

Analemmatic Sundial

Latitude: 38.5° N/S

Earliest Sunrise: 4:34 a.m. Latest Sunset: 7:26 p.m.  
 Semi-Major Axis (E-W): 1000 mm Semi-Minor Axis (N-S): 622.5 mm  
 Sunrise/Sunset Markers: X = ± 585.7 mm

Local Time	X	Y	Z	W	Local Time	X	Y	Z	W		
12:00	0.0	622.5	622.5	0.0							
11:55	12:05	21.8	622.4	622.7	21.8	8:10	3:50	843.4	334.5	907.3	891.2
11:50	12:10	43.6	621.9	623.4	43.6	8:05	3:55	854.9	322.9	913.9	905.9
11:45	12:15	65.4	621.2	624.6	65.4	8:00	4:00	866.0	311.3	920.3	920.3
11:40	12:20	87.2	620.1	626.2	87.2	7:55	4:05	876.7	299.4	926.4	934.4
11:35	12:25	108.9	618.8	628.3	108.9	7:50	4:10	887.0	287.4	932.4	948.2
11:30	12:30	130.5	617.2	630.8	130.6	7:45	4:15	896.9	275.3	938.2	961.7
11:25	12:35	152.1	615.3	633.8	152.3	7:40	4:20	906.3	263.1	943.7	975.0
11:20	12:40	173.6	613.1	637.2	173.9	7:35	4:25	915.3	250.7	949.0	987.9
11:15	12:45	195.1	610.6	641.0	195.5	7:30	4:30	923.9	238.2	954.1	1000.6
11:10	12:50	216.4	607.8	645.1	216.9	7:25	4:35	932.0	225.6	958.9	1013.0
11:05	12:55	237.7	604.7	649.7	238.4	7:20	4:40	939.7	212.9	963.5	1025.1
11:00	1:00	258.8	601.3	654.6	259.7	7:15	4:45	946.9	200.1	967.8	1036.9
10:55	1:05	279.8	597.6	659.9	280.9	7:10	4:50	953.7	187.2	971.9	1048.4
10:50	1:10	300.7	593.7	665.5	302.1	7:05	4:55	960.0	174.2	975.7	1059.6
10:45	1:15	321.4	589.5	671.4	323.1	7:00	5:00	965.9	161.1	979.3	1070.5
10:40	1:20	342.0	585.0	677.6	344.1	6:55	5:05	971.3	148.0	982.5	1081.1
10:35	1:25	362.4	580.2	684.1	364.9	6:50	5:10	976.3	134.7	985.5	1091.4
10:30	1:30	382.7	575.1	690.8	385.6	6:45	5:15	980.8	121.4	988.3	1101.4
10:25	1:35	402.7	569.8	697.8	406.2	6:40	5:20	984.8	108.1	990.7	1111.1
10:20	1:40	422.6	564.2	704.9	426.6	6:35	5:25	988.4	94.7	992.9	1120.5
10:15	1:45	442.3	558.3	712.3	446.9	6:30	5:30	991.4	81.3	994.8	1129.6
10:10	1:50	461.7	552.2	719.8	467.1	6:25	5:35	994.1	67.8	996.4	1138.4
10:05	1:55	481.0	545.8	727.5	487.1	6:20	5:40	996.2	54.3	997.7	1146.9
10:00	2:00	500.0	539.1	735.3	506.9	6:15	5:45	997.9	40.7	998.7	1155.1
9:55	2:05	518.8	532.2	743.2	526.6	6:10	5:50	999.0	27.2	999.4	1163.0
9:50	2:10	537.3	525.0	751.2	546.1	6:05	5:55	999.8	13.6	999.9	1170.6
9:45	2:15	555.6	517.6	759.3	565.4	6:00	6:00	1000.0	0.0	1000.0	1177.9
9:40	2:20	573.6	509.9	767.5	584.5	5:55	6:05	999.8	-13.6	999.9	1185.0
9:35	2:25	591.3	502.0	775.7	603.5	5:50	6:10	999.0	-27.2	999.4	1191.7
9:30	2:30	608.8	493.9	783.9	622.2	5:45	6:15	997.9	-40.7	998.7	1198.2
9:25	2:35	625.9	485.5	792.1	640.7	5:40	6:20	996.2	-54.3	997.7	1204.3
9:20	2:40	642.8	476.9	800.4	659.1	5:35	6:25	994.1	-67.8	996.4	1210.2
9:15	2:45	659.3	468.0	808.6	677.2	5:30	6:30	991.4	-81.3	994.8	1215.8
9:10	2:50	675.6	459.0	816.7	695.1	5:25	6:35	988.4	-94.7	992.9	1221.2
9:05	2:55	691.5	449.7	824.9	712.8	5:20	6:40	984.8	-108.1	990.7	1226.2
9:00	3:00	707.1	440.2	832.9	730.2	5:15	6:45	980.8	-121.4	988.3	1231.0
8:55	3:05	722.4	430.5	840.9	747.5	5:10	6:50	976.3	-134.7	985.5	1235.5
8:50	3:10	737.3	420.6	848.8	764.4	5:05	6:55	971.3	-148.0	982.5	1239.8
8:45	3:15	751.8	410.5	856.6	781.2	5:00	7:00	965.9	-161.1	979.3	1243.8
8:40	3:20	766.0	400.1	864.3	797.7	4:55	7:05	960.0	-174.2	975.7	1247.6
8:35	3:25	779.9	389.6	871.8	813.9	4:50	7:10	953.7	-187.2	971.9	1251.1
8:30	3:30	793.4	379.0	879.2	829.9	4:45	7:15	946.9	-200.1	967.8	1254.3
8:25	3:35	806.4	368.1	886.5	845.6	4:40	7:20	939.7	-212.9	963.5	1257.4
8:20	3:40	819.2	357.1	893.6	861.1	4:35	7:25	932.0	-225.6	958.9	1260.1
8:15	3:45	831.5	345.9	900.5	876.3	4:30	7:30	923.9	-238.2	954.1	1262.7

## Analemmatic Sundial

Latitude: 38.5° N/S

## Date Scale

Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 622.5 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-332.0	-325.8	-323.8	-315.2	-312.7	-302.0	-299.0	-286.2	-282.8	-268.4	-264.6
February	-240.2	-222.6	-218.1	-199.5	-194.8	-175.4	-170.4	-150.3	-145.2	-124.5	-119.2
March	-103.4	-82.3	-76.9	-55.4	-50.1	-28.4	-23.1	-1.4	4.0	25.6	30.9
April	63.0	84.1	89.3	110.0	115.1	135.5	140.4	160.2	165.1	184.1	188.8
May	211.5	228.9	233.0	249.2	253.1	267.9	271.5	285.0	288.3	300.1	302.8
June	317.5	325.1	326.9	332.5	333.8	337.4	337.9	339.2	339.3	336.9	338.0
July	333.8	328.5	326.9	319.7	317.6	308.3	305.8	294.6	291.7	279.0	275.6
August	254.0	238.2	234.2	217.3	213.1	195.3	190.6	172.1	167.3	148.0	143.1
September	113.2	92.8	87.6	66.8	61.6	40.6	35.4	14.2	8.9	-12.4	-17.8
October	-44.3	-65.6	-70.8	-91.9	-97.1	-117.9	-123.1	-143.5	-148.6	-168.5	-173.4
November	-202.0	-220.3	-224.7	-242.0	-246.2	-262.2	-266.0	-280.5	-283.9	-296.8	-299.9
December	-313.3	-322.4	-324.3	-330.9	-332.4	-336.6	-337.4	-339.2	-339.3	-338.5	-338.0

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	332.0	325.8	323.8	315.2	312.7	302.0	299.0	286.2	282.8	268.4	264.6
February	240.2	222.6	218.1	199.5	194.8	175.4	170.4	150.3	145.2	124.5	119.2
March	103.4	82.3	76.9	55.4	50.1	28.4	23.1	1.4	-4.0	-25.6	-30.9
April	-63.0	-84.1	-89.3	-110.0	-115.1	-135.5	-140.4	-160.2	-165.1	-184.1	-188.8
May	-211.5	-228.9	-233.0	-249.2	-253.1	-267.9	-271.5	-285.0	-288.3	-300.1	-302.8
June	-317.5	-325.1	-326.9	-332.5	-333.8	-337.4	-337.9	-339.2	-339.3	-336.9	-338.0
July	-333.8	-328.5	-326.9	-319.7	-317.6	-308.3	-305.8	-294.6	-291.7	-279.0	-275.6
August	-254.0	-238.2	-234.2	-217.3	-213.1	-195.3	-190.6	-172.1	-167.3	-148.0	-143.1
September	-113.2	-92.8	-87.6	-66.8	-61.6	-40.6	-35.4	-14.2	-8.9	12.4	17.8
October	44.3	65.6	70.8	91.9	97.1	117.9	123.1	143.5	148.6	168.5	173.4
November	202.0	220.3	224.7	242.0	246.2	262.2	266.0	280.5	283.9	296.8	299.9
December	313.3	322.4	324.3	330.9	332.4	336.6	337.4	339.2	339.3	338.5	338.0

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    | 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: 38.5° N/S

Earliest Sunrise: 4:34 a.m.    Latest Sunset: 7:26 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 933.8 mm  
 Sunrise/Sunset Markers: X = ± 878.5 mm

Local Time	X	Y	Z	W	Local Time	X	Y	Z	W		
12:00	0.0	933.8	933.8	0.0							
11:55	12:05	32.7	933.5	934.1	32.7	8:10	3:50	1265.1	501.7	1360.9	1336.8
11:50	12:10	65.4	932.9	935.2	65.4	8:05	3:55	1282.4	484.4	1370.8	1358.8
11:45	12:15	98.1	931.8	936.9	98.1	8:00	4:00	1299.0	466.9	1380.4	1380.4
11:40	12:20	130.7	930.2	939.4	130.8	7:55	4:05	1315.1	449.1	1389.7	1401.5
11:35	12:25	163.3	928.2	942.5	163.4	7:50	4:10	1330.5	431.2	1398.6	1422.3
11:30	12:30	195.8	925.8	946.3	196.0	7:45	4:15	1345.3	413.0	1407.3	1442.6
11:25	12:35	228.2	922.9	950.7	228.4	7:40	4:20	1359.5	394.6	1415.6	1462.5
11:20	12:40	260.5	919.6	955.8	260.9	7:35	4:25	1373.0	376.1	1423.5	1481.9
11:15	12:45	292.6	915.8	961.4	293.2	7:30	4:30	1385.8	357.3	1431.1	1500.9
11:10	12:50	324.7	911.6	967.7	325.4	7:25	4:35	1398.0	338.4	1438.4	1519.5
11:05	12:55	356.5	907.0	974.6	357.5	7:20	4:40	1409.5	319.4	1445.3	1537.6
11:00	1:00	388.2	902.0	982.0	389.5	7:15	4:45	1420.4	300.2	1451.8	1555.3
10:55	1:05	419.7	896.5	989.9	421.4	7:10	4:50	1430.6	280.8	1457.9	1572.6
10:50	1:10	451.1	890.6	998.3	453.1	7:05	4:55	1440.1	261.3	1463.6	1589.4
10:45	1:15	482.2	884.2	1007.1	484.7	7:00	5:00	1448.9	241.7	1468.9	1605.7
10:40	1:20	513.0	877.5	1016.4	516.1	6:55	5:05	1457.0	221.9	1473.8	1621.6
10:35	1:25	543.7	870.3	1026.1	547.4	6:50	5:10	1464.4	202.1	1478.3	1637.0
10:30	1:30	574.0	862.7	1036.2	578.4	6:45	5:15	1471.2	182.2	1482.4	1652.1
10:25	1:35	604.1	854.7	1046.6	609.3	6:40	5:20	1477.2	162.1	1486.1	1666.6
10:20	1:40	633.9	846.3	1057.4	639.9	6:35	5:25	1482.5	142.0	1489.3	1680.7
10:15	1:45	663.4	837.5	1068.4	670.4	6:30	5:30	1487.2	121.9	1492.2	1694.4
10:10	1:50	692.6	828.3	1079.7	700.6	6:25	5:35	1491.1	101.7	1494.5	1707.6
10:05	1:55	721.5	818.7	1091.2	730.6	6:20	5:40	1494.3	81.4	1496.5	1720.3
10:00	2:00	750.0	808.7	1102.9	760.4	6:15	5:45	1496.8	61.1	1498.0	1732.6
9:55	2:05	778.2	798.3	1114.8	789.9	6:10	5:50	1498.6	40.7	1499.1	1744.5
9:50	2:10	805.9	787.5	1126.8	819.1	6:05	5:55	1499.6	20.4	1499.8	1755.9
9:45	2:15	833.4	776.4	1139.0	848.1	6:00	6:00	1500.0	0.0	1500.0	1766.9
9:40	2:20	860.4	764.9	1151.2	876.8	5:55	6:05	1499.6	-20.4	1499.8	1777.4
9:35	2:25	887.0	753.0	1163.5	905.2	5:50	6:10	1498.6	-40.7	1499.1	1787.6
9:30	2:30	913.1	740.8	1175.9	933.3	5:45	6:15	1496.8	-61.1	1498.0	1797.2
9:25	2:35	938.9	728.2	1188.2	961.1	5:40	6:20	1494.3	-81.4	1496.5	1806.5
9:20	2:40	964.2	715.3	1200.5	988.6	5:35	6:25	1491.1	-101.7	1494.5	1815.3
9:15	2:45	989.0	702.0	1212.9	1015.8	5:30	6:30	1487.2	-121.9	1492.2	1823.8
9:10	2:50	1013.4	688.4	1225.1	1042.7	5:25	6:35	1482.5	-142.0	1489.3	1831.8
9:05	2:55	1037.3	674.5	1237.3	1069.2	5:20	6:40	1477.2	-162.1	1486.1	1839.3
9:00	3:00	1060.7	660.3	1249.4	1095.4	5:15	6:45	1471.2	-182.2	1482.4	1846.5
8:55	3:05	1083.5	645.7	1261.4	1121.2	5:10	6:50	1464.4	-202.1	1478.3	1853.3
8:50	3:10	1105.9	630.8	1273.2	1146.7	5:05	6:55	1457.0	-221.9	1473.8	1859.7
8:45	3:15	1127.8	615.7	1284.9	1171.8	5:00	7:00	1448.9	-241.7	1468.9	1865.7
8:40	3:20	1149.1	600.2	1296.4	1196.5	4:55	7:05	1440.1	-261.3	1463.6	1871.4
8:35	3:25	1169.8	584.5	1307.7	1220.9	4:50	7:10	1430.6	-280.8	1457.9	1876.6
8:30	3:30	1190.0	568.4	1318.8	1244.8	4:45	7:15	1420.4	-300.2	1451.8	1881.5
8:25	3:35	1209.7	552.1	1329.7	1268.4	4:40	7:20	1409.5	-319.4	1445.3	1886.0
8:20	3:40	1228.7	535.6	1340.4	1291.6	4:35	7:25	1398.0	-338.4	1438.4	1890.2
8:15	3:45	1247.2	518.8	1350.8	1314.4	4:30	7:30	1385.8	-357.3	1431.1	1894.1

## Analematic Sundial

Latitude: 38.5° N/S

## Date Scale

Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 933.8 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-498.1	-488.7	-485.8	-472.9	-469.1	-453.0	-448.5	-429.4	-424.3	-402.6	-396.9
February	-360.2	-334.0	-327.1	-299.2	-292.3	-263.0	-255.5	-225.4	-217.8	-186.8	-178.8
March	-155.2	-123.4	-115.3	-83.1	-75.1	-42.6	-34.6	-2.0	5.9	38.3	46.3
April	94.5	126.1	134.0	165.0	172.7	203.2	210.6	240.3	247.6	276.2	283.1
May	317.2	343.3	349.5	373.7	379.6	401.9	407.2	427.5	432.4	450.2	454.2
June	476.2	487.7	490.3	498.8	500.7	506.1	506.8	508.7	509.0	505.3	507.0
July	500.7	492.7	490.3	479.5	476.4	462.4	458.6	441.9	437.5	418.5	413.4
August	381.0	357.3	351.3	326.0	319.6	292.9	286.0	258.1	251.0	222.0	214.6
September	169.8	139.1	131.5	100.2	92.4	60.9	53.1	21.3	13.3	-18.6	-26.6
October	-66.5	-98.4	-106.2	-137.9	-145.6	-176.9	-184.7	-215.2	-222.9	-252.7	-260.0
November	-302.9	-330.4	-337.1	-362.9	-369.2	-393.2	-398.9	-420.8	-425.9	-445.2	-449.9
December	-470.0	-483.6	-486.5	-496.4	-498.5	-504.8	-506.1	-508.7	-509.0	-507.8	-507.0

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	498.1	488.7	485.8	472.9	469.1	453.0	448.5	429.4	424.3	402.6	396.9
February	360.2	334.0	327.1	299.2	292.3	263.0	255.5	225.4	217.8	186.8	178.8
March	155.2	123.4	115.3	83.1	75.1	42.6	34.6	2.0	-5.9	-38.3	-46.3
April	-94.5	-126.1	-134.0	-165.0	-172.7	-203.2	-210.6	-240.3	-247.6	-276.2	-283.1
May	-317.2	-343.3	-349.5	-373.7	-379.6	-401.9	-407.2	-427.5	-432.4	-450.2	-454.2
June	-476.2	-487.7	-490.3	-498.8	-500.7	-506.1	-506.8	-508.7	-509.0	-505.3	-507.0
July	-500.7	-492.7	-490.3	-479.5	-476.4	-462.4	-458.6	-441.9	-437.5	-418.5	-413.4
August	-381.0	-357.3	-351.3	-326.0	-319.6	-292.9	-286.0	-258.1	-251.0	-222.0	-214.6
September	-169.8	-139.1	-131.5	-100.2	-92.4	-60.9	-53.1	-21.3	-13.3	18.6	26.6
October	66.5	98.4	106.2	137.9	145.6	176.9	184.7	215.2	222.9	252.7	260.0
November	302.9	330.4	337.1	362.9	369.2	393.2	398.9	420.8	425.9	445.2	449.9
December	470.0	483.6	486.5	496.4	498.5	504.8	506.1	508.7	509.0	507.8	507.0

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    | 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: 38.5° N/S

Earliest Sunrise: 4:34 a.m.    Latest Sunset: 7:26 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1245.0 mm  
 Sunrise/Sunset Markers: X = ± 1171.3 mm

Local Time	X	Y	Z	W	Local Time	X	Y	Z	W		
12:00	0.0	1245.0	1245.0	0.0							
11:55	12:05	43.6	1244.7	1245.5	43.6	8:10	3:50	1686.8	669.0	1814.6	1782.4
11:50	12:10	87.2	1243.8	1246.9	87.2	8:05	3:55	1709.8	645.9	1827.7	1811.8
11:45	12:15	130.8	1242.4	1249.2	130.8	8:00	4:00	1732.1	622.5	1840.5	1840.5
11:40	12:20	174.3	1240.3	1252.5	174.4	7:55	4:05	1753.5	598.8	1852.9	1868.7
11:35	12:25	217.7	1237.6	1256.6	217.9	7:50	4:10	1774.0	574.9	1864.8	1896.4
11:30	12:30	261.1	1234.4	1261.7	261.3	7:45	4:15	1793.7	550.7	1876.4	1923.5
11:25	12:35	304.2	1230.5	1267.6	304.6	7:40	4:20	1812.6	526.2	1887.4	1950.0
11:20	12:40	347.3	1226.1	1274.4	347.8	7:35	4:25	1830.6	501.4	1898.1	1975.9
11:15	12:45	390.2	1221.1	1281.9	390.9	7:30	4:30	1847.8	476.5	1908.2	2001.2
11:10	12:50	432.9	1215.5	1290.3	433.9	7:25	4:35	1864.0	451.2	1917.9	2026.0
11:05	12:55	475.4	1209.3	1299.4	476.7	7:20	4:40	1879.4	425.8	1927.0	2050.2
11:00	1:00	517.6	1202.6	1309.3	519.4	7:15	4:45	1893.9	400.2	1935.7	2073.8
10:55	1:05	559.7	1195.3	1319.8	561.9	7:10	4:50	1907.4	374.4	1943.8	2096.7
10:50	1:10	601.4	1187.4	1331.0	604.2	7:05	4:55	1920.1	348.4	1951.5	2119.1
10:45	1:15	642.9	1179.0	1342.8	646.3	7:00	5:00	1931.9	322.2	1958.5	2140.9
10:40	1:20	684.0	1169.9	1355.2	688.1	6:55	5:05	1942.7	295.9	1965.1	2162.1
10:35	1:25	724.9	1160.4	1368.2	729.8	6:50	5:10	1952.6	269.5	1971.1	2182.7
10:30	1:30	765.4	1150.3	1381.6	771.2	6:45	5:15	1961.6	242.9	1976.6	2202.7
10:25	1:35	805.5	1139.6	1395.5	812.4	6:40	5:20	1969.6	216.2	1981.4	2222.1
10:20	1:40	845.2	1128.4	1409.8	853.2	6:35	5:25	1976.7	189.4	1985.8	2240.9
10:15	1:45	884.6	1116.6	1424.6	893.8	6:30	5:30	1982.9	162.5	1989.5	2259.1
10:10	1:50	923.5	1104.4	1439.6	934.2	6:25	5:35	1988.1	135.5	1992.7	2276.7
10:05	1:55	962.0	1091.6	1455.0	974.1	6:20	5:40	1992.4	108.5	1995.3	2293.7
10:00	2:00	1000.0	1078.2	1470.6	1013.8	6:15	5:45	1995.7	81.4	1997.4	2310.2
9:55	2:05	1037.5	1064.4	1486.4	1053.2	6:10	5:50	1998.1	54.3	1998.8	2326.0
9:50	2:10	1074.6	1050.0	1502.5	1092.1	6:05	5:55	1999.5	27.2	1999.7	2341.2
9:45	2:15	1111.1	1035.2	1518.6	1130.8	6:00	6:00	2000.0	0.0	2000.0	2355.9
9:40	2:20	1147.2	1019.9	1535.0	1169.0	5:55	6:05	1999.5	-27.2	1999.7	2369.9
9:35	2:25	1182.6	1004.0	1551.4	1206.9	5:50	6:10	1998.1	-54.3	1998.8	2383.4
9:30	2:30	1217.5	987.7	1567.8	1244.4	5:45	6:15	1995.7	-81.4	1997.4	2396.3
9:25	2:35	1251.8	971.0	1584.3	1281.5	5:40	6:20	1992.4	-108.5	1995.3	2408.7
9:20	2:40	1285.6	953.7	1600.7	1318.2	5:35	6:25	1988.1	-135.5	1992.7	2420.4
9:15	2:45	1318.7	936.1	1617.1	1354.4	5:30	6:30	1982.9	-162.5	1989.5	2431.7
9:10	2:50	1351.2	917.9	1633.5	1390.2	5:25	6:35	1976.7	-189.4	1985.8	2442.3
9:05	2:55	1383.0	899.4	1649.7	1425.6	5:20	6:40	1969.6	-216.2	1981.4	2452.5
9:00	3:00	1414.2	880.4	1665.8	1460.5	5:15	6:45	1961.6	-242.9	1976.6	2462.0
8:55	3:05	1444.7	861.0	1681.8	1494.9	5:10	6:50	1952.6	-269.5	1971.1	2471.1
8:50	3:10	1474.6	841.1	1697.6	1528.9	5:05	6:55	1942.7	-295.9	1965.1	2479.6
8:45	3:15	1503.7	820.9	1713.2	1562.3	5:00	7:00	1931.9	-322.2	1958.5	2487.6
8:40	3:20	1532.1	800.3	1728.5	1595.3	4:55	7:05	1920.1	-348.4	1951.5	2495.2
8:35	3:25	1559.8	779.3	1743.6	1627.8	4:50	7:10	1907.4	-374.4	1943.8	2502.2
8:30	3:30	1586.7	757.9	1758.4	1659.8	4:45	7:15	1893.9	-400.2	1935.7	2508.7
8:25	3:35	1612.9	736.2	1773.0	1691.2	4:40	7:20	1879.4	-425.8	1927.0	2514.7
8:20	3:40	1638.3	714.1	1787.2	1722.2	4:35	7:25	1864.0	-451.2	1917.9	2520.3
8:15	3:45	1662.9	691.7	1801.1	1752.6	4:30	7:30	1847.8	-476.5	1908.2	2525.4

## Analematic Sundial

Latitude: 38.5° N/S

## Date Scale

Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1245.0 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-664.1	-651.5	-647.7	-630.5	-625.4	-604.0	-598.0	-572.5	-565.7	-536.8	-529.2
February	-480.3	-445.3	-436.1	-399.0	-389.7	-350.7	-340.7	-300.6	-290.4	-249.0	-238.4
March	-206.9	-164.5	-153.7	-110.8	-100.1	-56.8	-46.2	-2.7	7.9	51.1	61.8
April	125.9	168.1	178.6	220.0	230.3	270.9	280.8	320.4	330.1	368.3	377.5
May	422.9	457.7	466.0	498.3	506.2	535.9	542.9	570.0	576.5	600.2	605.5
June	634.9	650.3	653.8	665.0	667.6	674.7	675.7	678.3	678.6	673.8	676.0
July	667.6	657.0	653.8	639.4	635.3	616.6	611.5	589.3	583.3	558.0	551.2
August	508.0	476.4	468.4	434.7	426.1	390.5	381.3	344.1	334.7	296.0	286.1
September	226.4	185.5	175.3	133.6	123.2	81.2	70.8	28.4	17.8	-24.9	-35.5
October	-88.6	-131.2	-141.6	-183.9	-194.1	-235.9	-246.2	-287.0	-297.2	-337.0	-346.7
November	-403.9	-440.6	-449.4	-483.9	-492.3	-524.3	-531.9	-561.0	-567.8	-593.6	-599.9
December	-626.7	-644.8	-648.7	-661.8	-664.7	-673.1	-674.7	-678.3	-678.6	-677.0	-676.0

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	664.1	651.5	647.7	630.5	625.4	604.0	598.0	572.5	565.7	536.8	529.2
February	480.3	445.3	436.1	399.0	389.7	350.7	340.7	300.6	290.4	249.0	238.4
March	206.9	164.5	153.7	110.8	100.1	56.8	46.2	2.7	-7.9	-51.1	-61.8
April	-125.9	-168.1	-178.6	-220.0	-230.3	-270.9	-280.8	-320.4	-330.1	-368.3	-377.5
May	-422.9	-457.7	-466.0	-498.3	-506.2	-535.9	-542.9	-570.0	-576.5	-600.2	-605.5
June	-634.9	-650.3	-653.8	-665.0	-667.6	-674.7	-675.7	-678.3	-678.6	-673.8	-676.0
July	-667.6	-657.0	-653.8	-639.4	-635.3	-616.6	-611.5	-589.3	-583.3	-558.0	-551.2
August	-508.0	-476.4	-468.4	-434.7	-426.1	-390.5	-381.3	-344.1	-334.7	-296.0	-286.1
September	-226.4	-185.5	-175.3	-133.6	-123.2	-81.2	-70.8	-28.4	-17.8	24.9	35.5
October	88.6	131.2	141.6	183.9	194.1	235.9	246.2	287.0	297.2	337.0	346.7
November	403.9	440.6	449.4	483.9	492.3	524.3	531.9	561.0	567.8	593.6	599.9
December	626.7	644.8	648.7	661.8	664.7	673.1	674.7	678.3	678.6	677.0	676.0

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    | 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: 38.5° N/S

Earliest Sunrise: 4:34 a.m.    Latest Sunset: 7:26 p.m.  
 Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 1556.3 mm  
 Sunrise/Sunset Markers: X = ± 1464.1 mm

Local Time	X	Y	Z	W	Local Time	X	Y	Z	W		
12:00	0.0	1556.3	1556.3	0.0							
11:55	12:05	54.5	1555.9	1556.9	54.5	8:10	3:50	2108.5	836.2	2268.2	2228.1
11:50	12:10	109.0	1554.8	1558.6	109.1	8:05	3:55	2137.3	807.4	2284.7	2264.7
11:45	12:15	163.5	1553.0	1561.5	163.5	8:00	4:00	2165.1	778.1	2300.7	2300.7
11:40	12:20	217.9	1550.4	1565.6	218.0	7:55	4:05	2191.8	748.6	2316.1	2335.9
11:35	12:25	272.2	1547.0	1570.8	272.3	7:50	4:10	2217.5	718.6	2331.1	2370.5
11:30	12:30	326.3	1543.0	1577.1	326.6	7:45	4:15	2242.2	688.3	2345.5	2404.3
11:25	12:35	380.3	1538.2	1584.5	380.7	7:40	4:20	2265.8	657.7	2359.3	2437.4
11:20	12:40	434.1	1532.6	1592.9	434.8	7:35	4:25	2288.3	626.8	2372.6	2469.9
11:15	12:45	487.7	1526.4	1602.4	488.6	7:30	4:30	2309.7	595.6	2385.2	2501.5
11:10	12:50	541.1	1519.4	1612.9	542.4	7:25	4:35	2330.0	564.1	2397.3	2532.5
11:05	12:55	594.2	1511.7	1624.3	595.9	7:20	4:40	2349.2	532.3	2408.8	2562.7
11:00	1:00	647.0	1503.3	1636.6	649.2	7:15	4:45	2367.3	500.3	2419.6	2592.2
10:55	1:05	699.6	1494.1	1649.8	702.3	7:10	4:50	2384.3	468.0	2429.8	2620.9
10:50	1:10	751.8	1484.3	1663.8	755.2	7:05	4:55	2400.1	435.5	2439.3	2648.9
10:45	1:15	803.6	1473.7	1678.6	807.8	7:00	5:00	2414.8	402.8	2448.2	2676.2
10:40	1:20	855.1	1462.4	1694.1	860.2	6:55	5:05	2428.4	369.9	2456.4	2702.7
10:35	1:25	906.1	1450.5	1710.2	912.3	6:50	5:10	2440.7	336.8	2463.9	2728.4
10:30	1:30	956.7	1437.8	1727.0	964.0	6:45	5:15	2452.0	303.6	2470.7	2753.4
10:25	1:35	1006.9	1424.5	1744.4	1015.5	6:40	5:20	2462.0	270.2	2476.8	2777.7
10:20	1:40	1056.5	1410.5	1762.3	1066.6	6:35	5:25	2470.9	236.7	2482.2	2801.2
10:15	1:45	1105.7	1395.8	1780.7	1117.3	6:30	5:30	2478.6	203.1	2486.9	2823.9
10:10	1:50	1154.4	1380.4	1799.5	1167.7	6:25	5:35	2485.1	169.4	2490.9	2845.9
10:05	1:55	1202.5	1364.4	1818.7	1217.7	6:20	5:40	2490.5	135.6	2494.2	2867.2
10:00	2:00	1250.0	1347.8	1838.2	1267.3	6:15	5:45	2494.6	101.8	2496.7	2887.7
9:55	2:05	1296.9	1330.5	1858.0	1316.4	6:10	5:50	2497.6	67.9	2498.5	2907.5
9:50	2:10	1343.2	1312.6	1878.1	1365.2	6:05	5:55	2499.4	34.0	2499.6	2926.5
9:45	2:15	1388.9	1294.0	1898.3	1413.5	6:00	6:00	2500.0	0.0	2500.0	2944.8
9:40	2:20	1433.9	1274.8	1918.7	1461.3	5:55	6:05	2499.4	-34.0	2499.6	2962.4
9:35	2:25	1478.3	1255.1	1939.2	1508.7	5:50	6:10	2497.6	-67.9	2498.5	2979.3
9:30	2:30	1521.9	1234.7	1959.8	1555.5	5:45	6:15	2494.6	-101.8	2496.7	2995.4
9:25	2:35	1564.8	1213.7	1980.3	1601.9	5:40	6:20	2490.5	-135.6	2494.2	3010.8
9:20	2:40	1607.0	1192.2	2000.9	1647.7	5:35	6:25	2485.1	-169.4	2490.9	3025.6
9:15	2:45	1648.4	1170.1	2021.4	1693.0	5:30	6:30	2478.6	-203.1	2486.9	3039.6
9:10	2:50	1689.0	1147.4	2041.9	1737.8	5:25	6:35	2470.9	-236.7	2482.2	3052.9
9:05	2:55	1728.8	1124.2	2062.2	1782.0	5:20	6:40	2462.0	-270.2	2476.8	3065.6
9:00	3:00	1767.8	1100.5	2082.3	1825.6	5:15	6:45	2452.0	-303.6	2470.7	3077.6
8:55	3:05	1805.9	1076.2	2102.3	1868.6	5:10	6:50	2440.7	-336.8	2463.9	3088.9
8:50	3:10	1843.2	1051.4	2122.0	1911.1	5:05	6:55	2428.4	-369.9	2456.4	3099.5
8:45	3:15	1879.6	1026.1	2141.5	1952.9	5:00	7:00	2414.8	-402.8	2448.2	3109.6
8:40	3:20	1915.1	1000.4	2160.6	1994.2	4:55	7:05	2400.1	-435.5	2439.3	3118.9
8:35	3:25	1949.7	974.1	2179.5	2034.8	4:50	7:10	2384.3	-468.0	2429.8	3127.7
8:30	3:30	1983.4	947.4	2198.0	2074.7	4:45	7:15	2367.3	-500.3	2419.6	3135.9
8:25	3:35	2016.1	920.2	2216.2	2114.1	4:40	7:20	2349.2	-532.3	2408.8	3143.4
8:20	3:40	2047.9	892.6	2234.0	2152.7	4:35	7:25	2330.0	-564.1	2397.3	3150.4
8:15	3:45	2078.7	864.6	2251.3	2190.7	4:30	7:30	2309.7	-595.6	2385.2	3156.8

## Analematic Sundial

Latitude: 38.5° N/S

## Date Scale

Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 1556.3 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-830.1	-814.4	-809.6	-788.1	-781.8	-755.0	-747.5	-715.6	-707.1	-671.0	-661.5
February	-600.4	-556.6	-545.2	-498.7	-487.1	-438.4	-425.9	-375.7	-363.0	-311.3	-298.0
March	-258.6	-205.6	-192.2	-138.5	-125.2	-71.1	-57.7	-3.4	9.9	63.9	77.2
April	157.4	210.1	223.3	275.0	287.9	338.7	351.0	400.5	412.7	460.3	471.9
May	528.6	572.1	582.5	622.9	632.7	669.9	678.7	712.5	720.6	750.3	756.9
June	793.7	812.8	817.2	831.3	834.5	843.4	844.6	847.9	848.3	842.2	845.0
July	834.5	821.2	817.2	799.2	794.1	770.7	764.4	736.6	729.2	697.5	689.0
August	635.0	595.6	585.5	543.3	532.7	488.2	476.6	430.2	418.4	370.0	357.7
September	283.0	231.9	219.1	167.0	154.0	101.5	88.5	35.5	22.2	-31.1	-44.4
October	-110.8	-163.9	-177.0	-229.8	-242.7	-294.8	-307.8	-358.7	-371.5	-421.2	-433.4
November	-504.9	-550.7	-561.8	-604.9	-615.4	-655.4	-664.9	-701.3	-709.8	-742.0	-749.9
December	-783.3	-806.0	-810.8	-827.3	-830.9	-841.4	-843.4	-847.9	-848.3	-846.3	-845.0

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	830.1	814.4	809.6	788.1	781.8	755.0	747.5	715.6	707.1	671.0	661.5
February	600.4	556.6	545.2	498.7	487.1	438.4	425.9	375.7	363.0	311.3	298.0
March	258.6	205.6	192.2	138.5	125.2	71.1	57.7	3.4	-9.9	-63.9	-77.2
April	-157.4	-210.1	-223.3	-275.0	-287.9	-338.7	-351.0	-400.5	-412.7	-460.3	-471.9
May	-528.6	-572.1	-582.5	-622.9	-632.7	-669.9	-678.7	-712.5	-720.6	-750.3	-756.9
June	-793.7	-812.8	-817.2	-831.3	-834.5	-843.4	-844.6	-847.9	-848.3	-842.2	-845.0
July	-834.5	-821.2	-817.2	-799.2	-794.1	-770.7	-764.4	-736.6	-729.2	-697.5	-689.0
August	-635.0	-595.6	-585.5	-543.3	-532.7	-488.2	-476.6	-430.2	-418.4	-370.0	-357.7
September	-283.0	-231.9	-219.1	-167.0	-154.0	-101.5	-88.5	-35.5	-22.2	31.1	44.4
October	110.8	163.9	177.0	229.8	242.7	294.8	307.8	358.7	371.5	421.2	433.4
November	504.9	550.7	561.8	604.9	615.4	655.4	664.9	701.3	709.8	742.0	749.9
December	783.3	806.0	810.8	827.3	830.9	841.4	843.4	847.9	848.3	846.3	845.0

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    | 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 |