TABLE 3.1

ELEMENTS OF THE TOTAL SOLAR ECLIPSE OF 2010 JULY 11

Equatorial Conjunction: 19:52:01.30 TDT J.D. = 2455389.327793
(Sun & Moon in R.A.) (=19:50:55.11 UT)

Ecliptic Conjunction: 19:41:33.49 TDT J.D. = 2455389.320527
(Sun & Moon in Ec. Lo.) (=19:40:27.31 UT)

Instant of Greatest Eclipse: 19:34:37.63 TDT J.D. = 2455389.315713
(=19:33:31.45 UT)

Geocentric Coordinates of Sun & Moon at Greatest Eclipse (JPL DE200/LE200):

Sun:		Moon:	
R.A. =	07h23m57.621s	R.A. =	07h23m15.844s
Dec. =	+22°02'10.95"	Dec. =	+21°22'29.30"
Semi-Diameter =	15'43.94"	Semi-Diameter =	16'26.67"
Eq.Hor.Par. =	08.65"	Eq.Hor.Par. =	1°00'20.87"
Δ R.A. =	10.187s/h	Δ R.A. =	154.225s/h
Δ Dec. =	-20.41"/h	Δ Dec. =	-515.89"/h

Lunar Radius Constants: k1 = 0.2725076 (Penumbra) k2 = 0.2722810 (Umbra)

Shift in Lunar Position: Δb = 0.00" Δl = 0.00"

Geocentric Libration (Optical + Physical): l = -3.2° b = 0.9° c = 6.6°

Brown Lun. No. = 1083
Saros Series = 146 (27/76)
nDot = -26.00 "/cy**2

Eclipse Magnitude = 1.05804 Gamma =-0.67877 ΔT = 66.2 s

Polynomial Besselian Elements for: 2010 Jul 11 20:00:00 TDT (=t_0)

n	x	y	d	l_1	l_2	μ
0	0.0740999	-0.7170312	22.0357037	0.5344427	-0.0116561	118.614319
1	0.5572523	-0.1366581	-0.0053410	-0.0000908	-0.0000904	15.000069
2	-0.0000276	-0.0001121	-0.0000052	-0.0000124	-0.0000123	0.000002
3	-0.0000090	0.0000024	0.0000000	0.0000000	0.0000000	0.000000

Tan f_1 = 0.0045988 Tan f_2 = 0.0045759

At time t_1 (decimal hours), each Besselian element is evaluated by:

$$a = a_0 + a_1*t + a_2*t^2 + a_3*t^3 \quad (\text{or } a = \sum [a_n*t^n];\ n = 0 \text{ to } 3)$$

where: a = x, y, d, l_1, l_2, or μ
$t = t_1 - t_0$ (decimal hours) and t_0 = 20.00 TDT

The Besselian elements were derived from a least-squares fit to elements calculated at five uniformly spaced times over a 6-hour period centered at t_0. Thus, they are valid over the period $17.00 \le t_1 \le 23.00$ TDT.

All times are expressed in Terrestrial Dynamical Time (TDT).

Saros Series 146: Member 27 of 76 eclipses in series.