

Analemmatic Sundial

Latitude: 45.0° N/S

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 1000 mm Semi-Minor Axis (N-S): 707.1 mm
 Sunrise/Sunset Markers: X = ± 464.9 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	707.1	707.1	0.0						
11:55	12:05	21.8	706.9	707.3	21.8	8:25	3:35	806.4	418.1	908.4	856.7
11:50	12:10	43.6	706.4	707.8	43.6	8:20	3:40	819.2	405.6	914.1	872.9
11:45	12:15	65.4	705.6	708.6	65.4	8:15	3:45	831.5	392.8	919.6	888.9
11:40	12:20	87.2	704.4	709.8	87.2	8:10	3:50	843.4	379.9	925.0	904.6
11:35	12:25	108.9	702.9	711.3	108.9	8:05	3:55	854.9	366.8	930.3	920.1
11:30	12:30	130.5	701.1	713.1	130.7	8:00	4:00	866.0	353.6	935.4	935.4
11:25	12:35	152.1	698.9	715.2	152.3	7:55	4:05	876.7	340.1	940.4	950.4
11:20	12:40	173.6	696.4	717.7	174.0	7:50	4:10	887.0	326.5	945.2	965.2
11:15	12:45	195.1	693.5	720.4	195.6	7:45	4:15	896.9	312.7	949.8	979.7
11:10	12:50	216.4	690.3	723.5	217.1	7:40	4:20	906.3	298.8	954.3	994.0
11:05	12:55	237.7	686.8	726.8	238.5	7:35	4:25	915.3	284.8	958.6	1008.0
11:00	1:00	258.8	683.0	730.4	259.9	7:30	4:30	923.9	270.6	962.7	1021.8
10:55	1:05	279.8	678.9	734.3	281.3	7:25	4:35	932.0	256.3	966.6	1035.3
10:50	1:10	300.7	674.4	738.4	302.5	7:20	4:40	939.7	241.8	970.3	1048.6
10:45	1:15	321.4	669.6	742.7	323.6	7:15	4:45	946.9	227.3	973.8	1061.6
10:40	1:20	342.0	664.5	747.3	344.7	7:10	4:50	953.7	212.6	977.1	1074.3
10:35	1:25	362.4	659.0	752.1	365.6	7:05	4:55	960.0	197.9	980.2	1086.7
10:30	1:30	382.7	653.3	757.1	386.5	7:00	5:00	965.9	183.0	983.1	1098.9
10:25	1:35	402.7	647.2	762.3	407.2	6:55	5:05	971.3	168.1	985.8	1110.9
10:20	1:40	422.6	640.9	767.7	427.8	6:50	5:10	976.3	153.0	988.2	1122.6
10:15	1:45	442.3	634.2	773.2	448.3	6:45	5:15	980.8	137.9	990.4	1134.0
10:10	1:50	461.7	627.2	778.8	468.6	6:40	5:20	984.8	122.8	992.4	1145.1
10:05	1:55	481.0	619.9	784.6	488.8	6:35	5:25	988.4	107.6	994.2	1156.0
10:00	2:00	500.0	612.4	790.6	508.9	6:30	5:30	991.4	92.3	995.7	1166.6
9:55	2:05	518.8	604.5	796.6	528.8	6:25	5:35	994.1	77.0	997.0	1176.9
9:50	2:10	537.3	596.4	802.7	548.6	6:20	5:40	996.2	61.6	998.1	1187.0
9:45	2:15	555.6	587.9	808.9	568.2	6:15	5:45	997.9	46.2	998.9	1196.9
9:40	2:20	573.6	579.2	815.2	587.7	6:10	5:50	999.0	30.8	999.5	1206.4
9:35	2:25	591.3	570.2	821.5	606.9	6:05	5:55	999.8	15.4	999.9	1215.7
9:30	2:30	608.8	561.0	827.8	626.1	6:00	6:00	1000.0	0.0	1000.0	1224.7
9:25	2:35	625.9	551.5	834.2	645.0	5:55	6:05	999.8	-15.4	999.9	1233.5
9:20	2:40	642.8	541.7	840.6	663.7	5:50	6:10	999.0	-30.8	999.5	1242.0
9:15	2:45	659.3	531.6	847.0	682.3	5:45	6:15	997.9	-46.2	998.9	1250.3
9:10	2:50	675.6	521.3	853.4	700.7	5:40	6:20	996.2	-61.6	998.1	1258.3
9:05	2:55	691.5	510.8	859.7	718.8	5:35	6:25	994.1	-77.0	997.0	1266.1
9:00	3:00	707.1	500.0	866.0	736.8	5:30	6:30	991.4	-92.3	995.7	1273.6
8:55	3:05	722.4	489.0	872.3	754.6	5:25	6:35	988.4	-107.6	994.2	1280.8
8:50	3:10	737.3	477.7	878.5	772.1	5:20	6:40	984.8	-122.8	992.4	1287.9
8:45	3:15	751.8	466.2	884.7	789.5	5:15	6:45	980.8	-137.9	990.4	1294.6
8:40	3:20	766.0	454.5	890.7	806.6	5:10	6:50	976.3	-153.0	988.2	1301.2
8:35	3:25	779.9	442.6	896.7	823.5	5:05	6:55	971.3	-168.1	985.8	1307.5
8:30	3:30	793.4	430.5	902.6	840.2	5:00	7:00	965.9	-183.0	983.1	1313.5

The Sundial Primer - "Dialling Guide"

created by Carl Sabanski

Analemmatic Sundial

Latitude: 45.0° N/S

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 1000 mm Semi-Minor Axis (N-S): 707.1 mm
 Sunrise/Sunset Markers: $X = \pm 464.9$ mm

Local Time		X	Y	Z	W
4:55	7:05	960.0	-197.9	980.2	1319.3
4:50	7:10	953.7	-212.6	977.1	1325.0
4:45	7:15	946.9	-227.3	973.8	1330.3
4:40	7:20	939.7	-241.8	970.3	1335.5
4:35	7:25	932.0	-256.3	966.6	1340.4
4:30	7:30	923.9	-270.6	962.7	1345.2
4:25	7:35	915.3	-284.8	958.6	1349.7
4:20	7:40	906.3	-298.8	954.3	1354.0
4:15	7:45	896.9	-312.7	949.8	1358.1
4:10	7:50	887.0	-326.5	945.2	1362.0
4:05	7:55	876.7	-340.1	940.4	1365.8
4:00	8:00	866.0	-353.6	935.4	1369.3

Analemmatic Sundial

Latitude: 45.0° N/S

Date Scale

Semi-Major Axis (E-W): 1000 mm Semi-Minor Axis (N-S): 707.1 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-300.0	-294.3	-292.6	-284.8	-282.5	-272.8	-270.2	-258.6	-255.6	-242.5	-239.1
February	-217.0	-201.2	-197.0	-180.2	-176.0	-158.4	-153.9	-135.8	-131.2	-112.5	-107.7
March	-93.5	-74.3	-69.5	-50.1	-45.2	-25.7	-20.9	-1.2	3.6	23.1	27.9
April	56.9	75.9	80.7	99.4	104.0	122.4	126.8	144.8	149.1	166.4	170.5
May	191.1	206.8	210.5	225.1	228.7	242.1	245.3	257.5	260.4	271.1	273.6
June	286.8	293.8	295.4	300.4	301.6	304.8	305.3	306.4	306.6	304.4	305.4
July	301.6	296.8	295.4	288.9	287.0	278.5	276.3	266.2	263.5	252.1	249.0
August	229.5	215.2	211.6	196.4	192.5	176.4	172.2	155.5	151.2	133.7	129.3
September	102.3	83.8	79.2	60.4	55.7	36.7	32.0	12.8	8.0	-11.2	-16.0
October	-40.0	-59.3	-64.0	-83.1	-87.7	-106.6	-111.2	-129.7	-134.2	-152.2	-156.6
November	-182.5	-199.0	-203.0	-218.6	-222.4	-236.9	-240.3	-253.5	-256.5	-268.2	-271.0
December	-283.1	-291.3	-293.0	-299.0	-300.3	-304.1	-304.8	-306.4	-306.6	-305.8	-305.4

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	300.0	294.3	292.6	284.8	282.5	272.8	270.2	258.6	255.6	242.5	239.1
February	217.0	201.2	197.0	180.2	176.0	158.4	153.9	135.8	131.2	112.5	107.7
March	93.5	74.3	69.5	50.1	45.2	25.7	20.9	1.2	-3.6	-23.1	-27.9
April	-56.9	-75.9	-80.7	-99.4	-104.0	-122.4	-126.8	-144.8	-149.1	-166.4	-170.5
May	-191.1	-206.8	-210.5	-225.1	-228.7	-242.1	-245.3	-257.5	-260.4	-271.1	-273.6
June	-286.8	-293.8	-295.4	-300.4	-301.6	-304.8	-305.3	-306.4	-306.6	-304.4	-305.4
July	-301.6	-296.8	-295.4	-288.9	-287.0	-278.5	-276.3	-266.2	-263.5	-252.1	-249.0
August	-229.5	-215.2	-211.6	-196.4	-192.5	-176.4	-172.2	-155.5	-151.2	-133.7	-129.3
September	-102.3	-83.8	-79.2	-60.4	-55.7	-36.7	-32.0	-12.8	-8.0	11.2	16.0
October	40.0	59.3	64.0	83.1	87.7	106.6	111.2	129.7	134.2	152.2	156.6
November	182.5	199.0	203.0	218.6	222.4	236.9	240.3	253.5	256.5	268.2	271.0
December	283.1	291.3	293.0	299.0	300.3	304.1	304.8	306.4	306.6	305.8	305.4

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 | 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: 45.0° N/S

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 1500 mm Semi-Minor Axis (N-S): 1060.7 mm
 Sunrise/Sunset Markers: X = ± 697.4 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1060.7	1060.7	0.0						
11:55	12:05	32.7	1060.4	1060.9	32.7	8:25	3:35	1209.7	627.2	1362.6	1285.0
11:50	12:10	65.4	1059.7	1061.7	65.4	8:20	3:40	1228.7	608.4	1371.1	1309.3
11:45	12:15	98.1	1058.4	1062.9	98.1	8:15	3:45	1247.2	589.3	1379.4	1333.3
11:40	12:20	130.7	1056.6	1064.7	130.8	8:10	3:50	1265.1	569.9	1387.5	1356.9
11:35	12:25	163.3	1054.4	1066.9	163.4	8:05	3:55	1282.4	550.2	1395.4	1380.2
11:30	12:30	195.8	1051.6	1069.7	196.0	8:00	4:00	1299.0	530.3	1403.1	1403.1
11:25	12:35	228.2	1048.3	1072.9	228.5	7:55	4:05	1315.1	510.2	1410.6	1425.7
11:20	12:40	260.5	1044.5	1076.5	261.0	7:50	4:10	1330.5	489.8	1417.8	1447.8
11:15	12:45	292.6	1040.3	1080.7	293.3	7:45	4:15	1345.3	469.1	1424.8	1469.6
11:10	12:50	324.7	1035.5	1085.2	325.6	7:40	4:20	1359.5	448.3	1431.5	1491.0
11:05	12:55	356.5	1030.3	1090.2	357.8	7:35	4:25	1373.0	427.2	1437.9	1512.1
11:00	1:00	388.2	1024.5	1095.6	389.9	7:30	4:30	1385.8	405.9	1444.0	1532.7
10:55	1:05	419.7	1018.3	1101.4	421.9	7:25	4:35	1398.0	384.4	1449.9	1553.0
10:50	1:10	451.1	1011.6	1107.6	453.7	7:20	4:40	1409.5	362.8	1455.5	1572.8
10:45	1:15	482.2	1004.4	1114.1	485.4	7:15	4:45	1420.4	340.9	1460.7	1592.3
10:40	1:20	513.0	996.7	1121.0	517.0	7:10	4:50	1430.6	318.9	1465.7	1611.4
10:35	1:25	543.7	988.5	1128.2	548.4	7:05	4:55	1440.1	296.8	1470.3	1630.1
10:30	1:30	574.0	979.9	1135.7	579.7	7:00	5:00	1448.9	274.5	1474.7	1648.4
10:25	1:35	604.1	970.8	1143.5	610.8	6:55	5:05	1457.0	252.1	1478.7	1666.3
10:20	1:40	633.9	961.3	1151.5	641.7	6:50	5:10	1464.4	229.6	1482.3	1683.8
10:15	1:45	663.4	951.3	1159.8	672.4	6:45	5:15	1471.2	206.9	1485.7	1700.9
10:10	1:50	692.6	940.8	1168.3	702.9	6:40	5:20	1477.2	184.2	1488.6	1717.7
10:05	1:55	721.5	929.9	1177.0	733.2	6:35	5:25	1482.5	161.4	1491.3	1734.0
10:00	2:00	750.0	918.6	1185.9	763.3	6:30	5:30	1487.2	138.4	1493.6	1749.9
9:55	2:05	778.2	906.8	1194.9	793.2	6:25	5:35	1491.1	115.5	1495.5	1765.4
9:50	2:10	805.9	894.6	1204.1	822.9	6:20	5:40	1494.3	92.4	1497.1	1780.5
9:45	2:15	833.4	881.9	1213.4	852.3	6:15	5:45	1496.8	69.4	1498.4	1795.3
9:40	2:20	860.4	868.8	1222.7	881.5	6:10	5:50	1498.6	46.3	1499.3	1809.6
9:35	2:25	887.0	855.4	1232.2	910.4	6:05	5:55	1499.6	23.1	1499.8	1823.6
9:30	2:30	913.1	841.5	1241.7	939.1	6:00	6:00	1500.0	0.0	1500.0	1837.1
9:25	2:35	938.9	827.2	1251.3	967.5	5:55	6:05	1499.6	-23.1	1499.8	1850.3
9:20	2:40	964.2	812.5	1260.9	995.6	5:50	6:10	1498.6	-46.3	1499.3	1863.1
9:15	2:45	989.0	797.4	1270.5	1023.4	5:45	6:15	1496.8	-69.4	1498.4	1875.5
9:10	2:50	1013.4	782.0	1280.0	1051.0	5:40	6:20	1494.3	-92.4	1497.1	1887.5
9:05	2:55	1037.3	766.2	1289.6	1078.3	5:35	6:25	1491.1	-115.5	1495.5	1899.1
9:00	3:00	1060.7	750.0	1299.0	1105.2	5:30	6:30	1487.2	-138.4	1493.6	1910.4
8:55	3:05	1083.5	733.5	1308.4	1131.9	5:25	6:35	1482.5	-161.4	1491.3	1921.3
8:50	3:10	1105.9	716.6	1317.8	1158.2	5:20	6:40	1477.2	-184.2	1488.6	1931.8
8:45	3:15	1127.8	699.3	1327.0	1184.2	5:15	6:45	1471.2	-206.9	1485.7	1941.9
8:40	3:20	1149.1	681.8	1336.1	1209.9	5:10	6:50	1464.4	-229.6	1482.3	1951.7
8:35	3:25	1169.8	663.9	1345.1	1235.3	5:05	6:55	1457.0	-252.1	1478.7	1961.2
8:30	3:30	1190.0	645.7	1353.9	1260.3	5:00	7:00	1448.9	-274.5	1474.7	1970.3

Analemmatic Sundial

Latitude: 45.0° N/S

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 1500 mm Semi-Minor Axis (N-S): 1060.7 mm
 Sunrise/Sunset Markers: $X = \pm 697.4$ mm

Local Time		X	Y	Z	W
4:55	7:05	1440.1	-296.8	1470.3	1979.0
4:50	7:10	1430.6	-318.9	1465.7	1987.4
4:45	7:15	1420.4	-340.9	1460.7	1995.5
4:40	7:20	1409.5	-362.8	1455.5	2003.2
4:35	7:25	1398.0	-384.4	1449.9	2010.6
4:30	7:30	1385.8	-405.9	1444.0	2017.7
4:25	7:35	1373.0	-427.2	1437.9	2024.5
4:20	7:40	1359.5	-448.3	1431.5	2031.0
4:15	7:45	1345.3	-469.1	1424.8	2037.2
4:10	7:50	1330.5	-489.8	1417.8	2043.1
4:05	7:55	1315.1	-510.2	1410.6	2048.6
4:00	8:00	1299.0	-530.3	1403.1	2054.0

Analemmatic Sundial

Latitude: 45.0° N/S

Date Scale

Semi-Major Axis (E-W): 1500 mm Semi-Minor Axis (N-S): 1060.7 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-450.0	-441.5	-438.9	-427.2	-423.8	-409.3	-405.2	-387.9	-383.3	-363.8	-358.6
February	-325.5	-301.7	-295.5	-270.4	-264.1	-237.7	-230.9	-203.7	-196.8	-168.8	-161.5
March	-140.2	-111.5	-104.2	-75.1	-67.8	-38.5	-31.3	-1.9	5.4	34.6	41.9
April	85.3	113.9	121.0	149.1	156.1	183.6	190.3	217.1	223.7	249.6	255.8
May	286.6	310.2	315.8	337.7	343.0	363.1	367.9	386.3	390.7	406.7	410.3
June	430.3	440.6	443.0	450.7	452.4	457.2	457.9	459.6	459.9	456.6	458.1
July	452.4	445.2	443.0	433.3	430.5	417.8	414.4	399.3	395.3	378.1	373.5
August	344.2	322.9	317.4	294.5	288.8	264.6	258.4	233.2	226.8	200.6	193.9
September	153.4	125.7	118.8	90.6	83.5	55.0	48.0	19.3	12.0	-16.8	-24.1
October	-60.0	-88.9	-96.0	-124.6	-131.5	-159.8	-166.9	-194.5	-201.4	-228.4	-234.9
November	-273.7	-298.5	-304.5	-327.9	-333.6	-355.3	-360.5	-380.2	-384.8	-402.3	-406.5
December	-424.7	-437.0	-439.6	-448.5	-450.4	-456.1	-457.2	-459.6	-459.9	-458.8	-458.1

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	450.0	441.5	438.9	427.2	423.8	409.3	405.2	387.9	383.3	363.8	358.6
February	325.5	301.7	295.5	270.4	264.1	237.7	230.9	203.7	196.8	168.8	161.5
March	140.2	111.5	104.2	75.1	67.8	38.5	31.3	1.9	-5.4	-34.6	-41.9
April	-85.3	-113.9	-121.0	-149.1	-156.1	-183.6	-190.3	-217.1	-223.7	-249.6	-255.8
May	-286.6	-310.2	-315.8	-337.7	-343.0	-363.1	-367.9	-386.3	-390.7	-406.7	-410.3
June	-430.3	-440.6	-443.0	-450.7	-452.4	-457.2	-457.9	-459.6	-459.9	-456.6	-458.1
July	-452.4	-445.2	-443.0	-433.3	-430.5	-417.8	-414.4	-399.3	-395.3	-378.1	-373.5
August	-344.2	-322.9	-317.4	-294.5	-288.8	-264.6	-258.4	-233.2	-226.8	-200.6	-193.9
September	-153.4	-125.7	-118.8	-90.6	-83.5	-55.0	-48.0	-19.3	-12.0	16.8	24.1
October	60.0	88.9	96.0	124.6	131.5	159.8	166.9	194.5	201.4	228.4	234.9
November	273.7	298.5	304.5	327.9	333.6	355.3	360.5	380.2	384.8	402.3	406.5
December	424.7	437.0	439.6	448.5	450.4	456.1	457.2	459.6	459.9	458.8	458.1

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: 45.0° N/S

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 2000 mm Semi-Minor Axis (N-S): 1414.2 mm
 Sunrise/Sunset Markers: X = ± 929.9 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1414.2	1414.2	0.0						
11:55	12:05	43.6	1413.9	1414.6	43.6	8:25	3:35	1612.9	836.2	1816.8	1713.3
11:50	12:10	87.2	1412.9	1415.6	87.2	8:20	3:40	1638.3	811.2	1828.1	1745.8
11:45	12:15	130.8	1411.2	1417.2	130.8	8:15	3:45	1662.9	785.7	1839.2	1777.8
11:40	12:20	174.3	1408.8	1419.6	174.4	8:10	3:50	1686.8	759.9	1850.0	1809.3
11:35	12:25	217.7	1405.8	1422.6	217.9	8:05	3:55	1709.8	733.7	1860.6	1840.3
11:30	12:30	261.1	1402.1	1426.2	261.3	8:00	4:00	1732.1	707.1	1870.8	1870.8
11:25	12:35	304.2	1397.8	1430.5	304.7	7:55	4:05	1753.5	680.2	1880.8	1900.9
11:20	12:40	347.3	1392.7	1435.4	348.0	7:50	4:10	1774.0	653.0	1890.4	1930.4
11:15	12:45	390.2	1387.0	1440.9	391.1	7:45	4:15	1793.7	625.5	1899.7	1959.5
11:10	12:50	432.9	1380.7	1447.0	434.2	7:40	4:20	1812.6	597.7	1908.6	1988.0
11:05	12:55	475.4	1373.7	1453.6	477.1	7:35	4:25	1830.6	569.6	1917.2	2016.1
11:00	1:00	517.6	1366.0	1460.8	519.9	7:30	4:30	1847.8	541.2	1925.4	2043.6
10:55	1:05	559.7	1357.7	1468.5	562.5	7:25	4:35	1864.0	512.6	1933.2	2070.6
10:50	1:10	601.4	1348.8	1476.8	605.0	7:20	4:40	1879.4	483.7	1940.6	2097.1
10:45	1:15	642.9	1339.2	1485.5	647.2	7:15	4:45	1893.9	454.6	1947.7	2123.1
10:40	1:20	684.0	1328.9	1494.6	689.3	7:10	4:50	1907.4	425.3	1954.3	2148.6
10:35	1:25	724.9	1318.1	1504.2	731.2	7:05	4:55	1920.1	395.7	1960.5	2173.5
10:30	1:30	765.4	1306.6	1514.2	772.9	7:00	5:00	1931.9	366.0	1966.2	2197.9
10:25	1:35	805.5	1294.4	1524.6	814.3	6:55	5:05	1942.7	336.1	1971.6	2221.8
10:20	1:40	845.2	1281.7	1535.3	855.6	6:50	5:10	1952.6	306.1	1976.4	2245.1
10:15	1:45	884.6	1268.4	1546.4	896.5	6:45	5:15	1961.6	275.9	1980.9	2267.9
10:10	1:50	923.5	1254.4	1557.7	937.2	6:40	5:20	1969.6	245.6	1984.9	2290.2
10:05	1:55	962.0	1239.9	1569.3	977.6	6:35	5:25	1976.7	215.1	1988.4	2312.0
10:00	2:00	1000.0	1224.7	1581.1	1017.8	6:30	5:30	1982.9	184.6	1991.5	2333.2
9:55	2:05	1037.5	1209.0	1593.2	1057.6	6:25	5:35	1988.1	154.0	1994.1	2353.9
9:50	2:10	1074.6	1192.7	1605.4	1097.2	6:20	5:40	1992.4	123.3	1996.2	2374.1
9:45	2:15	1111.1	1175.9	1617.8	1136.4	6:15	5:45	1995.7	92.5	1997.9	2393.7
9:40	2:20	1147.2	1158.5	1630.3	1175.3	6:10	5:50	1998.1	61.7	1999.0	2412.8
9:35	2:25	1182.6	1140.5	1643.0	1213.9	6:05	5:55	1999.5	30.9	1999.8	2431.4
9:30	2:30	1217.5	1122.0	1655.7	1252.1	6:00	6:00	2000.0	0.0	2000.0	2449.5
9:25	2:35	1251.8	1102.9	1668.4	1290.0	5:55	6:05	1999.5	-30.9	1999.8	2467.0
9:20	2:40	1285.6	1083.4	1681.2	1327.5	5:50	6:10	1998.1	-61.7	1999.0	2484.1
9:15	2:45	1318.7	1063.3	1694.0	1364.6	5:45	6:15	1995.7	-92.5	1997.9	2500.6
9:10	2:50	1351.2	1042.7	1706.7	1401.3	5:40	6:20	1992.4	-123.3	1996.2	2516.6
9:05	2:55	1383.0	1021.6	1719.4	1437.7	5:35	6:25	1988.1	-154.0	1994.1	2532.1
9:00	3:00	1414.2	1000.0	1732.1	1473.6	5:30	6:30	1982.9	-184.6	1991.5	2547.2
8:55	3:05	1444.7	977.9	1744.6	1509.2	5:25	6:35	1976.7	-215.1	1988.4	2561.7
8:50	3:10	1474.6	955.4	1757.0	1544.3	5:20	6:40	1969.6	-245.6	1984.9	2575.7
8:45	3:15	1503.7	932.5	1769.3	1579.0	5:15	6:45	1961.6	-275.9	1980.9	2589.3
8:40	3:20	1532.1	909.0	1781.5	1613.2	5:10	6:50	1952.6	-306.1	1976.4	2602.3
8:35	3:25	1559.8	885.2	1793.4	1647.0	5:05	6:55	1942.7	-336.1	1971.6	2614.9
8:30	3:30	1586.7	860.9	1805.2	1680.4	5:00	7:00	1931.9	-366.0	1966.2	2627.0

Analemmatic Sundial

Latitude: 45.0° N/S

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 2000 mm Semi-Minor Axis (N-S): 1414.2 mm
 Sunrise/Sunset Markers: X = ± 929.9 mm

Local Time		X	Y	Z	W
4:55	7:05	1920.1	-395.7	1960.5	2638.7
4:50	7:10	1907.4	-425.3	1954.3	2649.9
4:45	7:15	1893.9	-454.6	1947.7	2660.7
4:40	7:20	1879.4	-483.7	1940.6	2671.0
4:35	7:25	1864.0	-512.6	1933.2	2680.9
4:30	7:30	1847.8	-541.2	1925.4	2690.3
4:25	7:35	1830.6	-569.6	1917.2	2699.4
4:20	7:40	1812.6	-597.7	1908.6	2708.0
4:15	7:45	1793.7	-625.5	1899.7	2716.2
4:10	7:50	1774.0	-653.0	1890.4	2724.1
4:05	7:55	1753.5	-680.2	1880.8	2731.5
4:00	8:00	1732.1	-707.1	1870.8	2738.6

Analematic Sundial

Latitude: 45.0° N/S

Date Scale

Semi-Major Axis (E-W): 2000 mm Semi-Minor Axis (N-S): 1414.2 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-600.0	-588.7	-585.2	-569.7	-565.1	-545.7	-540.3	-517.2	-511.1	-485.0	-478.1
February	-434.0	-402.3	-394.1	-360.5	-352.1	-316.9	-307.8	-271.6	-262.4	-225.0	-215.4
March	-186.9	-148.6	-138.9	-100.1	-90.5	-51.4	-41.7	-2.5	7.2	46.2	55.8
April	113.8	151.9	161.4	198.8	208.1	244.8	253.7	289.5	298.3	332.7	341.1
May	382.1	413.5	421.1	450.2	457.3	484.2	490.5	515.0	520.9	542.3	547.1
June	573.7	587.5	590.7	600.9	603.2	609.6	610.5	612.9	613.2	608.8	610.8
July	603.2	593.6	590.7	577.7	574.0	557.1	552.5	532.4	527.1	504.1	498.0
August	459.0	430.5	423.2	392.7	385.0	352.9	344.5	310.9	302.4	267.5	258.5
September	204.5	167.6	158.4	120.7	111.3	73.4	64.0	25.7	16.0	-22.5	-32.1
October	-80.1	-118.5	-128.0	-166.1	-175.4	-213.1	-222.5	-259.3	-268.5	-304.5	-313.3
November	-365.0	-398.1	-406.1	-437.2	-444.8	-473.7	-480.6	-506.9	-513.1	-536.4	-542.0
December	-566.2	-582.6	-586.1	-598.0	-600.6	-608.2	-609.6	-612.9	-613.2	-611.7	-610.8

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	600.0	588.7	585.2	569.7	565.1	545.7	540.3	517.2	511.1	485.0	478.1
February	434.0	402.3	394.1	360.5	352.1	316.9	307.8	271.6	262.4	225.0	215.4
March	186.9	148.6	138.9	100.1	90.5	51.4	41.7	2.5	-7.2	-46.2	-55.8
April	-113.8	-151.9	-161.4	-198.8	-208.1	-244.8	-253.7	-289.5	-298.3	-332.7	-341.1
May	-382.1	-413.5	-421.1	-450.2	-457.3	-484.2	-490.5	-515.0	-520.9	-542.3	-547.1
June	-573.7	-587.5	-590.7	-600.9	-603.2	-609.6	-610.5	-612.9	-613.2	-608.8	-610.8
July	-603.2	-593.6	-590.7	-577.7	-574.0	-557.1	-552.5	-532.4	-527.1	-504.1	-498.0
August	-459.0	-430.5	-423.2	-392.7	-385.0	-352.9	-344.5	-310.9	-302.4	-267.5	-258.5
September	-204.5	-167.6	-158.4	-120.7	-111.3	-73.4	-64.0	-25.7	-16.0	22.5	32.1
October	80.1	118.5	128.0	166.1	175.4	213.1	222.5	259.3	268.5	304.5	313.3
November	365.0	398.1	406.1	437.2	444.8	473.7	480.6	506.9	513.1	536.4	542.0
December	566.2	582.6	586.1	598.0	600.6	608.2	609.6	612.9	613.2	611.7	610.8

Southern Hemisphere

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

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

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

Analemmatic Sundial

Latitude: 45.0° N/S

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 1767.8 mm
 Sunrise/Sunset Markers: X = ± 1162.3 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1767.8	1767.8	0.0						
11:55	12:05	54.5	1767.3	1768.2	54.5	8:25	3:35	2016.1	1045.3	2271.0	2141.7
11:50	12:10	109.0	1766.1	1769.4	109.1	8:20	3:40	2047.9	1013.9	2285.1	2182.2
11:45	12:15	163.5	1764.0	1771.5	163.6	8:15	3:45	2078.7	982.1	2299.0	2222.2
11:40	12:20	217.9	1761.0	1774.5	218.0	8:10	3:50	2108.5	949.8	2312.5	2261.6
11:35	12:25	272.2	1757.3	1778.2	272.4	8:05	3:55	2137.3	917.1	2325.7	2300.4
11:30	12:30	326.3	1752.6	1782.8	326.7	8:00	4:00	2165.1	883.9	2338.5	2338.5
11:25	12:35	380.3	1747.2	1788.1	380.9	7:55	4:05	2191.8	850.3	2351.0	2376.1
11:20	12:40	434.1	1740.9	1794.2	435.0	7:50	4:10	2217.5	816.3	2363.0	2413.0
11:15	12:45	487.7	1733.8	1801.1	488.9	7:45	4:15	2242.2	781.9	2374.6	2449.4
11:10	12:50	541.1	1725.9	1808.7	542.7	7:40	4:20	2265.8	747.1	2385.8	2485.1
11:05	12:55	594.2	1717.1	1817.0	596.4	7:35	4:25	2288.3	712.0	2396.5	2520.1
11:00	1:00	647.0	1707.5	1826.0	649.8	7:30	4:30	2309.7	676.5	2406.7	2554.5
10:55	1:05	699.6	1697.1	1835.7	703.1	7:25	4:35	2330.0	640.7	2416.5	2588.3
10:50	1:10	751.8	1685.9	1846.0	756.2	7:20	4:40	2349.2	604.6	2425.8	2621.4
10:45	1:15	803.6	1674.0	1856.8	809.1	7:15	4:45	2367.3	568.2	2434.6	2653.9
10:40	1:20	855.1	1661.2	1868.3	861.7	7:10	4:50	2384.3	531.6	2442.8	2685.7
10:35	1:25	906.1	1647.6	1880.3	914.0	7:05	4:55	2400.1	494.7	2450.6	2716.9
10:30	1:30	956.7	1633.2	1892.8	966.1	7:00	5:00	2414.8	457.5	2457.8	2747.4
10:25	1:35	1006.9	1618.1	1905.8	1017.9	6:55	5:05	2428.4	420.2	2464.4	2777.2
10:20	1:40	1056.5	1602.1	1919.2	1069.4	6:50	5:10	2440.7	382.6	2470.5	2806.4
10:15	1:45	1105.7	1585.5	1933.0	1120.6	6:45	5:15	2452.0	344.9	2476.1	2834.9
10:10	1:50	1154.4	1568.0	1947.1	1171.5	6:40	5:20	2462.0	307.0	2481.1	2862.8
10:05	1:55	1202.5	1549.8	1961.6	1222.1	6:35	5:25	2470.9	268.9	2485.5	2890.0
10:00	2:00	1250.0	1530.9	1976.4	1272.2	6:30	5:30	2478.6	230.7	2489.3	2916.5
9:55	2:05	1296.9	1511.3	1991.5	1322.1	6:25	5:35	2485.1	192.5	2492.6	2942.4
9:50	2:10	1343.2	1490.9	2006.8	1371.5	6:20	5:40	2490.5	154.1	2495.2	2967.6
9:45	2:15	1388.9	1469.8	2022.3	1420.5	6:15	5:45	2494.6	115.6	2497.3	2992.1
9:40	2:20	1433.9	1448.1	2037.9	1469.1	6:10	5:50	2497.6	77.1	2498.8	3016.0
9:35	2:25	1478.3	1425.6	2053.7	1517.4	6:05	5:55	2499.4	38.6	2499.7	3039.3
9:30	2:30	1521.9	1402.5	2069.6	1565.1	6:00	6:00	2500.0	0.0	2500.0	3061.9
9:25	2:35	1564.8	1378.7	2085.5	1612.5	5:55	6:05	2499.4	-38.6	2499.7	3083.8
9:20	2:40	1607.0	1354.2	2101.5	1659.3	5:50	6:10	2497.6	-77.1	2498.8	3105.1
9:15	2:45	1648.4	1329.1	2117.4	1705.7	5:45	6:15	2494.6	-115.6	2497.3	3125.8
9:10	2:50	1689.0	1303.3	2133.4	1751.7	5:40	6:20	2490.5	-154.1	2495.2	3145.8
9:05	2:55	1728.8	1277.0	2149.3	1797.1	5:35	6:25	2485.1	-192.5	2492.6	3165.2
9:00	3:00	1767.8	1250.0	2165.1	1842.0	5:30	6:30	2478.6	-230.7	2489.3	3184.0
8:55	3:05	1805.9	1222.4	2180.7	1886.5	5:25	6:35	2470.9	-268.9	2485.5	3202.1
8:50	3:10	1843.2	1194.3	2196.3	1930.3	5:20	6:40	2462.0	-307.0	2481.1	3219.6
8:45	3:15	1879.6	1165.6	2211.7	1973.7	5:15	6:45	2452.0	-344.9	2476.1	3236.6
8:40	3:20	1915.1	1136.3	2226.8	2016.5	5:10	6:50	2440.7	-382.6	2470.5	3252.9
8:35	3:25	1949.7	1106.5	2241.8	2058.8	5:05	6:55	2428.4	-420.2	2464.4	3268.6
8:30	3:30	1983.4	1076.1	2256.5	2100.5	5:00	7:00	2414.8	-457.5	2457.8	3283.8

Analemmatic Sundial**Latitude: 45.0° N/S**

Earliest Sunrise: 4:11 a.m. Latest Sunset: 7:49 p.m.
 Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 1767.8 mm
 Sunrise/Sunset Markers: $X = \pm 1162.3$ mm

Local Time		X	Y	Z	W
4:55	7:05	2400.1	-494.7	2450.6	3298.4
4:50	7:10	2384.3	-531.6	2442.8	3312.4
4:45	7:15	2367.3	-568.2	2434.6	3325.8
4:40	7:20	2349.2	-604.6	2425.8	3338.7
4:35	7:25	2330.0	-640.7	2416.5	3351.1
4:30	7:30	2309.7	-676.5	2406.7	3362.9
4:25	7:35	2288.3	-712.0	2396.5	3374.2
4:20	7:40	2265.8	-747.1	2385.8	3385.0
4:15	7:45	2242.2	-781.9	2374.6	3395.3
4:10	7:50	2217.5	-816.3	2363.0	3405.1
4:05	7:55	2191.8	-850.3	2351.0	3414.4
4:00	8:00	2165.1	-883.9	2338.5	3423.3

Analemmatic Sundial

Latitude: 45.0° N/S

Date Scale

Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 1767.8 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-750.0	-735.9	-731.5	-712.1	-706.3	-682.1	-675.4	-646.6	-638.9	-606.3	-597.7
February	-542.5	-502.9	-492.6	-450.6	-440.1	-396.1	-384.8	-339.5	-328.0	-281.3	-269.2
March	-233.7	-185.8	-173.6	-125.2	-113.1	-64.2	-52.2	-3.1	8.9	57.7	69.8
April	142.2	189.9	201.7	248.4	260.1	306.0	317.1	361.9	372.8	415.9	426.4
May	477.6	516.9	526.3	562.8	571.7	605.2	613.2	643.8	651.1	677.9	683.9
June	717.1	734.4	738.4	751.1	754.0	762.1	763.2	766.1	766.4	761.0	763.5
July	754.0	742.0	738.4	722.1	717.5	696.3	690.6	665.5	658.8	630.2	622.5
August	573.7	538.1	529.0	490.9	481.3	441.1	430.6	388.7	378.0	334.3	323.2
September	255.7	209.5	198.0	150.9	139.1	91.7	80.0	32.1	20.1	-28.1	-40.1
October	-100.1	-148.1	-159.9	-207.7	-219.2	-266.4	-278.1	-324.1	-335.6	-380.6	-391.6
November	-456.2	-497.6	-507.6	-546.5	-556.0	-592.2	-600.8	-633.6	-641.3	-670.5	-677.5
December	-707.8	-728.3	-732.6	-747.5	-750.7	-760.2	-762.1	-766.1	-766.4	-764.6	-763.5

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	750.0	735.9	731.5	712.1	706.3	682.1	675.4	646.6	638.9	606.3	597.7
February	542.5	502.9	492.6	450.6	440.1	396.1	384.8	339.5	328.0	281.3	269.2
March	233.7	185.8	173.6	125.2	113.1	64.2	52.2	3.1	-8.9	-57.7	-69.8
April	-142.2	-189.9	-201.7	-248.4	-260.1	-306.0	-317.1	-361.9	-372.8	-415.9	-426.4
May	-477.6	-516.9	-526.3	-562.8	-571.7	-605.2	-613.2	-643.8	-651.1	-677.9	-683.9
June	-717.1	-734.4	-738.4	-751.1	-754.0	-762.1	-763.2	-766.1	-766.4	-761.0	-763.5
July	-754.0	-742.0	-738.4	-722.1	-717.5	-696.3	-690.6	-665.5	-658.8	-630.2	-622.5
August	-573.7	-538.1	-529.0	-490.9	-481.3	-441.1	-430.6	-388.7	-378.0	-334.3	-323.2
September	-255.7	-209.5	-198.0	-150.9	-139.1	-91.7	-80.0	-32.1	-20.1	28.1	40.1
October	100.1	148.1	159.9	207.7	219.2	266.4	278.1	324.1	335.6	380.6	391.6
November	456.2	497.6	507.6	546.5	556.0	592.2	600.8	633.6	641.3	670.5	677.5
December	707.8	728.3	732.6	747.5	750.7	760.2	762.1	766.1	766.4	764.6	763.5

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 |