

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern Limit	Southern Limit	Central Line	Universal Time h m s	Sun Alt °	Sun Az. °	Path Width km	Central Durat.
070°37.5'E	21°24.23'N		20°24.05'N	00:52:51	0.1	68.3	205.5	03m09.5s
070°45.0'E	21°27.07'N		20°26.86'N	00:52:51	0.2	68.4	205.6	03m09.7s
070°52.5'E	21°29.91'N		20°29.67'N	00:52:51	0.4	68.4	205.7	03m10.0s
071°00.0'E	21°32.74'N		20°32.48'N	00:52:52	0.5	68.5	205.9	03m10.3s
071°07.5'E	21°35.58'N	19°35.47'N	20°35.28'N	00:52:52	0.6	68.5	206.0	03m10.6s
071°15.0'E	21°38.40'N	19°38.24'N	20°38.07'N	00:52:52	0.7	68.6	206.1	03m10.9s
071°22.5'E	21°41.23'N	19°41.00'N	20°40.87'N	00:52:52	0.9	68.6	206.2	03m11.2s
071°30.0'E	21°44.05'N	19°43.76'N	20°43.66'N	00:52:52	1.0	68.6	206.4	03m11.5s
071°37.5'E	21°46.87'N	19°46.52'N	20°46.45'N	00:52:53	1.1	68.7	206.5	03m11.8s
071°45.0'E	21°49.68'N	19°49.28'N	20°49.24'N	00:52:53	1.2	68.7	206.6	03m12.1s
071°52.5'E	21°52.49'N	19°52.03'N	20°52.02'N	00:52:53	1.4	68.8	206.8	03m12.4s
072°00.0'E	21°55.30'N	19°54.78'N	20°54.80'N	00:52:53	1.5	68.8	206.9	03m12.7s
072°07.5'E	21°58.11'N	19°57.53'N	20°57.58'N	00:52:54	1.6	68.9	207.0	03m13.0s
072°15.0'E	22°00.91'N	20°00.27'N	21°00.35'N	00:52:54	1.8	68.9	207.1	03m13.3s
072°22.5'E	22°03.71'N	20°03.01'N	21°03.12'N	00:52:55	1.9	69.0	207.3	03m13.6s
072°30.0'E	22°06.50'N	20°05.75'N	21°05.88'N	00:52:55	2.0	69.0	207.4	03m13.9s
072°37.5'E	22°09.29'N	20°08.48'N	21°08.65'N	00:52:56	2.1	69.1	207.5	03m14.2s
072°45.0'E	22°12.08'N	20°11.22'N	21°11.41'N	00:52:56	2.3	69.1	207.6	03m14.5s
072°52.5'E	22°14.87'N	20°13.94'N	21°14.16'N	00:52:57	2.4	69.1	207.8	03m14.8s
073°00.0'E	22°17.65'N	20°16.67'N	21°16.92'N	00:52:57	2.5	69.2	207.9	03m15.1s
073°07.5'E	22°20.43'N	20°19.39'N	21°19.67'N	00:52:58	2.6	69.2	208.0	03m15.4s
073°15.0'E	22°23.20'N	20°22.10'N	21°22.41'N	00:52:59	2.8	69.3	208.1	03m15.7s
073°22.5'E	22°25.97'N	20°24.82'N	21°25.15'N	00:52:59	2.9	69.3	208.3	03m16.0s
073°30.0'E	22°28.74'N	20°27.53'N	21°27.89'N	00:53:00	3.0	69.4	208.4	03m16.3s
073°37.5'E	22°31.50'N	20°30.24'N	21°30.63'N	00:53:01	3.2	69.4	208.5	03m16.6s
073°45.0'E	22°34.26'N	20°32.94'N	21°33.36'N	00:53:02	3.3	69.5	208.6	03m16.9s
073°52.5'E	22°37.02'N	20°35.64'N	21°36.09'N	00:53:02	3.4	69.5	208.8	03m17.2s
074°00.0'E	22°39.77'N	20°38.34'N	21°38.81'N	00:53:03	3.5	69.6	208.9	03m17.6s
074°07.5'E	22°42.52'N	20°41.03'N	21°41.53'N	00:53:04	3.7	69.6	209.0	03m17.9s
074°15.0'E	22°45.26'N	20°43.72'N	21°44.25'N	00:53:05	3.8	69.7	209.1	03m18.2s
074°22.5'E	22°48.00'N	20°46.41'N	21°46.97'N	00:53:06	3.9	69.7	209.2	03m18.5s
074°30.0'E	22°50.74'N	20°49.09'N	21°49.68'N	00:53:07	4.0	69.8	209.4	03m18.8s
074°37.5'E	22°53.48'N	20°51.77'N	21°52.38'N	00:53:08	4.2	69.8	209.5	03m19.1s
074°45.0'E	22°56.21'N	20°54.44'N	21°55.09'N	00:53:09	4.3	69.9	209.6	03m19.4s
074°52.5'E	22°58.93'N	20°57.12'N	21°57.78'N	00:53:10	4.4	69.9	209.7	03m19.7s
075°00.0'E	23°01.65'N	20°59.78'N	22°00.48'N	00:53:11	4.6	70.0	209.9	03m20.1s
075°07.5'E	23°04.37'N	21°02.45'N	22°03.17'N	00:53:12	4.7	70.0	210.0	03m20.4s
075°15.0'E	23°07.09'N	21°05.11'N	22°05.86'N	00:53:13	4.8	70.1	210.1	03m20.7s
075°22.5'E	23°09.80'N	21°07.76'N	22°08.54'N	00:53:14	4.9	70.1	210.2	03m21.0s
075°30.0'E	23°12.50'N	21°10.42'N	22°11.22'N	00:53:16	5.1	70.1	210.4	03m21.3s
075°37.5'E	23°15.20'N	21°13.07'N	22°13.90'N	00:53:17	5.2	70.2	210.5	03m21.6s
075°45.0'E	23°17.90'N	21°15.71'N	22°16.57'N	00:53:18	5.3	70.2	210.6	03m22.0s
075°52.5'E	23°20.60'N	21°18.35'N	22°19.24'N	00:53:19	5.5	70.3	210.7	03m22.3s
076°00.0'E	23°23.29'N	21°20.99'N	22°21.90'N	00:53:21	5.6	70.3	210.9	03m22.6s
076°07.5'E	23°25.97'N	21°23.63'N	22°24.56'N	00:53:22	5.7	70.4	211.0	03m22.9s
076°15.0'E	23°28.66'N	21°26.25'N	22°27.22'N	00:53:24	5.8	70.4	211.1	03m23.2s
076°22.5'E	23°31.33'N	21°28.88'N	22°29.87'N	00:53:25	6.0	70.5	211.2	03m23.6s
076°30.0'E	23°34.01'N	21°31.50'N	22°32.52'N	00:53:26	6.1	70.5	211.4	03m23.9s
076°37.5'E	23°36.68'N	21°34.12'N	22°35.16'N	00:53:28	6.2	70.6	211.5	03m24.2s
076°45.0'E	23°39.34'N	21°36.73'N	22°37.80'N	00:53:29	6.4	70.6	211.6	03m24.5s
076°52.5'E	23°42.00'N	21°39.34'N	22°40.44'N	00:53:31	6.5	70.7	211.7	03m24.9s

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Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
077°00.0'E	23°44.66'N	21°41.95'N	22°43.07'N	00:53:33	6.6	70.7	211.8	03m25.2s
077°07.5'E	23°47.31'N	21°44.55'N	22°45.70'N	00:53:34	6.8	70.8	212.0	03m25.5s
077°15.0'E	23°49.96'N	21°47.15'N	22°48.32'N	00:53:36	6.9	70.9	212.1	03m25.8s
077°22.5'E	23°52.60'N	21°49.74'N	22°50.94'N	00:53:38	7.0	70.9	212.2	03m26.2s
077°30.0'E	23°55.24'N	21°52.33'N	22°53.56'N	00:53:39	7.1	71.0	212.3	03m26.5s
077°37.5'E	23°57.88'N	21°54.92'N	22°56.17'N	00:53:41	7.3	71.0	212.5	03m26.8s
077°45.0'E	24°00.51'N	21°57.50'N	22°58.77'N	00:53:43	7.4	71.1	212.6	03m27.2s
077°52.5'E	24°03.14'N	22°00.07'N	23°01.37'N	00:53:45	7.5	71.1	212.7	03m27.5s
078°00.0'E	24°05.76'N	22°02.65'N	23°03.97'N	00:53:46	7.7	71.2	212.8	03m27.8s
078°07.5'E	24°08.37'N	22°05.21'N	23°06.56'N	00:53:48	7.8	71.2	213.0	03m28.1s
078°15.0'E	24°10.99'N	22°07.78'N	23°09.15'N	00:53:50	7.9	71.3	213.1	03m28.5s
078°22.5'E	24°13.60'N	22°10.34'N	23°11.74'N	00:53:52	8.0	71.3	213.2	03m28.8s
078°30.0'E	24°16.20'N	22°12.89'N	23°14.32'N	00:53:54	8.2	71.4	213.3	03m29.1s
078°37.5'E	24°18.80'N	22°15.44'N	23°16.89'N	00:53:56	8.3	71.4	213.4	03m29.5s
078°45.0'E	24°21.39'N	22°17.99'N	23°19.46'N	00:53:58	8.4	71.5	213.6	03m29.8s
078°52.5'E	24°23.98'N	22°20.53'N	23°22.03'N	00:54:00	8.6	71.5	213.7	03m30.1s
079°00.0'E	24°26.57'N	22°23.07'N	23°24.59'N	00:54:02	8.7	71.6	213.8	03m30.5s
079°07.5'E	24°29.15'N	22°25.60'N	23°27.15'N	00:54:05	8.8	71.6	213.9	03m30.8s
079°15.0'E	24°31.72'N	22°28.13'N	23°29.70'N	00:54:07	9.0	71.7	214.1	03m31.2s
079°22.5'E	24°34.29'N	22°30.65'N	23°32.25'N	00:54:09	9.1	71.7	214.2	03m31.5s
079°30.0'E	24°36.86'N	22°33.17'N	23°34.79'N	00:54:11	9.2	71.8	214.3	03m31.8s
079°37.5'E	24°39.42'N	22°35.69'N	23°37.33'N	00:54:13	9.3	71.9	214.4	03m32.2s
079°45.0'E	24°41.98'N	22°38.20'N	23°39.86'N	00:54:16	9.5	71.9	214.5	03m32.5s
079°52.5'E	24°44.53'N	22°40.70'N	23°42.39'N	00:54:18	9.6	72.0	214.7	03m32.9s
080°00.0'E	24°47.08'N	22°43.20'N	23°44.91'N	00:54:20	9.7	72.0	214.8	03m33.2s
080°07.5'E	24°49.62'N	22°45.70'N	23°47.43'N	00:54:23	9.9	72.1	214.9	03m33.5s
080°15.0'E	24°52.15'N	22°48.19'N	23°49.95'N	00:54:25	10.0	72.1	215.0	03m33.9s
080°22.5'E	24°54.69'N	22°50.68'N	23°52.46'N	00:54:28	10.1	72.2	215.1	03m34.2s
080°30.0'E	24°57.21'N	22°53.16'N	23°54.96'N	00:54:30	10.3	72.2	215.3	03m34.6s
080°37.5'E	24°59.74'N	22°55.63'N	23°57.46'N	00:54:33	10.4	72.3	215.4	03m34.9s
080°45.0'E	25°02.25'N	22°58.11'N	23°59.96'N	00:54:35	10.5	72.3	215.5	03m35.3s
080°52.5'E	25°04.76'N	23°00.57'N	24°02.45'N	00:54:38	10.7	72.4	215.6	03m35.6s
081°00.0'E	25°07.27'N	23°03.04'N	24°04.93'N	00:54:40	10.8	72.5	215.7	03m36.0s
081°07.5'E	25°09.77'N	23°05.49'N	24°07.41'N	00:54:43	10.9	72.5	215.9	03m36.3s
081°15.0'E	25°12.27'N	23°07.95'N	24°09.89'N	00:54:46	11.0	72.6	216.0	03m36.7s
081°22.5'E	25°14.76'N	23°10.39'N	24°12.36'N	00:54:49	11.2	72.6	216.1	03m37.0s
081°30.0'E	25°17.25'N	23°12.84'N	24°14.82'N	00:54:51	11.3	72.7	216.2	03m37.4s
081°37.5'E	25°19.73'N	23°15.27'N	24°17.28'N	00:54:54	11.4	72.7	216.3	03m37.7s
081°45.0'E	25°22.21'N	23°17.71'N	24°19.74'N	00:54:57	11.6	72.8	216.5	03m38.1s
081°52.5'E	25°24.68'N	23°20.13'N	24°22.19'N	00:55:00	11.7	72.9	216.6	03m38.4s
082°00.0'E	25°27.14'N	23°22.56'N	24°24.63'N	00:55:03	11.8	72.9	216.7	03m38.8s
082°07.5'E	25°29.60'N	23°24.97'N	24°27.07'N	00:55:06	12.0	73.0	216.8	03m39.1s
082°15.0'E	25°32.06'N	23°27.39'N	24°29.51'N	00:55:09	12.1	73.0	216.9	03m39.5s
082°22.5'E	25°34.51'N	23°29.79'N	24°31.93'N	00:55:12	12.2	73.1	217.1	03m39.8s
082°30.0'E	25°36.95'N	23°32.20'N	24°34.36'N	00:55:15	12.4	73.1	217.2	03m40.2s
082°37.5'E	25°39.39'N	23°34.59'N	24°36.78'N	00:55:18	12.5	73.2	217.3	03m40.5s
082°45.0'E	25°41.82'N	23°36.98'N	24°39.19'N	00:55:21	12.6	73.3	217.4	03m40.9s
082°52.5'E	25°44.25'N	23°39.37'N	24°41.60'N	00:55:24	12.8	73.3	217.5	03m41.3s

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Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
083°00.0'E	25°46.67'N	23°41.75'N	24°44.00'N	00:55:27	12.9	73.4	217.7	03m41.6s
083°07.5'E	25°49.09'N	23°44.13'N	24°46.40'N	00:55:30	13.0	73.4	217.8	03m42.0s
083°15.0'E	25°51.50'N	23°46.50'N	24°48.79'N	00:55:33	13.1	73.5	217.9	03m42.3s
083°22.5'E	25°53.91'N	23°48.86'N	24°51.17'N	00:55:37	13.3	73.5	218.0	03m42.7s
083°30.0'E	25°56.31'N	23°51.22'N	24°53.55'N	00:55:40	13.4	73.6	218.1	03m43.1s
083°37.5'E	25°58.70'N	23°53.58'N	24°55.93'N	00:55:43	13.5	73.7	218.3	03m43.4s
083°45.0'E	26°01.09'N	23°55.93'N	24°58.30'N	00:55:47	13.7	73.7	218.4	03m43.8s
083°52.5'E	26°03.47'N	23°58.27'N	25°00.66'N	00:55:50	13.8	73.8	218.5	03m44.2s
084°00.0'E	26°05.85'N	24°00.61'N	25°03.02'N	00:55:53	13.9	73.8	218.6	03m44.5s
084°07.5'E	26°08.22'N	24°02.94'N	25°05.37'N	00:55:57	14.1	73.9	218.7	03m44.9s
084°15.0'E	26°10.59'N	24°05.27'N	25°07.72'N	00:56:00	14.2	74.0	218.9	03m45.2s
084°22.5'E	26°12.95'N	24°07.59'N	25°10.06'N	00:56:04	14.3	74.0	219.0	03m45.6s
084°30.0'E	26°15.30'N	24°09.90'N	25°12.40'N	00:56:07	14.5	74.1	219.1	03m46.0s
084°37.5'E	26°17.65'N	24°12.22'N	25°14.73'N	00:56:11	14.6	74.1	219.2	03m46.3s
084°45.0'E	26°20.00'N	24°14.52'N	25°17.05'N	00:56:15	14.7	74.2	219.3	03m46.7s
084°52.5'E	26°22.33'N	24°16.82'N	25°19.37'N	00:56:18	14.9	74.3	219.4	03m47.1s
085°00.0'E	26°24.66'N	24°19.11'N	25°21.68'N	00:56:22	15.0	74.3	219.6	03m47.5s
085°07.5'E	26°26.99'N	24°21.40'N	25°23.99'N	00:56:26	15.1	74.4	219.7	03m47.8s
085°15.0'E	26°29.31'N	24°23.68'N	25°26.29'N	00:56:29	15.3	74.5	219.8	03m48.2s
085°22.5'E	26°31.62'N	24°25.96'N	25°28.59'N	00:56:33	15.4	74.5	219.9	03m48.6s
085°30.0'E	26°33.93'N	24°28.23'N	25°30.88'N	00:56:37	15.5	74.6	220.0	03m48.9s
085°37.5'E	26°36.23'N	24°30.49'N	25°33.16'N	00:56:41	15.7	74.6	220.1	03m49.3s
085°45.0'E	26°38.53'N	24°32.75'N	25°35.44'N	00:56:45	15.8	74.7	220.3	03m49.7s
085°52.5'E	26°40.81'N	24°35.00'N	25°37.71'N	00:56:49	15.9	74.8	220.4	03m50.1s
086°00.0'E	26°43.10'N	24°37.25'N	25°39.97'N	00:56:53	16.1	74.8	220.5	03m50.4s
086°07.5'E	26°45.37'N	24°39.49'N	25°42.23'N	00:56:57	16.2	74.9	220.6	03m50.8s
086°15.0'E	26°47.65'N	24°41.73'N	25°44.49'N	00:57:01	16.3	74.9	220.7	03m51.2s
086°22.5'E	26°49.91'N	24°43.95'N	25°46.73'N	00:57:05	16.5	75.0	220.8	03m51.6s
086°30.0'E	26°52.17'N	24°46.18'N	25°48.97'N	00:57:09	16.6	75.1	221.0	03m51.9s
086°37.5'E	26°54.42'N	24°48.39'N	25°51.21'N	00:57:13	16.7	75.1	221.1	03m52.3s
086°45.0'E	26°56.67'N	24°50.60'N	25°53.44'N	00:57:17	16.9	75.2	221.2	03m52.7s
086°52.5'E	26°58.91'N	24°52.81'N	25°55.66'N	00:57:21	17.0	75.3	221.3	03m53.1s
087°00.0'E	27°01.14'N	24°55.01'N	25°57.88'N	00:57:25	17.1	75.3	221.4	03m53.5s
087°07.5'E	27°03.37'N	24°57.20'N	26°00.09'N	00:57:30	17.3	75.4	221.5	03m53.8s
087°15.0'E	27°05.59'N	24°59.39'N	26°02.29'N	00:57:34	17.4	75.5	221.7	03m54.2s
087°22.5'E	27°07.80'N	25°01.57'N	26°04.49'N	00:57:38	17.5	75.5	221.8	03m54.6s
087°30.0'E	27°10.01'N	25°03.74'N	26°06.68'N	00:57:43	17.7	75.6	221.9	03m55.0s
087°37.5'E	27°12.21'N	25°05.91'N	26°08.87'N	00:57:47	17.8	75.6	222.0	03m55.4s
087°45.0'E	27°14.41'N	25°08.07'N	26°11.05'N	00:57:51	17.9	75.7	222.1	03m55.8s
087°52.5'E	27°16.60'N	25°10.23'N	26°13.22'N	00:57:56	18.1	75.8	222.2	03m56.1s
088°00.0'E	27°18.78'N	25°12.37'N	26°15.39'N	00:58:00	18.2	75.8	222.3	03m56.5s
088°07.5'E	27°20.95'N	25°14.52'N	26°17.55'N	00:58:05	18.3	75.9	222.5	03m56.9s
088°15.0'E	27°23.12'N	25°16.65'N	26°19.70'N	00:58:10	18.5	76.0	222.6	03m57.3s
088°22.5'E	27°25.29'N	25°18.78'N	26°21.85'N	00:58:14	18.6	76.0	222.7	03m57.7s
088°30.0'E	27°27.44'N	25°20.91'N	26°23.99'N	00:58:19	18.7	76.1	222.8	03m58.1s
088°37.5'E	27°29.59'N	25°23.02'N	26°26.12'N	00:58:23	18.9	76.2	222.9	03m58.5s
088°45.0'E	27°31.73'N	25°25.13'N	26°28.25'N	00:58:28	19.0	76.2	223.0	03m58.9s
088°52.5'E	27°33.87'N	25°27.24'N	26°30.37'N	00:58:33	19.1	76.3	223.2	03m59.2s

TABLE 7 - EXTENDED VERSION

MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern Limit	Southern Limit	Central Line	Universal Time h m s	Sun Alt °	Sun Az. °	Path Width km	Central Durat.
089°00.0'E	27°36.00'N	25°29.33'N	26°32.48'N	00:58:38	19.3	76.4	223.3	03m59.6s
089°07.5'E	27°38.12'N	25°31.42'N	26°34.59'N	00:58:42	19.4	76.4	223.4	04m00.0s
089°15.0'E	27°40.24'N	25°33.51'N	26°36.69'N	00:58:47	19.5	76.5	223.5	04m00.4s
089°22.5'E	27°42.35'N	25°35.59'N	26°38.78'N	00:58:52	19.7	76.6	223.6	04m00.8s
089°30.0'E	27°44.45'N	25°37.66'N	26°40.87'N	00:58:57	19.8	76.6	223.7	04m01.2s
089°37.5'E	27°46.54'N	25°39.72'N	26°42.95'N	00:59:02	19.9	76.7	223.8	04m01.6s
089°45.0'E	27°48.63'N	25°41.78'N	26°45.02'N	00:59:07	20.1	76.8	223.9	04m02.0s
089°52.5'E	27°50.71'N	25°43.83'N	26°47.09'N	00:59:12	20.2	76.8	224.1	04m02.4s
090°00.0'E	27°52.79'N	25°45.87'N	26°49.15'N	00:59:17	20.3	76.9	224.2	04m02.8s
090°07.5'E	27°54.86'N	25°47.91'N	26°51.20'N	00:59:22	20.5	77.0	224.3	04m03.2s
090°15.0'E	27°56.92'N	25°49.94'N	26°53.25'N	00:59:27	20.6	77.0	224.4	04m03.6s
090°22.5'E	27°58.97'N	25°51.97'N	26°55.29'N	00:59:32	20.7	77.1	224.5	04m04.0s
090°30.0'E	28°01.02'N	25°53.98'N	26°57.32'N	00:59:37	20.9	77.2	224.6	04m04.4s
090°37.5'E	28°03.06'N	25°55.99'N	26°59.35'N	00:59:43	21.0	77.2	224.7	04m04.8s
090°45.0'E	28°05.09'N	25°58.00'N	27°01.37'N	00:59:48	21.2	77.3	224.9	04m05.2s
090°52.5'E	28°07.11'N	25°59.99'N	27°03.38'N	00:59:53	21.3	77.4	225.0	04m05.6s
091°00.0'E	28°09.13'N	26°01.98'N	27°05.38'N	00:59:59	21.4	77.4	225.1	04m06.0s
091°07.5'E	28°11.14'N	26°03.96'N	27°07.38'N	01:00:04	21.6	77.5	225.2	04m06.4s
091°15.0'E	28°13.15'N	26°05.94'N	27°09.37'N	01:00:09	21.7	77.6	225.3	04m06.8s
091°22.5'E	28°15.15'N	26°07.91'N	27°11.35'N	01:00:15	21.8	77.6	225.4	04m07.2s
091°30.0'E	28°17.14'N	26°09.87'N	27°13.33'N	01:00:20	22.0	77.7	225.5	04m07.6s
091°37.5'E	28°19.12'N	26°11.82'N	27°15.30'N	01:00:26	22.1	77.8	225.6	04m08.0s
091°45.0'E	28°21.09'N	26°13.77'N	27°17.26'N	01:00:31	22.2	77.9	225.8	04m08.4s
091°52.5'E	28°23.06'N	26°15.71'N	27°19.21'N	01:00:37	22.4	77.9	225.9	04m08.8s
092°00.0'E	28°25.02'N	26°17.64'N	27°21.16'N	01:00:42	22.5	78.0	226.0	04m09.2s
092°07.5'E	28°26.98'N	26°19.57'N	27°23.10'N	01:00:48	22.6	78.1	226.1	04m09.6s
092°15.0'E	28°28.92'N	26°21.49'N	27°25.03'N	01:00:54	22.8	78.1	226.2	04m10.0s
092°22.5'E	28°30.86'N	26°23.40'N	27°26.96'N	01:00:59	22.9	78.2	226.3	04m10.4s
092°30.0'E	28°32.79'N	26°25.30'N	27°28.88'N	01:01:05	23.0	78.3	226.4	04m10.9s
092°37.5'E	28°34.71'N	26°27.20'N	27°30.79'N	01:01:11	23.2	78.3	226.5	04m11.3s
092°45.0'E	28°36.63'N	26°29.09'N	27°32.69'N	01:01:17	23.3	78.4	226.6	04m11.7s
092°52.5'E	28°38.54'N	26°30.97'N	27°34.59'N	01:01:22	23.5	78.5	226.8	04m12.1s
093°00.0'E	28°40.44'N	26°32.84'N	27°36.48'N	01:01:28	23.6	78.6	226.9	04m12.5s
093°07.5'E	28°42.33'N	26°34.71'N	27°38.36'N	01:01:34	23.7	78.6	227.0	04m12.9s
093°15.0'E	28°44.22'N	26°36.57'N	27°40.23'N	01:01:40	23.9	78.7	227.1	04m13.3s
093°22.5'E	28°46.10'N	26°38.42'N	27°42.10'N	01:01:46	24.0	78.8	227.2	04m13.7s
093°30.0'E	28°47.97'N	26°40.27'N	27°43.96'N	01:01:52	24.1	78.8	227.3	04m14.1s
093°37.5'E	28°49.83'N	26°42.10'N	27°45.81'N	01:01:58	24.3	78.9	227.4	04m14.6s
093°45.0'E	28°51.69'N	26°43.93'N	27°47.65'N	01:02:04	24.4	79.0	227.5	04m15.0s
093°52.5'E	28°53.54'N	26°45.75'N	27°49.49'N	01:02:10	24.5	79.1	227.6	04m15.4s
094°00.0'E	28°55.38'N	26°47.57'N	27°51.31'N	01:02:16	24.7	79.1	227.7	04m15.8s
094°07.5'E	28°57.21'N	26°49.37'N	27°53.13'N	01:02:23	24.8	79.2	227.9	04m16.2s
094°15.0'E	28°59.03'N	26°51.17'N	27°54.95'N	01:02:29	25.0	79.3	228.0	04m16.6s
094°22.5'E	29°00.85'N	26°52.96'N	27°56.75'N	01:02:35	25.1	79.3	228.1	04m17.1s
094°30.0'E	29°02.66'N	26°54.75'N	27°58.55'N	01:02:41	25.2	79.4	228.2	04m17.5s
094°37.5'E	29°04.46'N	26°56.52'N	28°00.34'N	01:02:48	25.4	79.5	228.3	04m17.9s
094°45.0'E	29°06.25'N	26°58.29'N	28°02.12'N	01:02:54	25.5	79.6	228.4	04m18.3s
094°52.5'E	29°08.04'N	27°00.05'N	28°03.89'N	01:03:00	25.6	79.6	228.5	04m18.7s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
095°00.0'E	29°09.82'N	27°01.81'N	28°05.66'N	01:03:07	25.8	79.7	228.6	04m19.2s
095°07.5'E	29°11.59'N	27°03.55'N	28°07.42'N	01:03:13	25.9	79.8	228.7	04m19.6s
095°15.0'E	29°13.35'N	27°05.29'N	28°09.17'N	01:03:20	26.1	79.9	228.8	04m20.0s
095°22.5'E	29°15.10'N	27°07.02'N	28°10.91'N	01:03:26	26.2	79.9	228.9	04m20.4s
095°30.0'E	29°16.85'N	27°08.74'N	28°12.64'N	01:03:33	26.3	80.0	229.1	04m20.8s
095°37.5'E	29°18.58'N	27°10.45'N	28°14.37'N	01:03:39	26.5	80.1	229.2	04m21.3s
095°45.0'E	29°20.31'N	27°12.16'N	28°16.09'N	01:03:46	26.6	80.2	229.3	04m21.7s
095°52.5'E	29°22.03'N	27°13.85'N	28°17.79'N	01:03:53	26.7	80.2	229.4	04m22.1s
096°00.0'E	29°23.75'N	27°15.54'N	28°19.50'N	01:03:59	26.9	80.3	229.5	04m22.5s
096°07.5'E	29°25.45'N	27°17.22'N	28°21.19'N	01:04:06	27.0	80.4	229.6	04m23.0s
096°15.0'E	29°27.15'N	27°18.90'N	28°22.88'N	01:04:13	27.1	80.5	229.7	04m23.4s
096°22.5'E	29°28.84'N	27°20.56'N	28°24.55'N	01:04:20	27.3	80.5	229.8	04m23.8s
096°30.0'E	29°30.52'N	27°22.22'N	28°26.22'N	01:04:26	27.4	80.6	229.9	04m24.3s
096°37.5'E	29°32.19'N	27°23.86'N	28°27.88'N	01:04:33	27.6	80.7	230.0	04m24.7s
096°45.0'E	29°33.85'N	27°25.51'N	28°29.54'N	01:04:40	27.7	80.8	230.1	04m25.1s
096°52.5'E	29°35.51'N	27°27.14'N	28°31.18'N	01:04:47	27.8	80.8	230.2	04m25.5s
097°00.0'E	29°37.16'N	27°28.76'N	28°32.82'N	01:04:54	28.0	80.9	230.3	04m26.0s
097°07.5'E	29°38.80'N	27°30.38'N	28°34.44'N	01:05:01	28.1	81.0	230.5	04m26.4s
097°15.0'E	29°40.43'N	27°31.98'N	28°36.06'N	01:05:08	28.3	81.1	230.6	04m26.8s
097°22.5'E	29°42.05'N	27°33.58'N	28°37.68'N	01:05:15	28.4	81.2	230.7	04m27.3s
097°30.0'E	29°43.66'N	27°35.17'N	28°39.28'N	01:05:22	28.5	81.2	230.8	04m27.7s
097°37.5'E	29°45.27'N	27°36.76'N	28°40.87'N	01:05:30	28.7	81.3	230.9	04m28.1s
097°45.0'E	29°46.86'N	27°38.33'N	28°42.46'N	01:05:37	28.8	81.4	231.0	04m28.6s
097°52.5'E	29°48.45'N	27°39.89'N	28°44.04'N	01:05:44	28.9	81.5	231.1	04m29.0s
098°00.0'E	29°50.03'N	27°41.45'N	28°45.61'N	01:05:51	29.1	81.5	231.2	04m29.4s
098°07.5'E	29°51.60'N	27°43.00'N	28°47.17'N	01:05:59	29.2	81.6	231.3	04m29.9s
098°15.0'E	29°53.17'N	27°44.54'N	28°48.72'N	01:06:06	29.4	81.7	231.4	04m30.3s
098°22.5'E	29°54.72'N	27°46.07'N	28°50.26'N	01:06:13	29.5	81.8	231.5	04m30.7s
098°30.0'E	29°56.26'N	27°47.59'N	28°51.80'N	01:06:21	29.6	81.9	231.6	04m31.2s
098°37.5'E	29°57.80'N	27°49.11'N	28°53.32'N	01:06:28	29.8	81.9	231.7	04m31.6s
098°45.0'E	29°59.33'N	27°50.61'N	28°54.84'N	01:06:36	29.9	82.0	231.8	04m32.0s
098°52.5'E	30°00.85'N	27°52.11'N	28°56.35'N	01:06:43	30.1	82.1	231.9	04m32.5s
099°00.0'E	30°02.36'N	27°53.60'N	28°57.85'N	01:06:51	30.2	82.2	232.0	04m32.9s
099°07.5'E	30°03.86'N	27°55.08'N	28°59.34'N	01:06:58	30.3	82.2	232.2	04m33.4s
099°15.0'E	30°05.35'N	27°56.55'N	29°00.82'N	01:07:06	30.5	82.3	232.3	04m33.8s
099°22.5'E	30°06.84'N	27°58.01'N	29°02.30'N	01:07:13	30.6	82.4	232.4	04m34.2s
099°30.0'E	30°08.31'N	27°59.46'N	29°03.76'N	01:07:21	30.7	82.5	232.5	04m34.7s
099°37.5'E	30°09.78'N	28°00.91'N	29°05.22'N	01:07:29	30.9	82.6	232.6	04m35.1s
099°45.0'E	30°11.24'N	28°02.34'N	29°06.66'N	01:07:37	31.0	82.6	232.7	04m35.6s
099°52.5'E	30°12.69'N	28°03.77'N	29°08.10'N	01:07:44	31.2	82.7	232.8	04m36.0s
100°00.0'E	30°14.13'N	28°05.19'N	29°09.53'N	01:07:52	31.3	82.8	232.9	04m36.5s
100°07.5'E	30°15.56'N	28°06.59'N	29°10.95'N	01:08:00	31.4	82.9	233.0	04m36.9s
100°15.0'E	30°16.98'N	28°07.99'N	29°12.36'N	01:08:08	31.6	83.0	233.1	04m37.3s
100°22.5'E	30°18.39'N	28°09.39'N	29°13.77'N	01:08:16	31.7	83.1	233.2	04m37.8s
100°30.0'E	30°19.80'N	28°10.77'N	29°15.16'N	01:08:24	31.9	83.1	233.3	04m38.2s
100°37.5'E	30°21.19'N	28°12.14'N	29°16.54'N	01:08:32	32.0	83.2	233.4	04m38.7s
100°45.0'E	30°22.58'N	28°13.50'N	29°17.92'N	01:08:40	32.1	83.3	233.5	04m39.1s
100°52.5'E	30°23.95'N	28°14.86'N	29°19.29'N	01:08:48	32.3	83.4	233.6	04m39.6s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9 \text{ s}$

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
101°00.0'E	30°25.32'N	28°16.20'N	29°20.64'N	01:08:56	32.4	83.5	233.7	04m40.0s
101°07.5'E	30°26.68'N	28°17.54'N	29°21.99'N	01:09:04	32.6	83.5	233.8	04m40.5s
101°15.0'E	30°28.03'N	28°18.87'N	29°23.33'N	01:09:12	32.7	83.6	233.9	04m40.9s
101°22.5'E	30°29.37'N	28°20.18'N	29°24.66'N	01:09:20	32.8	83.7	234.0	04m41.3s
101°30.0'E	30°30.70'N	28°21.49'N	29°25.98'N	01:09:29	33.0	83.8	234.1	04m41.8s
101°37.5'E	30°32.02'N	28°22.79'N	29°27.29'N	01:09:37	33.1	83.9	234.2	04m42.2s
101°45.0'E	30°33.33'N	28°24.08'N	29°28.59'N	01:09:45	33.3	84.0	234.3	04m42.7s
101°52.5'E	30°34.63'N	28°25.36'N	29°29.88'N	01:09:54	33.4	84.0	234.4	04m43.1s
102°00.0'E	30°35.93'N	28°26.63'N	29°31.17'N	01:10:02	33.5	84.1	234.5	04m43.6s
102°07.5'E	30°37.21'N	28°27.89'N	29°32.44'N	01:10:10	33.7	84.2	234.7	04m44.0s
102°15.0'E	30°38.49'N	28°29.15'N	29°33.71'N	01:10:19	33.8	84.3	234.8	04m44.5s
102°22.5'E	30°39.75'N	28°30.39'N	29°34.96'N	01:10:27	34.0	84.4	234.9	04m44.9s
102°30.0'E	30°41.01'N	28°31.62'N	29°36.21'N	01:10:36	34.1	84.5	235.0	04m45.4s
102°37.5'E	30°42.25'N	28°32.85'N	29°37.44'N	01:10:44	34.3	84.5	235.1	04m45.8s
102°45.0'E	30°43.49'N	28°34.06'N	29°38.67'N	01:10:53	34.4	84.6	235.2	04m46.3s
102°52.5'E	30°44.72'N	28°35.27'N	29°39.88'N	01:11:02	34.5	84.7	235.3	04m46.7s
103°00.0'E	30°45.94'N	28°36.46'N	29°41.09'N	01:11:10	34.7	84.8	235.4	04m47.2s
103°07.5'E	30°47.14'N	28°37.65'N	29°42.29'N	01:11:19	34.8	84.9	235.5	04m47.7s
103°15.0'E	30°48.34'N	28°38.82'N	29°43.48'N	01:11:28	35.0	85.0	235.6	04m48.1s
103°22.5'E	30°49.53'N	28°39.99'N	29°44.66'N	01:11:37	35.1	85.0	235.7	04m48.6s
103°30.0'E	30°50.71'N	28°41.15'N	29°45.82'N	01:11:45	35.2	85.1	235.8	04m49.0s
103°37.5'E	30°51.88'N	28°42.29'N	29°46.98'N	01:11:54	35.4	85.2	235.9	04m49.5s
103°45.0'E	30°53.04'N	28°43.43'N	29°48.13'N	01:12:03	35.5	85.3	236.0	04m49.9s
103°52.5'E	30°54.19'N	28°44.56'N	29°49.27'N	01:12:12	35.7	85.4	236.1	04m50.4s
104°00.0'E	30°55.33'N	28°45.67'N	29°50.40'N	01:12:21	35.8	85.5	236.2	04m50.8s
104°07.5'E	30°56.46'N	28°46.78'N	29°51.52'N	01:12:30	36.0	85.6	236.3	04m51.3s
104°15.0'E	30°57.58'N	28°47.88'N	29°52.63'N	01:12:39	36.1	85.7	236.4	04m51.7s
104°22.5'E	30°58.69'N	28°48.97'N	29°53.73'N	01:12:48	36.2	85.7	236.5	04m52.2s
104°30.0'E	30°59.80'N	28°50.05'N	29°54.82'N	01:12:57	36.4	85.8	236.6	04m52.7s
104°37.5'E	31°00.89'N	28°51.11'N	29°55.90'N	01:13:06	36.5	85.9	236.7	04m53.1s
104°45.0'E	31°01.97'N	28°52.17'N	29°56.97'N	01:13:16	36.7	86.0	236.8	04m53.6s
104°52.5'E	31°03.04'N	28°53.22'N	29°58.03'N	01:13:25	36.8	86.1	236.9	04m54.0s
105°00.0'E	31°04.10'N	28°54.26'N	29°59.08'N	01:13:34	36.9	86.2	237.0	04m54.5s
105°07.5'E	31°05.15'N	28°55.29'N	30°00.13'N	01:13:43	37.1	86.3	237.1	04m55.0s
105°15.0'E	31°06.19'N	28°56.30'N	30°01.16'N	01:13:53	37.2	86.4	237.2	04m55.4s
105°22.5'E	31°07.23'N	28°57.31'N	30°02.18'N	01:14:02	37.4	86.4	237.3	04m55.9s
105°30.0'E	31°08.25'N	28°58.31'N	30°03.19'N	01:14:11	37.5	86.5	237.4	04m56.3s
105°37.5'E	31°09.26'N	28°59.30'N	30°04.19'N	01:14:21	37.7	86.6	237.5	04m56.8s
105°45.0'E	31°10.26'N	29°00.27'N	30°05.18'N	01:14:30	37.8	86.7	237.6	04m57.3s
105°52.5'E	31°11.25'N	29°01.24'N	30°06.16'N	01:14:40	37.9	86.8	237.7	04m57.7s
106°00.0'E	31°12.23'N	29°02.20'N	30°07.13'N	01:14:49	38.1	86.9	237.8	04m58.2s
106°07.5'E	31°13.20'N	29°03.14'N	30°08.08'N	01:14:59	38.2	87.0	237.9	04m58.6s
106°15.0'E	31°14.16'N	29°04.08'N	30°09.03'N	01:15:08	38.4	87.1	238.0	04m59.1s
106°22.5'E	31°15.11'N	29°05.00'N	30°09.97'N	01:15:18	38.5	87.2	238.1	04m59.6s
106°30.0'E	31°16.05'N	29°05.92'N	30°10.90'N	01:15:28	38.7	87.2	238.2	05m00.0s
106°37.5'E	31°16.98'N	29°06.82'N	30°11.82'N	01:15:38	38.8	87.3	238.3	05m00.5s
106°45.0'E	31°17.90'N	29°07.72'N	30°12.73'N	01:15:47	39.0	87.4	238.4	05m00.9s
106°52.5'E	31°18.81'N	29°08.60'N	30°13.62'N	01:15:57	39.1	87.5	238.5	05m01.4s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
107°00.0'E	31°19.71'N	29°09.47'N	30°14.51'N	01:16:07	39.2	87.6	238.6	05m01.9s
107°07.5'E	31°20.60'N	29°10.34'N	30°15.39'N	01:16:17	39.4	87.7	238.7	05m02.3s
107°15.0'E	31°21.48'N	29°11.19'N	30°16.25'N	01:16:27	39.5	87.8	238.8	05m02.8s
107°22.5'E	31°22.34'N	29°12.03'N	30°17.11'N	01:16:37	39.7	87.9	238.9	05m03.3s
107°30.0'E	31°23.20'N	29°12.86'N	30°17.95'N	01:16:47	39.8	88.0	239.0	05m03.7s
107°37.5'E	31°24.05'N	29°13.68'N	30°18.78'N	01:16:57	40.0	88.1	239.1	05m04.2s
107°45.0'E	31°24.88'N	29°14.49'N	30°19.61'N	01:17:07	40.1	88.2	239.2	05m04.6s
107°52.5'E	31°25.71'N	29°15.29'N	30°20.42'N	01:17:17	40.2	88.2	239.3	05m05.1s
108°00.0'E	31°26.52'N	29°16.08'N	30°21.22'N	01:17:27	40.4	88.3	239.4	05m05.6s
108°07.5'E	31°27.33'N	29°16.85'N	30°22.01'N	01:17:37	40.5	88.4	239.5	05m06.0s
108°15.0'E	31°28.12'N	29°17.62'N	30°22.79'N	01:17:47	40.7	88.5	239.6	05m06.5s
108°22.5'E	31°28.90'N	29°18.37'N	30°23.56'N	01:17:57	40.8	88.6	239.7	05m07.0s
108°30.0'E	31°29.68'N	29°19.12'N	30°24.32'N	01:18:08	41.0	88.7	239.7	05m07.4s
108°37.5'E	31°30.44'N	29°19.85'N	30°25.07'N	01:18:18	41.1	88.8	239.8	05m07.9s
108°45.0'E	31°31.19'N	29°20.57'N	30°25.81'N	01:18:28	41.3	88.9	239.9	05m08.4s
108°52.5'E	31°31.93'N	29°21.29'N	30°26.53'N	01:18:39	41.4	89.0	240.0	05m08.8s
109°00.0'E	31°32.66'N	29°21.99'N	30°27.25'N	01:18:49	41.6	89.1	240.1	05m09.3s
109°07.5'E	31°33.37'N	29°22.68'N	30°27.95'N	01:19:00	41.7	89.2	240.2	05m09.8s
109°15.0'E	31°34.08'N	29°23.35'N	30°28.65'N	01:19:10	41.8	89.3	240.3	05m10.2s
109°22.5'E	31°34.78'N	29°24.02'N	30°29.33'N	01:19:21	42.0	89.4	240.4	05m10.7s
109°30.0'E	31°35.46'N	29°24.68'N	30°30.00'N	01:19:31	42.1	89.5	240.5	05m11.2s
109°37.5'E	31°36.14'N	29°25.32'N	30°30.66'N	01:19:42	42.3	89.6	240.6	05m11.6s
109°45.0'E	31°36.80'N	29°25.96'N	30°31.31'N	01:19:52	42.4	89.6	240.7	05m12.1s
109°52.5'E	31°37.45'N	29°26.58'N	30°31.95'N	01:20:03	42.6	89.7	240.8	05m12.6s
110°00.0'E	31°38.09'N	29°27.19'N	30°32.58'N	01:20:14	42.7	89.8	240.9	05m13.0s
110°07.5'E	31°38.72'N	29°27.79'N	30°33.19'N	01:20:25	42.9	89.9	241.0	05m13.5s
110°15.0'E	31°39.34'N	29°28.38'N	30°33.80'N	01:20:35	43.0	90.0	241.1	05m14.0s
110°22.5'E	31°39.95'N	29°28.95'N	30°34.39'N	01:20:46	43.2	90.1	241.2	05m14.4s
110°30.0'E	31°40.55'N	29°29.52'N	30°34.97'N	01:20:57	43.3	90.2	241.3	05m14.9s
110°37.5'E	31°41.13'N	29°30.07'N	30°35.54'N	01:21:08	43.5	90.3	241.4	05m15.4s
110°45.0'E	31°41.71'N	29°30.62'N	30°36.10'N	01:21:19	43.6	90.4	241.5	05m15.8s
110°52.5'E	31°42.27'N	29°31.15'N	30°36.65'N	01:21:30	43.7	90.5	241.6	05m16.3s
111°00.0'E	31°42.82'N	29°31.67'N	30°37.19'N	01:21:41	43.9	90.6	241.7	05m16.8s
111°07.5'E	31°43.36'N	29°32.18'N	30°37.71'N	01:21:52	44.0	90.7	241.8	05m17.2s
111°15.0'E	31°43.89'N	29°32.67'N	30°38.22'N	01:22:03	44.2	90.8	241.9	05m17.7s
111°22.5'E	31°44.41'N	29°33.16'N	30°38.73'N	01:22:14	44.3	90.9	242.0	05m18.2s
111°30.0'E	31°44.92'N	29°33.63'N	30°39.22'N	01:22:25	44.5	91.0	242.0	05m18.6s
111°37.5'E	31°45.41'N	29°34.09'N	30°39.70'N	01:22:37	44.6	91.1	242.1	05m19.1s
111°45.0'E	31°45.90'N	29°34.54'N	30°40.16'N	01:22:48	44.8	91.2	242.2	05m19.6s
111°52.5'E	31°46.37'N	29°34.98'N	30°40.62'N	01:22:59	44.9	91.3	242.3	05m20.0s
112°00.0'E	31°46.83'N	29°35.41'N	30°41.06'N	01:23:10	45.1	91.4	242.4	05m20.5s
112°07.5'E	31°47.28'N	29°35.82'N	30°41.50'N	01:23:22	45.2	91.5	242.5	05m21.0s
112°15.0'E	31°47.72'N	29°36.22'N	30°41.92'N	01:23:33	45.4	91.6	242.6	05m21.4s
112°22.5'E	31°48.14'N	29°36.61'N	30°42.33'N	01:23:45	45.5	91.7	242.7	05m21.9s
112°30.0'E	31°48.56'N	29°36.99'N	30°42.72'N	01:23:56	45.7	91.8	242.8	05m22.4s
112°37.5'E	31°48.96'N	29°37.36'N	30°43.11'N	01:24:08	45.8	91.9	242.9	05m22.8s
112°45.0'E	31°49.35'N	29°37.71'N	30°43.48'N	01:24:19	46.0	92.0	243.0	05m23.3s
112°52.5'E	31°49.73'N	29°38.06'N	30°43.84'N	01:24:31	46.1	92.1	243.1	05m23.8s

TABLE 7 - EXTENDED VERSION

MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
113°00.0'E	31°50.10'N	29°38.39'N	30°44.19'N	01:24:42	46.3	92.2	243.2	05m24.2s
113°07.5'E	31°50.45'N	29°38.71'N	30°44.53'N	01:24:54	46.4	92.3	243.3	05m24.7s
113°15.0'E	31°50.80'N	29°39.01'N	30°44.86'N	01:25:06	46.6	92.4	243.4	05m25.2s
113°22.5'E	31°51.13'N	29°39.31'N	30°45.17'N	01:25:17	46.7	92.5	243.4	05m25.6s
113°30.0'E	31°51.45'N	29°39.59'N	30°45.47'N	01:25:29	46.9	92.6	243.5	05m26.1s
113°37.5'E	31°51.76'N	29°39.86'N	30°45.76'N	01:25:41	47.0	92.7	243.6	05m26.6s
113°45.0'E	31°52.05'N	29°40.12'N	30°46.04'N	01:25:53	47.2	92.8	243.7	05m27.0s
113°52.5'E	31°52.34'N	29°40.36'N	30°46.31'N	01:26:05	47.3	92.9	243.8	05m27.5s
114°00.0'E	31°52.61'N	29°40.59'N	30°46.56'N	01:26:17	47.5	93.0	243.9	05m28.0s
114°07.5'E	31°52.87'N	29°40.81'N	30°46.80'N	01:26:29	47.6	93.1	244.0	05m28.4s
114°15.0'E	31°53.12'N	29°41.02'N	30°47.03'N	01:26:41	47.8	93.2	244.1	05m28.9s
114°22.5'E	31°53.36'N	29°41.22'N	30°47.25'N	01:26:53	47.9	93.3	244.2	05m29.4s
114°30.0'E	31°53.58'N	29°41.40'N	30°47.45'N	01:27:05	48.1	93.4	244.3	05m29.8s
114°37.5'E	31°53.79'N	29°41.57'N	30°47.64'N	01:27:17	48.2	93.5	244.4	05m30.3s
114°45.0'E	31°53.99'N	29°41.73'N	30°47.82'N	01:27:29	48.4	93.6	244.5	05m30.7s
114°52.5'E	31°54.18'N	29°41.87'N	30°47.99'N	01:27:41	48.5	93.7	244.5	05m31.2s
115°00.0'E	31°54.35'N	29°42.01'N	30°48.14'N	01:27:53	48.7	93.8	244.6	05m31.7s
115°07.5'E	31°54.52'N	29°42.13'N	30°48.29'N	01:28:06	48.8	93.9	244.7	05m32.1s
115°15.0'E	31°54.67'N	29°42.23'N	30°48.42'N	01:28:18	49.0	94.0	244.8	05m32.6s
115°22.5'E	31°54.81'N	29°42.33'N	30°48.53'N	01:28:30	49.1	94.1	244.9	05m33.1s
115°30.0'E	31°54.93'N	29°42.41'N	30°48.64'N	01:28:43	49.3	94.2	245.0	05m33.5s
115°37.5'E	31°55.05'N	29°42.48'N	30°48.73'N	01:28:55	49.4	94.4	245.1	05m34.0s
115°45.0'E	31°55.15'N	29°42.53'N	30°48.81'N	01:29:08	49.6	94.5	245.2	05m34.4s
115°52.5'E	31°55.24'N	29°42.58'N	30°48.87'N	01:29:20	49.7	94.6	245.3	05m34.9s
116°00.0'E	31°55.31'N	29°42.61'N	30°48.93'N	01:29:33	49.9	94.7	245.4	05m35.4s
116°07.5'E	31°55.38'N	29°42.62'N	30°48.97'N	01:29:45	50.0	94.8	245.4	05m35.8s
116°15.0'E	31°55.43'N	29°42.63'N	30°49.00'N	01:29:58	50.2	94.9	245.5	05m36.3s
116°22.5'E	31°55.47'N	29°42.62'N	30°49.01'N	01:30:11	50.3	95.0	245.6	05m36.7s
116°30.0'E	31°55.49'N	29°42.60'N	30°49.02'N	01:30:23	50.5	95.1	245.7	05m37.2s
116°37.5'E	31°55.50'N	29°42.56'N	30°49.01'N	01:30:36	50.6	95.2	245.8	05m37.7s
116°45.0'E	31°55.50'N	29°42.51'N	30°48.98'N	01:30:49	50.8	95.3	245.9	05m38.1s
116°52.5'E	31°55.49'N	29°42.45'N	30°48.95'N	01:31:02	50.9	95.4	246.0	05m38.6s
117°00.0'E	31°55.47'N	29°42.38'N	30°48.90'N	01:31:15	51.1	95.5	246.1	05m39.0s
117°07.5'E	31°55.43'N	29°42.29'N	30°48.83'N	01:31:28	51.2	95.6	246.2	05m39.5s
117°15.0'E	31°55.38'N	29°42.19'N	30°48.76'N	01:31:41	51.4	95.8	246.2	05m40.0s
117°22.5'E	31°55.31'N	29°42.07'N	30°48.67'N	01:31:54	51.5	95.9	246.3	05m40.4s
117°30.0'E	31°55.24'N	29°41.94'N	30°48.57'N	01:32:07	51.7	96.0	246.4	05m40.9s
117°37.5'E	31°55.15'N	29°41.80'N	30°48.45'N	01:32:20	51.8	96.1	246.5	05m41.3s
117°45.0'E	31°55.05'N	29°41.65'N	30°48.33'N	01:32:33	52.0	96.2	246.6	05m41.8s
117°52.5'E	31°54.93'N	29°41.48'N	30°48.19'N	01:32:46	52.2	96.3	246.7	05m42.2s
118°00.0'E	31°54.80'N	29°41.30'N	30°48.03'N	01:32:59	52.3	96.4	246.8	05m42.7s
118°07.5'E	31°54.66'N	29°41.10'N	30°47.86'N	01:33:12	52.5	96.5	246.9	05m43.1s
118°15.0'E	31°54.50'N	29°40.89'N	30°47.68'N	01:33:26	52.6	96.6	246.9	05m43.6s
118°22.5'E	31°54.34'N	29°40.67'N	30°47.49'N	01:33:39	52.8	96.7	247.0	05m44.0s
118°30.0'E	31°54.16'N	29°40.43'N	30°47.28'N	01:33:52	52.9	96.9	247.1	05m44.5s
118°37.5'E	31°53.96'N	29°40.18'N	30°47.06'N	01:34:06	53.1	97.0	247.2	05m44.9s
118°45.0'E	31°53.75'N	29°39.92'N	30°46.82'N	01:34:19	53.2	97.1	247.3	05m45.4s
118°52.5'E	31°53.53'N	29°39.64'N	30°46.57'N	01:34:33	53.4	97.2	247.4	05m45.8s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9 \text{ s}$

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
119°00.0'E	31°53.30'N	29°39.35'N	30°46.31'N	01:34:46	53.5	97.3	247.5	05m46.3s
119°07.5'E	31°53.05'N	29°39.04'N	30°46.03'N	01:35:00	53.7	97.4	247.5	05m46.7s
119°15.0'E	31°52.79'N	29°38.72'N	30°45.74'N	01:35:13	53.9	97.5	247.6	05m47.2s
119°22.5'E	31°52.51'N	29°38.39'N	30°45.44'N	01:35:27	54.0	97.7	247.7	05m47.6s
119°30.0'E	31°52.22'N	29°38.04'N	30°45.12'N	01:35:41	54.2	97.8	247.8	05m48.1s
119°37.5'E	31°51.92'N	29°37.68'N	30°44.79'N	01:35:54	54.3	97.9	247.9	05m48.5s
119°45.0'E	31°51.61'N	29°37.30'N	30°44.45'N	01:36:08	54.5	98.0	248.0	05m49.0s
119°52.5'E	31°51.28'N	29°36.91'N	30°44.09'N	01:36:22	54.6	98.1	248.1	05m49.4s
120°00.0'E	31°50.94'N	29°36.50'N	30°43.71'N	01:36:36	54.8	98.2	248.1	05m49.9s
120°07.5'E	31°50.58'N	29°36.08'N	30°43.33'N	01:36:50	54.9	98.4	248.2	05m50.3s
120°15.0'E	31°50.21'N	29°35.65'N	30°42.93'N	01:37:04	55.1	98.5	248.3	05m50.8s
120°22.5'E	31°49.83'N	29°35.20'N	30°42.51'N	01:37:18	55.3	98.6	248.4	05m51.2s
120°30.0'E	31°49.43'N	29°34.74'N	30°42.08'N	01:37:32	55.4	98.7	248.5	05m51.6s
120°37.5'E	31°49.02'N	29°34.26'N	30°41.64'N	01:37:46	55.6	98.8	248.6	05m52.1s
120°45.0'E	31°48.59'N	29°33.77'N	30°41.18'N	01:38:00	55.7	98.9	248.6	05m52.5s
120°52.5'E	31°48.15'N	29°33.27'N	30°40.71'N	01:38:14	55.9	99.1	248.7	05m53.0s
121°00.0'E	31°47.70'N	29°32.75'N	30°40.22'N	01:38:28	56.0	99.2	248.8	05m53.4s
121°07.5'E	31°47.23'N	29°32.21'N	30°39.72'N	01:38:42	56.2	99.3	248.9	05m53.8s
121°15.0'E	31°46.75'N	29°31.66'N	30°39.21'N	01:38:57	56.4	99.4	249.0	05m54.3s
121°22.5'E	31°46.26'N	29°31.10'N	30°38.68'N	01:39:11	56.5	99.5	249.1	05m54.7s
121°30.0'E	31°45.75'N	29°30.52'N	30°38.14'N	01:39:25	56.7	99.7	249.1	05m55.1s
121°37.5'E	31°45.22'N	29°29.93'N	30°37.58'N	01:39:40	56.8	99.8	249.2	05m55.6s
121°45.0'E	31°44.68'N	29°29.32'N	30°37.01'N	01:39:54	57.0	99.9	249.3	05m56.0s
121°52.5'E	31°44.13'N	29°28.69'N	30°36.42'N	01:40:09	57.2	100.0	249.4	05m56.4s
122°00.0'E	31°43.57'N	29°28.06'N	30°35.82'N	01:40:23	57.3	100.1	249.5	05m56.9s
122°07.5'E	31°42.99'N	29°27.40'N	30°35.20'N	01:40:38	57.5	100.3	249.5	05m57.3s
122°15.0'E	31°42.39'N	29°26.73'N	30°34.57'N	01:40:52	57.6	100.4	249.6	05m57.7s
122°22.5'E	31°41.78'N	29°26.05'N	30°33.92'N	01:41:07	57.8	100.5	249.7	05m58.1s
122°30.0'E	31°41.16'N	29°25.35'N	30°33.26'N	01:41:22	58.0	100.6	249.8	05m58.6s
122°37.5'E	31°40.52'N	29°24.64'N	30°32.59'N	01:41:36	58.1	100.8	249.9	05m59.0s
122°45.0'E	31°39.87'N	29°23.91'N	30°31.90'N	01:41:51	58.3	100.9	249.9	05m59.4s
122°52.5'E	31°39.20'N	29°23.17'N	30°31.19'N	01:42:06	58.4	101.0	250.0	05m59.8s
123°00.0'E	31°38.52'N	29°22.41'N	30°30.47'N	01:42:21	58.6	101.1	250.1	06m00.3s
123°07.5'E	31°37.82'N	29°21.63'N	30°29.74'N	01:42:36	58.8	101.3	250.2	06m00.7s
123°15.0'E	31°37.11'N	29°20.84'N	30°28.99'N	01:42:51	58.9	101.4	250.3	06m01.1s
123°22.5'E	31°36.38'N	29°20.03'N	30°28.22'N	01:43:06	59.1	101.5	250.3	06m01.5s
123°30.0'E	31°35.64'N	29°19.21'N	30°27.44'N	01:43:21	59.2	101.7	250.4	06m01.9s
123°37.5'E	31°34.89'N	29°18.38'N	30°26.65'N	01:43:36	59.4	101.8	250.5	06m02.4s
123°45.0'E	31°34.11'N	29°17.52'N	30°25.84'N	01:43:51	59.6	101.9	250.6	06m02.8s
123°52.5'E	31°33.33'N	29°16.66'N	30°25.01'N	01:44:06	59.7	102.0	250.6	06m03.2s
124°00.0'E	31°32.53'N	29°15.77'N	30°24.17'N	01:44:21	59.9	102.2	250.7	06m03.6s
124°07.5'E	31°31.71'N	29°14.87'N	30°23.31'N	01:44:37	60.0	102.3	250.8	06m04.0s
124°15.0'E	31°30.88'N	29°13.96'N	30°22.44'N	01:44:52	60.2	102.4	250.9	06m04.4s
124°22.5'E	31°30.04'N	29°13.03'N	30°21.55'N	01:45:07	60.4	102.6	251.0	06m04.8s
124°30.0'E	31°29.18'N	29°12.08'N	30°20.65'N	01:45:23	60.5	102.7	251.0	06m05.2s
124°37.5'E	31°28.30'N	29°11.12'N	30°19.73'N	01:45:38	60.7	102.8	251.1	06m05.7s
124°45.0'E	31°27.41'N	29°10.14'N	30°18.80'N	01:45:54	60.9	103.0	251.2	06m06.1s
124°52.5'E	31°26.50'N	29°09.14'N	30°17.85'N	01:46:09	61.0	103.1	251.3	06m06.5s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
125°00.0'E	31°25.58'N	29°08.13'N	30°16.88'N	01:46:25	61.2	103.2	251.3	06m06.9s
125°07.5'E	31°24.64'N	29°07.11'N	30°15.90'N	01:46:40	61.3	103.4	251.4	06m07.3s
125°15.0'E	31°23.69'N	29°06.06'N	30°14.91'N	01:46:56	61.5	103.5	251.5	06m07.7s
125°22.5'E	31°22.72'N	29°05.00'N	30°13.89'N	01:47:12	61.7	103.6	251.6	06m08.1s
125°30.0'E	31°21.74'N	29°03.93'N	30°12.86'N	01:47:28	61.8	103.8	251.6	06m08.5s
125°37.5'E	31°20.74'N	29°02.83'N	30°11.82'N	01:47:43	62.0	103.9	251.7	06m08.9s
125°45.0'E	31°19.73'N	29°01.73'N	30°10.76'N	01:47:59	62.2	104.1	251.8	06m09.2s
125°52.5'E	31°18.70'N	29°00.60'N	30°09.68'N	01:48:15	62.3	104.2	251.9	06m09.6s
126°00.0'E	31°17.65'N	28°59.46'N	30°08.59'N	01:48:31	62.5	104.3	251.9	06m10.0s
126°07.5'E	31°16.59'N	28°58.30'N	30°07.48'N	01:48:47	62.7	104.5	252.0	06m10.4s
126°15.0'E	31°15.51'N	28°57.13'N	30°06.36'N	01:49:03	62.8	104.6	252.1	06m10.8s
126°22.5'E	31°14.42'N	28°55.94'N	30°05.21'N	01:49:19	63.0	104.8	252.1	06m11.2s
126°30.0'E	31°13.31'N	28°54.73'N	30°04.06'N	01:49:35	63.2	104.9	252.2	06m11.6s
126°37.5'E	31°12.18'N	28°53.50'N	30°02.88'N	01:49:51	63.3	105.1	252.3	06m12.0s
126°45.0'E	31°11.04'N	28°52.26'N	30°01.69'N	01:50:08	63.5	105.2	252.4	06m12.3s
126°52.5'E	31°09.88'N	28°51.00'N	30°00.49'N	01:50:24	63.7	105.3	252.4	06m12.7s
127°00.0'E	31°08.71'N	28°49.73'N	29°59.26'N	01:50:40	63.8	105.5	252.5	06m13.1s
127°07.5'E	31°07.52'N	28°48.44'N	29°58.02'N	01:50:56	64.0	105.6	252.6	06m13.5s
127°15.0'E	31°06.32'N	28°47.13'N	29°56.77'N	01:51:13	64.2	105.8	252.6	06m13.9s
127°22.5'E	31°05.10'N	28°45.80'N	29°55.49'N	01:51:29	64.3	105.9	252.7	06m14.2s
127°30.0'E	31°03.86'N	28°44.46'N	29°54.20'N	01:51:46	64.5	106.1	252.8	06m14.6s
127°37.5'E	31°02.60'N	28°43.10'N	29°52.90'N	01:52:02	64.7	106.2	252.8	06m15.0s
127°45.0'E	31°01.33'N	28°41.72'N	29°51.58'N	01:52:19	64.8	106.4	252.9	06m15.3s
127°52.5'E	31°00.05'N	28°40.33'N	29°50.24'N	01:52:35	65.0	106.5	253.0	06m15.7s
128°00.0'E	30°58.74'N	28°38.91'N	29°48.88'N	01:52:52	65.2	106.7	253.1	06m16.1s
128°07.5'E	30°57.42'N	28°37.48'N	29°47.50'N	01:53:09	65.3	106.9	253.1	06m16.4s
128°15.0'E	30°56.09'N	28°36.04'N	29°46.11'N	01:53:26	65.5	107.0	253.2	06m16.8s
128°22.5'E	30°54.73'N	28°34.57'N	29°44.71'N	01:53:42	65.7	107.2	253.3	06m17.1s
128°30.0'E	30°53.36'N	28°33.09'N	29°43.28'N	01:53:59	65.8	107.3	253.3	06m17.5s
128°37.5'E	30°51.98'N	28°31.59'N	29°41.84'N	01:54:16	66.0	107.5	253.4	06m17.9s
128°45.0'E	30°50.57'N	28°30.07'N	29°40.38'N	01:54:33	66.2	107.6	253.5	06m18.2s
128°52.5'E	30°49.15'N	28°28.54'N	29°38.90'N	01:54:50	66.3	107.8	253.5	06m18.6s
129°00.0'E	30°47.72'N	28°26.99'N	29°37.41'N	01:55:07	66.5	108.0	253.6	06m18.9s
129°07.5'E	30°46.26'N	28°25.41'N	29°35.90'N	01:55:24	66.7	108.1	253.7	06m19.2s
129°15.0'E	30°44.79'N	28°23.83'N	29°34.37'N	01:55:41	66.9	108.3	253.7	06m19.6s
129°22.5'E	30°43.31'N	28°22.22'N	29°32.82'N	01:55:58	67.0	108.5	253.8	06m19.9s
129°30.0'E	30°41.80'N	28°20.60'N	29°31.26'N	01:56:16	67.2	108.6	253.8	06m20.3s
129°37.5'E	30°40.28'N	28°18.95'N	29°29.68'N	01:56:33	67.4	108.8	253.9	06m20.6s
129°45.0'E	30°38.74'N	28°17.29'N	29°28.08'N	01:56:50	67.5	109.0	254.0	06m20.9s
129°52.5'E	30°37.18'N	28°15.61'N	29°26.46'N	01:57:08	67.7	109.1	254.0	06m21.3s
130°00.0'E	30°35.61'N	28°13.92'N	29°24.83'N	01:57:25	67.9	109.3	254.1	06m21.6s
130°07.5'E	30°34.02'N	28°12.20'N	29°23.18'N	01:57:42	68.1	109.5	254.2	06m21.9s
130°15.0'E	30°32.41'N	28°10.47'N	29°21.51'N	01:58:00	68.2	109.7	254.2	06m22.3s
130°22.5'E	30°30.79'N	28°08.72'N	29°19.82'N	01:58:17	68.4	109.8	254.3	06m22.6s
130°30.0'E	30°29.14'N	28°06.95'N	29°18.12'N	01:58:35	68.6	110.0	254.3	06m22.9s
130°37.5'E	30°27.48'N	28°05.16'N	29°16.39'N	01:58:53	68.7	110.2	254.4	06m23.2s
130°45.0'E	30°25.80'N	28°03.35'N	29°14.65'N	01:59:10	68.9	110.4	254.5	06m23.6s
130°52.5'E	30°24.11'N	28°01.53'N	29°12.89'N	01:59:28	69.1	110.6	254.5	06m23.9s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
131°00.0'E	30°22.39'N	27°59.68'N	29°11.11'N	01:59:46	69.3	110.8	254.6	06m24.2s
131°07.5'E	30°20.66'N	27°57.82'N	29°09.32'N	02:00:04	69.4	110.9	254.7	06m24.5s
131°15.0'E	30°18.91'N	27°55.94'N	29°07.50'N	02:00:22	69.6	111.1	254.7	06m24.8s
131°22.5'E	30°17.15'N	27°54.03'N	29°05.67'N	02:00:40	69.8	111.3	254.8	06m25.1s
131°30.0'E	30°15.36'N	27°52.12'N	29°03.82'N	02:00:58	70.0	111.5	254.8	06m25.4s
131°37.5'E	30°13.56'N	27°50.18'N	29°01.95'N	02:01:16	70.1	111.7	254.9	06m25.7s
131°45.0'E	30°11.74'N	27°48.22'N	29°00.06'N	02:01:34	70.3	111.9	254.9	06m26.0s
131°52.5'E	30°09.90'N	27°46.24'N	28°58.15'N	02:01:52	70.5	112.1	255.0	06m26.3s
132°00.0'E	30°08.04'N	27°44.25'N	28°56.23'N	02:02:10	70.7	112.3	255.1	06m26.6s
132°07.5'E	30°06.17'N	27°42.23'N	28°54.28'N	02:02:28	70.8	112.5	255.1	06m26.9s
132°15.0'E	30°04.27'N	27°40.20'N	28°52.32'N	02:02:46	71.0	112.7	255.2	06m27.2s
132°22.5'E	30°02.36'N	27°38.14'N	28°50.34'N	02:03:05	71.2	112.9	255.2	06m27.5s
132°30.0'E	30°00.43'N	27°36.07'N	28°48.34'N	02:03:23	71.4	113.1	255.3	06m27.7s
132°37.5'E	29°58.48'N	27°33.98'N	28°46.32'N	02:03:42	71.5	113.3	255.3	06m28.0s
132°45.0'E	29°56.52'N	27°31.87'N	28°44.28'N	02:04:00	71.7	113.6	255.4	06m28.3s
132°52.5'E	29°54.53'N	27°29.74'N	28°42.23'N	02:04:18	71.9	113.8	255.4	06m28.6s
133°00.0'E	29°52.53'N	27°27.59'N	28°40.15'N	02:04:37	72.1	114.0	255.5	06m28.8s
133°07.5'E	29°50.51'N	27°25.42'N	28°38.05'N	02:04:56	72.2	114.2	255.6	06m29.1s
133°15.0'E	29°48.46'N	27°23.23'N	28°35.94'N	02:05:14	72.4	114.5	255.6	06m29.4s
133°22.5'E	29°46.40'N	27°21.02'N	28°33.81'N	02:05:33	72.6	114.7	255.7	06m29.6s
133°30.0'E	29°44.33'N	27°18.79'N	28°31.65'N	02:05:52	72.8	114.9	255.7	06m29.9s
133°37.5'E	29°42.23'N	27°16.54'N	28°29.48'N	02:06:11	72.9	115.1	255.8	06m30.2s
133°45.0'E	29°40.11'N	27°14.27'N	28°27.29'N	02:06:29	73.1	115.4	255.8	06m30.4s
133°52.5'E	29°37.98'N	27°11.98'N	28°25.08'N	02:06:48	73.3	115.6	255.9	06m30.7s
134°00.0'E	29°35.82'N	27°09.67'N	28°22.85'N	02:07:07	73.5	115.9	255.9	06m30.9s
134°07.5'E	29°33.65'N	27°07.34'N	28°20.60'N	02:07:26	73.7	116.1	256.0	06m31.2s
134°15.0'E	29°31.46'N	27°05.00'N	28°18.33'N	02:07:45	73.8	116.4	256.0	06m31.4s
134°22.5'E	29°29.24'N	27°02.63'N	28°16.04'N	02:08:04	74.0	116.6	256.1	06m31.6s
134°30.0'E	29°27.01'N	27°00.24'N	28°13.73'N	02:08:24	74.2	116.9	256.1	06m31.9s
134°37.5'E	29°24.76'N	26°57.83'N	28°11.40'N	02:08:43	74.4	117.2	256.2	06m32.1s
134°45.0'E	29°22.49'N	26°55.40'N	28°09.05'N	02:09:02	74.5	117.4	256.2	06m32.3s
134°52.5'E	29°20.21'N	26°52.95'N	28°06.68'N	02:09:21	74.7	117.7	256.3	06m32.6s
135°00.0'E	29°17.90'N	26°50.48'N	28°04.30'N	02:09:41	74.9	118.0	256.3	06m32.8s
135°07.5'E	29°15.57'N	26°47.99'N	28°01.89'N	02:10:00	75.1	118.3	256.3	06m33.0s
135°15.0'E	29°13.22'N	26°45.47'N	27°59.46'N	02:10:19	75.3	118.6	256.4	06m33.2s
135°22.5'E	29°10.86'N	26°42.94'N	27°57.01'N	02:10:39	75.4	118.9	256.4	06m33.4s
135°30.0'E	29°08.47'N	26°40.39'N	27°54.54'N	02:10:58	75.6	119.2	256.5	06m33.6s
135°37.5'E	29°06.06'N	26°37.82'N	27°52.05'N	02:11:18	75.8	119.5	256.5	06m33.9s
135°45.0'E	29°03.64'N	26°35.22'N	27°49.54'N	02:11:38	76.0	119.8	256.6	06m34.1s
135°52.5'E	29°01.19'N	26°32.61'N	27°47.01'N	02:11:57	76.2	120.1	256.6	06m34.3s
136°00.0'E	28°58.73'N	26°29.97'N	27°44.47'N	02:12:17	76.3	120.4	256.7	06m34.5s
136°07.5'E	28°56.24'N	26°27.31'N	27°41.90'N	02:12:37	76.5	120.7	256.7	06m34.6s
136°15.0'E	28°53.73'N	26°24.64'N	27°39.30'N	02:12:57	76.7	121.1	256.7	06m34.8s
136°22.5'E	28°51.21'N	26°21.94'N	27°36.69'N	02:13:17	76.9	121.4	256.8	06m35.0s
136°30.0'E	28°48.66'N	26°19.22'N	27°34.06'N	02:13:36	77.1	121.8	256.8	06m35.2s
136°37.5'E	28°46.10'N	26°16.48'N	27°31.41'N	02:13:56	77.2	122.1	256.9	06m35.4s
136°45.0'E	28°43.51'N	26°13.71'N	27°28.74'N	02:14:16	77.4	122.5	256.9	06m35.6s
136°52.5'E	28°40.91'N	26°10.93'N	27°26.04'N	02:14:37	77.6	122.9	257.0	06m35.7s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9 \text{ s}$

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
137°00.0'E	28°38.28'N	26°08.13'N	27°23.33'N	02:14:57	77.8	123.3	257.0	06m35.9s
137°07.5'E	28°35.63'N	26°05.30'N	27°20.59'N	02:15:17	78.0	123.7	257.0	06m36.1s
137°15.0'E	28°32.97'N	26°02.45'N	27°17.84'N	02:15:37	78.1	124.1	257.1	06m36.2s
137°22.5'E	28°30.28'N	25°59.59'N	27°15.06'N	02:15:57	78.3	124.5	257.1	06m36.4s
137°30.0'E	28°27.57'N	25°56.70'N	27°12.26'N	02:16:18	78.5	124.9	257.1	06m36.5s
137°37.5'E	28°24.84'N	25°53.78'N	27°09.44'N	02:16:38	78.7	125.4	257.2	06m36.7s
137°45.0'E	28°22.09'N	25°50.85'N	27°06.60'N	02:16:58	78.9	125.8	257.2	06m36.8s
137°52.5'E	28°19.32'N	25°47.90'N	27°03.74'N	02:17:19	79.0	126.3	257.3	06m37.0s
138°00.0'E	28°16.53'N	25°44.92'N	27°00.86'N	02:17:39	79.2	126.7	257.3	06m37.1s
138°07.5'E	28°13.72'N	25°41.92'N	26°57.96'N	02:18:00	79.4	127.2	257.3	06m37.3s
138°15.0'E	28°10.89'N	25°38.90'N	26°55.03'N	02:18:20	79.6	127.7	257.4	06m37.4s
138°22.5'E	28°08.04'N	25°35.86'N	26°52.09'N	02:18:41	79.7	128.3	257.4	06m37.5s
138°30.0'E	28°05.16'N	25°32.80'N	26°49.12'N	02:19:02	79.9	128.8	257.4	06m37.6s
138°37.5'E	28°02.27'N	25°29.72'N	26°46.13'N	02:19:23	80.1	129.3	257.5	06m37.8s
138°45.0'E	27°59.35'N	25°26.61'N	26°43.12'N	02:19:43	80.3	129.9	257.5	06m37.9s
138°52.5'E	27°56.42'N	25°23.48'N	26°40.09'N	02:20:04	80.5	130.5	257.5	06m38.0s
139°00.0'E	27°53.46'N	25°20.33'N	26°37.04'N	02:20:25	80.6	131.1	257.6	06m38.1s
139°07.5'E	27°50.48'N	25°17.16'N	26°33.96'N	02:20:46	80.8	131.7	257.6	06m38.2s
139°15.0'E	27°47.48'N	25°13.97'N	26°30.86'N	02:21:07	81.0	132.4	257.6	06m38.3s
139°22.5'E	27°44.46'N	25°10.75'N	26°27.75'N	02:21:28	81.2	133.1	257.7	06m38.4s
139°30.0'E	27°41.42'N	25°07.51'N	26°24.61'N	02:21:49	81.3	133.8	257.7	06m38.5s
139°37.5'E	27°38.35'N	25°04.25'N	26°21.45'N	02:22:10	81.5	134.5	257.7	06m38.6s
139°45.0'E	27°35.27'N	25°00.97'N	26°18.26'N	02:22:31	81.7	135.2	257.7	06m38.7s
139°52.5'E	27°32.16'N	24°57.66'N	26°15.06'N	02:22:53	81.9	136.0	257.8	06m38.7s
140°00.0'E	27°29.03'N	24°54.34'N	26°11.83'N	02:23:14	82.0	136.8	257.8	06m38.8s
140°07.5'E	27°25.88'N	24°50.99'N	26°08.58'N	02:23:35	82.2	137.7	257.8	06m38.9s
140°15.0'E	27°22.71'N	24°47.62'N	26°05.31'N	02:23:56	82.4	138.6	257.9	06m39.0s
140°22.5'E	27°19.52'N	24°44.22'N	26°02.02'N	02:24:18	82.5	139.5	257.9	06m39.0s
140°30.0'E	27°16.31'N	24°40.81'N	25°58.71'N	02:24:39	82.7	140.4	257.9	06m39.1s
140°37.5'E	27°13.07'N	24°37.37'N	25°55.37'N	02:25:01	82.9	141.4	257.9	06m39.1s
140°45.0'E	27°09.82'N	24°33.91'N	25°52.01'N	02:25:22	83.0	142.5	258.0	06m39.2s
140°52.5'E	27°06.54'N	24°30.43'N	25°48.63'N	02:25:44	83.2	143.6	258.0	06m39.2s
141°00.0'E	27°03.24'N	24°26.92'N	25°45.23'N	02:26:06	83.3	144.7	258.0	06m39.3s
141°07.5'E	26°59.91'N	24°23.39'N	25°41.80'N	02:26:27	83.5	145.9	258.0	06m39.3s
141°15.0'E	26°56.57'N	24°19.84'N	25°38.36'N	02:26:49	83.7	147.2	258.1	06m39.3s
141°22.5'E	26°53.20'N	24°16.27'N	25°34.89'N	02:27:11	83.8	148.5	258.1	06m39.4s
141°30.0'E	26°49.82'N	24°12.68'N	25°31.40'N	02:27:32	84.0	149.9	258.1	06m39.4s
141°37.5'E	26°46.41'N	24°09.06'N	25°27.88'N	02:27:54	84.1	151.3	258.1	06m39.4s
141°45.0'E	26°42.98'N	24°05.42'N	25°24.35'N	02:28:16	84.3	152.8	258.1	06m39.4s
141°52.5'E	26°39.52'N	24°01.76'N	25°20.79'N	02:28:38	84.4	154.4	258.2	06m39.4s
142°00.0'E	26°36.05'N	23°58.07'N	25°17.21'N	02:29:00	84.5	156.1	258.2	06m39.4s
142°07.5'E	26°32.55'N	23°54.36'N	25°13.61'N	02:29:22	84.7	157.8	258.2	06m39.4s
142°15.0'E	26°29.03'N	23°50.63'N	25°09.98'N	02:29:44	84.8	159.7	258.2	06m39.4s
142°22.5'E	26°25.49'N	23°46.88'N	25°06.34'N	02:30:06	84.9	161.6	258.2	06m39.4s
142°30.0'E	26°21.92'N	23°43.11'N	25°02.67'N	02:30:28	85.0	163.6	258.3	06m39.4s
142°37.5'E	26°18.34'N	23°39.31'N	24°58.98'N	02:30:51	85.1	165.7	258.3	06m39.4s
142°45.0'E	26°14.73'N	23°35.49'N	24°55.26'N	02:31:13	85.2	167.9	258.3	06m39.4s
142°52.5'E	26°11.10'N	23°31.64'N	24°51.53'N	02:31:35	85.3	170.2	258.3	06m39.4s

TABLE 7 - EXTENDED VERSION

MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
143°00.0'E	26°07.45'N	23°27.78'N	24°47.77'N	02:31:57	85.4	172.6	258.3	06m39.3s
143°07.5'E	26°03.77'N	23°23.89'N	24°43.98'N	02:32:20	85.5	175.1	258.3	06m39.3s
143°15.0'E	26°00.08'N	23°19.98'N	24°40.18'N	02:32:42	85.6	177.7	258.4	06m39.2s
143°22.5'E	25°56.36'N	23°16.05'N	24°36.35'N	02:33:05	85.7	180.4	258.4	06m39.2s
143°30.0'E	25°52.62'N	23°12.09'N	24°32.51'N	02:33:27	85.7	183.1	258.4	06m39.2s
143°37.5'E	25°48.85'N	23°08.11'N	24°28.63'N	02:33:50	85.8	186.0	258.4	06m39.1s
143°45.0'E	25°45.07'N	23°04.11'N	24°24.74'N	02:34:12	85.8	188.9	258.4	06m39.0s
143°52.5'E	25°41.26'N	23°00.09'N	24°20.83'N	02:34:35	85.8	191.8	258.4	06m39.0s
144°00.0'E	25°37.43'N	22°56.04'N	24°16.89'N	02:34:57	85.9	194.8	258.4	06m38.9s
144°07.5'E	25°33.58'N	22°51.97'N	24°12.93'N	02:35:20	85.9	197.8	258.4	06m38.8s
144°15.0'E	25°29.70'N	22°47.88'N	24°08.94'N	02:35:43	85.9	200.8	258.5	06m38.8s
144°22.5'E	25°25.80'N	22°43.77'N	24°04.94'N	02:36:05	85.8	203.8	258.5	06m38.7s
144°30.0'E	25°21.88'N	22°39.63'N	24°00.91'N	02:36:28	85.8	206.7	258.5	06m38.6s
144°37.5'E	25°17.94'N	22°35.47'N	23°56.86'N	02:36:51	85.8	209.7	258.5	06m38.5s
144°45.0'E	25°13.98'N	22°31.29'N	23°52.78'N	02:37:14	85.7	212.6	258.5	06m38.4s
144°52.5'E	25°09.99'N	22°27.09'N	23°48.69'N	02:37:37	85.7	215.4	258.5	06m38.3s
145°00.0'E	25°05.98'N	22°22.86'N	23°44.57'N	02:38:00	85.6	218.1	258.5	06m38.2s
145°07.5'E	25°01.95'N	22°18.61'N	23°40.43'N	02:38:23	85.5	220.8	258.5	06m38.1s
145°15.0'E	24°57.90'N	22°14.34'N	23°36.27'N	02:38:46	85.5	223.4	258.5	06m38.0s
145°22.5'E	24°53.82'N	22°10.05'N	23°32.08'N	02:39:09	85.4	225.9	258.5	06m37.8s
145°30.0'E	24°49.72'N	22°05.74'N	23°27.87'N	02:39:32	85.3	228.3	258.5	06m37.7s
145°37.5'E	24°45.60'N	22°01.40'N	23°23.64'N	02:39:55	85.2	230.6	258.5	06m37.6s
145°45.0'E	24°41.46'N	21°57.04'N	23°19.39'N	02:40:18	85.0	232.8	258.5	06m37.4s
145°52.5'E	24°37.29'N	21°52.66'N	23°15.12'N	02:40:41	84.9	234.9	258.6	06m37.3s
146°00.0'E	24°33.11'N	21°48.26'N	23°10.82'N	02:41:04	84.8	236.9	258.6	06m37.1s
146°07.5'E	24°28.90'N	21°43.83'N	23°06.50'N	02:41:28	84.7	238.8	258.6	06m37.0s
146°15.0'E	24°24.66'N	21°39.38'N	23°02.16'N	02:41:51	84.5	240.7	258.6	06m36.8s
146°22.5'E	24°20.41'N	21°34.91'N	22°57.80'N	02:42:14	84.4	242.4	258.6	06m36.7s
146°30.0'E	24°16.13'N	21°30.42'N	22°53.41'N	02:42:37	84.2	244.1	258.6	06m36.5s
146°37.5'E	24°11.83'N	21°25.91'N	22°49.01'N	02:43:01	84.1	245.6	258.6	06m36.3s
146°45.0'E	24°07.51'N	21°21.37'N	22°44.58'N	02:43:24	83.9	247.2	258.6	06m36.2s
146°52.5'E	24°03.17'N	21°16.82'N	22°40.13'N	02:43:48	83.7	248.6	258.6	06m36.0s
147°00.0'E	23°58.81'N	21°12.24'N	22°35.65'N	02:44:11	83.6	250.0	258.6	06m35.8s
147°07.5'E	23°54.42'N	21°07.64'N	22°31.16'N	02:44:34	83.4	251.3	258.6	06m35.6s
147°15.0'E	23°50.01'N	21°03.02'N	22°26.64'N	02:44:58	83.2	252.5	258.6	06m35.4s
147°22.5'E	23°45.58'N	20°58.38'N	22°22.11'N	02:45:21	83.1	253.7	258.6	06m35.2s
147°30.0'E	23°41.13'N	20°53.71'N	22°17.54'N	02:45:45	82.9	254.8	258.6	06m35.0s
147°37.5'E	23°36.65'N	20°49.03'N	22°12.96'N	02:46:09	82.7	255.9	258.6	06m34.8s
147°45.0'E	23°32.16'N	20°44.32'N	22°08.36'N	02:46:32	82.5	256.9	258.6	06m34.6s
147°52.5'E	23°27.64'N	20°39.59'N	22°03.74'N	02:46:56	82.3	257.9	258.6	06m34.3s
148°00.0'E	23°23.10'N	20°34.85'N	21°59.09'N	02:47:19	82.1	258.9	258.5	06m34.1s
148°07.5'E	23°18.53'N	20°30.08'N	21°54.42'N	02:47:43	82.0	259.8	258.5	06m33.9s
148°15.0'E	23°13.95'N	20°25.29'N	21°49.73'N	02:48:07	81.8	260.6	258.5	06m33.7s
148°22.5'E	23°09.35'N	20°20.47'N	21°45.02'N	02:48:30	81.6	261.5	258.5	06m33.4s
148°30.0'E	23°04.72'N	20°15.64'N	21°40.29'N	02:48:54	81.4	262.3	258.5	06m33.2s
148°37.5'E	23°00.07'N	20°10.79'N	21°35.54'N	02:49:18	81.2	263.0	258.5	06m32.9s
148°45.0'E	22°55.40'N	20°05.92'N	21°30.76'N	02:49:42	81.0	263.8	258.5	06m32.7s
148°52.5'E	22°50.71'N	20°01.02'N	21°25.97'N	02:50:05	80.8	264.5	258.5	06m32.4s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9 \text{ s}$

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
149°00.0'E	22°46.00'N	19°56.11'N	21°21.15'N	02:50:29	80.6	265.2	258.5	06m32.1s
149°07.5'E	22°41.26'N	19°51.18'N	21°16.32'N	02:50:53	80.4	265.8	258.5	06m31.9s
149°15.0'E	22°36.51'N	19°46.22'N	21°11.46'N	02:51:17	80.2	266.5	258.5	06m31.6s
149°22.5'E	22°31.73'N	19°41.25'N	21°06.58'N	02:51:41	80.0	267.1	258.5	06m31.3s
149°30.0'E	22°26.94'N	19°36.26'N	21°01.69'N	02:52:04	79.8	267.7	258.5	06m31.0s
149°37.5'E	22°22.12'N	19°31.24'N	20°56.77'N	02:52:28	79.6	268.2	258.4	06m30.7s
149°45.0'E	22°17.28'N	19°26.21'N	20°51.83'N	02:52:52	79.4	268.8	258.4	06m30.4s
149°52.5'E	22°12.42'N	19°21.16'N	20°46.87'N	02:53:16	79.1	269.3	258.4	06m30.1s
150°00.0'E	22°07.54'N	19°16.09'N	20°41.89'N	02:53:40	78.9	269.8	258.4	06m29.8s
150°07.5'E	22°02.64'N	19°10.99'N	20°36.89'N	02:54:04	78.7	270.3	258.4	06m29.5s
150°15.0'E	21°57.72'N	19°05.88'N	20°31.87'N	02:54:28	78.5	270.8	258.4	06m29.2s
150°22.5'E	21°52.78'N	19°00.75'N	20°26.84'N	02:54:52	78.3	271.3	258.4	06m28.9s
150°30.0'E	21°47.81'N	18°55.61'N	20°21.78'N	02:55:16	78.1	271.7	258.4	06m28.6s
150°37.5'E	21°42.83'N	18°50.44'N	20°16.70'N	02:55:40	77.9	272.2	258.3	06m28.2s
150°45.0'E	21°37.83'N	18°45.25'N	20°11.60'N	02:56:04	77.7	272.6	258.3	06m27.9s
150°52.5'E	21°32.81'N	18°40.05'N	20°06.49'N	02:56:28	77.4	273.0	258.3	06m27.6s
151°00.0'E	21°27.76'N	18°34.83'N	20°01.35'N	02:56:52	77.2	273.4	258.3	06m27.2s
151°07.5'E	21°22.70'N	18°29.59'N	19°56.20'N	02:57:16	77.0	273.8	258.3	06m26.9s
151°15.0'E	21°17.62'N	18°24.33'N	19°51.02'N	02:57:40	76.8	274.2	258.3	06m26.5s
151°22.5'E	21°12.52'N	18°19.06'N	19°45.83'N	02:58:04	76.6	274.6	258.2	06m26.2s
151°30.0'E	21°07.40'N	18°13.76'N	19°40.62'N	02:58:28	76.4	274.9	258.2	06m25.8s
151°37.5'E	21°02.26'N	18°08.45'N	19°35.39'N	02:58:52	76.1	275.3	258.2	06m25.4s
151°45.0'E	20°57.10'N	18°03.12'N	19°30.14'N	02:59:16	75.9	275.6	258.2	06m25.1s
151°52.5'E	20°51.92'N	17°57.78'N	19°24.88'N	02:59:40	75.7	276.0	258.2	06m24.7s
152°00.0'E	20°46.72'N	17°52.41'N	19°19.59'N	03:00:04	75.5	276.3	258.1	06m24.3s
152°07.5'E	20°41.51'N	17°47.04'N	19°14.29'N	03:00:28	75.3	276.6	258.1	06m23.9s
152°15.0'E	20°36.27'N	17°41.64'N	19°08.97'N	03:00:52	75.0	276.9	258.1	06m23.6s
152°22.5'E	20°31.02'N	17°36.23'N	19°03.63'N	03:01:16	74.8	277.2	258.1	06m23.2s
152°30.0'E	20°25.74'N	17°30.80'N	18°58.28'N	03:01:39	74.6	277.5	258.0	06m22.8s
152°37.5'E	20°20.45'N	17°25.35'N	18°52.91'N	03:02:03	74.4	277.8	258.0	06m22.4s
152°45.0'E	20°15.14'N	17°19.89'N	18°47.52'N	03:02:27	74.2	278.1	258.0	06m22.0s
152°52.5'E	20°09.82'N	17°14.41'N	18°42.11'N	03:02:51	73.9	278.4	258.0	06m21.5s
153°00.0'E	20°04.47'N	17°08.92'N	18°36.69'N	03:03:15	73.7	278.7	257.9	06m21.1s
153°07.5'E	19°59.11'N	17°03.41'N	18°31.25'N	03:03:39	73.5	278.9	257.9	06m20.7s
153°15.0'E	19°53.73'N	16°57.89'N	18°25.79'N	03:04:03	73.3	279.2	257.9	06m20.3s
153°22.5'E	19°48.33'N	16°52.35'N	18°20.32'N	03:04:27	73.0	279.4	257.9	06m19.9s
153°30.0'E	19°42.92'N	16°46.80'N	18°14.83'N	03:04:51	72.8	279.7	257.8	06m19.4s
153°37.5'E	19°37.49'N	16°41.23'N	18°09.33'N	03:05:15	72.6	279.9	257.8	06m19.0s
153°45.0'E	19°32.04'N	16°35.65'N	18°03.81'N	03:05:39	72.4	280.2	257.8	06m18.6s
153°52.5'E	19°26.57'N	16°30.05'N	17°58.27'N	03:06:03	72.1	280.4	257.8	06m18.1s
154°00.0'E	19°21.09'N	16°24.44'N	17°52.72'N	03:06:27	71.9	280.6	257.7	06m17.7s
154°07.5'E	19°15.59'N	16°18.82'N	17°47.15'N	03:06:50	71.7	280.9	257.7	06m17.2s
154°15.0'E	19°10.08'N	16°13.18'N	17°41.57'N	03:07:14	71.4	281.1	257.7	06m16.8s
154°22.5'E	19°04.55'N	16°07.53'N	17°35.98'N	03:07:38	71.2	281.3	257.6	06m16.3s
154°30.0'E	18°59.00'N	16°01.86'N	17°30.36'N	03:08:02	71.0	281.5	257.6	06m15.8s
154°37.5'E	18°53.44'N	15°56.18'N	17°24.74'N	03:08:26	70.8	281.7	257.6	06m15.4s
154°45.0'E	18°47.86'N	15°50.49'N	17°19.10'N	03:08:49	70.5	281.9	257.5	06m14.9s
154°52.5'E	18°42.27'N	15°44.79'N	17°13.45'N	03:09:13	70.3	282.1	257.5	06m14.4s

TABLE 7 - EXTENDED VERSION

MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
155°00.0'E	18°36.66'N	15°39.07'N	17°07.78'N	03:09:37	70.1	282.3	257.5	06m14.0s
155°07.5'E	18°31.03'N	15°33.35'N	17°02.10'N	03:10:00	69.8	282.5	257.4	06m13.5s
155°15.0'E	18°25.40'N	15°27.61'N	16°56.40'N	03:10:24	69.6	282.7	257.4	06m13.0s
155°22.5'E	18°19.74'N	15°21.85'N	16°50.70'N	03:10:48	69.4	282.9	257.4	06m12.5s
155°30.0'E	18°14.08'N	15°16.09'N	16°44.98'N	03:11:11	69.2	283.1	257.3	06m12.0s
155°37.5'E	18°08.39'N	15°10.32'N	16°39.24'N	03:11:35	68.9	283.2	257.3	06m11.5s
155°45.0'E	18°02.70'N	15°04.53'N	16°33.50'N	03:11:58	68.7	283.4	257.2	06m11.0s
155°52.5'E	17°56.99'N	14°58.73'N	16°27.74'N	03:12:22	68.5	283.6	257.2	06m10.5s
156°00.0'E	17°51.27'N	14°52.93'N	16°21.97'N	03:12:45	68.2	283.8	257.2	06m10.0s
156°07.5'E	17°45.53'N	14°47.11'N	16°16.19'N	03:13:09	68.0	283.9	257.1	06m09.5s
156°15.0'E	17°39.78'N	14°41.28'N	16°10.39'N	03:13:32	67.8	284.1	257.1	06m09.0s
156°22.5'E	17°34.02'N	14°35.44'N	16°04.59'N	03:13:56	67.5	284.3	257.0	06m08.5s
156°30.0'E	17°28.24'N	14°29.60'N	15°58.77'N	03:14:19	67.3	284.4	257.0	06m07.9s
156°37.5'E	17°22.46'N	14°23.74'N	15°52.94'N	03:14:42	67.1	284.6	256.9	06m07.4s
156°45.0'E	17°16.66'N	14°17.87'N	15°47.10'N	03:15:06	66.8	284.7	256.9	06m06.9s
156°52.5'E	17°10.84'N	14°12.00'N	15°41.25'N	03:15:29	66.6	284.9	256.9	06m06.4s
157°00.0'E	17°05.02'N	14°06.12'N	15°35.39'N	03:15:52	66.4	285.0	256.8	06m05.8s
157°07.5'E	16°59.18'N	14°00.22'N	15°29.52'N	03:16:15	66.2	285.2	256.8	06m05.3s
157°15.0'E	16°53.34'N	13°54.32'N	15°23.64'N	03:16:38	65.9	285.3	256.7	06m04.8s
157°22.5'E	16°47.48'N	13°48.41'N	15°17.75'N	03:17:01	65.7	285.5	256.7	06m04.2s
157°30.0'E	16°41.61'N	13°42.50'N	15°11.86'N	03:17:24	65.5	285.6	256.6	06m03.7s
157°37.5'E	16°35.73'N	13°36.57'N	15°05.95'N	03:17:47	65.2	285.7	256.6	06m03.1s
157°45.0'E	16°29.84'N	13°30.64'N	15°00.03'N	03:18:10	65.0	285.9	256.5	06m02.6s
157°52.5'E	16°23.93'N	13°24.70'N	14°54.10'N	03:18:33	64.8	286.0	256.5	06m02.0s
158°00.0'E	16°18.02'N	13°18.75'N	14°48.17'N	03:18:56	64.5	286.2	256.4	06m01.5s
158°07.5'E	16°12.10'N	13°12.80'N	14°42.23'N	03:19:19	64.3	286.3	256.4	06m00.9s
158°15.0'E	16°06.17'N	13°06.84'N	14°36.28'N	03:19:42	64.1	286.4	256.3	06m00.3s
158°22.5'E	16°00.23'N	13°00.88'N	14°30.32'N	03:20:04	63.8	286.5	256.3	05m59.8s
158°30.0'E	15°54.28'N	12°54.91'N	14°24.35'N	03:20:27	63.6	286.7	256.2	05m59.2s
158°37.5'E	15°48.32'N	12°48.93'N	14°18.38'N	03:20:50	63.4	286.8	256.2	05m58.6s
158°45.0'E	15°42.35'N	12°42.95'N	14°12.40'N	03:21:12	63.1	286.9	256.1	05m58.1s
158°52.5'E	15°36.38'N	12°36.96'N	14°06.41'N	03:21:35	62.9	287.0	256.0	05m57.5s
159°00.0'E	15°30.39'N	12°30.97'N	14°00.42'N	03:21:57	62.7	287.1	256.0	05m56.9s
159°07.5'E	15°24.40'N	12°24.97'N	13°54.42'N	03:22:20	62.4	287.3	255.9	05m56.4s
159°15.0'E	15°18.40'N	12°18.97'N	13°48.41'N	03:22:42	62.2	287.4	255.9	05m55.8s
159°22.5'E	15°12.39'N	12°12.96'N	13°42.40'N	03:23:04	62.0	287.5	255.8	05m55.2s
159°30.0'E	15°06.38'N	12°06.95'N	13°36.38'N	03:23:27	61.7	287.6	255.7	05m54.6s
159°37.5'E	15°00.36'N	12°00.94'N	13°30.35'N	03:23:49	61.5	287.7	255.7	05m54.0s
159°45.0'E	14°54.33'N	11°54.92'N	13°24.33'N	03:24:11	61.3	287.8	255.6	05m53.4s
159°52.5'E	14°48.29'N	11°48.90'N	13°18.29'N	03:24:33	61.1	287.9	255.6	05m52.8s
160°00.0'E	14°42.25'N	11°42.87'N	13°12.25'N	03:24:55	60.8	288.0	255.5	05m52.3s
160°07.5'E	14°36.20'N	11°36.85'N	13°06.21'N	03:25:17	60.6	288.1	255.4	05m51.7s
160°15.0'E	14°30.15'N	11°30.82'N	13°00.16'N	03:25:39	60.4	288.2	255.4	05m51.1s
160°22.5'E	14°24.09'N	11°24.78'N	12°54.11'N	03:26:01	60.1	288.3	255.3	05m50.5s
160°30.0'E	14°18.02'N	11°18.75'N	12°48.06'N	03:26:22	59.9	288.4	255.2	05m49.9s
160°37.5'E	14°11.95'N	11°12.71'N	12°42.00'N	03:26:44	59.7	288.5	255.2	05m49.3s
160°45.0'E	14°05.88'N	11°06.68'N	12°35.94'N	03:27:06	59.4	288.6	255.1	05m48.7s
160°52.5'E	13°59.80'N	11°00.64'N	12°29.87'N	03:27:27	59.2	288.7	255.0	05m48.1s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9 \text{ s}$

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
161°00.0'E	13°53.72'N	10°54.59'N	12°23.80'N	03:27:49	59.0	288.8	255.0	05m47.5s
161°07.5'E	13°47.63'N	10°48.55'N	12°17.73'N	03:28:10	58.7	288.9	254.9	05m46.8s
161°15.0'E	13°41.53'N	10°42.51'N	12°11.66'N	03:28:32	58.5	289.0	254.8	05m46.2s
161°22.5'E	13°35.44'N	10°36.47'N	12°05.58'N	03:28:53	58.3	289.1	254.7	05m45.6s
161°30.0'E	13°29.34'N	10°30.42'N	11°59.51'N	03:29:14	58.0	289.2	254.7	05m45.0s
161°37.5'E	13°23.23'N	10°24.38'N	11°53.43'N	03:29:35	57.8	289.3	254.6	05m44.4s
161°45.0'E	13°17.13'N	10°18.33'N	11°47.35'N	03:29:57	57.6	289.3	254.5	05m43.8s
161°52.5'E	13°11.02'N	10°12.29'N	11°41.27'N	03:30:18	57.4	289.4	254.4	05m43.2s
162°00.0'E	13°04.91'N	10°06.24'N	11°35.18'N	03:30:39	57.1	289.5	254.4	05m42.6s
162°07.5'E	12°58.79'N	10°00.20'N	11°29.10'N	03:30:59	56.9	289.6	254.3	05m41.9s
162°15.0'E	12°52.68'N	09°54.16'N	11°23.02'N	03:31:20	56.7	289.7	254.2	05m41.3s
162°22.5'E	12°46.56'N	09°48.12'N	11°16.93'N	03:31:41	56.4	289.8	254.1	05m40.7s
162°30.0'E	12°40.44'N	09°42.08'N	11°10.85'N	03:32:02	56.2	289.8	254.1	05m40.1s
162°37.5'E	12°34.32'N	09°36.04'N	11°04.76'N	03:32:22	56.0	289.9	254.0	05m39.5s
162°45.0'E	12°28.20'N	09°30.00'N	10°58.68'N	03:32:43	55.8	290.0	253.9	05m38.8s
162°52.5'E	12°22.07'N	09°23.97'N	10°52.60'N	03:33:03	55.5	290.1	253.8	05m38.2s
163°00.0'E	12°15.95'N	09°17.94'N	10°46.51'N	03:33:24	55.3	290.1	253.7	05m37.6s
163°07.5'E	12°09.83'N	09°11.91'N	10°40.43'N	03:33:44	55.1	290.2	253.6	05m37.0s
163°15.0'E	12°03.70'N	09°05.88'N	10°34.35'N	03:34:04	54.8	290.3	253.6	05m36.3s
163°22.5'E	11°57.58'N	08°59.85'N	10°28.27'N	03:34:24	54.6	290.4	253.5	05m35.7s
163°30.0'E	11°51.45'N	08°53.83'N	10°22.19'N	03:34:44	54.4	290.4	253.4	05m35.1s
163°37.5'E	11°45.33'N	08°47.81'N	10°16.12'N	03:35:04	54.2	290.5	253.3	05m34.4s
163°45.0'E	11°39.20'N	08°41.80'N	10°10.04'N	03:35:24	53.9	290.6	253.2	05m33.8s
163°52.5'E	11°33.08'N	08°35.79'N	10°03.97'N	03:35:44	53.7	290.6	253.1	05m33.2s
164°00.0'E	11°26.96'N	08°29.78'N	09°57.90'N	03:36:04	53.5	290.7	253.0	05m32.6s
164°07.5'E	11°20.84'N	08°23.77'N	09°51.84'N	03:36:24	53.2	290.8	252.9	05m31.9s
164°15.0'E	11°14.72'N	08°17.77'N	09°45.77'N	03:36:43	53.0	290.8	252.8	05m31.3s
164°22.5'E	11°08.60'N	08°11.78'N	09°39.71'N	03:37:03	52.8	290.9	252.7	05m30.7s
164°30.0'E	11°02.49'N	08°05.78'N	09°33.66'N	03:37:22	52.6	291.0	252.7	05m30.0s
164°37.5'E	10°56.37'N	07°59.80'N	09°27.60'N	03:37:41	52.3	291.0	252.6	05m29.4s
164°45.0'E	10°50.26'N	07°53.82'N	09°21.55'N	03:38:01	52.1	291.1	252.5	05m28.8s
164°52.5'E	10°44.15'N	07°47.84'N	09°15.50'N	03:38:20	51.9	291.1	252.4	05m28.1s
165°00.0'E	10°38.05'N	07°41.87'N	09°09.46'N	03:38:39	51.7	291.2	252.3	05m27.5s
165°07.5'E	10°31.94'N	07°35.90'N	09°03.42'N	03:38:58	51.4	291.3	252.2	05m26.9s
165°15.0'E	10°25.84'N	07°29.94'N	08°57.39'N	03:39:17	51.2	291.3	252.1	05m26.2s
165°22.5'E	10°19.74'N	07°23.98'N	08°51.36'N	03:39:36	51.0	291.4	252.0	05m25.6s
165°30.0'E	10°13.65'N	07°18.03'N	08°45.33'N	03:39:55	50.8	291.4	251.9	05m25.0s
165°37.5'E	10°07.56'N	07°12.09'N	08°39.31'N	03:40:13	50.6	291.5	251.8	05m24.3s
165°45.0'E	10°01.48'N	07°06.15'N	08°33.30'N	03:40:32	50.3	291.5	251.7	05m23.7s
165°52.5'E	09°55.39'N	07°00.22'N	08°27.29'N	03:40:50	50.1	291.6	251.6	05m23.1s
166°00.0'E	09°49.32'N	06°54.29'N	08°21.28'N	03:41:09	49.9	291.6	251.5	05m22.4s
166°07.5'E	09°43.24'N	06°48.37'N	08°15.28'N	03:41:27	49.7	291.7	251.4	05m21.8s
166°15.0'E	09°37.17'N	06°42.46'N	08°09.29'N	03:41:45	49.4	291.7	251.2	05m21.2s
166°22.5'E	09°31.11'N	06°36.55'N	08°03.30'N	03:42:04	49.2	291.8	251.1	05m20.5s
166°30.0'E	09°25.05'N	06°30.65'N	07°57.32'N	03:42:22	49.0	291.8	251.0	05m19.9s
166°37.5'E	09°19.00'N	06°24.76'N	07°51.34'N	03:42:40	48.8	291.9	250.9	05m19.3s
166°45.0'E	09°12.95'N	06°18.88'N	07°45.38'N	03:42:57	48.6	291.9	250.8	05m18.6s
166°52.5'E	09°06.90'N	06°13.00'N	07°39.41'N	03:43:15	48.3	292.0	250.7	05m18.0s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9 \text{ s}$

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
167°00.0'E	09°00.87'N	06°07.13'N	07°33.46'N	03:43:33	48.1	292.0	250.6	05m17.4s
167°07.5'E	08°54.84'N	06°01.27'N	07°27.51'N	03:43:51	47.9	292.1	250.5	05m16.7s
167°15.0'E	08°48.81'N	05°55.42'N	07°21.57'N	03:44:08	47.7	292.1	250.4	05m16.1s
167°22.5'E	08°42.79'N	05°49.57'N	07°15.63'N	03:44:26	47.5	292.2	250.2	05m15.5s
167°30.0'E	08°36.78'N	05°43.74'N	07°09.70'N	03:44:43	47.2	292.2	250.1	05m14.9s
167°37.5'E	08°30.77'N	05°37.91'N	07°03.78'N	03:45:00	47.0	292.3	250.0	05m14.2s
167°45.0'E	08°24.77'N	05°32.09'N	06°57.87'N	03:45:18	46.8	292.3	249.9	05m13.6s
167°52.5'E	08°18.78'N	05°26.27'N	06°51.97'N	03:45:35	46.6	292.3	249.8	05m13.0s
168°00.0'E	08°12.79'N	05°20.47'N	06°46.07'N	03:45:52	46.4	292.4	249.7	05m12.3s
168°07.5'E	08°06.81'N	05°14.68'N	06°40.18'N	03:46:09	46.1	292.4	249.5	05m11.7s
168°15.0'E	08°00.84'N	05°08.89'N	06°34.30'N	03:46:26	45.9	292.5	249.4	05m11.1s
168°22.5'E	07°54.87'N	05°03.11'N	06°28.43'N	03:46:42	45.7	292.5	249.3	05m10.5s
168°30.0'E	07°48.92'N	04°57.35'N	06°22.56'N	03:46:59	45.5	292.5	249.2	05m09.8s
168°37.5'E	07°42.97'N	04°51.59'N	06°16.71'N	03:47:16	45.3	292.6	249.1	05m09.2s
168°45.0'E	07°37.03'N	04°45.84'N	06°10.86'N	03:47:32	45.1	292.6	248.9	05m08.6s
168°52.5'E	07°31.09'N	04°40.10'N	06°05.02'N	03:47:48	44.9	292.7	248.8	05m08.0s
169°00.0'E	07°25.17'N	04°34.37'N	05°59.19'N	03:48:05	44.6	292.7	248.7	05m07.3s
169°07.5'E	07°19.25'N	04°28.65'N	05°53.37'N	03:48:21	44.4	292.7	248.6	05m06.7s
169°15.0'E	07°13.34'N	04°22.93'N	05°47.56'N	03:48:37	44.2	292.8	248.4	05m06.1s
169°22.5'E	07°07.44'N	04°17.23'N	05°41.76'N	03:48:53	44.0	292.8	248.3	05m05.5s
169°30.0'E	07°01.55'N	04°11.54'N	05°35.96'N	03:49:09	43.8	292.8	248.2	05m04.9s
169°37.5'E	06°55.66'N	04°05.86'N	05°30.18'N	03:49:25	43.6	292.9	248.0	05m04.2s
169°45.0'E	06°49.79'N	04°00.19'N	05°24.41'N	03:49:41	43.4	292.9	247.9	05m03.6s
169°52.5'E	06°43.92'N	03°54.53'N	05°18.64'N	03:49:56	43.1	292.9	247.8	05m03.0s
170°00.0'E	06°38.07'N	03°48.88'N	05°12.89'N	03:50:12	42.9	293.0	247.7	05m02.4s
170°07.5'E	06°32.22'N	03°43.24'N	05°07.14'N	03:50:27	42.7	293.0	247.5	05m01.8s
170°15.0'E	06°26.38'N	03°37.61'N	05°01.41'N	03:50:43	42.5	293.0	247.4	05m01.2s
170°22.5'E	06°20.55'N	03°31.99'N	04°55.68'N	03:50:58	42.3	293.0	247.3	05m00.5s
170°30.0'E	06°14.74'N	03°26.38'N	04°49.97'N	03:51:13	42.1	293.1	247.1	04m59.9s
170°37.5'E	06°08.93'N	03°20.78'N	04°44.26'N	03:51:29	41.9	293.1	247.0	04m59.3s
170°45.0'E	06°03.13'N	03°15.19'N	04°38.57'N	03:51:44	41.7	293.1	246.9	04m58.7s
170°52.5'E	05°57.34'N	03°09.61'N	04°32.88'N	03:51:59	41.5	293.2	246.7	04m58.1s
171°00.0'E	05°51.56'N	03°04.05'N	04°27.21'N	03:52:13	41.3	293.2	246.6	04m57.5s
171°07.5'E	05°45.79'N	02°58.49'N	04°21.55'N	03:52:28	41.0	293.2	246.4	04m56.9s
171°15.0'E	05°40.03'N	02°52.95'N	04°15.90'N	03:52:43	40.8	293.2	246.3	04m56.3s
171°22.5'E	05°34.28'N	02°47.42'N	04°10.26'N	03:52:58	40.6	293.3	246.2	04m55.7s
171°30.0'E	05°28.54'N	02°41.90'N	04°04.63'N	03:53:12	40.4	293.3	246.0	04m55.1s
171°37.5'E	05°22.81'N	02°36.39'N	03°59.01'N	03:53:27	40.2	293.3	245.9	04m54.5s
171°45.0'E	05°17.10'N	02°30.89'N	03°53.40'N	03:53:41	40.0	293.3	245.7	04m53.9s
171°52.5'E	05°11.39'N	02°25.40'N	03°47.80'N	03:53:55	39.8	293.4	245.6	04m53.3s
172°00.0'E	05°05.69'N	02°19.92'N	03°42.21'N	03:54:09	39.6	293.4	245.5	04m52.7s
172°07.5'E	05°00.01'N	02°14.46'N	03°36.64'N	03:54:23	39.4	293.4	245.3	04m52.1s
172°15.0'E	04°54.33'N	02°09.01'N	03°31.08'N	03:54:37	39.2	293.4	245.2	04m51.5s
172°22.5'E	04°48.67'N	02°03.57'N	03°25.52'N	03:54:51	39.0	293.4	245.0	04m50.9s
172°30.0'E	04°43.02'N	01°58.14'N	03°19.98'N	03:55:05	38.8	293.5	244.9	04m50.3s
172°37.5'E	04°37.38'N	01°52.72'N	03°14.45'N	03:55:19	38.6	293.5	244.7	04m49.7s
172°45.0'E	04°31.75'N	01°47.31'N	03°08.93'N	03:55:32	38.4	293.5	244.6	04m49.1s
172°52.5'E	04°26.13'N	01°41.92'N	03°03.43'N	03:55:46	38.2	293.5	244.4	04m48.5s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
173°00.0'E	04°20.52'N	01°36.54'N	02°57.93'N	03:56:00	38.0	293.5	244.3	04m47.9s
173°07.5'E	04°14.92'N	01°31.17'N	02°52.45'N	03:56:13	37.8	293.6	244.1	04m47.3s
173°15.0'E	04°09.34'N	01°25.81'N	02°46.98'N	03:56:26	37.6	293.6	244.0	04m46.8s
173°22.5'E	04°03.77'N	01°20.46'N	02°41.52'N	03:56:39	37.4	293.6	243.8	04m46.2s
173°30.0'E	03°58.20'N	01°15.13'N	02°36.07'N	03:56:53	37.2	293.6	243.7	04m45.6s
173°37.5'E	03°52.66'N	01°09.81'N	02°30.64'N	03:57:06	37.0	293.6	243.5	04m45.0s
173°45.0'E	03°47.12'N	01°04.50'N	02°25.21'N	03:57:18	36.8	293.6	243.4	04m44.4s
173°52.5'E	03°41.59'N	00°59.20'N	02°19.80'N	03:57:31	36.6	293.7	243.2	04m43.8s
174°00.0'E	03°36.08'N	00°53.91'N	02°14.40'N	03:57:44	36.4	293.7	243.1	04m43.3s
174°07.5'E	03°30.57'N	00°48.64'N	02°09.02'N	03:57:57	36.2	293.7	242.9	04m42.7s
174°15.0'E	03°25.08'N	00°43.38'N	02°03.64'N	03:58:09	36.0	293.7	242.8	04m42.1s
174°22.5'E	03°19.61'N	00°38.13'N	01°58.28'N	03:58:22	35.8	293.7	242.6	04m41.5s
174°30.0'E	03°14.14'N	00°32.89'N	01°52.93'N	03:58:34	35.6	293.7	242.5	04m41.0s
174°37.5'E	03°08.69'N	00°27.67'N	01°47.59'N	03:58:47	35.4	293.7	242.3	04m40.4s
174°45.0'E	03°03.24'N	00°22.46'N	01°42.26'N	03:58:59	35.2	293.8	242.2	04m39.8s
174°52.5'E	02°57.81'N	00°17.26'N	01°36.95'N	03:59:11	35.0	293.8	242.0	04m39.3s
175°00.0'E	02°52.40'N	00°12.07'N	01°31.65'N	03:59:23	34.8	293.8	241.8	04m38.7s
175°07.5'E	02°46.99'N	00°06.90'N	01°26.36'N	03:59:35	34.6	293.8	241.7	04m38.1s
175°15.0'E	02°41.60'N	00°01.74'N	01°21.08'N	03:59:47	34.4	293.8	241.5	04m37.6s
175°22.5'E	02°36.22'N	00°03.41'S	01°15.82'N	03:59:59	34.2	293.8	241.4	04m37.0s
175°30.0'E	02°30.85'N	00°08.55'S	01°10.57'N	04:00:11	34.0	293.8	241.2	04m36.4s
175°37.5'E	02°25.50'N	00°13.67'S	01°05.33'N	04:00:22	33.8	293.8	241.0	04m35.9s
175°45.0'E	02°20.15'N	00°18.78'S	01°00.10'N	04:00:34	33.6	293.8	240.9	04m35.3s
175°52.5'E	02°14.82'N	00°23.88'S	00°54.89'N	04:00:46	33.4	293.9	240.7	04m34.8s
176°00.0'E	02°09.50'N	00°28.97'S	00°49.69'N	04:00:57	33.2	293.9	240.6	04m34.2s
176°07.5'E	02°04.20'N	00°34.04'S	00°44.50'N	04:01:08	33.0	293.9	240.4	04m33.7s
176°15.0'E	01°58.91'N	00°39.10'S	00°39.32'N	04:01:20	32.8	293.9	240.2	04m33.1s
176°22.5'E	01°53.63'N	00°44.15'S	00°34.16'N	04:01:31	32.7	293.9	240.1	04m32.6s
176°30.0'E	01°48.36'N	00°49.18'S	00°29.01'N	04:01:42	32.5	293.9	239.9	04m32.0s
176°37.5'E	01°43.11'N	00°54.21'S	00°23.87'N	04:01:53	32.3	293.9	239.7	04m31.5s
176°45.0'E	01°37.86'N	00°59.21'S	00°18.75'N	04:02:04	32.1	293.9	239.6	04m30.9s
176°52.5'E	01°32.64'N	01°04.21'S	00°13.64'N	04:02:15	31.9	293.9	239.4	04m30.4s
177°00.0'E	01°27.42'N	01°09.20'S	00°08.54'N	04:02:26	31.7	293.9	239.3	04m29.8s
177°07.5'E	01°22.22'N	01°14.17'S	00°03.45'N	04:02:36	31.5	293.9	239.1	04m29.3s
177°15.0'E	01°17.03'N	01°19.13'S	00°01.62'S	04:02:47	31.3	293.9	238.9	04m28.7s
177°22.5'E	01°11.85'N	01°24.07'S	00°06.68'S	04:02:57	31.1	293.9	238.8	04m28.2s
177°30.0'E	01°06.69'N	01°29.00'S	00°11.73'S	04:03:08	30.9	293.9	238.6	04m27.7s
177°37.5'E	01°01.53'N	01°33.92'S	00°16.76'S	04:03:18	30.8	293.9	238.4	04m27.1s
177°45.0'E	00°56.40'N	01°38.83'S	00°21.78'S	04:03:29	30.6	293.9	238.3	04m26.6s
177°52.5'E	00°51.27'N	01°43.73'S	00°26.79'S	04:03:39	30.4	293.9	238.1	04m26.1s
178°00.0'E	00°46.16'N	01°48.61'S	00°31.79'S	04:03:49	30.2	294.0	237.9	04m25.5s
178°07.5'E	00°41.06'N	01°53.48'S	00°36.77'S	04:03:59	30.0	294.0	237.8	04m25.0s
178°15.0'E	00°35.97'N	01°58.33'S	00°41.74'S	04:04:09	29.8	294.0	237.6	04m24.5s
178°22.5'E	00°30.90'N	02°03.18'S	00°46.70'S	04:04:19	29.6	294.0	237.4	04m24.0s
178°30.0'E	00°25.84'N	02°08.01'S	00°51.64'S	04:04:29	29.5	294.0	237.3	04m23.4s
178°37.5'E	00°20.79'N	02°12.82'S	00°56.57'S	04:04:39	29.3	294.0	237.1	04m22.9s
178°45.0'E	00°15.76'N	02°17.63'S	01°01.49'S	04:04:48	29.1	294.0	236.9	04m22.4s
178°52.5'E	00°10.73'N	02°22.42'S	01°06.40'S	04:04:58	28.9	294.0	236.7	04m21.9s

TABLE 7 - EXTENDED VERSION

MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
179°00.0'E	00°05.73'N	02°27.20'S	01°11.29'S	04:05:07	28.7	294.0	236.6	04m21.3s
179°07.5'E	00°00.73'N	02°31.96'S	01°16.17'S	04:05:17	28.5	294.0	236.4	04m20.8s
179°15.0'E	00°04.25'S	02°36.72'S	01°21.03'S	04:05:26	28.4	294.0	236.2	04m20.3s
179°22.5'E	00°09.22'S	02°41.46'S	01°25.89'S	04:05:36	28.2	294.0	236.1	04m19.8s
179°30.0'E	00°14.18'S	02°46.19'S	01°30.73'S	04:05:45	28.0	294.0	235.9	04m19.3s
179°37.5'E	00°19.12'S	02°50.90'S	01°35.55'S	04:05:54	27.8	294.0	235.7	04m18.8s
179°45.0'E	00°24.05'S	02°55.60'S	01°40.37'S	04:06:03	27.6	294.0	235.5	04m18.3s
179°52.5'E	00°28.96'S	03°00.29'S	01°45.17'S	04:06:12	27.4	294.0	235.4	04m17.8s
180°00.0'E	00°33.87'S	03°04.97'S	01°49.96'S	04:06:21	27.3	294.0	235.2	04m17.3s
179°52.5'W	00°38.76'S	03°09.63'S	01°54.73'S	04:06:30	27.1	294.0	235.0	04m16.7s
179°45.0'W	00°43.64'S	03°14.28'S	01°59.50'S	04:06:39	26.9	294.0	234.9	04m16.2s
179°37.5'W	00°48.50'S	03°18.92'S	02°04.25'S	04:06:48	26.7	294.0	234.7	04m15.7s
179°30.0'W	00°53.35'S	03°23.55'S	02°08.98'S	04:06:56	26.5	294.0	234.5	04m15.2s
179°22.5'W	00°58.19'S	03°28.16'S	02°13.71'S	04:07:05	26.4	294.0	234.3	04m14.7s
179°15.0'W	01°03.01'S	03°32.76'S	02°18.42'S	04:07:13	26.2	293.9	234.2	04m14.2s
179°07.5'W	01°07.82'S	03°37.35'S	02°23.12'S	04:07:22	26.0	293.9	234.0	04m13.8s
179°00.0'W	01°12.62'S	03°41.92'S	02°27.80'S	04:07:30	25.8	293.9	233.8	04m13.3s
178°52.5'W	01°17.41'S	03°46.49'S	02°32.47'S	04:07:38	25.7	293.9	233.6	04m12.8s
178°45.0'W	01°22.18'S	03°51.03'S	02°37.13'S	04:07:47	25.5	293.9	233.5	04m12.3s
178°37.5'W	01°26.94'S	03°55.57'S	02°41.78'S	04:07:55	25.3	293.9	233.3	04m11.8s
178°30.0'W	01°31.69'S	04°00.09'S	02°46.41'S	04:08:03	25.1	293.9	233.1	04m11.3s
178°22.5'W	01°36.42'S	04°04.61'S	02°51.03'S	04:08:11	25.0	293.9	232.9	04m10.8s
178°15.0'W	01°41.14'S	04°09.10'S	02°55.64'S	04:08:19	24.8	293.9	232.8	04m10.3s
178°07.5'W	01°45.85'S	04°13.59'S	03°00.23'S	04:08:27	24.6	293.9	232.6	04m09.8s
178°00.0'W	01°50.54'S	04°18.06'S	03°04.82'S	04:08:35	24.4	293.9	232.4	04m09.4s
177°52.5'W	01°55.22'S	04°22.52'S	03°09.39'S	04:08:42	24.3	293.9	232.2	04m08.9s
177°45.0'W	01°59.89'S	04°26.97'S	03°13.94'S	04:08:50	24.1	293.9	232.1	04m08.4s
177°37.5'W	02°04.54'S	04°31.41'S	03°18.49'S	04:08:58	23.9	293.9	231.9	04m07.9s
177°30.0'W	02°09.19'S	04°35.83'S	03°23.02'S	04:09:05	23.7	293.9	231.7	04m07.5s
177°22.5'W	02°13.82'S	04°40.24'S	03°27.53'S	04:09:13	23.6	293.9	231.5	04m07.0s
177°15.0'W	02°18.43'S	04°44.64'S	03°32.04'S	04:09:20	23.4	293.9	231.4	04m06.5s
177°07.5'W	02°23.03'S	04°49.03'S	03°36.53'S	04:09:27	23.2	293.9	231.2	04m06.0s
177°00.0'W	02°27.63'S	04°53.40'S	03°41.01'S	04:09:35	23.0	293.9	231.0	04m05.6s
176°52.5'W	02°32.20'S	04°57.76'S	03°45.48'S	04:09:42	22.9	293.8	230.8	04m05.1s
176°45.0'W	02°36.77'S	05°02.11'S	03°49.93'S	04:09:49	22.7	293.8	230.6	04m04.6s
176°37.5'W	02°41.32'S	05°06.44'S	03°54.38'S	04:09:56	22.5	293.8	230.5	04m04.2s
176°30.0'W	02°45.86'S	05°10.77'S	03°58.80'S	04:10:03	22.4	293.8	230.3	04m03.7s
176°22.5'W	02°50.38'S	05°15.08'S	04°03.22'S	04:10:10	22.2	293.8	230.1	04m03.2s
176°15.0'W	02°54.89'S	05°19.38'S	04°07.62'S	04:10:17	22.0	293.8	229.9	04m02.8s
176°07.5'W	02°59.39'S	05°23.66'S	04°12.02'S	04:10:24	21.8	293.8	229.8	04m02.3s
176°00.0'W	03°03.88'S	05°27.94'S	04°16.40'S	04:10:31	21.7	293.8	229.6	04m01.9s
175°52.5'W	03°08.36'S	05°32.20'S	04°20.76'S	04:10:37	21.5	293.8	229.4	04m01.4s
175°45.0'W	03°12.82'S	05°36.45'S	04°25.11'S	04:10:44	21.3	293.8	229.2	04m01.0s
175°37.5'W	03°17.27'S	05°40.68'S	04°29.46'S	04:10:50	21.2	293.8	229.1	04m00.5s
175°30.0'W	03°21.70'S	05°44.91'S	04°33.78'S	04:10:57	21.0	293.7	228.9	04m00.0s
175°22.5'W	03°26.12'S	05°49.12'S	04°38.10'S	04:11:03	20.8	293.7	228.7	03m59.6s
175°15.0'W	03°30.53'S	05°53.32'S	04°42.40'S	04:11:10	20.7	293.7	228.5	03m59.2s
175°07.5'W	03°34.93'S	05°57.51'S	04°46.70'S	04:11:16	20.5	293.7	228.3	03m58.7s

TABLE 7 - EXTENDED VERSION
MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
175°00.0'W	03°39.32'S	06°01.69'S	04°50.97'S	04:11:22	20.3	293.7	228.2	03m58.3s
174°52.5'W	03°43.69'S	06°05.85'S	04°55.24'S	04:11:29	20.2	293.7	228.0	03m57.8s
174°45.0'W	03°48.05'S	06°10.00'S	04°59.49'S	04:11:35	20.0	293.7	227.8	03m57.4s
174°37.5'W	03°52.40'S	06°14.14'S	05°03.74'S	04:11:41	19.8	293.7	227.6	03m56.9s
174°30.0'W	03°56.73'S	06°18.27'S	05°07.97'S	04:11:47	19.7	293.7	227.5	03m56.5s
174°22.5'W	04°01.05'S	06°22.39'S	05°12.18'S	04:11:53	19.5	293.6	227.3	03m56.1s
174°15.0'W	04°05.36'S	06°26.49'S	05°16.39'S	04:11:59	19.3	293.6	227.1	03m55.6s
174°07.5'W	04°09.66'S	06°30.58'S	05°20.58'S	04:12:05	19.2	293.6	226.9	03m55.2s
174°00.0'W	04°13.94'S	06°34.66'S	05°24.76'S	04:12:10	19.0	293.6	226.7	03m54.7s
173°52.5'W	04°18.21'S	06°38.73'S	05°28.93'S	04:12:16	18.9	293.6	226.6	03m54.3s
173°45.0'W	04°22.47'S	06°42.78'S	05°33.08'S	04:12:22	18.7	293.6	226.4	03m53.9s
173°37.5'W	04°26.72'S	06°46.83'S	05°37.23'S	04:12:27	18.5	293.6	226.2	03m53.4s
173°30.0'W	04°30.95'S	06°50.86'S	05°41.36'S	04:12:33	18.4	293.6	226.0	03m53.0s
173°22.5'W	04°35.18'S	06°54.88'S	05°45.48'S	04:12:38	18.2	293.5	225.9	03m52.6s
173°15.0'W	04°39.39'S	06°58.89'S	05°49.58'S	04:12:44	18.0	293.5	225.7	03m52.2s
173°07.5'W	04°43.58'S	07°02.88'S	05°53.68'S	04:12:49	17.9	293.5	225.5	03m51.7s
173°00.0'W	04°47.77'S	07°06.87'S	05°57.76'S	04:12:54	17.7	293.5	225.3	03m51.3s
172°52.5'W	04°51.94'S	07°10.84'S	06°01.83'S	04:13:00	17.6	293.5	225.1	03m50.9s
172°45.0'W	04°56.10'S	07°14.80'S	06°05.89'S	04:13:05	17.4	293.5	225.0	03m50.5s
172°37.5'W	05°00.25'S	07°18.75'S	06°09.94'S	04:13:10	17.2	293.5	224.8	03m50.1s
172°30.0'W	05°04.38'S	07°22.69'S	06°13.97'S	04:13:15	17.1	293.4	224.6	03m49.6s
172°22.5'W	05°08.51'S	07°26.61'S	06°18.00'S	04:13:20	16.9	293.4	224.4	03m49.2s
172°15.0'W	05°12.62'S	07°30.53'S	06°22.01'S	04:13:25	16.8	293.4	224.3	03m48.8s
172°07.5'W	05°16.72'S	07°34.43'S	06°26.01'S	04:13:30	16.6	293.4	224.1	03m48.4s
172°00.0'W	05°20.80'S	07°38.32'S	06°29.99'S	04:13:35	16.4	293.4	223.9	03m48.0s
171°52.5'W	05°24.88'S	07°42.20'S	06°33.97'S	04:13:40	16.3	293.4	223.7	03m47.6s
171°45.0'W	05°28.94'S	07°46.07'S	06°37.93'S	04:13:44	16.1	293.4	223.6	03m47.2s
171°37.5'W	05°32.99'S	07°49.93'S	06°41.89'S	04:13:49	16.0	293.3	223.4	03m46.8s
171°30.0'W	05°37.03'S	07°53.77'S	06°45.83'S	04:13:54	15.8	293.3	223.2	03m46.4s
171°22.5'W	05°41.06'S	07°57.61'S	06°49.75'S	04:13:58	15.6	293.3	223.0	03m45.9s
171°15.0'W	05°45.07'S	08°01.43'S	06°53.67'S	04:14:03	15.5	293.3	222.8	03m45.5s
171°07.5'W	05°49.07'S	08°05.24'S	06°57.58'S	04:14:07	15.3	293.3	222.7	03m45.1s
171°00.0'W	05°53.06'S	08°09.04'S	07°01.47'S	04:14:12	15.2	293.3	222.5	03m44.7s
170°52.5'W	05°57.04'S	08°12.83'S	07°05.35'S	04:14:16	15.0	293.2	222.3	03m44.3s
170°45.0'W	06°01.01'S	08°16.60'S	07°09.22'S	04:14:21	14.9	293.2	222.1	03m43.9s
170°37.5'W	06°04.96'S	08°20.37'S	07°13.08'S	04:14:25	14.7	293.2	222.0	03m43.5s
170°30.0'W	06°08.91'S	08°24.12'S	07°16.93'S	04:14:29	14.6	293.2	221.8	03m43.1s
170°22.5'W	06°12.84'S	08°27.86'S	07°20.76'S	04:14:33	14.4	293.2	221.6	03m42.8s
170°15.0'W	06°16.76'S	08°31.60'S	07°24.58'S	04:14:37	14.2	293.2	221.4	03m42.4s
170°07.5'W	06°20.66'S	08°35.32'S	07°28.40'S	04:14:41	14.1	293.1	221.3	03m42.0s
170°00.0'W	06°24.56'S	08°39.03'S	07°32.20'S	04:14:46	13.9	293.1	221.1	03m41.6s
169°52.5'W	06°28.44'S	08°42.72'S	07°35.99'S	04:14:49	13.8	293.1	220.9	03m41.2s
169°45.0'W	06°32.32'S	08°46.41'S	07°39.76'S	04:14:53	13.6	293.1	220.7	03m40.8s
169°37.5'W	06°36.18'S	08°50.09'S	07°43.53'S	04:14:57	13.5	293.1	220.6	03m40.4s
169°30.0'W	06°40.03'S	08°53.75'S	07°47.29'S	04:15:01	13.3	293.0	220.4	03m40.0s
169°22.5'W	06°43.86'S	08°57.41'S	07°51.03'S	04:15:05	13.2	293.0	220.2	03m39.6s
169°15.0'W	06°47.69'S	09°01.05'S	07°54.76'S	04:15:09	13.0	293.0	220.0	03m39.3s
169°07.5'W	06°51.50'S	09°04.68'S	07°58.48'S	04:15:12	12.9	293.0	219.9	03m38.9s

TABLE 7 - EXTENDED VERSION

MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
169°00.0'W	06°55.31'S	09°08.30'S	08°02.19'S	04:15:16	12.7	293.0	219.7	03m38.5s
168°52.5'W	06°59.10'S	09°11.91'S	08°05.89'S	04:15:19	12.6	293.0	219.5	03m38.1s
168°45.0'W	07°02.88'S	09°15.51'S	08°09.58'S	04:15:23	12.4	292.9	219.3	03m37.7s
168°37.5'W	07°06.65'S	09°19.10'S	08°13.26'S	04:15:26	12.3	292.9	219.2	03m37.4s
168°30.0'W	07°10.40'S	09°22.67'S	08°16.92'S	04:15:30	12.1	292.9	219.0	03m37.0s
168°22.5'W	07°14.15'S	09°26.24'S	08°20.58'S	04:15:33	12.0	292.9	218.8	03m36.6s
168°15.0'W	07°17.88'S	09°29.80'S	08°24.22'S	04:15:37	11.8	292.9	218.6	03m36.2s
168°07.5'W	07°21.61'S	09°33.34'S	08°27.85'S	04:15:40	11.7	292.8	218.5	03m35.9s
168°00.0'W	07°25.32'S	09°36.87'S	08°31.47'S	04:15:43	11.5	292.8	218.3	03m35.5s
167°52.5'W	07°29.02'S	09°40.40'S	08°35.08'S	04:15:46	11.4	292.8	218.1	03m35.1s
167°45.0'W	07°32.71'S	09°43.91'S	08°38.68'S	04:15:49	11.2	292.8	217.9	03m34.8s
167°37.5'W	07°36.38'S	09°47.41'S	08°42.27'S	04:15:53	11.1	292.8	217.8	03m34.4s
167°30.0'W	07°40.05'S	09°50.90'S	08°45.85'S	04:15:56	10.9	292.7	217.6	03m34.0s
167°22.5'W	07°43.71'S	09°54.38'S	08°49.41'S	04:15:59	10.8	292.7	217.4	03m33.7s
167°15.0'W	07°47.35'S	09°57.85'S	08°52.97'S	04:16:02	10.6	292.7	217.3	03m33.3s
167°07.5'W	07°50.98'S	10°01.31'S	08°56.51'S	04:16:04	10.5	292.7	217.1	03m32.9s
167°00.0'W	07°54.60'S	10°04.76'S	09°00.05'S	04:16:07	10.3	292.6	216.9	03m32.6s
166°52.5'W	07°58.22'S	10°08.20'S	09°03.57'S	04:16:10	10.2	292.6	216.7	03m32.2s
166°45.0'W	08°01.82'S	10°11.63'S	09°07.08'S	04:16:13	10.0	292.6	216.6	03m31.9s
166°37.5'W	08°05.40'S	10°15.04'S	09°10.58'S	04:16:16	9.9	292.6	216.4	03m31.5s
166°30.0'W	08°08.98'S	10°18.45'S	09°14.07'S	04:16:18	9.7	292.6	216.2	03m31.1s
166°22.5'W	08°12.55'S	10°21.85'S	09°17.55'S	04:16:21	9.6	292.5	216.1	03m30.8s
166°15.0'W	08°16.10'S	10°25.23'S	09°21.02'S	04:16:24	9.4	292.5	215.9	03m30.4s
166°07.5'W	08°19.65'S	10°28.61'S	09°24.48'S	04:16:26	9.3	292.5	215.7	03m30.1s
166°00.0'W	08°23.18'S	10°31.97'S	09°27.93'S	04:16:29	9.1	292.5	215.5	03m29.7s
165°52.5'W	08°26.71'S	10°35.33'S	09°31.37'S	04:16:31	9.0	292.5	215.4	03m29.4s
165°45.0'W	08°30.22'S	10°38.67'S	09°34.80'S	04:16:34	8.9	292.4	215.2	03m29.0s
165°37.5'W	08°33.72'S	10°42.01'S	09°38.21'S	04:16:36	8.7	292.4	215.0	03m28.7s
165°30.0'W	08°37.21'S	10°45.33'S	09°41.62'S	04:16:38	8.6	292.4	214.9	03m28.3s
165°22.5'W	08°40.69'S	10°48.64'S	09°45.01'S	04:16:41	8.4	292.4	214.7	03m28.0s
165°15.0'W	08°44.16'S	10°51.95'S	09°48.40'S	04:16:43	8.3	292.3	214.5	03m27.6s
165°07.5'W	08°47.62'S	10°55.24'S	09°51.77'S	04:16:45	8.1	292.3	214.4	03m27.3s
165°00.0'W	08°51.07'S	10°58.53'S	09°55.14'S	04:16:47	8.0	292.3	214.2	03m27.0s
164°52.5'W	08°54.50'S	11°01.80'S	09°58.49'S	04:16:49	7.8	292.3	214.0	03m26.6s
164°45.0'W	08°57.93'S	11°05.06'S	10°01.83'S	04:16:51	7.7	292.3	213.8	03m26.3s
164°37.5'W	09°01.35'S	11°08.31'S	10°05.17'S	04:16:53	7.6	292.2	213.7	03m25.9s
164°30.0'W	09°04.75'S	11°11.56'S	10°08.49'S	04:16:55	7.4	292.2	213.5	03m25.6s
164°22.5'W	09°08.15'S	11°14.79'S	10°11.80'S	04:16:57	7.3	292.2	213.3	03m25.3s
164°15.0'W	09°11.53'S	11°18.01'S	10°15.10'S	04:16:59	7.1	292.2	213.2	03m24.9s
164°07.5'W	09°14.91'S	11°21.23'S	10°18.40'S	04:17:01	7.0	292.1	213.0	03m24.6s
164°00.0'W	09°18.27'S	11°24.43'S	10°21.68'S	04:17:03	6.9	292.1	212.8	03m24.3s
163°52.5'W	09°21.62'S	11°27.62'S	10°24.95'S	04:17:05	6.7	292.1	212.7	03m23.9s
163°45.0'W	09°24.96'S	11°30.81'S	10°28.21'S	04:17:07	6.6	292.1	212.5	03m23.6s
163°37.5'W	09°28.30'S	11°33.98'S	10°31.46'S	04:17:08	6.4	292.0	212.3	03m23.3s
163°30.0'W	09°31.62'S	11°37.14'S	10°34.71'S	04:17:10	6.3	292.0	212.2	03m22.9s
163°22.5'W	09°34.93'S	11°40.30'S	10°37.94'S	04:17:12	6.2	292.0	212.0	03m22.6s
163°15.0'W	09°38.23'S	11°43.44'S	10°41.16'S	04:17:13	6.0	292.0	211.8	03m22.3s
163°07.5'W	09°41.52'S	11°46.58'S	10°44.37'S	04:17:15	5.9	291.9	211.7	03m21.9s

TABLE 7 - EXTENDED VERSION

MAPPING COORDINATES FOR THE UMBRAL PATH
TOTAL SOLAR ECLIPSE OF 2009 JULY 22

$\Delta T = 65.9$ s

Longitude	Latitude of:			Circumstances on Central Line				
	Northern	Southern	Central	Universal	Sun	Sun	Path	Central
	Limit	Limit	Line	Time	Alt	Az.	Width	Durat.
				h m s	°	°	km	
163°00.0'W	09°44.80'S	11°49.70'S	10°47.57'S	04:17:16	5.7	291.9	211.5	03m21.6s
162°52.5'W	09°48.07'S	11°52.82'S	10°50.76'S	04:17:18	5.6	291.9	211.3	03m21.3s
162°45.0'W	09°51.33'S	11°55.92'S	10°53.94'S	04:17:19	5.5	291.9	211.2	03m21.0s
162°37.5'W	09°54.58'S	11°59.02'S	10°57.11'S	04:17:21	5.3	291.8	211.0	03m20.6s
162°30.0'W	09°57.82'S	12°02.10'S	11°00.28'S	04:17:22	5.2	291.8	210.8	03m20.3s
162°22.5'W	10°01.05'S	12°05.18'S	11°03.43'S	04:17:23	5.0	291.8	210.7	03m20.0s
162°15.0'W	10°04.27'S	12°08.25'S	11°06.57'S	04:17:25	4.9	291.8	210.5	03m19.7s
162°07.5'W	10°07.48'S	12°11.30'S	11°09.70'S	04:17:26	4.8	291.7	210.4	03m19.4s
162°00.0'W	10°10.68'S	12°14.35'S	11°12.82'S	04:17:27	4.6	291.7	210.2	03m19.1s
161°52.5'W	10°13.87'S	12°17.39'S	11°15.94'S	04:17:28	4.5	291.7	210.0	03m18.7s
161°45.0'W	10°17.05'S	12°20.42'S	11°19.04'S	04:17:29	4.3	291.7	209.9	03m18.4s
161°37.5'W	10°20.22'S	12°23.44'S	11°22.13'S	04:17:31	4.2	291.6	209.7	03m18.1s
161°30.0'W	10°23.38'S	12°26.45'S	11°25.22'S	04:17:32	4.1	291.6	209.5	03m17.8s
161°22.5'W	10°26.53'S	12°29.45'S	11°28.29'S	04:17:33	3.9	291.6	209.4	03m17.5s
161°15.0'W	10°29.67'S	12°32.44'S	11°31.35'S	04:17:34	3.8	291.6	209.2	03m17.2s
161°07.5'W	10°32.80'S	12°35.42'S	11°34.41'S	04:17:35	3.7	291.5	209.1	03m16.9s
161°00.0'W	10°35.92'S	12°38.39'S	11°37.45'S	04:17:35	3.5	291.5	208.9	03m16.6s
160°52.5'W	10°39.03'S	12°41.35'S	11°40.49'S	04:17:36	3.4	291.5	208.7	03m16.2s
160°45.0'W	10°42.14'S	12°44.31'S	11°43.52'S	04:17:37	3.3	291.5	208.6	03m15.9s
160°37.5'W	10°45.23'S	12°47.25'S	11°46.53'S	04:17:38	3.1	291.4	208.4	03m15.6s
160°30.0'W	10°48.31'S	12°50.19'S	11°49.54'S	04:17:39	3.0	291.4	208.2	03m15.3s
160°22.5'W	10°51.38'S	12°53.11'S	11°52.54'S	04:17:40	2.9	291.4	208.1	03m15.0s
160°15.0'W	10°54.44'S	12°56.03'S	11°55.52'S	04:17:40	2.7	291.4	207.9	03m14.7s
160°07.5'W	10°57.49'S	12°58.94'S	11°58.50'S	04:17:41	2.6	291.3	207.8	03m14.4s
160°00.0'W	11°00.54'S	13°01.83'S	12°01.47'S	04:17:42	2.4	291.3	207.6	03m14.1s
159°52.5'W	11°03.57'S	13°04.72'S	12°04.43'S	04:17:42	2.3	291.3	207.4	03m13.8s
159°45.0'W	11°06.59'S	13°07.60'S	12°07.38'S	04:17:43	2.2	291.3	207.3	03m13.5s
159°37.5'W	11°09.61'S	13°10.47'S	12°10.32'S	04:17:43	2.0	291.2	207.1	03m13.2s
159°30.0'W	11°12.61'S	13°13.33'S	12°13.25'S	04:17:44	1.9	291.2	207.0	03m12.9s
159°22.5'W	11°15.61'S	13°16.19'S	12°16.18'S	04:17:44	1.8	291.2	206.8	03m12.6s
159°15.0'W	11°18.59'S	13°19.03'S	12°19.09'S	04:17:45	1.6	291.1	206.6	03m12.3s
159°07.5'W	11°21.57'S	13°21.87'S	12°21.99'S	04:17:45	1.5	291.1	206.5	03m12.0s
159°00.0'W	11°24.53'S	13°24.69'S	12°24.89'S	04:17:45	1.4	291.1	206.3	03m11.7s
158°52.5'W	11°27.49'S	13°27.51'S	12°27.78'S	04:17:46	1.2	291.1	206.2	03m11.4s
158°45.0'W	11°30.44'S	13°30.32'S	12°30.65'S	04:17:46	1.1	291.0	206.0	03m11.2s
158°37.5'W	11°33.38'S	13°33.12'S	12°33.52'S	04:17:46	1.0	291.0	205.9	03m10.9s
158°30.0'W	11°36.31'S	13°35.91'S	12°36.38'S	04:17:47	0.9	291.0	205.7	03m10.6s
158°22.5'W	11°39.22'S	13°38.69'S	12°39.23'S	04:17:47	0.7	291.0	205.5	03m10.3s
158°15.0'W	11°42.14'S	13°41.46'S	12°42.07'S	04:17:47	0.6	290.9	205.4	03m10.0s
158°07.5'W	11°45.04'S	13°44.22'S	12°44.90'S	04:17:47	0.5	290.9	205.2	03m09.7s
158°00.0'W	11°47.93'S		12°47.72'S	04:17:47	0.3	290.9	205.1	03m09.4s
157°52.5'W	11°50.81'S		12°50.53'S	04:17:47	0.2	290.8	204.9	03m09.1s
157°45.0'W	11°53.68'S		12°53.34'S	04:17:47	0.1	290.8	204.8	03m08.9s