

## Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m.    Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 814.1 mm  
 Sunrise/Sunset Markers: X = ± 288.9 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	814.1	814.1	0.0						
11:55	12:05	21.8	813.9	814.2	21.8	8:25	3:35	806.4	481.4	939.2	872.4
11:50	12:10	43.6	813.3	814.5	43.6	8:20	3:40	819.2	467.0	942.9	889.7
11:45	12:15	65.4	812.4	815.0	65.4	8:15	3:45	831.5	452.3	946.5	906.8
11:40	12:20	87.2	811.0	815.7	87.2	8:10	3:50	843.4	437.4	950.1	923.7
11:35	12:25	108.9	809.3	816.6	109.0	8:05	3:55	854.9	422.3	953.5	940.4
11:30	12:30	130.5	807.2	817.6	130.7	8:00	4:00	866.0	407.1	956.9	956.9
11:25	12:35	152.1	804.6	818.9	152.4	7:55	4:05	876.7	391.6	960.2	973.2
11:20	12:40	173.6	801.7	820.3	174.1	7:50	4:10	887.0	375.9	963.4	989.3
11:15	12:45	195.1	798.5	822.0	195.7	7:45	4:15	896.9	360.1	966.5	1005.3
11:10	12:50	216.4	794.8	823.8	217.3	7:40	4:20	906.3	344.1	969.4	1021.0
11:05	12:55	237.7	790.8	825.7	238.8	7:35	4:25	915.3	327.9	972.3	1036.4
11:00	1:00	258.8	786.4	827.9	260.3	7:30	4:30	923.9	311.5	975.0	1051.7
10:55	1:05	279.8	781.6	830.2	281.7	7:25	4:35	932.0	295.1	977.6	1066.8
10:50	1:10	300.7	776.4	832.6	303.1	7:20	4:40	939.7	278.4	980.1	1081.6
10:45	1:15	321.4	770.9	835.2	324.3	7:15	4:45	946.9	261.7	982.4	1096.3
10:40	1:20	342.0	765.0	838.0	345.5	7:10	4:50	953.7	244.8	984.6	1110.7
10:35	1:25	362.4	758.8	840.9	366.6	7:05	4:55	960.0	227.8	986.7	1124.9
10:30	1:30	382.7	752.1	843.9	387.7	7:00	5:00	965.9	210.7	988.6	1138.9
10:25	1:35	402.7	745.2	847.0	408.6	6:55	5:05	971.3	193.5	990.4	1152.7
10:20	1:40	422.6	737.8	850.3	429.4	6:50	5:10	976.3	176.2	992.1	1166.2
10:15	1:45	442.3	730.2	853.7	450.2	6:45	5:15	980.8	158.8	993.6	1179.6
10:10	1:50	461.7	722.1	857.1	470.8	6:40	5:20	984.8	141.4	994.9	1192.7
10:05	1:55	481.0	713.8	860.7	491.3	6:35	5:25	988.4	123.8	996.1	1205.5
10:00	2:00	500.0	705.0	864.3	511.8	6:30	5:30	991.4	106.3	997.1	1218.2
9:55	2:05	518.8	696.0	868.1	532.1	6:25	5:35	994.1	88.6	998.0	1230.6
9:50	2:10	537.3	686.6	871.9	552.2	6:20	5:40	996.2	71.0	998.7	1242.9
9:45	2:15	555.6	676.9	875.7	572.3	6:15	5:45	997.9	53.2	999.3	1254.8
9:40	2:20	573.6	666.9	879.6	592.2	6:10	5:50	999.0	35.5	999.7	1266.6
9:35	2:25	591.3	656.5	883.6	611.9	6:05	5:55	999.8	17.8	999.9	1278.2
9:30	2:30	608.8	645.9	887.6	631.6	6:00	6:00	1000.0	0.0	1000.0	1289.5
9:25	2:35	625.9	634.9	891.6	651.1	5:55	6:05	999.8	-17.8	999.9	1300.6
9:20	2:40	642.8	623.6	895.6	670.4	5:50	6:10	999.0	-35.5	999.7	1311.5
9:15	2:45	659.3	612.1	899.7	689.6	5:45	6:15	997.9	-53.2	999.3	1322.1
9:10	2:50	675.6	600.2	903.7	708.6	5:40	6:20	996.2	-71.0	998.7	1332.6
9:05	2:55	691.5	588.1	907.8	727.5	5:35	6:25	994.1	-88.6	998.0	1342.8
9:00	3:00	707.1	575.7	911.8	746.2	5:30	6:30	991.4	-106.3	997.1	1352.8
8:55	3:05	722.4	563.0	915.8	764.8	5:25	6:35	988.4	-123.8	996.1	1362.6
8:50	3:10	737.3	550.0	919.8	783.2	5:20	6:40	984.8	-141.4	994.9	1372.2
8:45	3:15	751.8	536.8	923.8	801.4	5:15	6:45	980.8	-158.8	993.6	1381.5
8:40	3:20	766.0	523.3	927.7	819.4	5:10	6:50	976.3	-176.2	992.1	1390.6
8:35	3:25	779.9	509.6	931.6	837.2	5:05	6:55	971.3	-193.5	990.4	1399.6
8:30	3:30	793.4	495.6	935.4	854.9	5:00	7:00	965.9	-210.7	988.6	1408.3

## Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m.    Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 814.1 mm  
 Sunrise/Sunset Markers: X = ± 288.9 mm

Local Time		X	Y	Z	W
4:55	7:05	960.0	-227.8	986.7	1416.8
4:50	7:10	953.7	-244.8	984.6	1425.1
4:45	7:15	946.9	-261.7	982.4	1433.2
4:40	7:20	939.7	-278.4	980.1	1441.1
4:35	7:25	932.0	-295.1	977.6	1448.8
4:30	7:30	923.9	-311.5	975.0	1456.3
4:25	7:35	915.3	-327.9	972.3	1463.5
4:20	7:40	906.3	-344.1	969.4	1470.6
4:15	7:45	896.9	-360.1	966.5	1477.5
4:10	7:50	887.0	-375.9	963.4	1484.2
4:05	7:55	876.7	-391.6	960.2	1490.8
4:00	8:00	866.0	-407.1	956.9	1497.1
3:55	8:05	854.9	-422.3	953.5	1503.2
3:50	8:10	843.4	-437.4	950.1	1509.2
3:45	8:15	831.5	-452.3	946.5	1515.0
3:40	8:20	819.2	-467.0	942.9	1520.6
3:35	8:25	806.4	-481.4	939.2	1526.0
3:30	8:30	793.4	-495.6	935.4	1531.3
3:25	8:35	779.9	-509.6	931.6	1536.4
3:20	8:40	766.0	-523.3	927.7	1541.3
3:15	8:45	751.8	-536.8	923.8	1546.0

## Analematic Sundial

Latitude: 54.5° N/S

## Date Scale

Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 814.1 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-246.4	-241.7	-240.3	-233.9	-232.0	-224.1	-221.9	-212.4	-209.9	-199.2	-196.3
February	-178.2	-165.2	-161.8	-148.0	-144.6	-130.1	-126.4	-111.5	-107.7	-92.4	-88.4
March	-76.8	-61.0	-57.0	-41.1	-37.1	-21.1	-17.1	-1.0	2.9	19.0	22.9
April	46.7	62.4	66.3	81.6	85.4	100.5	104.2	118.9	122.5	136.6	140.1
May	156.9	169.8	172.9	184.9	187.8	198.8	201.4	211.5	213.9	222.7	224.7
June	235.6	241.2	242.6	246.7	247.7	250.3	250.7	251.7	251.8	250.0	250.8
July	247.7	243.7	242.6	237.2	235.7	228.7	226.9	218.6	216.4	207.0	204.5
August	188.5	176.8	173.8	161.3	158.1	144.9	141.5	127.7	124.2	109.8	106.2
September	84.0	68.8	65.0	49.6	45.7	30.1	26.3	10.5	6.6	-9.2	-13.2
October	-32.9	-48.7	-52.5	-68.2	-72.0	-87.5	-91.4	-106.5	-110.2	-125.0	-128.6
November	-149.9	-163.4	-166.7	-179.5	-182.6	-194.5	-197.3	-208.2	-210.7	-220.2	-222.6
December	-232.5	-239.2	-240.7	-245.5	-246.6	-249.7	-250.3	-251.7	-251.8	-251.2	-250.8

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	246.4	241.7	240.3	233.9	232.0	224.1	221.9	212.4	209.9	199.2	196.3
February	178.2	165.2	161.8	148.0	144.6	130.1	126.4	111.5	107.7	92.4	88.4
March	76.8	61.0	57.0	41.1	37.1	21.1	17.1	1.0	-2.9	-19.0	-22.9
April	-46.7	-62.4	-66.3	-81.6	-85.4	-100.5	-104.2	-118.9	-122.5	-136.6	-140.1
May	-156.9	-169.8	-172.9	-184.9	-187.8	-198.8	-201.4	-211.5	-213.9	-222.7	-224.7
June	-235.6	-241.2	-242.6	-246.7	-247.7	-250.3	-250.7	-251.7	-251.8	-250.0	-250.8
July	-247.7	-243.7	-242.6	-237.2	-235.7	-228.7	-226.9	-218.6	-216.4	-207.0	-204.5
August	-188.5	-176.8	-173.8	-161.3	-158.1	-144.9	-141.5	-127.7	-124.2	-109.8	-106.2
September	-84.0	-68.8	-65.0	-49.6	-45.7	-30.1	-26.3	-10.5	-6.6	9.2	13.2
October	32.9	48.7	52.5	68.2	72.0	87.5	91.4	106.5	110.2	125.0	128.6
November	149.9	163.4	166.7	179.5	182.6	194.5	197.3	208.2	210.7	220.2	222.6
December	232.5	239.2	240.7	245.5	246.6	249.7	250.3	251.7	251.8	251.2	250.8

Southern Hemisphere

The shaded "Date" boxes identify the two extremes of the "Date Scale" that occur on the Summer and Winter Solstices.

A number of "Date Scale" configurations are available including the following "Date Line" combinations:

a) 1

c) 1,10,20

e) 1,5,10,15,20,25

b) 1,15

d) 1,11,21

f) 1,6,11,16,21,26

## Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m.    Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1221.2 mm  
 Sunrise/Sunset Markers: X = ± 433.3 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1221.2	1221.2	0.0						
11:55	12:05	32.7	1220.9	1221.3	32.7	8:25	3:35	1209.7	722.1	1408.8	1308.6
11:50	12:10	65.4	1220.0	1221.8	65.4	8:20	3:40	1228.7	700.4	1414.3	1334.5
11:45	12:15	98.1	1218.6	1222.5	98.1	8:15	3:45	1247.2	678.4	1419.8	1360.2
11:40	12:20	130.7	1216.5	1223.5	130.8	8:10	3:50	1265.1	656.1	1425.1	1385.5
11:35	12:25	163.3	1213.9	1224.8	163.5	8:05	3:55	1282.4	633.5	1430.3	1410.6
11:30	12:30	195.8	1210.7	1226.5	196.1	8:00	4:00	1299.0	610.6	1435.4	1435.4
11:25	12:35	228.2	1207.0	1228.3	228.6	7:55	4:05	1315.1	587.4	1440.3	1459.9
11:20	12:40	260.5	1202.6	1230.5	261.1	7:50	4:10	1330.5	563.9	1445.1	1484.0
11:15	12:45	292.6	1197.7	1232.9	293.6	7:45	4:15	1345.3	540.1	1449.7	1507.9
11:10	12:50	324.7	1192.2	1235.6	325.9	7:40	4:20	1359.5	516.1	1454.1	1531.4
11:05	12:55	356.5	1186.2	1238.6	358.2	7:35	4:25	1373.0	491.8	1458.4	1554.7
11:00	1:00	388.2	1179.6	1241.8	390.5	7:30	4:30	1385.8	467.3	1462.5	1577.6
10:55	1:05	419.7	1172.4	1245.3	422.6	7:25	4:35	1398.0	442.6	1466.4	1600.2
10:50	1:10	451.1	1164.7	1248.9	454.6	7:20	4:40	1409.5	417.7	1470.1	1622.5
10:45	1:15	482.2	1156.4	1252.9	486.5	7:15	4:45	1420.4	392.5	1473.6	1644.4
10:40	1:20	513.0	1147.5	1257.0	518.3	7:10	4:50	1430.6	367.2	1477.0	1666.1
10:35	1:25	543.7	1138.1	1261.3	550.0	7:05	4:55	1440.1	341.7	1480.1	1687.4
10:30	1:30	574.0	1128.2	1265.9	581.5	7:00	5:00	1448.9	316.1	1483.0	1708.4
10:25	1:35	604.1	1117.8	1270.6	612.9	6:55	5:05	1457.0	290.3	1485.6	1729.0
10:20	1:40	633.9	1106.8	1275.5	644.2	6:50	5:10	1464.4	264.3	1488.1	1749.3
10:15	1:45	663.4	1095.2	1280.5	675.3	6:45	5:15	1471.2	238.2	1490.3	1769.3
10:10	1:50	692.6	1083.2	1285.7	706.2	6:40	5:20	1477.2	212.1	1492.4	1789.0
10:05	1:55	721.5	1070.6	1291.0	737.0	6:35	5:25	1482.5	185.8	1494.1	1808.3
10:00	2:00	750.0	1057.6	1296.5	767.6	6:30	5:30	1487.2	159.4	1495.7	1827.3
9:55	2:05	778.2	1044.0	1302.1	798.1	6:25	5:35	1491.1	132.9	1497.0	1846.0
9:50	2:10	805.9	1029.9	1307.8	828.3	6:20	5:40	1494.3	106.4	1498.1	1864.3
9:45	2:15	833.4	1015.4	1313.6	858.4	6:15	5:45	1496.8	79.9	1498.9	1882.3
9:40	2:20	860.4	1000.3	1319.4	888.3	6:10	5:50	1498.6	53.3	1499.5	1899.9
9:35	2:25	887.0	984.8	1325.4	917.9	6:05	5:55	1499.6	26.6	1499.9	1917.2
9:30	2:30	913.1	968.8	1331.3	947.4	6:00	6:00	1500.0	0.0	1500.0	1934.2
9:25	2:35	938.9	952.4	1337.4	976.6	5:55	6:05	1499.6	-26.6	1499.9	1950.9
9:20	2:40	964.2	935.5	1343.4	1005.6	5:50	6:10	1498.6	-53.3	1499.5	1967.2
9:15	2:45	989.0	918.1	1349.5	1034.4	5:45	6:15	1496.8	-79.9	1498.9	1983.2
9:10	2:50	1013.4	900.3	1355.6	1063.0	5:40	6:20	1494.3	-106.4	1498.1	1998.9
9:05	2:55	1037.3	882.1	1361.6	1091.3	5:35	6:25	1491.1	-132.9	1497.0	2014.2
9:00	3:00	1060.7	863.5	1367.7	1119.3	5:30	6:30	1487.2	-159.4	1495.7	2029.2
8:55	3:05	1083.5	844.5	1373.7	1147.2	5:25	6:35	1482.5	-185.8	1494.1	2043.9
8:50	3:10	1105.9	825.0	1379.7	1174.7	5:20	6:40	1477.2	-212.1	1492.4	2058.2
8:45	3:15	1127.8	805.2	1385.7	1202.0	5:15	6:45	1471.2	-238.2	1490.3	2072.3
8:40	3:20	1149.1	785.0	1391.6	1229.1	5:10	6:50	1464.4	-264.3	1488.1	2086.0
8:35	3:25	1169.8	764.4	1397.4	1255.9	5:05	6:55	1457.0	-290.3	1485.6	2099.4
8:30	3:30	1190.0	743.4	1403.1	1282.4	5:00	7:00	1448.9	-316.1	1483.0	2112.4

## Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m.    Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1221.2 mm  
 Sunrise/Sunset Markers: X = ± 433.3 mm

Local Time		X	Y	Z	W
4:55	7:05	1440.1	-341.7	1480.1	2125.2
4:50	7:10	1430.6	-367.2	1477.0	2137.6
4:45	7:15	1420.4	-392.5	1473.6	2149.8
4:40	7:20	1409.5	-417.7	1470.1	2161.6
4:35	7:25	1398.0	-442.6	1466.4	2173.1
4:30	7:30	1385.8	-467.3	1462.5	2184.4
4:25	7:35	1373.0	-491.8	1458.4	2195.3
4:20	7:40	1359.5	-516.1	1454.1	2206.0
4:15	7:45	1345.3	-540.1	1449.7	2216.3
4:10	7:50	1330.5	-563.9	1445.1	2226.4
4:05	7:55	1315.1	-587.4	1440.3	2236.1
4:00	8:00	1299.0	-610.6	1435.4	2245.6
3:55	8:05	1282.4	-633.5	1430.3	2254.8
3:50	8:10	1265.1	-656.1	1425.1	2263.8
3:45	8:15	1247.2	-678.4	1419.8	2272.5
3:40	8:20	1228.7	-700.4	1414.3	2280.9
3:35	8:25	1209.7	-722.1	1408.8	2289.0
3:30	8:30	1190.0	-743.4	1403.1	2296.9
3:25	8:35	1169.8	-764.4	1397.4	2304.5
3:20	8:40	1149.1	-785.0	1391.6	2311.9
3:15	8:45	1127.8	-805.2	1385.7	2319.0

## Analematic Sundial

Latitude: 54.5° N/S

## Date Scale

Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1221.2 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-369.6	-362.6	-360.4	-350.9	-348.0	-336.1	-332.8	-318.6	-314.8	-298.7	-294.5
February	-267.3	-247.8	-242.7	-222.0	-216.9	-195.2	-189.6	-167.3	-161.6	-138.6	-132.7
March	-115.1	-91.6	-85.6	-61.7	-55.7	-31.6	-25.7	-1.5	4.4	28.4	34.4
April	70.1	93.6	99.4	122.4	128.2	150.8	156.3	178.3	183.7	204.9	210.1
May	235.4	254.7	259.3	277.3	281.7	298.2	302.1	317.2	320.8	334.0	337.0
June	353.3	361.9	363.8	370.1	371.5	375.5	376.0	377.5	377.7	375.0	376.2
July	371.5	365.6	363.8	355.8	353.5	343.1	340.3	327.9	324.6	310.5	306.7
August	282.7	265.1	260.7	241.9	237.2	217.3	212.2	191.5	186.3	164.7	159.2
September	126.0	103.3	97.6	74.4	68.6	45.2	39.4	15.8	9.9	-13.8	-19.8
October	-49.3	-73.0	-78.8	-102.3	-108.0	-131.3	-137.0	-159.7	-165.4	-187.5	-192.9
November	-224.8	-245.2	-250.1	-269.3	-274.0	-291.8	-296.0	-312.2	-316.0	-330.4	-333.8
December	-348.7	-358.8	-361.0	-368.3	-369.9	-374.6	-375.5	-377.5	-377.7	-376.8	-376.2

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	369.6	362.6	360.4	350.9	348.0	336.1	332.8	318.6	314.8	298.7	294.5
February	267.3	247.8	242.7	222.0	216.9	195.2	189.6	167.3	161.6	138.6	132.7
March	115.1	91.6	85.6	61.7	55.7	31.6	25.7	1.5	-4.4	-28.4	-34.4
April	-70.1	-93.6	-99.4	-122.4	-128.2	-150.8	-156.3	-178.3	-183.7	-204.9	-210.1
May	-235.4	-254.7	-259.3	-277.3	-281.7	-298.2	-302.1	-317.2	-320.8	-334.0	-337.0
June	-353.3	-361.9	-363.8	-370.1	-371.5	-375.5	-376.0	-377.5	-377.7	-375.0	-376.2
July	-371.5	-365.6	-363.8	-355.8	-353.5	-343.1	-340.3	-327.9	-324.6	-310.5	-306.7
August	-282.7	-265.1	-260.7	-241.9	-237.2	-217.3	-212.2	-191.5	-186.3	-164.7	-159.2
September	-126.0	-103.3	-97.6	-74.4	-68.6	-45.2	-39.4	-15.8	-9.9	13.8	19.8
October	49.3	73.0	78.8	102.3	108.0	131.3	137.0	159.7	165.4	187.5	192.9
November	224.8	245.2	250.1	269.3	274.0	291.8	296.0	312.2	316.0	330.4	333.8
December	348.7	358.8	361.0	368.3	369.9	374.6	375.5	377.5	377.7	376.8	376.2

Southern Hemisphere

The shaded "Date" boxes identify the two extremes of the "Date Scale" that occur on the Summer and Winter Solstices.

A number of "Date Scale" configurations are available including the following "Date Line" combinations:

- |         |            |                    |
|---------|------------|--------------------|
| a) 1    | c) 1,10,20 | e) 1,5,10,15,20,25 |
| b) 1,15 | d) 1,11,21 | f) 1,6,11,16,21,26 |

## Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m.    Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1628.2 mm  
 Sunrise/Sunset Markers: X = ± 577.8 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1628.2	1628.2	0.0						
11:55	12:05	43.6	1627.8	1628.4	43.6	8:25	3:35	1612.9	962.8	1878.4	1744.8
11:50	12:10	87.2	1626.7	1629.0	87.3	8:20	3:40	1638.3	933.9	1885.8	1779.4
11:45	12:15	130.8	1624.7	1630.0	130.9	8:15	3:45	1662.9	904.6	1893.1	1813.6
11:40	12:20	174.3	1622.0	1631.4	174.4	8:10	3:50	1686.8	874.8	1900.2	1847.4
11:35	12:25	217.7	1618.6	1633.1	217.9	8:05	3:55	1709.8	844.7	1907.1	1880.8
11:30	12:30	261.1	1614.3	1635.3	261.4	8:00	4:00	1732.1	814.1	1913.8	1913.8
11:25	12:35	304.2	1609.3	1637.8	304.8	7:55	4:05	1753.5	783.2	1920.4	1946.5
11:20	12:40	347.3	1603.5	1640.7	348.2	7:50	4:10	1774.0	751.8	1926.8	1978.7
11:15	12:45	390.2	1596.9	1643.9	391.4	7:45	4:15	1793.7	720.1	1932.9	2010.5
11:10	12:50	432.9	1589.6	1647.5	434.6	7:40	4:20	1812.6	688.1	1938.8	2041.9
11:05	12:55	475.4	1581.6	1651.5	477.7	7:35	4:25	1830.6	655.8	1944.5	2072.9
11:00	1:00	517.6	1572.8	1655.7	520.6	7:30	4:30	1847.8	623.1	1950.0	2103.5
10:55	1:05	559.7	1563.2	1660.3	563.4	7:25	4:35	1864.0	590.1	1955.2	2133.6
10:50	1:10	601.4	1552.9	1665.3	606.1	7:20	4:40	1879.4	556.9	1960.2	2163.3
10:45	1:15	642.9	1541.8	1670.5	648.7	7:15	4:45	1893.9	523.4	1964.8	2192.6
10:40	1:20	684.0	1530.0	1676.0	691.1	7:10	4:50	1907.4	489.6	1969.3	2221.4
10:35	1:25	724.9	1517.5	1681.8	733.3	7:05	4:55	1920.1	455.6	1973.4	2249.8
10:30	1:30	765.4	1504.3	1687.8	775.3	7:00	5:00	1931.9	421.4	1977.3	2277.8
10:25	1:35	805.5	1490.3	1694.1	817.2	6:55	5:05	1942.7	387.0	1980.9	2305.4
10:20	1:40	845.2	1475.7	1700.6	858.9	6:50	5:10	1952.6	352.4	1984.1	2332.5
10:15	1:45	884.6	1460.3	1707.3	900.4	6:45	5:15	1961.6	317.7	1987.1	2359.1
10:10	1:50	923.5	1444.3	1714.3	941.6	6:40	5:20	1969.6	282.7	1989.8	2385.3
10:05	1:55	962.0	1427.5	1721.4	982.7	6:35	5:25	1976.7	247.7	1992.2	2411.1
10:00	2:00	1000.0	1410.1	1728.7	1023.5	6:30	5:30	1982.9	212.5	1994.2	2436.4
9:55	2:05	1037.5	1392.0	1736.1	1064.1	6:25	5:35	1988.1	177.3	1996.0	2461.3
9:50	2:10	1074.6	1373.2	1743.7	1104.4	6:20	5:40	1992.4	141.9	1997.4	2485.7
9:45	2:15	1111.1	1353.8	1751.4	1144.5	6:15	5:45	1995.7	106.5	1998.6	2509.7
9:40	2:20	1147.2	1333.8	1759.2	1184.3	6:10	5:50	1998.1	71.0	1999.4	2533.2
9:35	2:25	1182.6	1313.1	1767.1	1223.9	6:05	5:55	1999.5	35.5	1999.8	2556.3
9:30	2:30	1217.5	1291.8	1775.1	1263.2	6:00	6:00	2000.0	0.0	2000.0	2579.0
9:25	2:35	1251.8	1269.8	1783.1	1302.1	5:55	6:05	1999.5	-35.5	1999.8	2601.2
9:20	2:40	1285.6	1247.3	1791.2	1340.8	5:50	6:10	1998.1	-71.0	1999.4	2622.9
9:15	2:45	1318.7	1224.2	1799.3	1379.2	5:45	6:15	1995.7	-106.5	1998.6	2644.3
9:10	2:50	1351.2	1200.5	1807.4	1417.3	5:40	6:20	1992.4	-141.9	1997.4	2665.1
9:05	2:55	1383.0	1176.2	1815.5	1455.0	5:35	6:25	1988.1	-177.3	1996.0	2685.6
9:00	3:00	1414.2	1151.3	1823.6	1492.5	5:30	6:30	1982.9	-212.5	1994.2	2705.6
8:55	3:05	1444.7	1125.9	1831.7	1529.6	5:25	6:35	1976.7	-247.7	1992.2	2725.2
8:50	3:10	1474.6	1100.0	1839.7	1566.3	5:20	6:40	1969.6	-282.7	1989.8	2744.3
8:45	3:15	1503.7	1073.6	1847.6	1602.7	5:15	6:45	1961.6	-317.7	1987.1	2763.0
8:40	3:20	1532.1	1046.6	1855.4	1638.8	5:10	6:50	1952.6	-352.4	1984.1	2781.3
8:35	3:25	1559.8	1019.1	1863.2	1674.5	5:05	6:55	1942.7	-387.0	1980.9	2799.1
8:30	3:30	1586.7	991.2	1870.9	1709.8	5:00	7:00	1931.9	-421.4	1977.3	2816.6

## Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m.    Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1628.2 mm  
 Sunrise/Sunset Markers: X = ± 577.8 mm

Local Time		X	Y	Z	W
4:55	7:05	1920.1	-455.6	1973.4	2833.6
4:50	7:10	1907.4	-489.6	1969.3	2850.2
4:45	7:15	1893.9	-523.4	1964.8	2866.4
4:40	7:20	1879.4	-556.9	1960.2	2882.2
4:35	7:25	1864.0	-590.1	1955.2	2897.5
4:30	7:30	1847.8	-623.1	1950.0	2912.5
4:25	7:35	1830.6	-655.8	1944.5	2927.1
4:20	7:40	1812.6	-688.1	1938.8	2941.3
4:15	7:45	1793.7	-720.1	1932.9	2955.1
4:10	7:50	1774.0	-751.8	1926.8	2968.5
4:05	7:55	1753.5	-783.2	1920.4	2981.5
4:00	8:00	1732.1	-814.1	1913.8	2994.2
3:55	8:05	1709.8	-844.7	1907.1	3006.5
3:50	8:10	1686.8	-874.8	1900.2	3018.4
3:45	8:15	1662.9	-904.6	1893.1	3029.9
3:40	8:20	1638.3	-933.9	1885.8	3041.2
3:35	8:25	1612.9	-962.8	1878.4	3052.0
3:30	8:30	1586.7	-991.2	1870.9	3062.5
3:25	8:35	1559.8	-1019.1	1863.2	3072.7
3:20	8:40	1532.1	-1046.6	1855.4	3082.5
3:15	8:45	1503.7	-1073.6	1847.6	3092.0

## Analematic Sundial

Latitude: 54.5° N/S

## Date Scale

Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1628.2 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-492.7	-483.4	-480.6	-467.8	-464.1	-448.1	-443.7	-424.8	-419.7	-398.3	-392.7
February	-356.4	-330.4	-323.6	-296.0	-289.1	-260.2	-252.8	-223.0	-215.5	-184.8	-176.9
March	-153.5	-122.1	-114.1	-82.2	-74.3	-42.2	-34.3	-2.0	5.9	37.9	45.8
April	93.4	124.7	132.5	163.2	170.9	201.0	208.3	237.8	245.0	273.3	280.1
May	313.8	339.6	345.8	369.8	375.6	397.6	402.9	422.9	427.8	445.4	449.3
June	471.1	482.5	485.1	493.5	495.4	500.7	501.4	503.3	503.5	499.9	501.6
July	495.4	487.5	485.1	474.4	471.4	457.5	453.7	437.2	432.8	414.0	409.0
August	376.9	353.5	347.6	322.5	316.2	289.8	282.9	255.4	248.3	219.7	212.3
September	168.0	137.7	130.1	99.2	91.4	60.3	52.5	21.1	13.2	-18.4	-26.4
October	-65.7	-97.3	-105.1	-136.4	-144.0	-175.0	-182.7	-212.9	-220.5	-250.0	-257.3
November	-299.7	-326.9	-333.5	-359.1	-365.3	-389.1	-394.7	-416.3	-421.3	-440.5	-445.1
December	-465.0	-478.5	-481.3	-491.1	-493.2	-499.5	-500.7	-503.3	-503.5	-502.3	-501.6

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	492.7	483.4	480.6	467.8	464.1	448.1	443.7	424.8	419.7	398.3	392.7
February	356.4	330.4	323.6	296.0	289.1	260.2	252.8	223.0	215.5	184.8	176.9
March	153.5	122.1	114.1	82.2	74.3	42.2	34.3	2.0	-5.9	-37.9	-45.8
April	-93.4	-124.7	-132.5	-163.2	-170.9	-201.0	-208.3	-237.8	-245.0	-273.3	-280.1
May	-313.8	-339.6	-345.8	-369.8	-375.6	-397.6	-402.9	-422.9	-427.8	-445.4	-449.3
June	-471.1	-482.5	-485.1	-493.5	-495.4	-500.7	-501.4	-503.3	-503.5	-499.9	-501.6
July	-495.4	-487.5	-485.1	-474.4	-471.4	-457.5	-453.7	-437.2	-432.8	-414.0	-409.0
August	-376.9	-353.5	-347.6	-322.5	-316.2	-289.8	-282.9	-255.4	-248.3	-219.7	-212.3
September	-168.0	-137.7	-130.1	-99.2	-91.4	-60.3	-52.5	-21.1	-13.2	18.4	26.4
October	65.7	97.3	105.1	136.4	144.0	175.0	182.7	212.9	220.5	250.0	257.3
November	299.7	326.9	333.5	359.1	365.3	389.1	394.7	416.3	421.3	440.5	445.1
December	465.0	478.5	481.3	491.1	493.2	499.5	500.7	503.3	503.5	502.3	501.6

Southern Hemisphere

The shaded "Date" boxes identify the two extremes of the "Date Scale" that occur on the Summer and Winter Solstices.

A number of "Date Scale" configurations are available including the following "Date Line" combinations:

- |         |            |                    |
|---------|------------|--------------------|
| a) 1    | c) 1,10,20 | e) 1,5,10,15,20,25 |
| b) 1,15 | d) 1,11,21 | f) 1,6,11,16,21,26 |

Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m. Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 2035.3 mm  
 Sunrise/Sunset Markers: X = ± 722.2 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	2035.3	2035.3	0.0						
11:55	12:05	54.5	2034.8	2035.5	54.5	8:25	3:35	2016.1	1203.5	2348.0	2181.0
11:50	12:10	109.0	2033.4	2036.3	109.1	8:20	3:40	2047.9	1167.4	2357.2	2224.2
11:45	12:15	163.5	2030.9	2037.5	163.6	8:15	3:45	2078.7	1130.7	2366.3	2267.0
11:40	12:20	217.9	2027.5	2039.2	218.0	8:10	3:50	2108.5	1093.6	2375.2	2309.2
11:35	12:25	272.2	2023.2	2041.4	272.4	8:05	3:55	2137.3	1055.9	2383.9	2351.0
11:30	12:30	326.3	2017.9	2044.1	326.8	8:00	4:00	2165.1	1017.6	2392.3	2392.3
11:25	12:35	380.3	2011.6	2047.2	381.0	7:55	4:05	2191.8	979.0	2400.5	2433.1
11:20	12:40	434.1	2004.4	2050.8	435.2	7:50	4:10	2217.5	939.8	2408.5	2473.4
11:15	12:45	487.7	1996.2	2054.9	489.3	7:45	4:15	2242.2	900.2	2416.1	2513.1
11:10	12:50	541.1	1987.0	2059.4	543.2	7:40	4:20	2265.8	860.2	2423.5	2552.4
11:05	12:55	594.2	1977.0	2064.3	597.1	7:35	4:25	2288.3	819.7	2430.7	2591.1
11:00	1:00	647.0	1965.9	2069.7	650.8	7:30	4:30	2309.7	778.9	2437.5	2629.3
10:55	1:05	699.6	1954.0	2075.4	704.3	7:25	4:35	2330.0	737.7	2444.0	2667.0
10:50	1:10	751.8	1941.1	2081.6	757.6	7:20	4:40	2349.2	696.1	2450.2	2704.1
10:45	1:15	803.6	1927.3	2088.1	810.8	7:15	4:45	2367.3	654.2	2456.1	2740.7
10:40	1:20	855.1	1912.5	2095.0	863.8	7:10	4:50	2384.3	612.0	2461.6	2776.8
10:35	1:25	906.1	1896.9	2102.2	916.6	7:05	4:55	2400.1	569.5	2466.8	2812.3
10:30	1:30	956.7	1880.4	2109.8	969.2	7:00	5:00	2414.8	526.8	2471.6	2847.3
10:25	1:35	1006.9	1862.9	2117.6	1021.5	6:55	5:05	2428.4	483.8	2476.1	2881.7
10:20	1:40	1056.5	1844.6	2125.8	1073.6	6:50	5:10	2440.7	440.5	2480.2	2915.6
10:15	1:45	1105.7	1825.4	2134.2	1125.5	6:45	5:15	2452.0	397.1	2483.9	2948.9
10:10	1:50	1154.4	1805.3	2142.8	1177.1	6:40	5:20	2462.0	353.4	2487.3	2981.6
10:05	1:55	1202.5	1784.4	2151.7	1228.4	6:35	5:25	2470.9	309.6	2490.2	3013.9
10:00	2:00	1250.0	1762.6	2160.9	1279.4	6:30	5:30	2478.6	265.7	2492.8	3045.5
9:55	2:05	1296.9	1740.0	2170.2	1330.1	6:25	5:35	2485.1	221.6	2495.0	3076.6
9:50	2:10	1343.2	1716.5	2179.6	1380.5	6:20	5:40	2490.5	177.4	2496.8	3107.1
9:45	2:15	1388.9	1692.3	2189.3	1430.7	6:15	5:45	2494.6	133.1	2498.2	3137.1
9:40	2:20	1433.9	1667.2	2199.0	1480.4	6:10	5:50	2497.6	88.8	2499.2	3166.5
9:35	2:25	1478.3	1641.3	2208.9	1529.9	6:05	5:55	2499.4	44.4	2499.8	3195.4
9:30	2:30	1521.9	1614.7	2218.9	1578.9	6:00	6:00	2500.0	0.0	2500.0	3223.7
9:25	2:35	1564.8	1587.3	2228.9	1627.7	5:55	6:05	2499.4	-44.4	2499.8	3251.5
9:20	2:40	1607.0	1559.1	2239.0	1676.0	5:50	6:10	2497.6	-88.8	2499.2	3278.7
9:15	2:45	1648.4	1530.2	2249.1	1724.0	5:45	6:15	2494.6	-133.1	2498.2	3305.3
9:10	2:50	1689.0	1500.6	2259.3	1771.6	5:40	6:20	2490.5	-177.4	2496.8	3331.4
9:05	2:55	1728.8	1470.2	2269.4	1818.8	5:35	6:25	2485.1	-221.6	2495.0	3357.0
9:00	3:00	1767.8	1439.2	2279.5	1865.6	5:30	6:30	2478.6	-265.7	2492.8	3382.0
8:55	3:05	1805.9	1407.4	2289.6	1911.9	5:25	6:35	2470.9	-309.6	2490.2	3406.5
8:50	3:10	1843.2	1375.0	2299.6	1957.9	5:20	6:40	2462.0	-353.4	2487.3	3430.4
8:45	3:15	1879.6	1342.0	2309.5	2003.4	5:15	6:45	2452.0	-397.1	2483.9	3453.8
8:40	3:20	1915.1	1308.3	2319.3	2048.5	5:10	6:50	2440.7	-440.5	2480.2	3476.6
8:35	3:25	1949.7	1273.9	2329.0	2093.1	5:05	6:55	2428.4	-483.8	2476.1	3498.9
8:30	3:30	1983.4	1239.0	2338.6	2137.3	5:00	7:00	2414.8	-526.8	2471.6	3520.7

## Analemmatic Sundial

Latitude: 54.5° N/S

Earliest Sunrise: 3:23 a.m.    Latest Sunset: 8:37 p.m.  
 Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 2035.3 mm  
 Sunrise/Sunset Markers:  $X = \pm 722.2$  mm

Local Time		X	Y	Z	W
4:55	7:05	2400.1	-569.5	2466.8	3542.0
4:50	7:10	2384.3	-612.0	2461.6	3562.7
4:45	7:15	2367.3	-654.2	2456.1	3583.0
4:40	7:20	2349.2	-696.1	2450.2	3602.7
4:35	7:25	2330.0	-737.7	2444.0	3621.9
4:30	7:30	2309.7	-778.9	2437.5	3640.6
4:25	7:35	2288.3	-819.7	2430.7	3658.9
4:20	7:40	2265.8	-860.2	2423.5	3676.6
4:15	7:45	2242.2	-900.2	2416.1	3693.8
4:10	7:50	2217.5	-939.8	2408.5	3710.6
4:05	7:55	2191.8	-979.0	2400.5	3726.9
4:00	8:00	2165.1	-1017.6	2392.3	3742.7
3:55	8:05	2137.3	-1055.9	2383.9	3758.1
3:50	8:10	2108.5	-1093.6	2375.2	3773.0
3:45	8:15	2078.7	-1130.7	2366.3	3787.4
3:40	8:20	2047.9	-1167.4	2357.2	3801.4
3:35	8:25	2016.1	-1203.5	2348.0	3815.0
3:30	8:30	1983.4	-1239.0	2338.6	3828.2
3:25	8:35	1949.7	-1273.9	2329.0	3840.9
3:20	8:40	1915.1	-1308.3	2319.3	3853.2
3:15	8:45	1879.6	-1342.0	2309.5	3865.1

**Analematic Sundial**

Latitude: 54.5° N/S

**Date Scale**

Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 2035.3 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-615.9	-604.3	-600.7	-584.8	-580.1	-560.2	-554.7	-531.0	-524.7	-497.9	-490.8
February	-445.5	-413.0	-404.5	-370.0	-361.4	-325.3	-316.0	-278.8	-269.3	-231.0	-221.1
March	-191.9	-152.6	-142.6	-102.8	-92.9	-52.7	-42.8	-2.5	7.3	47.4	57.3
April	116.8	155.9	165.7	204.0	213.6	251.3	260.4	297.2	306.2	341.6	350.1
May	392.3	424.5	432.2	462.2	469.5	497.0	503.6	528.7	534.7	556.7	561.6
June	588.9	603.1	606.4	616.8	619.2	625.8	626.7	629.1	629.4	624.9	627.0
July	619.2	609.4	606.4	593.0	589.2	571.9	567.2	546.5	541.1	517.5	511.2
August	471.1	441.9	434.4	403.2	395.3	362.2	353.6	319.2	310.4	274.6	265.4
September	210.0	172.1	162.6	123.9	114.3	75.3	65.7	26.4	16.5	-23.1	-32.9
October	-82.2	-121.7	-131.4	-170.5	-180.1	-218.8	-228.4	-266.2	-275.6	-312.6	-321.6
November	-374.6	-408.6	-416.8	-448.8	-456.6	-486.3	-493.4	-520.4	-526.7	-550.6	-556.4
December	-581.2	-598.1	-601.6	-613.8	-616.5	-624.3	-625.8	-629.1	-629.4	-627.9	-627.0

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	615.9	604.3	600.7	584.8	580.1	560.2	554.7	531.0	524.7	497.9	490.8
February	445.5	413.0	404.5	370.0	361.4	325.3	316.0	278.8	269.3	231.0	221.1
March	191.9	152.6	142.6	102.8	92.9	52.7	42.8	2.5	-7.3	-47.4	-57.3
April	-116.8	-155.9	-165.7	-204.0	-213.6	-251.3	-260.4	-297.2	-306.2	-341.6	-350.1
May	-392.3	-424.5	-432.2	-462.2	-469.5	-497.0	-503.6	-528.7	-534.7	-556.7	-561.6
June	-588.9	-603.1	-606.4	-616.8	-619.2	-625.8	-626.7	-629.1	-629.4	-624.9	-627.0
July	-619.2	-609.4	-606.4	-593.0	-589.2	-571.9	-567.2	-546.5	-541.1	-517.5	-511.2
August	-471.1	-441.9	-434.4	-403.2	-395.3	-362.2	-353.6	-319.2	-310.4	-274.6	-265.4
September	-210.0	-172.1	-162.6	-123.9	-114.3	-75.3	-65.7	-26.4	-16.5	23.1	32.9
October	82.2	121.7	131.4	170.5	180.1	218.8	228.4	266.2	275.6	312.6	321.6
November	374.6	408.6	416.8	448.8	456.6	486.3	493.4	520.4	526.7	550.6	556.4
December	581.2	598.1	601.6	613.8	616.5	624.3	625.8	629.1	629.4	627.9	627.0

Southern Hemisphere

The shaded "Date" boxes identify the two extremes of the "Date Scale" that occur on the Summer and Winter Solstices.

A number of "Date Scale" configurations are available including the following "Date Line" combinations:

- a) 1
- b) 1,15
- c) 1,10,20
- d) 1,11,21
- e) 1,5,10,15,20,25
- f) 1,6,11,16,21,26