15.0	+50.9	94.4	6	10.4	+51.5	94.5	6	05.7	+52.0	94.6	3
4	7	24.3	+47.8	93.2	7	20.9	+48.5	93.3	7	17.3	+49.1	93.4	7	13.7	+49.7	93.6	7	09.9	+50.3	93.7	7	05.9	+51.4	93.8	7	01.9	+51.4	94.1	4				
5	8	12.1	+47.9	92.6	8	09.4	+48.4	92.7	8	06.4	+49.1	92.9	8	03.4	+49.6	93.0	8	00.2	+50.2	93.1	7	56.8	+50.8	93.3	7	53.3	+51.3	93.4	7	49.6	+51.9	93.6	5
6	9	00.0	+47.7	92.0	8	57.8	+48.4	92.1	8	55.5	+49.0	92.3	8	53.0	+49.6	92.4	8	50.4	+50.2	92.6	8	47.6	+50.8	92.7	8	44.6	+51.4	92.9	8	41.5	+51.9	93.1	6
7	9	47.7	+47.7	91.4	9	46.2	+48.3	91.5	9	44.5	+49.0	91.7	9	42.6	+49.6	91.9	9	40.6	+50.1	92.1	9	38.4	+50.7	92.2	9	36.0	+51.3	92.4	9	33.4	+51.8	92.5	7
8	10	35.4	+47.6	90.7	10	34.5	+48.3	90.9	10	33.5	+48.1	91.1	10	32.0	+49.5	91.3	10	30.7	+50.1	91.5	10	29.1	+50.7	91.7	10	27.3	+51.2	91.9	10	25.2	+51.8	92.0	8
9	11	23.0	+47.5	90.1	11	22.8	+48.2	90.3	11	22.3	+48.9	90.5	11	21.7	+49.4	90.7	11	20.8	+50.1	90.9	11	19.8	+50.6	91.1	11	18.5	+51.2	91.3	11	17.0	+51.7	91.5	9
10	12	10.5	+47.5	89.5	12	11.0	+48.1	89.7	12	11.2	+48.7	89.9	12	11.1	+49.4	90.1	12	10.9	+49.9	90.4	12	10.4	+50.5	90.6	12	09.7	+51.1	90.8	12	08.7	+51.7	91.0	10
11	12	58.0	+47.4	88.9	12	59.1	+48.0	89.1	12	59.9	+48.6	89.3	13	00.5	+49.2	89.6	13	00.8	+49.9	89.8	13	00.9	+50.5	90.0	13	00.4	+51.6	90.5	11				
12	13	45.4	+47.2	88.2	13	47.1	+47.9	88.5	13	48.5	+48.6	88.6	13	49.7	+49.2	89.0	13	50.7	+49.8	89.3	13	51.4	+50.4	89.5	13	51.8	+51.0	90.0	12				
13	14	32.6	+47.2	87.6	14	35.0	+47.8	87.9	14	37.1	+48.5	88.1	14	38.9	+49.1	88.4	14	40.5	+49.7	88.6	14	41.8	+50.3	88.9	14	42.5	+51.5	89.4	13				
14	15	19.8	+47.0	87.0	15	22.8	+47.7	87.2	15	25.6	+48.3	87.5	15	28.0	+49.0	87.8	15	30.2	+49.6	88.1	15	32.1	+50.8	88.3	15	33.7	+50.8	88.6	15	35.0	+51.4	88.9	14
15	16	6.6	+47.0	86.3	16	10.5	+47.6	86.6	16	13.9	+48.3	86.9	16	17.0	+48.9	87.2	16	19.8	+49.6	87.5	16	22.3	+50.1	87.8	16	24.5	+50.7	88.1	16	26.4	+51.3	88.4	15
16	16	53.8	+46.8	85.7	16	58.1	+47.6	86.0	17	02.2	+48.1	86.3	17	05.9	+48.8	86.6	17	09.4	+49.4	86.9	17	12.4	+50.1	87.2	17	15.2	+50.7	87.5	17	17.7	+51.2	87.8	16
17	17	40.6	+46.6	85.0	17	45.6	+47.4	85.3	17	50.3	+48.1	85.6	17	54.7	+48.7	86.0	17	58.8	+49.3	86.3	18	02.5	+49.9	86.6	18	05.9	+50.5	86.9	18	08.9	+51.1	87.3	17
18	18	27.2	+46.6	84.3	18	33.0	+47.2	84.7	18	38.4	+47.9	85.0	18	43.4	+48.6	85.4	18	48.1	+49.2	85.7	18	52.4	+49.8	86.0	18	56.4	+50.4	86.4	19	00.0	+51.0	86.7	18
19	19	13.8	+46.4	83.7	19	20.2	+47.1	84.0	19	26.3	+47.7	84.4	19	32.0	+48.4	84.7	19	37.3	+49.1	85.1	19	42.2	+49.7	85.4	19	46.8	+50.3	85.8	19	51.0	+50.9	86.2	19
20	20	0.0	+46.2	83.0	20	0.7	+46.9	83.4	20	14.0	+47.7	83.7	20	20.4	+48.3	84.1	20	26.4	+48.9	84.5	20	31.9	+49.6	84.8	20	37.1	+50.2	85.2	20	41.9	+50.8	85.6	20
21	20	46.4	+46.1	82.3	20	54.2	+46.8	82.7	21	01.7	+47.4	83.1	21	08.7	+48.1	83.5	21	15.3	+48.8	83.9	21	21.5	+49.5	84.2	21	27.3	+50.1	84.6	21	32.7	+50.7	85.0	21
22	21	32.5	+45.9	81.6	21	41.0	+46.6	82.0	21	49.1	+47.3	82.4	21	56.8	+48.0	82.8	22	04.1	+48.7	83.2	22	11.0	+49.3	83.6	22	17.4	+50.0	84.0	22	23.4	+50.6	84.4	22
23	22	18.4	+45.7	80.9	22	27.6	+46.5	81.4	22	36.4	+47.2	81.8	22	44.8	+47.9	82.2	22	52.8	+48.5	82.6	23	00.3	+49.1	83.0	23	07.4	+49.8	83.4	23	14.0	+50.4	83.9	23
24	23	04.1	+45.6	80.2	23	14.1	+46.2	80.7	23	23.6	+47.0	81.1	23	32.7	+47.6	81.5	23	41.3	+48.3	82.0	23	49.4	+49.1	82.4	24	57.2	+49.6	82.8	24	64.4	+50.3	83.3	24
25	23	49.7	+45.3	79.5	24	00.3	+46.1	80.0	24	10.6	+46.8	80.4	24	20.3	+47.5	80.9	24	29.6	+48.2	81.3	24	38.5	+48.8	81.8	24	46.8	+49.5	82.2	24	54.7	+50.2	82.7	25
26	24	35.0	+45.1	78.8	24	46.4	+45.9	79.3	24	57.4	+46.5	79.7	25	07.8	+47.3	80.2	25	17.8	+48.0	80.6	25	27.3	+48.7	81.1	25	36.3	+49.4	81.6	25	44.9	+50.0	82.1	26
27	25	20.1	+45.0	78.1	25	32.3	+45.7	78.6	25	43.9	+46.4	79.0	25	55.1	+47.1	79.5	26	05.8	+47.8	80.0	26	16.0	+48.5	80.5	26	25.7	+49.2	81.0	26	34.9	+49.8	81.5	27
28	26	05.1	+44.7	77.4	26	18.0	+45.4	77.8	26	30.3	+46.2	78.3	26	42.2	+47.0	78.6	26	53.6	+47.6	79.3	27	04.5	+48.3	79.8	27	14.9	+49.0	80.3	27	24.7	+49.6	80.8	28
29	26	49.8	+44.4	76.6	27	03.4	+45.2	77.1	27	16.5	+46.0	77.6	27	27.6	+46.7	78.1	27	41.2	+47.5	78.6	27	52.8	+48.1	79.1	28	03.9	+48.8	79.7	28	14.3	+49.5	80.2	29
30	27	34.2	+44.2	75.9	27	48.6	+45.0	76.4	28	02.5	+45.7	76.9	28	15.8	+46.5	77.4	28	28.7	+47.2	77.9	28	40.9	+48.0	78.5	28	52.7	+48.6	79.0	29	03.8	+49.3	79.5	30
31	28	18.4	+44.0	75.1	28	33.6	+44.7	75.6	28	48.2	+45.5	76.1	29	02.3	+46.3	76.7	29	15.9	+46.9	77.2	29	28.9	+47.7	77.8	29	53.1	+49.1	78.9	31				
32	29	0.2	+43.6	74.3	29	18.3	+44.5	74.9	29	33.7	+45.3	75.4	29	48.6	+46.0	76.0	30	02.8	+46.8	76.5	30	16.6	+47.4	77.6	30	29.7	+48.2	78.2	32				
33	30	49.6	+43.4	73.5	30	19.0	+44.9	74.1	30	34.9	+45.6	74.5	30	43.6	+46.5	75.0	31	49.6	+46.5	75.3	31	17.9	+47.9	77.0	31	31.1	+48.7	77.5	33				
34	30	29.4	+43.1	73.1	31	03.9	+43.6	73.3	31	48.6	+44.4	73.7	31	52.0	+45.0	74.1	31																

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A. 83°, 277°

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	4	12.4	-48.1	95.6	4	06.5	-48.7	95.7	4	00.5	-49.3	95.7	3	54.5	-49.9	95.8	3	48.3	-50.4	95.9	3	42.2	-51.0	95.9	3	35.9	-51.5	96.0	3	29.6	-52.1	96.1	0
1	3	24.3	-48.1	96.2	3	17.8	-48.7	96.3	3	11.2	-49.3	96.3	3	04.6	-49.9	96.4	2	57.9	-50.5	96.4	2	51.2	-51.0	96.5	2	44.4	-51.6	96.5	2	37.5	-52.0	96.6	1
2	2	36.2	-48.1	96.8	2	29.1	-48.7	96.8	2	21.9	-49.3	96.9	2	14.7	-49.9	96.9	2	07.4	-50.4	97.0	2	00.2	-51.1	97.0	1	52.8	-51.5	97.0	1	45.5	-52.1	97.1	3
3	1	48.1	-48.1	97.4	1	40.4	-48.7	97.4	1	32.6	-49.3	97.5	1	24.8	-49.9	97.5	1	17.0	-50.5	97.5	1	09.1	-51.0	97.5	1	01.3	-51.6	97.5	0	53.4	-52.1	97.6	3
4	1	00.0	-48.1	98.0	0	51.7	-48.8	98.0	0	43.3	-49.3	98.0	0	34.9	-49.9	98.0	0	26.5	-50.5	98.0	0	18.1	-51.0	98.1	0	0.1	-52.1	98.1	0	4			
5	0	11.9	-48.1	98.6	0	02.9	-48.7	98.6	0	06.0	-49.4	81.4	0	15.0	-49.9	81.4	0	24.0	+50.4	81.4	0	32.9	+51.1	81.4	0	41.9	+51.5	81.4	0	50.8	+52.1	81.4	5
6	0	36.2	+48.1	80.8	0	45.8	+48.7	80.8	0	55.4	+49.3	80.8	1	04.9	+49.9	80.9	1	14.4	+50.5	80.9	1	24.0	+51.0	80.9	1	33.4	+51.6	80.9	1	42.9	+52.1	80.9	6
7	1	24.3	+48.2	80.2	1	34.5	+48.7	80.2	1	44.7	+49.3	80.3	1	54.8	+49.9	80.3	2	04.9	+50.5	80.3	2	15.0	+51.0	80.4	2	25.0	+51.5	80.4	2	35.0	+52.0	80.5	7
8	2	12.5	+48.0	79.6	2	23.2	+48.8	79.7	2	34.0	+49.3	79.7	2	44.7	+49.9	79.7	2	55.4	+50.4	79.8	3	06.0	+51.0	79.8	3	16.5	+51.6	79.8	3	27.0	+52.1	80.0	8
9	3	00.5	+48.1	79.0	3	12.0	+48.8	79.1	3	23.3	+49.3	79.1	3	34.6	+49.8	79.2	3	45.8	+50.4	79.2	3	57.0	+50.9	79.3	4	08.1	+51.5	79.4	4	19.1	+52.0	79.5	9
10	3	48.6	+48.1	78.4	4	00.6	+48.7	78.5	4	12.6	+49.2	78.6	4	24.4	+49.9	78.6	4	36.2	+50.4	78.7	4	47.9	+51.0	78.8	4	59.6	+51.5	78.9	5	11.1	+52.0	79.0	10
11	4	36.7	+48.0	77.8	4	49.3	+48.6	77.9	5	01.8	+49.2	78.0	5	14.3	+49.8	78.1	5	26.6	+50.4	78.2	5	38.9	+50.9	78.3	5	51.1	+51.4	78.4	6	03.1	+52.0	78.5	11
12	5	24.7	+48.0	77.2	5	37.9	+48.6	77.3	5	51.0	+49.2	77.4	6	04.1	+49.7	77.5	6	17.0	+50.3	77.6	6	29.8	+50.9	77.7	6	42.5	+51.4	77.8	7	55.1	+51.9	78.0	12
13	6	12.7	+47.9	76.6	6	26.5	+48.6	76.7	6	40.2	+49.2	76.8	6	53.8	+49.8	76.9	7	07.3	+50.3	77.1	7	20.7	+50.8	77.2	7	33.9	+51.4	77.3	7	47.0	+52.0	77.4	13
14	7	00.6	+47.9	76.0	7	15.1	+48.5	76.1	7	29.4	+49.1	76.3	7	43.6	+49.6	76.4	7	57.6	+50.3	76.5	8	11.5	+50.9	76.7	8	25.3	+51.4	76.8	8	39.0	+51.8	76.9	14
15	7	48.5	+47.8	75.4	8	03.6	+48.4	75.5	8	18.5	+49.0	75.7	8	33.2	+49.7	75.8	8	47.9	+50.2	76.0	9	02.4	+50.7	76.1	9	16.7	+51.3	76.3	9	30.8	+51.9	76.4	15
16	8	36.3	+47.8	74.8	8	52.0	+48.4	74.9	9	07.5	+49.0	75.1	9	22.9	+49.6	75.2	9	38.1	+50.1	75.4	10	08.0	+51.2	75.7	10	22.7	+51.7	75.9	16				
17	9	24.1	+47.7	74.2	9	40.4	+48.3	74.3	9	56.5	+48.9	74.5	10	12.5	+49.5	74.7	10	28.2	+50.1	74.9	10	43.8	+50.7	75.0	10	59.2	+51.2	75.2	11	14.4	+51.8	75.4	17
18	10	11.8	+47.7	73.6	10	28.7	+48.3	73.7	10	45.4	+48.9	73.9	11	02.0	+49.4	74.1	11	18.3	+50.0	74.3	11	34.5	+50.6	74.5	12	10.6	+51.6	74.9	18				
19	10	59.5	+47.6	72.9	11	17.0	+48.2	73.1	11	34.3	+48.8	73.3	11	51.4	+49.4	73.5	12	08.3	+50.0	73.7	12	25.1	+50.5	73.9	12	41.6	+51.0	74.1	12	57.8	+51.6	74.4	19
20	11	47.1	+47.5	72.3	12	05.2	+48.1	72.5	12	23.1	+48.7	72.7	12	40.8	+49.3	72.9	12	58.3	+49.3	73.2	13	15.6	+50.4	73.4	13	32.6	+51.0	73.6	13	49.4	+51.6	73.8	20
21	12	34.6	+47.4	71.7	12	53.3	+48.0	71.9	13	11.8	+48.6	72.1	13	30.1	+49.2	72.4	13	48.2	+49.8	72.6	14	06.0	+50.4	72.8	14	23.6	+50.9	73.1	14	41.0	+51.4	73.3	21
22	13	22.0	+47.3	71.1	13	41.3	+48.0	71.3	14	00.4	+48.6	71.5	14	19.3	+49.2	71.8	14	38.0	+49.7	72.0	14	56.4	+50.3	72.3	15	14.5	+50.9	72.5	15	32.4	+51.4	72.8	22
23	14	09.3	+47.2	70.4	14	29.3	+47.8	70.7	14	49.0	+48.4	70.9	15	08.5	+49.0	71.2	15	27.7	+49.6	71.4	15	46.7	+50.2	71.7	16	05.4	+50.7	72.0	16	23.8	+51.3	72.2	23
24	14	56.5	+47.1	69.8	15	17.1	+47.7	70.0	15	37.4	+48.4	70.3	15	57.5	+49.0	70.6	16	17.3	+49.6	70.8	16	36.9	+50.1	71.1	16	56.1	+50.7	71.4	17	15.1	+51.2	71.7	24
25	15	43.6	+47.0	69.2	16	04.8	+47.6	69.4	16	25.8	+48.2	69.7	16	46.5	+48.8	70.0	17	06.9	+49.4	70.3	17	27.0	+50.0	70.6	17	46.8	+50.6	70.9	18	06.3	+51.2	71.2	25
26	16	30.6	+46.9	68.5	16	52.4	+47.5	68.8	17	14.0	+48.1	69.1	17	35.3	+48.7	69.4	17	56.3	+49.3	69.7	18	17.0	+49.9	70.0	18	37.4	+50.5	70.3	18	57.5	+51.0	70.6	26
27	17	17.5	+46.7	67.9	17	39.9	+47.4	68.1	18	02.1	+48.0	68.4	18	24.0	+48.6	68.8	18	45.6	+49.2	69.1	19	06.9	+49.8	69.4	19	27.9	+50.3	69.7	19	48.5	+50.9	70.0	27
28	18	04.2	+46.6	67.2	18	27.3	+47.3	67.5	18	50.1	+47.9	67.8	19	12.6	+46.5	68.1	19	34.8	+49.1	68.5	19	56.7	+49.6	68.8	20	18.2	+50.3	69.1	20	39.4	+50.8	69.5	28
29	18.0	+46.5	66.5	19	14.6	+47.1	66.8	19	38.0	+47.7	67.2	20	01.1	+48.3	67.5	20	23.9	+48.9	67.8	21	08.5	+49.6	68.2	21	20.8	+50.1	68.6	21	30.2	+50.7	68.9	29	
30	19.3	+46.3	65.9	20	01.7	+46.9	66.2	20	25.7	+47.6	66.5	20	49.4	+48.3	66.9	21	12.8	+48.9	67.2	21	35.9	+49.4	67.6	21	58.6	+50.0	68.0	22	20.9	+50.6	68.3	30	
31	20.6	+46.1	65.2	20	48.6	+46.8	65.5	21	13.3	+47.4	65.9	21	37.7	+48.0	66.2	22	01.7	+48.6	66.6	22	25.3	+49.3	67.0	22	48.6	+49.8	67.4	23	11.5	+50.4	67.8	31	
32	21.9	+46.0	64.5	21	35.4	+45.6	64.9	22	20.7	+47.3	65.2	22	25.7	+47.9	65.6	22	50.3	+48.5	66.0	23	38.4	+49.8	66.4	23	62.8	+50.5	66.6	24	28.2	+51.5	67.0	33	
33	22.1	+45.9	63.8	22	22.0	+46.6	64.2	23	36.0	+47.4	64.5	23	13.6	+47.7	64.9	23	38.8	+48.4	65.3	24	03.7	+49.0	65.7	24	28.2	+49.5	66.1	24	52.2	+50.2	66.6	34	
34	23.7	+45.8	63.1	23	08.5	+45.6	63.5	23	37.9	+45.6	63.8	24	34.9	+45.3	64.1	25	51.3	+4															

84°, 276° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	3 36.4 +48.0	94.8	3 31.3 +48.7	94.9	3 26.2 +49.3	94.9	3 21.1 +49.8	95.0	3 15.8 +50.4	95.0	3 10.5 +51.0	95.1	3 05.2 +51.5	95.1	2 59.8 +52.0	95.2	0	0	0	0	0	0	0	0	
1	4 24.4 +48.0	94.2	4 20.0 +48.6	94.3	4 15.5 +49.2	94.3	4 10.9 +49.8	94.4	4 06.2 +50.4	94.5	4 01.5 +50.9	94.6	3 56.7 +51.4	94.6	3 51.8 +52.0	94.7	1	0	0	0	0	0	0	0	
2	5 12.4 +47.9	93.6	5 08.6 +48.5	93.7	5 04.7 +49.1	93.8	5 00.7 +49.7	93.9	4 56.6 +50.3	93.9	4 52.4 +50.9	94.0	4 48.1 +51.5	94.1	4 43.8 +52.0	94.2	2	0	0	0	0	0	0	0	
3	6 00.3 +47.9	93.0	5 57.1 +48.5	93.1	5 53.8 +49.2	93.2	5 50.4 +49.8	93.3	5 46.9 +50.3	93.4	5 43.3 +50.9	93.5	5 39.6 +51.4	93.6	5 35.8 +51.9	93.7	3	0	0	0	0	0	0	0	
4	6 48.2 +47.9	92.4	6 45.6 +48.5	92.5	6 43.0 +49.1	92.6	6 40.2 +49.7	92.7	6 37.2 +50.3	92.8	6 34.2 +50.9	93.0	6 31.0 +51.4	93.1	6 27.7 +52.0	93.2	4	0	0	0	0	0	0	0	
5	7 36.1 +47.8	91.8	7 34.1 +48.5	91.9	7 32.1 +49.0	92.0	7 29.9 +49.6	92.2	7 27.5 +50.2	92.3	7 25.0 +50.8	92.4	7 22.4 +51.4	92.6	7 19.7 +51.9	92.7	5	0	0	0	0	0	0	0	
6	8 23.9 +47.7	91.2	8 22.6 +48.3	91.3	8 21.1 +49.0	91.5	8 19.5 +49.6	91.6	8 17.7 +50.2	91.8	8 15.8 +50.8	91.9	8 13.8 +51.3	92.0	8 11.6 +51.8	92.2	6	0	0	0	0	0	0	0	
7	9 11.6 +47.7	90.6	9 10.9 +48.4	90.7	9 10.1 +48.9	90.9	9 09.1 +49.6	91.0	9 07.9 +50.2	91.2	9 06.6 +50.7	91.4	9 05.1 +51.3	91.5	9 03.4 +51.8	91.7	7	0	0	0	0	0	0	0	
8	9 59.3 +47.6	89.9	9 59.3 +48.2	90.1	9 59.0 +48.9	90.3	9 58.7 +49.4	90.5	9 58.1 +50.1	90.6	9 57.3 +50.7	90.8	9 56.4 +51.2	91.0	9 55.2 +51.8	91.2	8	0	0	0	0	0	0	0	
9	10 46.9 +47.5	89.3	10 47.5 +48.2	89.5	10 47.9 +48.8	89.7	10 48.1 +49.5	89.9	10 48.2 +50.0	90.1	10 48.0 +50.6	90.3	10 47.6 +51.2	90.5	10 47.0 +51.7	90.7	9	0	0	0	0	0	0	0	
10	11 34.4 +47.5	88.7	11 35.7 +48.1	88.9	11 36.7 +48.8	89.1	11 37.6 +49.3	89.3	11 38.2 +49.9	89.5	11 38.6 +50.5	89.7	11 38.8 +51.1	89.9	11 38.7 +51.7	90.1	10	0	0	0	0	0	0	0	
11	12 21.9 +47.4	88.1	12 23.8 +48.0	88.3	12 25.5 +48.6	88.5	12 26.9 +49.3	88.7	12 28.1 +49.9	89.0	12 29.1 +50.5	89.2	12 29.9 +51.0	89.4	12 30.4 +51.6	89.6	11	0	0	0	0	0	0	0	
12	13 09.3 +47.3	87.4	13 11.8 +48.0	87.7	13 14.1 +48.6	87.9	13 16.2 +49.2	88.1	13 18.0 +49.8	88.4	13 19.6 +50.4	88.6	13 20.9 +51.0	88.9	13 22.0 +51.5	89.1	12	0	0	0	0	0	0	0	
13	13 56.6 +47.1	86.8	13 59.8 +47.8	87.1	14 02.7 +48.5	87.3	14 05.4 +49.1	87.6	14 07.8 +49.8	87.8	14 10.0 +50.3	88.1	14 11.9 +50.9	88.3	14 13.5 +51.5	88.6	13	0	0	0	0	0	0	0	
14	14 43.7 +47.1	86.2	14 47.6 +47.7	86.4	14 51.2 +48.4	86.7	14 54.5 +49.0	87.0	14 57.6 +49.6	87.2	15 00.3 +50.3	87.5	15 02.8 +50.8	87.8	15 05.0 +51.4	88.0	14	0	0	0	0	0	0	0	
15	15 30.8 +47.0	85.5	15 35.3 +47.7	85.8	15 39.6 +48.3	86.1	15 43.5 +49.0	86.4	15 47.2 +49.5	86.6	15 50.6 +50.1	86.9	15 53.6 +50.8	87.2	15 56.4 +51.3	87.5	15	0	0	0	0	0	0	0	
16	16 17.8 +46.8	84.9	16 23.0 +47.5	85.2	16 27.9 +48.1	85.5	16 32.5 +48.6	85.8	16 36.7 +49.3	86.1	16 40.7 +50.1	86.4	16 44.4 +50.6	86.7	16 47.7 +51.2	87.0	16	0	0	0	0	0	0	0	
17	17 04.6 +46.7	84.2	17 10.5 +47.4	84.5	17 16.0 +48.1	84.8	17 21.3 +48.7	85.2	17 26.2 +49.3	85.5	17 30.8 +49.9	85.8	17 35.0 +50.6	86.1	17 38.9 +51.2	86.4	17	0	0	0	0	0	0	0	
18	17 51.3 +46.6	83.6	17 57.9 +47.3	83.9	18 04.1 +47.9	84.2	18 10.0 +48.6	84.5	18 15.5 +49.2	84.9	18 20.7 +49.9	85.2	18 25.6 +50.4	85.5	18 30.1 +51.0	85.9	18	0	0	0	0	0	0	0	
19	18 37.9 +46.5	82.9	18 45.2 +47.1	83.2	18 52.0 +47.8	83.6	18 58.6 +48.4	83.9	19 04.7 +49.2	84.3	19 10.6 +50.4	85.0	19 16.0 +50.9	85.3	19 21.1 +50.9	85.3	19	0	0	0	0	0	0	0	
20	19 24.4 +46.3	82.2	19 32.3 +47.0	82.6	19 38.9 +47.7	82.9	19 47.0 +48.4	83.3	19 53.9 +48.9	83.7	20 00.3 +50.4	84.0	20 06.4 +50.2	84.4	20 12.0 +50.9	84.7	20	0	0	0	0	0	0	0	
21	20 10.7 +46.1	81.6	20 19.3 +46.8	81.9	20 27.5 +47.5	82.3	20 35.4 +48.2	82.7	20 42.8 +48.9	83.0	20 49.9 +49.5	83.4	20 56.6 +50.1	83.8	21 02.9 +50.7	84.2	21	0	0	0	0	0	0	0	
22	20 56.8 +46.0	80.9	21 06.1 +46.7	81.3	21 15.0 +47.4	81.6	21 23.6 +48.0	82.0	21 31.7 +48.7	82.4	21 39.4 +49.3	82.8	21 46.7 +50.0	83.2	21 53.6 +50.6	83.6	22	0	0	0	0	0	0	0	
23	21 42.8 +45.8	80.2	21 52.8 +46.5	80.6	22 02.4 +47.2	81.0	22 11.6 +47.9	81.4	22 20.4 +48.6	81.8	22 28.7 +49.3	82.2	22 36.7 +49.8	82.6	22 44.2 +50.5	83.0	23	0	0	0	0	0	0	0	
24	22 28.6 +45.6	79.5	22 39.3 +46.4	79.9	22 49.6 +47.1	80.3	22 59.5 +47.7	80.7	23 09.0 +48.4	81.2	23 18.0 +49.0	81.6	23 26.5 +49.7	82.0	23 34.7 +50.3	82.4	24	0	0	0	0	0	0	0	
25	23 14.2 +45.4	78.8	23 25.7 +46.1	79.2	23 36.7 +46.8	79.6	23 47.2 +47.6	80.1	23 57.4 +48.2	80.5	24 07.0 +48.8	80.9	24 16.2 +49.6	81.4	24 25.0 +50.2	81.8	25	0	0	0	0	0	0	0	
26	23 59.6 +45.3	78.1	24 11.8 +46.0	78.5	24 23.5 +46.7	79.0	24 34.8 +47.4	79.4	24 45.6 +48.1	79.9	24 55.9 +48.8	80.3	25 05.8 +49.4	80.8	25 15.2 +50.0	81.2	26	0	0	0	0	0	0	0	
27	24 44.9 +45.0	77.4	24 57.8 +45.7	77.8	25 10.2 +46.5	78.3	25 22.2 +47.2	78.7	25 33.7 +47.9	79.2	25 44.7 +48.5	79.7	25 55.2 +49.2	80.1	26 05.2 +49.9	80.6	27	0	0	0	0	0	0	0	
28	25 29.9 +44.8	76.6	25 43.5 +45.6	77.1	25 56.7 +46.3	77.6	26 09.4 +47.0	78.0	26 21.6 +47.7	78.5	26 33.2 +48.4	79.0	26 44.4 +49.1	79.5	26 55.1 +49.7	80.0	28	0	0	0	0	0	0	0	
29	26 14.7 +44.6	75.9	26 29.1 +45.3	76.4	26 43.0 +46.6	76.9	26 56.4 +46.6	77.3	27 09.3 +47.5	77.8	27 21.6 +48.2	78.3	27 33.5 +48.9	78.9	27 44.8 +49.6	79.4	29	0	0	0	0	0	0	0	
30	26 59.3 +44.3	75.1	27 14.4 +45.1	75.6	27 29.0 +45.9	76.1	27 43.2 +46.5	76.6	27 56.8 +47.2	77.2	28 09.8 +48.0	77.7	28 22.4 +48.7	78.2	28 34.4 +49.3	78.7	30	0	0	0	0	0	0	0	
31	27 43.6 +44.1	74.4	27 59.5 +44.8	74.9	28 14.9 +45.6	75.4	28 29.7 +46.4	75.9	28 44.0 +47.1	76.5	28 57.8 +47.7	77.0	29 11.1 +48.4	77.5	29 23.7 +49.2	78.1	31	0	0	0	0	0	0	0	
32	28 27.7 +43.8	73.6	28 44.3 +44.6	74.1	29 00.5 +44.5	74.7	29 16.1 +47.1	75.2	29 31.1 +46.9	75.7	29 45.6 +47.6	76.3	29 59.5 +48.3	76.9	30 12.9 +49.0	77.4	32	0	0	0	0	0	0	0	
33	29 11.5 +43.5	72.8	29 28.9 +44.3	73.4	29 45.8 +45.1	73.9	30 02.2 +45.8	74.5	30 18.0 +46.6	75.0	30 33.2 +47.3	75.6	30 47.8 +48.1	76.2	31 01.9 +48.7	76.7	33	0	0	0	0	0	0	0	
34	33 28.1 +41.7	67.9	33 50.4 +42.5	68.5	34 12.1 +43.3	69.1	34 33.1 +44.1	69.8	34 53.5 +44.9	70.4	35 13.3 +45.5	71.1	35 23.6 +46.1	71.7	35 31.0 +46.7	72.3	36	0	0	0	0	0	0	0	
35	34 09.8 +41.2	67.0	34 32.9 +42.0	67.7	34 55.4 +42.9	68.3	35 17.2 +43.8	69.0	35 38.4 +44.6	69.6	35 59.0 +45.4	70.3	36 18.9 +46.1	71.0	36 38.1 +46.9	71.7	39	0	0	0	0	0	0	0	
36	34 51.0 +40.8	66.2	35 14.9 +41.8	66.8	35 38.3 +42.5	67.4	36 01.0 +43.3	68.1	36 23.0 +44.2	6															

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $84^\circ$ ,  $276^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	3	36.4	-48.0	94.8	3	31.3	-48.6	94.9	3	26.2	-49.2	94.9	3	21.1	-49.9	95.0	3	15.8	-50.4	95.0	3	10.5	-50.9	95.1	3	05.2	-51.5	95.1
1	2	48.4	-48.1	95.4	2	42.7	-48.7	95.4	2	37.0	-49.3	95.5	2	31.2	-49.8	95.5	2	25.4	-50.4	95.6	2	19.6	-51.0	95.6	2	13.7	-51.6	95.7
2	2	00.3	-48.0	96.0	1	54.0	-48.6	96.0	1	47.7	-49.2	96.1	1	41.4	-49.9	96.1	1	35.0	-50.4	96.1	1	28.6	-51.0	96.1	1	22.1	-51.5	96.2
3	1	12.3	-48.1	96.6	1	05.4	-48.7	96.6	0	58.5	-49.3	96.6	0	51.5	-49.9	96.7	0	44.6	-50.5	96.7	0	37.6	-51.0	96.7	0	30.6	-51.5	96.7
4	0	24.2	-48.1	97.2	0	16.7	-48.7	97.2	0	09.2	-49.3	97.2	0	01.6	-49.8	97.2	0	05.9	+50.4	82.8	0	13.4	+51.0	82.8	0	20.9	+51.6	82.8
5	0	23.9	+48.0	82.2	0	32.0	+48.7	82.2	0	40.1	+49.3	82.2	0	48.2	+49.9	82.2	0	56.3	+50.4	82.3	1	04.4	+51.0	82.3	1	12.5	+51.5	82.3
6	1	11.9	+48.1	81.6	1	20.7	+48.6	81.6	1	29.4	+49.3	81.7	1	38.1	+49.8	81.7	1	46.7	+50.5	81.7	1	55.4	+51.0	81.7	2	04.0	+51.5	81.8
7	2	00.0	+48.0	81.0	2	09.3	+48.7	81.0	2	18.7	+49.2	81.1	2	27.9	+49.9	81.1	2	37.2	+50.4	81.2	2	46.4	+50.9	81.2	2	55.5	+51.5	81.3
8	2	48.0	+48.0	80.4	2	58.0	+48.6	80.5	3	07.9	+49.2	80.5	3	17.8	+49.8	80.6	3	27.6	+50.4	80.6	3	37.3	+51.0	80.7	3	47.0	+51.5	80.8
9	3	36.0	+48.0	79.8	3	46.6	+48.6	79.9	3	57.1	+49.3	79.9	4	07.6	+49.8	80.0	4	18.0	+50.3	80.1	4	28.3	+50.9	80.2	4	38.5	+51.4	80.3
10	4	24.0	+48.0	79.2	4	35.2	+48.6	79.3	4	46.4	+49.1	79.4	4	57.4	+49.7	79.4	5	08.3	+50.4	79.5	5	19.2	+50.9	79.6	5	29.9	+51.5	79.8
11	5	12.0	+47.9	78.6	5	23.8	+48.6	78.7	5	35.5	+49.2	78.8	5	47.1	+49.8	78.9	5	58.7	+50.3	79.0	6	10.1	+50.8	79.1	6	21.4	+51.4	79.2
12	5	59.9	+47.9	78.0	6	12.4	+48.5	78.1	6	24.7	+49.1	78.2	6	36.9	+49.7	78.3	6	49.0	+50.2	78.4	7	00.9	+50.9	78.6	7	12.8	+51.3	78.7
13	6	47.8	+47.9	77.4	7	09.0	+48.4	77.5	7	13.8	+49.1	77.6	7	26.6	+49.6	77.8	7	39.2	+50.3	77.9	7	51.8	+50.7	78.0	8	04.1	+51.4	78.2
14	7	35.7	+47.8	76.8	7	49.3	+48.5	76.9	8	02.9	+49.0	77.1	8	16.2	+49.6	77.2	8	29.5	+50.1	77.3	8	42.5	+50.8	77.5	8	55.5	+51.2	77.6
15	8	23.5	+47.7	76.2	8	37.8	+48.3	76.3	8	51.9	+48.9	76.5	9	05.8	+49.6	76.6	9	19.6	+50.2	76.8	9	33.3	+50.7	76.9	9	46.7	+51.3	77.1
16	9	11.2	+47.7	75.6	9	26.1	+48.3	75.7	9	40.8	+48.9	75.9	9	55.4	+49.5	76.1	10	09.8	+50.0	76.2	10	24.0	+50.6	76.4	10	38.0	+51.2	76.6
17	10	59.8	+47.6	74.0	10	14.4	+48.3	75.1	10	29.7	+48.9	75.3	10	44.9	+49.4	75.5	10	59.8	+50.0	75.7	11	14.6	+50.6	75.9	11	29.2	+51.1	76.0
18	10	46.5	+47.6	74.3	11	02.7	+48.1	74.5	11	18.6	+48.7	74.7	11	34.3	+49.4	74.9	11	49.8	+50.0	75.1	12	05.2	+50.5	75.3	12	20.3	+51.0	75.5
19	11	34.1	+47.4	73.7	11	50.8	+48.1	73.9	12	07.3	+48.7	74.1	12	23.7	+49.3	74.3	12	39.8	+49.8	74.5	12	55.7	+50.4	74.8	13	11.3	+51.0	75.0
20	12	21.5	+47.4	73.1	12	38.9	+48.0	73.3	12	56.0	+48.6	73.5	13	13.0	+49.2	73.7	13	29.6	+48.9	74.0	13	46.1	+50.4	74.2	14	02.3	+50.9	74.4
21	13	08.9	+47.3	72.5	13	26.9	+47.9	72.7	13	44.6	+48.6	72.9	14	02.2	+49.1	73.1	14	19.4	+49.7	73.4	14	36.5	+50.2	73.6	14	53.2	+50.9	73.9
22	13	56.2	+47.2	71.8	14	14.8	+47.8	72.1	14	33.2	+48.4	72.3	14	51.3	+49.0	72.6	15	09.1	+49.7	72.8	15	26.7	+50.2	73.1	15	44.1	+50.7	73.3
23	14	43.4	+47.1	71.2	15	02.6	+47.7	71.4	15	21.6	+48.3	71.7	15	40.3	+48.9	72.0	15	58.8	+49.5	72.2	16	16.9	+50.1	72.5	16	34.8	+50.7	72.8
24	15	30.5	+46.9	70.5	15	50.3	+47.6	70.8	16	09.8	+49.2	71.1	16	29.2	+48.9	71.4	16	48.3	+49.4	71.6	17	07.0	+50.0	71.9	17	25.5	+50.6	72.2
25	16	17.4	+46.9	69.9	16	37.9	+47.5	70.2	16	58.1	+48.1	70.5	17	18.1	+48.7	70.7	17	37.7	+49.3	71.0	17	57.0	+49.9	71.3	18	16.1	+50.5	71.7
26	17	04.3	+46.7	69.2	17	25.4	+47.4	69.5	17	46.2	+48.0	69.8	18	06.8	+48.6	70.1	18	27.0	+48.2	70.4	18	46.9	+49.8	70.8	19	06.6	+50.3	71.1
27	17	51.0	+46.6	68.6	18	12.8	+47.2	68.9	18	34.2	+47.9	69.2	18	55.4	+48.4	69.5	19	16.2	+49.1	69.8	19	36.7	+49.7	70.2	19	56.9	+50.3	70.5
28	18	37.6	+46.4	67.9	19	00.0	+47.1	68.2	19	22.1	+47.7	68.6	19	43.8	+48.4	68.9	20	05.3	+48.9	69.2	20	26.4	+49.5	69.6	20	47.2	+50.1	69.9
29	19	24.0	+46.3	67.2	19	47.1	+46.3	67.6	20	09.8	+47.6	67.9	20	32.2	+48.2	68.3	20	54.2	+48.9	68.6	21	15.9	+49.5	69.0	21	37.3	+50.0	69.3
30	20	10.3	+46.2	66.6	20	34.0	+46.8	66.9	20	57.4	+47.4	67.3	21	20.4	+48.0	67.6	21	43.1	+48.6	68.0	22	05.4	+49.2	68.4	22	27.3	+49.9	68.7
31	20	56.5	+45.9	65.9	21	20.8	+46.6	66.2	21	44.8	+47.3	66.6	22	08.4	+47.9	67.0	22	31.7	+47.6	67.4	22	54.6	+49.2	67.7	23	17.2	+49.7	68.1
32	21	42.4	+45.8	65.2	22	07.4	+46.5	65.6	22	32.1	+47.1	65.9	22	56.3	+47.8	66.3	23	20.3	+48.3	66.7	24	06.9	+49.6	67.5	24	35.2	+49.1	67.9
33	22	28.2	+45.7	64.5	22	53.9	+46.3	64.9	23	19.2	+46.9	65.3	24	44.1	+47.6	65.7	24	08.6	+48.2	66.1	24	32.4	+48.8	66.5	25	22.8	+49.4	67.3
34	23	13.9	+45.4	63.8	23	40.2	+46.1	64.2	24	06.1	+47.4	64.6	24	31.3	+47.6	65.0	24	56.8	+48.1	65.4	25	21.6	+49.4	65.6	26	45.5	+49.4	65.9
35	23	59.3	+45.2	63.1	24	26.3	+45.9	63.5	24	52.9	+46.5	63.9	25	19.1	+47.2	64.3	25	44.9	+47.8	64.8	26	10.2	+48.5	65.2	26	35.2	+49.1	65.6
36	24	44.5	+45.0	62.4	25	12.2	+45.7	62.8	25	39.4	+46.4	63.2	26	06.3	+47.0	63.6	26	32.7	+47.4	64.1	26	58.7	+48.3	64.5	27	24.3	+48.9	65.0
37	25	29.5	+44.8	61.6	25	57.9	+45.4	62.1	26	25.8	+46.1	62.5	26	53.3	+46.8	62.9	27	20.4	+47.4	63.4	28	13.2	+48.7	64.3	29	01.9	+48.6	64.7
38	26	14.3	+44.6	60.9	26	43.3	+45.3	61.3	27	11.9	+45.9	61.8	27	40.1	+46.6	62.2	28	07.8	+47.2	62.7	29	35.1	+47.9	63.2	30	27.9	+48.3	63.6
39	27	30.7	+43.6	60.1	27	31.6	+43.9	60.4	28	10.7	+41.1	61.6	28	49.4	+41.8													

85°, 275° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	3 00.4 +48.0	94.0	2 56.2 +48.6	94.0	2 51.9 +49.2	94.1	2 47.6 +49.8	94.1	2 43.2 +50.4	94.2	2 38.8 +51.0	94.2	2 34.4 +51.4	94.3	2 29.9 +52.0	94.3	0	3 21.9 +52.0	93.8	3 21.9 +52.0	93.8	3 21.9 +52.0	93.8	0	
1	3 48.4 +47.9	93.4	3 44.8 +48.6	93.5	3 41.1 +49.2	93.5	3 37.4 +49.8	93.6	3 33.6 +50.4	93.7	3 29.8 +50.9	93.7	3 25.8 +51.5	93.8	3 21.9 +52.0	93.8	1	3 21.9 +52.0	93.8	3 21.9 +52.0	93.8	3 21.9 +52.0	93.8	1	
2	4 36.3 +47.9	92.8	4 33.4 +48.5	92.9	4 30.3 +49.2	93.0	4 27.2 +49.7	93.0	4 24.0 +50.3	93.1	4 20.7 +50.9	93.2	4 17.3 +51.4	93.3	4 13.9 +51.9	93.3	2	4 13.9 +51.9	93.3	4 13.9 +51.9	93.3	4 13.9 +51.9	93.3	2	
3	5 24.2 +47.9	92.2	5 21.9 +48.5	92.3	5 19.5 +49.1	92.4	5 16.9 +49.7	92.5	5 14.3 +50.3	92.6	5 11.6 +50.8	92.7	5 08.7 +51.5	92.7	5 05.8 +52.0	92.8	3	5 05.8 +52.0	92.8	5 05.8 +52.0	92.8	5 05.8 +52.0	92.8	3	
4	6 12.1 +47.9	91.6	6 10.4 +48.5	91.7	6 08.6 +49.1	91.8	6 06.6 +49.7	91.9	6 04.6 +50.3	92.0	6 02.4 +50.8	92.1	6 00.2 +51.3	92.2	5 57.8 +51.9	92.3	4	5 57.8 +51.9	92.3	5 57.8 +51.9	92.3	5 57.8 +51.9	92.3	4	
5	7 00.0 +47.8	91.0	6 58.9 +48.4	91.1	6 57.7 +49.0	91.2	6 56.3 +49.7	91.3	6 54.9 +50.2	91.5	6 53.3 +50.8	91.6	6 51.5 +51.4	91.7	6 49.7 +51.9	91.8	5	6 49.7 +51.9	91.8	6 49.7 +51.9	91.8	6 49.7 +51.9	91.8	5	
6	7 47.8 +47.7	90.4	7 47.3 +48.4	90.5	7 46.7 +49.0	90.6	7 46.0 +49.6	90.8	7 45.1 +50.2	90.9	7 44.1 +50.7	91.0	7 42.9 +51.3	91.2	7 41.6 +51.8	91.3	6	7 41.6 +51.8	91.3	7 41.6 +51.8	91.3	7 41.6 +51.8	91.3	6	
7	8 35.5 +47.7	89.8	8 35.7 +48.3	89.9	8 35.7 +48.9	89.9	8 35.6 +49.5	90.2	8 35.3 +50.1	90.4	8 34.8 +50.7	90.5	8 34.2 +51.3	90.7	8 33.4 +51.8	90.8	7	8 33.4 +51.8	90.8	8 33.4 +51.8	90.8	8 33.4 +51.8	90.8	7	
8	9 23.2 +47.6	89.1	9 24.0 +48.2	89.3	9 24.6 +48.9	89.5	9 25.1 +49.5	89.6	9 25.4 +50.1	89.8	9 25.5 +50.7	90.0	9 25.5 +51.2	90.1	9 25.2 +51.8	90.3	8	9 25.2 +51.8	90.3	9 25.2 +51.8	90.3	9 25.2 +51.8	90.3	8	
9	10 10.8 +47.5	88.5	10 12.2 +48.2	88.7	10 13.5 +48.8	88.9	10 14.6 +49.4	89.1	10 15.5 +50.0	89.4	10 16.2 +50.6	89.4	10 16.7 +51.2	89.6	10 17.0 +51.7	89.8	9	10 17.0 +51.7	89.8	10 17.0 +51.7	89.8	10 17.0 +51.7	89.8	9	
10	10 58.3 +47.5	87.9	11 00.4 +48.2	88.1	11 02.3 +48.8	88.3	11 04.0 +49.4	88.5	11 05.5 +50.0	88.7	11 06.8 +50.5	88.9	11 07.9 +51.1	89.1	11 08.7 +51.7	89.3	10	11 08.7 +51.7	89.3	11 08.7 +51.7	89.3	11 08.7 +51.7	89.3	10	
11	11 45.8 +47.4	87.3	11 48.6 +48.0	87.5	11 51.1 +48.7	87.7	11 53.4 +49.3	87.9	11 55.5 +49.9	88.1	11 57.3 +50.5	88.3	11 59.0 +51.0	88.5	12 00.4 +51.6	88.8	11	12 00.4 +51.6	88.8	12 00.4 +51.6	88.8	12 00.4 +51.6	88.8	11	
12	12 33.2 +47.3	86.6	12 36.6 +48.0	86.9	12 39.8 +48.5	87.1	12 42.7 +49.2	87.3	12 45.4 +49.8	87.5	12 47.8 +50.4	87.8	12 50.0 +51.0	88.0	12 52.0 +51.5	88.2	12	12 52.0 +51.5	88.2	12 52.0 +51.5	88.2	12 52.0 +51.5	88.2	12	
13	13 20.5 +47.2	86.0	13 24.6 +47.8	86.3	13 28.3 +48.6	86.5	13 31.9 +49.1	86.7	13 35.2 +49.7	87.0	13 38.2 +50.4	87.2	13 41.0 +50.9	87.5	13 43.5 +51.5	87.7	13	13 43.5 +51.5	87.7	13 43.5 +51.5	87.7	13 43.5 +51.5	87.7	13	
14	14 07.7 +47.1	85.4	14 12.4 +47.8	85.6	14 16.9 +48.4	85.9	14 21.0 +49.1	86.1	14 24.9 +49.7	86.4	14 28.6 +50.2	86.7	14 31.9 +50.9	86.9	14 35.0 +51.4	87.2	14	14 35.0 +51.4	87.2	14 35.0 +51.4	87.2	14 35.0 +51.4	87.2	14	
15	14 54.8 +47.0	84.7	15 00.2 +47.7	85.0	15 05.3 +48.3	85.3	15 10.1 +48.9	85.5	15 14.6 +49.6	85.8	15 18.8 +50.2	86.1	15 22.8 +50.7	86.4	15 26.4 +51.4	86.6	15	15 26.4 +51.4	86.6	15 26.4 +51.4	86.6	15 26.4 +51.4	86.6	15	
16	15 41.8 +46.9	84.1	15 47.9 +47.5	84.4	15 53.6 +48.2	84.7	15 59.0 +48.9	84.9	16 04.2 +49.4	85.2	16 09.0 +50.1	85.5	16 13.5 +50.7	85.8	16 17.8 +51.2	86.1	16	16 17.8 +51.2	86.1	16 17.8 +51.2	86.1	16 17.8 +51.2	86.1	16	
17	16 28.7 +46.8	83.4	16 35.4 +47.4	83.7	16 41.8 +48.1	84.0	16 47.9 +48.7	84.3	16 53.6 +49.4	84.6	16 59.1 +50.0	84.9	17 04.2 +50.6	85.3	17 09.0 +51.2	85.6	17	17 09.0 +51.2	85.6	17 09.0 +51.2	85.6	17 09.0 +51.2	85.6	17	
18	17 15.5 +46.6	82.8	17 22.8 +47.4	83.1	17 29.9 +48.0	83.4	17 36.6 +48.6	83.7	17 43.0 +49.3	84.0	17 49.1 +49.8	84.4	17 54.8 +50.5	84.7	18 00.2 +51.0	85.0	18	18 00.2 +51.0	85.0	18 00.2 +51.0	85.0	18 00.2 +51.0	85.0	18	
19	18 02.1 +46.5	82.1	18 10.2 +47.2	82.5	18 17.9 +47.8	82.8	18 25.2 +48.5	83.1	18 32.3 +49.1	83.4	18 38.9 +49.8	83.8	18 45.3 +50.3	84.1	18 51.2 +51.0	84.5	19	18 51.2 +51.0	84.5	18 51.2 +51.0	84.5	18 51.2 +51.0	84.5	19	
20	18 48.6 +46.4	81.5	18 57.4 +47.0	81.8	19 05.7 +47.7	82.1	19 13.7 +48.4	82.5	19 21.4 +49.0	82.8	19 28.7 +49.6	83.2	19 35.6 +50.3	83.5	19 42.2 +50.9	83.9	20	19 42.2 +50.9	83.9	19 42.2 +50.9	83.9	19 42.2 +50.9	83.9	20	
21	19 35.0 +46.2	80.8	19 44.4 +46.9	81.1	19 53.4 +47.6	81.5	20 02.1 +48.3	81.9	20 10.4 +48.9	82.2	20 18.3 +49.6	82.6	20 25.9 +50.1	83.0	20 33.1 +50.7	83.3	21	20 33.1 +50.7	83.3	20 33.1 +50.7	83.3	20 33.1 +50.7	83.3	21	
22	20 21.2 +46.0	80.1	20 31.3 +46.7	80.5	20 41.0 +47.5	80.9	20 50.4 +48.1	81.2	20 59.3 +48.8	81.6	21 07.9 +49.4	82.0	21 16.0 +50.1	82.4	21 23.8 +50.6	82.8	22	21 23.8 +50.6	82.8	21 23.8 +50.6	82.8	21 23.8 +50.6	82.8	22	
23	21 07.2 +45.9	79.4	21 18.0 +46.6	79.8	21 28.5 +47.2	80.1	21 38.5 +47.9	80.6	21 48.1 +48.6	81.0	21 57.3 +49.3	81.4	22 06.1 +49.9	81.8	22 14.4 +50.5	82.2	23	22 14.4 +50.5	82.2	22 14.4 +50.5	82.2	22 14.4 +50.5	82.2	23	
24	21 53.1 +45.7	78.7	22 04.6 +46.5	79.1	22 15.7 +47.2	79.5	22 26.4 +47.8	79.9	22 36.7 +48.5	80.3	22 46.5 +49.2	80.8	22 56.0 +49.7	81.2	23 04.9 +50.4	81.6	24	23 04.9 +50.4	81.6	23 04.9 +50.4	81.6	23 04.9 +50.4	81.6	24	
25	22 38.8 +45.6	78.0	22 51.1 +46.2	78.5	23 02.9 +46.9	78.9	23 14.2 +47.7	79.3	23 25.2 +48.3	79.7	23 35.7 +48.8	80.1	23 45.7 +49.6	80.6	23 55.3 +50.3	81.0	24	23 55.3 +50.3	81.0	23 55.3 +50.3	81.0	23 55.3 +50.3	81.0	24	
26	23 24.4 +45.3	77.3	23 37.3 +46.0	77.8	23 49.8 +46.8	78.2	24 01.9 +47.4	78.6	24 13.5 +48.1	79.1	24 24.6 +48.8	79.5	24 35.3 +49.5	80.0	24 45.6 +50.1	80.4	25	24 45.6 +50.1	80.4	24 45.6 +50.1	80.4	24 45.6 +50.1	80.4	25	
27	24 09.7 +45.1	76.6	24 23.3 +45.6	77.1	24 36.6 +46.5	77.5	24 49.3 +47.3	77.9	25 01.6 +48.0	78.4	25 13.4 +48.7	79.0	25 24.8 +49.3	79.3	25 35.7 +49.9	79.8	26	25 35.7 +49.9	79.8	25 35.7 +49.9	79.8	25 35.7 +49.9	79.8	26	
28	24 54.8 +44.9	75.9	25 09.2 +45.7	76.3	25 23.1 +46.4	76.8	25 36.6 +47.1	77.3	25 49.6 +47.8	77.7	26 02.1 +48.4	78.2	26 14.1 +49.1	78.7	26 25.6 +49.8	79.2	27	26 25.6 +49.8	79.2	26 25.6 +49.8	79.2	26 25.6 +49.8	79.2	27	
29	25 39.7 +44.7	75.2	26 55.2 +44.5	75.7	27 12.8 +45.2	73.2	27 29.9 +46.0	73.7	27 46.5 +46.7	74.3	28 02.4 +47.5	74.8	28 17.9 +48.1	75.4	28 32.7 +48.9	76.0	29	28 32.7 +48.9	76.0	28 32.7 +48.9	76.0	28 32.7 +48.9	76.0	29	
30	30 04.1 +43.2	70.6	30 23.9 +43.9	71.1	30 43.0 +44.7	71.7	31 01.6 +45.5	72.2	31 19.6 +46.2	72.8	31 37.1 +46.9	73.4	31 53.9 +47.7	74.0	32 10.2 +48.4	74.6	35	32 10.2 +48.4	74.6	32 10.2 +48.4	74.6	32 10.2 +48.4	74.6	35	
31	30 47.3 +42.8	69.7	31 07.8 +43.6	70.3	31 27.7 +44.4	70.9	31 47.1 +45.1	71.5	32 05.8 +46.0	72.1	32 24.0 +46.7	72.7	32 41.6 +47												

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 85°, 275°

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	3	00.4	-48.0	94.0	2	56.2	-48.6	94.0	2	51.9	-49.2	94.1	2	47.6	-49.8	94.1	2	43.2	-50.3	94.2	2	38.8	-50.9	94.2	2	29.9	-52.1	94.3
1	2	12.4	-48.0	94.6	2	07.6	-48.7	94.6	2	02.7	-49.2	94.7	1	57.8	-49.8	94.7	1	52.9	-50.4	94.7	1	47.9	-51.0	94.8	1	42.9	-51.5	94.8
2	1	24.4	-48.0	95.2	1	18.9	-48.6	95.2	1	13.5	-49.3	95.2	1	08.0	-49.8	95.3	1	02.5	-50.4	95.3	0	56.9	-50.9	95.3	0	51.4	-51.5	95.3
3	0	36.4	-48.0	95.8	0	30.3	-48.6	95.8	0	24.2	-49.2	95.8	0	18.2	-49.9	95.8	0	12.1	-50.4	95.8	0	06.0	-51.0	95.8	0	00.1	+51.5	84.2
4	0	11.6	+48.1	83.6	0	18.3	+48.7	83.6	0	25.0	+49.2	83.6	0	31.7	+49.8	83.6	0	38.3	+50.4	83.6	0	45.0	+50.9	83.6	0	51.6	+51.5	83.7
5	0	59.7	+48.0	83.0	1	07.0	+48.6	83.0	1	14.2	+49.3	83.0	1	21.5	+49.8	83.1	1	28.7	+50.4	83.1	1	35.9	+51.0	83.1	1	43.1	+51.5	83.1
6	1	47.7	+48.0	82.4	1	55.6	+48.6	82.4	2	03.5	+49.2	82.5	2	11.3	+49.8	82.5	2	19.1	+50.4	82.5	2	26.9	+50.9	82.6	2	34.6	+51.5	82.6
7	2	35.7	+48.0	81.8	2	44.2	+48.6	81.8	2	52.7	+49.2	81.9	3	01.1	+49.8	81.9	3	09.5	+50.4	82.0	3	17.8	+50.9	82.1	3	26.1	+51.4	82.1
8	3	23.7	+47.9	81.2	3	32.8	+48.6	81.3	3	41.9	+49.2	81.3	3	50.9	+49.8	81.4	3	58.9	+50.3	81.5	4	08.7	+50.9	81.5	4	17.5	+51.5	81.6
9	4	11.6	+48.0	80.6	4	21.4	+48.5	80.7	4	31.1	+49.1	80.8	4	40.7	+49.7	80.8	4	50.2	+50.3	80.9	4	59.6	+50.9	81.0	5	09.0	+51.4	81.1
10	4	59.6	+47.9	80.0	5	09.9	+48.6	80.1	5	20.2	+49.1	80.2	5	30.4	+49.7	80.3	5	40.5	+50.3	80.4	5	50.5	+50.8	80.5	6	00.4	+51.4	80.6
11	5	47.5	+47.8	79.4	5	58.5	+48.4	79.5	6	09.3	+49.1	79.6	6	20.1	+49.7	79.7	6	30.8	+50.2	79.8	6	41.3	+50.8	79.9	6	51.8	+51.3	80.0
12	6	35.3	+47.8	78.8	6	46.9	+48.5	78.9	6	58.4	+49.1	79.0	7	09.8	+49.6	79.1	7	21.0	+50.2	79.3	7	32.1	+50.8	79.4	7	43.1	+51.3	79.5
13	7	23.1	+47.8	78.2	7	35.4	+48.4	78.3	7	47.5	+49.0	78.4	7	59.4	+49.6	78.6	8	11.2	+50.2	78.7	8	22.9	+50.7	78.9	8	34.4	+51.3	79.0
14	8	10.9	+47.7	77.6	8	23.8	+48.3	77.7	8	36.5	+48.9	77.9	8	49.0	+49.5	78.0	9	01.4	+50.1	78.2	9	13.6	+50.7	78.3	9	25.7	+51.2	78.5
15	9	58.6	+47.7	77.0	9	12.1	+48.3	77.1	9	25.4	+48.9	77.3	9	38.5	+49.5	77.4	9	51.5	+50.1	77.6	10	04.3	+50.6	77.8	10	16.9	+51.2	77.9
16	10	46.3	+47.6	76.3	10	00.4	+48.2	76.5	10	14.3	+48.8	76.7	10	28.0	+49.4	76.9	10	41.6	+49.9	77.0	10	54.9	+50.6	77.2	11	08.1	+51.1	77.4
17	11	33.9	+47.5	75.7	10	48.6	+48.1	76.0	11	03.1	+48.7	76.1	11	17.4	+49.4	76.3	11	31.5	+50.0	76.5	11	45.5	+50.5	76.7	11	59.2	+51.1	76.9
18	12	21.4	+47.4	75.1	11	36.7	+48.1	75.3	11	51.8	+48.7	75.5	12	06.8	+49.2	75.7	12	21.5	+49.8	75.9	12	36.0	+50.4	76.1	13	04.3	+51.5	76.6
19	13	08.8	+47.4	74.5	12	24.8	+47.9	74.7	12	40.5	+48.6	74.9	12	56.0	+49.2	75.1	13	11.3	+49.8	75.3	13	26.4	+50.4	75.6	13	41.2	+51.0	75.8
20	14	56.2	+47.2	73.8	13	12.7	+47.9	74.1	13	29.1	+48.5	74.3	13	45.2	+49.1	74.5	14	01.1	+49.7	74.8	14	16.8	+50.2	75.0	14	32.2	+50.8	75.3
21	15	43.4	+47.2	73.2	14	00.6	+47.8	73.4	14	17.6	+48.4	73.7	14	34.3	+49.1	73.9	14	50.8	+49.6	74.2	15	07.0	+50.2	74.4	15	23.0	+50.8	74.7
22	16	30.6	+47.0	72.6	14	48.4	+47.7	72.8	15	06.0	+48.3	73.1	15	23.4	+48.9	73.3	15	40.4	+49.5	73.6	15	57.2	+50.1	73.9	16	13.8	+50.6	74.2
23	17	17.6	+47.0	71.9	15	36.1	+47.6	72.2	15	54.3	+48.2	72.5	16	12.3	+48.7	72.7	16	29.9	+49.5	73.0	16	47.3	+50.0	73.3	17	04.4	+50.6	73.6
24	18	04.6	+46.8	71.3	16	23.7	+47.5	71.6	16	42.5	+48.1	71.8	17	01.1	+48.7	72.1	17	19.4	+49.3	72.4	17	37.3	+49.9	72.7	17	55.0	+50.5	73.0
25	19	51.4	+46.7	70.6	17	11.2	+47.3	70.9	17	30.6	+48.0	71.2	17	49.8	+48.6	71.5	18	08.7	+49.2	71.8	18	27.2	+49.8	72.1	18	45.5	+50.4	72.5
26	20	38.1	+46.6	70.0	17	58.5	+47.2	70.3	18	18.6	+47.9	70.6	18	38.4	+48.5	70.9	18	57.9	+49.1	71.2	19	17.0	+49.7	71.5	19	35.9	+50.2	71.8
27	21	24.7	+46.4	69.3	18	45.7	+47.1	69.6	19	06.5	+47.7	69.9	19	26.9	+48.3	70.3	19	47.0	+48.9	70.6	20	06.7	+49.6	71.0	20	26.1	+50.2	71.3
28	22	11.1	+46.3	68.6	19	32.8	+47.0	69.0	19	54.2	+47.6	69.3	20	15.2	+48.2	69.6	20	35.9	+48.8	70.0	21	16.3	+50.0	70.7	21	35.9	+50.6	71.1
29	23	57.4	+46.1	68.0	20	19.8	+46.7	68.3	20	41.8	+47.4	68.7	21	03.4	+48.1	69.0	21	24.7	+48.7	69.4	22	06.3	+49.9	69.7	22	36.3	+50.5	70.5
30	24	43.5	+46.0	67.3	21	06.5	+46.7	67.6	21	29.2	+47.3	68.0	21	51.5	+47.9	68.4	22	13.4	+48.6	68.7	22	35.0	+49.2	69.1	22	56.2	+49.7	69.5
31	25	29.5	+45.8	66.6	21	53.2	+46.4	67.0	22	16.5	+47.1	67.3	22	39.4	+47.8	67.7	23	02.0	+48.2	68.1	23	24.2	+49.0	68.5	23	45.9	+49.7	68.9
32	26	15.3	+45.6	65.9	22	39.6	+46.3	66.3	23	03.6	+46.9	66.7	23	27.2	+47.5	67.1	23	50.4	+48.2	67.5	24	13.2	+48.8	67.9	24	35.6	+49.4	68.3
33	27	00.9	+45.5	65.2	23	25.9	+46.1	65.6	23	50.5	+46.8	66.0	24	14.7	+47.5	66.4	24	38.6	+48.0	66.8	25	02.0	+48.7	67.2	25	49.0	+49.5	67.4
34	28	46.4	+45.2	64.5	24	12.0	+45.9	64.9	24	37.3	+46.6	65.3	25	02.2	+47.2	65.7	25	26.6	+47.9	66.1	26	14.3	+49.5	66.6	26	37.5	+49.7	67.5
35	29	31.6	+45.0	63.8	24	57.9	+45.7	64.2	25	23.9	+46.3	64.6	26	49.4	+47.0	65.0	26	14.5	+47.7	65.5	27	39.4	+49.0	66.4	27	27.2	+49.6	66.9
36	30	16.6	+44.8	63.0	25	43.6	+45.3	63.5	26	10.2	+46.2	63.9	26	36.4	+46.8	64.3	27	02.2	+48.7	64.8	27	25.4	+48.7	65.3	28	16.8	+49.4	66.2
37	31	01.4	+44.6	62.5	26	39.3	+45.3	62.7	26	56.4	+45.9	63.2	27	23.2	+46.7	63.6	27	49.7	+47.2	64.1	28	15.6	+48.0	64.6	28	36.1	+49.4	65.7
38	32	37.1	+44.2	61.9	27	37.7	+44.9	62.0	27	40.3	+45.7	62.4	28	09.8	+47.2	62.8	28	33.8	+44.7	63.4	29	13.7	+45.3	64.0	29	37.2	+45.5	64.9
39	33	18.7	+43.8	61.3	28	34.3	+43.9	61.6	28	17.7	+40.3	61.9	29	56.7	+41.0	61.												

86°, 274° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	2 24.4 +47.9	93.2	2 21.0 +48.6	93.2	2 17.6 +49.2	93.3	2 14.1 +49.8	93.3	2 10.6 +50.4	93.4	2 07.1 +50.9	93.4	2 03.5 +51.5	93.4	1 59.9 +52.0	93.5	0	0	0	0	0	0	0	0	0
1	3 12.3 +47.9	92.6	3 09.6 +48.5	92.7	3 06.8 +49.1	92.7	3 03.9 +49.8	92.8	3 01.0 +50.3	92.8	2 58.0 +50.9	92.9	2 55.0 +51.4	92.9	2 51.9 +52.0	93.0	1	0	0	0	0	0	0	0	0
2	4 00.2 +47.9	92.0	3 58.1 +48.5	92.1	3 55.9 +49.2	92.1	3 53.7 +49.7	92.2	3 51.3 +50.3	92.3	3 48.9 +50.9	92.3	3 46.4 +51.5	92.4	3 43.9 +51.9	92.5	2	0	0	0	0	0	0	0	0
3	4 48.1 +47.9	91.4	4 46.6 +48.5	91.5	4 45.1 +49.1	91.6	4 43.4 +49.7	91.6	4 41.6 +50.3	91.7	4 39.8 +50.8	91.8	4 37.9 +51.4	91.9	4 35.8 +52.0	92.0	3	0	0	0	0	0	0	0	0
4	5 36.0 +47.9	90.8	5 35.1 +48.5	90.9	5 34.2 +49.1	91.0	5 33.1 +49.7	91.1	5 31.9 +50.3	91.3	5 30.6 +50.6	91.3	5 29.3 +51.3	91.4	5 27.8 +51.9	91.5	4	0	0	0	0	0	0	0	0
5	6 23.9 +47.7	90.2	6 23.6 +48.4	90.3	6 23.3 +49.0	90.4	6 22.8 +49.6	90.5	6 22.2 +50.2	90.6	6 21.5 +50.8	90.7	6 20.6 +51.4	90.8	6 19.7 +51.9	91.0	5	0	0	0	0	0	0	0	0
6	7 11.6 +47.8	89.6	7 12.0 +48.4	89.7	7 12.3 +49.0	89.8	7 12.4 +49.6	89.9	7 12.4 +50.2	90.1	7 12.3 +50.7	90.2	7 12.0 +51.3	90.3	7 11.6 +51.8	90.5	6	0	0	0	0	0	0	0	0
7	7 59.4 +47.7	89.0	8 00.4 +48.3	89.1	8 01.3 +48.9	89.2	8 02.0 +49.6	89.4	8 02.6 +50.1	89.5	8 03.0 +50.7	89.7	8 03.3 +51.3	89.8	8 03.4 +51.8	89.9	7	0	0	0	0	0	0	0	0
8	8 47.1 +47.6	88.3	8 48.7 +48.3	88.5	8 50.2 +48.4	88.7	8 51.6 +49.5	88.8	8 52.7 +50.1	89.0	8 53.7 +50.7	89.1	8 54.6 +51.2	89.3	8 55.2 +51.8	89.4	8	0	0	0	0	0	0	0	0
9	9 34.7 +47.6	87.7	9 37.0 +48.2	87.9	9 39.1 +48.8	88.1	9 41.1 +49.4	88.2	9 42.8 +50.0	88.4	9 44.4 +50.6	88.6	9 45.8 +51.2	88.7	9 47.0 +51.7	88.9	9	0	0	0	0	0	0	0	0
10	10 22.3 +47.5	87.1	10 25.2 +48.1	87.3	10 27.9 +48.8	87.5	10 30.5 +49.4	87.7	10 32.8 +50.0	87.8	10 35.0 +50.6	88.0	10 37.0 +51.1	88.2	10 38.7 +51.7	88.4	10	0	0	0	0	0	0	0	0
11	11 09.8 +47.4	86.5	11 13.3 +48.1	86.7	11 16.7 +48.7	86.9	11 19.9 +49.3	87.1	11 22.8 +49.9	87.3	11 25.6 +50.5	87.5	11 28.1 +51.1	87.7	11 30.4 +51.6	87.9	11	0	0	0	0	0	0	0	0
12	11 57.2 +47.3	85.9	12 01.4 +48.0	86.1	12 05.4 +48.6	86.3	12 09.2 +49.2	86.5	12 12.7 +49.9	86.7	12 16.1 +50.4	86.9	12 19.2 +51.0	87.1	12 22.0 +51.6	87.4	12	0	0	0	0	0	0	0	0
13	12 44.5 +47.3	85.2	12 49.4 +47.9	85.5	12 54.0 +48.5	85.7	12 58.4 +49.2	85.9	13 02.6 +49.7	86.1	13 06.5 +50.3	86.4	13 10.2 +50.9	86.6	13 13.6 +51.5	86.8	13	0	0	0	0	0	0	0	0
14	13 31.8 +47.1	84.6	13 37.3 +47.8	84.8	13 42.5 +48.5	85.1	13 47.6 +49.0	85.3	13 52.3 +49.7	85.6	13 56.8 +50.3	85.8	14 01.1 +50.8	86.1	14 05.1 +51.4	86.3	14	0	0	0	0	0	0	0	0
15	14 18.9 +47.0	84.0	14 25.1 +47.7	84.2	14 31.0 +48.3	84.5	14 36.6 +49.0	84.7	14 42.0 +49.6	85.0	14 47.1 +50.2	85.3	14 51.9 +50.8	85.5	14 56.5 +51.3	85.8	15	0	0	0	0	0	0	0	0
16	15 05.9 +47.0	83.3	15 12.8 +47.6	83.6	15 19.3 +48.3	83.9	15 25.6 +48.9	84.1	15 31.6 +49.5	84.4	15 37.3 +50.1	84.7	15 42.7 +50.7	85.0	15 47.8 +51.3	85.2	16	0	0	0	0	0	0	0	0
17	15 52.9 +46.8	82.7	16 00.4 +47.5	83.0	16 07.6 +48.1	83.2	16 14.5 +48.8	83.5	16 21.1 +49.4	83.8	16 27.4 +50.0	84.1	16 33.4 +50.6	84.4	16 39.1 +51.2	84.7	17	0	0	0	0	0	0	0	0
18	16 39.7 +46.7	82.0	16 47.9 +47.3	82.3	16 55.7 +48.1	82.6	17 03.3 +48.7	82.9	17 10.5 +49.3	83.2	17 17.4 +49.9	83.5	17 24.0 +50.5	83.8	17 30.3 +51.1	84.2	18	0	0	0	0	0	0	0	0
19	17 26.4 +46.6	81.4	17 35.2 +47.3	81.7	17 43.8 +47.9	82.0	17 52.0 +48.5	82.3	17 59.8 +49.2	82.6	18 07.3 +49.9	83.0	18 14.5 +50.4	83.3	18 21.4 +51.0	83.6	19	0	0	0	0	0	0	0	0
20	18 13.0 +46.4	80.7	18 22.5 +47.1	81.0	18 31.7 +47.7	81.4	18 40.5 +48.4	81.7	18 49.0 +49.1	82.0	18 57.2 +49.7	82.4	19 04.9 +50.4	82.7	19 12.4 +50.9	83.1	20	0	0	0	0	0	0	0	0
21	18 59.4 +46.3	80.0	19 09.6 +47.0	80.4	19 19.4 +47.7	80.7	19 28.9 +48.3	81.1	19 38.1 +48.9	81.4	19 46.9 +49.5	81.8	19 55.3 +50.1	82.1	20 03.3 +50.8	82.5	21	0	0	0	0	0	0	0	0
22	19 45.7 +46.1	79.4	19 56.6 +46.8	79.7	20 07.1 +47.5	80.1	20 17.2 +48.2	80.4	20 27.0 +48.8	80.8	20 36.4 +49.5	81.2	20 45.4 +50.1	81.5	20 54.1 +50.6	81.9	22	0	0	0	0	0	0	0	0
23	20 31.8 +46.0	78.7	20 43.4 +46.6	79.0	20 54.6 +47.3	79.4	21 05.4 +48.0	79.8	21 15.8 +48.7	80.2	21 25.9 +49.3	80.6	21 35.5 +50.0	81.0	21 44.7 +50.6	81.3	23	0	0	0	0	0	0	0	0
24	21 17.8 +45.8	78.0	21 30.0 +46.5	78.4	21 41.9 +47.2	78.8	21 53.4 +47.9	79.2	22 04.5 +48.6	79.6	22 15.2 +49.2	80.0	22 25.5 +49.8	80.4	22 35.3 +50.4	80.8	24	0	0	0	0	0	0	0	0
25	22 03.6 +45.6	77.3	22 16.5 +46.4	77.7	22 29.1 +47.1	78.1	22 41.3 +47.7	78.5	22 53.1 +48.3	78.9	23 04.4 +49.0	79.3	23 15.3 +49.6	79.8	23 25.7 +50.3	80.2	25	0	0	0	0	0	0	0	0
26	22 49.2 +45.4	76.6	23 02.9 +46.1	77.0	23 16.2 +46.8	77.4	23 29.0 +47.6	77.8	23 41.4 +48.2	78.3	23 53.4 +48.9	78.7	24 04.9 +49.6	79.1	24 16.0 +50.2	79.6	26	0	0	0	0	0	0	0	0
27	23 34.6 +45.2	75.9	23 49.0 +46.0	76.3	24 03.0 +46.7	76.7	24 16.6 +47.3	77.2	24 29.6 +48.1	77.6	24 42.3 +48.7	78.1	24 54.5 +49.3	78.5	25 06.2 +50.0	79.0	27	0	0	0	0	0	0	0	0
28	24 19.8 +45.1	75.2	24 35.0 +45.7	75.6	24 49.7 +46.5	76.0	25 03.9 +47.2	76.5	25 17.7 +47.9	77.0	25 31.0 +48.6	77.4	25 43.8 +49.2	77.9	25 56.2 +49.8	78.4	28	0	0	0	0	0	0	0	0
29	25 04.9 +44.8	74.4	25 20.7 +45.6	74.9	25 36.2 +46.5	75.3	25 36.2 +47.1	75.8	26 05.6 +47.6	76.3	26 19.5 +48.4	76.8	26 33.0 +49.1	77.3	26 46.0 +49.7	77.7	29	0	0	0	0	0	0	0	0
30	25 49.7 +44.6	73.7	26 06.3 +45.3	74.2	26 22.4 +46.1	74.6	26 38.1 +46.8	75.1	26 53.2 +47.5	75.6	27 07.9 +48.2	76.1	27 22.1 +48.8	76.6	27 35.7 +49.5	77.1	30	0	0	0	0	0	0	0	0
31	26 34.3 +44.3	73.0	26 51.6 +45.1	73.4	27 08.5 +45.8	73.9	27 24.9 +46.5	74.4	27 40.7 +47.3	74.9	27 56.1 +47.9	75.4	28 10.9 +48.7	75.9	28 25.2 +49.3	76.5	31	0	0	0	0	0	0	0	0
32	27 18.6 +44.1	72.2	27 36.7 +44.9	72.7	27 54.3 +45.6	73.2	28 11.4 +46.4	73.7	28 28.0 +47.1	74.2	28 44.0 +47.8	74.7	28 59.6 +48.4	75.3	29 14.5 +49.2	75.8	32	0	0	0	0	0	0	0	0
33	28 02.7 +43.9	71.4	28 21.6 +44.6	71.9	28 39.9 +45.4	72.5	28 57.8 +46.1	73.0	29 15.1 +46.8	73.4	29 31.8 +47.6	74.1	29 48.0 +48.3	74.7	30 03.7 +48.9	75.2	33	0	0	0	0	0	0	0	0
34	28 46.6 +43.6	70.7	29 06.2 +44.4	71.2	29 25.3 +45.1	71.7	29 43.9 +45.8	72.2	30 01.9 +46.6	72.8	30 19.4 +47.3	73.4	30 36.3 +48.0	73.9	30 52.6 +48.7	74.5	34	0	0	0	0	0	0	0	0
35	29 30.2 +43.3	69.9	29 50.6 +44.0	70.4	30 10.4 +44.9	70.9	30 29.7 +45.6	71.5	30 48.5 +46.3	72.1	31 06.7 +47.0	72.6	31 24.3 +47.8	73.2	31 41.										

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $86^\circ$ ,  $274^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	2	24.4	-48.0	93.2	2	21.0	-48.6	93.2	2	17.6	-49.2	93.3	2	14.1	-49.8	93.3	2	10.6	-50.3	93.4	2	07.1	-50.9	93.4
1	1	36.4	-48.0	93.8	1	32.4	-48.6	93.8	1	28.4	-49.2	93.9	1	24.3	-49.7	93.9	1	20.3	-50.4	93.9	1	16.2	-50.9	93.9
2	0	48.4	-48.0	94.4	0	43.8	-48.6	94.4	0	39.2	-49.2	94.4	0	34.6	-49.8	94.4	0	29.9	-50.4	94.4	0	25.3	-51.0	94.5
3	0	00.4	-48.0	95.0	0	04.8	+48.6	85.0	0	10.0	+49.2	85.0	0	15.2	+49.8	85.0	0	20.5	+50.3	85.0	0	25.7	+50.9	85.0
4	0	47.6	+47.9	84.4	0	53.4	+48.6	84.4	0	59.2	+49.2	84.4	1	10.8	+50.0	84.8	1	16.6	+50.9	84.5	1	22.4	+51.4	84.5
5	1	35.5	+48.0	83.8	1	42.0	+48.6	83.8	1	48.4	+49.2	83.9	1	54.8	+49.8	83.9	2	01.2	+50.3	83.9	2	07.5	+50.9	84.0
6	2	23.5	+47.9	83.2	2	30.6	+48.6	83.2	2	37.6	+49.2	83.3	2	44.6	+49.8	83.3	2	51.5	+50.4	83.4	2	58.4	+50.9	83.4
7	3	11.4	+48.0	82.6	3	19.2	+48.5	82.7	3	26.8	+49.1	82.7	3	34.4	+49.7	82.8	3	41.9	+50.3	82.8	3	49.3	+50.9	82.9
8	3	59.4	+47.9	82.0	4	07.7	+48.5	82.1	4	15.9	+49.2	82.1	4	24.1	+49.7	82.2	4	32.2	+50.3	82.3	4	40.2	+50.9	82.4
9	4	47.3	+47.9	81.4	4	56.2	+48.5	81.5	5	05.1	+49.1	81.6	5	13.8	+49.7	81.7	5	22.5	+50.3	81.7	5	31.1	+50.8	81.8
10	5	35.2	+47.8	80.8	5	44.7	+48.5	80.9	5	54.2	+49.0	81.0	6	03.5	+49.7	81.1	6	12.8	+50.2	81.2	6	21.9	+50.8	81.3
11	6	23.0	+47.8	80.2	6	33.2	+48.4	80.3	6	43.2	+49.0	80.4	6	53.2	+49.6	80.5	7	03.0	+50.2	80.6	7	12.7	+50.7	80.8
12	7	10.8	+47.7	79.6	7	21.6	+48.3	79.7	7	32.2	+49.0	79.8	7	42.8	+49.5	79.8	7	53.2	+50.1	80.1	8	03.4	+50.7	80.2
13	8	58.5	+47.7	79.0	8	09.9	+48.4	79.1	8	21.2	+48.9	79.2	8	32.3	+49.6	79.4	8	43.3	+50.1	79.5	9	04.8	+51.2	79.8
14	9	46.2	+47.6	78.3	8	58.3	+48.2	78.5	9	10.1	+48.9	78.7	9	21.9	+49.4	78.8	9	33.4	+50.1	79.0	9	44.8	+50.6	79.1
15	10	33.8	+47.6	77.7	9	46.5	+48.2	77.9	9	59.0	+48.8	78.1	10	11.3	+49.4	78.2	10	23.5	+50.0	78.4	10	35.4	+50.6	78.6
16	11	21.4	+47.5	77.1	10	34.7	+48.1	77.3	10	47.8	+48.7	77.5	11	00.7	+49.4	77.6	11	13.5	+49.9	77.9	11	26.0	+50.5	78.1
17	12	11.0	+47.4	76.5	11	22.8	+48.1	76.7	11	36.5	+48.7	76.9	11	50.1	+49.2	77.1	12	03.4	+49.8	77.3	12	16.5	+50.4	77.5
18	13	56.3	+47.4	75.9	12	10.9	+47.9	76.1	12	25.2	+48.6	76.3	12	39.3	+49.2	76.5	12	53.2	+49.8	76.7	13	20.3	+51.0	77.2
19	14	43.7	+47.2	75.2	12	58.8	+47.9	75.5	13	13.8	+48.5	75.7	13	28.5	+49.1	75.9	13	43.0	+49.7	76.1	14	11.3	+50.8	76.6
20	15	30.9	+47.2	74.6	13	46.7	+47.8	74.8	14	02.3	+48.4	75.1	14	17.6	+49.0	75.3	14	32.7	+49.6	75.6	14	47.5	+50.2	75.8
21	16	18.1	+47.0	74.0	14	34.5	+47.7	74.2	15	40.5	+48.3	74.5	15	06.6	+49.0	74.7	15	22.3	+49.5	75.0	15	37.7	+50.1	75.3
22	17	50.1	+46.9	73.3	15	22.2	+47.6	73.6	15	39.0	+48.2	73.8	15	55.6	+48.8	74.1	16	11.8	+49.5	74.4	16	27.8	+50.0	74.7
23	18	55.0	+46.9	72.7	16	09.8	+47.4	73.0	16	27.2	+48.1	73.2	16	44.4	+48.7	73.5	17	01.3	+49.3	73.8	17	17.8	+50.0	74.1
24	19	38.9	+46.6	72.0	16	57.2	+47.4	72.3	17	13.5	+48.0	72.6	17	50.6	+49.2	72.9	18	07.8	+49.8	73.5	18	24.6	+50.4	73.8
25	20	25.5	+46.6	71.4	17	44.6	+47.2	71.7	18	03.3	+47.8	72.0	18	21.7	+48.5	72.3	18	39.8	+49.1	72.6	19	15.0	+50.3	73.3
26	21	18.1	+46.4	70.7	18	31.8	+47.1	71.0	18	51.1	+47.8	71.3	19	10.2	+48.3	71.7	19	28.9	+49.0	72.0	19	47.3	+49.5	72.3
27	22	58.5	+46.3	70.0	19	18.9	+46.9	70.4	19	38.9	+47.6	70.7	19	58.5	+48.3	71.0	20	17.9	+48.8	71.4	20	36.8	+49.5	71.7
28	23	44.8	+46.2	69.4	20	05.8	+46.8	69.7	20	26.5	+47.4	70.0	20	46.8	+48.0	70.4	21	06.7	+48.7	70.8	21	26.3	+49.3	71.1
29	24	31.0	+45.9	68.7	20	52.6	+46.6	69.0	21	13.9	+47.3	69.4	21	34.8	+48.0	69.8	21	55.4	+48.6	70.1	22	15.6	+49.2	70.5
30	25	16.9	+45.8	68.0	21	39.2	+46.5	68.4	22	01.2	+47.1	68.7	22	22.8	+47.7	69.1	22	44.0	+48.4	69.5	23	04.8	+49.0	69.9
31	32	02.7	+45.7	67.3	22	25.7	+46.3	67.7	22	48.3	+47.0	68.1	23	10.5	+47.6	68.5	23	32.4	+48.2	68.9	23	53.8	+48.9	69.3
32	33	48.4	+45.6	66.6	23	12.0	+46.1	67.0	23	35.3	+46.7	67.4	23	58.1	+47.5	67.8	24	20.6	+48.1	68.2	24	42.7	+48.7	68.6
33	33	33.8	+45.2	65.9	23	58.1	+45.9	66.3	24	22.0	+46.6	66.7	24	45.6	+47.2	67.1	25	08.7	+47.9	67.5	25	31.4	+48.5	68.0
34	34	19.0	+45.1	65.2	24	44.0	+45.8	65.6	25	08.6	+46.4	66.0	25	32.8	+47.1	66.4	25	56.6	+47.7	66.9	26	19.9	+48.4	67.3
35	35	04.1	+44.8	64.4	25	29.8	+45.5	64.9	25	55.0	+46.2	65.3	26	19.9	+46.8	65.7	26	44.3	+47.5	66.2	27	08.3	+48.2	66.7
36	36	48.9	+44.6	63.7	26	15.3	+45.3	64.1	26	41.2	+46.0	64.6	27	06.7	+46.7	65.1	27	31.8	+47.3	65.5	27	56.5	+47.9	66.0
37	37	33.5	+44.3	63.0	27	00.6	+45.0	63.4	27	27.2	+45.7	63.9	27	53.4	+46.4	64.3	28	19.1	+47.2	64.8	28	44.4	+47.8	65.3
38	38	17.8	+44.2	62.2	27	45.6	+44.8	62.7	28	12.9	+45.5	63.1	28	39.8	+46.2	63.6	29	06.3	+46.8	64.1	29	32.2	+47.5	64.6
39	39	20.2	+43.8	61.4	28	30.4	+44.6	61.9	28	54.8	+45.3	62.4	29	53.1	+46.7	62.4	30	19.7	+47.4	63.4	30	45.9	+48.0	64.5
40	40	28.8	+43.6	60.7	29	15.0	+44.3	61.1	29	43.7	+45.0	61.6	30	12.0	+45.7	62.2	30	39.8	+46.4	62.7	31	31.9	+47.7	63.7
41	41	29.4	+43.3	59.9	29	59.3	+44.0	60.4	30	28.7	+44.7	60.9	30	10.7	+45.4	61.4	31	26.2	+46.1	61.9	31	54.1	+46.9	62.5
42	42	12.7	+43.0	59.1	30	43.3	+43.7	59.6	31	13.4	+44.5	60.1	31	43.1	+45.2	60.6	32	12.3	+45.8	61.2	33	09.1	+47.2	62.3
43	43	55.7	+42.7	58.3	31	27.0	+43.5	58.8	31	57.9	+44.1	59.3	32	28.3	+44.8	59.9	32	58.1	+45.6	60.4	33	37.5	+47.3	61.6
44	44	31.4	+42.4	57.4	32	10.5	+43.1	58.0	33	46.5	+43.9	58.4	34	22.0	+44.7	59.1	34	43.7	+45.3	59.6	35	10.9	+47.4	61.4
45	45	32.8	+42.6	56.3	33	25.7	+44.0	57.1	34	22.8	+45.0	57.6	35	10.4	+45.6	58.3	36	39.3	+46.2	59.0	37	46.4	+47	

**87°, 273° L.H.A.**

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than  $180^{\circ}$  .....Zn=Z  
           { L.H.A. less than  $180^{\circ}$  .....Zn= $360^{\circ}$ -Z

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			Dec.			
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z				
0	1	48.3	+47.9	92.4	1	45.8	+48.5	92.4	1	43.2	+49.2	92.5	1	40.6	+49.8	92.5	1	38.0	+50.3	92.5	1	35.4	+50.9	92.5	1	32.7	+51.4	92.6
1	2	36.2	+47.9	91.8	2	34.3	+48.6	91.8	2	32.4	+49.1	91.9	2	30.4	+49.7	91.9	2	28.3	+50.4	92.0	2	26.3	+50.8	92.0	2	24.1	+51.5	92.1
2	3	32.4	+47.9	91.2	3	22.9	+48.5	91.3	3	21.5	+49.2	91.3	3	20.1	+49.7	91.4	3	18.7	+50.3	91.4	3	17.1	+50.9	91.5	3	15.6	+51.4	91.6
3	4	12.0	+47.9	90.6	4	11.4	+48.5	90.7	4	10.7	+49.1	90.7	4	9.08	+49.8	90.8	4	8.09	+50.2	90.9	4	0.84	+50.9	91.0	4	0.70	+51.4	91.0
4	4	59.9	+47.8	90.0	4	59.9	+48.4	90.1	4	58.8	+49.0	90.2	4	59.6	+49.6	90.2	4	59.2	+50.3	90.3	4	58.9	+50.8	90.4	4	58.4	+51.3	90.5
5	5	47.7	+47.8	89.4	5	48.3	+48.5	89.5	5	48.8	+49.1	89.6	5	49.2	+49.7	89.7	5	49.5	+50.2	89.8	5	49.7	+50.8	89.9	5	49.7	+51.4	90.0
6	6	35.5	+47.8	88.8	6	36.8	+48.4	88.9	6	37.9	+49.0	89.0	6	38.9	+49.6	89.1	6	39.7	+50.2	89.2	6	40.5	+50.7	89.4	6	41.1	+51.3	89.5
7	7	23.3	+47.7	88.2	7	25.2	+48.3	88.3	7	26.9	+48.9	88.4	7	28.5	+49.5	88.6	7	29.9	+50.2	88.7	7	31.2	+50.7	88.8	7	32.4	+51.3	88.9
8	8	11.0	+47.6	87.5	8	13.5	+48.3	87.7	8	15.8	+48.9	87.8	8	18.0	+49.5	88.0	8	20.1	+50.1	88.1	8	21.9	+50.7	88.3	8	23.7	+51.2	88.4
9	9	58.6	+47.6	86.9	9	0.18	+48.2	87.1	9	0.47	+48.9	87.2	9	0.75	+49.5	87.4	9	10.2	+50.0	87.6	9	12.6	+50.6	87.7	9	14.9	+51.2	88.1
10	9	46.2	+47.5	86.3	9	50.0	+48.1	86.5	9	53.6	+48.8	86.7	9	57.0	+49.4	86.8	10	0.02	+50.0	87.0	10	0.3	+50.6	87.2	10	0.61	+51.1	87.4
11	10	33.7	+47.5	85.7	10	38.1	+48.1	85.9	10	42.4	+48.7	86.1	10	46.4	+49.3	86.3	10	50.2	+49.9	86.4	10	53.8	+50.5	86.6	10	57.2	+51.1	86.8
12	11	21.2	+47.3	85.1	11	26.2	+48.0	85.3	11	31.1	+48.6	85.5	11	35.7	+49.3	85.7	11	40.1	+49.9	85.9	11	44.3	+50.5	86.1	11	48.3	+51.0	86.3
13	12	08.5	+47.3	84.4	12	14.2	+48.0	84.7	12	19.7	+48.6	84.9	12	25.0	+49.1	85.1	12	30.0	+49.8	85.3	12	34.8	+50.3	85.5	12	39.3	+51.0	85.8
14	13	55.8	+47.2	83.8	13	0.22	+47.8	84.0	13	0.83	+48.5	84.3	13	14.1	+49.2	84.5	13	19.8	+49.7	84.7	13	25.1	+50.3	85.0	13	30.3	+50.9	85.5
15	13	43.0	+47.1	83.2	13	50.0	+47.8	83.4	13	56.8	+48.4	83.7	14	0.33	+49.0	83.9	14	0.95	+49.6	84.2	14	15.4	+50.3	84.4	14	21.2	+50.8	84.7
16	14	30.1	+47.0	82.5	14	37.8	+47.6	82.8	14	45.2	+48.2	83.1	14	52.3	+48.9	83.3	14	59.1	+49.6	83.6	15	0.57	+50.1	83.9	15	12.0	+50.7	84.1
17	15	17.1	+46.9	81.9	15	25.4	+47.6	82.2	15	33.4	+48.2	82.4	15	41.2	+48.8	82.7	15	48.7	+49.4	83.0	15	55.8	+50.1	83.3	16	0.27	+50.6	83.6
18	16	0.40	+46.7	81.2	16	13.0	+47.4	81.5	16	21.6	+48.1	81.8	16	30.0	+48.7	82.1	16	38.1	+49.3	82.4	16	45.9	+49.9	82.7	16	53.3	+50.6	83.0
19	16	50.7	+46.7	80.6	17	0.04	+47.3	80.9	17	0.97	+48.0	81.2	17	18.7	+48.6	81.5	17	27.4	+49.3	81.8	17	35.8	+49.9	82.1	17	43.9	+50.4	82.8
20	17	37.4	+46.5	79.9	17	47.7	+47.2	80.3	17	57.7	+47.8	80.6	18	0.73	+48.5	80.9	18	16.7	+49.1	81.2	18	25.7	+49.7	81.5	18	34.3	+50.4	81.9
21	18	23.9	+46.3	79.3	18	34.9	+47.0	79.6	18	45.5	+47.7	79.9	18	55.8	+48.4	80.3	19	0.58	+49.0	80.6	19	15.4	+49.6	81.0	19	24.7	+50.2	81.3
22	19	10.2	+46.2	78.6	19	21.9	+46.9	78.9	19	33.2	+47.6	79.3	19	44.2	+48.2	79.6	19	54.8	+48.9	80.0	20	0.50	+49.6	80.4	20	14.9	+50.1	80.7
23	19	56.4	+46.1	77.9	20	0.88	+46.8	78.3	20	20.8	+47.4	78.6	20	32.4	+48.1	79.1	20	43.7	+48.7	79.4	20	54.6	+49.3	79.8	21	0.45	+50.0	80.1
24	20	42.5	+45.9	77.2	20	55.6	+46.5	77.6	21	0.82	+47.3	78.0	21	20.5	+48.0	78.4	21	32.4	+48.6	78.8	21	43.9	+49.3	79.1	21	55.0	+50.7	79.9
25	21	28.4	+45.7	76.5	21	42.1	+46.5	76.9	21	55.5	+47.1	77.3	22	0.85	+47.8	77.7	22	21.0	+48.5	78.1	22	33.2	+49.1	78.5	22	44.9	+49.7	78.9
26	22	14.1	+45.5	75.9	22	28.6	+46.2	76.3	22	42.6	+47.0	76.7	22	56.3	+47.6	77.1	23	0.93	+49.5	77.5	23	22.3	+48.9	77.9	23	34.6	+49.6	78.3
27	22	59.2	+45.4	75.1	23	14.8	+46.1	75.6	23	29.6	+46.7	76.0	23	43.9	+47.4	76.4	23	57.8	+48.1	76.8	24	11.2	+48.8	77.3	24	24.2	+49.5	77.7
28	23	45.0	+45.2	74.4	24	0.09	+45.9	74.9	24	16.3	+46.6	75.3	24	31.3	+47.3	75.7	24	45.9	+48.0	76.2	25	0.00	+48.6	76.6	25	13.7	+49.2	77.1
29	24	30.2	+44.9	73.7	24	46.8	+45.6	74.2	25	0.29	+46.4	74.6	25	18.6	+47.1	75.1	25	33.9	+47.7	75.5	25	48.6	+48.5	76.0	26	0.29	+49.1	76.5
30	25	15.1	+44.7	73.0	25	32.4	+45.5	73.4	25	49.3	+46.2	73.9	26	0.57	+46.9	74.4	26	21.6	+47.6	74.8	26	37.1	+48.3	75.3	26	52.0	+49.0	75.8
31	25	55.8	+44.5	72.2	26	17.9	+45.2	72.7	26	35.5	+46.0	73.2	26	52.6	+46.7	73.7	27	0.92	+47.4	74.2	27	25.4	+48.0	74.7	27	41.0	+48.7	75.2
32	26	44.3	+44.3	71.5	27	0.31	+45.0	72.0	27	21.5	+45.7	72.5	27	39.3	+46.4	73.0	27	56.6	+47.2	73.5	28	29.7	+47.4	74.0	28	45.5	+49.2	75.0
33	27	28.6	+44.0	70.7	27	48.1	+44.8	71.2	28	0.72	+45.5	71.7	28	25.7	+46.3	72.2	28	43.8	+46.9	72.8	29	0.13	+47.7	73.3	29	18.3	+48.3	73.8
34	28	12.6	+43.7	70.0	28	32.9	+44.5	70.5	29	25.7	+45.3	71.0	29	12.0	+46.0	71.5	29	30.7	+46.7	72.1	29	49.0	+47.4	72.6	30	0.66	+48.2	73.1
35	28	56.3	+43.5	69.2	29	17.4	+44.2	69.7	29	38.0	+45.0	70.2	29	58.0	+45.7	70.8	30	37.15	+46.4	71.3	30	54.8	+47.9	72.5	31	12.6	+48.6	73.0
36	29	39.8	+43.2	68.4	30	0.16	+44.0	68.9	30	23.0	+44.7	69.5	30	34.37	+45.5	70.0	31	0.39	+46.3	70.6	31	23.6	+46.9	71.2	31	41.27	+47.6	71.7
37	30	23.0	+42.9	67.6	30	45.6	+43.7	68.1	31	31.7	+44.4	68.7	31	32.92	+45.2	69.3	31	50.2	+45.9	69.8	32	10.5	+46.7	70.4	32	30.3	+47.5	71.6
38	31	0.59	+42.8	66.8	31	29.3	+43.4	67.3	31	52.1	+44.2	67.9	32	14.4	+44.9	68.5	32	36.1	+45.7	69.1	33	17.8	+47.1	70.3	33	37.7	+47.9	70.9
39	31	48.5	+42.8	66.0	32	12.7	+43.0	66.5	32	36.3	+42.0	67.3	32	37.05	+43.4	67.6	33	37.3	+44.7	68.3	33	34.09	+46.9	68.9	34	0.49	+46.9	69.6
40	32	30.7	+42.0	65.1	32	55.7	+42.7	65.7	33	20.1	+43.5	66.3	33	43.9	+44.3	66.9	34	0.72	+45.1	67.5	34	29.8	+45.9	68.2	34	51.8	+46.6	68.8
41	33	12.7	+41.5	64.3	33	38.4	+42.4	64.9	34	0.36	+43.2	65.5	34	28.2	+44.0	66.1	34	52.3	+44.7	66.7	35	15.7	+45.5	67.3	35	38.4	+46.3	68.0
42	33	54.2	+41.2	63.4	34	20.8	+42.0	64.0	34	46.8	+42.8	64.5	35	12.2	+43.6	65.3	35	37.0	+44.4	65.6	36	24.7	+46.0	67.2	36	47.6	+46.4	67.9
43	34	35.4	+40.8	62.5	35	0.28	+41.6	63.1	35	29.6	+42.5	63.8	35	55.8	+43.3	64.4	36	21.4	+42.9	65.1	37	10.7	+45.7	66.4	37	34.4	+46.4	67.1
44	35	56.6	+40.0	60.7	36	25.7	+40.8	61.4	36	34.05	+41.2	61.8	36	38.32	+42.9	62.5	38	15.42	+42.6	63.5	39	26.6	+43.9	64.3	39	56.3	+45.6	64.7
45	35	36.6	+39.6	59.8	37	0.65	+40.4	60.4	37	35.8	+41.3	61.1	38	0.045	+42.1	61.8	38	32.35	+42.9	62.5	38	19.26	+43.6	63.9	39	52.6	+45.4	64.7
46	37	17.2	+39.1	58.9	37	46.9	+40.0	59.5	38	17.1																		

**87°, 273° L.H.A.**

## LATITUDE SAME NAME AS DECLINATION

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A. 87°, 273°

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			Dec.
	Hc	d	Z																						
0	1 48.3 -48.0	92.4	0	1 45.8 -48.6	92.4	0	1 43.2 -49.2	92.5	0	1 40.6 -49.7	92.5	0	1 38.0 -50.3	92.5	0	1 35.4 -51.0	92.5	0	1 32.7 -51.5	92.6	0	1 30.0 -52.0	92.6	0	
1	1 00.3 -47.9	93.0	0	1 05.2 -48.6	93.0	0	1 54.0 -49.1	93.0	0	1 50.9 -49.8	93.0	0	1 47.7 -50.4	93.1	0	1 44.4 -50.9	93.1	0	1 41.2 -51.4	93.1	0	1 38.0 -52.0	93.1	1	
2	0 12.4 -48.0	93.6	0	0 08.6 -48.5	93.6	0	0 04.9 -49.2	93.6	0	0 01.1 -49.8	93.6	0	0 02.7 +50.3	86.4	0	0 06.5 +50.9	86.4	0	0 10.2 +51.5	86.4	0	0 14.0 +52.0	86.4	2	
3	0 35.6 +47.9	85.8	0	0 39.9 +48.6	85.8	0	0 44.3 +49.2	85.8	0	0 48.7 +49.8	85.8	0	0 53.0 +50.4	85.9	0	0 57.4 +50.9	85.9	0	1 01.7 +51.4	85.9	1	1 06.0 +52.0	85.9	3	
4	1 23.5 +48.0	85.2	1	1 28.5 +48.6	85.2	1	1 33.5 +49.2	85.3	1	1 38.5 +49.7	85.3	1	1 43.4 +50.3	85.3	1	1 48.3 +50.9	85.3	1	1 53.1 +51.5	85.4	1	1 58.0 +51.9	85.4	4	
5	2 11.5 +47.9	84.6	2	2 17.1 +48.5	84.6	2	2 22.7 +49.1	84.7	2	2 28.2 +49.8	84.7	2	2 33.7 +50.3	84.8	2	2 39.2 +50.9	84.8	2	2 44.6 +51.4	84.9	2	2 49.9 +52.0	84.9	5	
6	2 59.4 +47.9	84.0	3	3 05.6 +48.6	84.0	3	3 11.8 +49.2	84.1	3	3 18.0 +49.7	84.2	3	3 24.0 +50.3	84.2	3	3 30.1 +50.8	84.3	3	3 36.0 +51.4	84.3	3	3 41.9 +51.9	84.4	6	
7	3 47.3 +47.9	83.4	3	3 54.2 +48.5	83.5	4	4 01.0 +49.1	83.5	4	4 07.7 +49.7	83.6	4	4 14.3 +50.3	83.7	4	4 20.9 +50.9	83.7	4	4 27.4 +51.4	83.8	4	4 33.8 +51.9	83.9	7	
8	4 35.2 +47.8	82.8	4	4 42.7 +48.4	82.9	4	5 01.0 +49.0	83.0	4	5 57.4 +49.7	83.0	5	5 04.6 +50.3	83.1	5	5 11.8 +50.8	83.2	5	5 18.8 +51.4	83.3	5	5 25.7 +51.9	83.4	8	
9	5 23.0 +47.8	82.2	5	5 31.1 +48.5	82.3	5	5 39.1 +49.1	82.4	5	5 47.1 +49.6	82.5	5	5 54.9 +50.2	82.6	6	6 02.6 +50.8	82.7	6	6 10.2 +51.3	82.8	6	6 17.6 +51.9	82.9	9	
10	6 10.8 +47.8	81.6	6	6 19.6 +48.4	81.7	6	6 28.2 +49.0	81.8	6	6 36.7 +49.6	81.9	6	6 45.1 +50.2	82.0	6	6 53.4 +50.7	82.1	7	7 01.5 +51.3	82.3	7	7 09.5 +51.8	82.4	10	
11	6 58.6 +47.7	81.0	7	7 08.0 +48.3	81.1	7	7 17.2 +49.0	81.2	7	7 26.3 +49.6	81.3	7	7 35.3 +50.1	81.5	7	7 44.1 +50.7	81.6	7	7 52.8 +51.2	81.7	8	8 01.3 +51.8	81.9	11	
12	7 46.3 +47.7	80.4	7	7 56.3 +48.3	80.5	8	8 06.2 +48.9	80.6	8	8 15.9 +49.5	80.8	8	8 25.4 +50.1	80.9	8	8 34.8 +50.7	81.1	8	8 44.0 +51.3	81.2	8	8 53.1 +51.8	81.4	12	
13	8 34.0 +47.6	79.7	8	8 44.6 +48.3	79.9	8	8 55.1 +48.8	80.0	9	9 05.4 +49.4	80.2	9	9 15.5 +50.0	80.4	9	9 25.5 +50.6	80.5	9	9 35.3 +51.1	80.7	9	9 44.9 +51.7	80.9	13	
14	9 21.6 +47.6	79.1	9	9 32.9 +48.1	79.3	9	9 43.9 +48.8	79.5	9	9 54.8 +49.4	79.6	10	10 05.5 +50.0	79.8	10	10 16.1 +50.5	80.0	10	10 26.4 +51.1	80.2	10	10 36.6 +51.6	80.3	14	
15	10 09.2 +47.5	78.5	10	10 21.0 +48.2	78.7	10	10 32.7 +48.8	78.9	10	10 44.2 +49.4	79.0	10	10 55.5 +49.9	79.2	11	11 06.6 +50.5	79.4	11	11 17.5 +51.1	79.6	11	11 28.2 +51.6	79.8	15	
16	10 56.7 +47.4	77.9	11	10 09.2 +48.0	78.1	11	11 21.5 +48.6	78.3	11	11 33.6 +49.2	78.5	11	11 45.4 +49.9	78.7	11	11 57.1 +50.5	78.9	12	12 08.6 +51.0	79.1	12	12 19.8 +51.6	79.3	16	
17	11 44.1 +47.3	77.3	11	11 57.2 +48.0	77.5	12	12 10.1 +48.6	77.7	12	12 22.8 +49.2	77.9	12	12 35.3 +49.8	78.1	12	12 47.6 +50.3	78.3	12	12 59.6 +50.9	78.5	13	13 11.4 +51.5	78.8	17	
18	12 31.4 +47.2	76.6	12	12 45.2 +47.8	76.8	13	12 58.7 +48.5	77.1	13	13 12.0 +49.1	77.3	13	13 25.1 +49.7	77.5	13	13 37.9 +50.3	77.8	13	13 50.5 +50.9	78.0	14	14 02.9 +51.4	78.2	18	
19	13 18.6 +47.2	76.0	13	13 33.0 +47.8	76.2	13	13 47.2 +48.4	76.5	14	14 01.1 +49.0	76.7	14	14 14.8 +49.6	77.0	14	14 28.2 +50.2	77.2	14	14 41.4 +50.7	77.5	14	14 54.3 +51.3	77.7	19	
20	14 05.8 +47.0	75.4	14	14 20.8 +47.7	75.6	14	14 35.6 +48.3	75.9	14	14 50.1 +49.0	76.1	15	15 04.4 +49.4	76.4	15	15 18.4 +50.1	76.6	15	15 32.1 +50.7	76.9	15	15 45.6 +51.3	77.2	20	
21	14 52.8 +47.0	74.7	15	15 08.5 +47.6	75.0	15	15 23.9 +48.2	75.2	15	15 39.1 +48.8	75.5	15	15 53.9 +49.5	75.8	16	16 08.5 +50.1	76.1	16	16 22.8 +50.6	76.3	16	16 36.9 +51.1	76.6	21	
22	15 39.8 +46.8	74.1	15	15 56.1 +47.4	74.3	16	16 12.1 +48.1	74.6	16	16 27.9 +48.7	74.9	16	16 43.4 +49.3	75.2	16	16 58.6 +49.9	75.5	17	17 13.4 +50.6	75.8	17	17 28.0 +51.1	76.1	22	
23	16 26.6 +46.7	73.4	16	16 43.5 +47.4	73.7	17	17 00.2 +48.0	74.0	17	17 16.6 +48.6	74.3	17	17 32.7 +49.2	74.6	17	17 48.5 +49.8	74.9	18	18 04.0 +50.4	75.2	18	18 19.1 +51.0	75.5	23	
24	17 13.3 +46.5	72.8	17	17 30.9 +47.2	73.1	17	17 48.2 +47.9	73.4	18	18 05.2 +48.5	73.7	18	18 21.9 +49.1	74.0	18	18 38.3 +49.7	74.3	19	18 54.4 +50.3	74.6	19	19 10.1 +50.8	75.0	24	
25	17 59.8 +46.5	72.1	18	18 1.1 +47.1	72.4	18	18 36.1 +47.7	72.7	18	18 53.7 +48.4	73.1	19	19 11.0 +49.0	73.4	19	19 28.0 +49.6	73.7	19	19 44.7 +50.2	74.1	20	20 01.0 +50.7	74.4	25	
26	18 46.3 +46.3	71.4	19	19 05.2 +47.0	71.8	19	19 23.8 +47.6	72.1	19	19 41.1 +48.2	72.4	20	20 00.0 +48.9	72.8	20	20 17.6 +49.5	73.1	20	20 34.9 +50.0	73.5	20	20 51.7 +50.7	73.8	26	
27	19 32.6 +46.1	70.8	19	19 52.2 +46.6	71.1	20	20 11.4 +47.5	71.4	20	20 30.3 +48.1	71.8	20	20 48.9 +48.7	72.2	21	21 07.1 +49.3	72.5	21	21 24.9 +50.0	72.9	21	21 42.4 +50.5	73.3	27	
28	20 18.7 +46.0	70.1	20	20 39.0 +46.6	70.4	20	20 58.9 +47.3	70.8	21	21 18.4 +48.0	71.2	21	21 37.6 +48.7	71.5	21	21 56.4 +49.3	71.9	22	22 14.9 +49.8	72.3	22	22 32.9 +50.4	72.7	28	
29	21 04.7 +45.8	69.4	21	21 25.6 +45.6	69.8	21	21 46.2 +47.1	70.1	22	22 06.4 +47.8	70.5	22	22 26.2 +48.4	70.9	22	22 45.7 +49.0	71.3	23	23 04.7 +49.7	71.7	23	23 23.3 +50.2	72.1	29	
30	21 50.5 +45.6	68.7	22	22 12.1 +46.3	69.1	22	22 33.3 +47.0	69.5	22	22 54.2 +47.6	69.9	23	23 14.6 +48.3	70.3	23	23 34.7 +48.9	70.7	23	23 54.4 +49.5	71.1	24	24 13.6 +50.1	71.5	30	
31	22 36.1 +45.5	68.0	22	22 58.4 +46.1	68.4	23	23 20.3 +46.8	68.8	23	23 41.8 +47.5	69.2	24	24 02.9 +48.1	69.6	24	24 23.6 +48.8	70.0	25	25 03.7 +50.0	70.9	25	25 40.7 +50.9	71.3	31	
32	23 21.6 +45.2	67.3	23	23 44.5 +46.0	67.7	24	24 07.1 +46.6	68.1	24	24 29.3 +47.3	68.5	25	25 10.0 +48.0	68.9	25	25 24.7 +48.6	69.4	25	25 33.3 +49.2	69.8	25	25 53.7 +49.9	70.3	32	
33	24 06.8 +45.1	66.6	24	24 30.5 +45.7	67.4	24	24 53.7 +46.5	67.5	24	24 56.6 +47.1	67.8	25	25 39.0 +47.7	68.3	26	26 22.5 +49.0	69.2	26	26 43.6 +49.6	69.7	26	26 58.2 +49.5	70.1	33	
34	24 51.9 +44.8	65.9	25	25 16.2 +45.6	66.3	25	25 40.2 +46.2	66.7	26	26 03.7 +46.9	67.2	26	26 27.7 +47.6	67.6	26	26 49.4 +48.2	68.1	27	27 11.5 +48.9	68.6	27	27 33.2 +49.5	69.0	34	
35	25 36.7 +44.7	65.1	26	26 01.8 +45.3	65.6	26	26 26.4 +46.0	66.0	26	26 50.6 +46.7	66.5	27	27 14.3 +47.4	66.9	27	27 37.6 +48.0	67.4	28	28 00.4 +48.7	67.9	28	28 22.7 +49.3	68.4	35	
36	26 21.4 +44.3	64.4	26	26 47.1 +45.8	64.8																				

88°, 272° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	1	12.2	+47.9	91.6	1	10.5	+48.6	91.6	1	08.8	+49.2	91.6	1	07.1	+49.7	91.7	1	05.3	+50.4	91.7	1	03.6	+50.9	91.7	1	00.0	+52.0	91.7	0
1	2	00.1	+47.9	91.0	1	59.1	+48.5	91.0	1	58.0	+49.1	91.1	1	56.8	+49.8	91.1	1	55.7	+50.3	91.1	1	54.5	+50.8	91.2	1	53.2	+51.5	91.2	1
2	2	48.0	+47.9	90.4	2	47.6	+48.5	90.4	2	47.1	+49.1	90.5	2	46.6	+49.7	90.5	2	46.0	+50.3	90.6	2	45.3	+50.9	90.6	2	44.7	+51.4	90.7	2
3	3	35.9	+47.9	89.8	3	36.1	+48.5	89.9	3	36.2	+49.1	89.9	3	36.3	+49.7	90.0	3	36.3	+50.3	90.0	3	36.2	+50.9	90.1	3	35.9	+51.9	90.2	3
4	4	23.8	+47.8	89.2	4	24.6	+48.5	89.3	4	25.3	+49.1	89.3	4	26.0	+49.7	89.4	4	26.6	+50.2	89.5	4	27.1	+50.8	89.6	4	27.5	+51.3	89.7	4
5	5	11.6	+47.8	88.6	5	13.1	+48.4	88.7	5	14.4	+49.1	88.8	5	15.7	+49.6	88.9	5	16.8	+50.3	88.9	5	17.9	+50.8	89.0	5	18.8	+51.4	89.1	5
6	6	59.4	+47.8	88.0	6	01.5	+48.4	88.1	6	03.5	+49.0	88.2	6	05.3	+49.6	88.3	6	07.1	+50.1	88.4	6	08.7	+50.7	88.5	6	10.2	+51.3	88.6	6
7	7	47.2	+47.7	87.4	6	49.9	+48.4	87.5	6	52.5	+48.9	87.6	6	54.9	+49.6	87.7	6	57.2	+50.2	87.8	6	59.4	+50.8	88.0	7	01.5	+51.3	88.1	7
8	8	34.9	+47.7	86.8	7	38.3	+48.3	86.9	7	41.4	+49.0	87.0	7	44.5	+49.5	87.2	7	47.4	+50.1	87.3	7	50.2	+50.7	87.4	7	52.8	+51.2	87.6	7
9	9	22.6	+47.6	86.1	8	26.6	+48.2	86.3	8	30.4	+48.8	86.4	8	34.0	+49.5	86.6	8	37.5	+50.1	86.7	8	40.9	+50.6	86.9	8	44.0	+51.2	87.0	8
10	10	9.2	+47.6	85.5	9	14.8	+48.2	85.7	9	19.2	+48.8	85.8	9	23.5	+49.4	86.0	9	27.6	+50.0	86.2	9	31.5	+50.6	86.3	9	35.2	+51.2	86.5	9
11	11	57.8	+47.4	84.9	10	03.0	+48.1	85.1	10	08.0	+48.8	85.3	10	12.9	+49.4	85.4	10	17.6	+49.9	85.6	10	22.1	+50.5	85.8	10	30.5	+51.6	86.2	11
12	12	45.2	+47.4	84.3	10	51.1	+48.1	84.5	10	56.8	+49.7	84.7	11	02.3	+49.3	84.9	11	07.5	+49.9	85.1	11	12.6	+50.5	85.3	11	17.5	+51.0	85.6	12
13	13	32.6	+47.4	83.7	11	39.2	+47.9	83.9	11	45.5	+48.6	84.1	11	51.6	+49.2	84.3	11	57.4	+49.9	84.5	12	03.1	+50.4	84.7	12	08.5	+51.0	84.9	13
14	14	20.0	+47.2	83.0	12	27.1	+47.9	83.2	12	34.1	+48.5	83.5	12	40.8	+49.1	83.7	12	47.3	+49.7	83.9	12	53.5	+50.3	84.1	12	59.5	+50.9	84.4	14
15	15	07.2	+47.1	82.4	13	15.0	+47.8	82.6	13	22.6	+48.4	82.9	13	29.9	+49.1	83.1	13	37.0	+49.7	83.3	13	43.8	+50.3	83.6	13	50.4	+50.8	83.8	15
16	16	53.4	+47.1	81.8	14	02.8	+47.7	82.0	14	11.0	+48.4	82.3	14	19.0	+48.9	82.5	14	26.7	+49.5	82.8	14	34.1	+50.2	83.0	14	41.2	+50.8	83.5	16
17	17	41.4	+46.9	81.1	14	50.5	+47.6	81.4	14	59.4	+48.2	81.6	15	07.9	+48.9	81.9	15	16.2	+49.5	82.5	15	24.3	+50.7	82.7	15	39.5	+51.2	83.0	17
18	18	28.3	+46.8	80.5	15	38.1	+47.5	80.8	15	47.6	+48.1	81.0	15	56.8	+48.8	81.3	16	05.7	+49.4	81.6	16	14.4	+50.0	81.9	16	22.7	+50.6	82.2	18
19	19	15.1	+46.7	79.8	16	25.6	+47.4	80.1	16	35.7	+48.1	80.4	16	45.6	+48.7	80.7	16	55.1	+49.3	81.0	17	04.4	+49.9	81.3	17	13.3	+50.5	81.6	19
20	20	17.8	+46.6	79.2	17	13.0	+47.2	79.5	17	23.8	+47.9	79.8	17	34.3	+48.5	80.1	17	44.4	+49.2	80.4	17	54.3	+49.8	80.7	18	03.8	+50.4	81.0	20
21	21	48.4	+46.5	78.5	18	00.2	+47.1	78.8	18	11.7	+47.8	79.1	18	22.8	+48.4	79.5	18	33.6	+49.1	79.8	18	44.1	+49.6	80.1	18	54.2	+50.3	80.5	21
22	22	34.9	+46.3	77.8	18	47.3	+47.0	78.2	18	59.5	+47.6	78.5	19	11.2	+48.3	78.8	19	22.7	+48.9	79.2	19	33.7	+49.6	79.5	19	44.5	+50.1	79.9	22
23	23	21.2	+46.1	77.2	19	34.3	+46.9	77.5	19	47.1	+47.5	77.9	19	59.5	+48.2	78.2	20	11.6	+48.8	78.6	20	23.3	+50.1	79.3	20	45.6	+50.6	79.7	23
24	24	07.3	+46.0	76.5	20	21.2	+46.6	76.9	20	34.6	+47.4	77.2	20	47.7	+48.0	77.6	21	00.4	+48.7	78.0	21	12.7	+49.4	78.3	21	24.7	+49.9	78.7	24
25	25	53.3	+45.8	75.8	21	07.8	+46.6	76.2	21	22.0	+47.2	76.6	21	35.7	+47.9	77.3	22	02.1	+49.1	77.7	22	14.6	+49.8	78.1	22	26.8	+50.4	78.5	25
26	26	39.1	+45.7	75.1	21	54.4	+46.3	75.5	22	09.2	+47.0	75.9	22	23.6	+47.7	76.3	22	37.6	+48.4	76.7	22	51.2	+49.1	77.1	23	04.4	+49.7	77.5	26
27	27	24.8	+45.5	74.4	22	40.7	+46.2	74.8	22	56.2	+46.9	75.2	23	11.3	+47.6	75.6	23	26.0	+48.2	76.1	23	40.3	+48.8	76.5	24	54.1	+49.5	76.9	27
28	28	10.3	+45.3	73.7	23	26.9	+46.0	74.1	23	43.1	+46.7	74.5	23	58.9	+47.4	75.0	24	14.2	+48.1	75.4	24	29.1	+48.7	75.8	24	43.6	+49.3	76.3	28
29	29	55.6	+45.0	73.0	24	12.9	+45.8	73.4	24	29.4	+46.5	73.9	24	46.3	+47.3	74.3	25	02.3	+47.9	74.7	25	17.8	+48.6	75.2	25	32.9	+49.2	75.7	29
30	30	40.6	+44.9	72.3	24	58.7	+45.6	72.7	25	16.3	+46.3	73.2	25	33.5	+47.0	73.6	25	50.2	+47.6	74.1	26	06.4	+48.4	74.5	26	22.1	+49.1	75.0	30
31	31	25.5	+44.7	71.5	25	44.3	+45.4	72.0	26	02.6	+46.1	72.5	26	20.5	+46.8	72.9	26	37.8	+47.5	73.4	26	54.8	+48.1	73.9	27	11.2	+48.8	74.4	31
32	32	10.2	+44.4	70.8	26	29.7	+45.1	71.3	26	48.7	+45.9	71.7	27	07.3	+46.6	72.2	27	25.3	+47.3	72.7	27	42.9	+48.0	73.2	28	00.0	+48.7	73.7	32
33	33	26.4	+44.4	70.0	27	14.8	+44.9	70.5	27	34.6	+45.6	71.0	27	53.9	+46.3	71.5	28	12.6	+47.1	72.0	28	30.9	+47.8	72.5	28	48.7	+48.4	73.1	33
34	34	56.4	+44.4	66.1	31	20.3	+44.3	66.7	32	31.1	+44.7	67.2	32	50.7	+45.8	68.4	32	27.5	+46.6	69.0	32	48.7	+47.3	69.6	33	09.4	+48.0	70.2	38
35	35	15.6	+44.3	65.3	32	04.6	+44.1	65.9	32	04.6	+44.8	66.5	32	09.5	+45.2	67.1	32	18.7	+47.5	71.8	32	39.7	+47.5	72.4	32	55.0	+48.9	72.9	34
36	36	35.5	+43.9	64.3	32	35.9	+43.6	64.2	32	37.5	+43.4	64.8	32	35.7	+44.1	65.4	33	03.6	+43.2	61.9	38	31.6	+44.0	62.5	38	58.9	+44.8	63.3	36
37	37	45.4	+43.9	63.3	32	37.4	+43.5	63.7	32	38.4	+40.4	58.7	32	38.9	+38.9	68.6	31	19.6	+46.1	69.1	31	40.7	+46.8	69.7	32	01.2	+47.5	70.3	37
38	38	0.7	+43.8	63.4	32	36.7	+																						

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $88^\circ$ ,  $272^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			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	1 12.2	-47.9	91.6	1 10.5	-48.5	91.6	1 08.8	-49.1	91.6	1 07.1	-49.8	91.7	1 05.3	-50.3	91.7	1 03.6	-50.9	91.7	1 01.8	-51.4	91.7	1 00.0	-52.0	91.7	0
1	0 24.3	-48.0	92.2	0 22.0	-48.6	92.2	0 19.7	-49.2	92.2	0 17.3	-49.7	92.2	0 15.0	-50.3	92.2	0 12.7	-50.9	92.2	0 10.4	-51.5	92.2	0 08.0	-52.0	92.2	1
2	0 23.7	+47.9	87.2	0 26.6	+48.5	87.2	0 29.5	+49.2	87.2	0 32.4	+49.8	87.2	0 35.3	+50.3	87.2	0 38.2	+50.9	87.2	0 41.1	+51.4	87.3	0 44.0	+51.9	87.3	2
3	1 11.6	+47.9	86.6	1 15.1	+48.6	86.6	1 18.7	+49.1	86.6	1 22.2	+49.7	86.7	1 25.6	+50.4	86.7	1 29.1	+50.9	86.7	1 32.5	+51.5	86.7	1 35.9	+52.0	86.8	3
4	1 59.5	+47.9	86.0	2 03.7	+48.5	86.1	2 07.8	+49.2	86.1	2 11.9	+49.7	86.1	2 16.0	+50.3	86.1	2 20.0	+50.9	86.2	2 24.0	+51.4	86.2	2 27.9	+51.9	86.3	4
5	2 47.4	+47.9	85.4	2 52.2	+48.5	85.4	2 57.0	+49.1	85.5	3 01.6	+49.8	85.5	3 06.3	+50.3	85.6	3 10.9	+50.8	85.7	3 15.4	+51.4	85.7	3 19.8	+52.0	85.8	5
6	3 35.3	+47.9	84.8	3 40.7	+48.5	84.9	3 46.1	+49.1	84.9	3 51.4	+49.7	85.0	3 56.6	+50.2	85.1	4 01.7	+50.8	85.1	4 06.8	+51.4	85.2	4 11.8	+51.9	85.3	6
7	4 23.2	+47.8	84.2	4 29.2	+48.5	84.3	4 35.2	+49.1	84.3	4 41.1	+49.6	84.4	4 46.8	+50.3	84.5	4 52.5	+50.9	84.6	4 58.2	+51.3	84.7	5 03.7	+51.9	84.8	7
8	5 11.0	+47.8	83.6	5 17.7	+48.4	83.7	5 24.3	+49.0	83.8	5 30.7	+49.7	83.9	5 37.1	+50.2	84.0	5 43.4	+50.7	84.1	5 49.5	+51.3	84.2	5 55.6	+51.8	84.3	8
9	5 58.8	+47.8	83.0	6 06.1	+48.4	83.1	6 13.3	+49.0	83.2	6 20.4	+49.6	83.3	6 27.3	+50.2	83.4	6 34.1	+50.8	83.5	6 40.8	+51.3	83.6	6 47.4	+51.9	83.8	9
10	6 46.6	+47.7	82.4	6 54.5	+48.3	82.5	7 02.3	+48.9	82.6	7 10.0	+49.5	82.7	7 17.5	+50.1	82.9	7 24.9	+50.7	83.0	7 32.1	+51.3	83.1	7 39.3	+51.8	83.2	10
11	7 34.3	+47.7	81.8	7 42.8	+48.3	81.9	7 51.2	+49.0	82.0	7 59.5	+49.5	82.2	8 07.6	+50.1	82.3	8 15.6	+50.6	82.4	8 23.4	+51.2	82.6	8 31.1	+51.7	82.7	11
12	8 22.0	+47.6	81.1	8 31.1	+48.3	81.3	8 40.2	+48.8	81.4	8 49.0	+49.5	81.6	8 57.7	+50.1	81.7	9 06.2	+50.7	81.9	9 14.6	+51.2	82.1	9 22.8	+51.7	82.2	12
13	9 09.6	+47.5	80.5	9 19.4	+48.2	80.7	9 29.0	+48.8	80.8	9 38.5	+49.4	81.0	9 47.8	+49.9	81.2	9 56.9	+50.5	81.4	10 05.8	+51.1	81.5	10 14.5	+51.7	81.7	13
14	9 57.1	+47.5	79.9	10 07.6	+48.1	80.1	10 17.8	+48.7	80.3	10 27.9	+49.3	80.4	10 37.7	+50.0	80.6	10 47.4	+50.5	80.8	10 56.9	+51.1	81.0	11 06.2	+51.6	81.2	14
15	10 44.6	+47.4	79.3	10 55.7	+48.0	79.5	11 06.5	+48.7	79.7	11 17.2	+49.3	79.9	11 27.7	+49.8	80.1	11 37.9	+50.5	80.3	11 48.0	+51.0	80.5	11 57.8	+51.6	80.7	15
16	11 32.0	+47.3	78.7	11 43.7	+48.0	78.9	11 55.2	+48.6	79.1	12 06.5	+49.2	79.3	12 17.5	+49.8	79.5	12 28.4	+50.3	79.7	12 39.0	+50.9	79.9	12 49.4	+51.5	80.1	16
17	12 19.3	+47.3	78.0	12 31.7	+47.9	78.2	12 43.8	+48.5	78.5	12 55.7	+49.1	78.7	13 07.3	+49.7	78.9	13 18.7	+50.3	79.1	13 29.9	+50.9	79.4	13 40.9	+51.4	79.6	17
18	13 06.6	+47.1	77.4	13 19.6	+47.7	77.6	13 32.3	+48.4	77.9	13 44.8	+49.0	78.1	13 57.0	+49.7	78.3	14 09.0	+50.3	78.6	14 20.8	+50.8	78.8	14 32.3	+51.3	79.1	18
19	13 53.7	+47.1	76.8	14 07.3	+47.7	77.0	14 20.7	+48.3	77.3	14 33.8	+49.0	77.5	14 46.7	+49.5	77.8	14 59.3	+50.1	78.0	15 11.6	+50.7	78.3	15 23.6	+51.3	78.6	19
20	14 40.8	+46.9	76.1	14 55.0	+47.6	76.4	15 09.0	+48.3	76.6	15 22.8	+48.6	76.9	15 36.2	+49.5	77.2	15 49.4	+50.0	77.5	16 02.3	+50.6	77.7	16 14.9	+51.2	78.0	20
21	15 27.7	+46.8	75.5	15 42.6	+47.5	75.7	15 57.3	+48.1	76.0	16 11.6	+48.7	76.3	16 25.7	+49.3	76.6	16 39.4	+50.0	76.9	16 52.9	+50.5	77.2	17 06.1	+51.1	77.5	21
22	16 14.5	+46.7	74.8	16 30.1	+47.4	75.1	16 45.4	+48.0	75.4	17 00.3	+48.7	75.7	17 15.0	+49.3	76.0	17 29.4	+49.8	76.3	17 43.4	+50.5	76.6	17 57.2	+51.0	76.9	22
23	17 01.2	+46.6	74.2	17 17.5	+47.2	74.5	17 33.4	+47.9	74.8	17 49.0	+48.5	75.1	18 04.3	+49.1	75.4	18 19.2	+49.8	75.7	18 33.9	+50.3	76.0	18 48.2	+50.9	76.4	23
24	17 47.8	+46.5	73.5	18 04.7	+47.1	73.8	18 21.3	+47.7	74.1	18 37.5	+48.4	74.5	18 53.4	+49.0	74.8	19 09.0	+49.6	75.1	19 24.2	+50.2	75.5	19 39.1	+50.8	75.8	24
25	18 34.3	+46.3	72.8	18 51.8	+47.0	73.2	19 09.0	+47.6	73.5	19 25.9	+48.3	73.8	19 42.4	+48.9	74.2	19 58.6	+49.5	74.5	20 14.4	+50.1	74.9	20 29.9	+50.7	75.2	25
26	19 20.6	+46.1	72.2	19 38.8	+46.8	72.5	19 56.6	+47.5	72.9	20 14.2	+48.1	73.2	20 31.3	+48.8	73.6	20 48.1	+49.4	73.9	21 04.5	+50.0	74.3	21 20.6	+50.6	74.7	26
27	20 06.7	+46.0	71.5	20 25.6	+46.7	71.8	20 44.1	+47.4	72.2	21 02.3	+48.0	72.6	21 20.1	+48.6	72.9	21 37.5	+49.2	73.3	21 54.5	+49.9	73.7	22 11.2	+50.4	74.1	27
28	20 52.7	+45.9	70.8	21 12.3	+46.5	71.2	21 31.5	+47.1	71.5	21 50.3	+47.8	71.9	22 08.7	+48.5	72.3	22 26.7	+49.1	72.7	22 44.4	+49.7	73.1	23 01.6	+50.3	73.5	28
29	21 38.6	+45.6	70.1	21 58.8	+46.3	70.5	22 18.6	+47.0	70.9	22 38.1	+47.7	71.3	22 57.2	+48.3	71.7	23 15.8	+49.0	72.1	23 34.1	+49.6	72.5	23 51.9	+50.2	72.9	29
30	22 24.2	+45.5	69.4	22 45.1	+46.2	69.8	23 05.6	+46.9	70.2	23 25.8	+47.5	70.6	23 45.5	+48.1	71.0	24 04.8	+48.8	71.4	24 23.7	+49.4	71.9	24 42.1	+50.1	72.3	30
31	23 09.7	+45.3	68.7	23 31.3	+46.0	69.1	23 52.5	+46.6	69.5	24 13.3	+47.3	69.9	23 36.4	+48.0	70.4	24 53.6	+48.6	70.8	25 13.1	+49.3	71.2	25 32.2	+49.8	71.7	31
32	23 55.0	+45.1	68.0	24 17.3	+45.7	68.4	24 39.1	+46.5	68.8	25 00.6	+47.1	69.3	25 21.6	+47.8	69.7	26 02.4	+49.0	70.2	26 20.4	+49.6	70.6	26 39.0	+50.1	70.7	32
33	24 40.1	+44.8	67.3	25 03.0	+45.6	67.7	25 25.6	+46.3	68.1	25 47.7	+47.0	68.6	26 09.4	+47.2	69.0	26 30.7	+48.2	69.5	26 51.4	+49.0	70.0	27 11.8	+49.5	70.4	33
34	25 24.9	+44.6	66.5	25 48.6	+45.4	67.0	26 11.9	+46.0	67.4	26 34.7	+46.7	67.9	26 57.0	+47.4	68.4	27 18.9	+48.1	68.8	28 01.3	+49.4	69.8	28 08.8	+49.8	70.3	34
35	26 09.6	+44.4	65.8	26 34.0	+45.1	66.2	26 57.9	+45.8	66.7	27 21.4	+46.5	67.2	27 44.4	+47.3	67.7	28 07.0	+47.9	68.2	28 29.1	+48.5	68.7	28 50.7	+49.2	69.2	35
36	26 54.0	+44.2	65.0	25 35.7	+44.9	65.5	27 43.7	+45.6	66.0	28 07.9	+46.3	66.5	28 31.7	+46.8	67.0	28 54.9	+47.7	67.5	29 17.6	+48.4	68.0	29 39.9	+49.0	68.5	36
37	27 38.2	+43.9	64.3	28 04.0	+44.6	64.8	28 29.3	+45.4	65.2	28 54.2	+46.1	65.7	29 18.6	+46.8	66.3	30 06.0	+48.1	67.3	30 28.9	+48.7	67.8	37			
38	28 22.1	+43.7	63.5	28 48.6	+44.4	64.0	29 14.7</																		

89°, 271° 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.	53°			54°			55°			56°			57°			58°			59°			60°			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	0	36.1	+47.9	90.8	0	35.3	+48.5	90.8	0	34.4	+49.2	90.8	0	33.6	+49.7	90.8	0	32.7	+50.3	90.8	0	31.8	+50.9	90.8	0	30.9	+51.4	90.9	0	30.0	+52.0	90.9	0
1	1	24.0	+47.9	90.2	1	23.8	+48.5	90.2	1	23.6	+49.1	90.2	1	23.3	+49.7	90.3	1	23.0	+50.3	90.3	1	22.7	+50.9	90.3	1	22.3	+51.5	90.3	1	22.0	+51.9	90.4	1
2	2	11.9	+47.9	89.6	2	12.3	+48.6	89.6	2	12.7	+49.1	89.7	2	13.0	+49.7	89.7	2	13.3	+50.3	89.7	2	13.6	+50.8	89.8	2	13.8	+51.4	89.8	2	13.9	+52.0	89.9	2
3	3	59.8	+47.9	89.0	3	0.9	+48.5	89.0	3	0.18	+49.1	89.1	3	0.27	+49.8	89.1	3	0.36	+50.3	89.2	3	0.44	+50.9	89.3	3	0.52	+51.4	89.3	3	0.59	+51.9	89.4	3
4	4	37.7	+47.9	88.4	3	49.4	+48.4	88.5	3	50.9	+49.1	88.5	3	52.5	+49.6	88.6	3	53.9	+50.3	88.7	3	55.3	+51.3	88.8	3	56.6	+51.3	88.8	3	57.8	+51.9	88.9	4
5	4	35.6	+47.8	87.8	4	37.8	+48.5	87.9	4	40.0	+49.1	87.9	4	42.1	+49.7	88.0	4	44.2	+50.2	88.1	4	46.1	+50.8	88.2	4	47.9	+51.4	88.3	4	49.7	+51.9	88.4	5
6	5	23.4	+47.8	87.2	5	26.3	+48.4	87.3	5	29.1	+49.0	87.4	5	31.8	+49.6	87.5	5	34.4	+50.2	87.6	5	36.9	+50.8	87.7	5	39.3	+51.3	87.8	5	41.6	+51.9	87.9	6
7	6	11.2	+47.7	86.6	6	14.7	+48.4	86.7	6	18.1	+49.0	86.8	6	21.4	+49.6	86.9	6	24.6	+50.2	87.0	6	27.7	+50.7	87.1	6	30.6	+51.3	87.2	6	33.5	+51.8	87.3	7
8	7	58.9	+47.7	86.0	7	0.31	+48.3	86.1	7	0.71	+48.9	86.2	7	1.10	+49.5	86.3	7	1.48	+50.1	86.5	7	1.84	+50.7	86.6	7	2.19	+51.3	86.7	7	25.3	+51.8	86.8	8
9	7	46.6	+47.6	85.3	7	51.4	+48.3	85.5	7	56.6	+48.9	85.6	8	60.5	+49.5	85.8	8	64.9	+50.1	85.9	8	69.1	+50.7	86.0	8	13.2	+51.2	86.2	8	17.1	+51.8	86.3	9
10	8	34.2	+47.6	84.7	8	39.7	+48.2	84.9	8	44.9	+48.9	85.0	8	50.0	+49.5	85.2	8	55.0	+50.0	85.3	8	59.8	+50.6	85.5	9	0.44	+51.2	85.7	9	0.89	+51.7	85.8	10
11	9	21.8	+47.5	84.1	9	27.9	+48.1	84.3	9	33.8	+48.7	84.4	9	39.5	+49.4	84.6	9	45.0	+50.0	84.8	9	50.4	+50.5	85.0	9	55.6	+51.1	85.1	10	0.06	+51.6	85.3	11
12	10	09.3	+47.5	83.5	10	16.0	+48.1	83.7	10	22.5	+48.5	83.9	10	28.9	+49.3	84.0	10	35.0	+49.9	84.4	10	40.9	+50.5	84.4	10	46.7	+51.1	84.6	10	52.2	+51.7	84.8	12
13	10	56.8	+47.3	82.9	11	04.1	+48.0	83.1	11	11.3	+48.6	83.3	11	18.2	+49.3	83.5	11	24.9	+49.9	83.7	11	31.4	+50.5	83.9	11	37.8	+51.0	84.1	11	43.9	+51.5	84.3	13
14	11	44.1	+47.3	82.2	11	52.1	+48.0	82.5	11	59.9	+48.6	82.7	12	07.5	+49.1	82.9	12	14.8	+49.8	83.1	12	21.9	+50.4	83.3	12	28.8	+50.9	83.5	12	35.4	+51.5	83.7	14
15	12	31.4	+47.2	81.6	12	40.1	+47.8	81.8	12	48.5	+48.5	82.1	12	55.6	+49.1	82.3	13	04.6	+49.7	82.5	13	12.3	+50.3	82.8	13	19.7	+50.9	83.0	13	26.9	+51.4	83.2	15
16	13	18.6	+47.1	81.0	13	27.9	+47.8	81.2	13	37.0	+48.3	81.5	13	45.7	+49.1	81.7	13	54.3	+49.6	81.9	14	02.6	+50.2	82.2	14	10.6	+50.8	82.4	14	18.3	+51.4	82.7	16
17	14	05.7	+47.0	80.3	14	15.7	+47.6	80.6	14	25.3	+48.3	80.8	14	34.8	+48.9	81.1	14	43.9	+49.5	81.4	14	52.8	+50.1	81.6	15	01.4	+50.7	81.9	15	09.7	+51.3	82.2	17
18	14	52.7	+46.9	79.7	15	03.3	+47.6	80.0	15	13.6	+48.3	80.2	15	23.7	+48.8	80.5	15	33.4	+49.5	80.8	15	42.9	+50.1	81.1	15	52.1	+50.6	81.3	16	0.0	+51.2	81.6	18
19	15	39.6	+46.8	79.1	15	50.9	+47.4	79.3	16	01.9	+48.0	79.6	16	12.5	+48.7	79.9	16	22.9	+49.3	80.2	16	33.0	+49.9	80.5	16	42.7	+50.6	80.8	16	52.2	+51.1	81.1	19
20	16	26.4	+46.7	78.4	16	38.3	+47.4	78.7	16	49.5	+48.0	79.0	17	01.2	+48.7	79.3	17	12.2	+49.3	79.6	17	22.9	+49.7	79.9	17	33.3	+50.4	80.2	17	43.3	+51.0	80.5	20
21	17	13.1	+46.5	77.8	17	25.7	+47.2	78.1	17	37.9	+47.9	78.4	17	49.4	+48.5	78.7	18	01.5	+49.1	79.0	18	12.8	+49.7	79.3	18	23.7	+50.4	79.6	18	34.3	+51.0	80.0	21
22	17	59.6	+46.4	77.1	18	12.9	+47.0	77.4	18	25.8	+47.7	77.7	18	38.4	+48.3	78.1	18	50.6	+49.0	78.4	19	02.5	+49.6	78.7	19	14.1	+50.2	79.1	19	25.3	+50.8	79.4	22
23	18	46.0	+46.3	76.4	18	59.9	+47.0	76.8	19	13.5	+47.6	77.1	19	26.7	+48.3	77.4	19	39.6	+48.9	77.8	19	52.1	+49.6	78.1	20	04.3	+50.1	78.5	20	16.1	+50.7	78.8	23
24	19	32.3	+46.1	75.7	19	46.9	+46.8	76.1	20	01.1	+47.5	76.4	20	15.0	+48.1	76.8	20	28.5	+48.8	77.2	20	41.7	+49.3	77.5	21	50.4	+50.0	77.9	21	06.8	+50.6	78.3	24
25	20	18.4	+45.9	75.1	20	33.7	+46.6	75.4	20	48.6	+47.3	75.8	21	03.1	+48.0	76.2	21	17.3	+48.6	76.5	21	31.0	+49.3	76.9	21	44.4	+49.9	77.3	21	57.4	+50.5	77.7	25
26	21	04.3	+45.8	74.4	21	20.3	+46.4	74.8	21	35.9	+47.1	75.1	21	51.1	+47.8	75.5	22	05.9	+48.4	75.9	22	20.3	+49.7	76.3	22	47.9	+50.3	76.7	22	54.7	+50.7	77.1	26
27	21	50.1	+45.6	73.7	22	06.7	+46.3	74.1	22	23.0	+47.0	74.5	22	38.9	+47.6	74.9	22	54.3	+48.4	75.3	23	09.4	+49.0	75.7	23	24.0	+49.6	76.1	23	38.2	+50.2	76.5	27
28	22	35.7	+45.4	73.0	22	53.0	+46.2	73.4	23	10.0	+46.8	73.8	23	26.5	+47.5	74.2	23	42.7	+48.1	74.6	23	58.4	+48.8	75.1	24	13.6	+49.5	75.5	24	28.4	+50.1	75.9	28
29	23	21.1	+45.2	72.3	23	39.2	+45.9	72.7	23	56.8	+46.3	73.1	24	14.0	+47.3	73.5	24	30.8	+48.0	73.9	24	47.4	+48.6	74.4	25	03.1	+49.2	74.9	25	18.5	+49.9	75.3	29
30	24	06.3	+45.0	71.6	24	25.1	+45.7	72.0	24	43.4	+46.5	72.4	25	01.3	+47.2	72.9	25	18.8	+47.8	73.3	25	35.8	+48.5	73.8	25	52.3	+49.2	74.2	26	08.4	+49.8	74.7	30
31	24	51.3	+44.8	70.8	25	10.8	+45.5	71.3	25	29.9	+46.2	71.7	25	48.5	+46.9	72.2	26	06.6	+47.6	72.6	26	24.3	+48.2	73.1	26	41.5	+48.9	73.6	26	58.2	+49.6	74.1	31
32	25	36.1	+44.6	70.1	25	56.3	+45.3	70.5	26	16.1	+46.0	71.0	26	35.4	+46.7	71.5	27	12.5	+48.1	72.4	27	30.4	+48.8	72.9	27	47.8	+49.4	73.4	32				
33	26	20.7	+44.3	69.3	26	41.6	+45.1	69.8	27	02.1	+45.8	70.3	27	22.1	+46.5	70.8	28	00.6	+47.9	71.3	28	19.2	+48.5	72.3	28	37.2	+49.2	72.8	33				
34	27</																																

**LATITUDE CONTRARY NAME TO DECLINATION**

L.H.A.  $89^\circ$ ,  $271^\circ$

Dec.	53°			54°			55°			56°			57°			58°			59°			Dec.											
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z									
0	0	36.1	-47.9	90.8	0	35.3	-48.6	90.8	0	34.4	-49.1	90.8	0	33.6	-49.8	90.8	0	32.7	-50.3	90.8	0	31.8	-50.9	90.8	0	30.9	-51.4	90.9	0	30.0	-52.0	90.9	0
1	1	11.8	+47.9	88.6	0	13.3	+48.5	88.6	0	14.7	+49.2	88.6	0	16.2	+49.7	88.6	0	17.6	+50.4	88.6	0	19.1	+50.9	88.6	0	20.5	+51.5	88.6	0	22.0	+51.9	88.6	1
2	2	59.7	+47.9	88.0	1	01.8	+48.6	88.0	1	03.9	+49.1	88.0	1	05.9	+49.8	88.1	1	08.0	+50.3	88.1	1	10.0	+50.9	88.1	1	12.0	+51.4	88.1	1	13.9	+52.0	88.1	2
3	3	47.6	+48.0	87.4	1	50.4	+48.5	87.4	1	53.0	+49.2	87.5	1	55.7	+49.7	87.5	1	58.3	+50.3	87.5	2	00.9	+50.8	87.6	2	03.4	+51.4	87.6	2	05.9	+51.9	87.6	3
4	4	35.6	+47.8	86.8	2	38.9	+48.5	86.8	2	42.2	+49.1	86.9	2	45.4	+49.7	86.9	2	48.6	+50.3	87.0	2	51.7	+50.9	87.0	2	54.8	+51.4	87.1	2	57.8	+52.0	87.1	4
5	5	23.4	+47.9	86.2	3	27.4	+48.5	86.2	3	31.3	+49.1	86.3	3	35.1	+49.7	86.4	3	38.9	+50.2	86.4	3	42.6	+50.8	86.5	3	46.2	+51.4	86.6	3	49.8	+51.9	86.6	5
6	6	41.3	+47.8	85.6	4	15.9	+48.4	85.7	4	20.4	+49.1	85.7	4	24.8	+49.7	85.8	4	29.1	+50.3	85.9	4	33.4	+50.8	86.0	4	37.6	+51.3	86.0	4	41.7	+51.9	86.1	6
7	8	45.9	+47.8	84.4	5	52.8	+48.4	84.5	5	58.5	+49.0	84.6	6	04.1	+49.6	84.7	6	09.6	+50.2	84.8	6	15.0	+50.8	84.9	6	20.3	+51.3	85.0	6	25.4	+51.9	85.1	8
9	9	34.7	+47.7	83.8	6	41.2	+48.3	83.9	6	47.5	+48.9	84.0	6	53.7	+49.6	84.1	6	59.8	+50.1	84.2	7	05.8	+50.7	84.4	7	11.6	+51.2	84.5	7	17.3	+51.8	84.6	9
10	10	22.4	+47.7	83.2	7	29.5	+48.3	83.3	7	36.4	+49.0	83.4	7	43.3	+49.5	83.5	7	49.9	+50.1	83.7	7	55.6	+50.6	83.8	8	02.8	+51.3	84.0	8	09.1	+51.8	84.1	10
11	11	10.1	+47.6	82.5	8	17.8	+48.2	82.7	8	25.4	+48.8	82.8	8	32.8	+49.4	83.0	8	40.0	+50.1	83.1	8	47.1	+50.7	83.3	8	54.1	+51.2	83.4	9	00.9	+51.7	83.6	11
12	12	07.5	+47.2	79.4	12	18.4	+47.9	79.6	12	29.0	+48.6	79.9	12	39.5	+49.1	80.1	12	49.7	+49.7	80.3	12	59.7	+50.3	80.5	13	09.4	+50.9	80.8	13	19.0	+51.4	81.0	16
13	13	54.5	+47.5	78.8	13	06.3	+47.8	79.0	13	17.6	+48.4	79.3	13	28.6	+49.1	79.5	13	39.4	+49.7	79.7	13	50.0	+50.3	80.0	14	00.3	+50.8	80.2	14	10.4	+51.4	80.5	17
14	14	41.9	+47.0	78.2	13	54.1	+47.7	78.4	14	06.0	+48.3	78.7	14	17.7	+48.9	78.9	14	29.1	+49.6	79.2	14	40.3	+50.1	79.4	15	01.8	+51.3	79.9	15	18.9	+47.0	77.5	19
15	15	32.7	+47.4	80.7	10	42.3	+48.1	80.9	10	51.8	+48.6	81.1	11	01.0	+49.3	81.3	11	10.0	+49.9	81.4	11	18.8	+50.5	81.6	11	27.5	+51.0	81.8	11	35.9	+51.5	82.0	14
16	16	20.1	+47.4	80.1	11	30.4	+48.0	80.3	11	40.4	+48.6	80.5	11	50.3	+49.2	80.7	11	59.9	+49.8	80.9	12	09.3	+50.4	81.1	12	18.5	+50.9	81.3	12	27.4	+51.6	81.5	15
17	17	07.5	+47.2	79.4	12	18.4	+47.9	79.6	12	29.0	+48.6	79.9	12	39.5	+49.1	80.1	12	49.7	+49.7	80.3	12	59.7	+50.3	80.5	13	09.4	+50.9	80.8	13	19.0	+51.4	81.0	16
18	18	54.7	+47.2	78.8	13	06.3	+47.8	79.0	13	17.6	+48.4	79.3	13	28.6	+49.1	79.5	13	39.4	+49.7	79.7	13	50.0	+50.3	80.0	14	00.3	+50.8	80.2	14	10.4	+51.4	80.5	17
19	19	41.9	+47.0	78.2	13	54.1	+47.7	78.4	14	06.0	+48.3	78.7	14	17.7	+48.9	78.9	14	29.1	+49.6	79.2	14	40.3	+50.1	79.4	15	01.8	+51.3	79.9	15	18.9	+47.0	77.5	19
20	20	15.9	+46.8	76.9	15	29.4	+47.5	77.2	15	42.6	+48.1	77.4	15	55.5	+48.8	77.6	15	68.1	+49.4	78.0	16	20.5	+50.0	78.3	16	32.5	+50.6	78.6	16	44.3	+51.1	78.8	20
21	21	06.2	+46.8	76.2	16	16.9	+47.3	76.5	16	30.7	+48.0	76.8	16	44.3	+48.6	77.1	16	57.5	+49.3	77.4	17	10.5	+49.8	77.7	17	23.1	+50.5	78.0	17	35.4	+51.2	78.3	21
22	22	49.5	+46.5	75.6	17	04.2	+47.3	75.9	17	18.7	+47.9	76.2	17	32.9	+48.6	76.5	17	46.8	+49.1	76.8	18	00.3	+49.8	77.1	18	13.6	+50.3	77.4	18	26.5	+50.9	77.7	22
23	23	36.0	+46.5	74.9	17	51.5	+47.1	75.2	18	06.6	+47.8	75.5	18	21.5	+48.4	75.9	18	35.9	+49.1	76.2	18	50.1	+49.7	76.5	19	03.9	+50.3	76.9	19	17.4	+50.8	77.2	23
24	24	22.5	+46.3	74.3	18	38.6	+47.0	74.6	18	54.4	+47.7	74.9	19	09.9	+48.3	75.2	19	25.0	+48.9	75.6	19	39.8	+49.5	75.9	19	54.2	+50.1	76.3	20	08.2	+50.8	76.6	24
25	25	08.8	+46.2	73.6	19	25.6	+46.9	73.9	19	42.1	+47.5	74.3	19	58.2	+48.1	74.6	20	13.9	+48.8	75.0	20	29.3	+49.4	75.3	20	44.3	+50.1	75.7	20	59.0	+50.6	76.1	25
26	26	55.0	+46.0	72.9	20	12.5	+46.7	73.3	20	29.6	+47.4	73.6	20	46.3	+48.1	74.0	21	02.7	+48.7	74.3	21	18.7	+49.3	74.7	21	34.4	+49.8	75.1	21	49.6	+50.5	75.5	26
27	27	40.1	+45.9	72.2	20	59.2	+46.5	72.6	21	17.0	+47.2	73.0	21	31.4	+48.4	73.3	21	51.4	+48.5	73.7	22	08.0	+49.2	74.1	22	24.2	+49.8	74.5	22	40.1	+50.4	74.9	27
28	28	21.9	+45.7	71.5	21	45.7	+46.4	71.9	22	04.2	+47.0	72.3	22	22.2	+47.7	72.7	22	39.9	+48.3	73.1	22	57.2	+49.0	73.5	23	14.0	+49.6	73.9	23	30.5	+50.2	74.3	28
29	29	12.6	+45.5	70.8	22	32.1	+46.2	71.2	22	51.2	+46.9	71.6	23	09.9	+47.6	72.0	23	28.2	+48.3	72.4	23	46.2	+48.2	72.9	24	03.6	+49.5	73.3	24	20.7	+50.1	73.7	29
30	30	25.8	+45.3	70.1	23	18.3	+46.0	70.5	23	38.1	+46.7	70.9	23	57.5	+47.4	71.4	24	16.5	+48.0	71.8	24	35.0	+48.7	72.2	24	53.1	+49.3	72.7	25	10.8	+49.9	73.1	30
31	31	23.4	+45.1	69.4	24	04.3	+45.8	69.8	24	24.8	+46.5	70.3	24	44.9	+49.1	70.7	25	04.5	+47.8	71.1	25	23.7	+48.5	71.6	26	00.7	+49.8	72.5	31				
32	32	24.8	+44.9	68.7	24	50.1	+45.6	69.1	25	11.3	+46.3	69.6	25	32.0	+47.0	70.0	25	52.3	+47.7	70.5	26	12.2	+48.3	70.9	26	31.6	+48.6	71.4	32	50.5	+49.6	71.9	32
33	33	52.1	+41.2	58.4	34	23.3	+42.0	59.0	34	54.0	+42.7	59.5	35	24.2	+43.4	60.4	35	53.7	+44.3	60.8	36	22.7	+45.0	61.4	36	51.1	+45.8	62.1	37	18.9	+46.5	62.7	45
34	34	33.3	+40.8	57.5	35	05.3	+41.5	58.1	35	36.7	+42.4	58.7	36	07.6	+43.1	59.3	36	38.0	+43.9	59.9	37	07.7	+44.7	60.6	37	36.9	+45.4	61.3	38	05.4	+46.2	61.9	46
35	35	44.1	+40.3	56.6	35</																												

90°, 270° 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.	53°			54°			55°			56°			57°			58°			59°			60°			Dec.
	Hc	d	Z																						
0	0 00.0	+47.9	90.0	0 00.0	+48.5	90.0	0 00.0	+49.1	90.0	0 00.0	+49.7	90.0	0 00.0	+50.3	90.0	0 00.0	+50.9	90.0	0 00.0	+51.4	90.0	0 00.0	+52.0	90.0	0
1	0 47.9	+47.9	89.4	0 48.5	+48.6	89.4	0 49.1	+49.2	89.4	0 49.7	+49.8	89.4	0 50.3	+50.3	89.5	0 50.9	+50.9	89.5	0 51.4	+51.5	89.5	0 52.0	+51.9	89.5	1
2	1 35.8	+47.9	88.8	1 37.1	+48.5	88.8	1 38.3	+49.1	88.9	1 39.5	+49.7	88.9	1 40.6	+50.3	88.9	1 41.8	+50.8	88.9	1 42.9	+51.4	89.0	1 43.9	+52.0	89.0	2
3	2 23.7	+47.9	88.2	2 25.6	+48.5	88.2	2 27.4	+49.1	88.3	2 29.2	+49.7	88.3	2 30.9	+50.3	88.4	2 32.6	+50.9	88.4	2 34.3	+51.4	88.5	2 35.9	+51.9	88.5	3
4	3 11.6	+47.9	87.6	3 14.1	+48.5	87.6	3 16.5	+49.1	87.7	3 18.9	+49.7	87.8	3 21.2	+50.3	87.8	3 23.5	+50.7	87.9	3 25.7	+51.4	87.9	3 27.8	+51.9	88.0	4
5	3 59.5	+47.8	87.0	4 02.6	+48.5	87.1	4 05.6	+49.1	87.1	4 08.6	+49.7	87.2	4 11.5	+50.3	87.3	4 14.3	+50.8	87.3	4 17.1	+51.3	87.4	4 19.7	+51.9	87.5	5
6	4 47.3	+47.8	86.4	4 51.1	+48.4	86.5	4 54.7	+49.1	86.6	4 58.3	+49.6	86.6	5 01.8	+50.2	86.7	5 05.1	+50.8	86.8	5 08.4	+51.4	86.9	5 11.6	+51.9	87.0	6
7	5 35.1	+47.8	85.8	5 39.5	+48.4	85.9	5 43.8	+49.0	86.0	5 47.9	+49.6	86.1	5 52.0	+50.2	86.2	5 55.9	+50.8	86.3	5 59.8	+51.3	86.4	6 03.5	+51.9	86.5	7
8	6 22.9	+47.7	85.2	6 27.9	+48.3	85.3	6 32.8	+48.9	85.4	6 37.5	+49.6	85.5	6 42.2	+50.1	85.6	6 46.7	+50.7	85.7	6 51.1	+51.3	85.9	6 55.4	+51.8	86.0	8
9	7 10.6	+47.7	84.6	7 16.2	+48.4	84.7	7 21.7	+49.0	84.8	7 27.1	+49.5	84.9	7 32.3	+50.1	85.1	7 37.4	+50.7	85.2	7 42.4	+51.2	85.3	7 47.2	+51.7	85.5	9
10	7 58.3	+47.6	83.9	8 04.6	+48.2	84.1	8 10.7	+48.8	84.2	8 16.6	+49.5	84.4	8 22.4	+50.1	84.5	8 28.1	+50.6	84.7	8 33.6	+51.2	84.8	8 38.9	+51.8	85.0	10
11	8 45.9	+47.6	83.3	8 52.8	+48.2	83.5	8 59.5	+48.9	83.6	9 06.1	+49.4	83.8	9 12.5	+50.0	84.0	9 18.7	+50.6	84.1	9 24.8	+51.1	84.3	9 30.7	+51.7	84.4	11
12	9 33.5	+47.6	82.7	9 41.0	+48.1	82.9	9 48.4	+48.7	83.0	9 55.5	+49.4	83.2	10 02.5	+50.0	83.4	10 09.3	+50.6	83.6	10 15.9	+51.1	83.8	10 22.4	+51.6	83.9	12
13	10 21.0	+47.4	82.1	10 29.1	+48.1	82.3	10 37.1	+48.7	82.5	10 44.9	+49.3	82.6	10 52.5	+49.9	82.8	10 59.9	+50.4	83.0	11 07.0	+51.1	83.2	11 14.0	+51.6	83.4	13
14	11 08.4	+47.3	81.5	11 17.2	+48.0	81.7	11 25.8	+48.6	81.9	11 34.2	+49.2	82.1	11 42.4	+49.8	82.3	11 50.3	+50.4	82.5	11 58.1	+51.0	82.7	12 05.6	+51.6	82.9	14
15	11 55.7	+47.3	80.8	12 05.2	+47.9	81.0	12 14.4	+48.6	81.3	12 23.4	+49.2	81.5	12 32.2	+49.8	81.7	12 40.7	+50.4	81.9	12 49.1	+50.9	82.1	12 57.2	+51.4	82.4	15
16	12 43.0	+47.2	80.2	12 53.1	+47.8	80.4	13 03.0	+48.4	80.7	13 12.6	+49.0	80.9	13 22.0	+49.6	81.1	13 31.1	+50.3	81.4	13 40.0	+50.8	81.6	13 48.6	+51.4	81.8	16
17	13 30.2	+47.1	79.6	13 40.9	+47.8	79.8	13 51.4	+48.4	80.0	14 01.6	+49.0	80.3	14 11.6	+49.6	80.5	14 21.4	+50.1	80.8	14 30.8	+50.8	81.1	14 40.0	+51.3	81.7	17
18	14 17.3	+46.9	78.9	14 28.7	+47.6	79.2	14 39.8	+48.2	79.4	14 50.6	+48.9	79.7	15 01.2	+49.5	80.0	15 11.5	+50.1	80.2	15 21.6	+50.7	80.5	15 31.3	+51.3	80.8	18
19	15 04.2	+46.9	78.3	15 16.3	+47.5	78.6	15 28.0	+48.2	78.8	15 39.5	+48.8	79.1	15 50.7	+49.4	79.4	16 01.6	+50.1	79.7	16 12.3	+50.6	79.9	16 22.6	+51.2	80.2	19
20	15 51.1	+46.8	77.6	16 03.8	+47.4	77.9	16 16.2	+48.1	78.2	16 28.3	+48.7	78.5	16 40.1	+49.3	78.8	16 51.7	+49.9	79.1	17 02.9	+50.5	79.4	17 13.8	+51.0	79.7	20
21	16 37.9	+46.6	77.0	16 51.2	+47.3	77.3	17 04.3	+47.9	77.6	17 17.0	+48.6	77.9	17 29.4	+49.2	78.2	17 41.6	+49.8	78.5	17 53.4	+50.4	78.8	18 04.8	+51.0	79.1	21
22	17 24.5	+46.5	76.3	17 38.5	+47.2	76.6	17 52.2	+47.8	77.0	18 05.6	+48.4	77.3	18 18.6	+49.1	77.6	18 31.4	+49.7	77.9	18 43.8	+50.3	78.2	18 55.8	+50.9	78.6	22
23	18 11.0	+46.3	75.7	18 25.7	+47.0	76.0	18 40.0	+47.7	76.3	19 07.7	+49.0	77.0	19 21.1	+49.6	77.3	19 34.1	+50.2	77.7	19 46.7	+50.8	78.0	23			
24	18 57.3	+46.2	75.0	19 12.7	+46.9	75.3	19 27.7	+47.6	75.7	19 42.4	+48.2	76.0	19 56.7	+48.8	76.4	20 10.7	+49.4	76.7	20 24.3	+50.0	77.1	20 37.5	+50.6	77.4	24
25	19 43.5	+46.1	74.3	19 59.6	+46.7	74.7	20 15.3	+47.4	75.0	20 30.6	+48.0	75.4	20 45.5	+48.7	75.7	21 00.1	+49.4	76.1	21 14.3	+50.0	76.5	21 28.1	+50.6	76.9	25
26	20 29.6	+45.9	73.6	20 46.3	+46.6	74.0	21 02.7	+47.2	74.4	21 18.6	+48.0	74.7	21 34.2	+48.6	75.1	21 49.5	+49.1	75.5	22 04.3	+49.8	75.9	22 18.7	+50.4	76.3	26
27	21 15.5	+45.7	73.0	21 32.9	+46.4	73.3	21 49.9	+47.1	73.7	22 06.6	+47.7	74.1	22 22.8	+48.4	74.5	22 38.6	+49.1	74.9	22 54.1	+49.7	75.3	23 09.1	+50.3	75.7	27
28	22 01.2	+45.6	72.3	22 19.3	+46.3	72.6	22 37.0	+46.9	73.0	22 54.3	+47.6	73.4	23 11.2	+48.3	73.8	23 27.7	+48.9	74.3	23 43.8	+49.5	74.7	23 59.4	+50.1	75.1	28
29	22 46.8	+45.3	71.6	23 05.6	+46.0	72.0	23 23.9	+46.8	72.4	23 41.9	+47.4	72.8	23 59.5	+48.1	73.2	24 16.6	+48.7	73.6	24 33.3	+49.4	74.1	24 49.5	+50.0	74.5	29
30	23 32.1	+45.2	70.8	23 51.6	+45.9	71.3	24 10.7	+46.6	71.7	24 29.3	+47.3	72.1	24 47.6	+47.9	72.5	25 05.3	+48.6	73.0	25 22.7	+49.2	73.4	25 39.5	+49.9	73.9	30
31	24 17.3	+45.0	70.1	24 37.5	+45.7	70.5	25 57.3	+46.3	71.0	25 16.6	+47.0	71.4	25 35.5	+47.7	71.9	25 53.9	+48.4	72.3	26 11.9	+49.0	72.8	26 29.4	+49.7	73.3	31
32	25 02.3	+44.7	69.4	25 23.2	+45.4	69.8	25 43.6	+46.3	70.3	26 03.6	+46.9	70.7	26 23.2	+47.5	71.2	26 42.3	+48.2	71.7	26 59.0	+48.7	72.0	26 80.6	+49.3	72.0	32
33	25 47.0	+44.5	68.7	26 08.6	+45.3	69.1	26 29.8	+45.9	69.6	26 50.5	+46.6	70.0	27 10.7	+47.4	70.5	27 30.5	+48.0	71.0	27 49.8	+48.7	71.5	28 08.6	+49.3	72.0	33
34	26 31.5	+44.3	67.9	26 53.9	+45.0	68.4	27 15.7	+45.8	68.8	27 37.1	+46.5	69.3	28 18.5	+47.8	70.3	28 38.5	+48.4	70.8	28 57.9	+49.1	71.4	28 57.9	+49.1	71.4	34
35	27 15.8	+44.0	67.1	27 38.9	+44.7	67.6	28 01.5	+45.4	68.1	28 23.6	+46.2	68.6	28 45.2	+46.9	69.1	29 06.3	+47.6	69.6	29 26.9	+48.3	70.2	29 47.0	+49.0	70.7	35
36	27 59.8	+43.8	66.4	28 23.6	+44.5	66.9	28 46.9	+45.3	67.4	29 09.8	+45.9	67.9	29 32.1	+46.7	68.4	29 53.9	+47.4	68.9	30 15.2	+48.1	69.5	30 36.0	+48.7	70.0	36
37	28 43.6	+43.5	65.6	29 08.1	+44.3	66.1	29 32.2	+45.0	66.6	29 55.7	+45.7	67.2	30 18.8	+46.4	67.7	30 41.3	+47.1	68.2	31 03.3	+47.8	68.8	31 24.7	+48.5	69.4	37
38	29 27.1	+43.2	64.																						

LATITUDE \*CONTRARY NAME TO DECLINATION

L.H.A. 90°, 270°

Dec.	53°			54°			55°			56°			57°			58°			59°			60°			Dec.
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	
	°	'	,	°	'	,	°	'	,	°	'	,	°	'	,	°	'	,	°	'	,	°	'	,	°
0	0	00.0	+47.9	90.0	0	00.0	+48.5	90.0	0	00.0	+49.1	90.0	0	00.0	+49.7	90.0	0	00.0	+50.3	90.0	0	00.0	+51.4	90.0	0
1	0	47.9	+47.9	89.4	0	48.5	+48.6	89.4	0	49.1	+49.2	89.4	0	49.7	+49.8	89.4	0	50.3	+50.3	89.5	0	50.9	+50.9	89.5	1
2	1	35.8	+47.9	88.8	1	37.1	+48.5	88.8	1	38.3	+49.1	88.9	1	39.5	+49.7	88.9	1	40.6	+50.3	88.9	1	41.8	+50.8	88.9	1
3	2	23.7	+47.9	88.2	2	25.6	+48.5	88.2	2	27.4	+49.1	88.3	2	29.2	+49.7	88.3	2	30.9	+50.3	88.4	2	32.6	+50.9	88.4	3
4	3	11.6	+47.9	87.6	3	14.1	+48.5	87.6	3	16.5	+49.1	87.7	3	18.9	+49.7	87.8	3	21.2	+50.3	87.8	3	23.5	+50.8	87.9	4
5	5	59.5	+47.8	87.0	4	02.6	+48.5	87.1	4	05.6	+49.1	87.1	4	08.6	+49.7	87.2	4	11.5	+50.3	87.3	4	14.3	+50.8	87.3	5
6	6	47.3	+47.8	86.4	4	51.1	+48.4	86.5	4	54.7	+49.1	86.6	4	58.3	+49.6	86.6	5	01.8	+50.2	86.7	5	05.1	+50.8	86.8	6
7	7	35.1	+47.8	85.8	5	39.5	+48.4	85.9	5	43.8	+49.0	86.0	5	47.9	+49.6	86.1	5	52.0	+50.2	86.2	5	55.9	+50.8	86.3	7
8	8	22.9	+47.7	85.2	6	27.9	+48.3	85.3	6	32.8	+48.9	85.4	6	37.5	+49.6	85.5	6	42.2	+50.1	85.6	6	46.7	+50.7	85.7	8
9	9	10.6	+47.7	84.6	7	16.2	+48.4	84.7	7	21.7	+49.0	84.8	7	27.1	+49.5	84.9	7	32.3	+50.1	85.1	7	37.4	+50.7	85.2	9
10	10	58.3	+47.6	83.9	8	04.6	+48.2	84.1	8	10.7	+48.8	84.2	8	16.6	+49.5	84.4	8	22.4	+50.1	84.5	8	28.1	+50.6	84.7	10
11	11	45.9	+47.6	83.3	8	52.8	+48.2	83.5	8	59.5	+48.9	83.6	9	06.1	+49.4	83.8	9	12.5	+50.0	84.0	9	18.7	+50.6	84.1	11
12	12	33.5	+47.5	82.7	9	41.0	+48.1	82.9	9	48.4	+48.7	83.0	10	02.5	+49.2	83.2	10	09.3	+50.6	83.6	10	15.9	+51.1	83.8	12
13	13	20.1	+47.4	82.1	10	29.1	+48.1	82.3	10	37.1	+48.7	82.5	10	44.9	+49.3	82.6	10	52.5	+49.9	82.8	10	59.9	+50.4	83.0	13
14	14	10.8	+47.3	81.5	11	17.2	+48.0	81.7	11	25.8	+48.6	81.9	11	34.2	+49.2	82.1	11	42.4	+49.8	82.3	11	50.3	+50.4	82.5	14
15	15	55.7	+47.3	80.8	12	05.2	+47.9	81.0	12	14.4	+48.6	81.3	12	23.4	+49.2	81.5	12	32.2	+49.8	81.7	12	40.7	+50.4	81.9	15
16	16	43.0	+47.2	80.2	12	53.1	+47.8	80.4	13	03.0	+48.4	80.7	13	12.6	+49.0	80.9	13	22.0	+49.6	81.1	13	31.1	+50.3	81.4	16
17	17	30.2	+47.1	79.6	13	40.9	+47.8	79.8	13	51.4	+48.4	80.1	14	01.6	+49.0	80.3	14	11.6	+49.6	80.5	14	21.4	+50.1	80.8	17
18	18	17.3	+46.9	78.9	14	28.7	+47.6	79.2	14	39.8	+48.2	79.4	14	50.6	+48.9	79.7	15	01.2	+49.5	80.0	15	21.6	+50.7	80.5	18
19	19	15.0	+46.9	78.3	15	16.3	+47.5	78.6	15	28.0	+48.2	78.8	15	39.5	+48.8	79.1	15	50.7	+49.4	79.4	16	01.6	+50.1	79.7	19
20	20	15.1	+46.8	77.6	16	03.8	+47.8	77.9	16	16.2	+48.1	78.2	16	28.3	+48.7	78.5	16	40.1	+49.3	78.8	16	51.7	+49.9	79.1	20
21	21	37.9	+46.7	77.0	16	51.2	+47.3	77.3	17	04.3	+47.9	77.6	17	17.0	+48.6	77.9	17	29.4	+49.2	78.2	17	41.6	+49.8	78.5	21
22	22	24.5	+46.5	76.3	17	38.5	+47.2	76.6	17	52.2	+47.8	77.0	18	05.6	+48.4	77.3	18	18.6	+49.1	77.6	18	34.8	+50.3	78.2	22
23	23	11.0	+46.3	75.7	18	25.7	+47.0	76.0	18	40.0	+47.7	76.3	18	54.0	+48.4	76.6	19	07.7	+47.4	77.0	19	21.1	+49.6	77.3	23
24	24	57.3	+46.2	75.0	19	12.7	+46.9	75.3	19	27.7	+47.6	75.7	19	42.4	+48.2	76.0	19	56.7	+48.8	76.4	20	10.7	+49.4	76.7	24
25	25	49.3	+46.1	74.3	19	59.6	+46.7	74.7	20	15.3	+47.4	75.0	20	30.6	+48.0	75.4	20	45.5	+48.7	75.7	21	00.1	+49.4	76.1	25
26	26	20.9	+45.9	73.6	20	46.3	+46.6	74.0	21	02.7	+47.2	74.4	21	18.6	+48.0	74.7	21	34.2	+48.6	75.1	21	49.5	+49.1	75.5	26
27	27	21.5	+45.7	73.0	21	32.9	+46.4	73.3	21	49.9	+47.1	73.7	22	06.6	+47.7	74.1	22	22.8	+48.4	74.5	22	38.6	+49.1	74.9	27
28	28	21.2	+45.6	72.3	22	19.3	+46.3	72.6	22	37.0	+46.9	73.0	22	54.3	+47.6	73.4	23	11.2	+48.3	73.8	23	27.7	+48.9	74.3	28
29	29	24.6	+45.3	71.6	23	05.6	+46.0	72.0	23	23.9	+46.8	72.4	23	41.9	+47.4	72.8	23	59.5	+48.1	73.2	24	16.3	+48.7	73.6	29
30	30	32.1	+45.2	70.8	23	51.6	+45.9	71.3	24	10.7	+46.6	71.7	24	29.3	+47.3	72.1	24	47.6	+47.9	72.5	25	05.3	+48.6	73.0	30
31	31	17.3	+45.0	70.1	24	37.5	+45.7	70.5	24	57.3	+46.3	71.0	25	16.6	+47.0	71.4	25	35.5	+47.7	71.9	26	11.9	+49.0	72.8	31
32	32	20.3	+44.7	69.4	25	23.2	+45.4	69.8	25	43.6	+46.2	70.3	26	30.6	+46.9	70.7	26	23.2	+47.5	71.2	27	07.0	+48.9	72.2	32
33	33	47.0	+44.5	68.7	26	08.6	+45.3	69.1	26	29.8	+45.9	69.6	26	50.5	+46.6	70.0	27	10.7	+47.4	70.5	27	31.8	+48.9	70.5	33
34	34	31.5	+44.3	67.9	27	15.7	+45.8	68.4	27	37.1	+46.5	69.3	27	58.1	+47.1	69.8	28	18.5	+47.8	70.3	28	38.5	+48.4	70.8	34
35	35	15.8	+44.0	67.1	27	38.9	+44.7	67.6	28	01.5	+45.4	68.1	28	23.6	+46.2	68.6	28	45.2	+46.9	69.1	29	06.3	+47.6	69.6	35
36	36	27.8	+43.8	66.4	28	23.6	+44.5	66.9	28	46.9	+45.3	67.4	29	32.1	+45.7	67.9	29	53.1	+47.4	68.9	30	15.2	+48.1	69.5	36
37	37	24.3	+43.6	65.6	29	08.1	+44.3	66.1	29	32.2	+45.0	66.6	29	55.7	+45.8	67.2	30	18.8	+46.4	67.7	31	30.3	+47.8	68.8	37
38	38	27.1	+43.2	64.8	30	17.2	+43.8	65.3	30	17.2	+44.7	65.9	30	41.5	+45.4	66.4	31	05.2	+46.2	66.9	31	51.1	+47.6	68.1	38
39	39	10.3	+42.9	64.0	31	01.9	+43.4	65.1	31	26.9	+45.3	65.6	31	36.2	+46.0	66.8	31	51.4	+45.9	67.6	32	38.7	+47.3	67.4	39
40	40	32.0	+42.7	63.1	32	11.2	+43.4	63.6	32	10.2	+43.9	64.3	32	37.3	+45.6	64.9	33	37.3	+45.6	65.4	34	22.0	+46.1	65.9	40
41	41	35.8	+42.5	62.4	33	35.3	+43.1	62.9	33	30.5	+43.8	63.5	33	57.0	+44.5	64.1	34	22.9	+45.7	64.7	34	34.3	+46.1	65.3	41
42	42	31.8	+42.1	61.5	34	46.5	+42.7	62.1	34	13.3	+44.5	62.7	34	41.5	+45.1	63.3	34	08.2	+45.1	64.5	34	59.9	+46.5	65.5	42
43	43	30.0	+41.																						