

## Analemmatic Sundial

Latitude: 42.0° N/S

Earliest Sunrise: 4:22 a.m.    Latest Sunset: 7:38 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 669.1 mm  
 Sunrise/Sunset Markers: X = ± 521.1 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	669.1	669.1	0.0						
11:55	12:05	21.8	669.0	669.3	21.8	8:25	3:35	806.4	395.7	898.3	851.5
11:50	12:10	43.6	668.5	669.9	43.6	8:20	3:40	819.2	383.8	904.6	867.4
11:45	12:15	65.4	667.7	670.9	65.4	8:15	3:45	831.5	371.7	910.8	883.1
11:40	12:20	87.2	666.6	672.3	87.2	8:10	3:50	843.4	359.5	916.8	898.4
11:35	12:25	108.9	665.2	674.0	108.9	8:05	3:55	854.9	347.1	922.7	913.5
11:30	12:30	130.5	663.4	676.1	130.7	8:00	4:00	866.0	334.6	928.4	928.4
11:25	12:35	152.1	661.3	678.6	152.3	7:55	4:05	876.7	321.8	933.9	943.0
11:20	12:40	173.6	659.0	681.5	173.9	7:50	4:10	887.0	309.0	939.3	957.3
11:15	12:45	195.1	656.3	684.7	195.5	7:45	4:15	896.9	295.9	944.4	971.4
11:10	12:50	216.4	653.3	688.2	217.0	7:40	4:20	906.3	282.8	949.4	985.2
11:05	12:55	237.7	650.0	692.1	238.5	7:35	4:25	915.3	269.5	954.2	998.8
11:00	1:00	258.8	646.3	696.2	259.8	7:30	4:30	923.9	256.1	958.7	1012.0
10:55	1:05	279.8	642.4	700.7	281.1	7:25	4:35	932.0	242.5	963.0	1025.0
10:50	1:10	300.7	638.2	705.5	302.3	7:20	4:40	939.7	228.9	967.2	1037.7
10:45	1:15	321.4	633.6	710.5	323.4	7:15	4:45	946.9	215.1	971.1	1050.2
10:40	1:20	342.0	628.8	715.8	344.4	7:10	4:50	953.7	201.2	974.7	1062.3
10:35	1:25	362.4	623.6	721.3	365.3	7:05	4:55	960.0	187.2	978.1	1074.2
10:30	1:30	382.7	618.2	727.1	386.1	7:00	5:00	965.9	173.2	981.3	1085.8
10:25	1:35	402.7	612.5	733.0	406.7	6:55	5:05	971.3	159.0	984.3	1097.1
10:20	1:40	422.6	606.4	739.2	427.2	6:50	5:10	976.3	144.8	987.0	1108.2
10:15	1:45	442.3	600.1	745.5	447.6	6:45	5:15	980.8	130.5	989.4	1118.9
10:10	1:50	461.7	593.5	752.0	467.9	6:40	5:20	984.8	116.2	991.6	1129.4
10:05	1:55	481.0	586.6	758.6	488.0	6:35	5:25	988.4	101.8	993.6	1139.6
10:00	2:00	500.0	579.5	765.4	508.0	6:30	5:30	991.4	87.3	995.3	1149.5
9:55	2:05	518.8	572.0	772.2	527.8	6:25	5:35	994.1	72.8	996.7	1159.2
9:50	2:10	537.3	564.3	779.2	547.4	6:20	5:40	996.2	58.3	997.9	1168.5
9:45	2:15	555.6	556.4	786.3	566.9	6:15	5:45	997.9	43.8	998.8	1177.6
9:40	2:20	573.6	548.1	793.4	586.2	6:10	5:50	999.0	29.2	999.5	1186.4
9:35	2:25	591.3	539.6	800.5	605.3	6:05	5:55	999.8	14.6	999.9	1195.0
9:30	2:30	608.8	530.9	807.7	624.3	6:00	6:00	1000.0	0.0	1000.0	1203.2
9:25	2:35	625.9	521.8	814.9	643.0	5:55	6:05	999.8	-14.6	999.9	1211.2
9:20	2:40	642.8	512.6	822.1	661.6	5:50	6:10	999.0	-29.2	999.5	1218.9
9:15	2:45	659.3	503.1	829.4	679.9	5:45	6:15	997.9	-43.8	998.8	1226.4
9:10	2:50	675.6	493.3	836.5	698.1	5:40	6:20	996.2	-58.3	997.9	1233.5
9:05	2:55	691.5	483.4	843.7	716.0	5:35	6:25	994.1	-72.8	996.7	1240.4
9:00	3:00	707.1	473.1	850.8	733.8	5:30	6:30	991.4	-87.3	995.3	1247.1
8:55	3:05	722.4	462.7	857.9	751.3	5:25	6:35	988.4	-101.8	993.6	1253.5
8:50	3:10	737.3	452.1	864.8	768.6	5:20	6:40	984.8	-116.2	991.6	1259.6
8:45	3:15	751.8	441.2	871.7	785.6	5:15	6:45	980.8	-130.5	989.4	1265.5
8:40	3:20	766.0	430.1	878.5	802.5	5:10	6:50	976.3	-144.8	987.0	1271.1
8:35	3:25	779.9	418.8	885.2	819.1	5:05	6:55	971.3	-159.0	984.3	1276.5
8:30	3:30	793.4	407.3	891.8	835.4	5:00	7:00	965.9	-173.2	981.3	1281.6

**Analemmatic Sundial****Latitude: 42.0° N/S**

Earliest Sunrise: 4:22 a.m.    Latest Sunset: 7:38 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 669.1 mm  
 Sunrise/Sunset Markers:  $X = \pm 521.1$  mm

Local Time		X	Y	Z	W
4:55	7:05	960.0	-187.2	978.1	1286.5
4:50	7:10	953.7	-201.2	974.7	1291.2
4:45	7:15	946.9	-215.1	971.1	1295.6
4:40	7:20	939.7	-228.9	967.2	1299.8
4:35	7:25	932.0	-242.5	963.0	1303.7
4:30	7:30	923.9	-256.1	958.7	1307.5
4:25	7:35	915.3	-269.5	954.2	1311.0
4:20	7:40	906.3	-282.8	949.4	1314.4
4:15	7:45	896.9	-295.9	944.4	1317.5

## Analematic Sundial

Latitude: 42.0° N/S

## Date Scale

Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 669.1 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-315.3	-309.3	-307.5	-299.3	-296.9	-286.8	-283.9	-271.8	-268.6	-254.9	-251.3
February	-228.1	-211.4	-207.1	-189.4	-185.0	-166.5	-161.8	-142.7	-137.9	-118.2	-113.2
March	-98.2	-78.1	-73.0	-52.6	-47.5	-27.0	-21.9	-1.3	3.8	24.3	29.3
April	59.8	79.8	84.8	104.4	109.3	128.6	133.3	152.1	156.7	174.9	179.2
May	200.8	217.3	221.3	236.6	240.3	254.4	257.8	270.6	273.7	285.0	287.5
June	301.5	308.7	310.4	315.8	317.0	320.4	320.8	322.0	322.2	319.9	321.0
July	317.0	311.9	310.4	303.6	301.6	292.7	290.3	279.8	277.0	264.9	261.7
August	241.2	226.2	222.4	206.4	202.3	185.4	181.0	163.4	158.9	140.6	135.9
September	107.5	88.1	83.2	63.4	58.5	38.6	33.6	13.5	8.4	-11.8	-16.9
October	-42.1	-62.3	-67.2	-87.3	-92.2	-112.0	-116.9	-136.3	-141.1	-160.0	-164.6
November	-191.8	-209.2	-213.4	-229.8	-233.7	-248.9	-252.6	-266.4	-269.6	-281.8	-284.8
December	-297.5	-306.2	-308.0	-314.2	-315.6	-319.6	-320.4	-322.0	-322.2	-321.4	-321.0

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	315.3	309.3	307.5	299.3	296.9	286.8	283.9	271.8	268.6	254.9	251.3
February	228.1	211.4	207.1	189.4	185.0	166.5	161.8	142.7	137.9	118.2	113.2
March	98.2	78.1	73.0	52.6	47.5	27.0	21.9	1.3	-3.8	-24.3	-29.3
April	-59.8	-79.8	-84.8	-104.4	-109.3	-128.6	-133.3	-152.1	-156.7	-174.9	-179.2
May	-200.8	-217.3	-221.3	-236.6	-240.3	-254.4	-257.8	-270.6	-273.7	-285.0	-287.5
June	-301.5	-308.7	-310.4	-315.8	-317.0	-320.4	-320.8	-322.0	-322.2	-319.9	-321.0
July	-317.0	-311.9	-310.4	-303.6	-301.6	-292.7	-290.3	-279.8	-277.0	-264.9	-261.7
August	-241.2	-226.2	-222.4	-206.4	-202.3	-185.4	-181.0	-163.4	-158.9	-140.6	-135.9
September	-107.5	-88.1	-83.2	-63.4	-58.5	-38.6	-33.6	-13.5	-8.4	11.8	16.9
October	42.1	62.3	67.2	87.3	92.2	112.0	116.9	136.3	141.1	160.0	164.6
November	191.8	209.2	213.4	229.8	233.7	248.9	252.6	266.4	269.6	281.8	284.8
December	297.5	306.2	308.0	314.2	315.6	319.6	320.4	322.0	322.2	321.4	321.0

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: 42.0° N/S

Earliest Sunrise: 4:22 a.m.    Latest Sunset: 7:38 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1003.7 mm  
 Sunrise/Sunset Markers: X = ± 781.6 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1003.7	1003.7	0.0						
11:55	12:05	32.7	1003.5	1004.0	32.7	8:25	3:35	1209.7	593.5	1347.4	1277.3
11:50	12:10	65.4	1002.7	1004.9	65.4	8:20	3:40	1228.7	575.7	1356.9	1301.1
11:45	12:15	98.1	1001.5	1006.3	98.1	8:15	3:45	1247.2	557.6	1366.2	1324.6
11:40	12:20	130.7	999.9	1008.4	130.8	8:10	3:50	1265.1	539.3	1375.2	1347.6
11:35	12:25	163.3	997.7	1011.0	163.4	8:05	3:55	1282.4	520.7	1384.0	1370.3
11:30	12:30	195.8	995.1	1014.2	196.0	8:00	4:00	1299.0	501.8	1392.6	1392.6
11:25	12:35	228.2	992.0	1017.9	228.5	7:55	4:05	1315.1	482.8	1400.9	1414.5
11:20	12:40	260.5	988.4	1022.2	260.9	7:50	4:10	1330.5	463.5	1408.9	1436.0
11:15	12:45	292.6	984.4	1027.0	293.3	7:45	4:15	1345.3	443.9	1416.7	1457.1
11:10	12:50	324.7	979.9	1032.3	325.5	7:40	4:20	1359.5	424.2	1424.1	1477.8
11:05	12:55	356.5	974.9	1038.1	357.7	7:35	4:25	1373.0	404.2	1431.2	1498.1
11:00	1:00	388.2	969.5	1044.3	389.7	7:30	4:30	1385.8	384.1	1438.1	1518.0
10:55	1:05	419.7	963.6	1051.0	421.7	7:25	4:35	1398.0	363.8	1444.6	1537.5
10:50	1:10	451.1	957.2	1058.2	453.4	7:20	4:40	1409.5	343.3	1450.7	1556.6
10:45	1:15	482.2	950.4	1065.7	485.1	7:15	4:45	1420.4	322.6	1456.6	1575.2
10:40	1:20	513.0	943.2	1073.7	516.6	7:10	4:50	1430.6	301.8	1462.1	1593.5
10:35	1:25	543.7	935.5	1082.0	547.9	7:05	4:55	1440.1	280.9	1467.2	1611.3
10:30	1:30	574.0	927.3	1090.6	579.1	7:00	5:00	1448.9	259.8	1472.0	1628.7
10:25	1:35	604.1	918.7	1099.5	610.1	6:55	5:05	1457.0	238.6	1476.4	1645.7
10:20	1:40	633.9	909.7	1108.8	640.9	6:50	5:10	1464.4	217.2	1480.5	1662.3
10:15	1:45	663.4	900.2	1118.2	671.5	6:45	5:15	1471.2	195.8	1484.2	1678.4
10:10	1:50	692.6	890.3	1128.0	701.8	6:40	5:20	1477.2	174.3	1487.5	1694.1
10:05	1:55	721.5	880.0	1137.9	732.0	6:35	5:25	1482.5	152.7	1490.4	1709.4
10:00	2:00	750.0	869.2	1148.1	762.0	6:30	5:30	1487.2	131.0	1492.9	1724.3
9:55	2:05	778.2	858.1	1158.4	791.7	6:25	5:35	1491.1	109.3	1495.1	1738.8
9:50	2:10	805.9	846.5	1168.8	821.1	6:20	5:40	1494.3	87.5	1496.9	1752.8
9:45	2:15	833.4	834.5	1179.4	850.3	6:15	5:45	1496.8	65.6	1498.2	1766.4
9:40	2:20	860.4	822.2	1190.0	879.3	6:10	5:50	1498.6	43.8	1499.2	1779.7
9:35	2:25	887.0	809.4	1200.8	908.0	6:05	5:55	1499.6	21.9	1499.8	1792.4
9:30	2:30	913.1	796.3	1211.6	936.4	6:00	6:00	1500.0	0.0	1500.0	1804.8
9:25	2:35	938.9	782.8	1222.4	964.5	5:55	6:05	1499.6	-21.9	1499.8	1816.8
9:20	2:40	964.2	768.9	1233.2	992.4	5:50	6:10	1498.6	-43.8	1499.2	1828.4
9:15	2:45	989.0	754.6	1244.0	1019.9	5:45	6:15	1496.8	-65.6	1498.2	1839.5
9:10	2:50	1013.4	740.0	1254.8	1047.1	5:40	6:20	1494.3	-87.5	1496.9	1850.3
9:05	2:55	1037.3	725.0	1265.5	1074.0	5:35	6:25	1491.1	-109.3	1495.1	1860.7
9:00	3:00	1060.7	709.7	1276.2	1100.6	5:30	6:30	1487.2	-131.0	1492.9	1870.6
8:55	3:05	1083.5	694.1	1286.8	1126.9	5:25	6:35	1482.5	-152.7	1490.4	1880.2
8:50	3:10	1105.9	678.1	1297.2	1152.9	5:20	6:40	1477.2	-174.3	1487.5	1889.4
8:45	3:15	1127.8	661.8	1307.6	1178.5	5:15	6:45	1471.2	-195.8	1484.2	1898.2
8:40	3:20	1149.1	645.2	1317.8	1203.7	5:10	6:50	1464.4	-217.2	1480.5	1906.6
8:35	3:25	1169.8	628.2	1327.8	1228.6	5:05	6:55	1457.0	-238.6	1476.4	1914.7
8:30	3:30	1190.0	611.0	1337.7	1253.1	5:00	7:00	1448.9	-259.8	1472.0	1922.4

**Analemmatic Sundial****Latitude: 42.0° N/S**

Earliest Sunrise: 4:22 a.m.    Latest Sunset: 7:38 p.m.

Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1003.7 mm

Sunrise/Sunset Markers: X = ± 781.6 mm

Local Time		X	Y	Z	W
4:55	7:05	1440.1	-280.9	1467.2	1929.7
4:50	7:10	1430.6	-301.8	1462.1	1936.7
4:45	7:15	1420.4	-322.6	1456.6	1943.4
4:40	7:20	1409.5	-343.3	1450.7	1949.7
4:35	7:25	1398.0	-363.8	1444.6	1955.6
4:30	7:30	1385.8	-384.1	1438.1	1961.2
4:25	7:35	1373.0	-404.2	1431.2	1966.5
4:20	7:40	1359.5	-424.2	1424.1	1971.5
4:15	7:45	1345.3	-443.9	1416.7	1976.2

## Analematic Sundial

Latitude: 42.0° N/S

## Date Scale

Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1003.7 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-472.9	-464.0	-461.3	-449.0	-445.4	-430.1	-425.9	-407.7	-402.9	-382.3	-376.9
February	-342.1	-317.1	-310.6	-284.1	-277.5	-249.8	-242.6	-214.1	-206.8	-177.4	-169.8
March	-147.3	-117.2	-109.5	-78.9	-71.3	-40.5	-32.9	-1.9	5.6	36.4	44.0
April	89.7	119.7	127.2	156.7	164.0	192.9	200.0	228.2	235.1	262.3	268.9
May	301.2	326.0	331.9	354.9	360.5	381.7	386.7	405.9	410.6	427.5	431.3
June	452.2	463.1	465.6	473.6	475.5	480.5	481.2	483.1	483.3	479.8	481.5
July	475.5	467.9	465.6	455.4	452.4	439.1	435.5	419.7	415.4	397.4	392.6
August	361.8	339.3	333.6	309.6	303.5	278.1	271.5	245.1	238.4	210.8	203.8
September	161.2	132.1	124.8	95.2	87.7	57.8	50.4	20.2	12.6	-17.7	-25.3
October	-63.1	-93.4	-100.9	-130.9	-138.3	-168.0	-175.4	-204.4	-211.6	-240.0	-246.9
November	-287.7	-313.8	-320.1	-344.6	-350.6	-373.4	-378.8	-399.6	-404.4	-422.8	-427.2
December	-446.3	-459.2	-462.0	-471.3	-473.4	-479.4	-480.5	-483.1	-483.3	-482.2	-481.5

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	472.9	464.0	461.3	449.0	445.4	430.1	425.9	407.7	402.9	382.3	376.9
February	342.1	317.1	310.6	284.1	277.5	249.8	242.6	214.1	206.8	177.4	169.8
March	147.3	117.2	109.5	78.9	71.3	40.5	32.9	1.9	-5.6	-36.4	-44.0
April	-89.7	-119.7	-127.2	-156.7	-164.0	-192.9	-200.0	-228.2	-235.1	-262.3	-268.9
May	-301.2	-326.0	-331.9	-354.9	-360.5	-381.7	-386.7	-405.9	-410.6	-427.5	-431.3
June	-452.2	-463.1	-465.6	-473.6	-475.5	-480.5	-481.2	-483.1	-483.3	-479.8	-481.5
July	-475.5	-467.9	-465.6	-455.4	-452.4	-439.1	-435.5	-419.7	-415.4	-397.4	-392.6
August	-361.8	-339.3	-333.6	-309.6	-303.5	-278.1	-271.5	-245.1	-238.4	-210.8	-203.8
September	-161.2	-132.1	-124.8	-95.2	-87.7	-57.8	-50.4	-20.2	-12.6	17.7	25.3
October	63.1	93.4	100.9	130.9	138.3	168.0	175.4	204.4	211.6	240.0	246.9
November	287.7	313.8	320.1	344.6	350.6	373.4	378.8	399.6	404.4	422.8	427.2
December	446.3	459.2	462.0	471.3	473.4	479.4	480.5	483.1	483.3	482.2	481.5

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: 42.0° N/S

Earliest Sunrise: 4:22 a.m.    Latest Sunset: 7:38 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1338.3 mm  
 Sunrise/Sunset Markers: X = ± 1042.2 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1338.3	1338.3	0.0						
11:55	12:05	43.6	1337.9	1338.7	43.6	8:25	3:35	1612.9	791.3	1796.6	1703.1
11:50	12:10	87.2	1337.0	1339.8	87.2	8:20	3:40	1638.3	767.6	1809.2	1734.8
11:45	12:15	130.8	1335.4	1341.8	130.8	8:15	3:45	1662.9	743.5	1821.6	1766.1
11:40	12:20	174.3	1333.2	1344.5	174.4	8:10	3:50	1686.8	719.0	1833.6	1796.8
11:35	12:25	217.7	1330.3	1348.0	217.9	8:05	3:55	1709.8	694.3	1845.4	1827.1
11:30	12:30	261.1	1326.8	1352.2	261.3	8:00	4:00	1732.1	669.1	1856.8	1856.8
11:25	12:35	304.2	1322.7	1357.2	304.6	7:55	4:05	1753.5	643.7	1867.9	1886.0
11:20	12:40	347.3	1317.9	1362.9	347.9	7:50	4:10	1774.0	617.9	1878.6	1914.7
11:15	12:45	390.2	1312.5	1369.3	391.0	7:45	4:15	1793.7	591.9	1888.9	1942.8
11:10	12:50	432.9	1306.5	1376.4	434.0	7:40	4:20	1812.6	565.6	1898.8	1970.4
11:05	12:55	475.4	1299.9	1384.1	476.9	7:35	4:25	1830.6	539.0	1908.3	1997.5
11:00	1:00	517.6	1292.7	1392.5	519.6	7:30	4:30	1847.8	512.1	1917.4	2024.0
10:55	1:05	559.7	1284.8	1401.4	562.2	7:25	4:35	1864.0	485.0	1926.1	2050.0
10:50	1:10	601.4	1276.3	1410.9	604.6	7:20	4:40	1879.4	457.7	1934.3	2075.4
10:45	1:15	642.9	1267.2	1421.0	646.8	7:15	4:45	1893.9	430.2	1942.1	2100.3
10:40	1:20	684.0	1257.6	1431.6	688.8	7:10	4:50	1907.4	402.4	1949.4	2124.6
10:35	1:25	724.9	1247.3	1442.6	730.6	7:05	4:55	1920.1	374.5	1956.3	2148.4
10:30	1:30	765.4	1236.4	1454.1	772.1	7:00	5:00	1931.9	346.4	1962.7	2171.6
10:25	1:35	805.5	1224.9	1466.0	813.4	6:55	5:05	1942.7	318.1	1968.6	2194.3
10:20	1:40	845.2	1212.9	1478.3	854.5	6:50	5:10	1952.6	289.7	1974.0	2216.3
10:15	1:45	884.6	1200.3	1491.0	895.3	6:45	5:15	1961.6	261.1	1978.9	2237.9
10:10	1:50	923.5	1187.1	1504.0	935.8	6:40	5:20	1969.6	232.4	1983.3	2258.8
10:05	1:55	962.0	1173.3	1517.2	976.0	6:35	5:25	1976.7	203.6	1987.2	2279.2
10:00	2:00	1000.0	1159.0	1530.8	1015.9	6:30	5:30	1982.9	174.7	1990.6	2299.1
9:55	2:05	1037.5	1144.1	1544.5	1055.6	6:25	5:35	1988.1	145.7	1993.4	2318.4
9:50	2:10	1074.6	1128.7	1558.4	1094.8	6:20	5:40	1992.4	116.6	1995.8	2337.1
9:45	2:15	1111.1	1112.7	1572.5	1133.8	6:15	5:45	1995.7	87.5	1997.6	2355.3
9:40	2:20	1147.2	1096.2	1586.7	1172.4	6:10	5:50	1998.1	58.4	1998.9	2372.9
9:35	2:25	1182.6	1079.2	1601.0	1210.7	6:05	5:55	1999.5	29.2	1999.7	2389.9
9:30	2:30	1217.5	1061.7	1615.4	1248.5	6:00	6:00	2000.0	0.0	2000.0	2406.4
9:25	2:35	1251.8	1043.7	1629.8	1286.0	5:55	6:05	1999.5	-29.2	1999.7	2422.4
9:20	2:40	1285.6	1025.2	1644.3	1323.2	5:50	6:10	1998.1	-58.4	1998.9	2437.8
9:15	2:45	1318.7	1006.2	1658.7	1359.9	5:45	6:15	1995.7	-87.5	1997.6	2452.7
9:10	2:50	1351.2	986.7	1673.1	1396.2	5:40	6:20	1992.4	-116.6	1995.8	2467.1
9:05	2:55	1383.0	966.7	1687.4	1432.1	5:35	6:25	1988.1	-145.7	1993.4	2480.9
9:00	3:00	1414.2	946.3	1701.6	1467.5	5:30	6:30	1982.9	-174.7	1990.6	2494.2
8:55	3:05	1444.7	925.4	1715.7	1502.6	5:25	6:35	1976.7	-203.6	1987.2	2506.9
8:50	3:10	1474.6	904.1	1729.7	1537.1	5:20	6:40	1969.6	-232.4	1983.3	2519.2
8:45	3:15	1503.7	882.4	1743.5	1571.3	5:15	6:45	1961.6	-261.1	1978.9	2530.9
8:40	3:20	1532.1	860.2	1757.1	1604.9	5:10	6:50	1952.6	-289.7	1974.0	2542.2
8:35	3:25	1559.8	837.6	1770.5	1638.1	5:05	6:55	1942.7	-318.1	1968.6	2552.9
8:30	3:30	1586.7	814.7	1783.6	1670.9	5:00	7:00	1931.9	-346.4	1962.7	2563.2

**Analemmatic Sundial****Latitude: 42.0° N/S**

Earliest Sunrise: 4:22 a.m.    Latest Sunset: 7:38 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1338.3 mm  
 Sunrise/Sunset Markers:  $X = \pm 1042.2$  mm

Local Time		X	Y	Z	W
4:55	7:05	1920.1	-374.5	1956.3	2573.0
4:50	7:10	1907.4	-402.4	1949.4	2582.3
4:45	7:15	1893.9	-430.2	1942.1	2591.1
4:40	7:20	1879.4	-457.7	1934.3	2599.5
4:35	7:25	1864.0	-485.0	1926.1	2607.5
4:30	7:30	1847.8	-512.1	1917.4	2615.0
4:25	7:35	1830.6	-539.0	1908.3	2622.1
4:20	7:40	1812.6	-565.6	1898.8	2628.7
4:15	7:45	1793.7	-591.9	1888.9	2635.0

## Analemmatic Sundial

Latitude: 42.0° N/S

## Date Scale

Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1338.3 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-630.6	-618.7	-615.0	-598.7	-593.9	-573.5	-567.9	-543.6	-537.1	-509.7	-502.5
February	-456.1	-422.8	-414.1	-378.9	-370.0	-333.0	-323.5	-285.4	-275.7	-236.5	-226.4
March	-196.5	-156.2	-146.0	-105.2	-95.1	-54.0	-43.9	-2.6	7.5	48.5	58.7
April	119.6	159.6	169.6	208.9	218.7	257.3	266.6	304.3	313.5	349.7	358.5
May	401.6	434.6	442.5	473.2	480.6	508.9	515.5	541.3	547.4	569.9	575.0
June	602.9	617.5	620.8	631.5	634.0	640.7	641.6	644.1	644.4	639.8	641.9
July	634.0	623.9	620.8	607.1	603.2	585.5	580.7	559.5	553.9	529.8	523.4
August	482.4	452.4	444.8	412.7	404.7	370.8	362.0	326.8	317.8	281.1	271.7
September	215.0	176.2	166.5	126.9	117.0	77.1	67.2	27.0	16.9	-23.6	-33.7
October	-84.1	-124.5	-134.5	-174.6	-184.3	-224.0	-233.8	-272.5	-282.2	-320.0	-329.2
November	-383.6	-418.3	-426.7	-459.5	-467.5	-497.9	-505.1	-532.8	-539.2	-563.7	-569.6
December	-595.1	-612.3	-615.9	-628.4	-631.2	-639.2	-640.7	-644.1	-644.4	-642.9	-641.9

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	630.6	618.7	615.0	598.7	593.9	573.5	567.9	543.6	537.1	509.7	502.5
February	456.1	422.8	414.1	378.9	370.0	333.0	323.5	285.4	275.7	236.5	226.4
March	196.5	156.2	146.0	105.2	95.1	54.0	43.9	2.6	-7.5	-48.5	-58.7
April	-119.6	-159.6	-169.6	-208.9	-218.7	-257.3	-266.6	-304.3	-313.5	-349.7	-358.5
May	-401.6	-434.6	-442.5	-473.2	-480.6	-508.9	-515.5	-541.3	-547.4	-569.9	-575.0
June	-602.9	-617.5	-620.8	-631.5	-634.0	-640.7	-641.6	-644.1	-644.4	-639.8	-641.9
July	-634.0	-623.9	-620.8	-607.1	-603.2	-585.5	-580.7	-559.5	-553.9	-529.8	-523.4
August	-482.4	-452.4	-444.8	-412.7	-404.7	-370.8	-362.0	-326.8	-317.8	-281.1	-271.7
September	-215.0	-176.2	-166.5	-126.9	-117.0	-77.1	-67.2	-27.0	-16.9	23.6	33.7
October	84.1	124.5	134.5	174.6	184.3	224.0	233.8	272.5	282.2	320.0	329.2
November	383.6	418.3	426.7	459.5	467.5	497.9	505.1	532.8	539.2	563.7	569.6
December	595.1	612.3	615.9	628.4	631.2	639.2	640.7	644.1	644.4	642.9	641.9

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: 42.0° N/S

Earliest Sunrise: 4:22 a.m. Latest Sunset: 7:38 p.m.  
 Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 1672.8 mm  
 Sunrise/Sunset Markers: X = ± 1302.7 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1672.8	1672.8	0.0						
11:55	12:05	54.5	1672.4	1673.3	54.5	8:25	3:35	2016.1	989.2	2245.7	2128.9
11:50	12:10	109.0	1671.2	1674.8	109.1	8:20	3:40	2047.9	959.5	2261.5	2168.6
11:45	12:15	163.5	1669.2	1677.2	163.5	8:15	3:45	2078.7	929.4	2277.0	2207.6
11:40	12:20	217.9	1666.5	1680.6	218.0	8:10	3:50	2108.5	898.8	2292.1	2246.1
11:35	12:25	272.2	1662.9	1685.0	272.3	8:05	3:55	2137.3	867.8	2306.7	2283.9
11:30	12:30	326.3	1658.5	1690.3	326.6	8:00	4:00	2165.1	836.4	2321.0	2321.0
11:25	12:35	380.3	1653.4	1696.5	380.8	7:55	4:05	2191.8	804.6	2334.8	2357.5
11:20	12:40	434.1	1647.4	1703.7	434.9	7:50	4:10	2217.5	772.4	2348.2	2393.4
11:15	12:45	487.7	1640.7	1711.6	488.8	7:45	4:15	2242.2	739.9	2361.1	2428.5
11:10	12:50	541.1	1633.2	1720.5	542.5	7:40	4:20	2265.8	707.0	2373.5	2463.0
11:05	12:55	594.2	1624.9	1730.1	596.1	7:35	4:25	2288.3	673.7	2385.4	2496.9
11:00	1:00	647.0	1615.8	1740.6	649.6	7:30	4:30	2309.7	640.2	2396.8	2530.0
10:55	1:05	699.6	1606.0	1751.7	702.8	7:25	4:35	2330.0	606.3	2407.6	2562.5
10:50	1:10	751.8	1595.4	1763.6	755.7	7:20	4:40	2349.2	572.1	2417.9	2594.3
10:45	1:15	803.6	1584.0	1776.2	808.5	7:15	4:45	2367.3	537.7	2427.6	2625.4
10:40	1:20	855.1	1571.9	1789.4	861.0	7:10	4:50	2384.3	503.0	2436.8	2655.8
10:35	1:25	906.1	1559.1	1803.3	913.2	7:05	4:55	2400.1	468.1	2445.3	2685.5
10:30	1:30	956.7	1545.5	1817.6	965.1	7:00	5:00	2414.8	433.0	2453.3	2714.5
10:25	1:35	1006.9	1531.2	1832.5	1016.8	6:55	5:05	2428.4	397.6	2460.7	2742.8
10:20	1:40	1056.5	1516.1	1847.9	1068.1	6:50	5:10	2440.7	362.1	2467.4	2770.4
10:15	1:45	1105.7	1500.3	1863.7	1119.1	6:45	5:15	2452.0	326.4	2473.6	2797.3
10:10	1:50	1154.4	1483.8	1880.0	1169.7	6:40	5:20	2462.0	290.5	2479.1	2823.5
10:05	1:55	1202.5	1466.6	1896.5	1220.0	6:35	5:25	2470.9	254.5	2484.0	2849.0
10:00	2:00	1250.0	1448.7	1913.4	1269.9	6:30	5:30	2478.6	218.3	2488.2	2873.9
9:55	2:05	1296.9	1430.1	1930.6	1319.4	6:25	5:35	2485.1	182.1	2491.8	2898.0
9:50	2:10	1343.2	1410.8	1948.0	1368.6	6:20	5:40	2490.5	145.8	2494.8	2921.4
9:45	2:15	1388.9	1390.9	1965.6	1417.2	6:15	5:45	2494.6	109.4	2497.0	2944.1
9:40	2:20	1433.9	1370.3	1983.4	1465.5	6:10	5:50	2497.6	73.0	2498.7	2966.1
9:35	2:25	1478.3	1349.0	2001.3	1513.3	6:05	5:55	2499.4	36.5	2499.7	2987.4
9:30	2:30	1521.9	1327.1	2019.3	1560.7	6:00	6:00	2500.0	0.0	2500.0	3008.0
9:25	2:35	1564.8	1304.6	2037.3	1607.5	5:55	6:05	2499.4	-36.5	2499.7	3028.0
9:20	2:40	1607.0	1281.5	2055.4	1653.9	5:50	6:10	2497.6	-73.0	2498.7	3047.3
9:15	2:45	1648.4	1257.7	2073.4	1699.8	5:45	6:15	2494.6	-109.4	2497.0	3065.9
9:10	2:50	1689.0	1233.3	2091.4	1745.2	5:40	6:20	2490.5	-145.8	2494.8	3083.8
9:05	2:55	1728.8	1208.4	2109.2	1790.1	5:35	6:25	2485.1	-182.1	2491.8	3101.1
9:00	3:00	1767.8	1182.9	2127.0	1834.4	5:30	6:30	2478.6	-218.3	2488.2	3117.7
8:55	3:05	1805.9	1156.8	2144.6	1878.2	5:25	6:35	2470.9	-254.5	2484.0	3133.7
8:50	3:10	1843.2	1130.1	2162.1	1921.4	5:20	6:40	2462.0	-290.5	2479.1	3149.0
8:45	3:15	1879.6	1103.0	2179.3	1964.1	5:15	6:45	2452.0	-326.4	2473.6	3163.7
8:40	3:20	1915.1	1075.3	2196.3	2006.2	5:10	6:50	2440.7	-362.1	2467.4	3177.7
8:35	3:25	1949.7	1047.1	2213.1	2047.7	5:05	6:55	2428.4	-397.6	2460.7	3191.2
8:30	3:30	1983.4	1018.4	2229.5	2088.6	5:00	7:00	2414.8	-433.0	2453.3	3204.0

**Analemmatic Sundial****Latitude: 42.0° N/S**

Earliest Sunrise: 4:22 a.m.    Latest Sunset: 7:38 p.m.  
 Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 1672.8 mm  
 Sunrise/Sunset Markers:  $X = \pm 1302.7$  mm

Local Time		X	Y	Z	W
4:55	7:05	2400.1	-468.1	2445.3	3216.2
4:50	7:10	2384.3	-503.0	2436.8	3227.9
4:45	7:15	2367.3	-537.7	2427.6	3238.9
4:40	7:20	2349.2	-572.1	2417.9	3249.4
4:35	7:25	2330.0	-606.3	2407.6	3259.4
4:30	7:30	2309.7	-640.2	2396.8	3268.7
4:25	7:35	2288.3	-673.7	2385.4	3277.6
4:20	7:40	2265.8	-707.0	2373.5	3285.9
4:15	7:45	2242.2	-739.9	2361.1	3293.7

**Analematic Sundial**

Latitude: 42.0° N/S

**Date Scale**

Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 1672.8 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-788.2	-773.4	-768.8	-748.4	-742.3	-716.9	-709.8	-679.5	-671.4	-637.2	-628.1
February	-570.1	-528.5	-517.7	-473.6	-462.5	-416.3	-404.4	-356.8	-344.7	-295.6	-283.0
March	-245.6	-195.3	-182.5	-131.5	-118.8	-67.5	-54.8	-3.2	9.4	60.7	73.3
April	149.5	199.5	212.0	261.1	273.4	321.6	333.3	380.4	391.9	437.1	448.1
May	502.0	543.3	553.1	591.5	600.8	636.1	644.4	676.6	684.3	712.4	718.8
June	753.6	771.8	776.0	789.4	792.4	800.9	802.0	805.1	805.5	799.7	802.4
July	792.4	779.8	776.0	758.9	754.0	731.8	725.8	699.4	692.4	662.3	654.3
August	602.9	565.5	556.0	515.9	505.8	463.6	452.6	408.5	397.3	351.4	339.6
September	268.7	220.2	208.1	158.6	146.2	96.4	84.0	33.7	21.1	-29.5	-42.2
October	-105.2	-155.7	-168.1	-218.2	-230.4	-280.0	-292.3	-340.6	-352.7	-400.0	-411.5
November	-479.4	-522.9	-533.4	-574.4	-584.4	-622.4	-631.4	-665.9	-674.0	-704.6	-712.1
December	-743.8	-765.4	-769.9	-785.6	-789.0	-799.0	-800.9	-805.1	-805.5	-803.6	-802.4

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	788.2	773.4	768.8	748.4	742.3	716.9	709.8	679.5	671.4	637.2	628.1
February	570.1	528.5	517.7	473.6	462.5	416.3	404.4	356.8	344.7	295.6	283.0
March	245.6	195.3	182.5	131.5	118.8	67.5	54.8	3.2	-9.4	-60.7	-73.3
April	-149.5	-199.5	-212.0	-261.1	-273.4	-321.6	-333.3	-380.4	-391.9	-437.1	-448.1
May	-502.0	-543.3	-553.1	-591.5	-600.8	-636.1	-644.4	-676.6	-684.3	-712.4	-718.8
June	-753.6	-771.8	-776.0	-789.4	-792.4	-800.9	-802.0	-805.1	-805.5	-799.7	-802.4
July	-792.4	-779.8	-776.0	-758.9	-754.0	-731.8	-725.8	-699.4	-692.4	-662.3	-654.3
August	-602.9	-565.5	-556.0	-515.9	-505.8	-463.6	-452.6	-408.5	-397.3	-351.4	-339.6
September	-268.7	-220.2	-208.1	-158.6	-146.2	-96.4	-84.0	-33.7	-21.1	29.5	42.2
October	105.2	155.7	168.1	218.2	230.4	280.0	292.3	340.6	352.7	400.0	411.5
November	479.4	522.9	533.4	574.4	584.4	622.4	631.4	665.9	674.0	704.6	712.1
December	743.8	765.4	769.9	785.6	789.0	799.0	800.9	805.1	805.5	803.6	802.4

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