

## Analemmatic Sundial

Latitude: 59.0° N/S

Earliest Sunrise: 2:44 a.m.    Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 857.2 mm  
 Sunrise/Sunset Markers: X = ± 209.7 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	857.2	857.2	0.0						
11:55	12:05	21.8	857.0	857.2	21.8	8:25	3:35	806.4	506.9	952.5	879.2
11:50	12:10	43.6	856.4	857.5	43.6	8:20	3:40	819.2	491.7	955.4	897.0
11:45	12:15	65.4	855.3	857.8	65.4	8:15	3:45	831.5	476.2	958.2	914.6
11:40	12:20	87.2	853.9	858.3	87.2	8:10	3:50	843.4	460.6	960.9	932.0
11:35	12:25	108.9	852.1	859.0	109.0	8:05	3:55	854.9	444.7	963.6	949.2
11:30	12:30	130.5	849.8	859.8	130.7	8:00	4:00	866.0	428.6	966.3	966.3
11:25	12:35	152.1	847.2	860.7	152.5	7:55	4:05	876.7	412.3	968.8	983.1
11:20	12:40	173.6	844.1	861.8	174.1	7:50	4:10	887.0	395.8	971.3	999.8
11:15	12:45	195.1	840.7	863.0	195.8	7:45	4:15	896.9	379.1	973.7	1016.3
11:10	12:50	216.4	836.8	864.4	217.4	7:40	4:20	906.3	362.3	976.0	1032.6
11:05	12:55	237.7	832.6	865.9	239.0	7:35	4:25	915.3	345.2	978.2	1048.8
11:00	1:00	258.8	828.0	867.5	260.5	7:30	4:30	923.9	328.0	980.4	1064.7
10:55	1:05	279.8	822.9	869.2	281.9	7:25	4:35	932.0	310.7	982.4	1080.4
10:50	1:10	300.7	817.5	871.0	303.3	7:20	4:40	939.7	293.2	984.4	1096.0
10:45	1:15	321.4	811.7	873.0	324.6	7:15	4:45	946.9	275.5	986.2	1111.3
10:40	1:20	342.0	805.5	875.1	345.9	7:10	4:50	953.7	257.8	987.9	1126.4
10:35	1:25	362.4	798.9	877.3	367.1	7:05	4:55	960.0	239.9	989.6	1141.4
10:30	1:30	382.7	791.9	879.5	388.2	7:00	5:00	965.9	221.9	991.1	1156.1
10:25	1:35	402.7	784.6	881.9	409.2	6:55	5:05	971.3	203.7	992.5	1170.7
10:20	1:40	422.6	776.9	884.4	430.2	6:50	5:10	976.3	185.5	993.8	1185.0
10:15	1:45	442.3	768.8	886.9	451.0	6:45	5:15	980.8	167.2	994.9	1199.1
10:10	1:50	461.7	760.3	889.5	471.8	6:40	5:20	984.8	148.8	996.0	1213.1
10:05	1:55	481.0	751.5	892.2	492.5	6:35	5:25	988.4	130.4	996.9	1226.8
10:00	2:00	500.0	742.3	895.0	513.0	6:30	5:30	991.4	111.9	997.7	1240.3
9:55	2:05	518.8	732.8	897.8	533.5	6:25	5:35	994.1	93.3	998.4	1253.6
9:50	2:10	537.3	722.9	900.7	553.8	6:20	5:40	996.2	74.7	999.0	1266.7
9:45	2:15	555.6	712.7	903.7	574.0	6:15	5:45	997.9	56.1	999.4	1279.6
9:40	2:20	573.6	702.2	906.6	594.2	6:10	5:50	999.0	37.4	999.7	1292.3
9:35	2:25	591.3	691.3	909.7	614.1	6:05	5:55	999.8	18.7	999.9	1304.8
9:30	2:30	608.8	680.0	912.7	634.0	6:00	6:00	1000.0	0.0	1000.0	1317.1
9:25	2:35	625.9	668.5	915.8	653.7	5:55	6:05	999.8	-18.7	999.9	1329.2
9:20	2:40	642.8	656.6	918.9	673.3	5:50	6:10	999.0	-37.4	999.7	1341.0
9:15	2:45	659.3	644.5	922.0	692.8	5:45	6:15	997.9	-56.1	999.4	1352.7
9:10	2:50	675.6	632.0	925.1	712.1	5:40	6:20	996.2	-74.7	999.0	1364.1
9:05	2:55	691.5	619.2	928.2	731.3	5:35	6:25	994.1	-93.3	998.4	1375.3
9:00	3:00	707.1	606.1	931.3	750.4	5:30	6:30	991.4	-111.9	997.7	1386.4
8:55	3:05	722.4	592.7	934.4	769.2	5:25	6:35	988.4	-130.4	996.9	1397.2
8:50	3:10	737.3	579.1	937.5	788.0	5:20	6:40	984.8	-148.8	996.0	1407.8
8:45	3:15	751.8	565.2	940.6	806.6	5:15	6:45	980.8	-167.2	994.9	1418.2
8:40	3:20	766.0	551.0	943.6	825.0	5:10	6:50	976.3	-185.5	993.8	1428.4
8:35	3:25	779.9	536.5	946.6	843.2	5:05	6:55	971.3	-203.7	992.5	1438.4
8:30	3:30	793.4	521.8	949.6	861.3	5:00	7:00	965.9	-221.9	991.1	1448.2

## Analemmatic Sundial

Latitude: 59.0° N/S

Earliest Sunrise: 2:44 a.m.    Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 857.2 mm  
 Sunrise/Sunset Markers: X = ± 209.7 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
4:55	7:05	960.0	-239.9	989.6	1457.8	2:55	9:05	691.5	-619.2	928.2	1630.3
4:50	7:10	953.7	-257.8	987.9	1467.2	2:50	9:10	675.6	-632.0	925.1	1635.2
4:45	7:15	946.9	-275.5	986.2	1476.4	2:45	9:15	659.3	-644.5	922.0	1640.0
4:40	7:20	939.7	-293.2	984.4	1485.4	2:40	9:20	642.8	-656.6	918.9	1644.6
4:35	7:25	932.0	-310.7	982.4	1494.1	2:35	9:25	625.9	-668.5	915.8	1649.1
4:30	7:30	923.9	-328.0	980.4	1502.7	2:30	9:30	608.8	-680.0	912.7	1653.4
4:25	7:35	915.3	-345.2	978.2	1511.1						
4:20	7:40	906.3	-362.3	976.0	1519.3						
4:15	7:45	896.9	-379.1	973.7	1527.3						
4:10	7:50	887.0	-395.8	971.3	1535.2						
4:05	7:55	876.7	-412.3	968.8	1542.8						
4:00	8:00	866.0	-428.6	966.3	1550.2						
3:55	8:05	854.9	-444.7	963.6	1557.5						
3:50	8:10	843.4	-460.6	960.9	1564.5						
3:45	8:15	831.5	-476.2	958.2	1571.4						
3:40	8:20	819.2	-491.7	955.4	1578.1						
3:35	8:25	806.4	-506.9	952.5	1584.6						
3:30	8:30	793.4	-521.8	949.6	1590.9						
3:25	8:35	779.9	-536.5	946.6	1597.1						
3:20	8:40	766.0	-551.0	943.6	1603.0						
3:15	8:45	751.8	-565.2	940.6	1608.8						
3:10	8:50	737.3	-579.1	937.5	1614.4						
3:05	8:55	722.4	-592.7	934.4	1619.9						
3:00	9:00	707.1	-606.1	931.3	1625.2						

## Analematic Sundial

Latitude: 59.0° N/S

## Date Scale

Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 857.2 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-218.5	-214.4	-213.1	-207.5	-205.8	-198.7	-196.8	-188.4	-186.1	-176.6	-174.1
February	-158.1	-146.5	-143.5	-131.3	-128.2	-115.4	-112.1	-98.9	-95.5	-81.9	-78.4
March	-68.1	-54.1	-50.6	-36.5	-32.9	-18.7	-15.2	-0.9	2.6	16.8	20.3
April	41.4	55.3	58.8	72.4	75.8	89.1	92.4	105.4	108.6	121.2	124.2
May	139.2	150.6	153.3	164.0	166.6	176.3	178.6	187.6	189.7	197.5	199.3
June	208.9	214.0	215.1	218.8	219.7	222.0	222.3	223.2	223.3	221.7	222.5
July	219.7	216.2	215.1	210.4	209.0	202.9	201.2	193.9	192.0	183.6	181.4
August	167.1	156.8	154.1	143.0	140.2	128.5	125.5	113.2	110.1	97.4	94.2
September	74.5	61.0	57.7	44.0	40.5	26.7	23.3	9.3	5.8	-8.2	-11.7
October	-29.2	-43.2	-46.6	-60.5	-63.9	-77.6	-81.0	-94.4	-97.8	-110.9	-114.1
November	-132.9	-145.0	-147.9	-159.2	-162.0	-172.5	-175.0	-184.6	-186.8	-195.3	-197.4
December	-206.2	-212.2	-213.4	-217.8	-218.7	-221.5	-222.0	-223.2	-223.3	-222.8	-222.5

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	218.5	214.4	213.1	207.5	205.8	198.7	196.8	188.4	186.1	176.6	174.1
February	158.1	146.5	143.5	131.3	128.2	115.4	112.1	98.9	95.5	81.9	78.4
March	68.1	54.1	50.6	36.5	32.9	18.7	15.2	0.9	-2.6	-16.8	-20.3
April	-41.4	-55.3	-58.8	-72.4	-75.8	-89.1	-92.4	-105.4	-108.6	-121.2	-124.2
May	-139.2	-150.6	-153.3	-164.0	-166.6	-176.3	-178.6	-187.6	-189.7	-197.5	-199.3
June	-208.9	-214.0	-215.1	-218.8	-219.7	-222.0	-222.3	-223.2	-223.3	-221.7	-222.5
July	-219.7	-216.2	-215.1	-210.4	-209.0	-202.9	-201.2	-193.9	-192.0	-183.6	-181.4
August	-167.1	-156.8	-154.1	-143.0	-140.2	-128.5	-125.5	-113.2	-110.1	-97.4	-94.2
September	-74.5	-61.0	-57.7	-44.0	-40.5	-26.7	-23.3	-9.3	-5.8	8.2	11.7
October	29.2	43.2	46.6	60.5	63.9	77.6	81.0	94.4	97.8	110.9	114.1
November	132.9	145.0	147.9	159.2	162.0	172.5	175.0	184.6	186.8	195.3	197.4
December	206.2	212.2	213.4	217.8	218.7	221.5	222.0	223.2	223.3	222.8	222.5

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: 59.0° N/S

Earliest Sunrise: 2:44 a.m.    Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1285.8 mm  
 Sunrise/Sunset Markers: X = ± 314.6 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1285.8	1285.8	0.0						
11:55	12:05	32.7	1285.4	1285.9	32.7	8:25	3:35	1209.7	760.3	1428.7	1318.9
11:50	12:10	65.4	1284.5	1286.2	65.4	8:20	3:40	1228.7	737.5	1433.1	1345.5
11:45	12:15	98.1	1283.0	1286.7	98.1	8:15	3:45	1247.2	714.3	1437.3	1371.9
11:40	12:20	130.7	1280.9	1287.5	130.8	8:10	3:50	1265.1	690.8	1441.4	1398.0
11:35	12:25	163.3	1278.1	1288.5	163.5	8:05	3:55	1282.4	667.0	1445.5	1423.8
11:30	12:30	195.8	1274.8	1289.7	196.1	8:00	4:00	1299.0	642.9	1449.4	1449.4
11:25	12:35	228.2	1270.8	1291.1	228.7	7:55	4:05	1315.1	618.4	1453.2	1474.7
11:20	12:40	260.5	1266.2	1292.7	261.2	7:50	4:10	1330.5	593.7	1457.0	1499.7
11:15	12:45	292.6	1261.0	1294.6	293.7	7:45	4:15	1345.3	568.7	1460.6	1524.5
11:10	12:50	324.7	1255.3	1296.6	326.1	7:40	4:20	1359.5	543.4	1464.0	1549.0
11:05	12:55	356.5	1248.9	1298.8	358.4	7:35	4:25	1373.0	517.8	1467.4	1573.1
11:00	1:00	388.2	1241.9	1301.2	390.7	7:30	4:30	1385.8	492.0	1470.6	1597.0
10:55	1:05	419.7	1234.4	1303.8	422.9	7:25	4:35	1398.0	466.0	1473.6	1620.6
10:50	1:10	451.1	1226.2	1306.6	455.0	7:20	4:40	1409.5	439.8	1476.5	1643.9
10:45	1:15	482.2	1217.5	1309.5	487.0	7:15	4:45	1420.4	413.3	1479.3	1666.9
10:40	1:20	513.0	1208.2	1312.6	518.9	7:10	4:50	1430.6	386.6	1481.9	1689.7
10:35	1:25	543.7	1198.3	1315.9	550.6	7:05	4:55	1440.1	359.8	1484.3	1712.1
10:30	1:30	574.0	1187.9	1319.3	582.3	7:00	5:00	1448.9	332.8	1486.6	1734.2
10:25	1:35	604.1	1176.9	1322.9	613.9	6:55	5:05	1457.0	305.6	1488.7	1756.0
10:20	1:40	633.9	1165.3	1326.6	645.3	6:50	5:10	1464.4	278.3	1490.7	1777.5
10:15	1:45	663.4	1153.2	1330.4	676.6	6:45	5:15	1471.2	250.8	1492.4	1798.7
10:10	1:50	692.6	1140.5	1334.3	707.7	6:40	5:20	1477.2	223.3	1494.0	1819.6
10:05	1:55	721.5	1127.3	1338.4	738.7	6:35	5:25	1482.5	195.6	1495.4	1840.2
10:00	2:00	750.0	1113.5	1342.5	769.5	6:30	5:30	1487.2	167.8	1496.6	1860.5
9:55	2:05	778.2	1099.2	1346.8	800.2	6:25	5:35	1491.1	140.0	1497.6	1880.5
9:50	2:10	805.9	1084.4	1351.1	830.7	6:20	5:40	1494.3	112.1	1498.5	1900.1
9:45	2:15	833.4	1069.1	1355.5	861.1	6:15	5:45	1496.8	84.1	1499.1	1919.5
9:40	2:20	860.4	1053.2	1360.0	891.2	6:10	5:50	1498.6	56.1	1499.6	1938.5
9:35	2:25	887.0	1036.9	1364.5	921.2	6:05	5:55	1499.6	28.0	1499.9	1957.2
9:30	2:30	913.1	1020.1	1369.1	951.0	6:00	6:00	1500.0	0.0	1500.0	1975.6
9:25	2:35	938.9	1002.7	1373.7	980.6	5:55	6:05	1499.6	-28.0	1499.9	1993.7
9:20	2:40	964.2	984.9	1378.3	1010.0	5:50	6:10	1498.6	-56.1	1499.6	2011.5
9:15	2:45	989.0	966.7	1383.0	1039.2	5:45	6:15	1496.8	-84.1	1499.1	2029.0
9:10	2:50	1013.4	948.0	1387.6	1068.2	5:40	6:20	1494.3	-112.1	1498.5	2046.2
9:05	2:55	1037.3	928.8	1392.3	1097.0	5:35	6:25	1491.1	-140.0	1497.6	2063.0
9:00	3:00	1060.7	909.2	1397.0	1125.5	5:30	6:30	1487.2	-167.8	1496.6	2079.6
8:55	3:05	1083.5	889.1	1401.6	1153.9	5:25	6:35	1482.5	-195.6	1495.4	2095.8
8:50	3:10	1105.9	868.6	1406.3	1182.0	5:20	6:40	1477.2	-223.3	1494.0	2111.7
8:45	3:15	1127.8	847.8	1410.9	1209.8	5:15	6:45	1471.2	-250.8	1492.4	2127.3
8:40	3:20	1149.1	826.5	1415.4	1237.5	5:10	6:50	1464.4	-278.3	1490.7	2142.6
8:35	3:25	1169.8	804.8	1419.9	1264.8	5:05	6:55	1457.0	-305.6	1488.7	2157.6
8:30	3:30	1190.0	782.7	1424.4	1292.0	5:00	7:00	1448.9	-332.8	1486.6	2172.3

Analemmatic Sundial

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Earliest Sunrise: 2:44 a.m. Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 1500 mm Semi-Minor Axis (N-S): 1285.8 mm  
 Sunrise/Sunset Markers: X = ± 314.6 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
4:55	7:05	1440.1	-359.8	1484.3	2186.7	2:55	9:05	1037.3	-928.8	1392.3	2445.4
4:50	7:10	1430.6	-386.6	1481.9	2200.8	2:50	9:10	1013.4	-948.0	1387.6	2452.8
4:45	7:15	1420.4	-413.3	1479.3	2214.6	2:45	9:15	989.0	-966.7	1383.0	2460.0
4:40	7:20	1409.5	-439.8	1476.5	2228.0	2:40	9:20	964.2	-984.9	1378.3	2466.9
4:35	7:25	1398.0	-466.0	1473.6	2241.2	2:35	9:25	938.9	-1002.7	1373.7	2473.6
4:30	7:30	1385.8	-492.0	1470.6	2254.1	2:30	9:30	913.1	-1020.1	1369.1	2480.0
4:25	7:35	1373.0	-517.8	1467.4	2266.7						
4:20	7:40	1359.5	-543.4	1464.0	2279.0						
4:15	7:45	1345.3	-568.7	1460.6	2291.0						
4:10	7:50	1330.5	-593.7	1457.0	2302.7						
4:05	7:55	1315.1	-618.4	1453.2	2314.2						
4:00	8:00	1299.0	-642.9	1449.4	2325.3						
3:55	8:05	1282.4	-667.0	1445.5	2336.2						
3:50	8:10	1265.1	-690.8	1441.4	2346.8						
3:45	8:15	1247.2	-714.3	1437.3	2357.1						
3:40	8:20	1228.7	-737.5	1433.1	2367.1						
3:35	8:25	1209.7	-760.3	1428.7	2376.9						
3:30	8:30	1190.0	-782.7	1424.4	2386.4						
3:25	8:35	1169.8	-804.8	1419.9	2395.6						
3:20	8:40	1149.1	-826.5	1415.4	2404.5						
3:15	8:45	1127.8	-847.8	1410.9	2413.2						
3:10	8:50	1105.9	-868.6	1406.3	2421.7						
3:05	8:55	1083.5	-889.1	1401.6	2429.8						
3:00	9:00	1060.7	-909.2	1397.0	2437.8						

## Analematic Sundial

Latitude: 59.0° N/S

## Date Scale

Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1285.8 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-327.8	-321.6	-319.7	-311.2	-308.7	-298.1	-295.2	-282.6	-279.2	-265.0	-261.2
February	-237.1	-219.8	-215.3	-196.9	-192.3	-173.1	-168.2	-148.4	-143.3	-122.9	-117.7
March	-102.1	-81.2	-75.9	-54.7	-49.4	-28.1	-22.8	-1.3	3.9	25.2	30.5
April	62.2	83.0	88.2	108.6	113.7	133.7	138.6	158.2	162.9	181.8	186.3
May	208.7	225.9	230.0	246.0	249.8	264.5	268.0	281.3	284.6	296.2	298.9
June	313.4	321.0	322.7	328.2	329.5	333.0	333.5	334.8	335.0	332.6	333.7
July	329.5	324.3	322.7	315.6	313.5	304.3	301.8	290.8	287.9	275.4	272.1
August	250.7	235.2	231.2	214.5	210.3	192.8	188.2	169.9	165.2	146.1	141.2
September	111.7	91.6	86.5	66.0	60.8	40.1	34.9	14.0	8.8	-12.3	-17.5
October	-43.7	-64.7	-69.9	-90.8	-95.8	-116.4	-121.5	-141.7	-146.7	-166.3	-171.1
November	-199.4	-217.4	-221.8	-238.9	-243.0	-258.8	-262.5	-276.9	-280.3	-293.0	-296.1
December	-309.3	-318.3	-320.2	-326.7	-328.1	-332.2	-333.0	-334.8	-335.0	-334.2	-333.7

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	327.8	321.6	319.7	311.2	308.7	298.1	295.2	282.6	279.2	265.0	261.2
February	237.1	219.8	215.3	196.9	192.3	173.1	168.2	148.4	143.3	122.9	117.7
March	102.1	81.2	75.9	54.7	49.4	28.1	22.8	1.3	-3.9	-25.2	-30.5
April	-62.2	-83.0	-88.2	-108.6	-113.7	-133.7	-138.6	-158.2	-162.9	-181.8	-186.3
May	-208.7	-225.9	-230.0	-246.0	-249.8	-264.5	-268.0	-281.3	-284.6	-296.2	-298.9
June	-313.4	-321.0	-322.7	-328.2	-329.5	-333.0	-333.5	-334.8	-335.0	-332.6	-333.7
July	-329.5	-324.3	-322.7	-315.6	-313.5	-304.3	-301.8	-290.8	-287.9	-275.4	-272.1
August	-250.7	-235.2	-231.2	-214.5	-210.3	-192.8	-188.2	-169.9	-165.2	-146.1	-141.2
September	-111.7	-91.6	-86.5	-66.0	-60.8	-40.1	-34.9	-14.0	-8.8	12.3	17.5
October	43.7	64.7	69.9	90.8	95.8	116.4	121.5	141.7	146.7	166.3	171.1
November	199.4	217.4	221.8	238.9	243.0	258.8	262.5	276.9	280.3	293.0	296.1
December	309.3	318.3	320.2	326.7	328.1	332.2	333.0	334.8	335.0	334.2	333.7

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: 59.0° N/S

Earliest Sunrise: 2:44 a.m.    Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1714.3 mm  
 Sunrise/Sunset Markers: X = ± 419.4 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1714.3	1714.3	0.0						
11:55	12:05	43.6	1713.9	1714.5	43.6	8:25	3:35	1612.9	1013.7	1905.0	1758.5
11:50	12:10	87.2	1712.7	1714.9	87.3	8:20	3:40	1638.3	983.3	1910.7	1794.0
11:45	12:15	130.8	1710.7	1715.7	130.9	8:15	3:45	1662.9	952.4	1916.4	1829.2
11:40	12:20	174.3	1707.8	1716.7	174.4	8:10	3:50	1686.8	921.1	1921.9	1864.0
11:35	12:25	217.7	1704.1	1718.0	218.0	8:05	3:55	1709.8	889.4	1927.3	1898.4
11:30	12:30	261.1	1699.7	1719.6	261.5	8:00	4:00	1732.1	857.2	1932.5	1932.5
11:25	12:35	304.2	1694.4	1721.5	304.9	7:55	4:05	1753.5	824.6	1937.7	1966.3
11:20	12:40	347.3	1688.3	1723.6	348.3	7:50	4:10	1774.0	791.6	1942.6	1999.7
11:15	12:45	390.2	1681.4	1726.1	391.6	7:45	4:15	1793.7	758.2	1947.4	2032.6
11:10	12:50	432.9	1673.7	1728.8	434.8	7:40	4:20	1812.6	724.5	1952.0	2065.3
11:05	12:55	475.4	1665.2	1731.7	477.9	7:35	4:25	1830.6	690.4	1956.5	2097.5
11:00	1:00	517.6	1655.9	1734.9	520.9	7:30	4:30	1847.8	656.0	1960.8	2129.4
10:55	1:05	559.7	1645.8	1738.4	563.8	7:25	4:35	1864.0	621.3	1964.8	2160.8
10:50	1:10	601.4	1635.0	1742.1	606.6	7:20	4:40	1879.4	586.3	1968.7	2191.9
10:45	1:15	642.9	1623.4	1746.0	649.3	7:15	4:45	1893.9	551.1	1972.4	2222.6
10:40	1:20	684.0	1610.9	1750.2	691.8	7:10	4:50	1907.4	515.5	1975.9	2252.9
10:35	1:25	724.9	1597.8	1754.5	734.2	7:05	4:55	1920.1	479.7	1979.1	2282.8
10:30	1:30	765.4	1583.8	1759.1	776.4	7:00	5:00	1931.9	443.7	1982.2	2312.3
10:25	1:35	805.5	1569.2	1763.8	818.5	6:55	5:05	1942.7	407.5	1985.0	2341.3
10:20	1:40	845.2	1553.7	1768.7	860.4	6:50	5:10	1952.6	371.0	1987.5	2370.0
10:15	1:45	884.6	1537.5	1773.8	902.1	6:45	5:15	1961.6	334.5	1989.9	2398.3
10:10	1:50	923.5	1520.6	1779.1	943.6	6:40	5:20	1969.6	297.7	1992.0	2426.2
10:05	1:55	962.0	1503.0	1784.5	984.9	6:35	5:25	1976.7	260.8	1993.9	2453.6
10:00	2:00	1000.0	1484.7	1790.0	1026.0	6:30	5:30	1982.9	223.8	1995.5	2480.7
9:55	2:05	1037.5	1465.6	1795.7	1066.9	6:25	5:35	1988.1	186.6	1996.9	2507.3
9:50	2:10	1074.6	1445.9	1801.5	1107.6	6:20	5:40	1992.4	149.4	1998.0	2533.5
9:45	2:15	1111.1	1425.4	1807.3	1148.1	6:15	5:45	1995.7	112.1	1998.9	2559.3
9:40	2:20	1147.2	1404.3	1813.3	1188.3	6:10	5:50	1998.1	74.8	1999.5	2584.7
9:35	2:25	1182.6	1382.5	1819.3	1228.3	6:05	5:55	1999.5	37.4	1999.9	2609.6
9:30	2:30	1217.5	1360.1	1825.4	1268.0	6:00	6:00	2000.0	0.0	2000.0	2634.2
9:25	2:35	1251.8	1337.0	1831.6	1307.5	5:55	6:05	1999.5	-37.4	1999.9	2658.3
9:20	2:40	1285.6	1313.3	1837.8	1346.7	5:50	6:10	1998.1	-74.8	1999.5	2682.0
9:15	2:45	1318.7	1288.9	1844.0	1385.6	5:45	6:15	1995.7	-112.1	1998.9	2705.3
9:10	2:50	1351.2	1263.9	1850.2	1424.3	5:40	6:20	1992.4	-149.4	1998.0	2728.2
9:05	2:55	1383.0	1238.4	1856.4	1462.6	5:35	6:25	1988.1	-186.6	1996.9	2750.7
9:00	3:00	1414.2	1212.2	1862.7	1500.7	5:30	6:30	1982.9	-223.8	1995.5	2772.7
8:55	3:05	1444.7	1185.5	1868.9	1538.5	5:25	6:35	1976.7	-260.8	1993.9	2794.4
8:50	3:10	1474.6	1158.2	1875.0	1575.9	5:20	6:40	1969.6	-297.7	1992.0	2815.6
8:45	3:15	1503.7	1130.3	1881.1	1613.1	5:15	6:45	1961.6	-334.5	1989.9	2836.4
8:40	3:20	1532.1	1102.0	1887.2	1649.9	5:10	6:50	1952.6	-371.0	1987.5	2856.8
8:35	3:25	1559.8	1073.0	1893.2	1686.5	5:05	6:55	1942.7	-407.5	1985.0	2876.8
8:30	3:30	1586.7	1043.6	1899.2	1722.6	5:00	7:00	1931.9	-443.7	1982.2	2896.4

Analemmatic Sundial

Latitude: 59.0° N/S

Earliest Sunrise: 2:44 a.m. Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 2000 mm Semi-Minor Axis (N-S): 1714.3 mm  
 Sunrise/Sunset Markers: X = ± 419.4 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
4:55	7:05	1920.1	-479.7	1979.1	2915.6	2:55	9:05	1383.0	-1238.4	1856.4	3260.6
4:50	7:10	1907.4	-515.5	1975.9	2934.4	2:50	9:10	1351.2	-1263.9	1850.2	3270.4
4:45	7:15	1893.9	-551.1	1972.4	2952.7	2:45	9:15	1318.7	-1288.9	1844.0	3280.0
4:40	7:20	1879.4	-586.3	1968.7	2970.7	2:40	9:20	1285.6	-1313.3	1837.8	3289.2
4:35	7:25	1864.0	-621.3	1964.8	2988.3	2:35	9:25	1251.8	-1337.0	1831.6	3298.1
4:30	7:30	1847.8	-656.0	1960.8	3005.5	2:30	9:30	1217.5	-1360.1	1825.4	3306.7
4:25	7:35	1830.6	-690.4	1956.5	3022.3						
4:20	7:40	1812.6	-724.5	1952.0	3038.7						
4:15	7:45	1793.7	-758.2	1947.4	3054.7						
4:10	7:50	1774.0	-791.6	1942.6	3070.3						
4:05	7:55	1753.5	-824.6	1937.7	3085.6						
4:00	8:00	1732.1	-857.2	1932.5	3100.4						
3:55	8:05	1709.8	-889.4	1927.3	3114.9						
3:50	8:10	1686.8	-921.1	1921.9	3129.0						
3:45	8:15	1662.9	-952.4	1916.4	3142.8						
3:40	8:20	1638.3	-983.3	1910.7	3156.2						
3:35	8:25	1612.9	-1013.7	1905.0	3169.2						
3:30	8:30	1586.7	-1043.6	1899.2	3181.8						
3:25	8:35	1559.8	-1073.0	1893.2	3194.1						
3:20	8:40	1532.1	-1102.0	1887.2	3206.1						
3:15	8:45	1503.7	-1130.3	1881.1	3217.6						
3:10	8:50	1474.6	-1158.2	1875.0	3228.9						
3:05	8:55	1444.7	-1185.5	1868.9	3239.8						
3:00	9:00	1414.2	-1212.2	1862.7	3250.3						

## Analematic Sundial

Latitude: 59.0° N/S

## Date Scale

Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1714.3 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-437.0	-428.8	-426.3	-414.9	-411.6	-397.5	-393.6	-376.8	-372.3	-353.3	-348.3
February	-316.1	-293.0	-287.0	-262.6	-256.4	-230.8	-224.2	-197.8	-191.1	-163.9	-156.9
March	-136.2	-108.3	-101.2	-72.9	-65.9	-37.4	-30.4	-1.8	5.2	33.6	40.7
April	82.9	110.6	117.5	144.8	151.6	178.3	184.8	210.9	217.3	242.4	248.4
May	278.3	301.2	306.7	327.9	333.1	352.7	357.3	375.1	379.4	395.0	398.5
June	417.9	427.9	430.3	437.7	439.4	444.0	444.7	446.4	446.6	443.4	444.9
July	439.4	432.4	430.3	420.8	418.1	405.8	402.4	387.8	383.9	367.2	362.7
August	334.3	313.6	308.3	286.1	280.4	257.0	250.9	226.5	220.3	194.8	188.3
September	149.0	122.1	115.4	87.9	81.1	53.4	46.6	18.7	11.7	-16.4	-23.4
October	-58.3	-86.3	-93.2	-121.0	-127.8	-155.2	-162.0	-188.9	-195.6	-221.8	-228.2
November	-265.8	-289.9	-295.8	-318.5	-324.0	-345.1	-350.1	-369.2	-373.7	-390.7	-394.8
December	-412.4	-424.4	-426.9	-435.5	-437.5	-443.0	-444.0	-446.4	-446.6	-445.5	-444.9

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	437.0	428.8	426.3	414.9	411.6	397.5	393.6	376.8	372.3	353.3	348.3
February	316.1	293.0	287.0	262.6	256.4	230.8	224.2	197.8	191.1	163.9	156.9
March	136.2	108.3	101.2	72.9	65.9	37.4	30.4	1.8	-5.2	-33.6	-40.7
April	-82.9	-110.6	-117.5	-144.8	-151.6	-178.3	-184.8	-210.9	-217.3	-242.4	-248.4
May	-278.3	-301.2	-306.7	-327.9	-333.1	-352.7	-357.3	-375.1	-379.4	-395.0	-398.5
June	-417.9	-427.9	-430.3	-437.7	-439.4	-444.0	-444.7	-446.4	-446.6	-443.4	-444.9
July	-439.4	-432.4	-430.3	-420.8	-418.1	-405.8	-402.4	-387.8	-383.9	-367.2	-362.7
August	-334.3	-313.6	-308.3	-286.1	-280.4	-257.0	-250.9	-226.5	-220.3	-194.8	-188.3
September	-149.0	-122.1	-115.4	-87.9	-81.1	-53.4	-46.6	-18.7	-11.7	16.4	23.4
October	58.3	86.3	93.2	121.0	127.8	155.2	162.0	188.9	195.6	221.8	228.2
November	265.8	289.9	295.8	318.5	324.0	345.1	350.1	369.2	373.7	390.7	394.8
December	412.4	424.4	426.9	435.5	437.5	443.0	444.0	446.4	446.6	445.5	444.9

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: 59.0° N/S

Earliest Sunrise: 2:44 a.m. Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 2142.9 mm  
 Sunrise/Sunset Markers: X = ± 524.3 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	2142.9	2142.9	0.0						
11:55	12:05	54.5	2142.4	2143.1	54.5	8:25	3:35	2016.1	1267.1	2381.2	2198.1
11:50	12:10	109.0	2140.9	2143.7	109.1	8:20	3:40	2047.9	1229.1	2388.4	2242.5
11:45	12:15	163.5	2138.3	2144.6	163.6	8:15	3:45	2078.7	1190.5	2395.5	2286.5
11:40	12:20	217.9	2134.8	2145.9	218.0	8:10	3:50	2108.5	1151.4	2402.4	2330.0
11:35	12:25	272.2	2130.2	2147.5	272.5	8:05	3:55	2137.3	1111.7	2409.1	2373.1
11:30	12:30	326.3	2124.6	2149.5	326.8	8:00	4:00	2165.1	1071.5	2415.7	2415.7
11:25	12:35	380.3	2118.0	2151.9	381.1	7:55	4:05	2191.8	1030.7	2422.1	2457.9
11:20	12:40	434.1	2110.4	2154.6	435.3	7:50	4:10	2217.5	989.5	2428.3	2499.6
11:15	12:45	487.7	2101.7	2157.6	489.5	7:45	4:15	2242.2	947.8	2434.3	2540.8
11:10	12:50	541.1	2092.1	2161.0	543.5	7:40	4:20	2265.8	905.6	2440.1	2581.6
11:05	12:55	594.2	2081.5	2164.7	597.4	7:35	4:25	2288.3	863.1	2445.6	2621.9
11:00	1:00	647.0	2069.9	2168.7	651.2	7:30	4:30	2309.7	820.1	2451.0	2661.7
10:55	1:05	699.6	2057.3	2173.0	704.8	7:25	4:35	2330.0	776.7	2456.1	2701.0
10:50	1:10	751.8	2043.7	2177.6	758.3	7:20	4:40	2349.2	732.9	2460.9	2739.9
10:45	1:15	803.6	2029.2	2182.5	811.6	7:15	4:45	2367.3	688.8	2465.5	2778.2
10:40	1:20	855.1	2013.7	2187.7	864.8	7:10	4:50	2384.3	644.4	2469.8	2816.1
10:35	1:25	906.1	1997.2	2193.1	917.7	7:05	4:55	2400.1	599.7	2473.9	2853.5
10:30	1:30	956.7	1979.8	2198.8	970.5	7:00	5:00	2414.8	554.6	2477.7	2890.3
10:25	1:35	1006.9	1961.4	2204.8	1023.1	6:55	5:05	2428.4	509.3	2481.2	2926.7
10:20	1:40	1056.5	1942.1	2210.9	1075.5	6:50	5:10	2440.7	463.8	2484.4	2962.5
10:15	1:45	1105.7	1921.9	2217.3	1127.6	6:45	5:15	2452.0	418.1	2487.3	2997.9
10:10	1:50	1154.4	1900.8	2223.9	1179.5	6:40	5:20	2462.0	372.1	2490.0	3032.7
10:05	1:55	1202.5	1878.8	2230.6	1231.1	6:35	5:25	2470.9	326.0	2492.3	3067.0
10:00	2:00	1250.0	1855.8	2237.5	1282.5	6:30	5:30	2478.6	279.7	2494.3	3100.8
9:55	2:05	1296.9	1832.0	2244.6	1333.7	6:25	5:35	2485.1	233.3	2496.1	3134.1
9:50	2:10	1343.2	1807.3	2251.8	1384.5	6:20	5:40	2490.5	186.8	2497.5	3166.9
9:45	2:15	1388.9	1781.8	2259.2	1435.1	6:15	5:45	2494.6	140.2	2498.6	3199.1
9:40	2:20	1433.9	1755.4	2266.6	1485.4	6:10	5:50	2497.6	93.5	2499.4	3230.8
9:35	2:25	1478.3	1728.1	2274.2	1535.4	6:05	5:55	2499.4	46.7	2499.8	3262.0
9:30	2:30	1521.9	1700.1	2281.8	1585.0	6:00	6:00	2500.0	0.0	2500.0	3292.7
9:25	2:35	1564.8	1671.2	2289.5	1634.4	5:55	6:05	2499.4	-46.7	2499.8	3322.9
9:20	2:40	1607.0	1641.6	2297.2	1683.4	5:50	6:10	2497.6	-93.5	2499.4	3352.5
9:15	2:45	1648.4	1611.1	2305.0	1732.0	5:45	6:15	2494.6	-140.2	2498.6	3381.7
9:10	2:50	1689.0	1579.9	2312.7	1780.3	5:40	6:20	2490.5	-186.8	2497.5	3410.3
9:05	2:55	1728.8	1548.0	2320.5	1828.3	5:35	6:25	2485.1	-233.3	2496.1	3438.4
9:00	3:00	1767.8	1515.3	2328.3	1875.9	5:30	6:30	2478.6	-279.7	2494.3	3465.9
8:55	3:05	1805.9	1481.9	2336.1	1923.1	5:25	6:35	2470.9	-326.0	2492.3	3493.0
8:50	3:10	1843.2	1447.7	2343.8	1969.9	5:20	6:40	2462.0	-372.1	2490.0	3519.5
8:45	3:15	1879.6	1412.9	2351.4	2016.4	5:15	6:45	2452.0	-418.1	2487.3	3545.5
8:40	3:20	1915.1	1377.4	2359.0	2062.4	5:10	6:50	2440.7	-463.8	2484.4	3571.0
8:35	3:25	1949.7	1341.3	2366.5	2108.1	5:05	6:55	2428.4	-509.3	2481.2	3596.0
8:30	3:30	1983.4	1304.5	2373.9	2153.3	5:00	7:00	2414.8	-554.6	2477.7	3620.5

## Analemmatic Sundial

Latitude: 59.0° N/S

Earliest Sunrise: 2:44 a.m.    Latest Sunset: 9:16 p.m.  
 Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 2142.9 mm  
 Sunrise/Sunset Markers: X = ± 524.3 mm

Local Time	X	Y	Z	W	Local Time	X	Y	Z	W		
4:55	7:05	2400.1	-599.7	2473.9	3644.5	2:55	9:05	1728.8	-1548.0	2320.5	4075.7
4:50	7:10	2384.3	-644.4	2469.8	3668.0	2:50	9:10	1689.0	-1579.9	2312.7	4088.1
4:45	7:15	2367.3	-688.8	2465.5	3690.9	2:45	9:15	1648.4	-1611.1	2305.0	4100.0
4:40	7:20	2349.2	-732.9	2460.9	3713.4	2:40	9:20	1607.0	-1641.6	2297.2	4111.5
4:35	7:25	2330.0	-776.7	2456.1	3735.4	2:35	9:25	1564.8	-1671.2	2289.5	4122.7
4:30	7:30	2309.7	-820.1	2451.0	3756.9	2:30	9:30	1521.9	-1700.1	2281.8	4133.4
4:25	7:35	2288.3	-863.1	2445.6	3777.8						
4:20	7:40	2265.8	-905.6	2440.1	3798.3						
4:15	7:45	2242.2	-947.8	2434.3	3818.4						
4:10	7:50	2217.5	-989.5	2428.3	3837.9						
4:05	7:55	2191.8	-1030.7	2422.1	3856.9						
4:00	8:00	2165.1	-1071.5	2415.7	3875.5						
3:55	8:05	2137.3	-1111.7	2409.1	3893.6						
3:50	8:10	2108.5	-1151.4	2402.4	3911.3						
3:45	8:15	2078.7	-1190.5	2395.5	3928.5						
3:40	8:20	2047.9	-1229.1	2388.4	3945.2						
3:35	8:25	2016.1	-1267.1	2381.2	3961.5						
3:30	8:30	1983.4	-1304.5	2373.9	3977.3						
3:25	8:35	1949.7	-1341.3	2366.5	3992.6						
3:20	8:40	1915.1	-1377.4	2359.0	4007.6						
3:15	8:45	1879.6	-1412.9	2351.4	4022.1						
3:10	8:50	1843.2	-1447.7	2343.8	4036.1						
3:05	8:55	1805.9	-1481.9	2336.1	4049.7						
3:00	9:00	1767.8	-1515.3	2328.3	4062.9						

**Analematic Sundial**

Latitude: 59.0° N/S

**Date Scale**

Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 2142.9 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-546.3	-536.0	-532.8	-518.7	-514.5	-496.8	-491.9	-470.9	-465.3	-441.6	-435.3
February	-395.1	-366.3	-358.8	-328.2	-320.6	-288.5	-280.3	-247.3	-238.9	-204.9	-196.1
March	-170.2	-135.3	-126.5	-91.2	-82.4	-46.8	-38.0	-2.2	6.5	42.0	50.8
April	103.6	138.3	146.9	181.0	189.4	222.9	231.0	263.6	271.6	303.0	310.6
May	347.9	376.5	383.4	409.9	416.4	440.8	446.6	468.9	474.3	493.7	498.1
June	522.3	534.9	537.8	547.1	549.2	555.1	555.9	558.0	558.3	554.3	556.1
July	549.2	540.5	537.8	526.0	522.6	507.2	503.0	484.7	479.9	459.0	453.4
August	417.9	391.9	385.3	357.6	350.6	321.3	313.6	283.1	275.3	243.5	235.4
September	186.2	152.6	144.2	109.9	101.3	66.8	58.2	23.4	14.6	-20.5	-29.2
October	-72.9	-107.9	-116.5	-151.3	-159.7	-194.0	-202.6	-236.1	-244.5	-277.2	-285.2
November	-332.3	-362.4	-369.7	-398.1	-405.0	-431.3	-437.6	-461.5	-467.1	-488.3	-493.5
December	-515.5	-530.4	-533.6	-544.4	-546.8	-553.7	-555.1	-558.0	-558.3	-556.9	-556.1

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	546.3	536.0	532.8	518.7	514.5	496.8	491.9	470.9	465.3	441.6	435.3
February	395.1	366.3	358.8	328.2	320.6	288.5	280.3	247.3	238.9	204.9	196.1
March	170.2	135.3	126.5	91.2	82.4	46.8	38.0	2.2	-6.5	-42.0	-50.8
April	-103.6	-138.3	-146.9	-181.0	-189.4	-222.9	-231.0	-263.6	-271.6	-303.0	-310.6
May	-347.9	-376.5	-383.4	-409.9	-416.4	-440.8	-446.6	-468.9	-474.3	-493.7	-498.1
June	-522.3	-534.9	-537.8	-547.1	-549.2	-555.1	-555.9	-558.0	-558.3	-554.3	-556.1
July	-549.2	-540.5	-537.8	-526.0	-522.6	-507.2	-503.0	-484.7	-479.9	-459.0	-453.4
August	-417.9	-391.9	-385.3	-357.6	-350.6	-321.3	-313.6	-283.1	-275.3	-243.5	-235.4
September	-186.2	-152.6	-144.2	-109.9	-101.3	-66.8	-58.2	-23.4	-14.6	20.5	29.2
October	72.9	107.9	116.5	151.3	159.7	194.0	202.6	236.1	244.5	277.2	285.2
November	332.3	362.4	369.7	398.1	405.0	431.3	437.6	461.5	467.1	488.3	493.5
December	515.5	530.4	533.6	544.4	546.8	553.7	555.1	558.0	558.3	556.9	556.1

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