

TABLE 5 Natural and Numerical Chart Scales					
Natural Scale	Miles Per Inch		Inches Per Mile		Feet Per Inch
	Nautical	Statute	Nautical	Statute	
1:500	0.007	0.008	145.83	126.72	41.67
1:600	0.008	0.009	121.52	105.60	50.00
1:1,000	0.014	0.016	72.91	63.36	83.33
1:1,200	0.016	0.019	60.76	52.80	100.00
1:1,500	0.021	0.024	48.61	42.24	125.00
1:2,000	0.027	0.032	36.46	31.68	166.67
1:2,400	0.033	0.038	30.38	26.40	200.00
1:2,500	0.034	0.039	29.17	25.34	208.33
1:3,000	0.041	0.047	24.30	21.12	250.00
1:3,600	0.049	0.057	20.25	17.60	300.00
1:4,000	0.055	0.063	18.23	15.84	333.33
1:4,800	0.066	0.076	15.19	13.20	400.00
1:5,000	0.069	0.079	14.58	12.67	416.67
1:6,000	0.082	0.095	12.15	10.56	500.00
1:7,000	0.096	0.110	10.42	9.05	583.33
1:7,200	0.099	0.114	10.13	8.80	600.00
1:7,920	0.109	0.125	9.21	8.00	660.00
1:8,000	0.110	0.126	9.11	7.92	666.67
1:8,400	0.115	0.133	8.68	7.54	700.00
1:9,000	0.123	0.142	8.10	7.04	750.00
1:9,600	0.132	0.152	7.60	6.60	800.00
1:10,000	0.137	0.158	7.29	6.34	833.33
1:10,800	0.148	0.170	6.75	5.87	900.00
1:12,000	0.165	0.189	6.08	5.28	1,000.00
1:13,200	0.181	0.208	5.52	4.80	1,100.00
1:14,400	0.197	0.227	5.06	4.40	1,200.00
1:15,000	0.206	0.237	4.86	4.22	1,250.00
1:15,600	0.214	0.246	4.67	4.06	1,300.00
1:15,840	0.217	0.250	4.60	4.00	1,320.00
1:16,000	0.219	0.253	4.56	3.96	1,333.33
1:16,800	0.230	0.265	4.34	3.77	1,400.00
1:18,000	0.247	0.284	4.05	3.52	1,500.00
1:19,200	0.263	0.303	3.80	3.30	1,600.00
1:20,000	0.274	0.316	3.65	3.17	1,666.67
1:20,400	0.280	0.322	3.57	3.11	1,700.00
1:21,120	0.290	0.333	3.45	3.00	1,760.00
1:21,600	0.296	0.341	3.38	2.93	1,800.00
1:22,800	0.313	0.360	3.20	2.78	1,900.00
1:24,000	0.329	0.379	3.04	2.64	2,000.00
1:25,000	0.343	0.395	2.92	2.53	2,083.33
1:40,000	0.549	0.631	1.82	1.58	3,333.33
1:48,000	0.658	0.758	1.52	1.32	4,000.00
1:50,000	0.686	0.789	1.46	1.27	4,166.67
1:62,500	0.857	0.986	1.17	1.01	5,208.33
1:63,360	0.869	1.000	1.15	1.00	5,280.00
1:75,000	1.029	1.184	0.97	0.85	6,250.00
1:80,000	1.097	1.263	0.91	0.79	6,666.67
1:100,000	1.371	1.578	0.73	0.63	8,333.33
1:125,000	1.714	1.973	0.58	0.51	10,416.67
1:200,000	2.743	3.157	0.36	0.32	16,666.67
1:250,000	3.429	3.946	0.29	0.25	20,833.33
1:400,000	5.486	6.313	0.18	0.16	33,333.33
1:500,000	6.857	7.891	0.15	0.13	41,666.67
1:750,000	10.286	11.837	0.10	0.08	62,500.00
1:1,000,000	13.715	15.783	0.07	0.06	83,333.33
FORMULAS	$\frac{\text{SCALE}}{72,913.39}$	$\frac{\text{SCALE}}{63,360}$	$\frac{72,913.39}{\text{SCALE}}$	$\frac{63,360}{\text{SCALE}}$	$\frac{\text{SCALE}}{12}$

Lat.	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	Lat.
0	0.0	59.6	119.2	178.9	238.6	298.4	358.3	418.2	478.4	538.6	0
1	01.0	60.6	20.2	79.9	39.6	299.4	59.3	19.2	79.4	39.6	1
2	02.0	61.6	21.2	80.9	40.6	300.4	60.3	20.2	80.4	40.6	2
3	03.0	62.6	22.2	81.9	41.6	01.4	61.3	21.2	81.4	41.7	3
4	04.0	63.6	23.2	82.9	42.6	02.4	62.2	22.2	82.4	42.7	4
5	5.0	64.6	24.2	83.9	43.6	303.4	363.2	423.2	483.4	543.7	5
6	06.0	65.6	25.2	84.8	44.6	04.4	64.2	24.2	84.4	44.7	6
7	07.0	66.6	26.2	85.8	45.6	05.4	65.2	25.3	85.4	45.7	7
8	07.9	67.5	27.2	86.8	46.6	06.4	66.2	26.3	86.4	46.7	8
9	08.9	68.5	28.2	87.8	47.6	07.4	67.2	27.3	87.4	47.7	9
10	9.9	69.5	29.2	88.8	48.6	308.3	368.2	428.3	488.4	548.7	10
11	10.9	70.5	30.2	89.8	49.6	09.3	69.2	29.3	89.4	49.7	11
12	11.9	71.5	31.1	90.8	50.5	10.3	70.2	30.3	90.4	50.7	12
13	12.9	72.5	32.1	91.8	51.5	11.3	71.2	31.3	91.4	51.7	13
14	13.9	73.5	33.1	92.8	52.5	12.3	72.2	32.3	92.4	52.7	14
15	14.9	74.5	34.1	93.8	53.5	313.3	373.2	433.3	493.4	553.7	15
16	15.9	75.5	35.1	94.8	54.5	14.3	74.2	34.3	94.4	54.7	16
17	16.9	76.5	36.1	95.8	55.5	15.3	75.2	35.3	95.4	55.7	17
18	17.9	77.5	37.1	96.8	56.5	16.3	76.2	36.3	96.4	56.7	18
19	18.9	78.5	38.1	97.8	57.5	17.3	77.2	37.3	97.4	57.7	19
20	19.9	79.5	39.1	98.8	58.5	318.3	378.2	438.3	498.4	558.8	20
21	20.9	80.5	40.1	199.8	59.5	19.3	79.2	39.3	499.4	59.8	21
22	21.9	81.5	41.1	200.8	60.5	20.3	80.2	40.3	500.4	60.8	22
23	22.8	82.5	42.1	01.8	61.5	21.3	81.2	41.3	01.4	61.8	23
24	23.8	83.4	43.1	02.8	62.5	22.3	82.2	42.3	02.5	62.8	24
25	24.8	84.4	44.1	203.8	263.5	323.3	383.2	443.3	503.5	563.8	25
26	25.8	85.4	45.1	04.7	64.5	24.3	84.2	44.3	04.5	64.8	26
27	26.8	86.4	46.1	05.7	65.5	25.3	85.2	45.3	05.5	65.8	27
28	27.8	87.4	47.1	06.7	66.5	26.3	86.2	46.3	06.5	66.8	28
29	28.8	88.4	48.0	07.7	67.5	27.3	87.2	47.3	07.5	67.8	29
30	29.8	89.4	49.0	208.7	268.5	328.3	388.2	448.3	508.5	568.8	30
31	30.8	90.4	50.0	09.7	69.5	29.3	89.2	49.3	09.5	69.8	31
32	31.8	91.4	51.0	10.7	70.5	30.3	90.2	50.3	10.5	70.8	32
33	32.8	92.4	52.0	11.7	71.5	31.3	91.2	51.3	11.5	71.9	33
34	33.8	93.4	53.0	12.7	72.5	32.3	92.2	52.3	12.5	72.9	34
35	34.8	94.4	54.0	213.7	273.5	333.3	393.2	453.3	513.5	573.9	35
36	35.8	95.4	55.0	14.7	74.5	34.3	94.2	54.3	14.5	74.9	36
37	36.8	96.4	56.0	15.7	75.4	35.3	95.2	55.3	15.5	75.9	37
38	37.7	97.4	57.0	16.7	76.4	36.3	96.2	56.3	16.5	76.9	38
39	38.7	98.4	58.0	17.7	77.4	37.3	97.2	57.3	17.5	77.9	39
40	39.7	99.3	159.0	218.7	278.4	338.3	398.2	458.3	518.5	578.9	40
41	40.7	100.3	60.0	19.7	79.4	39.3	399.2	59.3	19.5	79.9	41
42	41.7	01.3	61.0	20.7	80.4	40.3	400.2	60.3	20.5	80.9	42
43	42.7	02.3	62.0	21.7	81.4	41.3	01.2	61.3	21.5	81.9	43
44	43.7	03.3	63.0	22.7	82.4	42.3	02.2	62.3	22.5	82.9	44
45	44.7	104.3	164.0	223.7	283.4	343.3	403.2	463.3	523.6	583.9	45
46	45.7	05.3	65.0	24.7	84.4	44.3	04.2	64.3	24.5	85.0	46
47	46.7	06.3	65.9	25.6	85.4	45.3	05.2	65.3	25.6	86.0	47
48	47.7	07.3	66.9	26.6	86.4	46.3	06.2	66.3	26.6	87.0	48
49	48.7	08.3	67.9	27.6	87.4	47.3	07.2	67.3	27.6	88.0	49
50	49.7	109.3	168.9	228.6	288.4	348.3	408.2	468.3	528.6	589.0	50
51	50.7	10.3	69.9	29.6	89.4	49.3	09.2	69.3	29.6	90.0	51
52	51.7	11.3	70.9	30.6	90.4	50.3	10.2	70.3	30.6	91.0	52
53	52.6	12.3	71.9	31.6	91.4	51.3	11.2	71.3	31.6	92.0	53
54	53.6	13.3	72.9	32.6	92.4	52.3	12.2	72.3	32.6	93.0	54
55	54.6	114.3	173.9	233.6	293.4	353.3	413.2	473.3	533.6	594.0	55
56	55.6	15.2	74.9	34.6	94.4	54.3	14.2	74.4	34.6	95.0	56
57	56.6	16.2	75.9	35.6	95.4	55.3	15.2	75.4	35.6	96.0	57
58	57.6	17.2	76.9	36.6	96.4	56.3	16.2	76.4	36.6	97.1	58
59	58.6	18.2	77.9	37.6	97.4	57.3	17.2	77.4	37.6	98.1	59
60	59.6	119.2	178.9	238.6	298.4	358.3	418.2	478.4	538.6	599.1	60
Lat.	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	Lat.

Lat.	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	Lat.
0	599.1	659.7	720.5	781.6	842.9	904.5	966.4	1028.6	1091.1	1154.0	0
1	600.1	60.7	21.6	82.6	43.9	05.5	67.4	29.6	92.1	55.0	1
2	01.1	61.7	22.6	83.6	45.0	06.6	68.4	30.7	93.2	56.1	2
3	02.1	62.7	23.6	84.7	46.0	07.6	69.5	31.7	94.2	57.1	3
4	03.1	63.7	24.6	85.7	47.0	08.6	70.5	32.7	95.3	58.2	4
5	604.1	664.8	725.6	786.7	848.0	909.6	971.6	1033.8	1096.3	1159.3	5
6	05.1	65.8	26.6	87.7	49.1	10.7	72.6	34.8	97.4	60.3	6
7	06.1	66.8	27.6	88.7	50.1	11.7	73.6	35.9	98.4	61.4	7
8	07.1	67.8	28.7	89.8	51.1	12.7	74.7	36.9	99.5	62.4	8
9	08.2	68.8	29.7	90.8	52.1	13.8	75.7	37.9	100.5	63.5	9
10	609.2	669.8	730.7	791.8	853.2	914.8	976.7	1039.0	1101.6	1164.5	10
11	10.2	70.8	31.7	92.8	54.2	15.8	77.8	40.0	02.6	65.6	11
12	11.2	71.9	32.7	93.8	55.2	16.9	78.8	41.1	03.7	66.6	12
13	12.2	72.9	33.7	94.9	56.2	17.9	79.8	42.1	04.7	67.7	13
14	13.2	73.9	34.8	95.9	57.3	18.9	80.9	43.1	05.7	68.7	14
15	614.2	674.9	735.8	796.9	858.3	919.9	981.9	1044.2	1106.8	1169.8	15
16	15.2	75.9	36.8	97.9	59.3	21.0	82.9	45.2	07.8	70.8	16
17	16.2	76.9	37.8	98.9	60.3	22.0	84.0	46.3	08.9	71.9	17
18	17.2	77.9	38.8	99.0	61.4	23.0	85.0	47.3	09.9	72.9	18
19	18.3	78.9	39.8	01.0	62.4	24.1	86.0	48.3	11.0	74.0	19
20	619.3	680.0	740.9	802.0	863.4	925.1	987.1	1049.4	1112.0	1175.0	20
21	20.3	81.0	41.9	03.0	64.4	26.1	88.1	50.4	13.1	76.1	21
22	21.3	82.0	42.9	04.1	65.5	27.2	89.1	51.5	14.1	77.1	22
23	22.3	83.0	43.9	05.1	66.5	28.2	90.2	52.5	15.2	78.2	23
24	23.3	84.0	44.9	06.1	67.5	29.2	91.2	53.5	16.2	79.3	24
25	624.3	685.0	746.0	807.1	868.5	930.2	992.3	1054.6	1117.3	1180.3	25
26	25.3	86.0	47.0	08.1	69.6	31.3	93.3	55.6	18.3	81.4	26
27	26.3	87.1	48.0	09.2	70.6	32.3	94.3	56.7	19.4	82.4	27
28	27.3	88.1	49.0	10.2	71.6	33.3	95.4	57.7	20.4	83.5	28
29	28.4	89.1	50.0	11.2	72.6	34.4	96.4	58.8	21.5	84.5	29
30	629.4	690.1	751.0	812.2	873.7	935.4	997.4	1059.8	1122.5	1185.6	30
31	30.4	91.1	52.1	13.2	74.7	36.4	98.5	60.8	23.5	86.6	31
32	31.4	92.1	53.1	14.3	75.7	37.5	99.5	61.9	24.6	87.7	32
33	32.4	93.1	54.1	15.3	76.8	38.5	100.5	62.9	25.6	88.7	33
34	33.4	94.1	55.1	16.3	77.8	39.5	01.6	64.0	26.7	89.8	34
35	634.4	695.2	756.1	817.3	878.8	940.6	1002.6	1065.0	1127.7	1190.9	35
36	35.4	96.2	57.1	18.4	79.8	41.6	03.7	66.0	28.8	91.9	36
37	36.4	97.2	58.2	19.4	80.9	42.6	04.7	67.1	29.8	93.0	37
38	37.4	98.2	59.2	20.4	81.9	43.7	05.7	68.1	30.9	94.0	38
39	38.5	99.2	60.2	21.4	82.9	44.7	06.8	69.2	31.9	95.1	39
40	639.5	700.2	761.2	822.5	883.9	945.7	1007.8	1070.2	1133.0	1196.1	40
41	40.5	01.2	62.2	23.5	85.0	46.8	08.8	71.3	34.0	97.2	41
42	41.5	02.3	63.3	24.5	86.0	47.8	09.9	72.3	35.1	98.2	42
43	42.5	03.3	64.3	25.5	87.0	48.8	10.9	73.4	36.1	1199.3	43
44	43.5	04.3	65.3	26.5	88.1	49.9	12.0	74.4	37.2	1200.4	44
45	644.5	705.3	766.3	827.6	889.1	950.9	1013.0	1075.4	1138.2	1201.4	45
46	45.5	06.3	67.3	28.6	90.1	51.9	14.0	76.5			

TABLE 6 Meridional Parts											
Lat.	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	Lat.
0	1217.3	1280.9	1345.1	1409.6	1474.7	1540.3	1606.4	1673.1	1740.4	1808.3	0
1	18.3	82.0	46.1	10.7	75.8	41.4	07.5	74.2	41.5	09.4	1
2	19.4	83.1	47.2	11.8	76.9	42.5	08.6	75.3	42.6	10.5	2
3	20.4	84.1	48.3	12.9	78.0	43.6	09.7	76.4	43.7	11.7	3
4	21.5	85.2	49.4	14.0	79.0	44.7	10.8	77.5	44.9	12.8	4
5	1222.6	1286.3	1350.4	1415.0	1480.1	1545.8	1611.9	1678.6	1746.0	1814.0	5
6	23.6	87.3	51.5	16.1	81.2	46.9	13.0	79.8	47.1	15.1	6
7	24.7	88.4	52.6	17.2	82.3	48.0	14.1	80.9	48.2	16.2	7
8	25.7	89.5	53.6	18.3	83.4	49.0	15.2	82.0	49.4	17.4	8
9	26.8	90.5	54.7	19.4	84.5	50.1	16.3	83.1	50.5	18.5	9
10	1227.9	1291.6	1355.8	1420.4	1485.6	1551.2	1617.5	1684.2	1751.6	1819.7	10
11	28.9	92.7	56.9	21.5	86.7	52.3	18.6	85.4	52.8	20.8	11
12	30.0	93.7	57.9	22.6	87.8	53.4	19.7	86.5	53.9	21.9	12
13	31.0	94.8	59.0	23.7	88.9	54.5	20.8	87.6	55.0	23.1	13
14	32.1	95.9	60.1	24.8	89.9	55.6	21.9	88.7	56.1	24.2	14
15	1233.1	1296.9	1361.2	1425.9	1491.0	1556.7	1623.0	1689.8	1757.3	1825.4	15
16	34.2	98.0	62.2	26.9	92.1	57.8	24.1	90.9	58.4	26.5	16
17	35.3	1299.1	63.3	28.0	93.2	58.9	25.2	92.1	59.5	27.6	17
18	36.3	1300.1	64.4	29.1	94.3	60.0	26.3	93.2	60.7	28.8	18
19	37.4	01.2	65.5	30.2	95.4	61.1	27.4	94.3	61.8	29.9	19
20	1238.4	1302.3	1366.5	1431.3	1496.5	1562.2	1628.5	1695.4	1762.9	1831.1	20
21	39.5	03.3	67.6	32.3	97.6	63.3	29.7	96.5	64.1	32.2	21
22	40.6	04.4	68.7	33.4	98.7	64.4	30.8	97.7	65.2	33.3	22
23	41.6	05.5	69.8	34.5	1499.8	65.5	31.9	98.8	66.3	34.5	23
24	42.7	06.5	70.8	35.6	1500.9	66.6	33.0	1699.9	67.4	35.6	24
25	1243.7	1307.6	1371.9	1436.7	1502.0	1567.7	1634.1	1701.0	1768.6	1836.8	25
26	44.8	08.7	73.0	37.8	03.0	68.8	35.2	02.1	69.7	37.9	26
27	45.9	09.7	74.1	38.8	04.1	69.9	36.3	03.3	70.8	39.1	27
28	46.9	10.8	75.1	39.9	05.2	71.0	37.4	04.4	72.0	40.2	28
29	48.0	11.9	76.2	41.0	06.3	72.2	38.5	05.5	73.1	41.3	29
30	1249.1	1312.9	1377.3	1442.1	1507.4	1573.3	1639.6	1706.6	1774.2	1842.5	30
31	50.1	14.0	78.4	43.2	08.5	74.4	40.8	07.8	75.4	43.6	31
32	51.2	15.1	79.4	44.3	09.6	75.5	41.9	08.9	76.5	44.8	32
33	52.2	16.2	80.5	45.4	10.7	76.6	43.0	010.0	77.6	45.9	33
34	53.3	17.2	81.6	46.4	11.8	77.7	44.1	11.1	78.8	47.1	34
35	1254.4	1318.3	1382.7	1447.5	1512.9	1578.8	1645.2	1712.2	1779.9	1848.2	35
36	55.4	19.4	83.7	48.6	14.0	79.9	46.3	13.4	81.0	49.3	36
37	56.5	20.4	84.8	49.7	15.1	81.0	47.4	14.5	82.2	50.5	37
38	57.5	21.5	85.9	50.8	16.2	82.1	48.5	15.6	83.3	51.6	38
39	58.6	22.6	87.0	51.9	17.3	83.2	49.7	16.7	84.4	52.8	39
40	1259.7	1323.6	1388.1	1453.0	1518.3	1584.3	1650.8	1717.9	1785.6	1853.9	40
41	60.7	24.7	89.1	54.0	19.4	85.4	51.9	19.0	86.7	55.1	41
42	61.8	25.8	90.2	55.1	20.5	86.5	53.0	20.1	87.8	56.2	42
43	62.9	26.9	91.3	56.2	21.6	87.6	54.1	21.2	89.0	57.4	43
44	63.9	27.9	92.4	57.3	22.7	88.7	55.2	22.3	90.1	58.5	44
45	1265.0	1329.0	1393.4	1458.4	1523.8	1589.8	1656.3	1723.5	1791.2	1859.7	45
46	66.1	30.1	94.5	59.5	24.9	90.9	57.5	24.6	92.4	60.8	46
47	67.1	31.1	95.6	60.6	26.0	92.0	58.6	25.7	93.5	61.9	47
48	68.2	32.2	96.7	61.6	27.1	93.1	59.7	26.8	94.6	63.1	48
49	69.2	33.3	97.8	62.7	28.2	94.2	60.8	28.0	95.8	64.2	49
50	1270.3	1334.3	1398.8	1463.8	1529.3	1595.3	1661.9	1729.1	1796.9	1865.4	50
51	71.4	35.4	1399.9	64.9	30.4	96.4	63.0	30.2	98.0	66.5	51
52	72.4	36.5	1401.0	66.0	31.5	97.5	64.1	31.3	1799.2	67.7	52
53	73.5	37.6	02.1	67.1	32.6	98.6	65.3	32.5	1800.3	68.8	53
54	74.6	38.6	03.2	68.2	33.7	1599.7	66.4	33.6	01.5	70.0	54
55	1275.6	1339.7	1404.2	1469.3	1534.8	1600.8	1667.5	1734.7	1802.6	1871.1	55
56	76.7	40.8	05.3	70.3	35.9	02.0	68.6	35.8	03.7	72.3	56
57	77.8	41.8	06.4	71.4	37.0	03.1	69.7	37.0	04.9	73.4	57
58	78.8	42.9	07.5	72.5	38.1	04.2	70.8	38.1	06.0	74.6	58
59	79.9	44.0	08.6	73.6	39.2	05.3	71.9	39.2	07.1	75.7	59
60	1280.9	1345.1	1409.6	1474.7	1540.3	1606.4	1673.1	1740.4	1808.3	1876.9	60
Lat.	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	Lat.

TABLE 6 Meridional Parts											
Lat.	30°	31°	32°	33°	34°	35°	36°	37°	38°	39°	Lat.
0	1876.9	1946.2	2016.2	2087.0	2158.6	2231.1	2304.5	2378.8	2454.1	2530.4	0
1	78.0	47.3	17.4	88.2	59.8	32.3	05.7	80.0	55.3	31.7	1
2	79.2	48.5	18.5	89.4	61.0	33.5	06.9	81.3	56.6	33.0	2
3	80.3	49.6	19.7	90.5	62.2	34.7	08.1	82.5	57.9	34.3	3
4	81.5	50.8	20.9	91.7	63.4	35.9	09.4	83.8	59.1	35.6	4
5	1882.6	1952.0	2022.1	2092.9	2164.6	2237.2	2310.6	2385.0	2460.4	2536.8	5
6	83.8	53.1	23.2	94.1	65.8	38.4	11.8	86.3	61.7	38.1	6
7	84.9	54.3	24.4	95.3	67.0	39.6	13.1	87.5	62.9	39.4	7
8	86.1	55.4	25.6	96.5	68.2	40.8	14.3	88.8	64.2	40.7	8
9	87.2	56.6	26.8	97.7	69.4	42.0	15.5	90.0	65.5	42.0	9
10	1888.4	1957.8	2027.9	2098.9	2170.6	2243.2	2316.8	2391.3	2466.7	2543.3	10
11	89.5	58.9	29.1	2100.1	71.8	44.5	18.0	92.5	68.0	44.5	11
12	90.7	60.1	30.3	01.2	73.0	45.7	19.2	93.8	69.3	45.8	12
13	91.8	61.3	31.5	02.4	74.2	46.9	20.5	95.0	70.5	47.1	13
14	93.0	62.4	32.6	03.6	75.4	48.1	21.7	96.3	71.8	48.4	14
15	1894.1	1963.6	2033.8	2104.8	2176.6	2249.3	2322.9	2397.5	2473.1	2549.7	15
16	95.3	64.8	35.0	06.0	77.8	50.6	24.2	2398.8	74.3	51.0	16
17	96.4	65.9	36.2	07.2	79.0	51.8	25.4	2400.0	75.6	52.3	17
18	97.6	67.1	37.3	08.4	80.3	53.0	26.6	01.3	76.9	53.6	18
19	98.7	68.2	38.5	09.6	81.5	54.2	27.9	02.5	78.1	54.8	19
20	1899.9	1969.4	2039.7	2110.8	2182.7	2255.4	2329.1	2403.8	2479.4	2556.1	20
21	1901.0	70.6	40.9	12.0	83.9	56.7	30.4	05.0	80.7	57.4	21
22	02.2	71.7	42.1	13.1	85.1	57.9	31.6	06.3	82.0	58.7	22
23	03.3	72.9	43.2	14.3	86.3	59.1	32.8	07.5	83.2	60.0	23
24	04.5	74.1	44.4	15.5	87.5	60.3	34.1	08.8	84.5	61.3	24
25	1905.6	1975.2	2045.6	2116.7	2188.7	2261.5	2335.3	2410.0	2485.8	2562.6	25
26	06.8	76.4	46.8	17.9	89.9	62.8	36.5	11.3	87.0	63.9	26
27	08.0	77.6	47.9	19.1	91.1	64.0	37.8	12.5	88.3	65.1	27
28	09.1	78.7	49.1	20.3	92.3	65.2	39.0	13.8	89.6	66.4	28
29	10.3	79.9	50.3	21.5	93.5	66.4	40.3	15.0	90.9	67.7	29
30	1911.4	1981.1	2051.5	2122.7	2194.7	2267.6	2341.5	2416.3	2492.1	2569.0	30
31	12.6	82.2	52.7	23.9	95.9	68.9	42.7	17.6	93.4	70.3	31
32	13.7	83.4	53.8	25.1	97.1	70.1	44.0	18.8	94.7	71.6	32
33	14.9	84.6	55.0	26.3	98.4	71.3	45.2	20.1	95.9	72.9	33
34	16.0	85.7	56.2	27.5	2199.6	72.5	46.4	21.3	97.2	74.2	34
35	1917.2	1986.9	2057.4	2128.7	2200.8	2273.8	2347.7	2422.6	2498.5	2575.5	35
36	18.4	88.1	58.6	29.9	02.0	75.0	48.9	23.8	2499.8	76.8	36
37	19.5	89.2	59.7	31.1	03.2	76.2	50.2	25.1	2501.0	78.1	37
38	20.7	90.4	60.9	32.2	04.4	77.4	51.4	26.3	02.3	79.4	38
39	21.8	91.6	62.1	33.4	05.6	78.7	52.6	27.6	03.6	80.6	39
40	1923.0	1992.8	2063.3	2134.6	2206.8	2279.9	2353.9	2428.9	2504.9	2581.9	40
41	24.1	93.9	64.5	35.8	08.0	81.1	55.1	30.1	06.1	83.2	41
42	25.3	95.1	65.7	37.0	09.2	82.3	56.4	31.4	07.4	84.5	42
43	26.4	96.3	66.8	38.2	10.5	83.6	57.6	32.6	08.7	85.8	43
44	27.6										

TABLE 6											
Meridional Parts											
Lat.	40°	41°	42°	43°	44°	45°	46°	47°	48°	49°	Lat.
0	2607.9	2686.5	2766.3	2847.4	2929.8	3013.6	3099.0	3185.9	3274.4	3364.7	0
1	09.2	87.8	67.6	48.7	31.2	15.1	3100.4	87.3	75.9	66.2	1
2	10.5	89.1	69.0	50.1	32.6	16.5	01.8	88.8	77.4	67.7	2
3	11.8	90.4	70.3	51.5	34.0	17.9	03.3	90.2	78.9	69.3	3
4	13.1	91.8	71.7	52.8	35.4	19.3	04.7	91.7	80.4	70.8	4
5	2614.4	2693.1	2773.0	2854.2	2936.7	3020.7	3106.2	3193.2	3281.9	3372.3	5
6	15.7	94.4	74.3	55.6	38.1	22.1	07.6	94.6	83.4	73.8	6
7	17.0	95.7	75.7	56.9	39.5	23.5	09.0	96.1	84.8	75.3	7
8	18.3	97.1	77.0	58.3	40.9	24.9	10.5	97.6	86.3	76.9	8
9	19.6	98.4	78.4	59.7	42.3	26.4	11.9	3199.0	87.8	78.4	9
10	2620.9	2699.7	2779.7	2861.0	2943.7	3027.8	3113.3	3200.5	3289.3	3379.9	10
11	22.2	2701.0	81.1	62.4	45.1	29.2	14.8	02.0	90.8	81.4	11
12	23.5	02.3	82.4	63.8	46.5	30.6	16.2	03.4	92.3	83.0	12
13	24.8	03.7	83.8	65.1	47.9	32.0	17.7	04.9	93.8	84.5	13
14	26.1	05.0	85.1	66.5	49.2	33.4	19.1	06.4	95.3	86.0	14
15	2627.4	2706.3	2786.4	2867.9	2950.6	3034.8	3120.5	3207.8	3296.8	3387.5	15
16	28.7	07.6	87.8	69.2	52.0	36.3	22.0	09.3	98.3	89.1	16
17	30.0	09.0	89.1	70.6	53.4	37.7	23.4	10.8	3299.8	90.6	17
18	31.3	10.3	90.5	72.0	54.8	39.1	24.9	12.2	3301.3	92.1	18
19	32.6	11.6	91.8	73.3	56.2	40.5	26.3	13.7	02.8	93.7	19
20	2634.0	2713.0	2793.2	2874.7	2957.6	3041.9	3127.8	3215.2	3304.3	3395.2	20
21	35.3	14.3	94.5	76.1	59.0	43.3	29.2	16.7	05.8	96.7	21
22	36.6	15.6	95.9	77.4	60.4	44.8	30.6	18.1	07.3	98.3	22
23	37.9	16.9	97.2	78.8	61.8	46.2	32.1	19.6	08.8	3399.8	23
24	39.2	18.3	98.6	80.2	63.2	47.6	33.5	21.1	10.3	3401.3	24
25	2640.5	2719.6	2799.9	2881.6	2964.6	3049.0	3135.0	3222.5	3311.8	3402.8	25
26	41.8	20.9	2801.3	82.9	66.0	50.4	36.4	24.0	13.3	04.4	26
27	43.1	22.2	02.6	84.3	67.4	51.9	37.9	25.5	14.8	05.9	27
28	44.4	23.6	04.0	85.7	68.8	53.3	39.3	27.0	16.3	07.4	28
29	45.7	24.9	05.3	87.1	70.2	54.7	40.8	28.4	17.8	09.0	29
30	2647.0	2726.2	2806.7	2888.4	2971.5	3056.1	3142.2	3229.9	3319.3	3410.5	30
31	48.3	27.6	08.0	89.8	72.9	57.5	43.7	31.4	20.8	12.1	31
32	49.7	28.9	09.4	91.2	74.3	59.0	45.1	32.9	22.3	13.6	32
33	51.0	30.2	10.7	92.5	75.7	60.4	46.6	34.4	23.8	15.1	33
34	52.3	31.6	12.1	93.9	77.1	61.8	48.0	35.8	25.3	16.7	34
35	2653.6	2732.9	2813.4	2895.3	2978.5	3063.2	3149.5	3237.3	3326.9	3418.2	35
36	54.9	34.2	14.8	96.7	79.9	64.7	50.9	38.8	28.4	19.7	36
37	56.2	35.6	16.1	98.1	81.3	66.1	52.4	40.3	29.9	21.3	37
38	57.5	36.9	17.5	2899.4	82.7	67.5	53.8	41.7	31.4	22.8	38
39	58.8	38.2	18.9	2900.8	84.1	68.9	55.3	43.2	32.9	24.4	39
40	2660.2	2739.6	2820.2	2902.2	2985.5	3070.4	3156.7	3244.7	3334.4	3425.9	40
41	61.5	40.9	21.6	03.6	86.9	71.8	58.2	46.2	35.9	27.4	41
42	62.8	42.2	22.9	04.9	88.3	73.2	59.6	47.7	37.4	29.0	42
43	64.1	43.6	24.3	06.3	89.7	74.6	61.1	49.1	38.9	30.5	43
44	65.4	44.9	25.6	07.7	91.1	76.1	62.5	50.6	40.4	32.1	44
45	2666.7	2746.2	2827.0	2909.1	2992.6	3077.5	3164.0	3252.1	3342.0	3433.6	45
46	68.0	47.6	28.3	10.5	94.0	78.9	65.4	53.6	43.5	35.2	46
47	69.4	48.9	29.7	11.8	95.4	80.4	66.9	55.1	45.0	36.7	47
48	70.7	50.2	31.1	13.2	96.8	81.8	68.4	56.6	46.5	38.2	48
49	72.0	51.6	32.4	14.6	98.2	83.2	69.8	58.0	48.0	39.8	49
50	2673.3	2752.9	2833.8	2916.0	2999.6	3084.6	3171.3	3259.5	3349.5	3441.3	50
51	74.6	54.2	35.1	17.4	3001.0	86.1	72.7	61.0	51.0	42.9	51
52	75.9	55.6	36.5	18.7	02.4	87.5	74.2	62.5	52.5	44.4	52
53	77.3	56.9	37.9	20.1	03.8	88.9	75.6	64.0	54.1	46.0	53
54	78.6	58.3	39.2	21.5	05.2	90.4	77.1	65.5	55.6	47.5	54
55	2679.9	2759.6	2840.6	2922.9	3006.6	3091.8	3178.6	3267.0	3357.1	3449.1	55
56	81.2	60.9	41.9	24.3	08.0	93.2	80.0	68.4	58.6	50.6	56
57	82.5	62.3	43.3	25.7	09.4	94.7	81.5	69.9	60.1	52.2	57
58	83.8	63.6	44.7	27.0	10.8	96.1	82.9	71.4	61.7	53.7	58
59	85.2	65.0	46.0	28.4	12.2	97.5	84.4	72.9	63.2	55.3	59
60	2686.5	2766.3	2847.4	2929.8	3013.6	3099.0	3185.9	3274.4	3364.7	3456.8	60
Lat.	40°	41°	42°	43°	44°	45°	46°	47°	48°	49°	Lat.

TABLE 6											
Meridional Parts											
Lat.	50°	51°	52°	53°	54°	55°	56°	57°	58°	59°	Lat.
0	3456.8	3550.9	3647.0	3745.4	3846.0	3949.1	4054.8	4163.3	4274.8	4389.4	0
1	58.4	52.5	48.7	47.0	47.7	50.8	56.6	65.1	76.6	91.3	1
2	59.9	54.1	50.3	48.7	49.4	52.6	58.4	67.0	78.5	93.3	2
3	61.5	55.7	51.9	50.3	51.1	54.3	60.2	68.8	80.4	95.2	3
4	63.0	57.2	53.5	52.0	52.8	56.1	61.9	70.6	82.3	97.1	4
5	3464.6	3558.8	3655.1	3753.7	3854.5	3957.8	4063.7	4172.5	4284.2	4399.1	5
6	66.1	60.4	56.8	55.3	56.2	59.5	65.5	74.3	86.1	4401.0	6
7	67.7	62.0	58.4	57.0	57.9	61.3	67.3	76.1	88.0	03.0	7
8	69.2	63.6	60.0	58.6	59.6	63.0	69.1	78.0	89.8	04.9	8
9	70.8	65.2	61.6	60.3	61.3	64.8	70.9	79.8	91.7	06.9	9
10	3472.4	3566.8	3663.3	3762.0	3863.0	3966.5	4072.7	4181.7	4293.6	4408.8	10
11	73.9	68.4	64.9	63.6	64.7	68.3	74.5	83.5	95.5	10.8	11
12	75.5	70.0	66.5	65.3	66.4	70.0	76.3	85.3	97.4	12.7	12
13	77.0	71.5	68.1	67.0	68.1	71.8	78.1	87.2	4299.3	14.7	13
14	78.6	73.1	69.8	68.6	69.8	73.5	79.9	89.0	4301.2	16.6	14
15	3480.2	3574.7	3671.4	3770.3	3871.5	3975.3	4081.7	4190.9	4303.1	4418.6	15
16	81.7	76.3	73.0	72.0	73.2	77.0	83.4	92.7	05.0	20.5	16
17	83.3	77.9	74.7	73.6	74.9	78.8	85.2	94.6	06.9	22.5	17
18	84.8	79.5	76.3	75.3	76.7	80.5	87.0	96.4	08.8	24.4	18
19	86.4	81.1	77.9	77.0	78.4	82.3	88.8	98.3	10.7	26.4	19
20	3488.0	3582.7	3679.6	3778.6	3880.1	3984.0	4090.6	4200.1	4312.6	4428.3	20
21	89.5	84.3	81.2	80.3	81.8	85.8	92.4	02.0	14.5	30.3	21
22	91.1	85.9	82.8	82.0	83.5	87.5	94.2	03.8	16.4	32.3	22
23	92.6	87.5	84.5	83.7	85.2	89.3	96.0	05.7	18.3	34.2	23
24	94.2	89.1	86.1	85.3	86.9	91.0	97.8	07.5	20.2	36.2	24
25	3495.8	3590.7	3687.7	3787.0	3888.6	3992.8	4099.7	4209.4	4322.1	4438.1	25
26	97.3	92.3	89.4	88.7	90.4	94.6	4101.5	11.2	24.0	40.1	26
27	3498.9	93.9	91.0	90.3	92.1	96.3	03.3	13.1	25.9	42.1	27
28	3500.5	95.5	92.6	92.0	93.8	98.1	05.1	14.9	27.8	44.0	28
29	02.0	97.1	94.3	93.7	95.5	3999.8	06.9	16.8	29.7	46.0	29
30	3503.6	3598.7	3695.9	3795.4	3897.2	4001.6	4108.7	4218.6	4331.7	4448.0	30
31	05.2	3600.3	97.6	97.1	3898.9	03.4	10.5	20.5	33.6	49.9	31
32	06.7	01.9	3699.2	3798.7	3900.7	05.1	12.3	22.4	35.5	51.9	32
33	08.3	03.5	3700.8	3800.4	02.4	06.9	14.1	24.2	37.4	53.9	33
34	09.9	05.1	02.5	02.1	04.1	08.7	15.9	26.1	39.3	55.8	34
35	3511.5	3606.7	3704.1	3803.8	3905.8	4010.4	4117.7	4227.9	4341.2	4457.8	35
36	13.0	08.3	05.8	05.4	07.5	12.2	19.5	29.8	43.1	59.8	36
37	14.6	09.9	07.4	07.1	09.3	14.0	21.4	31.7	45.1	61.7	37
38	16.2	11.5	09.0	08.8	11.0	15.7	23.2	33.5	47.0	63.7	38
39	17.7	13.1	10.7	10.5	12.7	17.5	25.0	35.4	48.9	65.7	39
40	3519.3	3614.8	3712.3	3812.2	3914.4	4019.3	4126.8	4237.3	4350.8	4467.7	40
41	20.9	16.4	14.0	13.9	16.2	21.0	28.6	39.1	52.7	69.6	41
42	22.5	18.0	15.6	15.5	17.9	22.8	30.4	41.0	54.6	71.6	42
43	24.0	19.6	17.3	17.2	19.6	24.6	32.3	42.9	5		

TABLE 6 Meridional Parts											
Lat.	60°	61°	62°	63°	64°	65°	66°	67°	68°	69°	Lat.
0	4507.4	4629.1	4754.6	4884.4	5018.7	5157.9	5302.4	5452.8	5609.4	5773.0	0
1	09.4	31.1	56.8	86.6	21.0	60.3	04.9	55.3	12.1	75.8	1
2	11.4	33.2	58.9	88.8	23.3	62.6	07.4	57.9	14.8	78.6	2
3	13.4	35.2	61.0	91.0	25.5	65.0	09.8	60.5	17.4	81.4	3
4	15.4	37.3	63.1	93.2	27.8	67.4	12.3	63.0	20.1	84.2	4
5	4517.4	4639.4	4765.3	4895.4	5030.1	5169.7	5314.7	5465.6	5622.8	5787.0	5
6	19.4	41.4	67.4	97.6	32.4	72.1	17.2	68.2	25.5	89.8	6
7	21.4	43.5	69.5	4899.8	34.7	74.5	19.7	70.7	28.2	92.6	7
8	23.4	45.6	71.7	4902.0	37.0	76.9	22.1	73.3	30.8	95.4	8
9	25.4	47.6	73.8	04.2	39.3	79.2	24.6	75.9	33.5	5798.2	9
10	4527.4	4649.7	4776.0	4906.5	5041.6	5181.6	5327.1	5478.4	5636.2	5801.0	10
11	29.4	51.8	78.1	08.7	43.8	84.0	29.6	81.0	38.9	03.8	11
12	31.4	53.9	80.2	10.9	46.1	86.4	32.0	83.6	41.6	06.6	12
13	33.4	55.9	82.4	13.1	48.4	88.8	34.5	86.2	44.3	09.5	13
14	35.5	58.0	84.5	15.3	50.7	99.1	37.0	88.7	47.0	12.3	14
15	4537.5	4660.1	4786.7	4917.5	5053.0	5193.5	5339.5	5491.3	5649.7	5815.1	15
16	39.5	62.2	88.8	19.8	55.3	95.9	42.0	93.9	52.4	17.9	16
17	41.5	64.2	91.0	22.0	57.6	5198.3	44.4	96.5	55.1	20.7	17
18	43.5	66.3	93.1	24.2	59.9	5200.7	46.9	5499.1	57.8	23.6	18
19	45.5	68.4	95.3	26.4	62.2	03.1	49.4	5501.7	60.5	26.4	19
20	4547.5	4670.5	4797.4	4928.6	5064.5	5205.5	5351.9	5504.3	5663.2	5829.2	20
21	49.6	72.6	4799.6	30.9	66.8	07.9	54.4	06.9	35.9	32.1	21
22	51.6	74.6	4801.7	33.1	69.2	10.3	56.9	09.5	68.6	34.9	22
23	53.6	76.7	03.9	35.3	71.5	12.7	59.4	12.1	71.3	37.7	23
24	55.6	78.8	06.0	37.6	73.8	15.1	61.9	14.7	74.0	40.6	24
25	4557.6	4680.9	4808.2	4939.8	5076.1	5217.5	5364.4	5517.3	5676.7	5843.4	25
26	59.7	83.0	10.3	42.0	78.4	19.9	66.9	19.9	79.4	46.2	26
27	61.7	85.1	12.5	44.2	80.7	22.3	69.4	22.5	82.2	49.1	27
28	63.7	87.2	14.6	46.5	83.0	24.7	71.9	25.1	84.9	51.9	28
29	65.7	89.2	16.8	48.7	85.3	27.1	74.4	27.7	87.6	54.8	29
30	4567.8	4691.3	4819.0	4951.0	5087.7	5229.5	5376.9	5530.3	5690.3	5857.6	30
31	69.8	93.4	21.1	53.2	90.0	31.9	79.4	32.9	93.1	60.5	31
32	71.8	95.5	23.3	55.4	92.3	34.3	81.9	35.5	95.8	63.3	32
33	73.8	97.6	25.5	57.7	94.6	36.7	84.4	38.1	5698.5	66.2	33
34	75.9	4699.7	27.6	59.9	97.0	39.1	86.9	40.7	5701.2	69.1	34
35	4577.9	4701.8	4829.8	4962.2	5099.3	5241.6	5389.4	5543.6	5704.0	5871.9	35
36	79.9	03.9	32.0	64.4	5101.6	44.0	91.9	46.0	06.7	74.8	36
37	82.0	06.0	34.1	66.7	03.9	46.4	94.4	48.6	09.5	77.7	37
38	84.0	08.1	36.3	68.9	06.3	48.8	97.0	51.2	12.2	80.5	38
39	86.1	10.2	38.5	71.2	08.6	51.2	5399.5	53.9	14.9	83.4	39
40	4588.1	4712.3	4840.7	4973.4	5110.9	5253.7	5402.0	5556.5	5717.7	5886.3	40
41	90.1	14.4	42.8	75.7	13.3	56.1	04.5	59.1	20.4	89.2	41
42	92.2	16.5	45.0	77.9	15.6	58.5	07.0	61.7	23.2	92.0	42
43	94.2	18.6	47.2	80.2	17.9	60.9	09.6	64.4	25.9	94.9	43
44	96.3	20.7	49.4	82.4	20.3	63.4	12.1	67.0	28.7	5897.8	44
45	4598.3	4722.9	4851.5	4984.7	5122.6	5265.8	5414.6	5569.7	5731.4	5900.7	45
46	4600.3	25.0	53.7	86.9	25.0	68.2	17.2	72.3	34.2	03.6	46
47	02.4	27.1	55.9	89.2	27.3	70.7	19.7	74.9	37.0	06.5	47
48	04.4	29.2	58.1	91.5	29.7	73.1	22.2	77.6	39.7	09.4	48
49	06.5	31.3	60.3	93.7	32.0	75.5	24.8	80.2	42.5	12.3	49
50	4608.5	4733.4	4862.5	4996.0	5134.4	5278.0	5427.3	5582.9	5745.3	5915.2	50
51	10.6	35.5	64.6	4998.3	36.7	80.4	29.8	85.5	48.0	18.1	51
52	12.6	37.6	66.8	5000.5	39.1	82.9	32.4	88.2	50.8	21.0	52
53	14.7	39.8	69.0	02.8	41.4	85.3	34.9	90.8	53.6	23.9	53
54	16.7	41.9	71.2	05.1	43.8	87.7	37.5	93.5	56.3	26.8	54
55	4618.8	4744.0	4873.4	5007.3	5146.1	5290.2	5440.0	5596.1	5759.1	5929.7	55
56	20.8	46.1	75.6	09.6	48.5	92.6	42.6	5598.8	61.9	32.6	56
57	22.9	48.3	77.8	11.9	50.8	95.1	45.1	5601.4	64.7	35.5	57
58	24.9	50.4	80.0	14.1	53.2	5297.5	47.7	04.1	67.5	38.4	58
59	27.0	52.5	82.2	16.4	55.5	5300.0	50.2	06.8	70.2	41.3	59
60	4629.1	4754.6	4884.4	5018.7	5157.9	5302.4	5452.8	5609.4	5773.0	5944.2	60
Lat.	60°	61°	62°	63°	64°	65°	66°	67°	68°	69°	Lat.

TABLE 6 Meridional Parts											
Lat.	70°	71°	72°	73°	74°	75°	76°	77°	78°	79°	Lat.
0	5944.2	6123.9	6312.9	6512.4	6723.6	6948.1	7187.7	7444.7	7722.0	8023.1	0
1	47.2	27.0	16.1	15.8	27.2	51.9	91.8	49.2	26.8	28.3	1
2	50.1	30.0	19.4	19.2	30.8	55.8	7196.0	53.6	31.6	33.6	2
3	53.0	33.1	22.6	22.6	34.5	59.7	7200.1	58.1	36.5	38.8	3
4	56.0	36.2	25.9	26.1	38.1	63.5	04.3	62.6	41.3	44.1	4
5	5958.9	6139.3	6329.1	6529.5	6741.8	6967.4	7208.4	7467.0	7746.1	8049.4	5
6	61.8	42.4	32.4	32.9	45.4	71.3	12.6	71.5	51.0	54.6	6
7	64.8	45.4	35.6	36.4	49.0	75.2	16.7	76.0	55.8	59.9	7
8	67.7	48.5	38.9	39.8	52.7	79.1	20.9	80.5	60.7	65.2	8
9	70.6	51.6	42.1	43.3	56.4	83.0	25.1	85.0	65.6	70.5	9
10	5973.6	6154.7	6345.4	6546.7	6760.0	6986.9	7229.3	7489.5	7770.4	8075.9	10
11	76.5	57.8	48.7	50.2	63.7	90.8	33.4	94.0	75.3	81.2	11
12	79.5	60.9	51.9	53.6	67.4	94.7	37.6	7498.5	80.2	86.5	12
13	82.4	64.0	55.2	57.1	71.0	6998.6	41.8	7503.0	85.1	91.9	13
14	85.4	67.1	58.5	60.5	74.7	7002.5	46.0	07.5	90.0	8097.2	14
15	5988.3	6170.2	6361.7	6564.0	6778.4	7006.5	7250.2	7512.0	7794.9	8102.6	15
16	91.3	73.3	65.0	67.5	82.1	10.4	54.4	16.6	7799.8	07.9	16
17	94.3	76.5	68.3	71.0	85.8	14.3	58.6	21.1	7804.7	13.3	17
18	5997.2	79.6	71.6	74.4	89.4	18.3	62.9	25.6	09.6	18.7	18
19	6000.2	82.7	74.9	77.9	93.1	22.2	67.1	30.2	14.6	24.1	19
20	6003.2	6185.8	6378.2	6581.4	6796.8	7026.2	7271.3	7534.8	7819.5	8129.5	20
21	06.1	88.9	81.5	84.9	6800.5	30.1	75.5	39.3	24.5	34.9	21
22	09.1	92.1	84.8	88.4	04.3	34.1	79.8	43.9	29.4	40.3	22
23	12.1	95.2	88.1	91.9	08.0	38.0	84.0	48.5	34.4	45.7	23
24	15.0	6198.3	91.4	95.4	11.7	42.0	88.3	53.0	39.3	51.1	24
25	6018.0	6201.5	6394.7	6598.9	6815.4	7045.9	7292.5	7557.6	7844.3	8156.6	25
26	21.0	04.6	6398.0	6602.4	19.1	49.9	7296.8	62.2	49.3	62.0	26
27	24.0	07.7	6401.3	05.9	22.8	53.9	7301.1	66.8	54.3	67.5	27
28	27.0	10.9	04.6	09.4	26.6	57.9	05.3	71.4	59.3	72.9	28
29	30.0	14.0	07.9	12.9	30.3	61.9	09.6	76.0	64.3	78.4	29
30	6033.0	6217.2	6411.3	6616.4	6834.1	7065.9	7313.9	7580.6	7869.3	8183.9	30
31	36.0	20.3	14.6	19.9	37.8	69.8	18.2	85.3	74.3	89.4	31
32	39.0	23.5	17.9	23.5	41.5	73.8	22.4	89.9	79.3	8194.9	32
33	42.0	26.6	21.2	27.0	45.3	77.9	26.7	94.5	84.4	8200.4	33
34	45.0	29.8	24.6	30.5	49.0	81.9	31.0	7599.2	89.4	05.9	34
35	6048.0	6233.0	6427.9	6634.1	6852.8	7085.9	7335.4	7603.8	7894.5	8211.4	35
36	51.0	36.1	31.3	37.6	56.6	89.9	39.7	08.5	7899.5	17.0	36
37	54.0	39.3	34.6	41.1	60.3	93.9	44.0	13.1	7904.6	22.5	37
38	57.0	42.5	37.9	44.7	64.1	7097.9	48.3	17.8	09.7	28.1	38
39	60.0	45.6	41.3	48.2	67.9	7102.0	52.6	22.5	14.7	33.6	39
40	6063.0	6248.8	6444.6	6651.8	6871.7	7106.0	7357.0	7627.1	7919.8	8239.2	40
41	66.0	52.0	48.0	55.3	75.4	10.0	61.3	31.8	24.9	44.8	41
42	69.1	55.2	51.4	58.9	79.2	14.1	65.6	36.5	30.0	50.4	42
43	72.1	58.3	54.7	62.5	83.0	18.1	70.0</				

TABLE 6
Meridional Parts

Lat.	80°	81°	82°	83°	84°	85°	86°	87°	88°	89°	Lat.
0	8352.5	8716.3	9122.6	9582.9	10113.9	10741.6	11509.5	12499.1	13893.4	16276.5	0
1	58.2	22.7	29.8	91.1	123.5	753.1	523.9	518.2	922.2	334.3	1
2	64.0	29.1	37.0	9599.4	133.1	764.7	538.3	537.5	951.2	393.0	2
3	69.8	35.5	44.2	9607.6	142.8	776.2	552.8	556.9	13980.4	452.8	3
4	75.6	41.9	51.5	15.9	152.4	787.8	567.3	576.4	14009.9	513.7	4
5	8381.4	8748.4	9158.7	9624.2	10162.1	10799.5	11581.9	12596.0	14039.7	16575.6	5
6	87.2	54.8	66.0	32.5	171.8	811.2	596.6	615.7	069.7	638.7	6
7	93.0	61.3	73.3	40.8	181.6	822.9	611.3	635.5	100.0	703.0	7
8	8398.9	877.8	80.6	49.2	191.3	834.7	626.1	655.4	130.6	768.5	8
9	8404.7	74.3	87.9	57.6	201.1	846.5	641.0	675.5	161.4	835.2	9
10	8410.5	8780.8	9195.2	9666.0	10211.0	10858.3	11655.9	12695.7	14192.6	16903.3	10
11	16.4	87.3	9202.6	74.4	220.8	870.2	670.9	715.9	224.0	16972.8	11
12	22.3	8793.8	09.9	82.8	230.7	882.1	686.0	736.4	255.6	17043.6	12
13	28.1	8800.4	17.3	91.3	240.6	894.1	701.1	756.9	287.6	116.0	13
14	34.0	06.9	24.7	9699.7	250.5	906.1	716.3	777.5	319.9	189.9	14
15	8439.9	8813.5	9232.1	9708.2	10260.5	10918.2	11731.5	12798.3	14352.5	17265.5	15
16	45.8	20.1	39.5	16.8	270.5	930.3	746.9	819.2	385.4	342.8	16
17	51.8	26.7	47.0	25.3	280.5	942.4	762.3	840.3	418.6	421.8	17
18	57.7	33.3	54.4	33.9	290.6	954.6	777.7	861.4	452.2	502.7	18
19	63.6	39.9	61.9	42.4	300.7	966.8	793.2	882.7	486.0	585.5	19
20	8469.6	8846.5	9269.4	9751.0	10310.8	10979.1	11808.8	12904.1	14520.3	17670.4	20
21	75.5	53.2	76.9	59.7	320.9	10991.4	824.5	925.7	554.8	757.5	21
22	81.5	59.8	84.4	68.3	331.1	11003.8	840.3	947.4	589.7	846.8	22
23	87.5	66.5	91.9	77.0	341.3	016.2	856.1	969.2	625.0	17938.4	23
24	93.5	73.2	9299.5	85.7	351.5	028.6	872.0	12991.2	660.6	18032.6	24
25	8499.5	8879.9	9307.0	9794.4	10361.8	11041.1	11887.9	13013.3	14696.6	18129.5	25
26	8505.5	86.6	14.6	9803.1	372.1	053.6	904.0	035.6	733.0	229.1	26
27	11.5	8893.3	22.2	11.9	382.4	066.2	920.1	058.0	769.8	331.8	27
28	17.5	8900.0	29.8	20.6	392.7	078.8	936.3	080.5	806.9	437.6	28
29	23.6	06.8	37.5	29.4	403.1	091.5	952.5	103.2	844.5	546.7	29
30	8529.6	8913.5	9345.1	9838.3	10413.6	11104.2	11968.9	13126.1	14882.5	18659.4	30
31	35.7	20.3	52.8	47.1	424.0	117.0	11985.3	149.1	920.9	776.0	31
32	41.8	27.1	60.5	56.0	434.5	129.8	12001.8	172.2	959.8	18896.6	32
33	47.9	33.9	68.2	64.9	445.0	142.7	018.4	195.6	14999.1	19021.6	33
34	54.0	40.7	75.9	73.8	455.5	155.6	035.0	219.0	15038.8	151.4	34
35	8560.1	8947.5	9383.7	9882.7	10466.1	11168.6	12051.8	13242.7	15079.0	19286.2	35
36	66.2	54.3	91.4	9891.7	476.7	181.6	068.6	266.5	119.7	426.5	36
37	72.3	61.2	9399.2	9900.6	487.4	194.6	085.5	290.4	160.9	572.9	37
38	78.4	68.1	9407.0	09.7	498.0	207.7	102.5	314.6	202.6	725.7	38
39	84.6	74.9	14.8	18.7	508.7	220.9	119.5	338.9	244.7	19885.6	39
40	8590.7	8981.8	9422.6	9927.7	10519.5	11234.1	12136.7	13363.3	15287.5	20053.3	40
41	8596.9	88.7	30.4	36.8	530.3	247.4	153.9	388.0	330.7	229.7	41
42	8603.1	8995.7	38.3	45.9	541.1	260.7	171.3	412.8	374.5	415.5	42
43	09.3	9002.6	46.2	55.0	551.9	274.0	188.7	437.8	418.9	612.0	43
44	15.5	09.5	54.1	64.2	562.8	287.5	206.2	463.0	463.8	20820.4	44
45	8621.7	9016.5	9462.0	9973.4	10573.7	11300.9	12223.8	13488.4	15509.3	21042.3	45
46	27.9	23.5	69.9	82.6	584.6	314.4	241.5	513.9	555.5	279.5	46
47	34.2	30.5	77.9	9991.8	595.6	328.0	259.2	539.7	602.3	534.2	47
48	40.4	37.5	85.8	10001.0	606.6	341.6	277.1	565.7	649.7	21809.4	48
49	46.7	44.5	9493.8	010.3	617.7	355.3	295.1	591.8	697.8	22108.5	49
50	8652.9	9051.5	9501.8	10019.6	10628.8	11369.1	12313.1	13618.2	15746.5	22436.2	50
51	59.2	58.6	09.9	028.9	639.9	382.8	331.3	644.7	796.0	22798.4	51
52	65.5	65.6	17.9	038.3	651.1	396.7	349.5	671.5	846.2	23203.3	52
53	71.8	72.7	26.0	047.6	662.3	410.6	367.9	698.4	897.1	23662.4	53
54	78.1	79.8	34.0	057.0	673.5	424.6	386.3	725.6	15948.8	24192.3	54
55	8684.5	9086.9	9542.1	10066.4	10684.8	11438.6	12404.8	13753.0	16001.3	24819.1	55
56	90.8	9094.0	50.3	075.9	696.1	452.6	423.5	780.6	054.6	25586.2	56
57	8697.2	9101.1	58.4	085.4	707.4	466.8	442.2	808.5	108.8	26575.1	57
58	8703.5	08.3	66.6	094.9	718.8	481.0	461.1	836.5	163.8	27969.8	58
59	09.9	15.4	74.7	10104.4	730.2	495.2	480.0	864.8	219.7	30351.6	59
60	8716.3	9122.6	9582.9	10113.9	10741.6	11509.5	12499.1	13893.4	16276.5	---	60
Lat.	80°	81°	82°	83°	84°	85°	86°	87°	88°	89°	Lat.

TABLE 7									
Length of a Degree of Latitude and Longitude									
Lat.	Degree of latitude				Degree of longitude				Lat.
	Nautical Miles	Statute Miles	Feet	Meters	Nautical Miles	Statute Miles	Feet	Meters	
0	59.705	68.708	362 776	110 574	60.108	69.171	365 221	111 319	0
1	.706	.708	778	575	60.099	69.160	365 166	111 303	1
2	.706	.709	781	576	60.071	69.129	365 000	111 252	2
3	.707	.710	786	577	60.026	69.077	364 724	111 168	3
4	.708	.711	794	580	59.962	69.003	364 338	111 050	4
5	59.710	68.713	362 804	110 583	59.880	68.909	363 841	110 899	5
6	.712	.715	816	586	59.781	68.794	363 234	110 714	6
7	.714	.718	831	591	59.663	68.659	362 517	110 495	7
8	.717	.721	847	596	59.527	68.502	361 690	110 243	8
9	.720	.725	866	601	59.373	68.325	360 754	109 958	9
10	59.723	68.728	362 886	110 608	59.201	68.127	359 709	109 639	10
11	.727	.733	909	615	59.011	67.908	358 555	109 288	11
12	.731	.738	934	622	58.803	67.669	357 292	108 903	12
13	.736	.743	961	630	58.577	67.409	355 921	108 485	13
14	.740	.748	990	639	58.334	67.129	354 442	108 034	14
15	59.746	68.754	363 021	110 649	58.073	66.829	352 856	107 550	15
16	.751	.760	053	659	57.794	66.508	351 163	107 034	16
17	.757	.767	088	669	57.498	66.167	349 363	106 486	17
18	.763	.774	125	680	57.184	65.806	347 457	105 905	18
19	.769	.781	163	692	56.853	65.425	345 446	105 292	19
20	59.776	68.788	363 203	110 704	56.505	65.025	343 330	104 647	20
21	.782	.796	245	717	56.140	64.604	341 110	103 970	21
22	.790	.805	288	730	55.757	64.164	338 786	103 262	22
23	.797	.813	333	744	55.358	63.705	336 360	102 523	23
24	.805	.822	380	758	54.942	63.226	333 831	101 752	24
25	59.813	68.831	363 428	110 773	54.509	62.727	331 201	100 950	25
26	.821	.840	478	788	54.059	62.210	328 470	100 118	26
27	.829	.850	529	804	53.593	61.674	325 639	99 255	27
28	.838	.860	581	819	53.111	61.119	322 709	98 362	28
29	.847	.870	634	836	52.613	60.546	319 681	97 439	29
30	59.856	68.881	363 689	110 852	52.098	59.954	316 556	96 486	30
31	.865	.891	745	869	51.568	59.344	313 334	95 504	31
32	.874	.902	802	887	51.022	58.715	310 017	94 493	32
33	.884	.913	860	904	50.461	58.069	306 605	93 453	33
34	.893	.924	919	922	49.884	57.405	303 100	92 385	34
35	59.903	68.935	363 978	110 941	49.292	56.724	299 502	91 288	35
36	.913	.947	364 039	959	48.684	56.025	295 813	90 164	36
37	.923	.958	100	978	48.062	55.309	292 033	89 012	37
38	.933	.970	162	996	47.426	54.577	288 164	87 832	38
39	.944	.982	224	111 015	46.774	53.827	284 207	86 626	39
40	59.954	68.994	364 287	111 035	46.109	53.061	280 163	85 394	40
41	.964	69.006	350	054	45.429	52.279	276 034	84 135	41
42	.975	.018	414	073	44.736	51.481	271 820	82 851	42
43	.985	.030	477	093	44.029	50.667	267 523	81 541	43
44	.996	.042	541	112	43.308	49.838	263 144	80 206	44
45	60.006	69.054	364 605	111 132	42.574	48.993	258 684	78 847	45

TABLE 7									
Length of a Degree of Latitude and Longitude									
Lat.	Degree of latitude				Degree of longitude				Lat.
	Nautical Miles	Statute Miles	Feet	Meters	Nautical Miles	Statute Miles	Feet	Meters	
45	60.006	69.054	364 605	111 132	42.574	48.993	258 684	78 847	45
46	.017	.066	670	151	41.827	48.133	254 145	77 463	46
47	.027	.078	734	171	41.067	47.259	249 527	76 056	47
48	.038	.090	798	190	40.294	46.370	244 834	74 625	48
49	.048	.103	861	210	39.510	45.467	240 065	73 172	49
50	60.059	69.115	364 925	111 229	38.713	44.550	235 222	71 696	50
51	.069	.126	988	248	37.904	43.619	230 307	70 198	51
52	.080	.138	365 050	267	37.083	42.675	225 321	68 678	52
53	.090	.150	112	286	36.251	41.717	220 266	67 137	53
54	.100	.162	174	305	35.408	40.747	215 144	65 576	54
55	60.110	69.173	365 235	111 323	34.554	39.764	209 954	63 994	55
56	.120	.185	295	342	33.689	38.769	204 701	62 393	56
57	.129	.196	354	360	32.814	37.762	199 384	60 772	57
58	.139	.207	412	378	31.929	36.743	194 005	59 133	58
59	.149	.218	469	395	31.034	35.713	188 567	57 475	59
60	60.158	69.228	365 526	111 412	30.130	34.672	183 071	55 800	60
61	.167	.239	581	429	29.216	33.621	177 518	54 107	61
62	.176	.249	635	446	28.293	32.559	171 910	52 398	62
63	.184	.259	688	462	27.361	31.487	166 249	50 673	63
64	.193	.269	739	477	26.421	30.405	160 537	48 932	64
65	60.201	69.278	365 789	111 493	25.473	29.314	154 775	47 176	65
66	.209	.287	838	507	24.517	28.213	148 966	45 405	66
67	.217	.296	885	522	23.553	27.104	143 110	43 620	67
68	.224	.305	931	536	22.582	25.987	137 210	41 822	68
69	.232	.313	975	549	21.604	24.861	131 267	40 010	69
70	60.239	69.321	366 017	111 562	20.619	23.728	125 284	38 187	70
71	.245	.329	058	574	19.628	22.587	119 262	36 351	71
72	.252	.336	096	586	18.631	21.440	113 203	34 504	72
73	.258	.343	133	597	17.628	20.286	107 109	32 647	73
74	.264	.350	169	608	16.619	19.125	100 981	30 779	74
75	60.269	69.356	366 202	111 618	15.606	17.959	94 823	28 902	75
76	.274	.362	233	628	14.587	16.787	88 635	27 016	76
77	.279	.368	262	637	13.564	15.610	82 419	25 121	77
78	.284	.373	290	645	12.537	14.428	76 178	23 219	78
79	.288	.378	315	653	11.506	13.241	69 913	21 310	79
80	60.292	69.382	366 338	111 660	10.472	12.051	63 627	19 393	80
81	.295	.386	359	666	9.434	10.856	57 321	17 471	81
82	.298	.390	378	672	8.393	9.658	50 997	15 544	82
83	.301	.393	395	677	7.350	8.458	44 657	13 611	83
84	.303	.396	409	682	6.304	7.254	38 303	11 675	84
85	60.305	69.398	366 422	111 685	5.256	6.049	31 937	9 735	85
86	.307	.400	432	688	4.207	4.841	25 562	7 791	86
87	.308	.401	440	691	3.156	3.632	19 178	5 846	87
88	.309	.403	445	693	2.105	2.422	12 789	3 898	88
89	.310	.403	449	694	1.053	1.211	6 395	1 949	89
90	60.310	69.403	366 450	111 694	0.000	0.000	0	0	90