

There are four eclipses, two of the Sun and two of the Moon.

I March 3	Partial eclipse of the Moon
II March 17-18	Total eclipse of the Sun
III August 27	Partial eclipse of the Moon
IV September 11	Annular eclipse of the Sun

A standard correction of $+0''.5$ has been applied to the tabular longitude of the Moon, and of $-0''.25$ has been applied to the tabular latitude of the Moon, to help correct for the difference between the center of figure and the center of mass when using the DE200 lunar ephemeris.

The arguments are given provisionally in Universal Time, using $\Delta T(A) = +56^s$.

Define $\delta T = \Delta T - \Delta T(A)$. Once the value of ΔT is known, the data on these pages may be expressed in Universal Time as follows:

Convert all arguments in provisional Universal Time by subtracting δT .

Apply the correction $1.0027 \delta T$ to μ and the longitudes in such a way that if δT is positive, μ decreases and the longitudes shift to the east.

Leave all other quantities unchanged.

I.—*Partial Eclipse of the Moon, March 3*; the umbral phase lasts less than 14 minutes, and is visible in Asia, Central and eastern Europe, northeast Africa, Wilkes Land of Antarctica, Australia, New Zealand, Alaska and Hawaii, the Arctic regions, the Indian Ocean, and the west half of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE

U.T. of geocentric opposition in right ascension, March 3^d15^h09^m40^s.258

Julian Day No. = 2447224.13172

	h	m	s		
R.A. of Sun	22	58	18.332	Hourly motion	9 ^s .315
R.A. of Moon	10	58	18.332	Hourly motion	106.601

Declination of Sun	-	6	34 43.14	Hourly motion	+ 0 57.64
Declination of Moon	+	7	35 30.98	Hourly motion	-13 54.05
Equatorial hor. par. of Sun			8.87	True semidiameter of Sun	16 07.8
Equatorial hor. par. of Moon		54	11.05	True semidiameter of Moon	14 45.9

CIRCUMSTANCES OF THE ECLIPSE

	d	h	m	
Moon enters penumbra	March	3	13 43.6	
Moon enters umbra		3	16 06.1	
Middle of the eclipse		3	16 12.7	U.T.
Moon leaves umbra		3	16 19.5	
Moon leaves penumbra		3	18 41.9	

Contacts of Umbra with Limb of Moon	Position Angles from the North Point	The Moon being in the Zenith in	
		Longitude	Latitude
First	155 to West	+121 49	+ 7 21
Last	149 to West	+118 34	+ 7 19

Magnitude of the Eclipse 0.003

This is the terminal umbral eclipse of this series. The next eclipse in this series will be the penumbral eclipse of 2006 March 14.

II.—*Total Eclipse of the Sun, March 17-18.*

ELEMENTS OF THE ECLIPSE

U.T. of geocentric conjunction in right ascension, March 18^d 02^h 22^m 13^s.612

Julian Day No.=2447238.59877

	h	m	s			
R.A. of Sun and Moon	23	51	35.692	Hourly motions	9 ^h 131	and 131 ^m 306

Declination of Sun	-	0	54 39.08	Hourly motion	+	0 59.35
Declination of Moon	-	0	25 36.73	Hourly motion	+	17 58.33
Equatorial hor. par. of Sun			8.83	True semidiameter of Sun		16 04.1
Equatorial hor. par. of Moon		60	45.43	True semidiameter of Moon		16 33.4

CIRCUMSTANCES OF THE ECLIPSE

	U.T.			Longitude	Latitude
	d	h	m		
Eclipse begins	March 17	23	24.0	+100 48.5	-13 22.5
Central eclipse begins	18	0	23.5	+ 86 05.4	- 4 21.8
Central eclipse at local apparent noon	18	2	22.2	+146 28.4	+27 53.9
Central eclipse ends	18	3	32.2	-142 15.9	+54 04.1
Eclipse ends	18	4	31.8	-156 49.2	+45 04.8

III.—*Partial Eclipse of the Moon, August 27; the beginning of the umbral phase visible on the east coast of Asia, most of Antarctica, Australia, New Zealand, the eastern half of South America, Central America, North America except east of Hudson Bay, and the Pacific Ocean; the end visible in eastern Asia, most of Antarctica, Australia, New Zealand, northern Central America, central and western North America, and the Pacific Ocean.*

ELEMENTS OF THE ECLIPSE

U.T. of geocentric opposition in right ascension, August 27^d 10^h 19^m 10^s.306

Julian Day No.=2447400.92998

	h	m	s			
R.A. of Sun	10	24	55.223	Hourly motion		9 ^h 126
R.A. of Moon	22	24	55.223	Hourly motion		139.125

Declination of Sun	+	9	54 50.79	Hourly motion	-	0 52.71
Declination of Moon	-	10	54 37.30	Hourly motion	+	17 04.38
Equatorial hor. par. of Sun			8.71	True semidiameter of Sun		15 50.0
Equatorial hor. par. of Moon		61	23.51	True semidiameter of Moon		16 43.7

CIRCUMSTANCES OF THE ECLIPSE

	d	h	m	
Moon enters penumbra	August 27	08	51.6	
Moon enters umbra		27	10 07.5	
Middle of the eclipse		27	11 04.5	U.T.
Moon leaves umbra		27	12 01.7	
Moon leaves penumbra		27	13 17.5	
Contacts of Umbra with Limb of Moon	Position Angles from the North Point	The Moon being in the Zenith in		
		Longitude	Latitude	
First	6 to West	-151 37	-10 58	
Last	60 to West	-171 39	-10 25	

Magnitude of the Eclipse 0.297

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IV.—Annular Eclipse of the Sun, September 11.

ELEMENTS OF THE ECLIPSE

U.T. of geocentric conjunction in right ascension, September 11^d 05^h 14^m 04.830

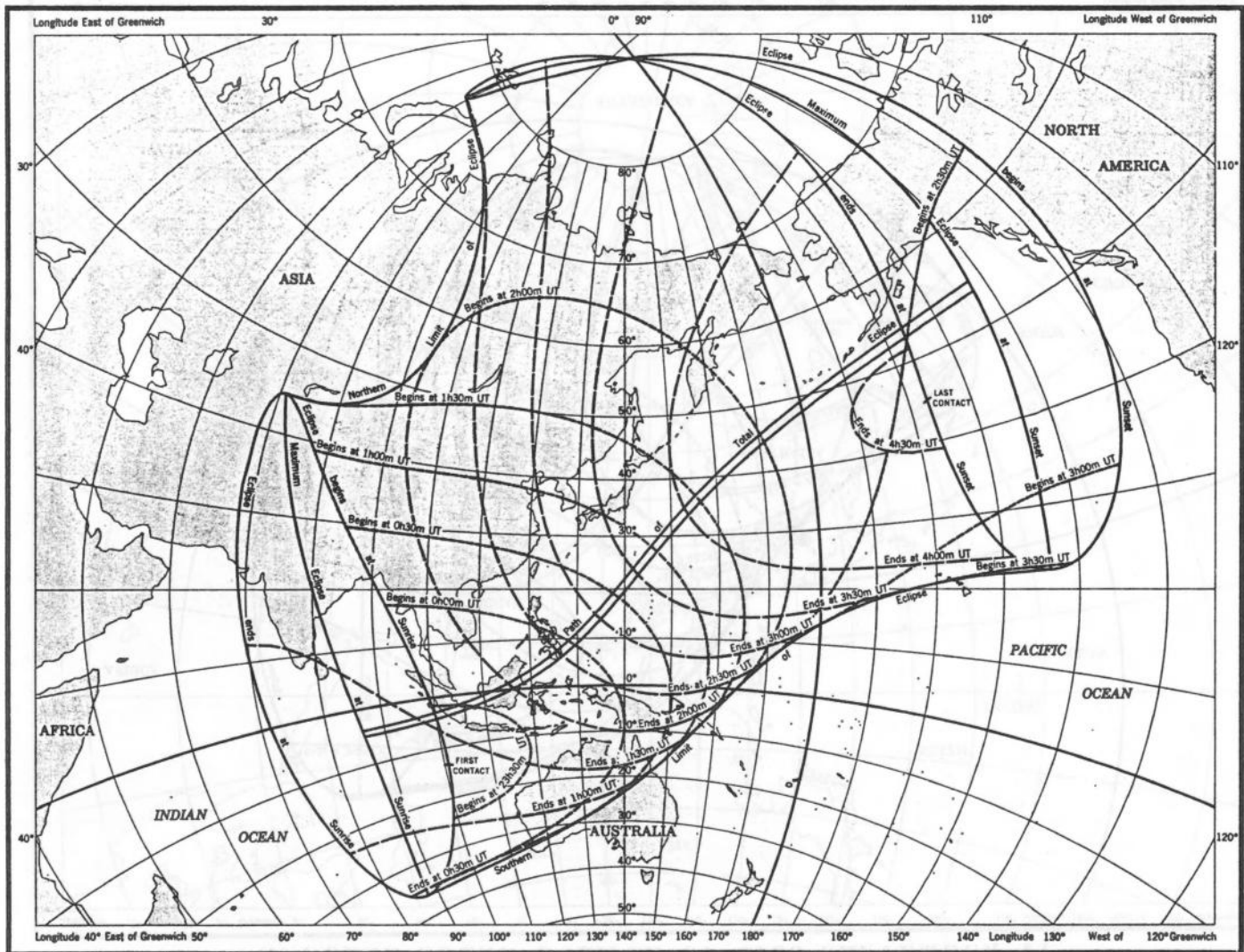
Julian Day No.=2447415.71811

	h	m	s		
R.A. of Sun and Moon	11	18	23.942	Hourly motions	8:981 and 104:481
Declination of Sun	+ 4	28	33.60	Hourly motion	- 0 57.11
Declination of Moon	+ 3	59	48.95	Hourly motion	-14 02.18
Equatorial hor. par. of Sun			8.74	True semidiameter of Sun	15 53.3
Equatorial hor. par. of Moon	53	57.62		True semidiameter of Moon	14 42.2

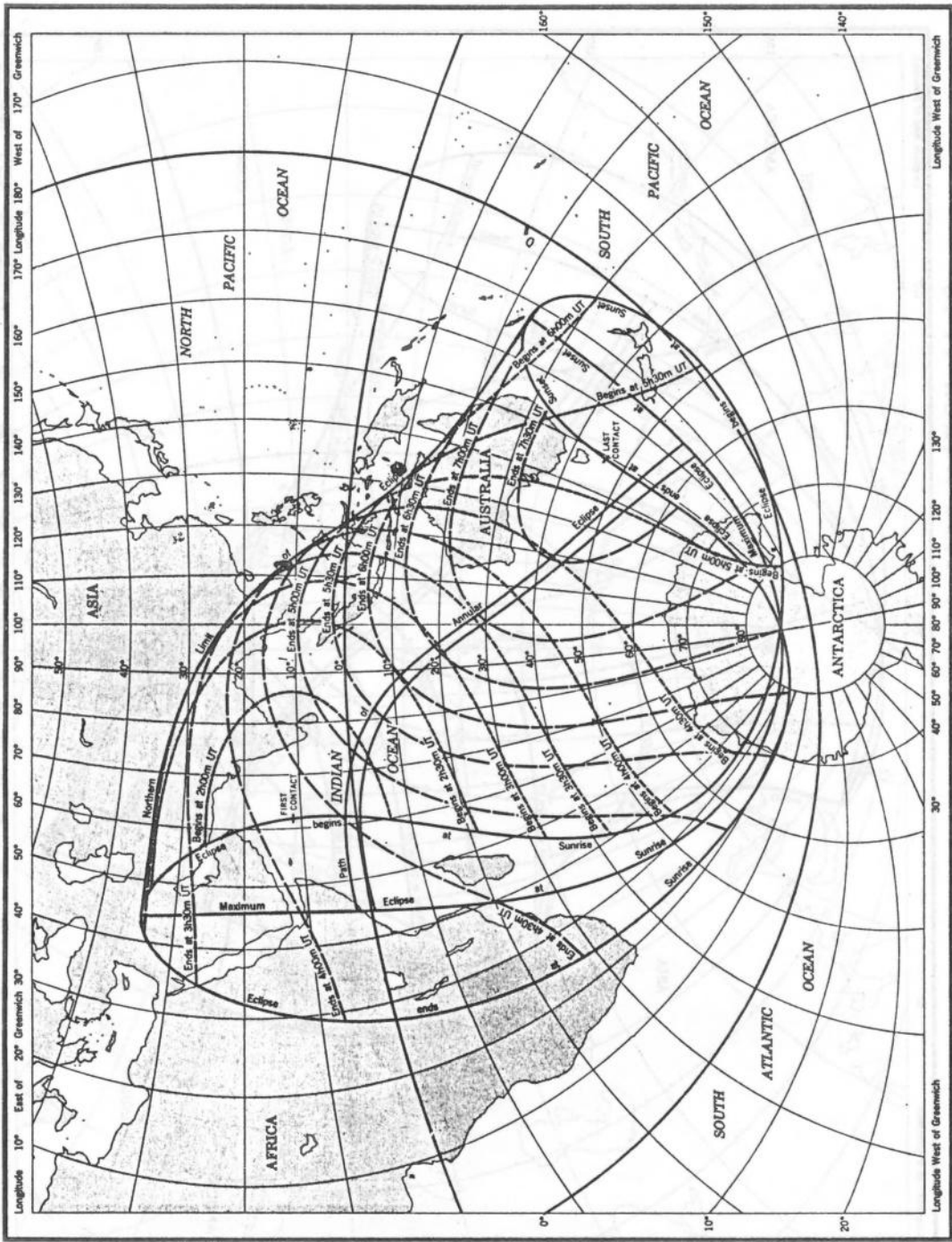
CIRCUMSTANCES OF THE ECLIPSE

	September	U.T.			Longitude	Latitude
		d	h	m		
Eclipse begins	September	11	1	45.7	+ 61 50.1	+11 26.8
Central eclipse begins		11	2	58.5	+ 44 27.8	+ 0 51.9
Central eclipse at local apparent noon		11	5	14.1	+100 38.0	-27 59.7
Central eclipse ends		11	6	28.2	+165 17.1	-56 40.6
Eclipse ends		11	7	41.2	+149 12.3	-46 10.8

TOTAL SOLAR ECLIPSE OF 1988 MARCH 17-18



ANNULAR SOLAR ECLIPSE OF 1988 SEPTEMBER 11



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BESELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN MARCH 17-18

U.T.	Intersection of Axis of Shadow with Fundamental Plane		Direction of Axis of Shadow			Radius of Shadow on Fundamental Plane	
	x	y	sin d	cos d	μ	Penumbra	Umbra
h m					°		
23 00	-1.698351	-0.465801	-0.016846	0.999858	162.95493	0.537950	-0.008394
10	1.614392	0.419078	.016800	.999859	165.45564	.537973	.008371
20	1.530429	0.372354	.016755	.999860	167.95635	.537995	.008349
30	1.446463	0.325628	.016709	.999860	170.45706	.538016	.008328
40	1.362493	0.278902	.016663	.999861	172.95777	.538037	.008307
50	1.278520	0.232175	.016617	.999862	175.45848	.538057	.008287
0 00	-1.194544	-0.185448	-0.016571	0.999863	177.95919	0.538077	-0.008268
10	1.110565	0.138720	.016525	.999863	180.45989	.538095	.008249
20	1.026584	0.091991	.016479	.999864	182.96059	.538113	.008231
30	0.942601	-0.045262	.016433	.999865	185.46130	.538131	.008214
40	0.858616	+0.001467	.016387	.999866	187.96200	.538147	.008197
50	0.774629	0.048195	.016341	.999866	190.46270	.538163	.008182
1 00	-0.690640	+0.094924	-0.016295	0.999867	192.96341	0.538178	-0.008166
10	0.606650	0.141652	.016249	.999868	195.46412	.538193	.008152
20	0.522659	0.188380	.016203	.999869	197.96482	.538207	.008138
30	0.438668	0.235108	.016157	.999869	200.46553	.538220	.008125
40	0.354675	0.281834	.016111	.999870	202.96624	.538232	.008113
50	0.270682	0.328560	.016065	.999871	205.46696	.538244	.008102
2 00	-0.186689	+0.375285	-0.016019	0.999872	207.96767	0.538254	-0.008091
10	0.102697	0.422009	.015973	.999872	210.46838	.538265	.008081
20	-0.018704	0.468731	.015928	.999873	212.96909	.538274	.008071
30	+0.065288	0.515453	.015882	.999874	215.46980	.538283	.008062
40	0.149280	0.562172	.015836	.999875	217.97051	.538291	.008054
50	0.233270	0.608891	.015790	.999875	220.47121	.538298	.008047
3 00	+0.317259	+0.655607	-0.015744	0.999876	222.97192	0.538305	-0.008040
10	0.401247	0.702322	.015698	.999877	225.47263	.538311	.008034
20	0.485233	0.749034	.015652	.999878	227.97334	.538316	.008029
30	0.569217	0.795744	.015606	.999878	230.47405	.538321	.008025
40	0.653199	0.842453	.015560	.999879	232.97476	.538325	.008021
50	0.737179	0.889158	.015514	.999880	235.47547	.538328	.008018
4 00	+0.821156	+0.935861	-0.015468	0.999880	237.97618	0.538330	-0.008015
10	0.905131	0.982562	.015422	.999881	240.47690	.538332	.008014
20	0.989102	1.029260	.015376	.999882	242.97761	.538333	.008013
30	1.073071	1.075954	.015330	.999882	245.47832	.538333	.008012
40	1.157035	1.122646	.015284	.999883	247.97903	.538333	.008013
50	+1.240996	+1.169334	-0.015238	0.999884	250.47974	0.538332	-0.008014

$\tan f_1$ 0.004697
 $\tan f_2$ 0.004674
 μ' 0.261874 radians per hour
 d' +0.000276 radians per hour

PATH OF THE TOTAL SOLAR ECLIPSE OF 1988 MARCH 17-18

U.T.	Northern Limit		Central Line		Southern Limit		Central Line	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Duration of Total Phase	Altitude
Limits	° ' 3 50.4	+ 86 00.0	- 4 21.8	+ 86 05.4	- 4 53.1	+ 86 10.6	m s 1 43.0	° 0
h m 0 25	- 3 38.9	+ 93 26.5	- 4 06.8	+ 94 59.7	- 4 35.2	+ 96 21.6	2 00.0	9
0 30	- 2 26.7	+102 57.2	- 2 55.5	+103 50.1	- 3 24.7	+104 41.1	2 20.3	19
35	- 1 11.0	108 14.3	1 40.4	109 00.0	2 10.1	109 44.6	2 34.0	26
40	+ 0 05.9	112 09.8	- 0 24.0	112 52.5	- 0 54.0	113 34.3	2 45.1	31
45	1 23.4	115 20.8	+ 0 53.3	116 01.8	+ 0 23.0	116 42.2	2 54.7	35
50	2 41.4	118 02.9	2 11.1	118 42.9	1 40.7	119 22.5	3 03.1	39
55	3 59.9	120 24.5	3 29.5	121 03.9	2 59.0	121 42.9	3 10.6	43
1 00	+ 5 18.9	+122 30.8	+ 4 48.4	+123 09.8	+ 4 17.8	+123 48.5	3 17.2	46
05	6 38.2	124 25.3	6 07.7	125 04.0	5 37.1	125 42.5	3 23.1	49
10	7 58.0	126 10.5	7 27.4	126 49.0	6 56.8	127 27.2	3 28.4	51
15	9 18.3	127 48.3	8 47.7	128 26.6	8 17.0	129 04.6	3 33.1	54
20	10 39.0	129 20.0	10 08.4	129 58.1	9 37.7	130 36.0	3 37.1	56
25	12 00.3	130 47.0	11 29.6	131 24.9	10 58.9	132 02.7	3 40.6	58
1 30	+13 22.2	+132 10.2	+12 51.4	+132 47.9	+12 20.7	+133 25.5	3 43.6	60
35	14 44.7	133 30.4	14 13.8	134 08.0	13 43.0	134 45.4	3 46.0	62
40	16 07.9	134 48.4	15 36.9	135 25.8	15 06.0	136 03.1	3 47.9	63
45	17 31.9	136 05.0	17 00.7	136 42.2	16 29.6	137 19.2	3 49.3	64
50	18 56.6	137 20.8	18 25.3	137 57.7	17 54.0	138 34.5	3 50.2	65
55	20 22.2	138 36.4	19 50.7	139 13.0	19 19.2	139 49.5	3 50.6	65
2 00	+21 48.8	+139 52.5	+21 17.0	+140 28.8	+20 45.3	+141 05.0	3 50.5	65
05	23 16.4	141 09.7	22 44.3	141 45.6	22 12.3	142 21.4	3 49.9	65
10	24 45.1	142 28.8	24 12.6	143 04.2	23 40.3	143 39.5	3 48.8	64
15	26 15.0	143 50.3	25 42.2	144 25.3	25 09.5	145 00.1	3 47.2	63
20	27 46.3	145 15.3	27 13.0	145 49.6	26 39.9	146 23.8	3 45.1	62
25	29 19.0	146 44.6	28 45.3	147 18.1	28 11.7	147 51.6	3 42.5	60
2 30	+30 53.4	+148 19.2	+30 19.0	+148 51.8	+29 44.9	+149 24.5	3 39.4	59
35	32 29.4	150 00.4	31 54.5	150 32.0	31 19.8	151 03.6	3 35.8	56
40	34 07.4	151 49.8	33 31.8	152 20.1	32 56.5	152 50.5	3 31.6	54
45	35 47.5	153 49.1	35 11.2	154 17.9	34 35.2	154 46.8	3 26.9	52
50	37 30.0	156 00.9	36 52.9	156 27.8	36 16.2	156 54.9	3 21.5	49
55	39 15.1	158 28.3	38 37.2	158 52.8	37 59.7	159 17.5	3 15.6	46
3 00	+41 03.2	+161 15.4	+40 24.4	+161 36.8	+39 46.0	+161 58.7	3 08.9	43
05	42 54.7	164 28.2	42 14.9	164 45.8	41 35.6	165 03.9	3 01.5	40
10	44 50.0	168 15.8	44 09.2	168 28.1	43 28.9	168 41.2	2 53.2	36
15	46 49.9	172 52.7	46 08.1	172 57.5	45 26.7	173 03.6	2 43.7	31
20	48 55.4	+178 44.9	48 12.4	+178 38.4	47 30.0	+178 34.1	2 32.9	26
25	51 07.8	-173 08.8	50 23.8	-173 35.5	49 40.4	-173 58.3	2 19.7	20
3 30	+53 31.1	-159 08.0	+52 46.3	-160 36.7	+52 02.0	-161 51.2	2 01.3	11
Limits	+54 34.6	-142 11.5	+54 04.1	-142 15.9	+53 33.8	-142 20.2	1 40.5	0

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U.T. BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN SEPTEMBER 11

U.T.	Intersection of Axis of Shadow with Fundamental Plane		Direction of Axis of Shadow			Radius of Shadow on Fundamental Plane	
	<i>x</i>	<i>y</i>	<i>sin d</i>	<i>cos d</i>	μ	Penumbra	Umbra
h m					°		
1 30	-1.652816	+0.373641	+0.079056	0.996870	203.32875	0.568431	+0.021936
40	1.579072	0.333142	.079012	.996874	205.82953	.568440	.021944
50	1.505325	0.292642	.078968	.996877	208.33032	.568448	.021953
2 00	-1.431576	+0.252141	+0.078924	0.996881	210.83111	0.568456	+0.021960
10	1.357825	0.211637	.078879	.996884	213.33190	.568463	.021968
20	1.284072	0.171132	.078835	.996888	215.83268	.568470	.021974
30	1.210317	0.130626	.078791	.996891	218.33347	.568476	.021980
40	1.136560	0.090118	.078746	.996895	220.83426	.568482	.021986
50	1.062802	0.049609	.078702	.996898	223.33504	.568487	.021991
3 00	-0.989042	+0.009098	+0.078658	0.996902	225.83583	0.568491	+0.021995
10	0.915282	-0.031413	.078614	.996905	228.33662	.568495	.021999
20	0.841520	0.071926	.078569	.996909	230.83741	.568499	.022003
30	0.767756	0.112439	.078525	.996912	233.33819	.568501	.022006
40	0.693993	0.152954	.078481	.996916	235.83898	.568504	.022008
50	0.620228	0.193469	.078436	.996919	238.33977	.568506	.022010
4 00	-0.546463	-0.233986	+0.078392	0.996923	240.84055	0.568507	+0.022011
10	0.472697	0.274503	.078348	.996926	243.34134	.568508	.022012
20	0.398931	0.315020	.078304	.996930	245.84213	.568508	.022012
30	0.325165	0.355538	.078259	.996933	248.34292	.568507	.022012
40	0.251398	0.396057	.078215	.996937	250.84370	.568506	.022011
50	0.177632	0.436576	.078171	.996940	253.34449	.568505	.022009
5 00	-0.103866	-0.477095	+0.078126	0.996943	255.84528	0.568503	+0.022007
10	-0.030100	0.517614	.078082	.996947	258.34607	.568500	.022005
20	+0.043665	0.558134	.078038	.996950	260.84685	.568497	.022002
30	0.117430	0.598653	.077994	.996954	263.34764	.568494	.021998
40	0.191194	0.639173	.077949	.996957	265.84843	.568490	.021994
50	0.264957	0.679693	.077905	.996961	268.34922	.568485	.021989
6 00	+0.338719	-0.720212	+0.077861	0.996964	270.85000	0.568480	+0.021984
10	0.412480	0.760731	.077816	.996968	273.35079	.568474	.021978
20	0.486239	0.801250	.077772	.996971	275.85158	.568468	.021972
30	0.559998	0.841768	.077728	.996975	278.35237	.568461	.021965
40	0.633754	0.882286	.077683	.996978	280.85315	.568453	.021958
50	0.707509	0.922803	.077639	.996982	283.35394	.568445	.021950
7 00	+0.781262	-0.963320	+0.077595	0.996985	285.85473	0.568437	+0.021942
10	0.855014	1.003836	.077550	.996988	288.35552	.568428	.021933
20	0.928763	1.044351	.077506	.996992	290.85630	.568418	.021923
30	1.002509	1.084865	.077462	.996995	293.35709	.568408	.021913
40	1.076254	1.125378	.077418	.996999	295.85788	.568398	.021902
50	1.149996	1.165891	.077373	.997002	298.35867	.568386	.021891
8 00	+1.223735	-1.206402	+0.077329	0.997006	300.85945	0.568375	+0.021880

$\tan f_1$ 0.004646
 $\tan f_2$ 0.004623
 μ' 0.261882 radians per hour
 d' -0.000267 radians per hour

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PATH OF CENTRAL PHASE DURING THE ANNULAR SOLAR ECLIPSE OF 1988
SEPTEMBER 11

U.T.	Northern Limit		Central Line		Southern Limit		Central Line	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Duration of Central Phase	Altitude
Limits	+ 2 17.2	+ 44 39.8	+ 0 51.9	+ 44 27.8	- 0 34.5	+ 44 14.7	5 19.5	0
h m							m s	°
3 00	+ 2 30.0	+ 55 47.7	+ 1 11.5	+ 52 34.3	- 0 23.6	+ 46 42.3	5 32.5	8
05	1 53.0	62 34.4	0 44.6	60 41.6	0 26.9	58 35.1	5 47.9	18
10	1 04.9	66 57.3	+ 0 00.9	65 25.1	1 05.4	63 46.4	5 58.2	24
15	+ 0 12.0	70 19.3	- 0 49.0	68 57.1	1 52.0	67 30.9	6 06.4	28
20	- 0 43.9	73 05.3	1 42.6	71 49.3	2 43.0	70 30.3	6 13.3	32
25	1 42.0	75 27.1	2 38.7	74 15.3	3 37.0	73 01.1	6 19.4	36
3 30	- 2 41.8	+ 77 31.2	- 3 36.7	+ 76 22.4	- 4 33.1	+ 75 11.7	6 24.6	39
35	3 43.0	79 21.7	4 36.2	78 15.2	5 31.1	77 07.1	6 29.3	42
40	4 45.3	81 01.5	5 37.2	79 56.9	6 30.6	78 50.9	6 33.3	45
45	5 48.7	82 32.7	6 39.3	81 29.6	7 31.5	80 25.2	6 36.9	47
50	6 53.0	83 56.8	7 42.5	82 55.0	8 33.5	81 52.0	6 40.0	49
55	7 58.3	85 15.0	8 46.8	84 14.2	9 36.8	83 12.4	6 42.7	52
4 00	- 9 04.4	+ 86 28.4	- 9 52.0	+ 85 28.5	-10 41.1	+ 84 27.7	6 45.0	53
05	10 11.3	87 37.6	10 58.2	86 38.6	11 46.5	85 38.7	6 46.9	55
10	11 19.1	88 43.6	12 05.4	87 45.3	12 53.0	86 46.1	6 48.4	57
15	12 27.7	89 46.8	13 13.4	88 49.1	14 00.5	87 50.6	6 49.7	58
20	13 37.2	90 47.7	14 22.4	89 50.6	15 09.0	88 52.7	6 50.6	59
25	14 47.5	91 47.0	15 32.4	90 50.4	16 18.6	89 53.1	6 51.3	60
4 30	-15 58.7	+ 92 45.1	-16 43.4	+ 91 48.9	-17 29.3	+ 90 52.0	6 51.6	61
35	17 10.8	93 42.3	17 55.4	92 46.5	18 41.2	91 50.1	6 51.8	62
40	18 23.8	94 39.1	19 08.4	93 43.7	19 54.2	92 47.7	6 51.6	62
45	19 37.9	95 36.0	20 22.6	94 41.0	21 08.5	93 45.3	6 51.2	62
50	20 53.0	96 33.3	21 37.9	95 38.7	22 24.0	94 43.3	6 50.6	62
55	22 09.2	97 31.6	22 54.5	96 37.2	23 41.0	95 42.3	6 49.8	61
5 00	-23 26.6	+ 98 31.2	-24 12.4	+ 97 37.2	-24 59.3	+ 96 42.6	6 48.7	61
05	24 45.3	99 32.6	25 31.7	98 39.0	26 19.3	97 44.8	6 47.4	60
10	26 05.3	100 36.5	26 52.5	99 43.3	27 40.9	98 49.4	6 45.9	59
15	27 26.8	101 43.5	28 15.0	100 50.7	29 04.4	99 57.3	6 44.1	57
20	28 49.9	102 54.1	29 39.2	102 01.9	30 29.7	101 09.0	6 42.1	56
25	30 14.8	104 09.4	31 05.4	103 17.7	31 57.3	102 25.5	6 39.8	54
5 30	-31 41.6	+105 30.1	-32 33.7	+104 39.2	-33 27.2	+103 47.9	6 37.3	52
35	33 10.5	106 57.5	34 04.4	106 07.6	34 59.7	105 17.4	6 34.5	50
40	34 41.7	108 32.9	35 37.7	107 44.4	36 35.1	106 55.6	6 31.4	48
45	36 15.7	110 18.3	37 14.0	109 31.6	38 13.9	108 44.7	6 27.9	46
50	37 52.6	112 15.8	38 53.6	111 31.6	39 56.4	110 47.3	6 24.1	43
55	39 32.9	114 28.7	40 37.1	113 47.8	41 43.4	113 07.2	6 19.9	40
6 00	-41 17.3	+117 01.2	-42 25.3	+116 25.0	-43 35.6	+115 49.7	6 15.1	37
05	43 06.5	119 59.7	44 18.9	119 30.4	45 34.2	119 02.9	6 09.9	34
10	45 01.7	123 33.9	46 19.6	123 15.1	47 40.9	123 00.0	6 03.9	30
15	47 04.5	128 00.6	48 29.4	127 59.3	49 58.7	128 05.4	5 56.9	25
20	49 18.2	133 53.1	50 52.6	134 25.0	52 33.7	135 14.3	5 48.5	20
6 25	-51 50.2	+142 41.2	-53 41.2	+144 42.8	-55 46.2	+147 59.2	5 37.0	12
Limits	-55 16.4	+165 19.3	-56 40.6	+165 17.1	-58 05.9	+165 14.2	5 19.1	0