

# The Sundial Primer - "Dialling Guide"

created by Carl Sabanski

## Analemmatic Sundial

Latitude: 63.0° N/S

Earliest Sunrise: 1:51 a.m.    Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 891.0 mm  
 Sunrise/Sunset Markers: X = ± 142.6 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	891.0	891.0	0.0						
11:55	12:05	21.8	890.8	891.1	21.8	8:25	3:35	806.4	526.9	963.3	884.8
11:50	12:10	43.6	890.2	891.2	43.6	8:20	3:40	819.2	511.1	965.5	903.0
11:45	12:15	65.4	889.1	891.5	65.4	8:15	3:45	831.5	495.0	967.7	921.0
11:40	12:20	87.2	887.6	891.9	87.2	8:10	3:50	843.4	478.7	969.8	938.8
11:35	12:25	108.9	885.7	892.4	109.0	8:05	3:55	854.9	462.2	971.9	956.4
11:30	12:30	130.5	883.4	893.0	130.7	8:00	4:00	866.0	445.5	973.9	973.9
11:25	12:35	152.1	880.6	893.7	152.5	7:55	4:05	876.7	428.6	975.9	991.2
11:20	12:40	173.6	877.5	894.5	174.2	7:50	4:10	887.0	411.4	977.8	1008.4
11:15	12:45	195.1	873.9	895.4	195.8	7:45	4:15	896.9	394.1	979.6	1025.3
11:10	12:50	216.4	869.9	896.4	217.5	7:40	4:20	906.3	376.6	981.4	1042.1
11:05	12:55	237.7	865.5	897.5	239.1	7:35	4:25	915.3	358.8	983.1	1058.8
11:00	1:00	258.8	860.6	898.7	260.6	7:30	4:30	923.9	341.0	984.8	1075.2
10:55	1:05	279.8	855.4	900.0	282.1	7:25	4:35	932.0	322.9	986.4	1091.5
10:50	1:10	300.7	849.8	901.4	303.5	7:20	4:40	939.7	304.7	987.9	1107.6
10:45	1:15	321.4	843.7	902.9	324.9	7:15	4:45	946.9	286.4	989.3	1123.5
10:40	1:20	342.0	837.3	904.4	346.2	7:10	4:50	953.7	267.9	990.6	1139.2
10:35	1:25	362.4	830.4	906.1	367.5	7:05	4:55	960.0	249.3	991.9	1154.7
10:30	1:30	382.7	823.2	907.8	388.6	7:00	5:00	965.9	230.6	993.1	1170.1
10:25	1:35	402.7	815.5	909.6	409.8	6:55	5:05	971.3	211.8	994.2	1185.3
10:20	1:40	422.6	807.5	911.4	430.8	6:50	5:10	976.3	192.8	995.2	1200.2
10:15	1:45	442.3	799.1	913.4	451.7	6:45	5:15	980.8	173.8	996.1	1215.0
10:10	1:50	461.7	790.3	915.3	472.6	6:40	5:20	984.8	154.7	996.9	1229.6
10:05	1:55	481.0	781.2	917.4	493.4	6:35	5:25	988.4	135.5	997.6	1244.0
10:00	2:00	500.0	771.6	919.5	514.1	6:30	5:30	991.4	116.3	998.2	1258.2
9:55	2:05	518.8	761.7	921.6	534.6	6:25	5:35	994.1	97.0	998.8	1272.2
9:50	2:10	537.3	751.5	923.8	555.1	6:20	5:40	996.2	77.7	999.2	1286.1
9:45	2:15	555.6	740.8	926.0	575.5	6:15	5:45	997.9	58.3	999.6	1299.7
9:40	2:20	573.6	729.9	928.3	595.8	6:10	5:50	999.0	38.9	999.8	1313.1
9:35	2:25	591.3	718.5	930.6	615.9	6:05	5:55	999.8	19.4	1000.0	1326.3
9:30	2:30	608.8	706.9	932.9	636.0	6:00	6:00	1000.0	0.0	1000.0	1339.4
9:25	2:35	625.9	694.9	935.2	655.9	5:55	6:05	999.8	-19.4	1000.0	1352.2
9:20	2:40	642.8	682.6	937.6	675.7	5:50	6:10	999.0	-38.9	999.8	1364.8
9:15	2:45	659.3	669.9	939.9	695.4	5:45	6:15	997.9	-58.3	999.6	1377.3
9:10	2:50	675.6	656.9	942.3	715.0	5:40	6:20	996.2	-77.7	999.2	1389.5
9:05	2:55	691.5	643.6	944.7	734.4	5:35	6:25	994.1	-97.0	998.8	1401.5
9:00	3:00	707.1	630.0	947.1	753.7	5:30	6:30	991.4	-116.3	998.2	1413.4
8:55	3:05	722.4	616.1	949.4	772.9	5:25	6:35	988.4	-135.5	997.6	1425.0
8:50	3:10	737.3	602.0	951.8	791.9	5:20	6:40	984.8	-154.7	996.9	1436.5
8:45	3:15	751.8	587.5	954.1	810.8	5:15	6:45	980.8	-173.8	996.1	1447.7
8:40	3:20	766.0	572.7	956.5	829.5	5:10	6:50	976.3	-192.8	995.2	1458.7
8:35	3:25	779.9	557.7	958.8	848.1	5:05	6:55	971.3	-211.8	994.2	1469.6
8:30	3:30	793.4	542.4	961.1	866.6	5:00	7:00	965.9	-230.6	993.1	1480.2

## Analemmatic Sundial

Latitude: 63.0° N/S

Earliest Sunrise: 1:51 a.m.    Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 891.0 mm  
 Sunrise/Sunset Markers: X = ± 142.6 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
4:55	7:05	960.0	-249.3	991.9	1490.7	2:55	9:05	691.5	-643.6	944.7	1683.2
4:50	7:10	953.7	-267.9	990.6	1500.9	2:50	9:10	675.6	-656.9	942.3	1688.9
4:45	7:15	946.9	-286.4	989.3	1511.0	2:45	9:15	659.3	-669.9	939.9	1694.4
4:40	7:20	939.7	-304.7	987.9	1520.8	2:40	9:20	642.8	-682.6	937.6	1699.8
4:35	7:25	932.0	-322.9	986.4	1530.5	2:35	9:25	625.9	-694.9	935.2	1704.9
4:30	7:30	923.9	-341.0	984.8	1539.9	2:30	9:30	608.8	-706.9	932.9	1709.9
4:25	7:35	915.3	-358.8	983.1	1549.2	2:25	9:35	591.3	-718.5	930.6	1714.7
4:20	7:40	906.3	-376.6	981.4	1558.2	2:20	9:40	573.6	-729.9	928.3	1719.4
4:15	7:45	896.9	-394.1	979.6	1567.1	2:15	9:45	555.6	-740.8	926.0	1723.8
4:10	7:50	887.0	-411.4	977.8	1575.8	2:10	9:50	537.3	-751.5	923.8	1728.1
4:05	7:55	876.7	-428.6	975.9	1584.3	2:05	9:55	518.8	-761.7	921.6	1732.2
4:00	8:00	866.0	-445.5	973.9	1592.6	2:00	10:00	500.0	-771.6	919.5	1736.2
3:55	8:05	854.9	-462.2	971.9	1600.7	1:55	10:05	481.0	-781.2	917.4	1740.0
3:50	8:10	843.4	-478.7	969.8	1608.6	1:50	10:10	461.7	-790.3	915.3	1743.6
3:45	8:15	831.5	-495.0	967.7	1616.3	1:45	10:15	442.3	-799.1	913.4	1747.0
3:40	8:20	819.2	-511.1	965.5	1623.8						
3:35	8:25	806.4	-526.9	963.3	1631.2						
3:30	8:30	793.4	-542.4	961.1	1638.3						
3:25	8:35	779.9	-557.7	958.8	1645.3						
3:20	8:40	766.0	-572.7	956.5	1652.1						
3:15	8:45	751.8	-587.5	954.1	1658.7						
3:10	8:50	737.3	-602.0	951.8	1665.1						
3:05	8:55	722.4	-616.1	949.4	1671.3						
3:00	9:00	707.1	-630.0	947.1	1677.4						

## Analematic Sundial

Latitude: 63.0° N/S

## Date Scale

Semi-Major Axis (E-W): 1000 mm    Semi-Minor Axis (N-S): 891.0 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-192.6	-189.0	-187.9	-182.9	-181.4	-175.2	-173.5	-166.0	-164.1	-155.7	-153.5
February	-139.3	-129.2	-126.5	-115.7	-113.0	-101.7	-98.8	-87.2	-84.2	-72.2	-69.1
March	-60.0	-47.7	-44.6	-32.1	-29.0	-16.5	-13.4	-0.8	2.3	14.8	17.9
April	36.5	48.8	51.8	63.8	66.8	78.6	81.4	92.9	95.8	106.8	109.5
May	122.7	132.8	135.2	144.5	146.8	155.4	157.5	165.3	167.2	174.1	175.6
June	184.2	188.6	189.6	192.9	193.6	195.7	196.0	196.7	196.8	195.4	196.1
July	193.6	190.6	189.6	185.5	184.3	178.8	177.4	170.9	169.2	161.8	159.9
August	147.3	138.2	135.9	126.1	123.6	113.3	110.6	99.8	97.1	85.9	83.0
September	65.7	53.8	50.8	38.8	35.7	23.6	20.5	8.2	5.2	-7.2	-10.3
October	-25.7	-38.0	-41.1	-53.3	-56.3	-68.4	-71.4	-83.2	-86.2	-97.7	-100.6
November	-117.2	-127.8	-130.4	-140.4	-142.8	-152.1	-154.3	-162.7	-164.7	-172.2	-174.0
December	-181.8	-187.0	-188.1	-192.0	-192.8	-195.2	-195.7	-196.7	-196.8	-196.4	-196.1

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	192.6	189.0	187.9	182.9	181.4	175.2	173.5	166.0	164.1	155.7	153.5
February	139.3	129.2	126.5	115.7	113.0	101.7	98.8	87.2	84.2	72.2	69.1
March	60.0	47.7	44.6	32.1	29.0	16.5	13.4	0.8	-2.3	-14.8	-17.9
April	-36.5	-48.8	-51.8	-63.8	-66.8	-78.6	-81.4	-92.9	-95.8	-106.8	-109.5
May	-122.7	-132.8	-135.2	-144.5	-146.8	-155.4	-157.5	-165.3	-167.2	-174.1	-175.6
June	-184.2	-188.6	-189.6	-192.9	-193.6	-195.7	-196.0	-196.7	-196.8	-195.4	-196.1
July	-193.6	-190.6	-189.6	-185.5	-184.3	-178.8	-177.4	-170.9	-169.2	-161.8	-159.9
August	-147.3	-138.2	-135.9	-126.1	-123.6	-113.3	-110.6	-99.8	-97.1	-85.9	-83.0
September	-65.7	-53.8	-50.8	-38.8	-35.7	-23.6	-20.5	-8.2	-5.2	7.2	10.3
October	25.7	38.0	41.1	53.3	56.3	68.4	71.4	83.2	86.2	97.7	100.6
November	117.2	127.8	130.4	140.4	142.8	152.1	154.3	162.7	164.7	172.2	174.0
December	181.8	187.0	188.1	192.0	192.8	195.2	195.7	196.7	196.8	196.4	196.1

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: 63.0° N/S

Earliest Sunrise: 1:51 a.m.    Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1336.5 mm  
 Sunrise/Sunset Markers: X = ± 213.9 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1336.5	1336.5	0.0						
11:55	12:05	32.7	1336.2	1336.6	32.7	8:25	3:35	1209.7	790.3	1444.9	1327.3
11:50	12:10	65.4	1335.2	1336.8	65.4	8:20	3:40	1228.7	766.6	1448.3	1354.5
11:45	12:15	98.1	1333.6	1337.3	98.1	8:15	3:45	1247.2	742.5	1451.5	1381.4
11:40	12:20	130.7	1331.4	1337.8	130.8	8:10	3:50	1265.1	718.1	1454.7	1408.1
11:35	12:25	163.3	1328.6	1338.6	163.5	8:05	3:55	1282.4	693.3	1457.8	1434.6
11:30	12:30	195.8	1325.1	1339.5	196.1	8:00	4:00	1299.0	668.3	1460.8	1460.8
11:25	12:35	228.2	1321.0	1340.5	228.7	7:55	4:05	1315.1	642.8	1463.8	1486.8
11:20	12:40	260.5	1316.2	1341.7	261.3	7:50	4:10	1330.5	617.1	1466.7	1512.5
11:15	12:45	292.6	1310.8	1343.1	293.8	7:45	4:15	1345.3	591.1	1469.4	1538.0
11:10	12:50	324.7	1304.8	1344.6	326.2	7:40	4:20	1359.5	564.8	1472.1	1563.2
11:05	12:55	356.5	1298.2	1346.3	358.6	7:35	4:25	1373.0	538.3	1474.7	1588.1
11:00	1:00	388.2	1291.0	1348.1	390.9	7:30	4:30	1385.8	511.5	1477.2	1612.8
10:55	1:05	419.7	1283.1	1350.0	423.1	7:25	4:35	1398.0	484.4	1479.6	1637.2
10:50	1:10	451.1	1274.7	1352.1	455.3	7:20	4:40	1409.5	457.1	1481.8	1661.4
10:45	1:15	482.2	1265.6	1354.3	487.3	7:15	4:45	1420.4	429.6	1483.9	1685.2
10:40	1:20	513.0	1255.9	1356.7	519.3	7:10	4:50	1430.6	401.9	1486.0	1708.8
10:35	1:25	543.7	1245.6	1359.1	551.2	7:05	4:55	1440.1	374.0	1487.8	1732.1
10:30	1:30	574.0	1234.8	1361.7	583.0	7:00	5:00	1448.9	345.9	1489.6	1755.2
10:25	1:35	604.1	1223.3	1364.4	614.6	6:55	5:05	1457.0	317.7	1491.2	1777.9
10:20	1:40	633.9	1211.3	1367.1	646.2	6:50	5:10	1464.4	289.3	1492.7	1800.4
10:15	1:45	663.4	1198.7	1370.0	677.6	6:45	5:15	1471.2	260.7	1494.1	1822.5
10:10	1:50	692.6	1185.5	1373.0	708.9	6:40	5:20	1477.2	232.1	1495.3	1844.4
10:05	1:55	721.5	1171.8	1376.1	740.1	6:35	5:25	1482.5	203.3	1496.4	1866.0
10:00	2:00	750.0	1157.5	1379.2	771.1	6:30	5:30	1487.2	174.4	1497.4	1887.3
9:55	2:05	778.2	1142.6	1382.4	802.0	6:25	5:35	1491.1	145.5	1498.2	1908.4
9:50	2:10	805.9	1127.2	1385.7	832.7	6:20	5:40	1494.3	116.5	1498.8	1929.1
9:45	2:15	833.4	1111.3	1389.0	863.3	6:15	5:45	1496.8	87.4	1499.3	1949.5
9:40	2:20	860.4	1094.8	1392.4	893.7	6:10	5:50	1498.6	58.3	1499.7	1969.7
9:35	2:25	887.0	1077.8	1395.9	923.9	6:05	5:55	1499.6	29.2	1499.9	1989.5
9:30	2:30	913.1	1060.3	1399.3	954.0	6:00	6:00	1500.0	0.0	1500.0	2009.0
9:25	2:35	938.9	1042.3	1402.8	983.9	5:55	6:05	1499.6	-29.2	1499.9	2028.3
9:20	2:40	964.2	1023.8	1406.4	1013.6	5:50	6:10	1498.6	-58.3	1499.7	2047.2
9:15	2:45	989.0	1004.8	1409.9	1043.2	5:45	6:15	1496.8	-87.4	1499.3	2065.9
9:10	2:50	1013.4	985.4	1413.5	1072.5	5:40	6:20	1494.3	-116.5	1498.8	2084.3
9:05	2:55	1037.3	965.4	1417.0	1101.6	5:35	6:25	1491.1	-145.5	1498.2	2102.3
9:00	3:00	1060.7	945.1	1420.6	1130.6	5:30	6:30	1487.2	-174.4	1497.4	2120.1
8:55	3:05	1083.5	924.2	1424.2	1159.3	5:25	6:35	1482.5	-203.3	1496.4	2137.5
8:50	3:10	1105.9	902.9	1427.7	1187.9	5:20	6:40	1477.2	-232.1	1495.3	2154.7
8:45	3:15	1127.8	881.2	1431.2	1216.2	5:15	6:45	1471.2	-260.7	1494.1	2171.5
8:40	3:20	1149.1	859.1	1434.7	1244.3	5:10	6:50	1464.4	-289.3	1492.7	2188.1
8:35	3:25	1169.8	836.6	1438.2	1272.2	5:05	6:55	1457.0	-317.7	1491.2	2204.4
8:30	3:30	1190.0	813.6	1441.6	1299.8	5:00	7:00	1448.9	-345.9	1489.6	2220.3

## Analemmatic Sundial

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Earliest Sunrise: 1:51 a.m.    Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1336.5 mm  
 Sunrise/Sunset Markers: X = ± 213.9 mm

Local Time	X	Y	Z	W	Local Time	X	Y	Z	W		
4:55	7:05	1440.1	-374.0	1487.8	2236.0	2:55	9:05	1037.3	-965.4	1417.0	2524.9
4:50	7:10	1430.6	-401.9	1486.0	2251.4	2:50	9:10	1013.4	-985.4	1413.5	2533.4
4:45	7:15	1420.4	-429.6	1483.9	2266.4	2:45	9:15	989.0	-1004.8	1409.9	2541.7
4:40	7:20	1409.5	-457.1	1481.8	2281.2	2:40	9:20	964.2	-1023.8	1406.4	2549.7
4:35	7:25	1398.0	-484.4	1479.6	2295.7	2:35	9:25	938.9	-1042.3	1402.8	2557.4
4:30	7:30	1385.8	-511.5	1477.2	2309.9	2:30	9:30	913.1	-1060.3	1399.3	2564.9
4:25	7:35	1373.0	-538.3	1474.7	2323.8	2:25	9:35	887.0	-1077.8	1395.9	2572.1
4:20	7:40	1359.5	-564.8	1472.1	2337.4	2:20	9:40	860.4	-1094.8	1392.4	2579.1
4:15	7:45	1345.3	-591.1	1469.4	2350.7	2:15	9:45	833.4	-1111.3	1389.0	2585.7
4:10	7:50	1330.5	-617.1	1466.7	2363.7	2:10	9:50	805.9	-1127.2	1385.7	2592.2
4:05	7:55	1315.1	-642.8	1463.8	2376.4	2:05	9:55	778.2	-1142.6	1382.4	2598.4
4:00	8:00	1299.0	-668.3	1460.8	2388.8	2:00	10:00	750.0	-1157.5	1379.2	2604.3
3:55	8:05	1282.4	-693.3	1457.8	2401.0	1:55	10:05	721.5	-1171.8	1376.1	2610.0
3:50	8:10	1265.1	-718.1	1454.7	2412.9	1:50	10:10	692.6	-1185.5	1373.0	2615.4
3:45	8:15	1247.2	-742.5	1451.5	2424.4	1:45	10:15	663.4	-1198.7	1370.0	2620.6
3:40	8:20	1228.7	-766.6	1448.3	2435.7						
3:35	8:25	1209.7	-790.3	1444.9	2446.7						
3:30	8:30	1190.0	-813.6	1441.6	2457.5						
3:25	8:35	1169.8	-836.6	1438.2	2467.9						
3:20	8:40	1149.1	-859.1	1434.7	2478.1						
3:15	8:45	1127.8	-881.2	1431.2	2488.0						
3:10	8:50	1105.9	-902.9	1427.7	2497.6						
3:05	8:55	1083.5	-924.2	1424.2	2507.0						
3:00	9:00	1060.7	-945.1	1420.6	2516.1						

## Analematic Sundial

Latitude: 63.0° N/S

## Date Scale

Semi-Major Axis (E-W): 1500 mm    Semi-Minor Axis (N-S): 1336.5 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-288.9	-283.5	-281.8	-274.3	-272.1	-262.8	-260.2	-249.1	-246.1	-233.6	-230.2
February	-209.0	-193.7	-189.8	-173.6	-169.5	-152.6	-148.2	-130.8	-126.3	-108.3	-103.7
March	-90.0	-71.6	-66.9	-48.2	-43.6	-24.7	-20.1	-1.2	3.4	22.2	26.9
April	54.8	73.1	77.7	95.7	100.2	117.9	122.2	139.4	143.6	160.2	164.2
May	184.0	199.1	202.8	216.8	220.2	233.2	236.2	248.0	250.8	261.1	263.5
June	276.2	282.9	284.4	289.3	290.5	293.6	294.0	295.1	295.3	293.1	294.1
July	290.5	285.8	284.4	278.2	276.4	268.2	266.1	256.4	253.8	242.8	239.8
August	221.0	207.3	203.8	189.1	185.4	169.9	165.9	149.7	145.6	128.8	124.5
September	98.5	80.7	76.3	58.1	53.6	35.3	30.8	12.4	7.7	-10.8	-15.5
October	-38.5	-57.1	-61.6	-80.0	-84.5	-102.6	-107.1	-124.9	-129.3	-146.6	-150.8
November	-175.7	-191.7	-195.5	-210.5	-214.2	-228.1	-231.4	-244.1	-247.1	-258.3	-261.0
December	-272.7	-280.5	-282.2	-287.9	-289.2	-292.9	-293.6	-295.1	-295.3	-294.5	-294.1

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	288.9	283.5	281.8	274.3	272.1	262.8	260.2	249.1	246.1	233.6	230.2
February	209.0	193.7	189.8	173.6	169.5	152.6	148.2	130.8	126.3	108.3	103.7
March	90.0	71.6	66.9	48.2	43.6	24.7	20.1	1.2	-3.4	-22.2	-26.9
April	-54.8	-73.1	-77.7	-95.7	-100.2	-117.9	-122.2	-139.4	-143.6	-160.2	-164.2
May	-184.0	-199.1	-202.8	-216.8	-220.2	-233.2	-236.2	-248.0	-250.8	-261.1	-263.5
June	-276.2	-282.9	-284.4	-289.3	-290.5	-293.6	-294.0	-295.1	-295.3	-293.1	-294.1
July	-290.5	-285.8	-284.4	-278.2	-276.4	-268.2	-266.1	-256.4	-253.8	-242.8	-239.8
August	-221.0	-207.3	-203.8	-189.1	-185.4	-169.9	-165.9	-149.7	-145.6	-128.8	-124.5
September	-98.5	-80.7	-76.3	-58.1	-53.6	-35.3	-30.8	-12.4	-7.7	10.8	15.5
October	38.5	57.1	61.6	80.0	84.5	102.6	107.1	124.9	129.3	146.6	150.8
November	175.7	191.7	195.5	210.5	214.2	228.1	231.4	244.1	247.1	258.3	261.0
December	272.7	280.5	282.2	287.9	289.2	292.9	293.6	295.1	295.3	294.5	294.1

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: 63.0° N/S

Earliest Sunrise: 1:51 a.m.    Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1782.0 mm  
 Sunrise/Sunset Markers: X = ± 285.2 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	1782.0	1782.0	0.0						
11:55	12:05	43.6	1781.6	1782.1	43.6	8:25	3:35	1612.9	1053.7	1926.6	1769.7
11:50	12:10	87.2	1780.3	1782.5	87.3	8:20	3:40	1638.3	1022.1	1931.0	1806.0
11:45	12:15	130.8	1778.2	1783.0	130.9	8:15	3:45	1662.9	990.0	1935.3	1841.9
11:40	12:20	174.3	1775.2	1783.8	174.4	8:10	3:50	1686.8	957.5	1939.6	1877.5
11:35	12:25	217.7	1771.4	1784.8	218.0	8:05	3:55	1709.8	924.5	1943.7	1912.8
11:30	12:30	261.1	1766.8	1785.9	261.5	8:00	4:00	1732.1	891.0	1947.8	1947.8
11:25	12:35	304.2	1761.3	1787.4	305.0	7:55	4:05	1753.5	857.1	1951.7	1982.4
11:20	12:40	347.3	1754.9	1789.0	348.3	7:50	4:10	1774.0	822.8	1955.6	2016.7
11:15	12:45	390.2	1747.8	1790.8	391.7	7:45	4:15	1793.7	788.2	1959.3	2050.7
11:10	12:50	432.9	1739.8	1792.8	434.9	7:40	4:20	1812.6	753.1	1962.8	2084.3
11:05	12:55	475.4	1730.9	1795.0	478.1	7:35	4:25	1830.6	717.7	1966.3	2117.5
11:00	1:00	517.6	1721.3	1797.4	521.2	7:30	4:30	1847.8	681.9	1969.6	2150.4
10:55	1:05	559.7	1710.8	1800.0	564.2	7:25	4:35	1864.0	645.9	1972.7	2183.0
10:50	1:10	601.4	1699.5	1802.8	607.0	7:20	4:40	1879.4	609.5	1975.7	2215.2
10:45	1:15	642.9	1687.4	1805.8	649.8	7:15	4:45	1893.9	572.8	1978.6	2247.0
10:40	1:20	684.0	1674.5	1808.9	692.4	7:10	4:50	1907.4	535.9	1981.3	2278.4
10:35	1:25	724.9	1660.9	1812.1	734.9	7:05	4:55	1920.1	498.7	1983.8	2309.5
10:30	1:30	765.4	1646.4	1815.6	777.3	7:00	5:00	1931.9	461.2	1986.1	2340.2
10:25	1:35	805.5	1631.1	1819.1	819.5	6:55	5:05	1942.7	423.6	1988.3	2370.5
10:20	1:40	845.2	1615.1	1822.9	861.6	6:50	5:10	1952.6	385.7	1990.3	2400.5
10:15	1:45	884.6	1598.2	1826.7	903.5	6:45	5:15	1961.6	347.7	1992.1	2430.1
10:10	1:50	923.5	1580.7	1830.7	945.2	6:40	5:20	1969.6	309.4	1993.8	2459.2
10:05	1:55	962.0	1562.3	1834.7	986.7	6:35	5:25	1976.7	271.1	1995.2	2488.0
10:00	2:00	1000.0	1543.3	1838.9	1028.1	6:30	5:30	1982.9	232.6	1996.5	2516.5
9:55	2:05	1037.5	1523.5	1843.2	1069.3	6:25	5:35	1988.1	194.0	1997.6	2544.5
9:50	2:10	1074.6	1502.9	1847.6	1110.2	6:20	5:40	1992.4	155.3	1998.4	2572.1
9:45	2:15	1111.1	1481.7	1852.0	1151.0	6:15	5:45	1995.7	116.5	1999.1	2599.4
9:40	2:20	1147.2	1459.7	1856.6	1191.6	6:10	5:50	1998.1	77.7	1999.6	2626.2
9:35	2:25	1182.6	1437.1	1861.1	1231.9	6:05	5:55	1999.5	38.9	1999.9	2652.7
9:30	2:30	1217.5	1413.8	1865.8	1272.0	6:00	6:00	2000.0	0.0	2000.0	2678.7
9:25	2:35	1251.8	1389.8	1870.4	1311.9	5:55	6:05	1999.5	-38.9	1999.9	2704.4
9:20	2:40	1285.6	1365.1	1875.2	1351.5	5:50	6:10	1998.1	-77.7	1999.6	2729.7
9:15	2:45	1318.7	1339.8	1879.9	1390.9	5:45	6:15	1995.7	-116.5	1999.1	2754.5
9:10	2:50	1351.2	1313.8	1884.6	1430.0	5:40	6:20	1992.4	-155.3	1998.4	2779.0
9:05	2:55	1383.0	1287.3	1889.4	1468.9	5:35	6:25	1988.1	-194.0	1997.6	2803.1
9:00	3:00	1414.2	1260.1	1894.1	1507.5	5:30	6:30	1982.9	-232.6	1996.5	2826.7
8:55	3:05	1444.7	1232.3	1898.9	1545.8	5:25	6:35	1976.7	-271.1	1995.2	2850.0
8:50	3:10	1474.6	1203.9	1903.6	1583.8	5:20	6:40	1969.6	-309.4	1993.8	2872.9
8:45	3:15	1503.7	1175.0	1908.3	1621.6	5:15	6:45	1961.6	-347.7	1992.1	2895.4
8:40	3:20	1532.1	1145.5	1912.9	1659.1	5:10	6:50	1952.6	-385.7	1990.3	2917.5
8:35	3:25	1559.8	1115.4	1917.6	1696.2	5:05	6:55	1942.7	-423.6	1988.3	2939.1
8:30	3:30	1586.7	1084.8	1922.1	1733.1	5:00	7:00	1931.9	-461.2	1986.1	2960.4

Analemmatic Sundial

Latitude: 63.0° N/S

Earliest Sunrise: 1:51 a.m. Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 2000 mm Semi-Minor Axis (N-S): 1782.0 mm  
 Sunrise/Sunset Markers: X = ± 285.2 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
4:55	7:05	1920.1	-498.7	1983.8	2981.3	2:55	9:05	1383.0	-1287.3	1889.4	3366.5
4:50	7:10	1907.4	-535.9	1981.3	3001.8	2:50	9:10	1351.2	-1313.8	1884.6	3377.9
4:45	7:15	1893.9	-572.8	1978.6	3021.9	2:45	9:15	1318.7	-1339.8	1879.9	3388.9
4:40	7:20	1879.4	-609.5	1975.7	3041.6	2:40	9:20	1285.6	-1365.1	1875.2	3399.6
4:35	7:25	1864.0	-645.9	1972.7	3060.9	2:35	9:25	1251.8	-1389.8	1870.4	3409.9
4:30	7:30	1847.8	-681.9	1969.6	3079.8	2:30	9:30	1217.5	-1413.8	1865.8	3419.8
4:25	7:35	1830.6	-717.7	1966.3	3098.3	2:25	9:35	1182.6	-1437.1	1861.1	3429.5
4:20	7:40	1812.6	-753.1	1962.8	3116.5	2:20	9:40	1147.2	-1459.7	1856.6	3438.7
4:15	7:45	1793.7	-788.2	1959.3	3134.2	2:15	9:45	1111.1	-1481.7	1852.0	3447.7
4:10	7:50	1774.0	-822.8	1955.6	3151.6	2:10	9:50	1074.6	-1502.9	1847.6	3456.2
4:05	7:55	1753.5	-857.1	1951.7	3168.5	2:05	9:55	1037.5	-1523.5	1843.2	3464.5
4:00	8:00	1732.1	-891.0	1947.8	3185.1	2:00	10:00	1000.0	-1543.3	1838.9	3472.4
3:55	8:05	1709.8	-924.5	1943.7	3201.3	1:55	10:05	962.0	-1562.3	1834.7	3480.0
3:50	8:10	1686.8	-957.5	1939.6	3217.1	1:50	10:10	923.5	-1580.7	1830.7	3487.2
3:45	8:15	1662.9	-990.0	1935.3	3232.6	1:45	10:15	884.6	-1598.2	1826.7	3494.1
3:40	8:20	1638.3	-1022.1	1931.0	3247.6						
3:35	8:25	1612.9	-1053.7	1926.6	3262.3						
3:30	8:30	1586.7	-1084.8	1922.1	3276.6						
3:25	8:35	1559.8	-1115.4	1917.6	3290.6						
3:20	8:40	1532.1	-1145.5	1912.9	3304.1						
3:15	8:45	1503.7	-1175.0	1908.3	3317.3						
3:10	8:50	1474.6	-1203.9	1903.6	3330.2						
3:05	8:55	1444.7	-1232.3	1898.9	3342.6						
3:00	9:00	1414.2	-1260.1	1894.1	3354.7						

## Analematic Sundial

Latitude: 63.0° N/S

## Date Scale

Semi-Major Axis (E-W): 2000 mm    Semi-Minor Axis (N-S): 1782.0 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-385.2	-378.0	-375.7	-365.7	-362.8	-350.4	-346.9	-332.1	-328.1	-311.4	-307.0
February	-278.6	-258.3	-253.0	-231.4	-226.0	-203.5	-197.6	-174.4	-168.4	-144.5	-138.3
March	-120.0	-95.4	-89.2	-64.3	-58.1	-33.0	-26.8	-1.6	4.6	29.6	35.8
April	73.1	97.5	103.6	127.6	133.6	157.2	162.9	185.9	191.5	213.6	219.0
May	245.3	265.5	270.3	289.1	293.6	310.9	314.9	330.7	334.4	348.2	351.3
June	368.3	377.2	379.3	385.8	387.3	391.4	392.0	393.5	393.7	390.9	392.2
July	387.3	381.1	379.3	370.9	368.5	357.7	354.7	341.8	338.4	323.7	319.8
August	294.7	276.4	271.7	252.1	247.2	226.6	221.2	199.6	194.2	171.7	166.0
September	131.3	107.6	101.7	77.5	71.5	47.1	41.1	16.5	10.3	-14.4	-20.6
October	-51.4	-76.1	-82.2	-106.7	-112.6	-136.8	-142.8	-166.5	-172.4	-195.5	-201.1
November	-234.3	-255.6	-260.7	-280.7	-285.6	-304.2	-308.6	-325.5	-329.4	-344.4	-348.0
December	-363.5	-374.1	-376.3	-383.9	-385.6	-390.5	-391.4	-393.5	-393.7	-392.7	-392.2

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	385.2	378.0	375.7	365.7	362.8	350.4	346.9	332.1	328.1	311.4	307.0
February	278.6	258.3	253.0	231.4	226.0	203.5	197.6	174.4	168.4	144.5	138.3
March	120.0	95.4	89.2	64.3	58.1	33.0	26.8	1.6	-4.6	-29.6	-35.8
April	-73.1	-97.5	-103.6	-127.6	-133.6	-157.2	-162.9	-185.9	-191.5	-213.6	-219.0
May	-245.3	-265.5	-270.3	-289.1	-293.6	-310.9	-314.9	-330.7	-334.4	-348.2	-351.3
June	-368.3	-377.2	-379.3	-385.8	-387.3	-391.4	-392.0	-393.5	-393.7	-390.9	-392.2
July	-387.3	-381.1	-379.3	-370.9	-368.5	-357.7	-354.7	-341.8	-338.4	-323.7	-319.8
August	-294.7	-276.4	-271.7	-252.1	-247.2	-226.6	-221.2	-199.6	-194.2	-171.7	-166.0
September	-131.3	-107.6	-101.7	-77.5	-71.5	-47.1	-41.1	-16.5	-10.3	14.4	20.6
October	51.4	76.1	82.2	106.7	112.6	136.8	142.8	166.5	172.4	195.5	201.1
November	234.3	255.6	260.7	280.7	285.6	304.2	308.6	325.5	329.4	344.4	348.0
December	363.5	374.1	376.3	383.9	385.6	390.5	391.4	393.5	393.7	392.7	392.2

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: 63.0° N/S

Earliest Sunrise: 1:51 a.m.    Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 2227.5 mm  
 Sunrise/Sunset Markers: X = ± 356.5 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
12:00		0.0	2227.5	2227.5	0.0						
11:55	12:05	54.5	2227.0	2227.7	54.5	8:25	3:35	2016.1	1317.2	2408.2	2212.1
11:50	12:10	109.0	2225.4	2228.1	109.1	8:20	3:40	2047.9	1277.7	2413.8	2257.4
11:45	12:15	163.5	2222.7	2228.8	163.6	8:15	3:45	2078.7	1237.5	2419.2	2302.4
11:40	12:20	217.9	2219.0	2229.7	218.1	8:10	3:50	2108.5	1196.8	2424.5	2346.9
11:35	12:25	272.2	2214.3	2230.9	272.5	8:05	3:55	2137.3	1155.6	2429.7	2391.0
11:30	12:30	326.3	2208.5	2232.4	326.9	8:00	4:00	2165.1	1113.8	2434.7	2434.7
11:25	12:35	380.3	2201.6	2234.2	381.2	7:55	4:05	2191.8	1071.4	2439.7	2478.0
11:20	12:40	434.1	2193.7	2236.2	435.4	7:50	4:10	2217.5	1028.6	2444.5	2520.9
11:15	12:45	487.7	2184.7	2238.5	489.6	7:45	4:15	2242.2	985.2	2449.1	2563.3
11:10	12:50	541.1	2174.7	2241.0	543.7	7:40	4:20	2265.8	941.4	2453.6	2605.3
11:05	12:55	594.2	2163.7	2243.8	597.6	7:35	4:25	2288.3	897.1	2457.9	2646.9
11:00	1:00	647.0	2151.6	2246.8	651.5	7:30	4:30	2309.7	852.4	2462.0	2688.0
10:55	1:05	699.6	2138.5	2250.0	705.2	7:25	4:35	2330.0	807.3	2465.9	2728.7
10:50	1:10	751.8	2124.4	2253.5	758.8	7:20	4:40	2349.2	761.9	2469.7	2768.9
10:45	1:15	803.6	2109.3	2257.2	812.2	7:15	4:45	2367.3	716.0	2473.2	2808.7
10:40	1:20	855.1	2093.2	2261.1	865.5	7:10	4:50	2384.3	669.8	2476.6	2848.0
10:35	1:25	906.1	2076.1	2265.2	918.7	7:05	4:55	2400.1	623.3	2479.7	2886.9
10:30	1:30	956.7	2058.0	2269.5	971.6	7:00	5:00	2414.8	576.5	2482.7	2925.3
10:25	1:35	1006.9	2038.9	2273.9	1024.4	6:55	5:05	2428.4	529.4	2485.4	2963.2
10:20	1:40	1056.5	2018.8	2278.6	1077.0	6:50	5:10	2440.7	482.1	2487.9	3000.6
10:15	1:45	1105.7	1997.8	2283.4	1129.3	6:45	5:15	2452.0	434.6	2490.2	3037.6
10:10	1:50	1154.4	1975.8	2288.3	1181.5	6:40	5:20	2462.0	386.8	2492.2	3074.0
10:05	1:55	1202.5	1952.9	2293.4	1233.4	6:35	5:25	2470.9	338.9	2494.0	3110.0
10:00	2:00	1250.0	1929.1	2298.7	1285.1	6:30	5:30	2478.6	290.7	2495.6	3145.6
9:55	2:05	1296.9	1904.3	2304.0	1336.6	6:25	5:35	2485.1	242.5	2496.9	3180.6
9:50	2:10	1343.2	1878.7	2309.5	1387.8	6:20	5:40	2490.5	194.1	2498.0	3215.1
9:45	2:15	1388.9	1852.1	2315.0	1438.8	6:15	5:45	2494.6	145.7	2498.9	3249.2
9:40	2:20	1433.9	1824.7	2320.7	1489.5	6:10	5:50	2497.6	97.2	2499.5	3282.8
9:35	2:25	1478.3	1796.4	2326.4	1539.9	6:05	5:55	2499.4	48.6	2499.9	3315.8
9:30	2:30	1521.9	1767.2	2332.2	1590.0	6:00	6:00	2500.0	0.0	2500.0	3348.4
9:25	2:35	1564.8	1737.2	2338.1	1639.8	5:55	6:05	2499.4	-48.6	2499.9	3380.5
9:20	2:40	1607.0	1706.4	2343.9	1689.4	5:50	6:10	2497.6	-97.2	2499.5	3412.1
9:15	2:45	1648.4	1674.7	2349.9	1738.6	5:45	6:15	2494.6	-145.7	2498.9	3443.2
9:10	2:50	1689.0	1642.3	2355.8	1787.5	5:40	6:20	2490.5	-194.1	2498.0	3473.8
9:05	2:55	1728.8	1609.1	2361.7	1836.1	5:35	6:25	2485.1	-242.5	2496.9	3503.8
9:00	3:00	1767.8	1575.1	2367.7	1884.3	5:30	6:30	2478.6	-290.7	2495.6	3533.4
8:55	3:05	1805.9	1540.4	2373.6	1932.2	5:25	6:35	2470.9	-338.9	2494.0	3562.5
8:50	3:10	1843.2	1504.9	2379.5	1979.8	5:20	6:40	2462.0	-386.8	2492.2	3591.1
8:45	3:15	1879.6	1468.7	2385.4	2027.0	5:15	6:45	2452.0	-434.6	2490.2	3619.2
8:40	3:20	1915.1	1431.8	2391.2	2073.8	5:10	6:50	2440.7	-482.1	2487.9	3646.8
8:35	3:25	1949.7	1394.3	2396.9	2120.3	5:05	6:55	2428.4	-529.4	2485.4	3673.9
8:30	3:30	1983.4	1356.0	2402.6	2166.4	5:00	7:00	2414.8	-576.5	2482.7	3700.5

Analemmatic Sundial

Latitude: 63.0° N/S

Earliest Sunrise: 1:51 a.m. Latest Sunset: 10:09 p.m.  
 Semi-Major Axis (E-W): 2500 mm Semi-Minor Axis (N-S): 2227.5 mm  
 Sunrise/Sunset Markers: X = ± 356.5 mm

Local Time		X	Y	Z	W	Local Time		X	Y	Z	W
4:55	7:05	2400.1	-623.3	2479.7	3726.6	2:55	9:05	1728.8	-1609.1	2361.7	4208.1
4:50	7:10	2384.3	-669.8	2476.6	3752.3	2:50	9:10	1689.0	-1642.3	2355.8	4222.3
4:45	7:15	2367.3	-716.0	2473.2	3777.4	2:45	9:15	1648.4	-1674.7	2349.9	4236.1
4:40	7:20	2349.2	-761.9	2469.7	3802.0	2:40	9:20	1607.0	-1706.4	2343.9	4249.5
4:35	7:25	2330.0	-807.3	2465.9	3826.1	2:35	9:25	1564.8	-1737.2	2338.1	4262.4
4:30	7:30	2309.7	-852.4	2462.0	3849.8	2:30	9:30	1521.9	-1767.2	2332.2	4274.8
4:25	7:35	2288.3	-897.1	2457.9	3872.9	2:25	9:35	1478.3	-1796.4	2326.4	4286.8
4:20	7:40	2265.8	-941.4	2453.6	3895.6	2:20	9:40	1433.9	-1824.7	2320.7	4298.4
4:15	7:45	2242.2	-985.2	2449.1	3917.8	2:15	9:45	1388.9	-1852.1	2315.0	4309.6
4:10	7:50	2217.5	-1028.6	2444.5	3939.5	2:10	9:50	1343.2	-1878.7	2309.5	4320.3
4:05	7:55	2191.8	-1071.4	2439.7	3960.7	2:05	9:55	1296.9	-1904.3	2304.0	4330.6
4:00	8:00	2165.1	-1113.8	2434.7	3981.4	2:00	10:00	1250.0	-1929.1	2298.7	4340.5
3:55	8:05	2137.3	-1155.6	2429.7	4001.7	1:55	10:05	1202.5	-1952.9	2293.4	4349.9
3:50	8:10	2108.5	-1196.8	2424.5	4021.4	1:50	10:10	1154.4	-1975.8	2288.3	4359.0
3:45	8:15	2078.7	-1237.5	2419.2	4040.7	1:45	10:15	1105.7	-1997.8	2283.4	4367.6
3:40	8:20	2047.9	-1277.7	2413.8	4059.6						
3:35	8:25	2016.1	-1317.2	2408.2	4077.9						
3:30	8:30	1983.4	-1356.0	2402.6	4095.8						
3:25	8:35	1949.7	-1394.3	2396.9	4113.2						
3:20	8:40	1915.1	-1431.8	2391.2	4130.2						
3:15	8:45	1879.6	-1468.7	2385.4	4146.7						
3:10	8:50	1843.2	-1504.9	2379.5	4162.7						
3:05	8:55	1805.9	-1540.4	2373.6	4178.3						
3:00	9:00	1767.8	-1575.1	2367.7	4193.4						

**Analematic Sundial**

Latitude: 63.0° N/S

**Date Scale**

Semi-Major Axis (E-W): 2500 mm    Semi-Minor Axis (N-S): 2227.5 mm

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	-481.5	-472.4	-469.7	-457.2	-453.5	-438.0	-433.6	-415.1	-410.2	-389.3	-383.7
February	-348.3	-322.9	-316.3	-289.3	-282.6	-254.3	-247.0	-217.9	-210.6	-180.6	-172.9
March	-150.0	-119.3	-111.5	-80.4	-72.6	-41.2	-33.5	-2.0	5.7	37.1	44.8
April	91.3	121.9	129.5	159.5	167.0	196.5	203.6	232.4	239.4	267.0	273.7
May	306.7	331.9	337.9	361.3	367.0	388.6	393.7	413.3	418.0	435.2	439.1
June	460.4	471.5	474.1	482.2	484.1	489.3	490.0	491.9	492.1	488.6	490.2
July	484.1	476.4	474.1	463.6	460.6	447.1	443.4	427.3	423.0	404.6	399.7
August	368.3	345.5	339.6	315.2	309.0	283.2	276.5	249.5	242.7	214.7	207.5
September	164.2	134.5	127.1	96.9	89.3	58.9	51.3	20.6	12.9	-18.0	-25.8
October	-64.2	-95.1	-102.7	-133.3	-140.8	-171.0	-178.5	-208.1	-215.5	-244.4	-251.4
November	-292.9	-319.5	-325.9	-350.9	-357.0	-380.2	-385.7	-406.8	-411.8	-430.5	-435.0
December	-454.4	-467.6	-470.4	-479.9	-482.0	-488.1	-489.3	-491.9	-492.1	-490.9	-490.2

Northern Hemisphere

Month	Date										
	1	5	6	10	11	15	16	20	21	25	26
January	481.5	472.4	469.7	457.2	453.5	438.0	433.6	415.1	410.2	389.3	383.7
February	348.3	322.9	316.3	289.3	282.6	254.3	247.0	217.9	210.6	180.6	172.9
March	150.0	119.3	111.5	80.4	72.6	41.2	33.5	2.0	-5.7	-37.1	-44.8
April	-91.3	-121.9	-129.5	-159.5	-167.0	-196.5	-203.6	-232.4	-239.4	-267.0	-273.7
May	-306.7	-331.9	-337.9	-361.3	-367.0	-388.6	-393.7	-413.3	-418.0	-435.2	-439.1
June	-460.4	-471.5	-474.1	-482.2	-484.1	-489.3	-490.0	-491.9	-492.1	-488.6	-490.2
July	-484.1	-476.4	-474.1	-463.6	-460.6	-447.1	-443.4	-427.3	-423.0	-404.6	-399.7
August	-368.3	-345.5	-339.6	-315.2	-309.0	-283.2	-276.5	-249.5	-242.7	-214.7	-207.5
September	-164.2	-134.5	-127.1	-96.9	-89.3	-58.9	-51.3	-20.6	-12.9	18.0	25.8
October	64.2	95.1	102.7	133.3	140.8	171.0	178.5	208.1	215.5	244.4	251.4
November	292.9	319.5	325.9	350.9	357.0	380.2	385.7	406.8	411.8	430.5	435.0
December	454.4	467.6	470.4	479.9	482.0	488.1	489.3	491.9	492.1	490.9	490.2

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