

KG

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C LXV

165



11581

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5-

6

Star Measures

m

L	d	1	2	3	4
20.372		18741	19012	20282	
19.9	11022	18099	12322	16969	
12.6	22	91	18	59	
	62	48	02	82	
	<u>14.9341</u>	<u>14.9353</u>	<u>12.6686</u>	<u>12.6682</u>	

2	19952	20180	17982	20528	
17.4	16871	13278	10324	18151	
21.8	16870	72	26	57	
	54	80	83	26	
	<u>17.3082</u>	<u>17.3094</u>	<u>21.7653</u>	<u>21.7627</u>	

3	10318	19712	20390	19914	
29.6	13826	16220	19050	11248	
16.1	30	20	52	50	
	14	10	88	08	
	<u>29.6488</u>	<u>29.6508</u>	<u>16.1390</u>	<u>16.1370</u>	

Moon Measures

L		19956	19980	
24		16844	13103	
15.3		88	97	
		69	72	
		<u>15.3122</u>	<u>15.3126</u>	

2	14911	15182	
23.1	14478	74	
16	90	17762	
	<u>23.0427</u>	<u>23.0416</u>	

3	10136	20190	
22.6	13469	16840	
17.1	63	38	
-X	42	87	
	<u>22.6678</u>	<u>22.3350</u>	

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Star Measures.

	d	1	2	d	4
1	20372	18741	19012	20282	
17.9	11022	18099	12322	16969	
12.6	22	91	18	59	
	62	98	02	82	
	<u>19.9391</u>	<u>19.9353</u>	<u>12.6686</u>	<u>12.6682</u>	
2	19952	20180	17982	20528	
17.4	10871	15278	10304	18151	
21.8	16870	72	26	57	
	54	80	83	26	
	<u>17.3082</u>	<u>17.3099</u>	<u>21.7653</u>	<u>21.7627</u>	
3	10318	19712	20380	19919	
29.6	13826	16220	19050	11298	
16.1	30	20	52	50	
	19	10	~~982~~	08	
	<u>29.6488</u>	<u>29.6508</u>	<u>16.1390</u>	<u>16.1390</u>	

Moon Measures.

1		19966	19980
24		16899	13103
15.3		88	97
		69	72
		<u>15.3122</u>	<u>15.3126</u>
2	19911	15182	
23.1	14478	79	
16	90	19762	
	<u>23.0427</u>	<u>23.0916</u>	
3	10136	20190	
22.6	13469	16848	
17.1	63	38	
-x	42	87	
	<u>22.6674</u>	<u>22.3350</u>	

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Moon Measures.

2

<u>4</u>	19158	20180
22.8	10527	18810
18	28	00
	56	78
	<u>22.8629</u>	<u>22.8627</u>

<u>5</u>	19920	19992	18701
23	17580	17592	14082
18.2	72	96	20
	72	OK 32	05
		<u>18.2376</u>	<u>18.2302</u>

<u>6</u>	20380	18710
29	10592	18488
18.9	88	74
	98	18
	<u>18.9808</u>	<u>18.9770</u>

<u>7</u>	17422	15763
24.6	16674	63
19.1	62	14408
+4	<u>19.0754</u>	<u>19.0755</u>

<u>8</u>	19820	19542
26	15366	13990
18.4(2)	72	87
	10	43
	<u>18.4477</u>	<u>18.4475</u>

Phase Error

Moon Measures.

2

<u>9</u>	19158	20180
22.8	10527	18810
18	28	00
	56	78
	<u>22,8629</u>	<u>22,8627</u>

<u>5</u>	19920	19992	18701
23	17580	17592	14082
18.2	72	96	80
	12	32	05
		<u>18,2396</u>	<u>18,2302</u>

<u>6</u>	20380	18710
29	10592	18988
18.9	88	79
	88	18
	<u>18,9808</u>	<u>18,9770</u>

<u>7</u>	17922	15163
29.6	16679	63
19.1	62	19908
+4	<u>19,0759</u>	<u>19,0755</u>

<u>8</u>	19820	19592
26	15366	13990
18.9(?)	72	89
	10	43
	<u>18,9997</u>	<u>18,9995</u>

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Darius, Eto

3

Mar 8

Exp. to stars	3	58		7	10	
Moon	4	03	37.8	7	03	38.1
Clock fast		11	10.7			

H. Sid. Time	3	52	27.25	5-4-+1h	33m
H. Long	7	44	31.05		
G. Sid. T.	8	36	58.30		
Sid. T. M. Noon	15	09	21.51		
External	17	27	36.79		
Reduction		2	51.63		
G. M. T.	17	27	45.16		

From Naut Alman.		H. A		Loc.
Moon 174	2	18	59.58	+19 00 17.7
Machon 1m			2.2055	9.966
" 24.7527			59.58	+8 06.7
Tahiti Place	2	19	59.17	+19 07 24.4

Moons Age 13 days

Parallax	56	99.28
Semid.	15	30.5
R.		930.5
Long		13.7
Lat (S)		-0.8
H.		943.1
P		2.0216
alt.		-970
(1+9)/2		1924.6
R2		3.7091

$$934 = 13.5$$

$$\begin{array}{r}
 93-503.8 \\
 +27 \\
 \hline
 479.8
 \end{array}$$

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Times Etc

3

Nov 8

Exp. to stars	3	58		7	10	
" " Moon	7	03	37.8"	7	03	38.1"
clock fast		11	10.7"			

H. Sid. Time	3	52	27.25"	8-4- + 4 ^h	33 ^m -
H. Long	7	44	31.05"		
G. Sid. T	8	36	58.30"		
Sid T. M. Noon	15	09	21.51"		
Internal	17	27	36.79"		
Reduction		2	51.63"		
G. M. T	17	29	45.16"		

From Nant Alm	R	A	Class
Moon 17 ^h	2	18	59.58" + 19 00 17.7"
Moon 1 ^m			2.2055" 9.966"
" 29.7527			59.68" + 4 6.7"
Tabular Place	2	19	59.17" + 19 09 29.9"

Moon age 13 days

Palalay	56	99.29
Semi d	15	30.5"
P		930.5"
Aug		13.4
Ln (2)		-0.8
M		993.1
P		2.6216"
alt		-970
11+9)P		1.9246"
112		3.7091"

939 = 18.5"

93-503.8
+29
979.8

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Plate Constants

X	14.9347	17.3088	29.6498"
Y	14.5491	17.0928	30.0297
X-Y	+3856	+2160	-3749

u	12.6684	21.7640	16.1390
v	12.2785	21.8202	15.8452
u-v	+3899	-562	+2888

$$\begin{aligned}
 &X-Y + 500X && + 579.8Y && + 318X && -12073 \\
 &+3856 + 7467 = +11323 && + 694 = +12017 && + 57 = +12074 \\
 &+2760 + 8659 = 11419 && + 1193 = 12612 && + 662 = 12073 \\
 &-3749 + 14825 = 11076 && - 889 = 11960 && + 113 = 12073 \\
 &24.3888 + 18294 = && + 940 = && + 93 = 24.7192
 \end{aligned}$$

$$\begin{aligned}
 &u-v + 500u && - 49.8v && + 3.4v && - 9532 \\
 &+3899 + 6334 = +10233 && - 794 = +9439 && + 43 = +9532 \\
 &-562 + 10882 = +10320 && - 862 = 9458 && + 79 = 32 \\
 &+2888 + 8067 = +10955 && - 1477 = 9478 && + 55 = 33 \\
 &17.1460 + 8573 = && - 1225 = && + 58 = 16.9334
 \end{aligned}$$

$$\begin{aligned}
 &\text{Tables } a = +9 && c = +0 && a-c = +0.4 && b+d = -1 \\
 &Ob. && = -503.8 && = -503.4 && = -.4 && = -5. \\
 &u-c && -507.2 && -503.4 && && - 9.0
 \end{aligned}$$

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Plate Constants

x	19.9397	17.3088	29.6998
y	19.5991	17.0928	30.0297
x-y	+3856	+2160	-3799

u	12.6689	21.7690	16.1390
v	12.2785	21.8202	15.8952
u-v	+3899	-562	+2888

$$\begin{array}{rcl}
 x-y & +520x & +5.98y \\
 +3856 + 7967 = +11223 & + 699 = +12017 & +57 = +12074 \\
 +2160 + 8659 = 10819 & + 1193 = 12007 & + 66 = 12073 \\
 -3799 + 19825 = 11676 & + 889 = 11960 & + 113 = 12073 \\
 29.5888 + 12297 & + 990 & + 93 \quad 29.7192
 \end{array}$$

$$\begin{array}{rcl}
 u-v & +520y & -99.8x \\
 +3899 + 6339 = +10233 & - 799 = +9989 & + 93 = +9953 \\
 -562 + 10882 = +10320 & - 862 = 9958 & + 77 = 3 \\
 +2888 + 8067 = +10955 & - 1977 = 9978 & + 55 = 33 \\
 17.1960 + 8573 & - 1225 = & + 58 \quad 16.933
 \end{array}$$

$$\begin{array}{lcl}
 \text{Tables} & a = +.1 & c = +\phi \quad a-c \sim +0.9 \quad b+d = -1 \\
 \text{Obs} & = -503.8 & = -503.9 \quad = -.9 \quad = -5.
 \end{array}$$

A₂ + .8

B₃ + .5

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Moon's Center

	x	$(x-x_0)$	Δx	$(x-x_0)^2$	$(x-x_0) \pm (y-y_0)^2 - C$
1	24.0000	-0.5910	-1	0.3492	3.7119 +78
2	23.0921	-1.5489	-1	2.3994	3.7127 +86
3	22.6662	-1.9248	-0	3.7048	3.7048 +7
4	22.8628	-1.7282	+0	2.9867	3.7160 +119
5	23.0000	-1.5910	+1	2.5310	3.7113 +72
6	24.0000	-0.5910	+1	0.3492	3.7091 +50
7	24.5910	0.0000	+2	0.0000	3.7229 +188
8	26.0000	+1.4090	+1	1.9858	3.6722

3.7091

Phaul limit

	y	$(y-y_0)$	Δy	$(y-y_0)^2$	$\leftarrow$
1	15.3124	-1.8336	-1	3.3625	198
2	16.0000	-1.1460	-0	1.3133	254 233
3	17.1460	-0.0000	-0	0.0000	270
4	18.0000	+0.8540	+0	0.7293	296
5	18.2324	+1.0864	+0	1.1803	304
6	18.9789	+1.8329	+1	3.3599	342
7+	19.0754	+1.9294	+1	3.7229	360 -162°
8	18.9446	+1.2986	+1	3.6866	42

Phaul limit

Approx. Center

 $x = 24$ $y =$

15.3124

18.9789

34.2913

 y_0

17.1456

 y_{max}

19.0754

 R

1.9298

1.9246

 x_{min}

22.6662

 x_0

24.5908

Center

 $\{x_0$

24.5940

 $\{y_0$

17.1460

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Moon's Center

5

	x	$(x-x_0)$	Δx	$(x-x_0)^2$	$(x-x_0) + (y-y_0) \cdot 0.0$
1	29.0000	-0.5910	-1	0.3492	3.7119 +78
2	23.0921	-1.5989	-1	2.5576	3.7127 +86
3	22.6662	-1.9298	-0	3.7098	3.7098 +7
4	22.8628	-1.7282	+0	2.9867	3.7160 +119
5	23.0000	-1.5910	+1	2.5310	3.7113 +72
6	29.0000	-0.5910	+1	0.3492	3.7091 +50
7	29.5910	0.0000	+2	0.0000	3.7229 +188
8	26.0000	+1.9090	+1	1.9850	3.6722

3.7091

	y	$(y-y_0)$	Δy	$(y-y_0)^2$	
1	15.3129	-1.8336	-1	3.3625	198
2	16.0000	-1.1460	-0	1.3133	259
3	17.1860	-0.0000	-0	0.0000	270
4	18.0000	+0.8540	+0	0.7293	296
5	18.2329	+1.0864	+0	1.1803	309
6	18.9789	+1.8329	+1	3.3599	392
7+	19.0759	+1.9299	+1	3.7229	360 -162°
8	18.9996	+1.2986	+1	3.6866	92

Approx. Center

 $x = 29$ $y =$

15.3129

18.9789

39.2913

 y_0

17.1956

 y_{max}

19.0759

 R

1.9298

1.9296

 x_{min}

22.6662

 x_0

29.5908

Center

 $\{$ x_0 29.5910 $\{$ y_0 17.1960

Formation of Normals.

1	+ 1.08	- 46.0	- 14.3.0
2	+ 1.78	- 133.0	- 97.0
3	+ 0	- 13.5	- 0
4	- 1.77	- 206.0	+ 101.0
5	- 1.73	- 117.5	+ 78.5
6	- 1.08	- 29.5	+ 91.5
7	0.	0.	+ 36.5
8			
	<u>+ 2.86</u>		<u>+ 307.5</u>
	- 7.28	- 542.5	- 292.0
	<u>- 1.92</u>		<u>+ 65.5</u>

-34

	a	b	c
a	- 2.5	+ 1	- 9
b	+ 5	+ 4	- 6
c	- 38	+ 5	- 0
		+ 4	+ 9
		+ 4	+ 5
		+ 1	+ 9
		+ 0	+ 10
			- 28
			- 28

.115

$$-1.92 + 13.66 = +2.72$$

$$+ [] - 0.16 = -0.92$$

$$+ 13.50 = +1.80$$

$$+ 12.32 = -7.97 - 0.18 = -8.15$$

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Conditional Equations

6.
new
0-cv

							0-c	
1	-0.59	-	1.83	=	+ 78	+26	+52	+6
2	-1.55	-	1.15	=	+ 86	+68	+18	-22
3	-1.92	-	0.00	=	+ 7	+84	-77	-110
4	-1.73	+	0.85	=	+ 119	+76	+93	+13
5	-1.59	+	1.09	=	+ 72	+70	+2	-27
6	-0.59	+	1.83	=	+ 50	+26	+24	-4
7	0.00	+	1.93	=	+ 188	0	+188	+160
8								

$$+ 327 - 77$$

Average 50
58

$$12.32 - 1.92 = -592.5 - 7.97$$

$$-1.92 + 13.66 = +65.5 + 2.72$$

$$+ [] - .16 = -62.5$$

$$+13.50 = +3.0$$

$$+ 0.13 \Delta$$

$$b = + .22$$

$$12.32 = -592.5 + .3 = -592.2$$

$$a = -99.0$$

Are Measured 162°

$$- 0.66 \Delta$$

$$\frac{p}{h} = .21$$

$$\frac{\Sigma v}{h} = +31.5$$

$$\text{In } 5^{\circ} \text{ } 12.92 + 31.5 = +1.50$$

$$\Delta p = +1.8$$

$$- 2RC = -1.92 \quad .21$$

$$\text{Corr } +0.5$$

$$\Delta b = -0.25 \quad \Delta s = -0.1$$

$$\Delta p = +1.3$$

$$\Delta q = +1.27 \quad \Delta q = +0.09$$

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Conditional Equations

6.

					O-C
1	-0.59	- 1.53	= + 78	+ 26	+ 52
2	-1.55	- 1.15	= + 86	+ 68	+ 18
3	-1.92	- 0.00	= + 7	+ 89	- 77
4	-1.73	+ 0.55	= + 119	+ 76	+ 93
5	-1.59	+ 1.09	= + 72	+ 70	+ 2
6	-0.59	+ 1.83	= + 50	+ 26	+ 29
7	0.00	+ 1.93	= + 188	0	+ 158
8					

+ 327 - 77
Average 50
58

$$12.32 - 1.92 = - 592.5$$

$$- 1.92 + 13.66 = + 65.5$$

$$+ [] - .16 = - 62.5$$

$$+ 13.50 = + 3.0$$

$$b = + .22$$

$$12.32 = - 592.5 + .3 = - 592.2$$

$$a = - 99.0$$

Are Measured 162°

$$\frac{P}{h} = .21$$

$$\frac{\Sigma V}{h} = + 31.5$$

$$\frac{+ 31.5}{.21} = + 150 \quad \Delta P = + 1.8$$

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Mars Mean Position

7

$$\begin{array}{r} \lambda_0 \quad 24.5910^\circ \\ \quad - 22^\circ \\ \hline 24.5888^\circ \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 17.1760^\circ \\ \quad \quad \quad 0^\circ \end{array}$$

From Plate Constants

$$\begin{array}{r} \lambda \quad 24.7192^\circ \\ \gamma \quad + 2.7192^\circ \end{array}$$

$$\eta \quad 16.9339^\circ$$

$$h \quad - 1.0666^\circ$$

$$\log \gamma \quad 0.43364^\circ$$

$$\cos \delta \quad 9.97652^\circ$$

$$8.50729^\circ$$

$$1.94988^\circ$$

$$\log \tan \delta \quad 9.5291^\circ$$

$$\gamma^\circ \quad 0.8673^\circ$$

$$7.0539^\circ$$

$$7.9498^\circ$$

$$\delta - A \quad - 89.10^\circ$$

$$h_1 \quad + 0.0028^\circ$$

$$A \quad 2 \quad 17 \quad 10^\circ$$

$$S_0 \quad 2 \quad 18 \quad 39.10^\circ$$

$$\log h_0 \quad 0.02914^\circ$$

$$7.33113^\circ$$

$$2.69799^\circ = 498.9^\circ$$

$$Red \quad + 5.07^\circ$$

$$\delta - D \quad - 8 \quad 18.9^\circ$$

$$L' \quad 2 \quad 18 \quad 44.17^\circ$$

$$D \quad 18 \quad 48 \quad 36^\circ$$

$$S_0 \quad 18 \quad 40 \quad 17.1^\circ$$

$$Red \quad + 27.7^\circ$$

$$L' \quad 18 \quad 40 \quad 27.8^\circ$$

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Moon's Mean Position

7

$$\begin{array}{r} \lambda_0 \quad 29.5910'' \\ \quad \quad - 22'' \\ \hline 29.5888'' \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 17.7960'' \\ \quad \quad \quad 0'' \\ \hline \end{array}$$

From Plate Constants

$$\begin{array}{r} \lambda \quad 29.7192'' \\ \gamma \quad +2.7192'' \\ \log \gamma \quad 0.93369'' \\ \text{Cord} \quad 9.97652'' \\ \hline 8.50729 \\ 1.99988'' \end{array}$$

$$\begin{array}{r} \gamma \quad 16.9339'' \\ h \quad -1.0666'' \\ \log \tan \delta \quad 9.5291'' \\ \delta'' \quad 0.8873'' \\ 7.0539'' \\ 7.9998'' \end{array}$$

$$\gamma - A \quad -89.10''$$

$$h_1 + 0.0028$$

$$A \quad 2 \quad 17 \quad 10$$

$$\lambda_0 \quad 2 \quad 18 \quad 39.10'' \quad \log h_0 \quad 0.02919''$$

$$\hline 7.33113''$$

$$2.69799'' = -998.9''$$

$$\text{Red} \quad +5.07$$

$$\delta - D \quad -8 \quad 18.9''$$

$$\lambda' \quad 2 \quad 18 \quad 99.17''$$

$$D \quad 18 \quad 98 \quad 36$$

$$\lambda_0 \quad 18 \quad 90 \quad 17.1''$$

$$\text{Red} \quad +27.7$$

$$\lambda' \quad 18 \quad 90 \quad 99.8''$$

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Lunar Parallax

8

$\delta' \quad 2 \quad 18 \quad 49.17^{\circ}$
 $\delta \quad 3 \quad 52 \quad 27.25^{\circ}$
 $\delta - \delta' \quad 41 \quad 33 \quad 23.08^{\circ}$
 $= \quad 23 \quad 25 \quad 46.20^{\circ}$
 $\frac{1}{2}(\delta - \delta') \quad 8 \quad 50.1^{\circ}$
 $\quad 23 \quad 16 \quad 55.6^{\circ}$
 9.95727
 0.00000
 0.03689°
 9.99416°

$\delta \quad 44 \quad 36 \quad 52.8^{\circ}$

$\delta \quad 18 \quad 40 \quad 44.8^{\circ}$

$\delta - \delta' \quad 23 \quad 56 \quad 08.0^{\circ}$

9.82690
 8.21824
 9.64083
 0.15395
 78.3889°

$\delta - \delta' \quad + 20 \quad 43.9^{\circ}$

$\delta \quad 19 \quad 04 \quad 28.2^{\circ}$

$\text{Eph} \delta + 19 \quad 04 \quad 29.9^{\circ}$

$0 - c \quad + 3.8^{\circ}$

$\text{Curv Corr} \quad + 0.1$
 $2^{\text{nd}} \text{ Altitude Ref} \quad 0.0$

$\text{In Corr} \quad - 0.1$

$\delta + 19 \quad 04 \quad 28.1$

$0 - c \quad + 3.7$

$\pi \quad 56 \quad 49.24^{\circ}$

9.86913

8.21824°

9.59947°

0.02452°

7.71133°

$\delta - \delta' \quad 17 \quad 41.10$

$= \quad + 1 \quad 10.79$

$\alpha \quad 2 \quad 19 \quad 54.91^{\circ}$

$\text{Eph} \alpha \quad 2 \quad 19 \quad 54.17^{\circ}$

$0 - c \quad + 0.74^{\circ}$

$+ 0.02$

$+ 0.09$

$\alpha \quad 2 \quad 19 \quad 54.95^{\circ}$

$+ 0.78$

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Lunar Parallax

8

χ^2 2 18 99.17"
 χ^2 3 52 27.25"
 $\delta - \chi^2$ 1 33 93.08"
 $=$ 23 25 96.20"
 $\chi^2 (1-\chi^2)$ 8 50.16"
 χ^2 23 16 55.6"
 9.95727
 0.00000
 0.03689
 999916

δ 49 36 528"
 δ 18 40 99.8"
 $\delta - \delta$ 23 56 040"

9.82690
 8.21824
 9.64083
 0.15395
 78.3889

$\delta - \delta'$ 23 93.9"

δ 19 09 28.2"

Eph. +19 09 29.9"

O-C +3.8"

Cur. Corr +0.1

2nd Ulster Ref. 0.0

Cur. Corr -0.1

δ 19 09 28.1

O-C +3.7

π 56 99.24"

9.86913

8.21824"

9.59997"

0.024520

771138"

$\delta - \delta'$ 17 91.10

$=$ 1 10.79

χ 2 19 59.91"

Eph. χ 2 19 59.17"

O-C +0.74"

+0.02

+0.07

χ 2 19 59.95"

+0.78

1
20
13

2
23
18

3
30
30

4
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9

1
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11597

Star Measures

11

1	20.2	20752	10296	20386	20498
	13.2	18302	12799	18638	11786
		02	50	40	87
		50	302	80	60
		<u>20.2450</u>	<u>20.2496</u>	<u>13.1751</u>	<u>13.1724</u>
2	23.1	20350	20508	20079	19688
	18.7	19150	11720	13579	16166
		48	12	68	58
		52	18	80	87
		<u>23.1201</u>	<u>23.1199</u>	<u>28.6507</u>	<u>28.6775</u>
3	30.9	20070		20352	20758
	30.6	10670	19620	13680	17452
		78	29	52	62
		76	20230	60	50
		<u>30.9702</u>	<u>30.9392</u>	<u>30.6701</u>	<u>30.6703</u>
4	20.2	242		20338	19976
	33.9	12212	20352	16997	13320
	9.4	18	18389	7000	12
		40	95	32	82
		<u>33.8026</u>	<u>33.8038</u>	<u>9.3339</u>	<u>9.3336</u>

Moon Measures

1	20030	20232	19192	19810
30.2	15898	19386	16632	12300
17.2	78	58	40	30
20	40	32	78	20
	<u>30.4159</u>	<u>30.4121</u>	<u>14.2538</u>	<u>14.2512</u>
2		20712	20720	20598
31		11082	10238	19952
17.9		10996	88	40
		00	10	91
		<u>17.9701</u>	<u>17.9727</u>	<u>17.9398</u>

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132
23
83
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362
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91
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192
31
19

11597

Star Measures

11

20.2	20752	10296	20386	20498
13.2	18302	12799	18638	11786
	02	50	40	89
	50	302	80	60
	<u>20.2950</u>	<u>20.2996</u>	<u>13.1751</u>	<u>13.1729</u>

23.1	20350	20508	20079	19688
27	19150	11720	13579	16166
	98	12	68	58
	52	18	80	89
	<u>23.1201</u>	<u>23.1199</u>	<u>28.6507</u>	<u>28.6975</u>

30.9	20070		20352	20758
30.6	10670	19620	13680	17952
	78	29	52	62
	76	20230	60	50
	<u>30.9702</u>	<u>30.9392</u>	<u>30.6701</u>	<u>30.6703</u>

2	20292		20338	19976
33.9	12212	20352	16999	13320
9.4	18	18389	7000	12
	90	95	32	82
	<u>33.8026</u>	<u>33.8038</u>	<u>9.3339</u>	<u>9.3336</u>

Moon Measures

20.2	20030	30232	19192	17828
19.2	15592	19346	16632	12330
	78	58	90	30
	40	32	78	20
	<u>30.4159</u>	<u>30.9121</u>	<u>19.2538</u>	<u>19.2512</u>

2		20812	19722	20598
31		11002	10288	19752
199		10996	300	90
		00	12	91
		<u>19.9701</u>	<u>19.1929</u>	<u>19.9398</u>

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11597

Main Measures

<u>3</u>	19900	19770
31.2	17902	11799
15.7	898	48
X+	00	70
	<u>31.2000</u>	<u>31.1978</u>

20580	19780	19332
14530	113470	15672
30	67	62
90	802	20
<u>16.6256</u>	<u>16.6320</u>	<u>16.6370</u>

<u>5</u>	20788	20688
30.7	18292	18252
17	38	59
	92	88
	<u>30.7551</u>	<u>30.7565</u>

<u>6</u>	17680	19968
30	12200	15406
17.6	04	06
	70	67
	<u>17.5463</u>	<u>17.5439</u>

<u>7</u>	18700	19908
29.0	12192	16420
17.7	182	26
	20	12
	<u>17.6525</u>	<u>17.6513</u>

<u>8</u>	20310	19800	19732	19890
28.9	16084	14028	15282	14712
17.5	88	22	180	28
AC	10	00	32	92
	<u>28.4224</u>	<u>28.4225</u>	<u>27.4551</u>	<u>17.4524</u>

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11597

Main Measures.

<u>3</u>	19900	19770
31.2	17902	11199
15.7	898	98
At	00	70
	<u>312000</u>	<u>311978</u>

2058019788 19332

1932013470 10672

67 62

90 802 20

16.6320 16.6390

<u>5</u>	20788	20688
30.7	13292	10252
17	38	59
	92	88
	<u>307551</u>	<u>307565</u>

<u>6</u>	17680	19968
30	13200	15906
17.6	09	06
	70	69
	<u>17.5963</u>	<u>17.5939</u>

<u>7</u>	18700	19908
29.0	12182	16920
17.7	1872	26
	20	12
	<u>17.6225</u>	<u>17.6513</u>

<u>8</u>	20310	19800	17732	19890
28.9	16069	19028	15282	19712
17.5	88	22180	180	78
26	78	40776	32	92
	<u>287229</u>	<u>287225</u>	<u>17.4551</u>	<u>17.4529</u>

115-97

Times

Etc.

13

Nov 10 '16

Exp. to Stars	1	93		1	55
" " Moon	1	99	05.5"	1	99 05.6"
clock-fast	1	1	19.2		

H. Sid Time	1	37	51.35"	4-4- -	2" 25"
H. Long	4	44	31.05"		
G. Sid Time	6	22	22.90"		2 23
G. J. H. H.	15	17	19.62"		
Interval	15	05	04.78"		
Reduction		2	28.28"		
G. M. T.	15	02	39.50"		

From Nant Allen

R. A.

Dec.

Moon 15-4	4	02	53.59"	+24	39	51.8"
Motion 1 ^m			2.2968"			+ 9.323"
" 2.6583			6.11			+ 11.5"
Tabular Place	4	02	59.70"	+24	35	02.9"

Moon's Age 15-

Parallax	55	47.67"
Semid.	15	13.8"
R		913.8"
ang		12.9"
Par 5-		-0.8"
R		925.8
R		1.9837"
app		-939"
(1+9)/R		1.8898"
Hz		3.5713"

934 = 12.92

α-49 7.3

+24

-473.3

115-97

Times

Etc

13

Nov-10 '16

Exp. to Stars	1	93		1	55
" " Moon	1	99	05.5	1	99 05.6
Clock fast		11	19.2		

H. Sid Time	1	37	51.35	4-4- -	2 ^h 25 ^m
H Long	9	99	31.05		
9 Sid Time	6	22	22.90		
9 J. III. H.	15	17	19.62		
9 Interval	15	05	07.78		
Reduction		2	28.28		
9 M. T.	15	02	39.50		

From Vant Alm.		R. A.		Dec.	
Moon 15 ^h 4	9	02	53.59	+29	39 51.9
Motion 1 ^m			2.2968		1 93.33
" 2.6583			6.11		+11.5
Tabular Place	9	02	59.70	+29	35 02.9

Moon's Age 15

Parallax 55 97.67

Semi d. 15 13.8

R 983.8

ang 12.9

Pr 5 -0.8

R 925.9

R 1.9837

AR -939

(1+9)/R 1.8898

112 3.5713

939: 12.92

a = -99 7.3

+29

-973.3

$$\begin{array}{rclcl} 20.27 & + & 13.17 & = & 101.98 \\ 23.12 & + & 28.65 & = & 115.82 \\ 30.97 & + & 30.67 & = & 117.60 \\ 33.80 & + & 9.30 & = & 97.96 \end{array}$$

$$\begin{array}{rclcl} 43.36^\circ & + & 71.82^\circ & = & 217.80^\circ \\ 67.77^\circ & + & 90.00^\circ & = & 215.56^\circ \\ & & & & = 187.29^\circ \end{array}$$

$$\begin{array}{rclcl} + 21,38^{\circ} & - & 1,82^{\circ} & = & - 228^{\circ} & = & - 1978^{\circ} \\ & & & + & 165,8 & - & 2,9 \\ + 21,38 & & & = & - 58,6 & = & - 1980,9 \end{array}$$

$$x_2 = -2.7 \quad z = -92.7$$

$$\begin{aligned} 54.04' + 22.60' &= 19994'' = 19457'' \\ 54.06'' + 59.32'' &= 23342'' = 19379'' \end{aligned}$$

$$+102 + 36.82'' = +3378 \quad = -78$$

$$+ [] = , 02 = - 2,1 = - 18,6$$

$$+ 36.84 + 3350.1 - - 59.4$$

$$a_2 = +90.9 \quad z = 1.6$$

11097

18

Plate Center + Constants

X	Y	L	B
20.2778	13.7737	3	59.20.05
23.1200	28.6791	4	00.58.66
30.9397	30.6702		
33.8032	9.3337		

2) 43.3678	41.8228	2) 7	59.78.71	48.11.1	37.9
21.6824	20.9118	4	00.09.35	29.55	48.9
22	18		+10.16	-22	77.8
+0.3176	-2.9119	4	00.19.51	+29.33	01.1
<u>32.5</u>	<u>766.5</u>				
+10.16	-22.77.8				

X-7	+500X	-90.94	+2.7X	-90.97
+76	+10122	= +10198	-1197	= +9001
+22	+11560	= 11582	-2604	= 89.78
-3705	+15470	= 11760	-2788	= 89.72
-7106	+16962	= 9796	-848	= 89.98
29.3095	+14655	-1435	+79	-29.7397

Y-4	+500Y	+92.7X	+2.1Y	-122.57
+3765	+6587	= +10352	+1877	= +12229
-7270	+14325	= 10655	+2193	= 12198
-6011	+15335	= 9324	+2863	= 12192
+4438	+7667	= 9105	+3137	= 12239
15.7862	+7893	+27.26	+334	15.6257

Tables	a = -1.1	c = -.6	a-c = -.5	b+d = +1.2
Obs	-497.3	-497.9	= +.6	= -1.8
b-e	-496.2	-497.3		-3.0

11297

19

Plate Center + Constants

X	Y	X	Y
20.2998	13.1737	3	59.2005
23.1200	28.6991	4	00.5866
30.9397	30.6702		23.52
33.8032	9.3337		32.3

193.3698	91.8228	21.7	59.7871	98.111	37.7
21.6829	20.9118	4	00.0935	29.55	98.9
22	18		+10.16	-22	97.8
+0.3176	-29.119	4	00.1951	+29.33	01.1
<u>32.5</u>	<u>966.2</u>				
+10.16	-22.97.8				

X-7	+500X	-90.94	+2.71	-909
+76	+10122	= +10198	-1197	= +9001
+22	+11560	= 11582	-2609	= 8978
-3705	+15970	= 11760	-2788	= 8972
-7106	+16902	= 9796	-898	= 8998
29.3095	+19655	= -1935	+79	29.73

Y-4	+500Y	+92.78	+2.17	-1225
+3765	+6587	= +10352	+1877	= +12229
-9270	+19325	= 10055	+2193	= 12198
-6011	+15335	= 9324	+2863	= 12192
+9438	+9667	= 9105	+3138	= 12239
15.7862	+7893	= +2726	+33	15.625

Table 2 a: -1.1 e: -.6 a-e: -0.5 b+d: +1.2
 obs: -997.3 = -997.9 = +.6 = -1.8

Curr. Corr

ζ	η	$\Delta \zeta$	-5.6ζ	$+2\eta$	-4
-1.76	-5.20	-1	+10 = +9	-1 = +9	+2
+1.12	+11.08	+7	-6 = -2	+7 = +3	-2
+9.30	+13.22	+3.8	-52 = +6	+16 = +22	+15
+12.51	-9.19	+72	-70 = +2	-11 = -9	-16
				-41	
+7.73	-2.37	+9	-73	-0	= -50 = -0.14

$\Delta \eta$	-4.5η	-3ζ	-2
-4	+23 = +19	+1 = +20	
+35	-50 = -15	0 = -15	
+82	-60 = +22	-3 = +19	
-53	+91 = -12	-4 = -16	
-4	+11	-2	+3 = +0.1

-0.64	+5.88	= +4	= +31
+21.81	+4.03	= +130	= +29

+22.75	-1.85	= +126	= -2
	-0.7	= +8.3	
+22.75		= +125.6	= +6.3

$$\zeta = +5.6 = +0.29$$

+10.72	+27.30	= +62	= +117
+10.75	-19.39	= +71	= -57

+0.33	-38.69	= +9	= -177
+27	-0.03	= +1.85	= -0.02

$$-38.66 = +7.15 = -173.98$$

$$\eta = -0.18 = +17.5$$

Standard				Coordinates			15-
Cape 584 - Mg 5.6				Cape 589 - Mg 7.0			
C	3	58	22.78	4	00	00.76	
L	1902		22.74			00.49	
E			22.71			00.43	
Mean	3	58	22.73	4	00	00.47	
Proc			57.32			58.19	
α	3	59	20.05	4	00	58.66	
A	4	00	20	4	00	20	
$\alpha - A$	-	0	39.95			+38.66	
$\sin(\alpha - A)$			-59.95			+38.66	
log			1.77779			1.58726	
cos			9.96115			9.95371	
30			0.24618			0.04821	
30	-		1.7627			+1.1174	
31			-1			+7	
3			20.2372			23.1178	
X			20.2448			23.1200	
X-3			+7.6			+22	
C	+23	49	50.8	+25	56	25.7	
L			51.1			25.7	
E			50.1			25.9	
Mean	+23	49	50.7	+25	56	25.8	
Proc		+2	41.6		+2	39.8	
δ	+23	52	32.3	+25	59	05.6	
D	+24	33	00	+24	33	00	
$\delta - D$	-	40	27.7	+1	26	05.6	
$\sin(\delta - D)$			-24.27.8			+5.166.7	
log			3.38522			3.71321	
40			0.71637			1.04436	
log tan			9.6460			9.6879	
30			0.4924			0.0964	
41			7.1918			68.377	
40	-		5.2644			+1.10754	
41	+0		00.16			+0.0007	
41			12.7972			29.0761	
41			13.1737			28.6491	
(41-41)			+3.765			-4.270	

Standard

Coordinates

1.

Cape 589 - May 5.6

Cape 589 - May 7.5

C	3	58	22.79
L	190		22.79
E			22.71
Mean	3	58	22.73
Proc			57.32
X	3	59	20.05
A	9	00	20
X-A	-	0	39.95
sin(X-A)			-59.95
log.			1.777794
cos			9.96115
30			0.296184
30			-1.7627
31			-1
3			20.2372
1			20.2998
X-3			+76

4	00	00.76
		00.99
		00.95
9	00	00.97
		58.19
9	00	58.66
9	00	20
		+38.66
		+38.66
		1.58726
		9.95372
		0.09822
		+1.1174
		+7
		23.1178
		23.1200
		+22

C	+23	99	50.8
L			51.1
E			50.1
Mean	+23	99	50.7
Proc		+2	91.8
3	+23	52	323
D	+29	33	00
X-D	-90	27.7	
tan(X-D)		-29	27.8
log.			3.385224
40			0.716374
log Tan 1			9.6960
30			0.7924
41			7.1918
40			-5.2099
41			+0.0016
4			12.7972
4			13.1737
(4-41)			+3765

+25	56	25.7
		25.7
		25.9
+25	56	25.8
	+2	39.8
+25	59	05.6
+29	33	00
+1	26	05.6
	15	166.7
		3.71321
		1.09936
		9.6879
		0.0969
		68.377
		+11.0759
		+0.0007
		29.0761
		28.6991
		-9270

Standard Coordinates

16

Cape 602 Mag 5.5

A.G. 1353 - Mag 7.1

C	4 07	48.28	4 06	26.52
L		44.39		
E		44.36		
Mean	4 07	44.33	4 06	26.52
Proc		58.37		57.23
d	4 05	42.70	4 07	23.75
A	4 00	20	4 00	20
d-A	+ 5	22.70	+ 7	03.75
tan(d-A)		+ 322.67		+ 423.68
log	2.50874		2.62704	
mod	995269		996386	
70	0.96869		1.09717	
70	+ 93074		+ 125066	
71	+ 58		+ 72	
72	313102		345138	
73	309397		338032	
74	- 3705		- 7106	
C	+ 26 13	11.8	+ 23 19	01.3
L		11.8		
E		12.3		
Mean	+ 26 13	12.0	+ 23 19	01.3
Proc	+ 2	33.7	+ 2	33.8
d	+ 26 15	45.7	+ 23 21	35.1
D	24 33	00	24 33	00
d-D	+ 1	42 45.7	- 1	11 27.9
tan(d-D)		+ 6167.3		- 4285.5
log	+ 3.79009		3.63200	
11	1.12127		0.96315	
LogTan	96935		96359	
70	19373		21943	
41	8.6839		8.8831	
40	+ 13.2230		- 9.1865	
41	+ 0.0483		+ 0.0767	
42	312713		88899	
43	306702		9.3337	
44	- 6011		+ 7738	

Standard Coordinates

16

Cape 602 May 5.5

A.G. 135.3 - May 7.1

C	9 09	99.28	9 06	26.52
I		99.39		
E		99.36		
Mean	9 09	99.33	9 06	26.52
Pres		58.37		57.23
X	9 03	92.70	9 07	23.75
A	9 00	20	9 00	20
X-A	+ 5	22.70	+ 7	03.75
Sin(X-A)	+ 3	22.67	+ 9	23.68
log	2.50876		2.62709	
cos	9.95269		9.96286	
30	0.96869		1.09719	
30	+ 9.3099		+ 12.5066	
31	+ 58		+ 72	
32	31.3602		39.5138	
33	30.9397		33.8032	
X-3	- .3705		- .7106	

C	+ 26	13	11.8	+ 23	19	01.3
I			11.8			
E			12.3			
Mean	+ 26	13	12.0	+ 23	19	01.3
Pres		+ 2	33.9		+ 2	33.8
X	+ 26	15	95.1	+ 23	21	35.1
D	29	33	00	29	33	00
X-D	+ 1	92	95.9	- 1	11	29.9
Tan(X-D)		+ 6	16.73		- 9	28.55
log	+ 3.79009			3.63200		
41	1.12129			0.96315		
log Tan	9.6932			9.6359		
30	1.9373			2.1992		
41	8.6839			8.8831		
40	+ 13.2230			- 9.1865		
41	+ 0.0983			+ 0.0767		
42	31.2713			6.8899		
43	30.6702			9.3337		
44	- 6.011			+ .9938		

$$A = -1.2$$

$$B = -0.2$$

115-97

Maurice Center

17

	x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)^2 (y - y_0)^2$	
1	30.8140	+1.1050	+2	1.2219	3.5699	- 14
2	31.0000	+1.6910	+1	2.8598	3.5782	+ 69
2	31.1989	+1.8899	-0	3.5717	3.5717	+ 4
4	31.0000	+1.6910	-1	2.8592	3.5788	+ 75
5	30.7558	+1.4468	-1	2.0929	3.5681	- 32
6	30.0000	+0.6910	-2	0.4772	3.5751	+ 38
7	29.0000	-0.3090	-2	0.0959	3.5807	+ 194
8	28.2227	-0.8866	-2	0.7857	3.5669	- 44

 $R^2 = 3.5713$

	y	$y - y_0$	Δy	$(y - y_0)^2$	$\angle$
1	14.2525	-1.5325	+0	2.3485	14.90
2	14.9378	-0.8476	+0	0.7184	117
2	15.7850	0.0000	0	0.0000	90
4	16.6333	+0.8483	-0	0.7196	63
5	17.0000	+1.2150	-0	1.4762	50
6	17.5751	+1.7601	-0	3.0979	21
7	17.6519	+1.8669	-0	3.4853	351
8	17.5337	+1.6677	-0	2.7812	332

172°

Approx Center

$$x = 31 \quad y = 14.9378$$

$$16.6333$$

$$31.5707$$

$$15.7853$$

$$\text{Comment } R = 1.8898$$

$$x_{\text{max}} = 31.1989$$

$$y_0 = 29.3091$$

$$\text{Center } \{x_0 = 29.3090$$

$$\{y_0 = 15.7850$$

11597

Morris Center

17

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	
1 30.9190	+1.1050	+2	1.2219	3.5699	- 19
2 31.0000	+1.6910	+1	2.8598	3.5782	+ 69
3 31.1989	+1.8899	-0	3.5717	3.5717	+ 9
4 31.0000	+1.6910	-1	2.8592	3.5788	+ 75
5 30.7558	+1.4468	-1	2.0929	3.5681	- 32
6 30.0000	+0.6910	-2	0.9772	3.5751	+ 38
7 29.0000	-0.3090	-2	0.0959	3.5807	+ 199
8 28.9429	-0.8866	-2	0.7857	3.5669	- 99

 $R^2 = 3.3713$

y	$y - y_0$	Δy	$(y - y_0)^2$	
1 19.2525	-1.5325	+0	2.3985	199°
2 19.9379	-0.8476	+0	0.7184	117
3 15.7850	0.0000	0	0.0000	90
4 16.6333	+0.8483	-0	0.7196	63
5 17.0000	+1.2150	-0	1.9762	50
6 17.5751	+1.7601	-0	3.0979	21
7 17.6519	+1.8669	-0	3.9853	351
8 17.9537	+1.6677	-0	2.7812	322

172°

Approx Center

$$x = 31 \quad y = 19.9379$$

$$16.6333$$

$$31.3707$$

$$15.7853$$

$$\text{Computed } R = 11.8898$$

$$x_{\max} = 31.1989$$

$$x_0 = 29.3091$$

$$\text{Center } \begin{cases} x_0 = 29.3090 \\ y_0 = 15.7850 \end{cases}$$

Formation of Normals.

1	- 1.68	- 15.5	+ 21.5
2	- 1.42	+ 116.5	- 58.0
3	0.0	+ 7.5	0.0
4	+ 1.44	+ 127.0	+ 63.5
5	+ 1.77	- 46.5	- 39.0
6	+ 1.21	+ 26.0	+ 67.0
7	- 0.58	- 60.0	+ 362.5
8	- 1.49	- 39.2	- 73.5
	+ 4.42	+ 277.0	+ 514.5
	- 3.17	- 161.2	- 170.5
	- 0.75	+ 115.8	+ 344.0

	a	b	c
a	+ 20	+ 22	- 18
b	+ 12	+ 34	- 10
c	- 38	+ 38	0
		+ 34	+ 10
		+ 29	+ 13
		+ 18	+ 21
		- 6	+ 22
		- 18	+ 20

$$- 0.75 + 17.62 = + 5.00 \Delta$$

$$+ [] - 0.04 = + 1.39 \Delta$$

$$+ 17.58 = + 7.61 \Delta$$

$$+ 24.6$$

$$+ 13.96 = + 7.31 \Delta + 0.27 \Delta = + 7.58 \Delta$$

115-97

Conditional Equations

18

0 - C new

1	+	1.10	-	1.53	=	-14	+	11	-	37	=	-26	+	12	-	22
2	+	1.69	-	0.84	=	+69	+	16	-	20	=	-4	+	73	+	59
3	+	1.89		0.00	=	+4	+	18	-	0	=	+18	-	14	-	14
4	+	1.69	+	0.85	=	+75	+	16	+	20	=	+38	+	37	+	93
5	+	1.45	+	1.22	=	-32	+	14	+	29	=	+43	-	75	-	69
6	+	0.69	+	1.76	=	+38	+	7	+	42	=	+49	-	11	-	19
7	-	0.31	+	1.87	=	+194	-	3	+	45	=	+42	+	152	+	130
8	-	0.89	+	1.67	=	-94	-	9	+	40	=	+31	-	75	-	111

$$+ 274 - 175$$

Average 15-6

$$13.96 - 0.75 = +115.8 + 7.31 \Delta$$

$$-0.75 + 14.62 = +344.0 + 5.00 \Delta$$

$$+ [] - 0.4 = + 6.2$$

$$= + 0.32 \Delta$$

$$+ 14.58 = +350.2$$

$$b = + 24.1''$$

$$+ 13.96 = + 115.8 + 18.0 = + 133.8 \quad a = + 9.6''$$

$$+ 0.54 \Delta$$

Arc Measured $172''$

$$\frac{P}{h} = 0.27$$

$$\frac{\Sigma V}{h} = +12.4$$

$$\frac{+12.4}{.27} = + 46$$

$$\Delta R = +0.6$$

$$\text{Corr} = +0.5''$$

$$\Delta P = +0.1$$

$$\text{Inst- R } 1.89$$

$$- 2RC = -1.89$$

$$\Delta b = -0''.60$$

$$\Delta \delta = -0''.3$$

$$\Delta a = -0''.02$$

$$\Delta \eta = -0''.04$$

11097

Conditional Equations

11

0-C

1	+	110	-	1.53	=	-14		+	11	-	37	=	-26		+12
2	+	169	-	0.84	=	+69		+	16	-	20	=	-4		+73
3	+	189	-	0.00	=	+9		+	18	-	0	=	+18		-19
4	+	169	-	0.85	=	+75		+	16	+	20	=	+38		+37
5	+	175	+	12.2	=	-32		+	19	+	29	=	+48		-75
6	+	0.69	+	1.76	=	+138		+	7	+	92	=	+99		-11
7	-	0.31	+	1.87	=	+197		-	3	+	75	=	+72		+152
8	-	0.89	+	1.67	=	-99		-	9	+	90	=	+31		-75

$$+ 279 - 175$$

Average 15.6

$$13.96 - 0.75 = +115.8 + 7.31 \Delta$$

$$-0.75 + 19.62 = +379.0 + 5.00 \Delta$$

$$+ 2.3 - 0.9 = + 6.2$$

$$= + 0.32 \Delta$$

$$+ 14.58 = +350.2$$

$$b = + 29.1$$

$$+ 13.96 = + 115.8 + 18.0 = + 133.8 \quad a = + 9.6$$

$$+ 0.54 \Delta$$

Are Measured 172°

$$\frac{R}{h} = 0.27$$

$$\frac{2V}{h} = +12.9$$

$$\frac{112.9}{27} = + 96 \quad \Delta R = + 0.6$$

$$\Delta r = + 0.5$$

$$\text{Ins} = R = 1.89$$

$$- 2RC = - 1.89$$

$$\Delta b = - 0.60$$

$$\Delta \delta = - 0.3$$

$$\Delta a = - 0.02$$

$$\Delta r = - 0.04$$

11597

Moons Mean Position

19

$$\begin{array}{r} x_0 \quad 29.3090 \\ \quad \quad +5 \\ \quad \quad 29.3095 \end{array}$$

$$\begin{array}{r} y_0 \quad 15.7850 \\ \quad \quad +12 \\ \quad \quad 15.7862 \end{array}$$

From Plate Constants

$$x \quad 29.7387$$

$$y \quad 15.6257$$

$$z \quad +7.7397$$

$$y \quad -2.3773$$

$$\log z_0 \quad 0.88899$$

$$\log \tan \delta \quad 9.6337$$

$$\log \delta \quad 9.95992$$

$$z_2 \quad 1.7769$$

$$8.50727$$

$$7.0537$$

$$2.42128$$

$$8.4840$$

$$q-A \quad +263.86$$

$$h_1 \quad +0.0305$$

$$A \quad 4 \quad 00 \quad 20.00$$

$$h_0 \quad 2.4078$$

$$\log h_0 \quad 0.38108$$

$$y_0 \quad 4 \quad 07 \quad 43.81$$

$$7.33115$$

$$3.04993 \quad h - 1121.8$$

$$Red \quad +5.49$$

$$\delta-D \quad -18 \quad 41.8$$

$$q' \quad 4 \quad 07 \quad 49.30$$

$$D \quad +24 \quad 3.3 \quad 00.0$$

$$S_0 \quad +24 \quad 17 \quad 18.2$$

$$Red \quad +17.6$$

$$S' \quad +24 \quad 17 \quad 35.8$$

11597

Mars Mean Position

19

 λ_0 29.3090

+5

29.3095

 γ_0 15.7850

+12

15.7862

From Plate Constants

 λ 29.7397 γ 15.6257 γ +7.7397 γ -2.2793 $\log \lambda$ 30.88899 $\log \tan \delta$ 9.6537 $\cos \delta$ 9.95992 γ 1.7769

8.50729

7.0539

8.92158

8.4870

 $\gamma - A$ +263.86 λ +0.0305 A 9 00 20.00 λ_0 29.078 $\log \lambda$ 0.38108

7.33115

 γ_0 9 09 93.81

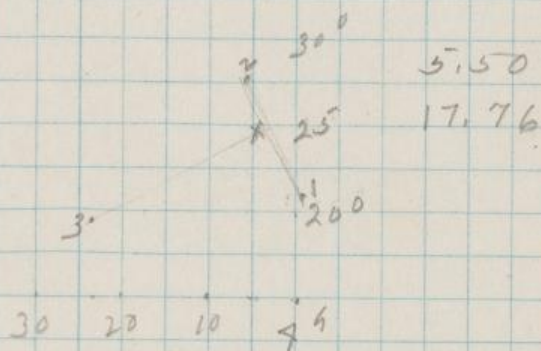
3.099935 - 1121.8

 Red +5.99 $\delta - D$ -18 91.8 γ' 9 08 99.30 D +29 33 00.0 δ_0 +29 17 18.2 Red +17.6 δ' +29 17 35.8

$$\begin{array}{r}
 3 \quad 59 \quad 49.00 \quad + 21 \quad 51 \quad 30.39 \\
 \quad 43.59 \\
 \hline
 \quad 75.41
 \end{array}
 \qquad
 \begin{array}{r}
 \quad 11.97 \\
 \hline
 + 18.92
 \end{array}$$

$$\begin{array}{r}
 4 \quad 05 \quad 48.29 \quad + 26 \quad 15 \quad 62.86 \\
 \quad 42.73 \\
 \hline
 \quad 55.66
 \end{array}
 \qquad
 \begin{array}{r}
 \quad 75.53 \\
 \hline
 + 17.33
 \end{array}$$

$$\begin{array}{r}
 4 \quad 23 \quad 47.90 \quad + 18 \quad 59 \quad 58.39 \\
 \quad 42.58 \\
 \hline
 \quad 53.22
 \end{array}
 \qquad
 \begin{array}{r}
 \quad 42.29 \\
 \hline
 + 16.03
 \end{array}$$



115-97 Reduction to Apparent Place

Nov 10 1.6

$$H + \alpha \quad 6 \quad 41.2 \quad 100 \quad 18.0^\circ \quad \delta \quad 29 \quad 19.3^\circ$$

$$H \quad 2 \quad 36.5^\circ$$

$$\alpha \quad 9 \quad 09.7^\circ$$

$$G \quad 23 \quad 25.0^\circ$$

$$G + \alpha \quad 3 \quad 29.7^\circ = 52^\circ \quad 25.5^\circ \quad \log \cos \delta \quad 9.9599^\circ$$

$$\mu \quad +0.7327^\circ$$

$$h \quad 0.6926^\circ$$

$$\log \cos(G + \alpha) \quad 9.7852^\circ$$

$$g \quad 1.3653^\circ$$

$$\sin(1) \quad 9.8990^\circ$$

$$\tan \delta \quad 9.6539^\circ$$

$$8.8239$$

$$\log \sin \delta \quad 9.6133^\circ$$

$$\cos(H + \alpha) \quad 9.2523^\circ$$

$$\mu \quad 1.2953^\circ$$

$$\sin(H + \alpha) \quad 9.9929^\circ$$

$$\sec \delta \quad 0.0901^\circ$$

$$8.8239$$

$$\log g' \quad 1.1505^\circ$$

$$g \quad 9.7916^\circ$$

$$h' \quad 0.1613^\circ$$

$$h \quad 0.1524^\circ$$

$$f \quad +35.22^\circ$$

$$g \quad +0.552^\circ$$

$$h \quad +18.20^\circ$$

$$+5.494$$

$$g' + 19.143^\circ$$

$$h' - 1.750^\circ$$

$$\mu' + 4.927^\circ$$

$$+17.620^\circ$$

11597 Reduction to Apparent Place

20

Nov 10 1.6

H + K	6	41.2	100	180	S	24	19.3
-------	---	------	-----	-----	---	----	------

H	2	36.5
---	---	------

K	9	09.7
---	---	------

G	23	25.0
---	----	------

G + K	3	29.7	=	52°	25.5
-------	---	------	---	-----	------

log cos δ 9.9599" μ 10.7327" μ 0.6926

log cos (G + K) 9.7852

g 1.3653

sum () 9.8990

trans 9.6539

88239

log sum δ 9.6132cos (H + K) 9.2525ⁿ

h 1.2955

sum (H + K) 9.9929

sec δ 0.0901

88239

log g' 1.1505

g 9.7416

h' 0.16134

h 0.1529

f + 3522

x + 0.552

h + 1720

+ 9.779

g' + 19.193

h' + 1.950

x' + 19.27

+ 17.620

11597

Lunar Parallax

28

γ 4 04 49.30^v
 δ 1 37 51.35^v
 $\delta - \gamma' - 2$ 26 57.95^v
 $= -36$ 44 29.25^v
 $\frac{1}{2}(\gamma - \gamma')$ -13 38.6^v
 $\frac{2}{2} -36$ 30 57.6^v

9.95727

0.00000

0.09490^v0.05217^v γ 48 26 00.0^v $\delta + 24$ 14 35.8^v $\delta - \delta'$ 11 29.2

9.82690

8.21029

9.61251

0.12599^v

7.77525

 $\delta - \delta'$ + 20 29.4^v $\delta + 24$ 35 05.2^vEph $\delta + 24$ 35 02.9^v

O-C + 2.3

2nd Urd. Ref 0.0

Corr from Constants page - .4

Irr Corr - 0.3

 $\delta + 24$ 35 07.5

O-C + 1.6

 π 55' 47.69

9.86913

8.21029^v9.77683^v0.04127^v7.89754^v $\gamma - \gamma'$ -27 09.19= -1 48.61^v γ 4 03 00.69^vEph γ 4 02 59.70^vO-C + 0.99^v γ 4 03 00.65^vO-C + .95^v

11597

Lunar Parallax

2.

γ 9 09 99.30
 δ 1 37 51.35
 $\delta - \gamma = 2$ 26 57.75
 $= 36$ 99 29.25
 $1/1.1$ -13 39.6
 $\delta - 36$ 30 59.6

9.95727
 0.00000
 0.09790
 0.05217

γ 98 26 00.0

$\delta + 29$ 19 35.8

$\delta - \gamma$ 27 17 29.2

9.82690
 8.24029
 9.07257
 0.17599
 7.77525

$\delta - \gamma$ 20 29.4

$\delta + 29$ 35 05.8

Eph $\delta + 29$ 35 02.9

O-C + 2.3

2nd Wrd Ref 0.0

Cor from Constants page - .4

I M Corr - 0.3

$\delta + 29$ 35 09.5

O-C + 1.6

γ 55 97.69

9.86913
 8.24029
 9.77683
 0.09127
 7.89754

$\delta - \gamma$ - 27 09.19

= - 1 98.64

γ 9 0.3 00.69

Eph γ 0.2 59.70

O-C + 0.99

γ 9 0.3 00.65

O-C + 95

1
2
13

2
22
28

3
30
31

4
31
9

1
3
1

2
2
1

11598

Star Measures

22

1	17610		20208	20419
20	17482	15212	15970	15650
136	90	26	72	48
		15088	08	16

20.0124 20.0131 13.5237 13.5237

2	20900	20886	16410	-(0088)
22.9	11192	20088	16470	16369
28.9	98	98	60	61
	09	88	(-0055)	16252
	<u>22.9209</u>	<u>22.9207</u>	<u>28.9995</u>	<u>28.9912</u>

3	19999	20717	15426	16910
30.7	12560	18160	15450	10
01	50	62	58	16970
	97	18	(-0028)	-(0060)
	<u>30.7443</u>	<u>30.7445</u>	<u>30.9972</u>	<u>30.9990</u>

4	20762	19978	19778	20070
33.6	15142	15618	13239	16616
9.7	14138	08	38	12
	68	79	82	77
	<u>33.5626</u>	<u>33.5637</u>	<u>9.6542</u>	<u>9.6542</u>

Moon Measures

1		19576	19191
31		10782	18220
14.9		86	10
		28	91
		<u>17.9078</u>	<u>17.9029</u>

2	18452		
31.1	15512	16072	
15	12	72	
		15139	
	<u>31.0990</u>	<u>31.0913</u>	

11598

Star Measures

L	17610		20208	20919
20	17982	15212	15970	15650
136	90	26	72	48
		15088	08	16
	<u>200129</u>	<u>200131</u>	<u>135237</u>	<u>135239</u>

L	20900	20886	16910	-(0088)
229	11192	20088	16970	16269
249	98	98	60	61
	09	88	(-0055)	16852
	<u>229209</u>	<u>229207</u>	<u>289995</u>	<u>289912</u>

L	19999	20719	15926	16910
301	12560	18160	15950	10
31	50	62	58	16970
	97	18	(-0028)	-(0060)
	<u>307993</u>	<u>307995</u>	<u>309972</u>	<u>309990</u>

L	20762	19978	19778	20070
336	18192	15618	13239	16616
97	15138	08	38	12
	68	79	82	77
	<u>335626</u>	<u>335639</u>	<u>96592</u>	<u>96592</u>

Moon Measures

19326	19191
10988	18220
86	10
28	91
<u>199098</u>	<u>199029</u>

18952	
15512	16072
12	72
	15159
<u>18990</u>	<u>310913</u>

11598

Times Etc

23

Nov 10 - 1916

Exp. to Flare	1	57		2	09	
" " Moon	2	03	17.4 ^v	2	03	17.6 ^v
Clock fast	1.1	17.2 ^v				

H. Sid. Time	1	52	03.3 ^v	8-8- - 2	11.5 ^v
H. Long	4	44	31.05 ^v		
G. Sid. T.	6	36	34.34 ^v		
Sid. T. M. Moon	15	17	17.62 ^v		
Interval	15	19	19.73 ^v		
Reduction	2		30.61 ^v		
G. M. T.	15	16	49.12 ^v		15.2803

From Nantalan.	4	02	53.59 ^v	+ 27	37	51.7 ^v
Moon			2.2969 ^v			7.317 ^v
Motion in 1 ^m	-	0	38.63		1	12.6
"	16.8	187	4 03	32.22 ^v	+ 27	36 07.0 ^v

Tabular Case

Uranus age 15

Pachlar	55	47.40 ^v
Summed	15	13.7 ^v
R.		913.7 ^v
Aug.		12.7 ^v
2hr 3-		-0.8
R		925.6
R		1.9841 ^v
a/c		-949 ^v
(1+4)/K.		1.8892 ^v
11-		3.5691 ^v

939 - 13.28

a - - 502.3
 + 27
 - 478.3

11598

Times Etc

23.

Nov 10 - 1916

Exp 7 - Flare	1	57		2	09	
" " Moon	2	03	17.9	2	03	17.6
Clock fast	11	19.2				
14 Sid time	1	52	033	4-1-2	11.5	
14 Long	9	99	31.05			
9 Sid J.	6	36	39.35			
Sid 1 My Moon	15	17	17.62			
Interval	15	19	19.73			
Reduction	2	30.61				
9 M. J.	15	16	79.12			

From Mant. obs.	9	02	53.59	+ 29	39	51.7
Moon			2.2969			4.317
Moon int ^m	0		38.63		1	12.6
"	16.81879	03	32.22	+ 29	36	09.0
Tabular Place						

Moon age 15

Parallax	55	97.90
Secund	15	13.7
R.		913.7
Aug		12.8
R. 5		-0.8
R.		925.6
R.		1.7891
ap		-999
11+4/R.		1.8892
R.		35691

$$\begin{array}{r}
 a. - 5023 \\
 + 29 \\
 \hline
 = 4783
 \end{array}$$

$$\begin{array}{rclcl}
 20.01 & + & 13.52 & = & 7761 & 17025 \\
 22.92 & + & 28.99 & = & 9990 & 13663 \\
 30.77 & + & 31.00 & = & 9717 & 12771 \\
 33.56 & + & 9.65 & = & 7273 & 12770
 \end{array}$$

$$\begin{array}{rclcl}
 42.93 & + & 42.51 & = & 17251 & 27688 \\
 67.30 & + & 40.65 & = & 16987 & 25211
 \end{array}$$

$$\begin{array}{rclcl}
 +21.37 & - & 1.86 & = & -267 & -2777 \\
 & & & + & 205.6 & = -4.1
 \end{array}$$

$$+21.37 = -58.4 = -2781.1$$

$$X = -2.7 = -116.1$$

$$\begin{array}{rclcl}
 +53.57 & + & 23.17 & = & 13034 & = 26795 \\
 +53.66 & + & 59.99 & = & 19204 & = 26707
 \end{array}$$

$$\begin{array}{rclcl}
 + & .09 & + & 36.82 & = & +4170 & = -91 \\
 + [&] & - & .01 & = & -1.1 & = -10.4
 \end{array}$$

$$+36.83 = +4171.1 = -80.6$$

$$Y = +113.2 = -2.2$$

Plate Constants.

29

X	20.0127	22.9208	30.7997	33.5630
Y	20.2372	23.1178	31.3102	34.5138
X-Y	-2.2245	-1.970	-5.658	-9.508

q	13.5235	28.9928	30.9956	9.6572
h	12.7972	29.0761	31.2713	8.8899
q-h	+7.263	-8.33	-2.757	+7.643

$x-z$	$+500x$	-113.27	$+2.3x$	-6268
-2275	$+10006 = +7761$	-1531	$= +6230 +76 = +6276 +8$	
-1970	$+11960 = 9890$	-3282	$= 6208 +53 = 6261 -7$	
-5658	$+15372 = 9718$	-3509	$= 6205 +71 = 6276 +8$	
-9508	$+16781 = 7273$	-1090	$= 6183 +77 = 6260 -8$	
29.7711	$+17871$	-1877	$+68 = 30.4235$	

$q-h$	$+500q$	$+116.1X$	$+224$	-16383
$+7263$	$+6762 = +14025$	$+2323 = +16348$	$+30 = 16378$	-5
-833	$+14496 = 13663$	$+2661 = 16324$	$+68 = 16388$	$+5$
-2757	$+15498 = 12741$	$+3567 = 16310$	$+68 = 16378$	-5
$+7643$	$+4827 = 12470$	$+3897 = 16367$	$+21 = 16388$	$+5$
16.3180	$+8159$	$+3753$	$+78$	15.8437

Tables	a = -b	e = -s	a-e = -1	b+d = +1.1
Obs	-502.3	-502.2	-1	-2.9
b-e	-501.7	-501.7		+4.0

Plate Constants.

29

x	20.0127	22.9208	30.7997	33.5630
y	20.2372	23.1178	31.3102	34.5138
$x-y$	-2.2245	-1.9770	-5.658	-9.508

y	13.5235	28.9928	30.9956	9.6592
y	12.7972	29.0761	31.2713	1.5899
$y-y$	+ 7263	- 833	- 2757	+ 7613

$x-y$	+ 3204	- 113.27	+ 2.31	- 626
- 2.2245	+ 10006	= + 7761	- 12.31	= 16230 + 76 + 6271
- 1.9770	+ 11460	= 9790	- 3282	= 6208 + 53 = 6261
- 5.658	+ 15372	= 9719	- 3209	= 6205 + 71 = 6276
- 9.508	+ 16781	= 7273	- 1090	= 6183 + 77 = 6260
29.7911	+ 17871	- 1877	+ 68	30.9

$y-y$	+ 3204	+ 116.17	+ 2.24	- 163
+ 7263	+ 6762	= + 14025	+ 3323	= + 16348 + 30 = 16378
- 833	+ 14976	= 13663	+ 2661	= 16324 + 64 = 16388
- 2757	+ 15498	= 12741	+ 3067	= 16310 + 68 = 16378
+ 7673	+ 9827	= 12470	+ 3897	= 16367 + 21 = 16388
16.3180	+ 8159	+ 3953	+ 98	15.89

Tables
 Obs a - b e - d a - e b + d + 1.1
 - - 502.3 - - 502.2 - - 1 - - 2.1

Moon Measures.

25

<u>3</u>	19672	19428
31.6	13638	15472
16	30	78
	76	22
	<u>31.6090</u>	<u>31.6020</u>

<u>4</u>	19720	20902
31.7	13382	16708
16.2	86	20
+X	12	00
	<u>31.6331</u>	<u>31.6321</u>

<u>5</u>	19762	20350
31.6	19740	15372
17	30	70
	68	58
	<u>31.5030</u>	<u>31.5018</u>

<u>6</u>	20172	19470
31	12967	16690
17.8	57	700
	67	70
	<u>17.7207</u>	<u>17.7225</u>

<u>7</u>	19926	20778
30	18018	12682
18.1	22	80
	32	77
	<u>18.1907</u>	<u>18.1907</u>

<u>8</u>	18972	19599
29.8	16872	11708
18.2	38	697
+7	72	606
	<u>18.2102</u>	<u>18.2096</u>

<u>9</u>	17870	16572	17130
29	17286	15966	32
18.1	97	58	16568
	<u>18.0580</u>	<u>18.0610</u>	<u>18.0563</u>

Moon Measures

25

<u>3</u>	19672	19728
31.6	13638	15992
16	30	98
	76	22
	<u>316090</u>	<u>316020</u>

<u>9</u>	19720	20902
31.7	13382	16748
16.2	86	20
+1	12	00
	<u>316331</u>	<u>316324</u>

<u>5</u>	19762	20350
31.6	19790	15392
17	30	70
	68	58
	<u>315030</u>	<u>315018</u>

<u>16</u>		20172	19970
31		12969	16690
17.8		39	700
		69	90
		<u>177207</u>	<u>177225</u>

<u>17</u>		19926	20778
30		18098	12652
18.1		22	80
		32	79
		<u>181907</u>	<u>181907</u>

<u>4</u>		18992	19599
29.8		16892	11708
18.2		38	699
+9		92	606
		<u>182102</u>	<u>182096</u>

<u>2</u>		17890	16572
29		17286	15906
18.1		98	58
		<u>180580</u>	<u>180610</u>
			17130
			32
			16568
			<u>180563</u>

$$A = -1.2$$

$$B = -1$$

115-98

Moon's Center

26

	X	X-X ₀	ΔX	X-X ₀	(X-X ₀) ²	(Y-Y ₀) ²
1	31.0000	+1.2570	+2	1.5805	3.5669	-22
2	31.0926	+1.3486	+2	1.8193	3.5933	-258
3	31.6030	+1.8600	+0	3.4596	3.5576	-115
4	31.6326	+1.8896	0	3.5706	3.5706	+15
5	31.5027	+1.7597	-1	3.0951	3.5671	-20
6	31.0000	+1.2570	-2	1.5795	3.5637	-54
7	30.0000	+0.2570	-2	0.0659	3.5917	+226
8	29.7730	0.0000	-2	0.0000	3.5982	+291
9	29.0000	-0.7430	-2	0.5523	3.5945	+257

	Y	Y-Y ₀	ΔY	Y-Y ₀	R	L
1	14.9036	-1.4099	+0	1.9867		138°
2	15.0000	-1.3130	+0	1.7240		137
3	16.0000	-0.3130	+0	0.0980		100
4	16.3130	0.0000	0	0.0000		90
5	17.0000	+0.6870	-0	0.4720		70 69
6	17.7216	+1.4086	-0	1.9842		42
7	18.1907	+1.8777	-6	3.5258		8
8	18.2099	+1.8969	-0	3.5982		0
9	18.0572	+1.7442	-0	3.0422		337 161°

Approx. Center

X = 31 Y = 14.9036
 17.7216
 32.6252

Y₀ 16.3126
 Y max 18.2099
 R 1.8973

R Com 1.8892

X max 31.6326
 X₀ 29.7730

Center { X₀ 29.7730
 Y₀ 16.3130

11598

Moon's Center

26

	x	$x - x_0$	Δx	$ x - x_0 $	$ x - x_0 + y - y_0 $	
1	31.0000	+1.2570	+2	1.5805	3.5689	-22
2	31.0926	+1.3486	+2	1.8193	3.5933	-258
3	31.6030	+1.8600	+0	3.9596	3.5576	-115
4	31.6326	+1.8896	0	3.5706	3.5706	+13
5	31.5029	+1.7599	-1	3.0951	3.5671	-20
6	31.0000	+1.2570	-2	1.5775	3.5637	-54
7	30.0000	+0.2570	-2	0.0659	3.5917	+226
8	29.7930	0.0000	-2	0.0000	3.5982	+291
9	29.0000	+0.7930	-2	0.5523	3.5995	+259

	y	$y - y_0$	Δy	$ y - y_0 $	$R35691$	L
1	19.9036	-1.9099	+0	1.9869		1380
2	15.0000	-1.3130	+0	1.7290		139
3	16.0000	-0.3130	+0	0.0980		100
4	16.3130	0.0000	0	0.0000		90
5	17.0000	+0.6870	-0	0.9720		70
6	17.7216	+1.4086	-0	1.9892		42
7	18.1907	+1.8777	-0	3.5258		8
8	18.2099	+1.8969	-0	3.5982		0
9	18.0572	+1.7442	-0	3.0922		337 16

Apprx. Center

$x = 31$ $y =$ 19.9036
 17.7216
 32.6252

y_0 16.3126
 y_{max} 18.2099
 x_0 1.8973

18 Com 1.8892

x_{max} 31.6326
 y_0 29.7936

Center $\left\{ \begin{array}{l} x_0 \text{ } 29.7930 \\ y_0 \text{ } 16.3130 \end{array} \right.$

Formation of Normals.

1	- 1.78	- 280	+ 31.0
2	- 1.78	- 348.0	+ 338.0
3	- 0.58	- 218.0	+ 355
4	0.0	+ 285	0.0
5	+ 1.22	- 35.0	- 170
6	+ 1.78	- 68.0	- 76.0
7	+ 0.99	+ 585	+ 425.0
8	+ 0.0	+ 00	+ 553.0
9	- 1.29	- 188.0	+ 441.0
	+ 3.49	+ 87.0	+ 1823.5
	- 543	- 881.0	- 90.0
	- 1.94	- 794.0	
			+ 1733.5

		a	b	c	new a-c
a	+ 23	+ 29	- 18	- 27	+ 153
b	+ 13	+ 31	- 17	- 24	- 87
c	- 38	+ 43	- 4	+ 1	- 11
		+ 43	+ 0	+ 5	+ 90
		+ 40	+ 9	+ 11	+ 7
		+ 29	+ 18	+ 9	- 15
		+ 6	+ 24	- 8	+ 19
		+ 0	+ 25	- 13	+ 64
		- 14	+ 23	- 32	+ 2

$$-1.94 + 16.73 = +8.59\Delta$$

$$+ [] - 0.28 = +1.40\Delta$$

$$+ 16.19 = +5.69\Delta$$

$$+ 15.72 = +8.90\Delta + 0.68\Delta = +9.58\Delta$$

Conditional Equations.

27

O.C

1 + 1.26 - 1.81 = -22	- 86 - 156 = -202	+180
2 + 1.35 - 1.31 = -258	- 50 - 145 = -195	- 63
3 + 1.86 - 0.31 = -115	- 69 - 39 = -103	- 12
4 + 1.89 0.00 = +15	- 70 0 = -70	+85
5 + 1.76 + 0.69 = -20	- 65 + 76 = +11	- 9
6 + 1.26 + 1.81 = -59	- 46 + 156 = +110	-164
7 + 0.26 + 1.88 = +226	- 9 + 208 = +199	+ 27
8 + 0.00 + 1.90 = +291	- 0 + 210 = +210	+81
9 - 0.74 + 1.79 = +259	+ 28 + 192 = +220	+34
		+407 - 248
+ 8.90 + 4.59		Corr for change in Δb + 468 - 187
		Average ± 73

$$+ 15.72 - 1.99 = -794.0 \quad + 8.90 \Delta$$

$$- 1.99 + 16.43 = +1733.5 \quad + 4.59 \Delta$$

$$+ [] - .29 = - 97.7$$

$$+ 16.19 = +1635.8$$

$$b = +101.0 \pm 0.35 \Delta$$

$$a = -38.0 \pm 0.61 \Delta$$

$$+ 15.72 = -794.0 + 196$$

$$= -598.0$$

Arc measured 161°

$$\frac{\Delta V}{n} = +31.2$$

$$\frac{p}{h} = 20$$

$$+ \frac{31.2}{.2} = +156 \quad \Delta R = +1.9$$

$$R = 1.89$$

$$\text{Corr} = +0.5$$

$$-2RC = -1.89$$

$$\Delta R = +1.7$$

$$\Delta b = -0.65$$

$$\Delta s = -0.3$$

$$\Delta a = -1.15$$

$$\Delta d = -0.09$$

Conditional Equations

27

O.C

1	+1.26	-1.71	-22	-96	-156	-202	+180
2	+1.35	-1.31	-25.8	-50	-195	-195	-63
3	+1.86	-0.31	-115	-69	-39	-103	-12
4	+1.89	0.00	+15	-70	0	-70	+85
5	+1.76	+0.69	-20	-65	+76	+11	-9
6	+1.26	+1.91	-3.9	-96	+156	+110	-169
7	+0.26	+1.88	+226	-9	+208	+199	+27
8	+0.00	+1.90	+291	-0	+210	+210	+81
9	-0.79	+1.79	+257	+28	+192	+220	+39
						+407	-298
	+8.90	+9.59					

crit for change $+46 + 968 = 18$
Average $+73$

$$+15.72 - 1.99 = -799.0 + 8.90 \Delta$$

$$-1.99 + 16.93 = +1733.5 + 9.59 \Delta$$

$$+6.7 - .29 = -97.7$$

$$+16.19 = +1635.8$$

$$t = +104.0 \pm 0.3$$

$$a = -38.0 \pm 0.6$$

$$+15.72 = -799.0 + 1962$$

$$= 3980$$

Arc measured 161°

$$\frac{2V}{h} = +01.2$$

$$\frac{P}{h} = 20$$

$$+ \frac{31.2}{.2} = +156 \quad DR = +1.9$$

$$R = 1.89$$

$$Corr = +0.5$$

$$-2RC = -1.89$$

$$\Delta R = +1.9$$

$$\Delta t = -0.65 \quad \Delta a = -0.3$$

$$\Delta a = -1.15 \quad \Delta q = -0.09$$

11598

Mooms Mean Position

28

$$\begin{array}{r} x_0 \quad 29.7430 \\ \quad -19 \\ \hline 29.7411 \end{array}$$

$$\begin{array}{r} y_0 \quad 16.3130 \\ \quad +50 \\ \hline 16.3180 \end{array}$$

From Plate Constants

$$X \quad 30.7235 \checkmark$$

$$Y \quad 15.8457 \checkmark$$

$$Z \quad +8.7235 \checkmark$$

$$Z \quad -2.1543$$

$$\begin{array}{l} \log Z \quad 0.92549 \checkmark \\ \cos \delta \quad 9.95982 \checkmark \\ \quad 8.50727 \\ \quad 2.75843 \checkmark \end{array}$$

$$\begin{array}{l} \log \tan \delta \quad 9.6543 \\ Z \quad 1.8510 \checkmark \\ \quad 7.0537 \\ \quad 8.5387 \checkmark \end{array}$$

$$q-A \quad +2.87.36 \checkmark$$

$$\begin{array}{l} h_1 + 0.0362 \checkmark \\ h_0 \quad 2.1905 \checkmark \end{array}$$

$$A \quad 4 \quad 00 \quad 20.00$$

$$\log h_0 \quad 0.34 \quad 054 \checkmark$$

$$q_0 \quad 7 \quad 05 \quad 07.36 \checkmark$$

$$7.33 \quad 115 \checkmark$$

$$Red \quad +5.79 \checkmark$$

$$S-D \quad -17 \quad 01.9 \checkmark$$

$$S' \quad 4 \quad 05 \quad 12.85 \checkmark$$

$$D \quad +27 \quad 33 \quad 00.0$$

$$S_0 \quad +27 \quad 15 \quad 58.1 \checkmark$$

$$Red. \quad +17.6$$

$$S' \quad +27 \quad 16 \quad 15.7 \checkmark$$

11598

Moons Mean Position

28

$$\begin{array}{r} \lambda_0 \quad 29.7930 \\ \quad -19 \\ \hline 29.7911 \end{array}$$

$$\begin{array}{r} \lambda_0 \quad 16.3130 \\ \quad +50 \\ \hline 16.3180 \end{array}$$

from Plate Constants

$$\lambda \quad 30.9235$$

$$\eta \quad 15.8457$$

$$\gamma \quad +8.9235$$

$$\eta \quad -2.1543$$

$$\begin{array}{r} \log \gamma \quad 0.92599 \\ \cos \delta \quad 9.95982 \\ \quad 8.30729 \\ \quad 2.95893 \end{array}$$

$$\begin{array}{r} \log \tan \delta \quad 9.6513 \\ \gamma_0 \quad 1.8510 \\ \quad 7.0539 \\ \quad 8.5587 \end{array}$$

$$\gamma - A \quad +287.36$$

$$\eta_1 + 0.0362$$

$$A \quad 9 \quad 00 \quad 20.00$$

$$\log \eta_0 \quad 0.29059$$

$$\lambda_0 \quad 9 \quad 05 \quad 07.36$$

$$\begin{array}{r} 7.331157 \\ 3.009394 - 1021.9 \end{array}$$

$$\text{Red} \quad +5.99$$

$$\delta - D \quad -17 \quad 0.19$$

$$\delta' \quad 9 \quad 05 \quad 12.85$$

$$D \quad +27 \quad 33 \quad 00.0$$

$$\lambda_0 \quad +29 \quad 15 \quad 53.1$$

$$\text{Red} \quad +17.6$$

$$\delta' \quad +29 \quad 16 \quad 15.7$$

11598

Lunar Parallax

29

$$\begin{array}{rcl}
 \delta' & 7 & 05 \quad 12.85'' \\
 \delta & 1 & 52 \quad 03.30'' \\
 \delta - \delta' & -2 & 13 \quad 09.55'' \\
 = -33 & 17 & 23.25'' \\
 \delta(\delta - \delta') & -12 & 27.86'' \\
 -33 & 04 & 55.8''
 \end{array}$$

$$\pi \quad 55' \quad 47.4''$$

$$\begin{array}{r}
 9.86913'' \\
 8.21026'' \\
 9.73948'' \\
 004132 \\
 \hline
 7.86019''
 \end{array}$$

$$\begin{array}{r}
 9.95727 \\
 0.00000 \\
 0.07683'' \\
 \hline
 0.03410
 \end{array}$$

$$\delta - \delta' \quad -24 \quad 57.93''$$

$$= \quad - \quad 1 \quad 39.66''$$

$$\delta \quad 77 \quad 17 \quad 50.4''$$

$$\delta \quad +24 \quad 16 \quad 15.7''$$

$$\delta - \delta \quad 22 \quad 58 \quad 34.7''$$

$$\begin{array}{r}
 9.82680'' \\
 8.21026'' \\
 9.59176'' \\
 0.13413'' \\
 \hline
 7.76225''
 \end{array}$$

$$\delta - \delta' \quad +19 \quad 53.1''$$

$$\delta \quad +24 \quad 36 \quad 08.8'' \quad \alpha \quad 7 \quad 03 \quad 33.19''$$

$$\text{Eph } \delta \quad +24 \quad 36 \quad 07.0 \quad \text{Eph } \alpha \quad 7 \quad 03 \quad 32.22''$$

$$0-C \quad +4.8'' \quad 0-C \quad +0.97''$$

$$\begin{array}{l}
 \text{Corr from constants pp. } -.6 \\
 2^{\text{nd}} \text{ Order Ref} \quad 0.0
 \end{array}$$

$$\text{Inv Corr} \quad -0.3 \quad -0.07$$

$$\begin{array}{rcl}
 \delta \quad +24 \quad 36 \quad 07.9 & \alpha \quad 7 \quad 03 \quad 33.15'' \\
 0-C \quad +3.9 & 0-C \quad +.93
 \end{array}$$

11598

Lunar

Parallax

29

$\begin{array}{r}
 \delta' \quad 9 \quad 05 \quad 12.85 \\
 \delta \quad 1 \quad 52 \quad 03.30 \\
 + \delta' - 2 \quad 13 \quad 09.55 \\
 = -33 \quad 17 \quad 23.25 \\
 \delta' - \delta \quad -12 \quad 27.76 \\
 -33 \quad 09 \quad 55.8
 \end{array}$

$\begin{array}{r}
 \pi \quad 55 \quad 97.7 \\
 9.86973 \\
 821026 \\
 913948 \\
 009132 \\
 186019
 \end{array}$

$\begin{array}{r}
 9.75127 \\
 0.00000 \\
 0.07683 \\
 0.03910
 \end{array}$

$\begin{array}{r}
 \delta - \delta' \quad -29 \quad 57.73 \\
 = \quad - \quad 1 \quad 39.66
 \end{array}$

$\delta \quad 97 \quad 19 \quad 50.9$

$\delta \quad +29 \quad 16 \quad 15.7$

$\delta - \delta \quad 22 \quad 58 \quad 34.7$

$\begin{array}{r}
 9.82690 \\
 821026 \\
 959176 \\
 013913 \\
 776225
 \end{array}$

$\delta - \delta' \quad +17 \quad 53.1$

$\delta \quad +29 \quad 36 \quad 08.8 \quad \delta \quad + \quad 03 \quad 33.19$

$\delta - \delta \quad +27 \quad 36 \quad 09.0 \quad \delta - \delta \quad 7 \quad 03 \quad 32.22$

$\delta - \delta \quad +9.8 \quad \delta - \delta \quad +0.97$

Corr from limitants pp. -0.6
 2" circle Ref -0.0

In Corr $-0.3 \quad -0.07$

$\delta \quad +29 \quad 36 \quad 09.9$
 $\delta - \delta \quad +3.9$

$\delta \quad 9 \quad 03 \quad 33.15$
 $\delta - \delta \quad +.93$

