

TABLE 1

ELEMENTS OF THE TOTAL SOLAR ECLIPSE OF 2009 JULY 22

<u>Equatorial Conjunction:</u>	02:34:07.29 TDT	J.D. = 2455034.607029
(Sun & Moon in R.A.)	(=02:33:01.42 UT)	
<u>Ecliptic Conjunction:</u>	02:35:41.89 TDT	J.D. = 2455034.608124
(Sun & Moon in Ec. Lo.)	(=02:34:36.03 UT)	
<u>Instant of Greatest Eclipse:</u>	02:36:24.37 TDT	J.D. = 2455034.608615
	(=02:35:18.50 UT)	

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

Sun:	R.A. = 08h06m24.115s	Moon:	R.A. = 08h06m29.643s
	Dec. = +20°16'03.00"		Dec. = +20°20'07.03"
	Semi-Diameter = 15'44.50"		Semi-Diameter = 16'42.73"
	Eq.Hor.Par. = 08.66"		Eq.Hor.Par. = 1°01'19.84"
	Δ R.A. = 9.958s/h		Δ R.A. = 155.021s/h
	Δ Dec. = -29.88"/h		Δ Dec. = -684.39"/h

<u>Lunar Radius Constants:</u>	k1 = 0.2725076 (Penumbra)	<u>Shift in Lunar Position:</u>	Δb = 0.00"
	k2 = 0.2722810 (Umbra)		Δl = 0.00"

Geocentric Libration: (Optical + Physical)	l = 0.8°	Brown Lun. No. = 1071	
	b = 0.0°	Saros Series = 136 (37/71)	
	c = 10.9°	nDot = -26.00 "/cy**2	

Eclipse Magnitude = 1.07990 Gamma = 0.06977 ΔT = 65.9 s

Polynomial Besselian Elements for: 2009 Jul 22 03:00:00.0 TDT (=t₀)

n	x	y	d	l ₁	l ₂	μ
0	0.2399887	-0.0032838	20.2642422	0.5304467	-0.0156322	223.388214
1	0.5563963	-0.1774582	-0.0078733	0.0000063	0.0000063	15.001003
2	-0.0000576	-0.0001344	-0.0000046	-0.0000128	-0.0000127	0.000002
3	-0.0000094	0.0000032	0.0000000	0.0000000	0.0000000	0.000000

$$\text{Tan } f_1 = 0.0046014 \quad \text{Tan } f_2 = 0.0045784$$

At time t₁ (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, l₁, l₂, or μ
t = t₁ - t₀ (decimal hours) and t₀ = 3.000 TDT

The Besselian elements were derived from a least-squares fit to elements calculated at five uniformly spaced times over a six hour period centered at t₀. Thus the Besselian elements are valid over the period 0.00 ≤ t₁ ≤ 6.00 TDT.

Note that all times are expressed in Terrestrial Dynamical Time (TDT).

Saros Series 136: Member 37 of 71 eclipses in series.