

## Analemmatic Sundial

Latitude: 50.5° N/S

Earliest Sunrise: 3:46 a.m.    Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 771.6 mm  
 Sunrise/Sunset Markers: X = ± 362.1 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	771.6	771.6	0.0						
11:55	12:05	21.8	771.4	771.7	21.8	8:25	3:35	806.4	456.3	926.6	865.9
11:50	12:10	43.6	770.9	772.1	43.6	8:20	3:40	819.2	442.6	931.1	882.8
11:45	12:15	65.4	770.0	772.7	65.4	8:15	3:45	831.5	428.7	935.5	899.4
11:40	12:20	87.2	768.7	773.6	87.2	8:10	3:50	843.4	414.6	939.8	915.8
11:35	12:25	108.9	767.0	774.7	109.0	8:05	3:55	854.9	400.3	944.0	932.1
11:30	12:30	130.5	765.0	776.1	130.7	8:00	4:00	866.0	385.8	948.1	948.1
11:25	12:35	152.1	762.6	777.7	152.4	7:55	4:05	876.7	371.1	952.0	963.9
11:20	12:40	173.6	759.9	779.5	174.0	7:50	4:10	887.0	356.3	955.9	979.4
11:15	12:45	195.1	756.8	781.5	195.7	7:45	4:15	896.9	341.3	959.6	994.8
11:10	12:50	216.4	753.3	783.8	217.2	7:40	4:20	906.3	326.1	963.2	1009.9
11:05	12:55	237.7	749.5	786.3	238.7	7:35	4:25	915.3	310.8	966.6	1024.8
11:00	1:00	258.8	745.3	789.0	260.2	7:30	4:30	923.9	295.3	969.9	1039.4
10:55	1:05	279.8	740.8	791.9	281.5	7:25	4:35	932.0	279.7	973.1	1053.9
10:50	1:10	300.7	735.9	795.0	302.8	7:20	4:40	939.7	263.9	976.0	1068.1
10:45	1:15	321.4	730.7	798.3	324.0	7:15	4:45	946.9	248.0	978.9	1082.0
10:40	1:20	342.0	725.1	801.7	345.2	7:10	4:50	953.7	232.0	981.5	1095.8
10:35	1:25	362.4	719.2	805.3	366.2	7:05	4:55	960.0	215.9	984.0	1109.3
10:30	1:30	382.7	712.9	809.1	387.2	7:00	5:00	965.9	199.7	986.4	1122.5
10:25	1:35	402.7	706.3	813.0	408.0	6:55	5:05	971.3	183.4	988.5	1135.6
10:20	1:40	422.6	699.3	817.1	428.8	6:50	5:10	976.3	167.0	990.5	1148.4
10:15	1:45	442.3	692.0	821.3	449.4	6:45	5:15	980.8	150.5	992.3	1160.9
10:10	1:50	461.7	684.4	825.6	469.9	6:40	5:20	984.8	134.0	993.9	1173.2
10:05	1:55	481.0	676.5	830.1	490.3	6:35	5:25	988.4	117.4	995.3	1185.3
10:00	2:00	500.0	668.2	834.6	510.6	6:30	5:30	991.4	100.7	996.5	1197.1
9:55	2:05	518.8	659.7	839.2	530.7	6:25	5:35	994.1	84.0	997.6	1208.7
9:50	2:10	537.3	650.8	843.9	550.7	6:20	5:40	996.2	67.3	998.5	1220.1
9:45	2:15	555.6	641.6	848.7	570.6	6:15	5:45	997.9	50.5	999.1	1231.2
9:40	2:20	573.6	632.1	853.5	590.3	6:10	5:50	999.0	33.7	999.6	1242.1
9:35	2:25	591.3	622.3	858.4	609.9	6:05	5:55	999.8	16.8	999.9	1252.7
9:30	2:30	608.8	612.2	863.3	629.3	6:00	6:00	1000.0	0.0	1000.0	1263.1
9:25	2:35	625.9	601.8	868.3	648.6	5:55	6:05	999.8	-16.8	999.9	1273.3
9:20	2:40	642.8	591.1	873.3	667.7	5:50	6:10	999.0	-33.7	999.6	1283.2
9:15	2:45	659.3	580.1	878.2	686.6	5:45	6:15	997.9	-50.5	999.1	1292.9
9:10	2:50	675.6	568.9	883.2	705.4	5:40	6:20	996.2	-67.3	998.5	1302.4
9:05	2:55	691.5	557.4	888.2	723.9	5:35	6:25	994.1	-84.0	997.6	1311.6
9:00	3:00	707.1	545.6	893.1	742.3	5:30	6:30	991.4	-100.7	996.5	1320.6
8:55	3:05	722.4	533.6	898.1	760.6	5:25	6:35	988.4	-117.4	995.3	1329.4
8:50	3:10	737.3	521.3	903.0	778.6	5:20	6:40	984.8	-134.0	993.9	1337.9
8:45	3:15	751.8	508.8	907.8	796.5	5:15	6:45	980.8	-150.5	992.3	1346.2
8:40	3:20	766.0	496.0	912.6	814.1	5:10	6:50	976.3	-167.0	990.5	1354.3
8:35	3:25	779.9	483.0	917.3	831.6	5:05	6:55	971.3	-183.4	988.5	1362.2
8:30	3:30	793.4	469.7	922.0	848.9	5:00	7:00	965.9	-199.7	986.4	1369.9

## Analemmatic Sundial

Latitude: 50.5° N/S

Earliest Sunrise: 3:46 a.m.    Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 771.6 mm  
 Sunrise/Sunset Markers: X = ± 362.1 mm

Local Time		X	Y	Z	W
4:55	7:05	960.0	-215.9	984.0	1377.3
4:50	7:10	953.7	-232.0	981.5	1384.5
4:45	7:15	946.9	-248.0	978.9	1391.5
4:40	7:20	939.7	-263.9	976.0	1398.3
4:35	7:25	932.0	-279.7	973.1	1404.9
4:30	7:30	923.9	-295.3	969.9	1411.3
4:25	7:35	915.3	-310.8	966.6	1417.5
4:20	7:40	906.3	-326.1	963.2	1423.5
4:15	7:45	896.9	-341.3	959.6	1429.3
4:10	7:50	887.0	-356.3	955.9	1434.9
4:05	7:55	876.7	-371.1	952.0	1440.3
4:00	8:00	866.0	-385.8	948.1	1445.6
3:55	8:05	854.9	-400.3	944.0	1450.6
3:50	8:10	843.4	-414.6	939.8	1455.5
3:45	8:15	831.5	-428.7	935.5	1460.2

## Analematic Sundial

Latitude: 50.5° N/S

## Date Scale

Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 771.6 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-269.9	-264.8	-263.2	-256.2	-254.2	-245.4	-243.0	-232.6	-229.9	-218.2	-215.1
February	-195.2	-181.0	-177.2	-162.1	-158.4	-142.5	-138.5	-122.1	-118.0	-101.2	-96.9
March	-84.1	-66.9	-62.5	-45.0	-40.7	-23.1	-18.8	-1.1	3.2	20.8	25.1
April	51.2	68.3	72.6	89.4	93.6	110.1	114.1	130.2	134.2	149.7	153.4
May	171.9	186.0	189.4	202.5	205.7	217.8	220.6	231.6	234.3	243.9	246.1
June	258.0	264.3	265.7	270.3	271.3	274.2	274.6	275.7	275.8	273.8	274.7
July	271.3	267.0	265.7	259.8	258.2	250.6	248.5	239.5	237.1	226.7	224.0
August	206.4	193.6	190.3	176.6	173.2	158.7	154.9	139.9	136.0	120.3	116.3
September	92.0	75.4	71.2	54.3	50.1	33.0	28.8	11.5	7.2	-10.1	-14.4
October	-36.0	-53.3	-57.6	-74.7	-78.9	-95.9	-100.1	-116.6	-120.8	-136.9	-140.9
November	-164.1	-179.0	-182.6	-196.7	-200.1	-213.1	-216.2	-228.0	-230.8	-241.2	-243.8
December	-254.7	-262.0	-263.6	-269.0	-270.1	-273.5	-274.2	-275.7	-275.8	-275.1	-274.7

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	269.9	264.8	263.2	256.2	254.2	245.4	243.0	232.6	229.9	218.2	215.1
February	195.2	181.0	177.2	162.1	158.4	142.5	138.5	122.1	118.0	101.2	96.9
March	84.1	66.9	62.5	45.0	40.7	23.1	18.8	1.1	-3.2	-20.8	-25.1
April	-51.2	-68.3	-72.6	-89.4	-93.6	-110.1	-114.1	-130.2	-134.2	-149.7	-153.4
May	-171.9	-186.0	-189.4	-202.5	-205.7	-217.8	-220.6	-231.6	-234.3	-243.9	-246.1
June	-258.0	-264.3	-265.7	-270.3	-271.3	-274.2	-274.6	-275.7	-275.8	-273.8	-274.7
July	-271.3	-267.0	-265.7	-259.8	-258.2	-250.6	-248.5	-239.5	-237.1	-226.7	-224.0
August	-206.4	-193.6	-190.3	-176.6	-173.2	-158.7	-154.9	-139.9	-136.0	-120.3	-116.3
September	-92.0	-75.4	-71.2	-54.3	-50.1	-33.0	-28.8	-11.5	-7.2	10.1	14.4
October	36.0	53.3	57.6	74.7	78.9	95.9	100.1	116.6	120.8	136.9	140.9
November	164.1	179.0	182.6	196.7	200.1	213.1	216.2	228.0	230.8	241.2	243.8
December	254.7	262.0	263.6	269.0	270.1	273.5	274.2	275.7	275.8	275.1	274.7

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: 50.5° N/S

Earliest Sunrise: 3:46 a.m.    Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1157.4 mm  
 Sunrise/Sunset Markers: X = ± 543.1 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1157.4	1157.4	0.0						
11:55	12:05	32.7	1157.2	1157.6	32.7	8:25	3:35	1209.7	684.4	1389.9	1298.9
11:50	12:10	65.4	1156.3	1158.2	65.4	8:20	3:40	1228.7	663.9	1396.6	1324.1
11:45	12:15	98.1	1155.0	1159.1	98.1	8:15	3:45	1247.2	643.0	1403.2	1349.1
11:40	12:20	130.7	1153.0	1160.4	130.8	8:10	3:50	1265.1	621.9	1409.7	1373.8
11:35	12:25	163.3	1150.6	1162.1	163.4	8:05	3:55	1282.4	600.4	1416.0	1398.1
11:30	12:30	195.8	1147.5	1164.1	196.0	8:00	4:00	1299.0	578.7	1422.1	1422.1
11:25	12:35	228.2	1144.0	1166.5	228.6	7:55	4:05	1315.1	556.7	1428.1	1445.8
11:20	12:40	260.5	1139.9	1169.2	261.1	7:50	4:10	1330.5	534.4	1433.8	1469.1
11:15	12:45	292.6	1135.2	1172.3	293.5	7:45	4:15	1345.3	511.9	1439.4	1492.2
11:10	12:50	324.7	1130.0	1175.7	325.8	7:40	4:20	1359.5	489.2	1444.8	1514.8
11:05	12:55	356.5	1124.3	1179.4	358.1	7:35	4:25	1373.0	466.2	1449.9	1537.2
11:00	1:00	388.2	1118.0	1183.5	390.2	7:30	4:30	1385.8	442.9	1454.9	1559.2
10:55	1:05	419.7	1111.2	1187.8	422.3	7:25	4:35	1398.0	419.5	1459.6	1580.8
10:50	1:10	451.1	1103.9	1192.5	454.2	7:20	4:40	1409.5	395.9	1464.1	1602.1
10:45	1:15	482.2	1096.0	1197.4	486.1	7:15	4:45	1420.4	372.0	1468.3	1623.1
10:40	1:20	513.0	1087.6	1202.6	517.8	7:10	4:50	1430.6	348.0	1472.3	1643.7
10:35	1:25	543.7	1078.7	1208.0	549.3	7:05	4:55	1440.1	323.9	1476.0	1663.9
10:30	1:30	574.0	1069.3	1213.7	580.7	7:00	5:00	1448.9	299.6	1479.5	1683.8
10:25	1:35	604.1	1059.4	1219.6	612.0	6:55	5:05	1457.0	275.1	1482.8	1703.3
10:20	1:40	633.9	1049.0	1225.7	643.1	6:50	5:10	1464.4	250.5	1485.7	1722.5
10:15	1:45	663.4	1038.1	1232.0	674.1	6:45	5:15	1471.2	225.8	1488.4	1741.4
10:10	1:50	692.6	1026.7	1238.4	704.9	6:40	5:20	1477.2	201.0	1490.8	1759.8
10:05	1:55	721.5	1014.8	1245.1	735.5	6:35	5:25	1482.5	176.1	1493.0	1777.9
10:00	2:00	750.0	1002.4	1251.9	765.9	6:30	5:30	1487.2	151.1	1494.8	1795.7
9:55	2:05	778.2	989.5	1258.8	796.1	6:25	5:35	1491.1	126.0	1496.4	1813.1
9:50	2:10	805.9	976.2	1265.9	826.1	6:20	5:40	1494.3	100.9	1497.7	1830.1
9:45	2:15	833.4	962.4	1273.0	855.9	6:15	5:45	1496.8	75.7	1498.7	1846.8
9:40	2:20	860.4	948.1	1280.3	885.5	6:10	5:50	1498.6	50.5	1499.4	1863.1
9:35	2:25	887.0	933.4	1287.6	914.8	6:05	5:55	1499.6	25.2	1499.9	1879.0
9:30	2:30	913.1	918.3	1295.0	943.9	6:00	6:00	1500.0	0.0	1500.0	1894.6
9:25	2:35	938.9	902.7	1302.4	972.8	5:55	6:05	1499.6	-25.2	1499.9	1909.9
9:20	2:40	964.2	886.6	1309.9	1001.5	5:50	6:10	1498.6	-50.5	1499.4	1924.8
9:15	2:45	989.0	870.2	1317.4	1029.9	5:45	6:15	1496.8	-75.7	1498.7	1939.3
9:10	2:50	1013.4	853.4	1324.8	1058.0	5:40	6:20	1494.3	-100.9	1497.7	1953.5
9:05	2:55	1037.3	836.1	1332.3	1085.9	5:35	6:25	1491.1	-126.0	1496.4	1967.4
9:00	3:00	1060.7	818.4	1339.7	1113.5	5:30	6:30	1487.2	-151.1	1494.8	1980.9
8:55	3:05	1083.5	800.4	1347.1	1140.9	5:25	6:35	1482.5	-176.1	1493.0	1994.0
8:50	3:10	1105.9	782.0	1354.4	1167.9	5:20	6:40	1477.2	-201.0	1490.8	2006.9
8:45	3:15	1127.8	763.2	1361.7	1194.7	5:15	6:45	1471.2	-225.8	1488.4	2019.3
8:40	3:20	1149.1	744.0	1368.9	1221.2	5:10	6:50	1464.4	-250.5	1485.7	2031.5
8:35	3:25	1169.8	724.5	1376.0	1247.4	5:05	6:55	1457.0	-275.1	1482.8	2043.3
8:30	3:30	1190.0	704.6	1383.0	1273.3	5:00	7:00	1448.9	-299.6	1479.5	2054.8

## Analemmatic Sundial

Latitude: 50.5° N/S

Earliest Sunrise: 3:46 a.m.    Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1157.4 mm  
 Sunrise/Sunset Markers: X = ± 543.1 mm

Local Time		X	Y	Z	W
4:55	7:05	1440.1	-323.9	1476.0	2065.9
4:50	7:10	1430.6	-348.0	1472.3	2076.8
4:45	7:15	1420.4	-372.0	1468.3	2087.3
4:40	7:20	1409.5	-395.9	1464.1	2097.5
4:35	7:25	1398.0	-419.5	1459.6	2107.4
4:30	7:30	1385.8	-442.9	1454.9	2117.0
4:25	7:35	1373.0	-466.2	1449.9	2126.3
4:20	7:40	1359.5	-489.2	1444.8	2135.3
4:15	7:45	1345.3	-511.9	1439.4	2144.0
4:10	7:50	1330.5	-534.4	1433.8	2152.4
4:05	7:55	1315.1	-556.7	1428.1	2160.5
4:00	8:00	1299.0	-578.7	1422.1	2168.3
3:55	8:05	1282.4	-600.4	1416.0	2175.9
3:50	8:10	1265.1	-621.9	1409.7	2183.2
3:45	8:15	1247.2	-643.0	1403.2	2190.3

## Analematic Sundial

Latitude: 50.5° N/S

## Date Scale

Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1157.4 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-404.8	-397.2	-394.8	-384.3	-381.2	-368.2	-364.5	-349.0	-344.8	-327.2	-322.6
February	-292.8	-271.4	-265.9	-243.2	-237.5	-213.8	-207.7	-183.2	-177.0	-151.8	-145.3
March	-126.1	-100.3	-93.7	-67.6	-61.0	-34.7	-28.2	-1.7	4.8	31.2	37.7
April	76.8	102.5	108.9	134.1	140.4	165.1	171.2	195.3	201.2	224.5	230.1
May	257.8	279.0	284.1	303.8	308.5	326.7	331.0	347.5	351.4	365.9	369.1
June	387.0	396.4	398.5	405.4	407.0	411.3	411.9	413.5	413.7	410.7	412.1
July	407.0	400.5	398.5	389.8	387.2	375.8	372.8	359.2	355.6	340.1	336.0
August	309.6	290.4	285.5	265.0	259.8	238.1	232.4	209.8	204.0	180.5	174.4
September	138.0	113.1	106.9	81.5	75.1	49.5	43.2	17.3	10.8	-15.2	-21.7
October	-54.0	-80.0	-86.3	-112.1	-118.3	-143.8	-150.1	-174.9	-181.1	-205.4	-211.3
November	-246.2	-268.5	-273.9	-295.0	-300.1	-319.6	-324.3	-342.0	-346.1	-361.9	-365.7
December	-382.0	-393.1	-395.4	-403.4	-405.2	-410.3	-411.3	-413.5	-413.7	-412.7	-412.1

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	404.8	397.2	394.8	384.3	381.2	368.2	364.5	349.0	344.8	327.2	322.6
February	292.8	271.4	265.9	243.2	237.5	213.8	207.7	183.2	177.0	151.8	145.3
March	126.1	100.3	93.7	67.6	61.0	34.7	28.2	1.7	-4.8	-31.2	-37.7
April	-76.8	-102.5	-108.9	-134.1	-140.4	-165.1	-171.2	-195.3	-201.2	-224.5	-230.1
May	-257.8	-279.0	-284.1	-303.8	-308.5	-326.7	-331.0	-347.5	-351.4	-365.9	-369.1
June	-387.0	-396.4	-398.5	-405.4	-407.0	-411.3	-411.9	-413.5	-413.7	-410.7	-412.1
July	-407.0	-400.5	-398.5	-389.8	-387.2	-375.8	-372.8	-359.2	-355.6	-340.1	-336.0
August	-309.6	-290.4	-285.5	-265.0	-259.8	-238.1	-232.4	-209.8	-204.0	-180.5	-174.4
September	-138.0	-113.1	-106.9	-81.5	-75.1	-49.5	-43.2	-17.3	-10.8	15.2	21.7
October	54.0	80.0	86.3	112.1	118.3	143.8	150.1	174.9	181.1	205.4	211.3
November	246.2	268.5	273.9	295.0	300.1	319.6	324.3	342.0	346.1	361.9	365.7
December	382.0	393.1	395.4	403.4	405.2	410.3	411.3	413.5	413.7	412.7	412.1

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    | 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: 50.5° N/S

Earliest Sunrise: 3:46 a.m.    Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1543.2 mm  
 Sunrise/Sunset Markers: X = ± 724.1 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1543.2	1543.2	0.0						
11:55	12:05	43.6	1542.9	1543.5	43.6	8:25	3:35	1612.9	912.5	1853.1	1731.8
11:50	12:10	87.2	1541.8	1544.2	87.3	8:20	3:40	1638.3	885.2	1862.1	1765.5
11:45	12:15	130.8	1539.9	1545.5	130.8	8:15	3:45	1662.9	857.4	1871.0	1798.8
11:40	12:20	174.3	1537.4	1547.2	174.4	8:10	3:50	1686.8	829.2	1879.6	1831.7
11:35	12:25	217.7	1534.1	1549.5	217.9	8:05	3:55	1709.8	800.6	1888.0	1864.1
11:30	12:30	261.1	1530.0	1552.2	261.4	8:00	4:00	1732.1	771.6	1896.2	1896.2
11:25	12:35	304.2	1525.3	1555.3	304.8	7:55	4:05	1753.5	742.3	1904.1	1927.7
11:20	12:40	347.3	1519.8	1559.0	348.1	7:50	4:10	1774.0	712.6	1911.8	1958.9
11:15	12:45	390.2	1513.6	1563.1	391.3	7:45	4:15	1793.7	682.6	1919.2	1989.5
11:10	12:50	432.9	1506.7	1567.6	434.4	7:40	4:20	1812.6	652.2	1926.4	2019.8
11:05	12:55	475.4	1499.0	1572.6	477.4	7:35	4:25	1830.6	621.5	1933.3	2049.6
11:00	1:00	517.6	1490.7	1578.0	520.3	7:30	4:30	1847.8	590.6	1939.8	2078.9
10:55	1:05	559.7	1481.6	1583.8	563.0	7:25	4:35	1864.0	559.3	1946.1	2107.8
10:50	1:10	601.4	1471.8	1590.0	605.6	7:20	4:40	1879.4	527.8	1952.1	2136.2
10:45	1:15	642.9	1461.3	1596.5	648.1	7:15	4:45	1893.9	496.1	1957.7	2164.1
10:40	1:20	684.0	1450.2	1603.4	690.3	7:10	4:50	1907.4	464.1	1963.1	2191.6
10:35	1:25	724.9	1438.3	1610.7	732.4	7:05	4:55	1920.1	431.8	1968.1	2218.6
10:30	1:30	765.4	1425.8	1618.2	774.3	7:00	5:00	1931.9	399.4	1972.7	2245.1
10:25	1:35	805.5	1412.6	1626.1	816.0	6:55	5:05	1942.7	366.8	1977.0	2271.1
10:20	1:40	845.2	1398.7	1634.2	857.5	6:50	5:10	1952.6	334.0	1981.0	2296.7
10:15	1:45	884.6	1384.1	1642.6	898.8	6:45	5:15	1961.6	301.1	1984.5	2321.8
10:10	1:50	923.5	1368.9	1651.3	939.8	6:40	5:20	1969.6	268.0	1987.8	2346.4
10:05	1:55	962.0	1353.0	1660.1	980.6	6:35	5:25	1976.7	234.8	1990.6	2370.6
10:00	2:00	1000.0	1336.5	1669.2	1021.2	6:30	5:30	1982.9	201.4	1993.1	2394.2
9:55	2:05	1037.5	1319.3	1678.4	1061.4	6:25	5:35	1988.1	168.0	1995.2	2417.4
9:50	2:10	1074.6	1301.6	1687.8	1101.4	6:20	5:40	1992.4	134.5	1996.9	2440.1
9:45	2:15	1111.1	1283.2	1697.4	1141.2	6:15	5:45	1995.7	100.9	1998.3	2462.3
9:40	2:20	1147.2	1264.2	1707.1	1180.6	6:10	5:50	1998.1	67.3	1999.2	2484.1
9:35	2:25	1182.6	1244.5	1716.8	1219.8	6:05	5:55	1999.5	33.7	1999.8	2505.4
9:30	2:30	1217.5	1224.3	1726.7	1258.6	6:00	6:00	2000.0	0.0	2000.0	2526.2
9:25	2:35	1251.8	1203.6	1736.6	1297.1	5:55	6:05	1999.5	-33.7	1999.8	2546.5
9:20	2:40	1285.6	1182.2	1746.5	1335.3	5:50	6:10	1998.1	-67.3	1999.2	2566.4
9:15	2:45	1318.7	1160.3	1756.5	1373.2	5:45	6:15	1995.7	-100.9	1998.3	2585.8
9:10	2:50	1351.2	1137.8	1766.4	1410.7	5:40	6:20	1992.4	-134.5	1996.9	2604.7
9:05	2:55	1383.0	1114.8	1776.4	1447.9	5:35	6:25	1988.1	-168.0	1995.2	2623.2
9:00	3:00	1414.2	1091.2	1786.3	1484.7	5:30	6:30	1982.9	-201.4	1993.1	2641.2
8:55	3:05	1444.7	1067.2	1796.1	1521.1	5:25	6:35	1976.7	-234.8	1990.6	2658.7
8:50	3:10	1474.6	1042.6	1805.9	1557.2	5:20	6:40	1969.6	-268.0	1987.8	2675.8
8:45	3:15	1503.7	1017.5	1815.6	1592.9	5:15	6:45	1961.6	-301.1	1984.5	2692.4
8:40	3:20	1532.1	992.0	1825.2	1628.2	5:10	6:50	1952.6	-334.0	1981.0	2708.6
8:35	3:25	1559.8	966.0	1834.7	1663.2	5:05	6:55	1942.7	-366.8	1977.0	2724.4
8:30	3:30	1586.7	939.5	1844.0	1697.7	5:00	7:00	1931.9	-399.4	1972.7	2739.7

## Analemmatic Sundial

Latitude: 50.5° N/S

Earliest Sunrise: 3:46 a.m.    Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1543.2 mm  
 Sunrise/Sunset Markers: X = ± 724.1 mm

Local Time		X	Y	Z	W
4:55	7:05	1920.1	-431.8	1968.1	2754.6
4:50	7:10	1907.4	-464.1	1963.1	2769.0
4:45	7:15	1893.9	-496.1	1957.7	2783.1
4:40	7:20	1879.4	-527.8	1952.1	2796.7
4:35	7:25	1864.0	-559.3	1946.1	2809.9
4:30	7:30	1847.8	-590.6	1939.8	2822.7
4:25	7:35	1830.6	-621.5	1933.3	2835.0
4:20	7:40	1812.6	-652.2	1926.4	2847.0
4:15	7:45	1793.7	-682.6	1919.2	2858.6
4:10	7:50	1774.0	-712.6	1911.8	2869.8
4:05	7:55	1753.5	-742.3	1904.1	2880.7
4:00	8:00	1732.1	-771.6	1896.2	2891.1
3:55	8:05	1709.8	-800.6	1888.0	2901.2
3:50	8:10	1686.8	-829.2	1879.6	2911.0
3:45	8:15	1662.9	-857.4	1871.0	2920.3

## Analemmatic Sundial

Latitude: 50.5° N/S

## Date Scale

Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1543.2 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-539.7	-529.5	-526.4	-512.4	-508.3	-490.9	-486.0	-465.3	-459.8	-436.3	-430.1
February	-390.4	-361.9	-354.5	-324.3	-316.7	-285.1	-276.9	-244.3	-236.0	-202.4	-193.8
March	-168.2	-133.7	-125.0	-90.1	-81.4	-46.2	-37.5	-2.2	6.4	41.5	50.2
April	102.4	136.6	145.2	178.8	187.2	220.2	228.2	260.4	268.3	299.3	306.8
May	343.7	372.0	378.8	405.0	411.4	435.6	441.3	463.3	468.6	487.8	492.2
June	516.1	528.5	531.4	540.5	542.6	548.4	549.2	551.3	551.6	547.6	549.5
July	542.6	534.0	531.4	519.7	516.3	501.1	497.0	478.9	474.1	453.5	448.0
August	412.9	387.2	380.7	353.3	346.4	317.4	309.9	279.7	272.0	240.6	232.6
September	184.0	150.8	142.5	108.6	100.1	66.0	57.5	23.1	14.4	-20.2	-28.9
October	-72.0	-106.6	-115.1	-149.4	-157.8	-191.7	-200.1	-233.3	-241.5	-273.9	-281.8
November	-328.3	-358.1	-365.3	-393.3	-400.1	-426.2	-432.3	-456.0	-461.5	-482.5	-487.6
December	-509.3	-524.1	-527.2	-537.9	-540.3	-547.1	-548.4	-551.3	-551.6	-550.2	-549.5

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	539.7	529.5	526.4	512.4	508.3	490.9	486.0	465.3	459.8	436.3	430.1
February	390.4	361.9	354.5	324.3	316.7	285.1	276.9	244.3	236.0	202.4	193.8
March	168.2	133.7	125.0	90.1	81.4	46.2	37.5	2.2	-6.4	-41.5	-50.2
April	-102.4	-136.6	-145.2	-178.8	-187.2	-220.2	-228.2	-260.4	-268.3	-299.3	-306.8
May	-343.7	-372.0	-378.8	-405.0	-411.4	-435.6	-441.3	-463.3	-468.6	-487.8	-492.2
June	-516.1	-528.5	-531.4	-540.5	-542.6	-548.4	-549.2	-551.3	-551.6	-547.6	-549.5
July	-542.6	-534.0	-531.4	-519.7	-516.3	-501.1	-497.0	-478.9	-474.1	-453.5	-448.0
August	-412.9	-387.2	-380.7	-353.3	-346.4	-317.4	-309.9	-279.7	-272.0	-240.6	-232.6
September	-184.0	-150.8	-142.5	-108.6	-100.1	-66.0	-57.5	-23.1	-14.4	20.2	28.9
October	72.0	106.6	115.1	149.4	157.8	191.7	200.1	233.3	241.5	273.9	281.8
November	328.3	358.1	365.3	393.3	400.1	426.2	432.3	456.0	461.5	482.5	487.6
December	509.3	524.1	527.2	537.9	540.3	547.1	548.4	551.3	551.6	550.2	549.5

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: 50.5° N/S

Earliest Sunrise: 3:46 a.m. Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 1929.1 mm  
 Sunrise/Sunset Markers: X = ± 905.1 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1929.1	1929.1	0.0						
11:55	12:05	54.5	1928.6	1929.4	54.5	8:25	3:35	2016.1	1140.7	2316.4	2164.8
11:50	12:10	109.0	1927.2	1930.3	109.1	8:20	3:40	2047.9	1106.5	2327.7	2206.9
11:45	12:15	163.5	1924.9	1931.9	163.6	8:15	3:45	2078.7	1071.7	2338.7	2248.5
11:40	12:20	217.9	1921.7	1934.0	218.0	8:10	3:50	2108.5	1036.5	2349.5	2289.6
11:35	12:25	272.2	1917.6	1936.8	272.4	8:05	3:55	2137.3	1000.7	2360.0	2330.2
11:30	12:30	326.3	1912.6	1940.2	326.7	8:00	4:00	2165.1	964.5	2370.2	2370.2
11:25	12:35	380.3	1906.6	1944.2	381.0	7:55	4:05	2191.8	927.9	2380.1	2409.7
11:20	12:40	434.1	1899.8	1948.7	435.1	7:50	4:10	2217.5	890.7	2389.7	2448.6
11:15	12:45	487.7	1892.0	1953.8	489.1	7:45	4:15	2242.2	853.2	2399.0	2486.9
11:10	12:50	541.1	1883.3	1959.5	543.0	7:40	4:20	2265.8	815.3	2408.0	2524.7
11:05	12:55	594.2	1873.8	1965.7	596.8	7:35	4:25	2288.3	776.9	2416.6	2562.0
11:00	1:00	647.0	1863.3	1972.5	650.4	7:30	4:30	2309.7	738.2	2424.8	2598.6
10:55	1:05	699.6	1852.0	1979.7	703.8	7:25	4:35	2330.0	699.2	2432.7	2634.7
10:50	1:10	751.8	1839.8	1987.4	757.0	7:20	4:40	2349.2	659.8	2440.1	2670.2
10:45	1:15	803.6	1826.7	1995.6	810.1	7:15	4:45	2367.3	620.1	2447.2	2705.1
10:40	1:20	855.1	1812.7	2004.3	862.9	7:10	4:50	2384.3	580.1	2453.8	2739.5
10:35	1:25	906.1	1797.9	2013.3	915.5	7:05	4:55	2400.1	539.8	2460.1	2773.2
10:30	1:30	956.7	1782.2	2022.8	967.9	7:00	5:00	2414.8	499.3	2465.9	2806.4
10:25	1:35	1006.9	1765.7	2032.6	1020.0	6:55	5:05	2428.4	458.5	2471.3	2838.9
10:20	1:40	1056.5	1748.3	2042.8	1071.9	6:50	5:10	2440.7	417.5	2476.2	2870.9
10:15	1:45	1105.7	1730.1	2053.3	1123.5	6:45	5:15	2452.0	376.3	2480.7	2902.3
10:10	1:50	1154.4	1711.1	2064.1	1174.8	6:40	5:20	2462.0	335.0	2484.7	2933.0
10:05	1:55	1202.5	1691.3	2075.2	1225.8	6:35	5:25	2470.9	293.5	2488.3	2963.2
10:00	2:00	1250.0	1670.6	2086.5	1276.4	6:30	5:30	2478.6	251.8	2491.4	2992.8
9:55	2:05	1296.9	1649.2	2098.1	1326.8	6:25	5:35	2485.1	210.0	2494.0	3021.8
9:50	2:10	1343.2	1627.0	2109.8	1376.8	6:20	5:40	2490.5	168.1	2496.2	3050.1
9:45	2:15	1388.9	1604.0	2121.7	1426.5	6:15	5:45	2494.6	126.2	2497.8	3077.9
9:40	2:20	1433.9	1580.2	2133.8	1475.8	6:10	5:50	2497.6	84.1	2499.0	3105.1
9:35	2:25	1478.3	1555.7	2146.0	1524.7	6:05	5:55	2499.4	42.1	2499.8	3131.7
9:30	2:30	1521.9	1530.4	2158.3	1573.2	6:00	6:00	2500.0	0.0	2500.0	3157.7
9:25	2:35	1564.8	1504.4	2170.7	1621.4	5:55	6:05	2499.4	-42.1	2499.8	3183.1
9:20	2:40	1607.0	1477.7	2183.1	1669.1	5:50	6:10	2497.6	-84.1	2499.0	3208.0
9:15	2:45	1648.4	1450.3	2195.6	1716.5	5:45	6:15	2494.6	-126.2	2497.8	3232.2
9:10	2:50	1689.0	1422.3	2208.0	1763.4	5:40	6:20	2490.5	-168.1	2496.2	3255.9
9:05	2:55	1728.8	1393.5	2220.5	1809.8	5:35	6:25	2485.1	-210.0	2494.0	3279.0
9:00	3:00	1767.8	1364.1	2232.9	1855.9	5:30	6:30	2478.6	-251.8	2491.4	3301.5
8:55	3:05	1805.9	1334.0	2245.2	1901.4	5:25	6:35	2470.9	-293.5	2488.3	3323.4
8:50	3:10	1843.2	1303.3	2257.4	1946.5	5:20	6:40	2462.0	-335.0	2484.7	3344.8
8:45	3:15	1879.6	1271.9	2269.5	1991.2	5:15	6:45	2452.0	-376.3	2480.7	3365.6
8:40	3:20	1915.1	1240.0	2281.5	2035.3	5:10	6:50	2440.7	-417.5	2476.2	3385.8
8:35	3:25	1949.7	1207.4	2293.3	2079.0	5:05	6:55	2428.4	-458.5	2471.3	3405.5
8:30	3:30	1983.4	1174.3	2305.0	2122.1	5:00	7:00	2414.8	-499.3	2465.9	3424.6

**Analemmatic Sundial****Latitude: 50.5° N/S**

Earliest Sunrise: 3:46 a.m.    Latest Sunset: 8:14 p.m.  
 Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 1929.1 mm  
 Sunrise/Sunset Markers:  $X = \pm 905.1$  mm

Local Time		X	Y	Z	W
4:55	7:05	2400.1	-539.8	2460.1	3443.2
4:50	7:10	2384.3	-580.1	2453.8	3461.3
4:45	7:15	2367.3	-620.1	2447.2	3478.8
4:40	7:20	2349.2	-659.8	2440.1	3495.9
4:35	7:25	2330.0	-699.2	2432.7	3512.3
4:30	7:30	2309.7	-738.2	2424.8	3528.3
4:25	7:35	2288.3	-776.9	2416.6	3543.8
4:20	7:40	2265.8	-815.3	2408.0	3558.8
4:15	7:45	2242.2	-853.2	2399.0	3573.3
4:10	7:50	2217.5	-890.7	2389.7	3587.3
4:05	7:55	2191.8	-927.9	2380.1	3600.8
4:00	8:00	2165.1	-964.5	2370.2	3613.9
3:55	8:05	2137.3	-1000.7	2360.0	3626.5
3:50	8:10	2108.5	-1036.5	2349.5	3638.7
3:45	8:15	2078.7	-1071.7	2338.7	3650.4

**Analematic Sundial**

Latitude: 50.5° N/S

**Date Scale**

Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 1929.1 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-674.7	-661.9	-658.0	-640.5	-635.4	-613.6	-607.6	-581.6	-574.7	-545.4	-537.6
February	-488.0	-452.4	-443.1	-405.3	-395.9	-356.3	-346.1	-305.4	-295.0	-253.0	-242.2
March	-210.2	-167.1	-156.2	-112.6	-101.7	-57.8	-46.9	-2.8	8.0	51.9	62.8
April	127.9	170.8	181.5	223.5	234.0	275.2	285.3	325.6	335.4	374.1	383.5
May	429.7	465.0	473.5	506.3	514.2	544.4	551.6	579.1	585.7	609.8	615.2
June	645.1	660.6	664.2	675.7	678.3	685.5	686.5	689.1	689.5	684.5	686.8
July	678.3	667.5	664.2	649.6	645.4	626.4	621.3	598.7	592.7	566.9	560.0
August	516.1	484.0	475.9	441.6	432.9	396.8	387.4	349.6	340.0	300.8	290.7
September	230.0	188.5	178.1	135.8	125.2	82.5	71.9	28.9	18.0	-25.3	-36.1
October	-90.0	-133.3	-143.9	-186.8	-197.2	-239.6	-250.2	-291.6	-301.9	-342.4	-352.2
November	-410.4	-447.6	-456.6	-491.6	-500.2	-532.7	-540.4	-570.0	-576.9	-603.1	-609.5
December	-636.7	-655.1	-659.0	-672.4	-675.3	-683.9	-685.5	-689.1	-689.5	-687.8	-686.8

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	674.7	661.9	658.0	640.5	635.4	613.6	607.6	581.6	574.7	545.4	537.6
February	488.0	452.4	443.1	405.3	395.9	356.3	346.1	305.4	295.0	253.0	242.2
March	210.2	167.1	156.2	112.6	101.7	57.8	46.9	2.8	-8.0	-51.9	-62.8
April	-127.9	-170.8	-181.5	-223.5	-234.0	-275.2	-285.3	-325.6	-335.4	-374.1	-383.5
May	-429.7	-465.0	-473.5	-506.3	-514.2	-544.4	-551.6	-579.1	-585.7	-609.8	-615.2
June	-645.1	-660.6	-664.2	-675.7	-678.3	-685.5	-686.5	-689.1	-689.5	-684.5	-686.8
July	-678.3	-667.5	-664.2	-649.6	-645.4	-626.4	-621.3	-598.7	-592.7	-566.9	-560.0
August	-516.1	-484.0	-475.9	-441.6	-432.9	-396.8	-387.4	-349.6	-340.0	-300.8	-290.7
September	-230.0	-188.5	-178.1	-135.8	-125.2	-82.5	-71.9	-28.9	-18.0	25.3	36.1
October	90.0	133.3	143.9	186.8	197.2	239.6	250.2	291.6	301.9	342.4	352.2
November	410.4	447.6	456.6	491.6	500.2	532.7	540.4	570.0	576.9	603.1	609.5
December	636.7	655.1	659.0	672.4	675.3	683.9	685.5	689.1	689.5	687.8	686.8

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
- 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