

KG
11366
v.998

CXLVI

146



Plate	Date	Page
10232	Jan 17 '16	1
10263	Jan 18 '16	11
10269	"	21

Harvard Lunar Plates
Measures and Reductions.
Martha C. Burton.

1
13
23

2
26
.8

3
30
7.

4
25
1.
4

5
2.
18

6
21.
15

10232		Star Measures		1	
d	x	~	d	y	~
1	20 696	19969	19796	19058	
13.5	15570	15032	10137	18668	
23.9	70	32	39	68	
	38	58	82	50	
	<u>135072</u>	<u>135072</u>	<u>239699</u>	<u>239610</u>	
2	20582	20709	20370	19670	
26.0	20514	20770	12638	17360	
.8.8	08	76	38	62	
	72	00	69	59	
	<u>260071</u>	<u>260075</u>	<u>87727</u>	<u>87695</u>	
3	19512	20420	20277	20618	
30.5	19928	14980	13226	17652	
22.7	36	80	26	42	
	484	09	68	24	
	<u>304567</u>	<u>304569</u>	<u>227099</u>	<u>227026</u>	

		Moon Measures			
L	19898	19586	19778	20326	
22.6	14322	15146	11077	19012	
13.9	30	50	82	10	
ac.	92	84	78	28	
	<u>225568</u>	<u>225564</u>	<u>138700</u>	<u>138684</u>	
2			17672	19902	
22			17097	10580	
19.1			06	78	
			72	12	
			<u>170672</u>	<u>170668</u>	
3	20168	19217			
21.2	18370	11020			
15	70	20			
	70	20			
	<u>211798</u>	<u>211800</u>			

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Star Measures

	d	1	d	4
1	20 686	19968	19796	19058
12.5	15570	10032	10137	18668
23.9	70	32	39	68
	38	58	82	50
	<u>135072</u>	<u>135072</u>	<u>237679</u>	<u>23.9610</u>

2	20582	20709	20370	19670
26.0	20519	20770	12638	17360
8.8	08	76	38	62
	72	00	59	59
	<u>260071</u>	<u>260075</u>	<u>8.1727</u>	<u>8.7695</u>

3	19512	20920	20278	20618
30.5	19928	14980	13226	17652
22.7	36	80	26	92
	989	09	68	29
	<u>30.567</u>	<u>30.969</u>	<u>22.7099</u>	<u>22.7026</u>

Moon Measures

1	19898	19586	19778	20326
12.6	19322	15196	11079	19012
13.9	30	50	12	10
20.	92	89	78	28
	<u>225568</u>	<u>225569</u>	<u>138700</u>	<u>13.8689</u>

2			17686	19902
22			17098	10580
17.1			06	78
			72	12
			<u>19.0672</u>	<u>19.4668</u>

3	20168	19219		
21.2	18370	11020		
15	70	20		
	70	20		
	<u>21.1798</u>	<u>21.1800</u>		

7
2
17
8
2
1
9
2
1

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Moon Measures.

2

<u>4</u>	20221	19162
21.1	19638	9768
15.6	36	62
+X	10	78
	<u>21.0584</u>	<u>21.0588</u>

<u>5</u>	20242	20160
21.2	19388	11002
16	88	02
	31	58
	<u>21.0853</u>	<u>21.0894</u>

<u>6</u>	19312	20093
21.7	13052	16328
17	78	28
	02	92
	<u>21.6256</u>	<u>21.6236</u>

<u>7</u>	19536
22	16777
17.3	60
	18
	<u>17.2766</u>

18998
11706
12
10
<u>17.2802</u>

<u>8</u>	19752
22.8	14400
17.4	392
+4	42
	<u>17.5056</u>

20046
15096
102
56
<u>17.5098</u>

<u>9</u>	19736
23	14450
17.4	44
	38
	<u>17.4990</u>

20058
15054
78
70
<u>17.4984</u>

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Moon Measures

2

<u>9</u>	20221	19162
21.1	19638	9768
15.6	36	62
+X	10	78
	<u>21.0589</u>	<u>21.0588</u>

<u>9</u>	20242	20160
21.2	19388	11002
16	88	02
	31	58
	<u>21.0853</u>	<u>21.0894</u>

<u>6</u>	19312	20093
21.7	13052	16328
17	98	28
	02	92
	<u>21.6256</u>	<u>21.6236</u>

<u>7</u>	19536	18998
22	16779	11706
17.3	60	12
	18	10
	<u>17.2766</u>	<u>17.2802</u>

<u>8</u>	19952	20046
22.8	19900	15096
17.9	392	102
+Y	92	56
	<u>17.5056</u>	<u>17.5098</u>

<u>9</u>	19938	20067
23	19950	15059
17.9	99	98
	38	70
	<u>17.9990</u>	<u>17.9984</u>

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Times Etc.

Jan 17 '16

Exp. to Stars	7	20		7	32	
" Moon	7	25	55.7	7	25	56.2
Clock fast		6	17.0			
H. Sid. Time	7	19	38.95	8-2=-	1	78
H. Long	7	77	31.05			
9. Sid. T.	9	04	10.00			
Sid. T. M.H.	19	72	21.12			
Interval	13	21	78.88			
Reduction		2	11.36			
9. M. T.	13	19	37.52			

Transit Alt.	R. a.		Dec.		
Moon 13 ^h	6	06	20.70	+26	35
Motion 1 ^m			2.2011		-2.533
19.6253		0	43.20		-49.7
Tabular Place	6	07	03.90	+26	35

Moon's Age 13 days

Parallax 57' 02.01

Semi-d 14' 43.0

R. 885.0

Aug. 12.5

In 2 -0.1

R. 897.4

R. 1.9237

alt -919

0+4/12 1.8318

R. 3.3555

934 - 13.94

a - 501.5

+24

-477.5

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Times Etc.

3.

Jan 17 '16

Exp. Stars	9	20		9	32	
111000	9	25	55.7 "	9	25	56.2 "
Clock fast		6	17.0 "			
H Sid Time	9	19	38.95	8-12	-	1" 98 "
H Long	9	47	31.05 "			
9 Sid T	9	07	10.00 "			"
Sid T M H	19	92	21.12 "			
Interval	13	21	48.88 "			
Reduction		2	11.36 "			
9 M T	13	19	37.52 "			

Transit Alt.	R. a.	Dec.
Moon 13"	6 06	20.70 +26 35 51.9
Moon 1"		2.2011 -2.533
19.6253	0	43.22 -99.7
Antular Place	6 07	03.90 +26 35 02.2

Mons Age 13 days

Parallax 57' 02.01

Semi-d 19' 93.0

R 885.0

Aug 12.5

Tr 2 -0.1

R 897.8

R 1.9237

alt -919

4+4/12 1831.8

R 3.3258

939 - 13.91

a: -501.5

+29

-477.5

10232 Plate Constants

7

X	13.5072	Y	26.0073		30.9568
5	13.1688		26.1133		30.9792
X-5	+3728		-1060		-7927

q	23.9627		8.7711		22.7035
η	24.0129		7.9093		22.7892
q-η	-0502		+8618		+2193

X-5	+500X		+117.2Y		+1.5X		-13011
+3728	+6758	=	+10182	+2809	=	+12991	+20 = +13011
-1060	+13008	=	+11948	+1028	=	+12972	+39 = +13011
-7927	+15228	=	+10309	+2660	=	+12969	-76 = +13010
22.8860	+11973		+1837		+37	22.9163	

q-η	+500Y		-118.7X		+2.7Y		-9971
-502	+11981	=	+11879	-1603	=	+10876	+65 = +9971
+8618	+7386	=	+13004	-3087	=	+9917	+27 = 91
+2193	+11352	=	+13495	-3615	=	+9880	+61 = 91
15.6722	+7836		-2716		+42	15.1973	

Tables	a = +.7	e = +.7	a-e = 0	b+d = +1
lbs	= -501.5	= -502.7	= +1.2	= +1.5

0-C	-501.9	-503.1	+0.5
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1023 = Plate Countants 7

λ	13.5072	γ	26.0073	30.9568
η	13.1699		26.1133	30.9992
$\lambda-\eta$	+3928		-1060	-4929

η	23.9627		8.7711	22.7035
η	24.0129		7.9093	22.9892
$\eta-\eta$	-0.502	+	8618	+2193

$\lambda-\eta$	+500X		+11724	+62X	-13011		
+3928	+6759	-	+16142	+2509	-	+12991 + 20 = +13011	0
-1060	+13009	-	+11999	+1028	-	+12972 + 39 = +13011	0
-4929	+15228	-	+10309	+2660	-	+12969 - 96 = +13010	-1
22.8560	+11993		+1837	+39		22.9163	

$\eta-\eta$	+500Y		-118.7X	+2.7Y	-999		
-502	+11981	-	+11979	-1603	-	+17596 + 42 = +9991	
+8618	+9386	-	+13007	-3687	-	+9917 + 29 = 91	
+2193	+11352	-	+13995	-3615	-	+9880 + 61 = 91	
15.6722	+7836		-2716	+92		= 15.1993	

Tables
Chs

a = +.7	e = +.7	a-e = 0	b+d = +1
= -501.5	= -502.7	= +1.2	= +1.5

A - 5

B 0



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Moon's center

5-

	x	$x-x_0$	Δx	$(x-x_0)^2$	$(x-x_0)^2/(y-y_0)^2$	$b-e$
1	22,5566	-0,3320	+1	0,1101	3,3638	+ 83
2	22,0000	-0,8886	+1	0,7894	3,3686	+ 131
3	21,1799	-1,7087	+0	2,9197	3,3726	+ 171
4	21,0586	-1,8300	0	3,3489	3,3489	- 66
5	21,0898	-1,8038	0	3,2537	3,3606	+ 51
6	21,6296	-1,2640	-1	1,5979	3,3688	+ 133
7	22,0000	-0,8886	-1	0,7898	3,3671	+ 116
8	22,8886	0,0000	-1	0,0000	3,3569	+ 14
9	23,0000	+0,1114	-1	0,0127	3,3456	- 99

	y	$y-y_0$	Δy	$(y-y_0)^2$	R^2	3.3555	L
1	13,8692	-1,8038	0	3,2537			+ 190
2	14,0670	-1,6060	1	2,5792			209
3	15,0000	-0,6730		0,4529			248
4	15,6730	0,0000		0,0000			270
5	16,0000	+0,3270		0,1069			280
6	17,0000	+1,3270		1,7609			316
7	17,2789	+1,6054		2,5773			331
8	+17,5052	+1,8322		3,3569			360
9	17,9987	+1,8257		3,3332		1730	3

Approx. center

$x = 23$	$y =$	14,0670
		17,2789
		3,1343
	y_0	15,6727
	y_{max}	17,5052
	R	1,8325
	x_{max}	21,0586
	x_0	22,8886

Moon's center $\begin{cases} x_0 & 22,8886 \\ y_0 & 15,6730 \end{cases}$

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Moons center

5

	x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	$y - y_0$
1	22.5566	+0.3320	+1	0.1101	3.3638	+ 83
2	22.0000	+0.8886	+1	0.7894	3.3686	+ 131
3	21.1799	+1.7087	+0	2.9197	3.3726	+ 171
4	21.0586	+1.8300	0	3.3489	3.3989	- 66
5	21.0898	+1.8038	0	3.2537	3.3606	+ 51
6	21.6296	+1.2690	-1	1.5779	3.3688	+ 133
7	22.0000	+0.8886	-1	0.7898	3.3671	+ 116
8	22.8886	0.0000	-1	0.0000	3.3569	+ 19
9	23.0000	+0.1117	-1	0.0129	3.3956	- 99

	y	$y - y_0$	Δy	$(y - y_0)^2$	R	L
1	13.8692	-1.8038	0	3.2537		+ 190
2	14.0670	-1.6060	0	2.5792		209
3	15.0000	-0.6730		0.4529		298
4	15.6730	0.0000		0.0000		270
5	16.0000	+0.3270		0.1069		280
6	17.0000	+1.3270		1.7609		316
7	17.2789	+1.6059		2.5773		331
8	+17.5052	+1.8322		3.3569		360
9	17.9987	+1.8257		3.3332	1730	3

Approx. center

$$x = 23 \quad y = 17.0670$$

$$17.2789$$

$$31.3839$$

$$y_0 = 15.6727$$

$$y_{max} = 17.5052$$

$$R = 1.8323$$

$$x_{max} = 21.0586$$

$$x_0 = 22.8886$$

Moons center

$$\left\{ \begin{array}{l} x_0 = 22.8886 \\ y_0 = 15.6730 \end{array} \right.$$

Formation of Normals.

1 + 0.60	- 27.5	- 149.5
2 + 1.73	- 116.5	- 211.0
3 + 1.15	- 292.0	- 115.0
4 0.0	+ 121.0	0.0
5 - 0.58	- 92.0	+ 16.5
6 - 1.68	- 168.0	+ 176.5
7 - 1.72	- 103.0	+ 186.0
8 - 0.0	- 0.0	+ 25.5
9 + 0.20	+ 11.0	- 181.0
+ 3.38	+ 132.0	+ 404.5
- 3.68	- 799.0	- 656.5
- 0.30	- 667.0	- 252.0

$$\begin{aligned}
 -20.0a &= +29 \\
 a + b &= -7 \\
 +c &= +84
 \end{aligned}$$

1 - 10	+ 13	+ 97
2 - 26	+ 11	+ 29
3 - 30	+ 5	- 1
4 - 53	0	- 9
5 - 52	- 2	- 10
6 - 36	- 9	- 1
7 - 26	- 11	+ 7
8 - 0	- 13	+ 31
9 + 32	- 13	+ 63

$$-0.30 + 17.72 = +2.83$$

$$+[\] - .01 = -0.20$$

$$+17.71 = +2.63$$

$$+12.82 = -8.60 + .09 = -8.56$$

10232 Conditional Equations

10232	Conditional	Equations	O-c	$\frac{6}{\text{new O-c}}$
1 - 0.33 - 1.80 = +83	)	+ 17 + 38 = +55	+ 28	+ 75 ²
2 - 0.89 - 1.61 = +131		+ 47 + 25 = +72	+ 59	+ 88 ⁵
3 - 1.71 - 0.67 = +171		+ 89 + 10 = +99	+ 72	+ 71 ⁴
4 - 1.83 0.00 = -66		+ 96 0 = +96	-162	-171 ⁴
5 - 1.80 + 0.32 = +51		+ 94 - 5 = +89	- 38	- 48 ⁶
6 - 1.26 + 1.33 = +133		+ 66 - 20 = +46	+ 77	+ 76 ⁶
7 - 0.89 + 1.60 = +116		+ 47 - 24 = +23	+ 93	+100 ⁵
8 - 0.00 + 1.83 = +18		+ 0 - 28 = -28	+ 42	+73 ⁴
9 + 0.11 + 1.83 = -99		- 6 - 28 = -34	- 65	- 2 ⁵
		+ 371 - 265		

$$12.82 - 0.30 = -667.0 - 8.60 \text{ average } 71$$

$$-0.30 + 17.82 = -252.0 + 2.83$$

$$+ [] - 0,01 = -15,6 \quad + 15^\circ \Delta$$

$$0 + 17,41 = -267,6 \quad b = -15,3$$

$$12.82 = -667.0 - 7.6 = -674.6 \quad a = -52.3$$

Arc Measure of 173°

$$\frac{P}{h} = 1.27$$

$$\frac{\Sigma v}{n} = -12$$

$\Delta r. 2 \quad PC \ 1.83 \quad \frac{-12}{27} \quad - 99 \quad \Delta P = -0.5$
 $-2PC = +2.20 \quad \text{Corr} = -0.6$

$$\Delta b_2 = +0,33 \quad \Delta \delta = +0,2'' \quad \Delta \mu = +0,1$$

$$\Delta q = -1,47 \quad \Delta q = -0,03^s$$

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Conditional Equations

6

1 -	0.33 -	1.80 =	+83	+17	+38 =	+55	+28
2 -	0.89 -	1.61 =	+131	+97	+25 =	+72	+59
3 -	1.71 -	0.67 =	+171	+89	+10 =	+99	+72
4 -	1.83	0.00 =	-66	+96	0 =	+96	-162
5 -	1.80 +	0.32 =	+51	+99	-5 =	+89	-38
6 -	1.26 +	1.33 =	+133	+66	-20 =	+96	+77
7 -	0.89 +	1.60 =	+116	+97	-29 =	+73	+73
8 -	0.00 +	1.83 =	+14	+0	-28 =	-28	+92
9 +	0.11 +	1.83 =	-99	-6	-28 =	-39	-65
				+ 371 = 265			

$$12.82 - 0.30 = -667.0$$

$$-0.30 + 17.92 = -232.0$$

Average 71

$$1 [] - 0.01 = -15.6$$

$$0 + 17.91 = -267.6 \quad -6 = -15.3$$

$$12.82 = -667.0 - 9.6 = -671.6 \quad a = -52.3$$

Arc Measurement of 1.73°

$$\frac{P}{h} = .27$$

$$\frac{\Sigma V}{h} = -1.2$$

$$\frac{-1.2}{.27} = -4.4$$

$$\Delta P = -0.5$$

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Moon's Mean Position

7

$$\begin{array}{r} x_0 \quad 22.8886^{\circ} \\ \quad -26^{\circ} \\ \hline 22.8860^{\circ} \end{array}$$

$$\begin{array}{r} y_0 \quad 15.6730^{\circ} \\ \quad -8^{\circ} \\ \hline 15.6722^{\circ} \end{array}$$

From Plate Constants

$$x \quad 22.9163^{\circ}$$

$$y \quad 15.1943^{\circ}$$

$$z \quad +.9163^{\circ}$$

$$h \quad -2.8057^{\circ}$$

$$\log z \quad 9.96204^{\circ}$$

$$\log \tan \delta \quad 9.6972^{\circ}$$

$$\log s \quad 9.95253^{\circ}$$

$$z^2 \quad 9.281^{\circ}$$

$$8.50727^{\circ}$$

$$7.0537^{\circ}$$

$$1.50227^{\circ}$$

$$8.6717^{\circ}$$

$$\alpha - A \quad +31.79$$

$$h_1 \quad +.0005^{\circ}$$

$$A \quad 6 \quad 07 \quad 52.00^{\circ}$$

$$\log h_0 \quad 0.74812^{\circ}$$

$$7.33113^{\circ}$$

$$\alpha_0 \quad 6 \quad 08 \quad 23.79^{\circ}$$

$$3.11697^{\circ}$$

$$1309.1$$

$$\text{Red} \quad +2.62^{\circ}$$

$$\delta - D \quad -22 \quad 99.1^{\circ}$$

$$\alpha' \quad 6 \quad 08 \quad 26.71^{\circ}$$

$$D + 26 \quad 40 \quad 06.00^{\circ}$$

$$s_0 + 26 \quad 18 \quad 16.9^{\circ}$$

$$\text{Red} \quad +5.3^{\circ}$$

$$s' + 26 \quad 18 \quad 22.2^{\circ}$$

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Moon's Mean Position

7

$$\begin{array}{r} \gamma_0 \quad 22.8886'' \\ \quad -26'' \\ \hline 22.8860'' \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 15.6730'' \\ \quad -8'' \\ \hline 15.6722'' \end{array}$$

From Plate Constants

$$\gamma \quad 22.9163''$$

$$\gamma \quad 15.1993''$$

$$\xi \quad +9.163''$$

$$\eta \quad -2.8057''$$

$$\begin{array}{r} \log \xi \quad 9.96209'' \\ \text{const} \quad 99.5253'' \\ \hline 8.50729'' \\ \hline 1.50227'' \end{array}$$

$$\begin{array}{r} \log \eta \quad 9.6972'' \\ \xi^2 \quad 9.9271'' \\ \hline 7.0539'' \\ \hline 8.6717'' \end{array}$$

$$\gamma - A \quad +31.79''$$

$$\eta \quad +.0005''$$

$$A \quad 6 \quad 07 \quad 52.00''$$

$$\log \eta_0 \quad 0.99812''$$

$$\gamma_0 \quad 6 \quad 08 \quad 23.79''$$

$$\begin{array}{r} 7.33115'' \\ \hline 3.11697'' \end{array}$$

$$\text{Red} \quad +2.62''$$

$$\alpha - D \quad -22 \quad 99.1''$$

$$\alpha' \quad 6 \quad 08 \quad 26.71''$$

$$D + 26 \quad 90 \quad 06.00''$$

$$J_0 \quad 126 \quad 18 \quad 16.9''$$

$$\text{Red} \quad +5.3''$$

$$J' + 26 \quad 18 \quad 22.2''$$

5 59

$$\begin{array}{r} 3.376 \\ 0.86 \\ \hline + 2.32 \end{array}$$

+23° 14

$$\begin{array}{r} 13.39 \\ 7.86 \\ \hline + 3.98 \end{array}$$

5 53

$$\begin{array}{r} 62.87 \\ 59.59 \\ \hline + 2.85 \end{array}$$

37 12

$$\begin{array}{r} 36.22 \\ 28.13 \\ \hline + 8.09 \end{array}$$

6 9

$$\begin{array}{r} 51.02 \\ 48.98 \\ \hline + 2.57 \end{array}$$

22 31

$$\begin{array}{r} 60.51 \\ 55.79 \\ \hline + 4.72 \end{array}$$

.2 +90

+30

+20

3.5
10 60 50
64 54

10232 Reduction to Apparent Place

8

$$H + \alpha \quad 9 \quad 29.5 = 67^\circ 22.5' \quad \delta \quad 26 \quad 18 \quad 1.6.9$$

$$H \quad 22 \quad 21.1$$

$$\alpha \quad 6 \quad 08.9$$

$$G \quad 21 \quad 23.6$$

$$G + \alpha \quad 3 \quad 32.0 = 53^\circ 0'$$

$$\log \cos \delta \quad 9.9525$$

$$i \quad 0.5630 n$$

$$i' \quad 0.5155 n$$

$$\log \cos G + \alpha \quad 9.7795$$

$$q \quad 0.9286$$

$$\sin \quad 9.9023$$

$$\tan \delta \quad 9.6940$$

$$8.8239$$

$$\log \sin \delta \quad 9.6765$$

$$l \quad \cos(H + \alpha) \quad 9.5851$$

$$h \quad 1.3091$$

$$\sin(H + \alpha) \quad 9.9652$$

$$\sec \delta \quad 0.0475$$

$$8.8239$$

$$\log q' \quad 0.7091$$

$$q \quad 9.3498$$

$$\log h' \quad 0.5357$$

$$h \quad 0.1707$$

$$l \quad +1.012$$

$$q \quad +0.224$$

$$h \quad +1.383$$

$$+2.619$$

$$q' \quad +5.118$$

$$h' \quad +3.733$$

$$i' \quad -3.277$$

$$+5.279$$

10232 Reduction to Apparent Place

8

$$H + L \quad 9 \quad 29.5 = 67^\circ 22.5 \quad S \quad 26 \quad 18 \quad 16.9$$

$$H \quad 22 \quad 21.1$$

$$L \quad 6 \quad 08.9$$

$$G \quad 21 \quad 23.6$$

$$G + L \quad 3 \quad 32.0 = 53^\circ 0'$$

$$\log \cos L \quad 9.9525$$

$$+ \quad 0.5630 \quad n$$

$$+ \quad 0.5155 \quad n$$

$$\log \cos G + L \quad 9.7795$$

$$+ \quad 0.9286$$

$$\sin \quad 9.9023$$

$$\tan \quad 9.6940$$

$$8.8239$$

$$\log \sin \quad 9.6965$$

$$\cos(H + L) \quad 9.5851$$

$$+ \quad 1.3091$$

$$\sin(H + L) \quad 9.9652$$

$$\sec \quad 0.0975$$

$$8.8239$$

$$\log q' \quad 0.7091$$

$$+ \quad 9.3998$$

$$\log L' \quad 0.5357$$

$$+ \quad 0.1907$$

$$f \quad +1.012$$

$$g \quad +0.229$$

$$h \quad +1.383$$

$$+2.619$$

$$q' \quad +5.118$$

$$L' \quad +3.933$$

$$n' \quad -3.277$$

$$+5.279$$

10232

Lunar Parallax

9

$\alpha' \quad 6 \quad 08 \quad 26.71^{\circ}$
 $\delta \quad 8 \quad 19 \quad 38.95^{\circ}$
 $\theta - \alpha' - 1 \quad 48 \quad 77.76^{\circ}$
 $= -27^{\circ} \quad 11 \quad 51.90^{\circ}$
 $\gamma \quad - \quad 10 \quad 12.91^{\circ}$
 $\gamma - \alpha' - 27 \quad 01 \quad 38.99^{\circ}$

9.95727°
 0.00000°
 0.05022°
 0.00779°

$\delta \quad 45 \quad 29 \quad 38.4^{\circ}$

$\delta \quad 26 \quad 18 \quad 22.2^{\circ}$

$\delta - \alpha' \quad 19 \quad 11 \quad 16.2^{\circ}$

9.82670°
 8.19637°
 9.51675°
 0.17680°
 7.68632°

$\delta - \alpha' \quad -16 \quad 41.7^{\circ}$

$\delta \quad 26 \quad 35 \quad 03.9^{\circ}$

$\text{Ephd} \quad 26 \quad 35 \quad 02.2^{\circ}$

$\text{O-C} \quad +1.7^{\circ}$

Curv. of Plate $+0.4$
 2nd Under Ref. 00

$\text{I & R Corr} \quad +0.2$

$\delta \quad +26 \quad 35 \quad 8.1$
 $\text{O-C} \quad +1.9$

$\pi \quad 54 \quad 0.2'' \quad 01^{\circ}$

9.86913°
 8.19637°
 9.85998°
 0.04852°
 7.77900°

$\alpha - \alpha' \quad -20 \quad 25.83^{\circ}$

$= \quad - \quad 1^{\circ} \quad 21.72^{\circ}$

$\alpha \quad 6 \quad 07 \quad 04.69^{\circ}$

$\text{Ephd} \quad 6 \quad 07 \quad 03.90^{\circ}$

$\text{O-C} \quad +0.79^{\circ}$

000

-0.05°

$\delta \quad +6 \quad 07 \quad 7.67$
 $+ .79$

10232

Lunar Parallax

9

$1' \ 6 \ 08 \ 26.71''$
 $8 \ 9 \ 19 \ 38.95''$
 $8-2' -1 \ 98 \ 97.96''$
 $= -27' 11 \ 51.90''$
 $-10 \ 12.91''$
 $-27 \ 01 \ 38.99''$

$9.95727''$
 $0.00000''$
 $0.05022''$
 $0.00799''$

$8 \ 45 \ 29 \ 38.4''$

$5 \ 26 \ 18 \ 22.2''$

$8-3 \ 19 \ 11 \ 16.2''$

$9.82670''$
 $8.19637''$
 $9.51675''$
 $0.19680''$
 $7.68632''$

$8.5' \ 16 \ 91.7''$

$8 \ 26 \ 35' \ 03.9''$

$8-3 \ 26 \ 35' \ 02.2''$

$0.0 \ 11.7''$

Curvature of Plate $+0.9$
 2nd Order Ref 0.0

$7 \ 54 \ 02'' \ 01''$

$9.86913''$

$8.19637''$

$9.65998''$

$0.09852''$

$7.77900''$

$8-2' -20 \ 25.83''$

$= -1' \ 21.72''$

$2 \ 6 \ 07 \ 09.69''$

$8-3 \ 6 \ 07 \ 03.90''$

$0.0 \ 10.79''$

000

1
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10263

x

Star Measures.

y

21

	d	n	d	n
1	20588	20648	19522	20363
10.4	16348	14852	16758	13400
16.3	44	56	52	13100
	60	18	02	56
	<u>10.7232</u>	<u>10.7227</u>	<u>16.2767</u>	<u>16.2772</u>
2	20238	19572	20106	20018
15.2	17930	11868	13628	16496
47	34	72	18	98
	08	48	22	02
	<u>15.2300</u>	<u>15.2316</u>	<u>4.6508</u>	<u>4.6486</u>
3	20614	20250	19728	19311
30.9	11230	19609	17116	11893
21.3	34	11	18	899
	00	34	12	08
	<u>30.9368</u>	<u>30.9362</u>	<u>21.2602</u>	<u>21.2588</u>

Moon Measures.

n

1	19100	19950
23	18030	11017
15.1	22	907
	092	72
	<u>15.1072</u>	<u>15.1066</u>

2	19982	19250
22.1	10316	18932
16	10	24
	74	32
	<u>22.0339</u>	<u>22.0321</u>
3	18672	20182
21.9	17089	11797
16.6	83	48
-X	52	72
	<u>26.8917</u>	<u>26.8927</u>

10263 "

Star Measures.

+1

	d	~	d	~
1	20388	20698	19322	20363
10.4	16398	19852	17758	13800
16.3	94	56	32	13100
	60	18	02	56
	<u>109232</u>	<u>109229</u>	<u>162769</u>	<u>162792</u>

2	20238	19579	20136	20018
15.2	17930	11868	13628	16496
4.7	39	72	18	98
	08	98	22	02
	<u>152300</u>	<u>152316</u>	<u>96508</u>	<u>96986</u>

3	20614	20250	19722	19311
30.9	11230	19609	17116	11893
21.3	39	11	18	899
	00	34	12	08
	<u>309368</u>	<u>309362</u>	<u>212602</u>	<u>212588</u>

Moon Measures.

1		19100	19950
23		18030	11019
15.1		22	009
		092	12
		<u>151072</u>	<u>151066</u>

2	19982	19250
22.1	10316	18932
16	10	24
	74	32
	<u>220339</u>	<u>220321</u>

3	18672	20182
21.9	17089	11799
16.6	83	48
-X	52	72
	<u>248917</u>	<u>248927</u>

10263

Moon Measures

12

9

22

17.6

19529

139.20

12

20

17.5606

19650

15230

20

30

17.55925

20390

19720

22.2

17632

12769

18

26

73

72

20

22.275722.27516

23

18.6

18969

13740

77

78

18.5239

20112

15378

36

10

18.52317

23.7

18.7

+7

19980

13719

12

50

18.6538

19152

15662

72

72

18.65188

27

18.6

19939

13670

62

28

18.6269

19198

15390

98

72

18.6298

10263

Moon Measures

12

9
22
17.6

19229 19650
13920 15230
12 20
20 30
17.5606 17.5592

5 20390 19720
22.2 17032 12969
18 26 73
 72 20
22.2757 22.2751

6
23
18.6

19969 20112
13740 15398
49 36
88 10
18.5239 18.5231

7
23.7
18.7
+7

19960 19152
13919 15662
12 72
50 92
18.6538 18.6518

8
29
18.6

19939 19198
13670 15390
62 98
28 92
18.6269 18.6278

10263

Times Etc.

13

Jan 18 '16

Exp. to stars	7	08		7	20
.. Moon	7	17	05.2 ✓	7	17
clock fast		6	19.3 ✓		

H. Sid. Time	7	07	56.0 ✓	$\theta - \alpha = +0^h$	2 ^m .5
H. Long	7	47	31.00 ✓		
G. Sid. Time	11	52	47.05 ✓		
Sid. T. M. H.	19	46	17.68 ✓		
Interval	16	05	59.37 ✓		
Reduction		2	38.25 ✓		
G. M. T.	16	03	21.12 ✓		

From Naut Alman.		R.A.		Dec.
Moon 16 ^h	7	05	09.32 ✓ + 27	72 35.5 ✓
Motion in 1 ^m			+2.1982 ✓	-5.832 ✓
" 3.3520 ✓			07.20 ✓	-19.5 ✓
Tabular Place	7	05	16.52 ✓ + 27	72 16.0 ✓

Moon's age	14 days
Parallax	57' 11".39 ✓
Semi-d	14 47.5 ✓
R	887.5 ✓
Aug	13.5 ✓
Gr 4	-0.6 ✓
R	900.4 ✓
R	1.9301 ✓
alt	-9.21 ✓
(1+4)/R	1.8380 ✓
R ²	3.3782 ✓

934 = 14.98

a = -501
 +29
 -477

10263

Linnica Etc.

23

Jan 18 '16

Exp to stars	7	08		7	20
" " Moon	7	19	05.2"	7	19
clock fast		6	19.3"		0.5.9"

H. Sid Time	7	07	46.0"	$\delta - \alpha = +0^h$	2 ^m 5
H. Long	9	49	31.05"		
q. Sid Time	11	52	47.05"		
Sid T M H.	19	96	17.68"		
Interval	16	05	59.37"		
Reduction		2	38.25"		
q. M J	16	03	20.02"		

From Naut Alman	R A	Dec.
Moon 16 ^h	7 05 09.32"	+ 29 42 35.5"
Motion in 1 ^m	+21.732"	-58.32"
" 3.35210"	007.20"	-19.57"
Tabular Place π 05	116.54"	+29 42 116.01"

Moon's age 19 days

Parallax	54'	11.39
Sun's d	19	97.5"
R		887.5"
Ang		13.5"
Long		-0.6"
R		900.9"
1/2		1.9301
alt		-921"
11+4/12		1.83806
12		3.3782"

934 - 19.98

a = -501

+29

-977

3

10263

Plate Center & Constants

29

X	Y	X	Y	S
10.7228	16.2753	6.57	17.55	29
15.2308	4.6797	7.00	15.09	22
30.9365	21.2595	7.09	33.81	25
3) 56.5901	72.1895	20.66	66.70	71
18.8634	14.0615	7.02	22.13	27
22	18	+1	37.3	"
+ 3.1366	+ 3.9385	7.03	59.73	27
315	466.5			
+ 97.3	+ 30.37.1			

Plate center { A = 7 03 59.00
D = +27 33 15.7

$$\begin{array}{rclcl}
 X-Y & +500X & -55.2Y & +1X & -6128 \\
 +1805 & +5211 & = +7016 - 898 & = +6118 + 10 & = +6128 \quad 0 \\
 -1255 & +7615 & = 6360 - 257 & = 6103 + 15 & = 28 \quad 0 \\
 -819.8 & +15768 & = 7270 - 1177 & = 6096 + 31 & = 27 - 1 \\
 23.6801 & +11870 & - 928 & +27 & = 24.7609
 \end{array}$$

$$\begin{array}{rclcl}
 Y-Y & +500Y & +59.3X & +4.6Y & -7658 \\
 -1120 & +8138 & = +7018 + 566 & = +7584 + 77 & = +7658 = 0 \\
 +9985 & +2325 & = 6810 + 827 & = 7637 + 21 & = 7658 = 0 \\
 -9779 & +10630 & = 5881 + 1680 & = 7561 + 98 & = 59 = +1 \\
 16.8153 & +8708 & +1286 & +77 & = 17.0266
 \end{array}$$

$$\begin{array}{lclcl}
 \text{Tables} & a = +1.2 & e = +1.2 & a-e = 0 & b+d = 0 \\
 \text{Obs} & = +501.0 & = -507.6 & = +3.6 & = +0.9
 \end{array}$$

$$O-C \quad -501.2'' \quad -504.8'' \quad +0.9''$$

10263

Plate Center & Constants

29

X	Y	X	Y
10.9228	16.2753	6.57	17.55 ⁷
15.2308	9.6997	7.00	15.09
30.9365	21.2593	7.09	33.81
31.565901	92.1895	20.66	66.70
18.8639	19.0615	7.02	22.13
22	18	+1	37.3
+ 3.1366	+ 3.9355	7.03	39.93
31 ⁵	966.5	2.9	33.15.7
+ 97.3	+ 10.27.1		

Plate Center } A = 7 03 59.0
 } D = +29 33 15.7

$$\begin{aligned}
 X-7 & + 500X & -55.27 & + 11 & - 61.2 \\
 +1803 & + 5211 & = +7016 & - 898 & = +6118 + 10 = +6128 & 0 \\
 -1255 & + 7615 & = 6360 & - 257 & = 6103 + 15 = & 28 & 0 \\
 -8198 & + 15768 & = 7270 & - 1179 & = 6096 + 31 = & 27 & -1 \\
 23.6561 & + 11890 & & - 928 & & + 29 & = 24.1609
 \end{aligned}$$

$$\begin{aligned}
 Y-7 & + 500Y & + 59.3X & + 9.6Y & - 765 \\
 -1120 & + 8138 & = +7018 & + 566 & = +7584 + 79 = +7663 \\
 +9985 & + 2325 & = 6810 & + 827 & = 7637 + 21 = & 7658 \\
 -9799 & + 10630 & = 5831 & + 1640 & = 7471 + 98 = & 7569 \\
 16.8153 & + 8908 & & + 1286 & & + 70 & = 17.0261
 \end{aligned}$$

Tables $a = +1.2$ $e = +1.2$ $a-e = 0$ $b+d = 0$
 Obs $= +501.0$ $= -509.6$ $= +3.6$ $= +0.9$

ξ	η	$\Delta\xi$	-3ξ	-8η	$+6$
1 -11.75	-1.68	-42	+35	-7	+1
2 -6.67	-13.82	-37	+20	-17	+10
3 +9.75	+3.68	+26	-29	-3	-3
M +2.16	-0.97	0	-6	+0	<u>0</u>

$\Delta\eta$	-5.5η	$+5\xi$	$+3$
-5	+9	+7	-6
-76	+76	0	-3
+10	-20	-20	+5
0	+5	+1	<u>+9</u>

Standard Coordinates										13	
Cape Nr 1005 - mag 5.2 PM					Cape Nr 1013 - mag 5.9 PM					Cape Nr 1026 - mag 6.1	
C	6	56	19.25		6	59	17.19		7	08	35.08
L			19.26				17.24				35.07
C			19.23				17.22				35.05
Mean	6	56	19.25		6	59	17.22		7	08	35.07
Prec			+58.52				57.82				+58.74
α	6	57	17.77		7	00	15.04		7	09	33.81
A	7	03	59.00		7	03	59.00		7	03	59.00
$\alpha-A$			-0641.23			-3	73.96			+5	34.81
$\sin(A-A)$			-401.17				-223.95				+334.78
log	2	60333	n		2	35015	n		2	52476	
log	9	96969			9	96478			9	96717	
$\log$	4	07016	n		0	82217	n		0	98917	
$\log$	-11	7532			-6	6809			+9	7537	
$\log$		-42				-37				+26	
$\log$	10	2426			15	3563			31	7563	
$\log$	10	7228			15	2308			30	9365	
$\log$	+1	802			-	1255			-	8198	
C	+24	21	28.5		+22	47	13.5		25	03	31.4
L			29.1				14.4				31.0
C			29.3				13.6				30.9
Mean	24	21	29.0		22	47	13.8		25	03	31.1
Prec		-1	18.6		-1		22.8		-1		36.7
α	24	20	10.4		22	45	51.0		25	1	54.4
D	24	33	15.7		27	33	15.7		27	33	15.7
$\alpha-D$		-13	05.3		-1	47	24.7		+28		38.7
$\tan(B-D)$			-7853				-6446.8				+1718.7
log	2	89504	n		3	80935	n		3	23520	
$\log$	0	22619	n		1	17050	n		0	56635	
log	9	6554			9	6229			9	6693	
$\log$	2	1403			1	6443			1	9783	
$\log$	8	8491			8	3206			8	7010	
$\log$	-1	6834			-1	38197			+3	6842	
$\log$	+0	0707			+0	0208			+0	0502	
$\log$	16	3873			7	2012			21	7344	
$\log$	16	2753			7	6477			21	2595	
$\log$	-	1120			+7	785			-	7749	

Checked twice

Checked twice

10262 Standard Correlation 13

Cape W 1005-mg 5.2m Cape W 1013-mg 5.9m Cape W 1026-mg 6.1

C	6	56	19.25	6	59	17.19	7	08	35.08
L			19.26			17.24			35.07
C			19.23			17.22			35.05
Mean	6	56	19.25	6	59	17.22	7	08	35.07
Proc			+5854			57.82			+58.79?
x	6	57	17.78	7	00	15.04	7	09	33.81
A	7	03	59.00	7	03	59.00	7	03	59.00
A-A			-0641.23		-3	93.96		+5	39.81
Smth-A			-901.89			-223.75			+339.78
Log	2	60333	n	2	35015	n	2	52976	
Coef	9	93939		9	96878		9	95717	
So	4	07086	n	0	82217	n	0	98917	

So	-11	7532		-6	6800		+9	7537	
So		-92			-37			+26	
So	10	2923		15	3583		31	7563	
A	10	7228		15	2308		30	9365	
A-S		+1802			-1255			-8198	

C	+29	21	28.5	+22	47	13.5	25	03	31.9
L			29.1			19.9			31.0
C			29.3			13.6			30.7
Mean	29	21	29.0	22	47	13.8	25	03	31.1
Proc		-1	18.6		-1	22.8		-1	36.9?
S	24	20	10.8	22	45	51.0	25	1	59.2
D	24	33	15.7	29	33	15.7	29	33	15.7
S-D		-13	05.3	-14	47	24.7		+28	38.8
Smth-D			-7853			-6946.8			+1718.3
Log	2	89509	n	3	80935	n	3	23520	
So	0	22619	n	1	19050	n	0	56635	

Logland	9	6559		9	6529		9	6693	
So	2	1903		1	6493		1	9783	
h	8	8994		8	3206		8	7010	

h	-1	6839		-1	38197		+3	6892	
h	+0	0707		+0	0209		+0	0502	
h	1	63873		7	2012		2	17384	
h	1	62753		7	6977		2	12595	
h	-	1120		+7	985		-	7749	

A - 0
B +.2

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10263	<i>Myoria</i>	Center				16
x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	$y - y_0$	
1 23.0000	-0.6800	0	0.4624	3.3811	+	29
2 22.0330	-1.6770	✓	2.7126	3.3771	-	11
3 24.8722	-1.8378		3.3775	3.3775	-	7
4 22.0000	-1.6800		2.8224	3.3774	-	8
5 22.2754	-1.4046		1.9729	3.3776	-	6
6 23.0000	-0.6800		0.4624	3.3824	+	42
7 23.6800	0.0000		0.0000	3.3789	+	7
8 29.0000	+0.3200		0.1024	3.3821	+	39

$$R \sim 3.3782$$

y	$y - y_0$	Δy	$(y - y_0)^2$	L
1 15.1069	-1.7081	-3	2.9187	202 ²
2 16.0000	-0.8150	-2	0.6675	244 ²
3 16.8150	0.0000	0	0.0000	270 ²
4 17.5599	+0.7449	+1	0.5550	294 ²
5 18.0000	+1.1850	+2	1.4097	310 ²
6 18.5235	+1.7085	+3	2.9200	338 ²
7 18.6528	+1.8378	+4	3.3789	360 ²
8 18.6256	+1.8106	+4	3.2797	10 ² 168 ⁰

Approx. Center

$$x = 23 \quad y = 15.1069$$

$$18.5235$$

$$3.36307$$

$$y_0 = 16.8152$$

$$y_{max} = 18.6528$$

$$R = 1.8376$$

$$x_{min} = 21.8722$$

$$x_0 = 23.6798$$

$$x_0 = 23.6800$$

$$y_0 = 16.8150$$

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10263	Myoria	Center				16
x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	$y - y_0$	
1 23,0000	-0,6800	0	0,4624	3,3811	+	29
2 22,0330	-1,6970	1	2,7126	3,3771	-	11
3 21,8922	-1,8378		3,3775	3,3775	-	7
4 22,0000	-1,6800		2,8224	3,3779	-	8
5 22,2759	-1,4046		1,9729	3,3776	-	6
6 23,0000	-0,6800		0,4624	3,3829	+	92
7 23,6800	0,0000		0,0000	3,3789	+	7
8 29,0000	+0,3200		0,1024	3,3821	+	39

$$R = 3,3782$$

y	$y - y_0$	Δy	$(y - y_0)^2$	L	
1 15,1069	-1,7081	-3	2,9187	202	
2 16,0000	-0,8150	-2	0,6695	299	
3 16,8150	0,0000	0	0,0000	270	
4 17,5599	+0,7449	+1	0,5550	299	
5 18,0000	+1,1850	+2	1,4097	310	
6 18,2235	+1,7085	+3	2,9200	338	
7 18,6528	+1,8378	+4	3,3789	360	
8 18,6256	+1,8106	+4	3,2797	10	168°

Approx Center

$$x = 23 \quad y = 15,1069$$

$$18,5235$$

$$3,26309$$

$$y_0 = 16,8152$$

$$y_{max} = 18,6528$$

$$R = 1,8376$$

$$x_{max} = 21,8922$$

$$y_0 = 23,6798$$

$$x_0 = 23,6800$$

$$y_0 = 16,8150$$

Formation of Normals

1	+ 1.16	- 19.9	- 49.5
2	+ 1.35	+ 14.1	+ 9.0
3	0.0	+ 13.0	0.0
4	- 1.24	+ 13.4	- 6.0
5	- 1.65	+ 8.5	- 7.0
6	- 1.16	- 28.5	+ 72.0
7	- 0.0	0.0	+ 13.0
8	+ 0.58	+ 12.5	+ 71.0
	+ 3.09	+ 65.5	+ 165.0
	- 4.05	- 48.2	- 62.5
	- 0.96	+ 17.3	+ 102.5

	a	b	c
-200 a	= -9	1 + 6	-7 -16 ^v
- " " b	= +4	2 + 15	-3 -3 ^v
+ " " c	= -15	3 + 16	0 +1 ^v
		4 + 15	+3 +3 ^v
		5 + 13	+5 +3 ^v
		6 + 6	+7 -2 ^v
		7 0	+7 -8 ^v
		8 -3	+7 -11 ^v

$$-0.96 + 15.12 = +7.75 \Delta$$

$$+ [] - 0.08 = -0.61$$

$$+ 15.09 = +7.17 \Delta$$

$$+ 11.91 = -7.61 \Delta + 1.26 \Delta = -7.35 \Delta$$

10263 Conditional Equations

17

1 - 0.68 - 1.71 = +29	- 1 - 12 = -13	+ 72	+26
2 - 1.65 - 0.82 = -11	- 3 - 6 = -9	- 2	-5
3 - 1.89 0.00 = -7	- 4 0 = -4	- 3	-2
4 - 1.68 + 0.79 = -8	- 3 + 5 = +2	- 10	-7
5 - 1.70 + 1.18 = -6	- 3 + 18 = -5	- 1	+2
6 - 0.68 + 1.71 = +92	- 1 + 12 = +11	+ 31	+29
7 0.00 + 1.89 = +7	0 + 13 = +13	- 6	-18
8 + 0.32 + 1.81 = +39	+ 1 + 12 = +13	+ 26	+16

+ 99 - 12

Average 15

$$11.91 - 0.96 = +17.3 \quad - 7.61 \Delta$$

$$- 0.96 + 15.12 = +102.5 \quad + 4.75 \Delta$$

$$+ [] - 0.08 = + 1.7 \quad + .27 \Delta$$

$$+ 15.08 = +103.9$$

$$b = + 6.9$$

$$11.91 = +17.3 + 6.6 = +23.6$$

$$a = + 2.0$$

$$- .62 \Delta$$

$$\text{Im } \gamma \quad R 1.89$$

$$-2PC = -0.79$$

$$\Delta b = -0''.20$$

$$\Delta \delta = -0''.1$$

$$\Delta a = +0''.46$$

$$\Delta \alpha = +0''.02$$

Arc Measure d 168°

$$\frac{P}{h} = .241$$

$$\frac{\Sigma V}{h} = +9.6$$

$$\frac{+9.6}{.24} = +40$$

$$\Delta R = +0.5$$

$$\text{Corr} = +0.2$$

$$\Delta R = +0.3$$

10263 Conditional Equation 17

1 - 0.68 - 1.71 = +29	- 1 - 12 = -13 + 92
2 - 1.65 - 0.82 = -11	- 3 - 6 = -9 - 2
3 - 1.89 0.00 = -7	- 9 0 = -9 - 3
4 - 1.68 + 0.79 = -8	- 3 + 5 = +2 - 10
5 - 1.90 + 1.18 = -6	- 3 + 18 = -3 - 1
6 - 0.68 + 1.71 = +92	- 1 + 12 = +11 + 31
7 0.00 + 1.89 = +7	0 + 13 = +13 - 6
8 + 0.32 + 1.81 = +39	+ 1 + 12 = +13 + 26
	+ 99 - 22

Average 13

$$11.91 - 0.96 = +17.3$$

$$-0.96 + 15.12 = +102.5$$

$$+ [] - 0.08 = +1.7$$

$$+15.09 = +103.9$$

$$b = +6.9$$

$$11.91 = +17.3 + 6.6 = +23.6$$

$$a = +2.0$$

Arc Measured 168°

$$\frac{P}{h} = .291$$

$$\frac{\Sigma V}{h} = +9.6$$

$$\frac{+9.6}{.29} = +90$$

$$DIP = +0.5$$

10263

Mean Position

18

$$\begin{array}{r} x_0 \quad 23.6800'' \\ \quad \quad +1'' \\ \hline 23.6801'' \end{array}$$

$$\begin{array}{r} y_0 \quad 16.8150'' \\ \quad \quad +3'' \\ \hline 16.8153'' \end{array}$$

From Plate Constants

$$x \quad 27.1609''$$

$$y \quad 17.0266''$$

$$\xi \quad +2.1609''$$

$$\eta \quad -0.9737''$$

$$\log \xi \quad 0.33463''$$

$$\log \tan \delta \quad 9.6574''$$

$$\cos \delta \quad 99.5927''$$

$$\xi'' \quad 0.6693''$$

$$8.50727''$$

$$7.0537''$$

$$1.86842''$$

$$7.3804''$$

$$\alpha - A \quad +73.87''$$

$$\eta_1 \quad +.0028''$$

$$A \quad 7 \quad 03 \quad 59.00''$$

$$\log h_0 \quad 9.98936''$$

$$7.33115''$$

$$q_0 \quad 7 \quad 05 \quad 12.81''$$

$$2.65821''$$

$$\text{Red} \quad +2.72''$$

$$\delta - D \quad -7 \quad 55.2''$$

$$q_1 \quad 7 \quad 05 \quad 13.33''$$

$$D \quad +27 \quad 33 \quad 13.7''$$

$$S_0 \quad 27 \quad 25 \quad 70.5''$$

$$\text{Red} \quad +1.2''$$

$$S_1 \quad 27 \quad 25 \quad 71.7''$$

0263

Mean Position

18

$$\begin{array}{r} \alpha_0 \quad 236800'' \\ \quad \quad +1'' \\ \hline 236801'' \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 16.8150'' \\ \quad \quad +3'' \\ \hline 16.8153'' \end{array}$$

From Plate Constants

$$X \quad 27.1609''$$

$$Y \quad 17.0265''$$

$$\xi \quad +2.1609''$$

$$\eta \quad -0.9739''$$

$$\log \xi \quad 0.33463''$$

$$\log \eta \quad 9.6578''$$

$$\cos \delta \quad 995927''$$

$$\xi'' \quad 0.8693''$$

$$850727''$$

$$7.0539''$$

$$1.86812''$$

$$7.8804''$$

 $\alpha - A$

$$+73.87''$$

$$\eta_1 \quad +.0029''$$

$$A \quad 7 \quad 03 \quad 59.00''$$

$$\log H_0 \quad 9.98936''$$

$$7.33115''$$

$$T_0 \quad 7 \quad 05 \quad 12.81''$$

$$265824''$$

Red

$$+2.72''$$

 δD

$$-7 \quad 35.2''$$

$$q_1 \quad 7 \quad 05 \quad 13.33''$$

$$D \quad +27 \quad 33 \quad 15.7''$$

$$S_0 \quad 27 \quad 25 \quad 9.05''$$

Red

$$+1.2''$$

$$S_1 \quad 27 \quad 25 \quad 9.18''$$

$$\begin{array}{r}
 6 \quad 59 \quad 10.31 \\
 \underline{7.69} \\
 + 2.62
 \end{array}$$

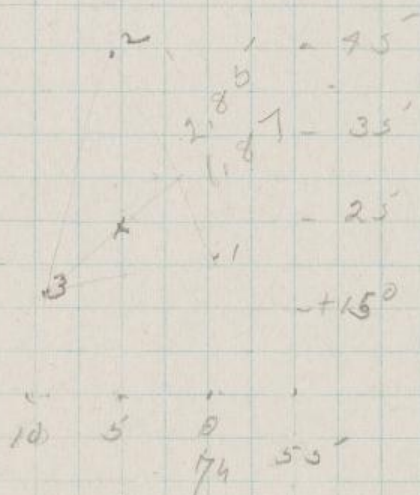
$$\begin{array}{r}
 + 20 \quad 71 \quad 71.58 \\
 \underline{70.18} \\
 + 1.40
 \end{array}$$

$$\begin{array}{r}
 7 \quad 05 \quad 56.02 \\
 \underline{52.86} \\
 + 3.16
 \end{array}$$

$$\begin{array}{r}
 + 39 \quad 27 \quad 33.88 \\
 \underline{31.38} \\
 + 2.50
 \end{array}$$

$$\begin{array}{r}
 7 \quad 08 \quad 35.53 \\
 \underline{32.97} \\
 + 2.56
 \end{array}$$

$$\begin{array}{r}
 + 16 \quad 18 \quad 9.22 \\
 \underline{8.93} \\
 + 0.29
 \end{array}$$



10263

Reduction to Apparent Place

19

$$\begin{array}{rcl}
 H + \lambda & 5 & 22.0 = 80^{\circ} 30.0 \\
 H & 22 & 16.7 \\
 \alpha & 7 & 05.3 \\
 G & 21 & 29.8 \\
 G + \lambda & 4 & 30.1 = 67^{\circ} 31.5
 \end{array}
 \quad
 \begin{array}{rcl}
 \delta & 24 & 25.40.9 \\
 \log \cos \delta & & 9.9593 \\
 " & \lambda & 0.5799 \text{ h} \\
 " & \lambda & 0.5392 \text{ h}
 \end{array}$$

$$\begin{array}{rcl}
 \log \cos G + \lambda & & 9.5824 \\
 g & & 0.9349 \\
 \sin " & & 9.9657 \\
 \tan \delta & & 9.6572 \\
 & & 8.8239
 \end{array}$$

$$\begin{array}{rcl}
 \log \sin \delta & & 9.6165 \\
 \cos H + \lambda & & 9.2176 \\
 \lambda & & 1.3035 \\
 \sin H + \lambda & & 9.9990 \\
 \sec \delta & & 0.0407 \\
 & & 8.8239
 \end{array}$$

$$\begin{array}{rcl}
 \log g' & & 0.5173 \\
 g & & 9.3817
 \end{array}$$

$$\begin{array}{rcl}
 \log h' & & 0.1376 \\
 h & & 0.1621
 \end{array}$$

$$\begin{array}{rcl}
 f & & +1.024 \\
 g & & +0.271 \\
 h & & +1.762 \\
 \hline
 & & +2.717
 \end{array}$$

$$\begin{array}{rcl}
 g' & & +3.291 \\
 h' & & +1.373 \\
 \lambda' & & -3.761 \\
 \hline
 & & +1.203
 \end{array}$$

10263

Reduction to Apparent Place

19

$$\begin{array}{rcl}
 H + L & 5 & 22.0 = 80^\circ 30.0 \quad S \quad 2.9 \quad 25^\circ 40.9 \\
 H & 22 & 16.7 \\
 x & 7 & 05.3 \\
 G & 21 & 29.8 \\
 G + L & 7 & 30.1 = 67^\circ 31.5
 \end{array}$$

$$\begin{array}{rcl}
 \log \cos \delta & 9.9393 \\
 & + 0.5799 \\
 & \hline
 & 0.5392
 \end{array}$$

$$\begin{array}{rcl}
 \log \cos G + L & 9.5827 \\
 g & 0.8399 \\
 \text{Sum} & 7.9657 \\
 \text{Tan } \delta & 9.6572 \\
 & 8.8239
 \end{array}$$

$$\begin{array}{rcl}
 \log \sin \delta & 9.6165 \\
 \cos H + L & 9.2176 \\
 L & 1.3035 \\
 \text{Sum } H + L & 9.9990 \\
 \text{Sec } \delta & 0.0407 \\
 & 8.8239
 \end{array}$$

$$\begin{array}{rcl}
 \log g' & 0.5173 \\
 g & 9.3817
 \end{array}$$

$$\begin{array}{rcl}
 \log h' & 0.1376 \\
 h & 0.1621
 \end{array}$$

$$\begin{array}{rcl}
 f & +1.029 \\
 g & +0.291 \\
 h & +1.952 \\
 \hline
 & +2.717
 \end{array}$$

$$\begin{array}{rcl}
 g' & +3.291 \\
 h' & +1.373 \\
 i' & -3.961 \\
 \hline
 & +1.203
 \end{array}$$

10263

Lunar Parallax

20

α' 7 05 15.53^v
 δ 7 07 36.0^v
 $\alpha - \alpha'$ + 2 30.47^v
 $=$ 0 37' 37.05^v
 μ + 17.25^v
 3.7 2280^v

9.95727^v
0.00000^v
0.00003^v
9.95730^v

γ 42 11 16.8^v

δ 24 25 21.7^v

$\gamma - \delta$ 17 45 35.7^v

9.82670^v
8.19762^v
9.78434^v
0.17291^v
7.68427^v

$\delta - \delta'$ 16 30.4

δ 24 42 11.8^v

Eph δ + 24 42 16.0^v

$\omega - c$ - 7.2^v

Plate Curv. + 0.4
2nd Order Ref. 0.0

Irr Corr - 0.1

δ + 24 42 11.7
 $\omega - c$ - 7.3

π 54 11.8^v

log Ans 9.86913^v
8.19762^v
8.03193^v
0.07169^v
6.19037^v
327.3

$\alpha - \alpha'$ 0 28.50
0 30.90

$=$ 0 01.90

α 7 05 11.73

Eph α 7 05 16.52^v

$\omega - c$ + 0.91

000

+ 0.02

α 7 05 17.75^v
 $\omega - c$ + 0.93

10263

Lunar Parallax

20

α'	7	05	13.33"	π	59	11.9"
δ	7	07	46.0"			
$H-\alpha'$	+	2	30.97"	log $\cos$	9.86913"	
$=$	0	1 98'	37.05"		8.19762"	
	+		17.25"		8.03292"	
	37		2280"		0.07169"	
					6.19037"	

9.95727"

0.00000"

0.00003"

9.95730"

$\alpha - \alpha'$	0	23.50
$=$	0	30.90
	0	01.95

 γ 92 11 16.8" δ 29 25 91.7" $\gamma - \delta$ 17 45 35.4"

9.82670"

8.19762"

9.98939"

0.17291"

7.63427"

 $\delta - \delta'$ 16 30.4 α 29 92 11.8" α 7 05 11.7.93"Eph δ + 27 92 16.0"ph δ 7 05 16.52" $\alpha - \alpha'$ - 9.2" $\alpha - \alpha'$ + 0.4"

Plate Curv. + 0.9
 2nd Order Ref 0.0

00

10264

x

Star Measures

21

	d	α	d	α
1	20720	20012	20006	20388
9.8	12368	18372	13930	16432
16.6	74	68	28	40
	10	08	08	69
	<u>9.8391</u>	<u>9.8359</u>	<u>16.6076</u>	<u>16.6068</u>

2	19830	19662	20398	18473
14.6	13209	16221	10938	18318
5-	02	15	36	07
	18	09	300	99
	<u>14.6619</u>	<u>14.6607</u>	<u>4.9863</u>	<u>4.9873</u>

3	19666	20402	20590	19608
30.3	16444	13860	14719	15750
21.7	96	62	21	88
	58	397	90	08
	<u>30.3468</u>	<u>30.3464</u>	<u>21.6170</u>	<u>21.6172</u>

Moon Measures.

1	18986	20260
23	16268	12968
15.2	68	62
	76	69
	<u>15.2715</u>	<u>15.2703</u>

2	18650	19910
22.1	17746	10818
16	48	18
	48	10
	<u>22.0902</u>	<u>22.0908</u>

3	19907	19668
21.9	18908	17672
17	07	62
-x	12	62
	<u>21.8008</u>	<u>21.8000</u>

10267 Star Measures 21

	d	x	2	d	21
1	20720		20012	20006	20378
9.8	12368		18372	13930	16432
14.6	79		68	28	90
	10		08	08	69
	<u>9.8391</u>		<u>9.8359</u>	<u>16.6076</u>	<u>16.6068</u>

2	19830		19642	20308	18443
14.6	13204		16221	10938	18318
5	02		15	36	69
	18		09	300	99
	<u>14.6619</u>		<u>14.6607</u>	<u>99863</u>	<u>9.9873</u>

3	19666		20902	20590	79608
30.3	16199		13860	14919	10750
21.7	96		62	21	98
	58		399	90	08
	<u>30.3968</u>		<u>30.3969</u>	<u>21.6170</u>	<u>21.6192</u>

Moon Measures

1			18986	20260
23			16268	12968
10.2			68	62
			76	69
			<u>10.2715</u>	<u>10.2703</u>

2	18650		19910	
22.1	17796		10818	
16	98		18	
	98		10	
	<u>22.0902</u>		<u>22.0908</u>	

2	19907		19668	
21.9	14908		17672	
17	09		62	
-x	12		62	
	<u>21.8008</u>		<u>21.8000</u>	

Moon Measures

22

<u>9</u>	18686	19072
22	10316	17872
17.8	08	408
	76	72
	<u>17.8366</u>	<u>17.8338</u>

<u>5</u>	19682	18932
23	12503	16090
18.8	493	98
	89	22
	<u>18.7485</u>	<u>18.7165</u>

<u>6</u>	19622	17070
23.6	14300	15332
18.9	92	30
+7	616	58
	<u>18.8322</u>	<u>18.8288</u>

<u>7</u>	19560	18060
24	11594	16008
18.7	90	06
	52	70
	<u>18.7962</u>	<u>18.7977</u>

<u>8</u>	20362	19096	19072	18190
24.5	13897	15560	13850	13376
18.5	88	66	70	90
20	62	102	78	22
	<u>24.6471</u>	<u>24.6465</u>	<u>18.5230</u>	<u>18.5212</u>

Moon Measure

22

9	1868.6	1907.2
12	10316	1787.2
17.8	08	908
	76	72
	<u>17.8366</u>	<u>17.8338</u>

3	1968.2	1893.2
23	12503	16090
18.8	493	98
	89	22
	<u>18.7135</u>	<u>18.7165</u>

6	1962.2	1803.8
23.6	11300	15332
18.9	92	30
1.9	616	58
	<u>18.8322</u>	<u>18.8288</u>

7	1956.0	1806.0
29	11599	16008
18.7	90	06
	52	70
	<u>18.7962</u>	<u>18.7977</u>

8	20362	19096	19072	18190
29.5	13899	12560	13850	13396
18.5	88	66	90	90
26	62	102	98	22
	<u>29.6971</u>	<u>29.6965</u>	<u>18.5230</u>	<u>18.5212</u>

10269

Times Etc.

23

Jan 18'16

Exp to Stars	7	22		7	37
Moon	7	28	00.7 ✓	7	28 00.6 ✓
Clock fast		6	19.3 ✓		

H. Sid. Time	7	21	71.2 ✓	$\delta = +0^h 16^m$
14 Long	7	77	31.05 ✓	
9. Sid. T.	12	06	12.25 ✓	
Sid. T. M. H.	19	76	17.68 ✓	
Interval	16	19	54.37 ✓	
Reduction		2	70.33 ✓	
9. M. T.	16	17	17.07 ✓	

From Naut. Alm.	R. A.	Dec.
Moon 16 ^h	7 05 09.32	+27 42 35.5
Motion m/m	2.1479 ✓	-1 25.876
" 17.2370	37.02 ✓	-1 40.7
Tabular Place	7 05 46.37 ✓	27 40 57.8 ✓

Moon's Age	17 days
Parallax	54. 11.51 ✓
Semid	17 47.6 ✓
R.	887.6 ✓
ang.	13.7 ✓
2nd 9.	-0.6 ✓
R	900.4 ✓
R	1.9301 ✓
ap	-916 ✓
(1+a)R	1.8385 ✓
R ✓	3.3178
	3.3800 ✓

9392 17.86 ✓

$$a = -798.5$$

$$\frac{+24}{-774.5}$$

70269

Times Etc.

23

Jan 18 '16

Exp to Stars	7	22		7	39
Moon	1	28	00.7	7	28 00.6
Clocks fast		6	19.3		

H. Sid Time	7	21	71.2	$\delta = +0^h 16^m$
H Long	7	49	31.03	
G. Sid T.	1	2	06 12.23	
Sid T M H.	19	46	17.68	
External	16	19	54.37	
Reduction		2	70.53	
G M. T.	16	17	17.07	

From Naut Alman	R. A.	Dec.
Moon 16 ^h	7 03 09.32	+29 42 33.5
Motion in 1 ^m	2.1779	-1 -5.896
17.2370	37.02	-1 40.7
Tabular Place	7 03 46.39	29 40 57.8

Moon's Age	19 days
Parallax	54 11.51
Semi-d	17 47.6
R.	887.6
Aug	13.7
Kv	-0.6
R	900.4
R	1.9301
AR	-9.16
(H+G)/R	1.8389
R	3.3718
	3.3800

939 = 17 86

$a = -798.5$
 $+29$
 -779.5

10269

Plate Constants

29

λ	9.8350	19.6613	30.3766
γ	10.2923	15.3563	31.7563
$\lambda - \gamma$	-4073	-6950	-19097

η	16.6072	7.9868	21.6156
η	16.3873	7.2012	21.7388
$\eta - \eta$	+2199	+7856	-1188

$\lambda - \gamma$	+500 λ	-90.94	-1.5 λ	-15 λ
-4073 + 4917 = +844	-671 = +173	-15 = +158	= 0	
-6950 + 7330 = 380	-201 = +179	-22 = 137	-1	
-19097 + 15773 = 1076	-873 = +203	-85 = 158	= 0	
23637 + 11819 =	-686 =	-35 = 29.7344		

$\eta - \eta$	+500 η	+42 λ	+4.2 η	-10986
+2199 + 8304 = +10503	+413 = +10916	+70 = +10986	= 0	
+7856 + 2493 = +10349	+616 = 10965	+21 = 86	= 0	
-1188 + 10808 = +9620	+1274 = 10894	+91 = 80	= -1	
16.9937 + 8497 =	+993 =	+71 = 16.8312		

Tables	$a = +.2$	$e = +.2$	$a - e = 0$	$b + d = -.2$
lts	= -501.5	= -495.8	= +3.7	= -1.6
	-498.5	-504.2		

O-C	-498.7	-504.4	-5.7
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checked
twice
Standard Error 4

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Plate Constant

29

λ	9.8350	19.6613	30.3966
γ	10.2923	15.3563	31.7563
$\lambda - \gamma$	-9073	-6950	-19097

η	16.6072	9.9868	21.6156
η	16.3873	9.2012	21.7399
$\eta - \lambda$	+2199	+7856	-1188

$\lambda - \gamma$	+5007	-90.94	-1.21	-15.8
-9073 + 9917	+844	-671	+173	+158
-6950 + 7330	-380	-201	+179	-22
-19097 + 15773	-3324	-873	+263	-95
23637	+11819	-686	-25	-29.734

$\eta - \lambda$	+5007	+921	+9.24	-10986
+2199 + 8309	+10508	+813	+10916	+70
+7856 + 2493	+10349	+616	10965	+21
-1188 + 10808	+9620	+1279	10899	+91
169937	+8997	+993	+71	16.8515

Tables	$a = +2$	$e = +.2$	$a - e = 0$	$b + d = -.2$
Wds	$= -301.5$	$= -495.8$	$= -5.7$	$= -1.6$

$A \sim 0$ $B + .9$ 

10264		Moon's		Center		25°	
x		$x-x_0$		Δx	$(x-x_0)$	$(x-x_0)(y-y_0)$	$O-C$
1	23.0000	-0.6370	0	0	0.4058	3.3732	-26
2	22.0905	-1.5765	↓	2	3.916	3.3796	+18
3	21.8007	-1.8366		3	3.731	3.3731	-47
4	22.0000	-1.6370		2	6.798	3.3875	+97
5	23.0000	-0.6370		0	4.058	3.3766	-12
6	23.6370	0.0000		0	0.000	3.3731	-47
7	24.0000	+0.3630		0	1.318	3.3768	-10
8	24.6768	+1.0098		1	0.197	3.355	-227

y		$y-y_0$		Δy	$(y-y_0)$	R	25°
						3.3778	
						3.3800	
1	15.2709	-1.7231	-1	2	9.699		+200
2	16.0000	-0.9940	-0	0	9.880		237
3	16.9990	0.0000	0	0	0.000		270
4	17.8352	+0.8412	+0	0	7.077		297
5	18.7175	+1.7235	+1	2	9.708		340
6	18.8305	+1.8365	+1	3	3.731		360
7	18.7953	+1.8013	+1	3	2.850		11
8	18.5221	+1.5281	+1	2	3.364	171°	337

Append Center	
$x = 23$	$y = 15.2709$
	18.7175
	33.9884
y_0	16.9992
y_{max}	18.8305
R	1.8363
y_{min}	21.8007
	23.6374

Moon's Center	x_0	23.6370
	y_0	16.9990

10264	Moonis	Center	$\bar{x}$	$\bar{y}$	$\bar{z}$
x	$x - \bar{x}$	y	$y - \bar{y}$	z	$z - \bar{z}$
1 230000	-0.6370	0	0.9058	3.3732	-26
2 220905	-1.5765	0	2.3916	3.3796	+18
3 218007	-1.8266		3.3731	3.3731	+97
4 220000	-1.6370		2.6798	3.3875	+97
5 230000	-0.6370		0.9058	3.3766	-12
6 23.6370	0.0000		0.0000	3.3731	-97
7 24.0000	+0.3630		0.1318	3.3768	-10
8 24.6768	+1.0098		1.0197	3.3551	-227

7	$x - \bar{x}$	y	$y - \bar{y}$	$\bar{z}$
1 15.2709	-1.7231	-1	2.9699	+200
2 16.0000	-0.9990	-0	0.9980	237
3 16.9990	0.0000	0	0.0000	270
4 17.8352	+0.8362	+0	0.7077	297
5 18.7175	+1.7235	+1	2.9708	370
6 18.8305	+1.8365	+1	3.3731	360
7 18.7953	+1.8013	+1	3.2750	11
8 18.5221	+1.5281	+1	2.3352	33?

Upper	Center
$\bar{x} = 23$	$\bar{y} = 15.2709$
	18.7175
	3.37884
	$\bar{y}_0 = 16.9992$
	$\bar{y}_{max} = 18.8305$
	$\bar{y}_K = 1.8363$
	$\bar{y}_{min} = 2.18007$
	23.6379

Moonis Center	$\bar{x}_0$	23.6370
	$\bar{y}_0$	16.9990

Formation of Normals.

1 + 1.10	4. 16.5	+ 99.5
2 + 1.57	- 28.0	- 18.0
3 0.0	+ 86.5	0.0
4 - 1.10	- 159.0	+ 81.5
5 - 1.10	+ 7.5	- 20.5
6 0.0	0.0	- 86.5
7 + 0.65	- 3.5	- 18.0
8 + 3.29	+ 100.5	+ 126.0
- 2.20	- 190.5	- 183.0
+ 1.09	- 80.0	- 17.0
	+ 108.8	- 76.7
	+ 18.8	- 93.7

		a	b	$\Delta \mu$
-20 Δa	-6	1 + 4	-3	-17 ^v
" " " "	+2	2 + 9	-2	-8 ^v
+ " " " "	-15	3 + 11	0	-4 ^v
		4 + 10	+2	-3 ^v
		5 + 8	+3	-8 ^v
		6 0	+4	-11 ^v
		7 - 2	+4	-13 ^v
		8 - 1	1	-7 ^v

$$+ 1.09 + 14.25 = +3.79 \Delta$$

$$+ [] + 0.13 = -0.57 \Delta$$

$$+ + 14.12 = +2.92 \Delta$$

$$+ 9.38 = +3.79 \Delta + 0.22 \Delta = -3.71 \Delta$$

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Conditional Equations

-22

b-c

36

new
a-c

1	-0.69	-	1.72	=	-26	+ 2	+ 42	=	+10	-36	-50"
2	-1.55	-	0.99	=	+18	- 4	+ 7	=	+ 3	+15	+7"
3	-1.89		0.00	=	-87	- 5	0	=	-3	-92	-96"
4	-1.68	+	0.88	=	+97	- 5	- 6	=	-11	+86	+83"
5	-0.69	+	1.72	=	-12	- 2	-12	=	-14	+ 2	-6"
6	0.0	+	1.89	=	-97	+ 0	-12	=	-12	-35	-96"
7	+0.36	+	1.80	=	-10	+ 1	-12	=	-11	+ 1	-12"
8	+1.01	+								+107	-113
	-4.94		+3.99								

$$9.38 + 1.09 = -80.0 + 18.8 \quad -4.94 \Delta$$

$$+1.09 + 14.25 = -17.0 - 93.7 \quad +3.99 \Delta$$

$$+ [] + 0.13 = -9.3 + 2.2$$

$$+14.12 = -7.7$$

$$+9.38 + 8 = +80$$

$$b = -1.5$$

$$a = -8.5$$

$$+0.21 \Delta$$

$$14.12 = -95.9$$

$$b = -6.8$$

$$9.38 = +18.8 + 7.9 = +26.2$$

$$a = +2.8$$

$$\text{In } 9 \quad R \quad 1.89$$

$$\Delta b = -0.11$$

$$-0.70 \Delta$$

$$-2 \quad R \quad C = -0.79 \quad \Delta a = +.30$$

$$\Delta \delta = -0.1$$

Arc Measured 171.0

$$\Delta \eta = +0.01$$

$$\frac{p}{q} = 126$$

$$\frac{2V}{h} = -91$$

$$-\frac{43}{26} = -5$$

$$\Delta R = -0.0$$

$$\text{Corr} = +0.2$$

$$\Delta R = -0.2$$

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Conditional Equations

26

1	-0.69	-1.72	= -26	+2	+12	= +10	-36
2	-1.35	-0.99	= +18	-9	+7	= +13	+15
3	-1.89	0.00	= -97	-15	0	= -15	-92
4	-1.62	+0.84	= +97	-31	-6	= -11	+86
5	-0.69	+1.72	= -12	+2	-12	= -14	+2
6	0.0	+1.84	= -97	+0	-12	= -12	-35
7	+0.36	+1.80	= -10	+1	-12	= -11	+1
8	+1.01						
		+3.99				+109	-113

Average = 9

$$9.38 + 1.09 = -80.0 + 18.8$$

$$+1.09 + 19.25 = -17.0 - 93.7$$

$$+1.09 + 0.13 = -9.3 + 22$$

$$+19.12 = -7.7$$

$$+9.38 + 0 = -80$$

$$b = -1.5$$

$$a = -8.5$$

$$19.12 = -72.9$$

$$b = -6.8$$

$$9.38 = +18.8 + 7.7 = +26.2$$

$$a = +2.8$$

Arc Measure 171°

$$\frac{p}{q} = 26$$

$$\frac{2V}{h} = \frac{9}{7}$$

$$\frac{-13}{2.6} = -5$$

$$\Delta R = -0.9$$

10268 Morris Mean Position 27

$$\begin{array}{r} X_0 \quad 23.6370'' \\ 16.9970'' \\ \hline 23.6371'' \end{array}$$

$$\begin{array}{r} Y_0 \quad 16.9970'' \\ -3'' \\ \hline 16.9937'' \end{array}$$

From Plate Constants.

$$X \quad 28.7344''$$

$$Y \quad 16.8512''$$

$$Z \quad +2.7344''$$

$$h \quad -1.1888''$$

$$\log \xi \quad 0.93637''$$

$$\cos \delta \quad 9.95935''$$

$$8.50724''$$

$$1.96975''$$

$$\alpha - A \quad +93.27''$$

$$A \quad 7 \quad 03 \quad 59.00''$$

$$\alpha_0 \quad 7 \quad 05 \quad 32.27''$$

$$\text{Red} \quad +2.72''$$

$$\alpha_1 \quad 7 \quad 05 \quad 34.99''$$

$$\log \tan \delta \quad 9.6570''$$

$$\xi'' \quad 0.8727''$$

$$7.0538''$$

$$7.5831''$$

$$h_1 \quad +0.0038''$$

$$\log h_0 \quad 0.06168''$$

$$7.33115''$$

$$2.73053''$$

$$537.7''$$

$$\delta - D \quad -8 \quad 57.7''$$

$$D \quad +27 \quad 33 \quad 15.7''$$

$$\delta_0 \quad 27 \quad 27 \quad 18.0''$$

$$\text{Red} \quad +27 \quad 33 \quad +1.2''$$

$$\delta' \quad +27 \quad 27 \quad 19.2''$$

10269 Morris Mean Position 27

$$\begin{array}{r} X_0 \quad 23.6370'' \\ 16.9970'' \\ \hline 23.6370'' \end{array}$$

$$\begin{array}{r} Y_0 \quad 16.9970'' \\ -3'' \\ \hline 16.9937'' \end{array}$$

From Plate Constants

$$\lambda \quad 29.7364''$$

$$\eta \quad 16.8512''$$

$$\zeta \quad +2.7344''$$

$$\eta \quad -1.1788''$$

$$\log \xi \quad 0.93639''$$

$$\log \tan \delta \quad 9.6570''$$

$$\cos \delta \quad 9.93935''$$

$$\xi'' \quad 0.8727''$$

$$8.50724''$$

$$\eta'' \quad 7.0337''$$

$$1.96885''$$

$$7.5831''$$

$$\gamma - A \quad +93.27''$$

$$\eta \quad +0.0038''$$

$$A \quad 7 \quad 03 \quad 59.00''$$

$$\log h_0 \quad 0.06168''$$

$$\delta_0 \quad 7 \quad 05 \quad 32.27''$$

$$7.33115''$$

$$2.73053''$$

$$\text{Red} \quad +2.72''$$

$$537.7$$

$$\gamma \quad 7 \quad 05 \quad 37.99''$$

$$\delta - D \quad -8 \quad 57.7''$$

$$D \quad +27 \quad 33 \quad 15.7$$

$$\delta_0 \quad 27 \quad 27 \quad 18.0$$

$$\text{Red} \quad +27 \quad 33 \quad +1.2$$

$$\delta' \quad 727 \quad 27 \quad 192$$

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Lunar Parallax

28

α' 7 05 39.99^h
 δ 7 21 41.2^m
 $\delta - \alpha' + 0$ 16 06.29^s
 $\ddagger + 4^\circ$ 1 33.75^s
 $\ddagger + 1$ 32.93^s
 $\frac{1}{2} + 9$ 0 00.22^s

π 54 11.51^h
 9.86913^h
 8.19764^h
 8.89639^h
 0.02161^h
 6.95477^h

9.93727^h
 0.00000^h
 0.00006^h
 9.93833^h

$\alpha - \alpha'$ 3' 05.86^h
 δ + 12.39^h

δ 42 15 19.2^h

δ 24 27 19.2^h

$\delta - \delta$ 17 54 00.0^h

9.82670^h
 8.19764^h
 9.48647^h
 0.17235^h
 7.68286^h

$\delta - \delta'$ + 16 33.8^h

δ 24 40 53.0^h

α 7 05 47.38^h

Ephs + 24 40 57.8^h

Ephs 7 05 46.37^h

o-c - 1.8^h

o-c + 1.07^h

Curv. of Plate + 0.7
 2nd Ord Ref 0.0

0.0

In corr - 0.1

+ 0.01

δ + 24 40 52.9

α 7 05 47.39

o-c - 1.9

+ 1.05^h

10267 Linnar + small up 23

α'	7	05	39.99"	π	54	11.51"
δ	7	21	91.2"			
$-\alpha' + 0$	16		06.21"		9.86913"	
$= + 4"$	7		33.85"		8.19764"	
δ	+1		32.93"		8.89639"	
μ	19	0	00.22"		0.09161"	
					6.95917"	

9.95727"
 0.00000"
 0.00606"
 9.95833"

$\alpha - \alpha'$ 3' 05.86"
 δ 12.39"

 δ 92 15 19.2" δ 29 27 19.2" $\delta - \delta$ 17 54 09.0"

9.82690"
 8.19769"
 9.98647"
 0.17235"
 7.68286"

 $\delta - \delta'$ 16 33.8" δ 29 40 53.0" α 7 05 47.38" $\delta - \delta + 29$ 40 57.8" $\alpha - \alpha$ 7 05 46.37" $\delta - \delta$ - 1.8" $\delta - \delta$ + 1.09"

Curve of Plate + 0.7
 2nd Ord Ref 0.0

0.0

In Cor - 0.1

+ 0.01

 δ 29 40 52.9 α 7 05 47.59 $\delta - \delta$ - 1.9

+ 1.05"

