

KG
71366
v.1609

CLVII
157

11198

11201

11202

11198

Star Measures

(6)

<u>1</u>	20746	20632	19661	19826
18.6	15942	15927	18.156	14299
11.2	44	28	60	300
	52	32	50	32
	<u>18,4806</u>	<u>18,4798</u>	<u>11.1502</u>	<u>11.1468</u>

Moon Measures

3	20034	20713
246	13002	17716
16	06	19
	39	18
	247030	247000

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Star Measures

1	20746	20632	19661	19826
18.6	15992	15939	18156	18299
11.2	74	28	60	300
	52	32	50	32
	<u>18.4806</u>	<u>18.9798</u>	<u>11.1502</u>	<u>11.1468</u>

2	19518	20089	10368	19809
21.4	15971	13658	19169	16010
26.7	73	54	60	19
	28	78	70	99
	<u>21.3550</u>	<u>21.3562</u>	<u>26.6207</u>	<u>26.6211</u>

3	17877	20182	19650	20369
31.4	19977	13098	13612	16900
19.6	73	98	08	02
	77	80	42	70
	<u>31.2902</u>	<u>31.2918</u>	<u>19.6035</u>	<u>19.6031</u>

Moon Measures

1	19879	18509	19512	18262
23.9	10904	17880	10039	17738
15	392	28	31	22
	84	12		68
	<u>23.9489</u>	<u>23.9419</u>	<u>23.9477</u>	<u>23.9467</u>

2			19599	97
24			19478	10030
15.1			188	10
				9730
			<u>15.0418</u>	<u>15.0390</u>

3	20039	20713		
24.6	13002	17716		
16	06	19		
	39	18		
	<u>24.7030</u>	<u>24.7000</u>		

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Moon Measures.

2

$$\begin{array}{r}
 4 \quad 20078 \quad 18686 \\
 29.7 \quad 12183 \quad 16586 \\
 16.5 \quad 77 \quad 88 \\
 +X \quad 83 \quad 84 \\
 \hline
 24.7902 \quad 24.7903
 \end{array}$$

$$\begin{array}{r}
 5 \quad 20103 \quad 18648 \\
 24.6 \quad 12683 \quad 16079 \\
 17 \quad 88 \quad 62 \\
 \quad 06 \quad 52 \\
 \hline
 24.7419 \quad 24.7418
 \end{array}$$

$$\begin{array}{r}
 6 \quad 20861 \quad 19587 \\
 24.1 \quad 19488 \quad 10980 \\
 18 \quad 86 \quad 80 \\
 \quad 68 \quad 94 \\
 \hline
 24.1375 \quad 24.1397
 \end{array}$$

$$\begin{array}{r}
 7 \quad 20008 \quad 19456 \\
 24 \quad 18910 \quad 10530 \\
 18.1 \quad 12 \quad 38 \\
 \quad 03 \quad 70 \\
 \hline
 18.1096 \quad 18.1065
 \end{array}$$

$$\begin{array}{r}
 8 \quad 20048 \quad 20390 \\
 23 \quad 15462 \quad 15007 \\
 18.4 \quad 42 \quad 03 \\
 +4 \quad 50 \quad 96 \\
 \hline
 18.4597 \quad 18.4611
 \end{array}$$

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Moon Measures.

2

4	20078	18686
29.7	12183	16586
16.5	77	88
+x	83	89
	<u>29.7902</u>	<u>24.7902</u>

5	20103	18698
29.6	12683	16079
17	88	62
	06	52
	<u>29.7919</u>	<u>24.7918</u>

6	20861	19587
29.1	19988	10980
18	86	80
	68	99
	<u>29.1375</u>	<u>24.1397</u>

7	20008	19956
29	18910	10530
18.1	12	38
	03	70
	<u>18.1096</u>	<u>18.1065</u>

8	20048	20390
23	15962	15007
18.4	92	03
+4	50	96
	<u>18.9597</u>	<u>18.9611</u>

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Lumina Etc.

3.

Sept 16 '116

Exp. to stars	4	17		4	29
" " Moon	4	22	55.8	4	22 56.0
Clockfast		9	41.1		

H. Sid Time	4	13	17.8	$\phi - \delta = +0^h 11^m$
H. Long	4	44	31.05	
G. Sid T.	8	37	43.83	
Sid T. M. M.	11	40	27.15	
Internal Reduction	21	17	21.70	
G. M. T.	21	13	52.94	

From Naut Alm.		R. A.		Dec.
Moon 21 ^h	4	01	37.86	+27 53 4.9
Motion in ^h			2.2587	+ 4.499
" " 03.8740			31.34	+1 2.4
Tabular Place	4	02	09.20	24 54 7.3

Moon's Age 19.3 days

Parallax	55	32 11
Semid	15	9.6
R.		909.6
ang		19.1
R _h (h)		-1.1
R		922.6
R		1.9777
all		-942
U+all		1883.3
R		3547.6

934 14.94

$\alpha - 500.8$
 $+ 28$
 $- 776.8$

11198 *Turner Etc.*

3

Sept 16 '116

Exp. to stars	9	17	-	9	29
" " Moon	9	22	55.8	9	22 56.0
Clock fast		9	71.1		

H. Sid Time	9	13	19.8	$\theta - \alpha = +0^h 11^m$
H. Long	9	9.9	31.05	
9. Sid T.	8	37	43.83	
Sid T. M. H.	11	40	29.15	
Interval	21	17	21.70	
Reduction		3	29.26	
G. M. T.	21	13	52.99	

From Mount Wilson		R. A.		Dec.
Moon 21 ^h	4	01	37.86	+29 53 9.9
Moon in 1 ^h			22.87	+ 9.99
" 13.8790			31.39	+1 2.9
Jatular Place	4	02	09.20	29 54 7.3

Moon Age 19.3 days

Parallax	55	32.11
Semi-d	15	9.6
R		909.6
Long		19.1
2 ^h (h)		-1.1
R		922.6
R		1.9777
alt		-94.2
11+911		1883.5
R		3597.6

$a - 500.9$
 $+ 29$
 $- 976.7$

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Lunna Etc.

3

Sept 16 '16

Exp. to stars	9	17	-	9	29	-
" " Moon	9	22	55.8	9	22	56.0
Clock fast		9	71.1			

H. Sid Time	9	13	19.8	$\delta - \alpha = +0^h 11^m$
H. Long	9	9.9	31.05	
g. Sid T.	8	57	45.35	
Sid T. M. N.	11	40	29.15	
Interval	21	17	21.70	
Reduction		3	29.26	
g. M. T.	21	13	52.99	

From North Alm.		R. a.		Dec.
Moon 21 ^h	9	01	37.86	+29 53 9.9
Motion in 1 ^h			2.2547	+ 7.499
" " 03.8790			31.39	+1 2.9
Tatular Place	4	02	09.20	29 54 73

Moon's Age 19.3 days

939 19.94

a - 500.9

+29

- 976.9

Parallax	55	32.11
2 nd mid	15	9.6
H		909.6
Long		19.1
2 nd (h)		-1.1
R		922.6
R		1.9777
alt		-982
(1+g)/1		1.8835
R ²		35976

11198 Plate Center and Constants γ

$$\begin{array}{rclcl}
 \gamma & & \gamma & & \gamma \\
 18.7802 & 11.1485 & & & \\
 213556 & 26.6209 & 40058.7 & +2559 & 05.7 \\
 31.2910 & 17.6033 & +20.0 & -1 & 7 \quad 1.7
 \end{array}$$

$$\begin{array}{rclcl}
 22 & 18 & & & \\
 +0.6777 & -8.6209 & 40118.7 & +2752 & 07.0 \\
 +19.98 & -67' 1.7 & & &
 \end{array}$$

 Plate Center $\left\{ \begin{array}{l} A \quad 4 \quad 01 \quad 19 \\ D \quad 27 \quad 52 \quad 07 \end{array} \right.$

$$\begin{array}{rclcl}
 x-\gamma & +500x & -73.94 & +.7x & -8156 \\
 -267 + 9240 = +8973 - 824 = +8149 + 7 = +8156 & 0 \\
 -567 + 16678 = 16111 - 1967 = 8147 + 9 = 8156 & 0 \\
 -6221 + 15645 = 9224 - 1079 = 8145 + 12 = 8156 & 0 \\
 22.9079 + 11757 = -1225 + 9 = 23.1161 & \checkmark
 \end{array}$$

$$\begin{array}{rclcl}
 y-\gamma & +500y & +73.7x & +3.9y & -14968 \\
 +7995 + 5579 = +13569 + 1356 = 14925 + 43 = +14968 & 0 \\
 -13 + 13310 = 13297 + 1567 = 14867 + 109 = 680 \\
 +5313 + 7362 = 12615 + 2297 = 14912 + 57 = 69 + 1 \\
 16.5740 + 8287 = +1681 + 63 = 16.0805
 \end{array}$$

$$\begin{array}{lcl}
 \text{Tables} & a = -.8 & e = +.8 & a-e = +0.5 & b+d = 0 \\
 \text{Obs} & = -500.7 & = -503.9 & = +3.5 & = +.5
 \end{array}$$

$$\begin{array}{rcl}
 U-C & -499.6 & -502.6 & +0.5
 \end{array}$$

11198 Plate Center and Constants γ

γ	γ	γ	γ
18.4802	11.1485		
21.3556	26.6209	4 00 58.7	+ 25 59 05.7
31.2910	17.6033	+ 20.0	- 1 7 1.7

22	18		
+ 0.6999	- 8.6209	9 01 18.7	+ 29 52 09.0
+ 19.98	- 67' 1.7		

Plate Center { A 4 01 19
D 29 52 09

$\lambda = 3$ 500 λ -73.94 + .7 λ -815.6

22.9079 + 11959 -1225 + 9 23.1161

$\gamma = 7$ +500 γ +73.9 λ + 3.94 -1996

16.5790 +8287 + 1681 + 65 16.080.

Tables $a = -.8$ $e = -.8$ $a-e = 0$ $b+d = 0$
Obs $=$ $=$ $=$ $=$

Curve Corr

Σ	h	$\Delta \eta$	-2.6η	$+1.2\eta$	-2
-3.49	-7.66	-6	+9 = +3	-1 = +2	
-0.59	+8.62	-1	+2 = +4	+1 = +2	
+9.93	-3.98	+29	-26 = +3	-0 = +3	

$$M = +1.12 - 3 \quad 0 \quad = -5 = -0.02$$

$\Delta \eta$	-1.8η	$+3\eta$	0
-13	+14 = +1	-2 = -1	
+16	-16 = 0	-0 = 0	
-12	+7 = -5	+5 = 0	

$$M = -1.92 + 3 \quad +.6 \quad +4 = +0.2$$

Standard Coordinates											
Cape Nr 589 Mg 5.6				Cape Nr 589 Mg 7.5				Cape Nr 608 Mg 8.7			
e	3	58	22.77	7	00	0.86	7	6	00.35		
I			22.77			0.79					
C			22.71			0.75					
Mean	3	58	22.73	7	00	0.77	7	6	00.35		
Prec			57.79			58.19			57.67		
d	3	59	20.22	7	00	58.66	7	6	58.02		
A	4	01	19	7	01	19	7	1	19		
d-A	-	1	58.78	-		20.37		+5	39.02		
Sum			-118.78			-20.37			+338.99		
log u	2	07	475 n	1	30	835 n	2	53	019		
cos	9	96	115	9	95	371	9	95	753		
So	0	54	317 n	9	76	930 n	0	99	696		
Σ ₀	-3	49	25	-0	58	79	+9	93	02		
Σ ₁			-6			-1			29		
Σ ₂	18	50	69	21	71	20	31	93	31		
Σ	18	48	02	21	35	56	31	29	10		
X-3	-		267	-		567	-		6421		
e	+23	79	50.8	+25	56	25.7	+27	18	35.6		
I			51.1			25.7					
C			50.1			25.9					
Mean	23	79	50.7	25	56	25.8	27	18	35.6		
Prec			+271.6			+239.9			+232.6		
d	23	52	32.3	25	59	05.7	27	21	08.2		
D	27	52	07	27	52	07	27	52	07		
d-D	-	59	31.7	+1	07	17	-	30	55.8		
tan(d-D)			-3572.1			7022.2			-1855.9		
log u	3	55	292 n	3	60	446	3	26	856 n		
no	0	88	407 n	0	93	561	0	59	971 n		
log tan d	9	64	60	9	68	79	9	65	57		
Σ ₂	10	86	63	9	53	86	1	99	39		
h ₁	7	78	57	6	27	99	8	70	30		
h ₀	-7	65	71	+8	62	20	-3	97	85		
h ₁	+0	00	61	+0	00	02	+0	05	05		
h	10	34	90	26	62	22	17	07	20		
h	11	17	85	26	62	09	17	60	33		
h-h	+4	99	95	-	13		+5	53	17		

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Standard Coordinates

5

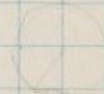
Cape No- 589 mag. 5.6 Cape No- 589 mag. 7.5 Cape No- 608 mag. 8.7

c	3	58	22.77	9	00	0.96	9	6	00.35
l			22.77			0.99			
C			22.71			0.95			
mean	3	58	22.73	9	00	0.97	9	6	00.35
Proc			57.89			58.19			57.67
d	3	59	20.22	9	00	58.66	9	6	58.02
A	9	01	19	9	01	19	9	1	19
-A	-	1	58.78	-		20.39	+5		39.02
...			-118.78			-20.39			+338.99
log ..			2.07975 ⁿ			1.30835 ⁿ			2.53019
log ..			9.96115			9.95371			9.95953
log ..			0.59319 ⁿ			9.76930 ⁿ			0.99696
Σ			-3.9925			-0.5879			+99302
Σ			-6			-1			29
Σ			185069			217120			319331
Σ			189802			213556			312710
X-3			-1267			-569			-6421

c	+23	99	50.8	+25	56	25.7	+29	18	35.6
l			51.1			25.7			
C			50.1			25.9			
mean	23	99	50.7	25	56	25.8	29	18	35.6
Proc			+291.6 ^v			+2139.9			+232.6
d	23	52	32.3	25	59	05.7	29	21	08.2
D	29	52	09	29	52	09	29	52	09
D-D	-	59	31.7	+1	09	1.7	-	30	55.8
tan(D-D)			-3572.1			9022.2			-1855.9
log ..			3.55292 ⁿ			3.65496			3.26856 ⁿ
log ..			0.88407 ⁿ			10.93561			0.59971 ⁿ
log ..			9.6460			9.6879			9.6557
Σ			10863			95386			19939
Σ			7.7857			62799			8.7030
log ..			-7.6571			+8.6220			-3.9785
log ..			+0.0061			+0.0002			+0.0505
log ..			10.3990			26.6222			17.0720
log ..			11.1985			26.6209			17.6033
log ..			+4.995			+1.3			+5.712

$$A = 0$$

$$B = +.8$$



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Moonia Center

6

	x	x-x ₀	Δx	(x-x ₀) ²	(x-x ₀)+(y-y ₀)	O-C
1	23.9472	+1.0372	0	1.0758	3.5536	-70
2	24.0000	+1.0900	0	1.1881	3.5407	+72
3	24.7015	+1.7915	0	3.2095	3.5390	-86
4	24.7902	+1.8802	0	3.5352	3.5352	-124
5	24.7418	+1.8318	0	3.3555	3.5370	-106
6	24.1386	+1.2286	0	1.5094	3.5430	-76
7	24.0000	+1.0900	0	1.1881	3.5416	-60
8	22.9100	0.0000	0	0.0000	3.5589	+113

	x	x-x ₀	Δx	(x-x ₀) ²	(x-x ₀)+(y-y ₀)	
					3.5776	
y	y-y ₀	Δy	(y-y ₀) ²			
1	15.0000	-1.5740	-1	2.4778	1.47	✓
2	15.0407	-1.5336	-1	2.3523	1.44	✓
3	16.0000	-0.5740	-0	0.3293	1.08	✓
4	16.5740	0.0000	0	0.0000	90	✓
5	17.0000	+0.4260	+0	0.1815	77	✓
6	18.0000	+1.4260	+1	2.0356	43	41
7	18.1080	+1.5340	+1	2.3533	36	✓
8	18.4607	+1.8867	+1	3.5589	0	✓ 147°

Approx Center

x=24

y=15.0407

18.1080

33.1784

y₀ 16.5742y_{max} 18.4507

R 1.8762

1.8835

x_{max} 24.7902x₀ 22.9100

Center

{x₀ 22.9100{y₀ 16.5740

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Morris Center

6

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	$O - C$
1 23,9972	+1,0372	0	1,0758	3,5536	-90
2 24,0000	+1,0900	0	1,1881	3,5909	+72
3 24,7015	+1,7915	0	3,2095	3,5390	-86
4 24,7902	+1,8802	0	3,5352	3,5352	-129
5 24,7918	+1,8318	0	3,3555	3,5370	-106
6 24,1386	+1,2286	0	1,5099	3,5730	-96
7 24,0000	+1,0900	0	1,1881	3,5916	-60
8 22,9100	0,0000	0	0,0000	3,5282	+113

3,5976

y	$y - y_0$	Δy	$(y - y_0)^2$	
1 15,0000	-1,5790	-1	2,4778	177
2 15,0909	-1,5336	-1	2,3523	177
3 16,0000	-0,5790	0	0,3295	108
4 16,5790	0,0000	0	0,0000	90
5 17,0000	+0,4260	+0	0,1815	77
6 18,0000	+1,4260	+1	2,0336	93
7 18,1080	+1,5390	+1	2,3535	36
8 18,9609	+1,8869	+1	3,5589	0

147°

Approx Center

 $x = 24$ $y = 15,0909$

18,1080

33,1989

 $y_0 = 16,5792$ $y_{max} = 18,9509$ $R = 1,8762$

1,8835

 $x_{min} = 24,7902$ $x_0 = 22,9100$

Center

$$\begin{cases} x_0 & 22,9100 \\ y_0 & 16,5790 \end{cases}$$

Formation of Normals:

1	- 1.63	- 41.5	+ 63.0
2	- 1.67	+ 78.5	- 110.0
3	- 10.2	- 154.0	+ 49.0
4	+ 0.0	- 203.5	- 0.0
5	+ 0.79	- 194.0	- 45.5
6	+ 17.6	- 56.5	- 66.0
7	+ 16.7	- 65.5	- 92.0
8	+ 0.0	+ 0.0	+ 212.0
	+ 4.22	+ 78.5	+ 324.0
	- 4.32	- 715.0	- 313.5
	- 0.10	- 636.5	+ 010.5

		a	b	c	new 0-c
		+ 35	- 9	- 27	- 22
a	+ 34	+ 37	- 9	- 25	+ 97
b	+ 6	+ 61	- 3	+ 5	- 5
c	- 53	+ 64	+ 0	+ 11	- 34
		+ 62	+ 3	+ 12	- 17
		+ 42	+ 9	- 2	+ 3
		+ 37	+ 9	- 4	- 22
		+ 0	+ 11	- 42	+ 70

$$- 0.10 + 13.28 = +1.61 \Delta$$

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Conditional Equations

7

1	+	1.09	-	1.57	=	-90		-99	-	1	=	-95	+5	B-C		
2	+	1.09	-	1.53	=	+72		-96	-	1	=	-97	+119			
3	+	1.79	-	0.57	=	-86		-76	-	0	=	-76	-10			
4	+	1.88	+	0.00	=	-124		-79	+	0	=	-79	-95			
5	+	1.83	+	0.93	=	-106		-77	+	0	=	-77	-29			
6	+	1.23	+	1.93	=	-96		-52	+	1	=	-51	+5			
7	+	1.09	+	1.53	=	-60		-96	+	1	=	-95	-15			
8	+	0.00	+	1.89	=	+113		-0	+	1	=	+1	+112			
													+291	-99		
													Average		43	

$$15.06 - 0.10 = -636.5 + 99.5 \Delta$$

$$-0.10 + 13.28 = +10.5 + 1.61 \Delta$$

$$+ [] \quad 0 = -7.2$$

$$+0.12 \Delta$$

$$+13.28 = +6.3$$

$$b = +.5$$

$$15.06 = -636.5 + 0$$

$$a = -72.3$$

$$+0.65 \Delta$$

arc Measured 197°

$$\frac{P}{n} = .13.5$$

$$\frac{\sum V}{n} = +17.7$$

$$\ln 26 - P = 1.88$$

$$-2PC = -2.63$$

$$\frac{+17.7}{.13.5} = +131$$

$$\Delta R = +1.6$$

$$\text{corr} = +0.7$$

$$\Delta b = -0.32$$

$$\Delta d = -0.12$$

$$\Delta R = +0.9$$

$$\Delta a = -1.71$$

$$\Delta t = -0.06$$

1
2
3
4
5
6
7
8

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Conditional Equations

7

1	+ 1.09	+ 1.57	= -90	-99	- 1	= -95	+ 5	6.0
2	+ 1.09	+ 1.53	= +72	-96	- 1	= -97	+119	
3	+ 1.79	+ 0.57	= -86	-76	- 0	= -76	-10	
4	+ 1.88	+ 0.00	= -129	-79	+ 0	= -79	-95	
5	+ 1.83	+ 0.93	= -106	-77	+ 0	= -77	-29	
6	+ 1.23	+ 1.93	= -96	-52	+ 1	= -51	+ 5	
7	+ 1.09	+ 1.53	= -60	-96	+ 1	= -95	-15	
8	+ 0.00	+ 1.89	= +113	- 0	+ 1	= +1	+112	
						+ 291	- 99	
						Average	93	

$$15.06 - 0.10 = -636.5$$

$$-0.10 + 13.28 = +10.5$$

$$+ [] \quad 0 = -9.2$$

$$+ 13.28 = +6.3$$

$$t = +.5$$

$$15.06 = -636.5 + 0$$

$$a = -92.3$$

Arc Measured 197°

$$\frac{p}{n} = .135$$

$$\frac{\Sigma 1}{n} = +17.7$$

$$\frac{+17.7}{.135} = +131 \quad \Delta R = +1.6$$

11198 Moon's Mean Position.

8

$$\begin{array}{r} x_0 \quad 22.9100^{\circ} \\ \quad -21^{\circ} \\ \hline 22.9079^{\circ} \end{array}$$

$$\begin{array}{r} y_0 \quad 16.5770^{\circ} \\ \quad 0^{\circ} \\ \hline 16.5770^{\circ} \end{array}$$

From Plate Constants

$$x \quad 23.1161^{\circ}$$

$$y \quad 16.0805^{\circ}$$

$$z \quad 1.1161^{\circ}$$

$$n \quad -1.9195^{\circ}$$

$$\log z, 0.04770^{\circ}$$

$$\log \tan \delta 9.6614^{\circ}$$

$$\cos \delta 9.95861^{\circ}$$

$$z = 0.0954^{\circ}$$

$$8.50729$$

$$7.0537$$

$$1.58185^{\circ}$$

$$6.8102^{\circ}$$

$$d-A \quad +38.18^{\circ}$$

$$n, +0.006^{\circ}$$

$$A \quad 4 \quad 01 \quad 19^{\circ}$$

$$\log h_0 \quad 0.28332^{\circ}$$

$$7.33115^{\circ}$$

$$d_0 \quad 7 \quad 01 \quad 57.18^{\circ}$$

$$2.95214^{\circ} - 895.7^{\circ}$$

$$Red \quad +7.11^{\circ}$$

$$S-D \quad -17 \quad 55.7^{\circ}$$

$$1' \quad 9 \quad 02 \quad 01.29^{\circ}$$

$$D \quad +27 \quad 52 \quad 07^{\circ}$$

$$S_0 \quad +27 \quad 37 \quad 08.3^{\circ}$$

$$Red \quad +14.1^{\circ}$$

$$S' \quad 27 \quad 37 \quad 22.4^{\circ}$$

11198 Thron's Mean Position

8

x_0	22.9100"	y_0	16.5790"
	-21"		0"
	22.9079"		16.5790"

From Plate Constants

x	23.1161"	y	16.0805"
z	1.1161"	n	-1.9195"

$\log z$ 0.09770"
 $\cos \delta$ 9.95862"
 8.50729
 1.58185

$\log \tan \delta$ 9.6619
 z 0.0959"
 7.0539
 6.8102
 n +0.0006

 $d-A$ +38.18" k 4 01 19" d_0 7 01 57.18" Red +9.11" i 9 02 01.29"

$\log h_0$ 0.28332"
 7.33115
 2.95217 -895.7"

 $d-D$ -19 55.7" D +29 52 07" d_0 +29 37 08.3" Red +19.1" d' 29 37 22.4"

11198 Reduction to Apparent Place

9

$$\begin{array}{rcl}
 H + \alpha & 10 & 31.7 = 157.55.5 \\
 H & 6 & 29.7 \\
 \alpha & 4 & 02.0 \\
 Q & 23 & 09.0 \\
 G + \alpha & 3 & 110 = 77.75.0
 \end{array}$$

$$\begin{array}{r}
 \log \cos \delta \quad 9.9586 \\
 + 0.9078 \\
 \hline
 = 0.8664
 \end{array}$$

$$\begin{array}{r}
 \log \cos(G + \alpha) \quad 9.8276 \\
 + 1.3185 \\
 \hline
 \sin \quad 9.8697 \\
 \tan \delta \quad 9.6611 \\
 \hline
 8.8239
 \end{array}$$

$$\begin{array}{r}
 \log \sin \delta \quad 9.6197 \\
 \cos(H + \alpha) \quad 9.9669 \\
 + 1.2472 \\
 \hline
 \sin \quad 9.5750 \\
 \sec \delta \quad 0.0417 \\
 \hline
 8.8239
 \end{array}$$

$$\begin{array}{r}
 \log g' \quad 1.1761 \\
 + 9.6729 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \log h' \quad 0.8608 \\
 + 9.7175 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 f + 3.127 \\
 g + 0.471 \\
 h + 0.518 \\
 \hline
 + 4.113
 \end{array}$$

$$\begin{array}{r}
 g' + 17.00 \\
 h' - 7.258 \\
 l' + 7.352 \\
 \hline
 + 17.094
 \end{array}$$

11198 Reduction to Apparent Place

9

$$H + \alpha \quad 10 \quad 31.7 = 157 \quad 55.5 \quad 29 \quad 37 \quad 08.3$$

$$H \quad 6 \quad 29.7$$

$$\alpha \quad 9 \quad 02.0$$

$$G \quad 23 \quad 09.0$$

$$G + \alpha \quad 3 \quad 110 = 97 \quad 75.0 \quad 2 \quad 08669$$

$$\log \cos \delta \quad 9.9586$$

$$L + 0.9028$$

$$\log \cos(G + \alpha) \quad 9.8276$$

$$9 \quad 1.3185$$

$$\text{Sum} \quad 9.8699$$

$$\text{tand} \quad 9.8611$$

$$8.8239$$

$$\log \sin \delta \quad 9.6197$$

$$\cos(H + \alpha) \quad 9.9669 \quad n$$

$$L \quad 1.2792$$

$$\text{Sum} \quad 9.5750$$

$$\text{Sec} \delta \quad 0.0919$$

$$8.8239$$

$$\log q' \quad 1.1761$$

$$9 \quad 9.6729$$

$$\log L' \quad 0.8608 \quad n$$

$$L \quad 9.7175$$

$$f \quad +3.129$$

$$9 \quad +0.971$$

$$L \quad +0.518$$

$$+9.113$$

$$9' \quad +19.00$$

$$L' \quad -7.258$$

$$L \quad +7.352$$

$$+29.094$$

11198

Lunar Parallax

10

α 4 02 01.29^v
 δ 7 13 14.81^v
 $\delta - \alpha$ 11 13.51^v
 $= + 2$ 48 22.65^v
 $\frac{1}{2}(\delta - \alpha) + 1$ 6.53^v
 $\frac{1}{2}$ 2 47 16.72^v

π 55 32.11^v
 9.86913
 8.20827^v
 8.68983^v
 0.04238^v
 6.80964^v

9.95727
 0.00000
 0.00051^v
 9.95778^v

$\gamma - \alpha$ 2 13.06^v
 $= + 8.87^v$

δ 42 13 9.6^v

δ 29 37 22.7^v

$\delta - \alpha$ 17 35 47.2^v

9.82690
 8.20827^v
 9.48045^v
 0.17265^v
 7.68777^v

$\delta - \alpha$ 16 45.4

δ 24 54 07.5^v

Eph $\delta + 24$ 57 7.3^v

α 4 02 10.16

Eph α 4 02 09.20^v

O-C +0.2

O-C +0.96

curr. Corr +0.2

-0.02

2nd Order Ref. 00

Ins Corr -0.2

-0.06

$\delta + 24$ 57 07.3

α 4 02 10.40

O-C 0.0

+0.90

11198

Lunar

Parallax

10

α 9 02 01.29^u
 δ 9 13 19.8⁻
 $\delta - \alpha$ 11 13.51⁻
 $= + 2$ 98 22.65⁻
 $k(1-\alpha) + 1$ 6.88⁻
 x 2 97 16.72⁻

π 55 32.11^u

9.86913
 8.20827^u
 8.68983^u
 0.04238⁻
 6.80964^u

9.95727

0.00000

0.00051^u9.95778^u

$\alpha - x$ 2 13.06⁻

$= + 8.87^u$

δ 92 13 9.6⁻

δ 29 37 22.9⁻

$\delta - \delta$ 17 35 47.2⁻

9.82690

8.20827^u9.98095⁻0.17265⁻7.68777^u

$\delta - \delta$ 16 95.4⁻

δ 29 54 07.5^u

Eph $\delta + 29$ 59 7.3^u

O-C 10.2

Curv. Corr +0.2

2nd Order Ref. 00

α 9 02 10.6

Eph α 9 02 09.20⁻

O-C +0.96

-0.02

11201

Star Measures

(19)

1	10778	20680	20171	19151
16.3	18381	13068	18388	10869
10.2	85	70	88	67
	78	82	30	46
	<u>16.2395</u>	<u>16.2387</u>	<u>10.1751</u>	<u>10.1721</u>

2	20111	19530	20287	20002
26.7	19512	15141	12320	18060
29.8	12	39	14	54
	03	28	80	96
	<u>26.5577</u>	<u>26.5610</u>	<u>29.7969</u>	<u>29.7856</u>

3	19508	20300	20170	20728
32.9	9666	20128	12791	18076
4.7	68	30	90	68
	02	300	60	16
	<u>32.9835</u>	<u>32.9829</u>	<u>4.7373</u>	<u>4.7349</u>

Moon Measures

1		20328	19847
23		11948	18200
14.8		60	02
		30	38
		<u>14.8366</u>	<u>14.8358</u>

2		20402	20684	19732
24		13688	13978	16368
15.7		80	84	70
		390	80	30
		<u>15.6707</u>	<u>15.6700</u>	<u>15.6638</u>

3	20266	20277	
24.1	18786	11756	
16.0	48	58	
	62	74	
	<u>24.1518</u>	<u>24.1983</u>	

fairly good

11201

Hair Measures

(1)

1	10778	20680	20191	19151
16.3	18381	13068	18388	10869
10.2	85	70	88	67
	78	82	30	96
	<u>162295</u>	<u>162387</u>	<u>101751</u>	<u>101721</u>

2	20111	19530	20289	20002
26.7	19512	15141	12320	18060
29.8	12	39	19	59
	03	28	80	96
	<u>265599</u>	<u>265610</u>	<u>297969</u>	<u>297856</u>

3	19508	20300	20170	20728
32.9	9666	20128	12791	18076
9.7	68	30	90	68
	02	300	60	16
	<u>329835</u>	<u>329829</u>	<u>47373</u>	<u>47399</u>

Moon Measures

1		20328	19899
23		11988	18200
17.8		60	02
		30	38
		<u>148366</u>	<u>148358</u>

2		20902	20689	19732
24		13689	13978	16368
15.7		80	89	70
		390	80	30
		<u>156707</u>	<u>156700</u>	<u>156638</u>

3	20266	20279	
24.2	18786	11756	
16.0	98	58	
1x	62	79	
	<u>241518</u>	<u>241983</u>	

unmeasured

11201

Moon Measures.

12

4	20268	20241
24.2	17812	12680
16.3	20	78
+X	71	41
	<u>24.2453</u>	<u>24.2438</u>

5	19458	19722
24	14272	14880
17.5	76	888
	59	20
	<u>17.5182</u>	<u>17.5168</u>

6	19751	20578
23.7	13738	16580
18	38	90
	52	78
	<u>23.6014</u>	<u>23.6016</u>

7	20020	19510
23	16488	13038
18.3	96	38
	20	17
	<u>18.3528</u>	<u>18.3526</u>

8	20060	19772
22.5	15476	14070
18.3	76	80
+Y	50	66
	<u>18.7580</u>	<u>18.7606</u>

11201

Moon Measures.

12

$$\begin{array}{r}
 4 \\
 29.2 \\
 16.5 \\
 + x \\
 \hline
 \end{array}
 \begin{array}{r}
 20268 \\
 17812 \\
 20 \\
 71 \\
 \hline
 29.2953
 \end{array}
 \begin{array}{r}
 20241 \\
 12680 \\
 78 \\
 91 \\
 \hline
 29.2938
 \end{array}$$

$$\begin{array}{r}
 5 \\
 29 \\
 17.5 \\
 \hline
 \end{array}
 \begin{array}{r}
 19958 \\
 19272 \\
 76 \\
 59 \\
 \hline
 17.5182
 \end{array}
 \begin{array}{r}
 19722 \\
 19890 \\
 888 \\
 20 \\
 \hline
 17.5168
 \end{array}$$

$$\begin{array}{r}
 6 \\
 23.7 \\
 18 \\
 \hline
 \end{array}
 \begin{array}{r}
 19751 \\
 13728 \\
 38 \\
 52 \\
 \hline
 23.6019
 \end{array}
 \begin{array}{r}
 20578 \\
 16580 \\
 90 \\
 78 \\
 \hline
 23.6016
 \end{array}$$

$$\begin{array}{r}
 7 \\
 23 \\
 18.3 \\
 \hline
 \end{array}
 \begin{array}{r}
 20020 \\
 16988 \\
 96 \\
 20 \\
 \hline
 18.3528
 \end{array}
 \begin{array}{r}
 19510 \\
 13038 \\
 38 \\
 17 \\
 \hline
 18.3526
 \end{array}$$

$$\begin{array}{r}
 8 \\
 22.5 \\
 18.5 \\
 + y \\
 \hline
 \end{array}
 \begin{array}{r}
 20060 \\
 15976 \\
 76 \\
 50 \\
 \hline
 18.7580
 \end{array}
 \begin{array}{r}
 19972 \\
 19070 \\
 80 \\
 66 \\
 \hline
 18.7606
 \end{array}$$

A. 0

B₊ 3

11204 Jones Etc.

Sept 17 ✓

Exp. to Stars	4	17		7	29
" " Moon	4	23	22.7 ✓	4	23 22.6 ✓
Clock fast		9	43.1 ✓		

H. Sid Time	4	13	39.7 ✓	$\theta - \alpha = -0^h 43^m$
H. Long	4	44	31.05 ✓	
9. Sid Time	18	58	10.45 ✓	"
Sid T. M. Noon	17	44	20.70 ✓	
Internal	21	13	49.45 ✓	
Reduction		3	28.69 ✓	
J. M. T.	21	10	21.06 ✓	

From Naut Alman.		R. a		Dec.
Moon 21 ^h	4	55	49.99 ✓	+26 03 08.9 ✓
Motion m/m				13.15 ✓
	10.3510		23.32	+13.6
Tabular Place	4	36	13.31 ✓	+26 03 22.5 ✓

Miron's Age 20.5 days

Phallax	54	57.27 ✓
Samid.	15	00.1 ✓
R.		900.1 ✓
Aug		13.8 ✓
Grk (4)		-6 ✓
R		913.3 ✓
R		1.9578 ✓
AR		-937 ✓
(1+2)R		1.8644 ✓
R-		3.7760 ✓

937 14.8+

$a - 501$
 $+ 27$
 $- 477$

11201 James Etc.

13

Sept 17

Exp. to Stars	9	17		9	29	
" Moon	9	23	22.7"	9	23	22.6"
Clock fast		9	93.1"			
H. Sid Time	9	13	39.9"	9-9 = -0"	43"	
H. Long	9	44	31.05"			
9 Sid Time	18	58	10.45"			
Sid T. Moon	11	44	20.70"			
Internal	21	13	99.75"			
Reduction		3	28.69"			
9 M. J.	21	10	21.06"			

From Naut Alman	R. a	Dec.	
Moon 21h	9 55	99.99	+26 03 08.9
Motions in h		10.351	1.315"
	10.3510	23.32	+13.6
Tabular Place	9 56	133.1	+26 03 22.5"

Moon's Age 20.5 days

Parallax	59	57.27"
Semid.	15	00.1"
R		900.1"
Ang		13.8"
Pro (9)		-.6"
R		913.3"
R		1.9578"
AR		-739"
(1+9)/R		1.8699"
R~		3.7760"

929 14.8+

a -50 1

$$+29$$

$$-977$$

11201 Plate Center and Constants 17

x	y	q	z
16.2391	10.1736	4	53
26.5602	29.7960		
32.9832	7.7361		

22	18	+3	27.9	+1	0	50.8
+5.7609	+7.8264	4	56	28.2	+25	53
36 ^s	766 ^{11.5}					
+207.39	+3.650.8					

Plate Center A 4 56 30.0
D +25 53 20.0

$x-3$	+500x	+95.1y	+1x	-12796
+3393	+8120	+11513	+967	+12780
-3645	+13280	-9635	+2839	+12769
-4479	+16792	-12013	+489	+12762
22.3809	+11190	+1578	+22	22.4103

$y-n$	+500y	-95.7x	+4.3y	+229
-3811	+5087	+1276	-1548	-272
-12725	+18898	+2173	-2531	-358
+526	+2368	+2894	-3143	-249
16.5936	+8297	-2172	+96	17.2776
			71	17.2391

Tables $a = -9$ $e = -9$ $a-e = 0$ $k+d = +0$
 Obs -501 -504.3 $+3.3$ $+1.6$
 (0-c) -500.1 -503.7 $+0.6$

11201 Plate Center and Constants 17

λ	η	δ	ϵ
16.2391	10.1736	9 53	00.89 + 29 52
26.5602	29.7960		
32.9832	7.7361		

22	18	+3	27.9	+1	0	50.8
+ 57609	+ 78264	9	56	28.2	+ 25	53
<u>39.2</u>	<u>146.5</u>					
+ 207.9	+ 3650.8					

Plate Center A 9 56 36.0
D + 25 53 20.1

δ	+ 502.1	+ 95.14	+ 11	- 12996
+ 3593	+ 8120	+ 115.13	+ 967	+ 12980
- 3495	+ 13280	- 9635	+ 2839	= 12969
- 9979	+ 16492	= 12013	+ 999	= 12962
22.3809	+ 11190	+ 1278	+ 22	22 + 103

γ	+ 500.4	- 95.71	+ 9.34	+ 22
- 3811	+ 5087	= + 1276	- 15.78	= - 272
+ 2725	+ 17898	= + 2173	- 25.31	= - 358
+ 526	+ 2368	= + 2898	- 31.43	= - 299
16.5936	+ 8297	- 2172	+ 76	17.2916
			71	17.2391

Tables $a = -.9$ $e = -.7$ $a-e = 0$ $k+d = +0$
 $b = -501$ $c = +504.3$ $d = +5.3$ $e = +$

Crown Corr.

ξ	η	$\Delta \xi$	-5.2ξ		$+14$	-12
-6.10	-7.76	-13	$+32$	$=$	$+19 - 7$	$= +12$
$+7.92$	$+13.05$	$+23$	-26	$=$	$-1 + 13$	$= +12$
$+11.82$	-13.38	$+83$	-58	$=$	$+26 - 13$	$= +13$
$+1.44$	$-$					
		$M = +0.81$	-2		$+0$	$= -14$
						$= -13 = -0.05$

$\Delta \eta$	-5.7η		$+2.2 \xi$	-7
-17	$+37$	$=$	$+20 - 13$	$= +7$
$+61$	-65	$=$	$-4 + 11$	$= +7$
-85	$+67$	$=$	$-18 + 25$	$= +7$

$M = -0.76 + 4$	$+1$	$=$	-12	$= -0.6$
			-2	$= -0.1$

111201			Standard Coordinates			13		
Cape No 717 - Ings 5.6			Cape No 726 - Ings 6.5			Cape No 737 - Ings 5.5		
C	4	52 02.13	4	58 22.77	4	50 02	0.99	
L	PM	2.16	22.80	PM	0.96			
E		2.19	22.76		0.95			
Mean	4	52 02.14	4	58 22.78	5	02	0.97	
Rec		+ 58.70		59.93		58.73		
α	4	53 00.89	4	59 22.71	5	02 59.90		
A	4	56 30.0	4	56 30.0	4	56 30.0		
$\alpha - A$	- 3	29.16	+ 2	52.71	+ 0	6 29.70		
$\sin(\alpha - A)$		- 209.15	+ 172.71		389.35			
$\log u$		2.32095	2.23731		2.59037			
$\cos$		995.756	997.761		996.021			
$\log$		0.78523	0.69216		1.05779			
$\log$		- 60989	+ 49222		11.7226			
$\log$		- 13	+ 23		+ 85			
$\log$		15.8998	269247		33.7317			
$\log$		16.2391	26.5602		32.9832			
$\log$		+ 3393	- 3645		+ 7479			
C	+ 24	53 45.8	+ 27 33 23.0	+ 24	07 58.5			
L		76.0	23.6		59.3			
E		75.6	23.5		58.8			
Mean	24	53 45.8	27 33 23.7	24	07 58.9			
Rec		+ 1 32.2	+ 1 27.5		+ 1 19.6			
α	24	55 18.0	27 37 47.9	24	09 18.5			
α	25	53 20.0	25 53 20.0	25	53 20.0			
$\alpha - D$	-	58 02.0	+ 1 71 27.9	- 1	77 01.5			
$\log$		- 34823	+ 6089.7		- 6243.7			
$\log u$		3.57187	3.78760		3.79572			
$\log$		0.87302	1.11575		1.12657			
$\log \tan$		9.6671	9.7180		9.6514			
$\log$		1.5705	1.3873		2.1156			
$\log$		8.2948	8.1557		8.8207			
$\log$		- 74648	+ 13.0572		- 13.3837			
$\log$		+ 0.0195	+ 0.0173		+ 0.669			
$\log$		10.5577	3.70685		7.6835			
$\log$		10.1736	29.7960		7.7361			
$\log$		+ 3811	- 12725		+ 526			

111201

Standard Coordinates

15

Cape Hu 717 - Inq 5.6 Cape Hu 726 - Inq 6.5 Cape Hu 737 - Inq 5.1

C	9	52	02.13	9	58	22.77	+5	02	0.99
L		Pm	2.16		22.80		Pm		0.96
E			2.19		22.76				0.95
Mean	9	52	02.19	9	58	22.78	5	02	0.97
Prec			+58.70			59.93			58.93
x	9	53	00.89	9	59	22.71	5	02	59.90
A	9	56	30.0	9	56	30.0	9	56	30.0
x-A		-3	29.16		+2	52.71		+0	629.70
Sin(x-A)			-209.13		+172.71				389.35
log			2.320954		2.23731				2.59039
cos			9.95759		9.97761				9.96021
" 50			0.78525		0.69266				1.05779
Σ			-60989		+99222				+11.7226
Σ			-13		+25				+85
Σ			15.8988		26.9247				33.9347
Σ			16.2391		26.5602				32.9832
x-Σ			+339.3		-364.5				+94.79
C	+29	53	95.8	+27	33	23.0	+29	07	58.5
L			96.0			23.6			59.3
E			95.6			23.5			58.8
Mean	29	53	95.8	27	33	23.9	29	07	58.9
Prec			+132.2			+129.5			+119.6
x	29	55	18.0	27	37	47.9	29	09	18.5
D	25	53	20.0	25	53	20.0	25	53	20.0
x-D	-1	58	02.0	+1	81	27.9	-1	58	01.5
Tan			-348.23		+6089.7				-6243.8
log			3.54187		3.78460				3.79592
no			0.87394		1.11575				1.12657
log Tan			9.66671		9.7180				9.6569
Σ			1.3705		1.3893				2.1156
Σ			8.2948		8.1557				8.8201
no	-74	648	+13.0572						-13.2834
h.	+0.0195		+0.0193						+0.669
h	10.5572		37.0685						7.6835
h	10.4736		29.7960						9.7361
h-h	+3817		-12725						+3526

1
2
3
4
5
6
7
8

1
2
3
4
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6
7
8

11201		Conditional		Equations		16
X		$X - X_0$	ΔX	$(X - X_0)^2$	$(X - X_0) + (y - y_0)^2$	$D - C$
1	23.0000	+ 0.6200	0	0.3844	3.4780	+ 5.0
2	24.0000	+ 1.6200	0	2.6244	3.4821	+ 6.1
3	24.1500	+ 1.7700	0	3.1329	3.4845	+ 8.5
4	24.2476	+ 1.8676	0	3.4787	3.4787	+ 7.1
5	24.0000	+ 1.6200	0	2.6244	3.4791	+ 3.1
6	23.6015	+ 1.2215	0	1.4920	3.4716	+ 4.4
7	23.0000	+ 0.6200	0	0.3844	3.4813	+ 5.3
8	22.3800	0.0000	0	0.0000	3.4835	+ 7.5

3.4760

y		$y - y_0$	Δy	$(y - y_0)^2$	$\angle$
1	14.8362	-1.7568	-1	3.0866	161 ^v
2	15.6669	-0.9261	-0	0.8577	120 ^v
3	16.0000	-0.5930	-0	0.3516	109 ^v
4	16.5930	0.0000	0	0.0000	90 ^v
5	17.5175	+0.9245	+0	0.8547	60 ^v
6	18.0000	+1.4070	+0	1.9796	41 ^v
7	18.3527	+1.7597	+1	3.0969	19 ^v
8	18.7593	+1.8663	+1	3.4835	0 ^v 161 ⁰

Approx. Center

$$\begin{aligned}
 X &= 27 & y &= 15.6669 \\
 & & & 17.5175 \\
 & & & 33.1844 \\
 y_0 &= 16.5922 \\
 y_{\max} &= 18.7593 \\
 R &= 1.8671 \\
 x_{\max} &= 27.2476 \\
 x_0 &= 22.3875
 \end{aligned}$$

Center

$$\begin{aligned}
 X_0 &\{ 22.3800 \\
 y_0 &\{ 16.5930
 \end{aligned}$$

11201		Conditional		Equations		
x		$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	$y - y_0$
1	23.0000	+ 0.6200	0	0.3844	3.9788	+ 570
2	29.0000	+ 1.6200	0	2.6244	3.9824	+ 61
3	29.1500	+ 1.7700	0	3.1329	3.9895	+ 185
4	27.2976	+ 1.8876	0	3.5784	3.9787	+ 71
5	29.0000	+ 1.6200	0	2.6244	3.9791	+ 31
6	23.6015	+ 1.2215	0	1.4920	3.9716	+ 47
7	23.0000	+ 0.6200	0	0.3844	3.9813	+ 53
8	22.3880	0.0000	0	0.0000	3.9833	+ 75

3.9760

y	$y - y_0$	Δy	$(y - y_0)^2$	$\angle$
1 17.8362	-1.7568	-1	3.0866	161
2 15.6669	-0.9261	-0	0.8577	120
3 16.0000	-0.5930	-0	0.3516	107
4 16.5930	0.0000	0	0.0000	90
5 17.5175	+0.9245	+0	0.8547	60
6 18.0000	+1.4070	+0	1.9796	91
7 18.3527	+1.7597	+1	3.0969	19
8 18.9593	+1.8663	+1	3.4835	0
				1610

Approx. Center

$$\begin{aligned}
 x &= 29 & y &= 15.6669 \\
 & & & 17.5175 \\
 & & & 33.1894 \\
 y_0 &= 16.5922 \\
 y_{\max} &= 18.9593 \\
 R &= 1.8671 \\
 x_{\max} &= 29.2976 \\
 x_0 &= 22.3875
 \end{aligned}$$

Center

$$\begin{aligned}
 x_0 &= 22.3880 \\
 y_0 &= 16.5930
 \end{aligned}$$

Formation of Normals.

1 -	1,09	-	31,0	+	83,0
2 -	1,51	+	99,0	-	57,0
3 -	1,04	+	150,5	-	50,0
4 +	0,0	+	113,0	+	0,0
5 +	1,79	+	50,0	+	28,5
6 +	1,72	-	53,5	-	62,0
7 +	1,09	+	33,0	+	93,0
8 +	0,0	+	0,0	+	140,0
+	4,30	+	345,5	+	344,5
-	3,67	-	87,5	-	169,0
+	0,66	+	261,0	+	175,5

	a	b	c	New o-c	
	+ 6	- 5	- 17	- 57	✓
a + 10	+ 16	- 3	- 2	+ 71	
b + 3	+ 18	- 2	+ 1	+ 61	
c - 15	+ 19	+ 0	+ 3 (+ 4)	- 23	- 22
	+ 16	+ 3	+ 3 (+ 4)	- 6	- 5
	+ 12	+ 7	+ 1	- 82	
	+ 6	+ 5	- 7	+ 17	
	+ 0	+ 6	- 9	+ 77	✓

10.47

$$+0,66 + 13,71 = +2,68 \Delta$$

+26°

$$+ [] + 0,31 = +0,77 \Delta$$

$$+13,90 = +2,29 \Delta$$

$$+14,12 + 49,33 \Delta - 0,11 \Delta = +9,22 \Delta$$

11201 Conditional Equations.

17

0-C

1 + 0.62 - 1.76 = -50	+ 19 - 21 = -10	-70
2 + 1.62 - 0.93 = +61	+ 29 - 11 = +18	+83
3 + 1.77 - 0.59 = +85	+ 32 - 71 = +25	+60
4 + 1.86 + 0.00 = +7	+ 33 + 0 = +33	-26
5 + 1.62 + 0.92 = +31	+ 29 + 11 = +40	-9
6 + 1.22 + 1.81 = +88	+ 22 + 17 = +39	-83
7 + 0.62 + 1.76 = +53	+ 11 + 21 = +32	+21
8 + 0.00 + 1.87 = +75	+ 0 + 22 = +22	+53
	+ 177	-158

Average 72

$$+ 17.12 + 0.66 = +261.0 + 9.33 \Delta$$

$$+ 0.66 + 13.71 = +175.5 + 268 \Delta$$

$$+ [] + .03 = + 12.2$$

$$+ 0.17 \Delta$$

$$+ 13.68 = +163.3$$

$$b = +11.9$$

$$+ 17.12 = +261.0 - 7.9 = +253.1 \quad a = +17.9$$

$$+ 0.65 \Delta$$

Arc Measured 161°

$$\frac{P}{h} = 120$$

$$\frac{\Sigma V}{h} = +2.9$$

$$\text{Im} \Delta \quad R \quad 1.86$$

$$-21PC = -0.79$$

$$\frac{+2.39}{20} = +119.5 \quad \Delta R = +0.2$$

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

$$\Delta b = -0''13$$

$$\Delta \delta = -''0.1$$

$$\Delta P = 0.0$$

$$\Delta a = -0.48$$

$$\Delta q = -0.02$$

Conditional Equations.

1 + 0.62 - 1.76 = -50	+ 19 - 21 = -10	-70
2 + 1.62 - 0.93 = +61	+ 29 - 11 = +18	+93
3 + 1.77 - 0.59 = +85	+ 32 - 71 = +25	+60
4 + 1.86 + 0.00 = +7	+ 33 + 0 = +33	-26
5 + 1.62 + 0.92 = +31	+ 29 + 11 = +40	-9
6 + 1.22 + 1.91 = +99	+ 22 + 17 = +39	-83
7 + 0.62 + 1.76 = +53	+ 11 + 21 = +32	+21
8 + 0.00 + 1.87 = +75	+ 0 + 22 = +22	+53
	+ 177	-158

Average 92

$$+ 19.12 + 0.66 = +261.0$$

$$+ 0.66 + 13.71 = +17.55$$

$$+ [] + .03 = +12.2$$

$$+ 13.68 = +163.3$$

$$b = +11.9$$

$$+ 19.12 = +261.0 - 7.9 = +253.1 \quad a = +17.9$$

Are Measured 161°

$$\frac{P}{h} = 120$$

$$\frac{\Sigma V}{h} = +2.9$$

$$\frac{+2.99}{20} = +119.5 \quad \Delta R = +0.2$$

$$\begin{array}{r}
 4 \quad 46 \quad 31.34 \\
 \underline{27.50} \\
 + 3.84
 \end{array}$$

$$\begin{array}{r}
 18 \quad 41 \quad 64.92 \\
 \underline{52.23} \\
 + 12.68
 \end{array}$$

$$\begin{array}{r}
 4 \quad 58 \quad 8.28 \\
 \underline{4.42} \\
 + 3.86
 \end{array}$$

$$\begin{array}{r}
 21 \quad 28 \quad 25.79 \\
 \underline{15.18} \\
 + 10.65
 \end{array}$$

$$25.76$$

$$\begin{array}{r}
 4 \quad 59 \quad 49.74 \\
 \underline{46.08} \\
 3.66
 \end{array}$$

$$\begin{array}{r}
 15 \quad 17 \quad 29.80 \\
 \underline{17.13} \\
 + 12.67
 \end{array}$$

$$\begin{array}{r}
 4 \quad 51 \quad 33.48 \\
 \underline{31.25} \\
 + 4.23
 \end{array}$$

$$\begin{array}{r}
 33 \quad 2 \quad 10.22 \\
 \underline{3.02} \\
 + 7.20 \\
 7.14
 \end{array}$$

$$3.99$$

$$9.97$$

$$+2$$

$$+20$$

$$.1$$

$$20$$

$$3$$

$$60 \quad 55 \quad 50 \quad 45$$

$$+15$$

11201 Reduction to Apparent Place

Sept 17-94

$$H + \alpha \quad 11 \quad 17.9 = 169 \quad 28.5 \quad \delta + 25 \quad 47.8$$

$$H \quad 6 \quad 24.2$$

$$\alpha \quad 9 \quad 56.7$$

$$\alpha \quad 23 \quad 10.1$$

$$G + \alpha \quad 28 \quad 068 \quad 61 \quad 32.0$$

$$\log \cos \delta \quad 9.9544$$

$$+ 0.9099$$

$$+ 0.8638$$

$$\log \cos(G + \alpha) \quad 9.6759$$

$$g \quad 1.3208$$

$$\sin \quad 9.9747$$

$$\tan \delta \quad 9.6841$$

$$8.8239$$

$$\log \sin \delta \quad 9.6386$$

$$\cos(H + \alpha) \quad 9.9926$$

$$h \quad 1.2740$$

$$\sin(H + \alpha) \quad 9.2615$$

$$\sec \delta \quad 0.0756$$

$$8.8239$$

$$\log g' \quad 0.9967$$

$$g \quad 9.7735$$

$$\log h' \quad 0.9052$$

$$h \quad 9.7050$$

$$f \quad +3.137$$

$$g \quad +0.592$$

$$h \quad +0.254$$

$$+3.983$$

$$g' \quad +9.927$$

$$h' \quad +8.039$$

$$i' \quad +7.308$$

$$+9.193$$

11201 Reduction to Apparent Place
Sept 17-96

$$H + \alpha \quad 11 \quad 27.9 = 179 \quad 26.5 \quad \delta + 25 \quad 77.8''$$

$$l + \quad 6 \quad 25.2''$$

$$\alpha \quad 9 \quad 56.7''$$

$$G \quad 23 \quad 10.6$$

$$G + h \quad 28 \quad 06.8 \quad 61 \quad 92.0$$

$$\log \cos \delta \quad 9.9511''$$

$$\sim 0.9099''$$

$$\sim 0.8638''$$

$$\log \cos(G + h) \quad 9.6759$$

$$q \quad 1.3208''$$

$$\sin \quad 9.9777$$

$$\tan \delta \quad 9.6811''$$

$$8.82329$$

$$\log \sin \delta \quad 9.6386''$$

$$\cos(H + \alpha) \quad 9.9926''$$

$$h \quad 1.2790''$$

$$\sin(H + \alpha) \quad 9.2615''$$

$$\sec \delta \quad 0.0756''$$

$$8.8239$$

$$\log q' \quad 0.9967''$$

$$q \quad 9.7735''$$

$$\log h' \quad 0.9052''$$

$$h \quad 9.8050''$$

$$f + 3.137''$$

$$q + 0.592$$

$$h + 0.259$$

$$+ 3.983$$

$$q' + 9.929$$

$$h' + 8.039$$

$$i + 7.308$$

$$+ 9.193$$

11201 Moon's Mean Position

19

γ_0 22.3800^v
+9^v
22.3809

X_0 16.5930^v
+6^v
16.5936^v

From Plate Constants

X 22.4103^v

Y 23.91
17.2716

Z +1.4103^v

W -7.609

$\log \epsilon$ 9.61310^v

$\log \tan \delta$ 9.6840^v

$\cos \epsilon$ 9.95473^v

Z_2 7.0537

8.50727

" $\rightarrow$ 9.226.2^v

11.5143^v

5.9636^v

$d-A$ +19.17^v

h_1 +.0001^v

A 7 56 30^v

$\log \mu_0$ 9.88138^v

d_0 7 56 77.27^v

7.33115^v

2.55023 -353.0

Red +3.98^v

$d-D$ -5 55.0

d' 7 56 48.15^v

D 25 53 20.0^v

S_0 25 47 25.0^v

Red +9.2^v

d' 25 47 34.2^v

11201 *Worms Mean Position*

$$\begin{array}{r} 70 \quad 22.3800'' \\ \quad + 9'' \\ \hline 22.3809'' \end{array}$$

$$\begin{array}{r} 10 \quad 16.5930'' \\ \quad + 6'' \\ \hline 16.5936'' \end{array}$$
From Plate Constants

$$X \quad 22.9103''$$

$$Y \quad 17.2776''$$

$$Z \quad +.9103''$$

$$W \quad - .7609''$$

$$\log \epsilon \quad 9.61310''$$

$$\log \tan \delta \quad 9.6890''$$

$$\log \delta \quad 9.92993''$$

$$Z'' \quad 7.0539''$$

$$850729$$

$$'' \rightarrow 9.2262''$$

$$1.15193''$$

$$5.9436''$$

$$I-A \quad + 17.47''$$

$$H \quad +.0001''$$

$$A \quad 7 \quad 56 \quad 30''$$

$$\log u_0 \quad 9.88138''$$

$$10 \quad 7 \quad 56 \quad 77.27''$$

$$7.3, 3115''$$

$$2.55023'' \sim 35.50''$$

$$Red \quad + 3.78''$$

$$I-D \quad - 5'' 55.0''$$

$$11 \quad 7 \quad 56 \quad 78.15''$$

$$D \quad 25'' 53 \quad 20.0''$$

$$50 \quad 25'' 47 \quad 35.0''$$

$$Red \quad + 7.2''$$

$$81 \quad 25'' 47 \quad 34.2''$$

11201 Lunar Parallax

20

$$\alpha' \quad 9 \quad 56 \quad 98.15''$$

$$\delta \quad 9 \quad 13 \quad 39.7''$$

$$\delta - \alpha' \quad - \quad 43 \quad 8.7''$$

$$-10 \quad 47 \quad 10.5''$$

$$k \quad - \quad 7 \quad 17.1''$$

$$l \quad -10 \quad 42 \quad 56.7''$$

$$9.95727$$

$$0.00000$$

$$0.00764''$$

$$9.96491''$$

$$\delta \quad 42 \quad 41 \quad 16.2''$$

$$\delta + 25 \quad 47 \quad 39.2''$$

$$\delta - \delta \quad 16 \quad 53 \quad 42.0''$$

$$9.82670$$

$$8.20372''$$

$$9.76332''$$

$$0.16877''$$

$$7.66224''$$

$$\delta - \delta' \quad 15'' \quad 47.6''$$

$$\delta \quad 26 \quad 03 \quad 27.8''$$

$$\text{Eph} \delta + 26 \quad 03 \quad 22.5''$$

$$O-C \quad -0.7''$$

$$\text{Curv. Corr} \quad -0.6''$$

$$2^{\text{nd}} \text{ Order Ref} \quad 0.0''$$

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

$$\delta + 26 \quad 03 \quad 21.7''$$

$$O-C \quad -0.8''$$

$$\pi \quad 57 \quad 57.27''$$

$$9.86913$$

$$8.20372''$$

$$9.27218''$$

$$0.07655''$$

$$7.39158''$$

$$\delta - \delta' \quad -8 \quad 28.16''$$

$$= \quad -33.88''$$

$$\alpha \quad 9 \quad 56 \quad 17.27''$$

$$\text{Eph} \quad 9 \quad 56 \quad 13.31''$$

$$O-C \quad +0.96''$$

$$-0.05''$$

$$-0.02''$$

$$\alpha \quad 9 \quad 56 \quad 17.25''$$

$$+0.97''$$

Fair

11201 Lunar Parallax

α' 9 56 98.15"
 δ 9 13 39.9"
 $\delta - \alpha'$ - 93 8.7"
 γ - 10 97 10.5"
 δ - 9 17.1"
 δ - 10 92 56.7"

9.95727
 0.00000
 0.00769 -
 9.96491"

γ 92 91 14.2"

$\delta + 25$ 97 39.9"

$\delta - \delta$ 16 53 42.0"

7.82690
 8.20372"
 9.76332"
 0.16879"
 7.66222"

$\delta - \delta'$ 15 97.6"

δ 26 03 21.8"

Eph $\delta + 26$ 03 22.5"

U-C +0.7"
 wave Corr -0.6"
 " Order Ref 0.0

π 59 57.27"

9.86913
 8.20372"
 9.27218"
 0.07655"
 7.39158"

$\delta - \delta'$ - 8 28.16"

= -33.88"

α 9 56 19.27"

Eph δ 9 56 13.31"

U-C +0.96"
 -0.05"

11202

Star Measures.

21

1	20804	20500	20182	19946	9802
16.4	17852	13448	17940	12172	12030
10.3	58	54	36	68	30
	04	00	80	38	02
	<u>16.2949</u>	<u>16.2951</u>	<u>10.2243</u>	<u>223</u>	<u>102228</u>

2	29878	20408	20496	20018
26.7	12259	18090	12802	17692
29.8	51	36	08	90
	78	10	92	02
	<u>26.8623</u>	<u>26.7629</u>	<u>29.7688</u>	<u>29.7686</u>

3			20240	19880
32.9	14181	17338	13640	16460
46	14168	17362	14122	52
	33(0013)	33(0024)	33.0403	70
			<u>9.6599</u>	<u>7.6579</u>

Moon Measures.

1	19856	20486
13.8	10910	19348
15	98	58
	54	92
	<u>23.8952</u>	<u>23.8966</u>

19652	19312
19001	19936
02	22
42	30
<u>15.0650</u>	<u>15.0500</u>

3	19104	19378
24.8	11352	17136
16	70	32
	24	88
	<u>24.7753</u>	<u>24.7753</u>

Good

11202

Star Micromer

21

✓	20804	20500	20182	19946	9802
16.1	17852	13998	17990	12172	12030
16.3	58	59	36	88	30
	09	00	80	38	02
	<u>16.2949</u>	<u>16.2951</u>	<u>10.2293</u>	<u>22310.2228</u>	

✓	29878	20408	20996	20018
26.7	12259	13090	12802	17692
27.5	51	36	08	90
	78	10	92	02
	<u>26.7623</u>	<u>26.7629</u>	<u>29.7688</u>	<u>29.7686</u>

✓			20290	19880
32.9+	17181	17398	13690	16460
46	17165	17362	17128	52
	33(0013)	33(0029)	893	70
			<u>9.6599</u>	<u>9.6579</u>

Main Micromer

✓	19858	20488
23.8	10910	19992
15	98	88
	59	92
	<u>23.8952</u>	<u>23.8944</u>

✓		19652	19312
27		19001	19936
15.1		02	22
		92	30
		<u>15.0650</u>	<u>15.0600</u>

✓	19109	19378
4.8	11358	17136
16	70	32
	29	88
	<u>24.7753</u>	<u>24.7753</u>

Moon Measures.

22

3
248
16

4 20158

249 11219

167 21

4 62

24.8941

19308

18262

62

38

24.8924

5 20184

248 11600

17 02

90

24.8588

20318

18802

10

14

24.8588

6 19216

243 16070

16 78

20

24.3140

20238

13404

02

40

24.3163

7
24
163

19608

17152

50

08

18.2457

19401

11851

79

396

18.2453

8
23
8.4
+7

19604

14430

28

10

18.5178

19322

14520

18

20

18.5198

Moon Measures.

22

✓	20158	19338
4.9	11219	18262
16.7	21	62
+	62	38
	<u>29.8971</u>	<u>24.8924</u>

✓	20187	20318
18	11600	18802
1	02	10
	90	19
	<u>29.8588</u>	<u>29.8588</u>

✓	19216	20238
4.3	16070	13404
18	78	02
	20	40
	<u>24.3195</u>	<u>24.3163</u>

✓	19608	19401
24	17152	11851
18.3	50	79
	08	396
	<u>18.2457</u>	<u>18.2453</u>

8	19608	19322
23	17430	17520
18.4	28	18
+	10	20
	<u>18.5178</u>	<u>18.5198</u>

11202 Times Etc. Jan. 7 23

Sept 17

Exp. to Stars	4	31		4	73	
Magn.	7	36	71.3 ^v	7	36	71.6 ^v
Clock fast		9	73.1 ^v			
H. Sid Time	4	26	58.3 ^v	9-4 =	-0 ^h	30 ^m
H. Long.	4	99	31.05 ^v			
9. Sid T.	9	11	29.35 ^v			
Sid Time M.H.	11	79	20.70 ^v			
Antenal	21	27	08.65 ^v			
Reduction		3	30.87 ^v			
9 M.T.	21	23	37.78 ^v			

From Nant Alu.	R. A.	Dec.				
Mean 21 ^h	7	55	49.99	+26	03	08.9 ✓
Motion in 1 ^{hr}	-		2.2525			+1.360 ✓
" 23.6297			53.22			30.7
Tabular Place	7	56	43.21	+26	03	39.6 ✓

Miron's Age 20.5 days.

Parallax	54	56.99 ^v
Semi-d.	15	00.0 ^v
R.		900.0 ^v
Aug.		13.9 ^v
2m. 4		-06 ^v
R.		913.3 ^v
R.		1.9578 ^v
app.		-935 ^v
H. A. R.		1.8643 ^v
R.		3.7756 ^v

$$934 = 14.96^v$$

$$\begin{aligned} 9 &= -501.9^v \\ &+ 27 \\ &= -477.9^v \end{aligned}$$

11202

Mercur Etc.

In. 4

23

Sept 17

Exp. to stars	9	31		9	73	
Moon	9	36	91.3 ^u	9	36	91.5 ^u
Clock fast		9	93.1 ^u			
H. Sid time	9	26	58.3 ^u	9-4-	-04	30 ^u
H. Long	9	99	31.05 ^u			
9 Sid R.	9	11	29.35 ^u			
Sid time M 11	11	99	20.70 ^u			
Laternal	21	27	08.65 ^u			
Perfection		3	30.87 ^u			
9 M.T.	21	23	37.78 ^u			

From Nant Allen	R. 4	Dec.			
Moon 21 ^h 9 55	49.79 ^u	+26	03	08.9 ^u	
Motion in 1 ^h	2.2525 ^u			+1.300 ^u	
" 23.6 297	53.22			30.7	
Latular Place 9 56	43.21	+26	03	39.6 ^u	

Mercuris Age . 20.5 days.

Parallax	59	56.79 ^u
Semi d.	15	00.0 ^u
R.		900.0 ^u
Aug.		13.9 ^u
In.		-06 ^u
R.		913.3 ^u
R.		1.9578 ^u
app.		-935 ^u
14 app		1.8643 ^u
R.		3.7756 ^u

$$939 = 1796$$

$$\begin{array}{r}
 9 = -501.9 \\
 + 29 \\
 \hline
 -477.9
 \end{array}$$

11202

Plate Center and Constants

24

x

y

16.2950

10.2235

26.7626

29.7687

32.9982

7.6589

x 16.2950 26.7626 32.9982

y 15.8998 26.9277 33.7311

x-y + 3952 - 1621 - 7329

y 10.2235 29.7687 7.6589

y 10.5597 31.0685 7.6835

y-y - 3312 + 12998 - 276

x-y + 500x + 16.7y + 1.7x - 12294

+ 3952 + 8177 = +12099 + 171 = 12270 + 23 = +12293 -1

- 1621 + 13381 = 11760 + 797 = 12257 + 37 = 99 0

- 7329 + 16799 = 12170 + 78 = 12248 + 46 = 99 0

23.0285 + 11519 + 278 + 32 22.9815

y-y + 500y - 15.6x + 3.9y - 1585

- 3312 + 5712 = +1800 - 257 = +1543 + 70 = +1585 = 0

- 12998 + 17887 = 1886 - 717 = 1169 + 116 = 1585 = 0

- 276 + 2329 = 2083 - 515 = 1568 + 17 = 1585 = 0

16.6528 + 8326 - 359 + 65 17.2975

Tables a = -9 e = -9 a-e = 0 b+d = 0

Obs -501.4 -503.9 = +2.5 = -1.1

O-C -500.5 -503.0 -1.1

11202

Plate Center and Constants

24

x

y

16.2950

10.2235

26.7626

29.7687

32.9982

9.6589

x 16.2950 26.7626 32.9982

y 15.8998 26.9277 33.7311

x-y + 3952 - 1621 - 9329

y 10.2235 29.7687 9.6589

y 10.5597 31.0685 9.6835

y-y - 3312 - 12998 - 296

x-y + 300x +16.7y +1.7x -12299

+3952 + 8197 = +12099 + 171 = 12270 + 23 = +12293 -1

-1621 + 13381 = 11760 + 999 = 12259 + 37 = 99 0

-9329 + 16799 = 12170 + 78 = 12248 + 96 = 99 0

23.0285 + 11519 + 278 + 32 22.9813

y-y + 300y -15.6x +3.9y -1585

-3312 + 5712 = +1800 - 259 = +1541 + 90 = +1585 = 0

-12998 + 14888 = 1886 - 917 = 1969 + 116 = 1585 = 0

-296 + 2329 = 2033 - 515 = 1568 + 17 = 1585 = 0

16.6528 + 8326 - 359 + 65 17.2975

Tables a = -9 e = -9 a-e = 0 b+d = 10
 lba -501.4 -503.9 = +2.5 = -1.1

19202

Moon's Center

25

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0) + (y - y_0)^2$	$O - C$
1	23,8959	+08679	0	0.7532	34892 +136
2	24,0000	+09720	0	0.9448	34777 +21
3	24,7753	+1,7473	0	3.0530	34807 +51
4	+24,8932	+1,8652	0	3.4790	34790 +34
5	24,8588	+1,8308	0	3.3519	34716 -40
6	24,3154	+1,2877	0	3.6574	34691 -65
7	24,0000	+09720	0	0.9448	34777 +21
8	23,0280	0,0000	0	0,0000	34778 +22

 $R = 3.4756$

y	$y - y_0$	Δy	$(y - y_0)^2$	$\angle$	
1	15,0000	-16540	-1	2,73 60	152°
2	15,0625	-15915	-0	2,53 29	149,
3	16,0000	-06540	-0	0,42 77	111°
4	16,6540	00000	0	00000	90°
5	17,0000	+03460	+0	0,11 97	79°
6	18,0000	+1,3460	+0	1,81 17	44°
7	18,2455	+1,5915	+0	2,53 29	31,
8	+18,5188	+1,8648	+1	3,47 78	0° 152°

Appar Center

 $x = 24$ y

15,0625

18,2455

33,3080

 y_0

16,6540

 y_{max}

18,5188

 R

1,8648

 x_{max}

24,8932

23,0284

 $\{x_0$ 23,0280 $\{y_0$ 16,6540 $A = 0$ $B = -1.3$

19202

Moon's Center

25

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0) / (y - y_0)$	$O - C$
1	23.8959	+0.8679	0	0.7532	3.9892 +136
2	29.0000	+0.9720	0	0.9498	3.9777 +21
3	29.7753	+1.7473	0	3.0530	3.9807 +51
4	+29.8932	+1.8652	0	3.7790	3.9790 +39
5	29.8588	+1.8308	0	3.3517	3.9716 -70
6	29.3157	+1.2879	0	3.6577	3.9691 -65
7	29.0000	+0.9720	0	0.9498	3.9777 +21
8	23.0280	0.0000	0	0.0000	3.9778 +22

 $R = 3.9756$

y	$y - y_0$	Δy	$(y - y_0)^2$	$\frac{1}{y - y_0}$		
1	15.0000	-1.6570	-1	2.7360	152	
2	15.0625	-1.5915	-0	2.5329	148.5	
3	16.0000	-0.6570	-0	0.7277	111	
4	16.6590	0.0000	0	0.0000	90	
5	17.0000	+0.3460	+0	0.1197	79	
6	18.0000	+1.3460	+0	1.8117	44	
7	18.2955	+1.5915	+0	2.5329	31.5	
8	+18.5188	+1.8698	+1	3.9778	0	152 ⁰

Approp Center

 $x = 29$ y

15.0625

18.2955

33.3080

40

16.6590

 y_{max}

18.5188

 R

1.8698

 x_{max}

29.8932

23.0289

 y_0 23.0280 y_0 16.6590 $A = 0$
 $B = +1.5$

Formation of Normals.

1 -1.44	+ 118.5-	- 224.0
2 -1.54	+ 20.5-	- 334
3 -1.14	+ 89.0	- 33.0
4 0.0	+ 63.5-	0.0
5 +0.64	- 73.0	- 15.5-
6 +1.74	- 84.0	- 87.5-
7 +1.54	+ 20.0	+ 33.5-
8 +0.0	+ 0.0	+ 41.0
+ 3.92	+ 311.5-	+ 74.5
- 4.12	- 157.0	- 393.4
- 0.20	+ 154.5	- 318.9

	a	b	c	new
	+ 8	- 2	- 9	0-0
a + 9	+ 9	- 2	- 8	+81
b + 1	+ 16	- 1	0	-33
c - 15-	+ 17	0	+ 2	+20
	+ 16	+ 0	+ 1	+19
	+ 12	+ 1	- 1 (-2)	-41, 42
	+ 9	+ 2	- 4	-47
	+ 0	+ 2	- 13	+26'
				+52

$$- 0.20 + 13.63 = +1.26 \Delta$$

+26°

$$+ [] - 0 = +0.10 \Delta$$

11202

Conditional Equations.

O-C

1	+	0.87	-	1.65	=	+	136	+	8	+	38	=	+	76	+	90
2	+	0.97	-	1.59	=	+	21	+	9	+	37	=	+	76	-	25
3	+	1.75	-	0.65	=	+	51	+	16	+	15	=	+	31	+	20
4	+	1.87		0.00	=	+	38	+	17		0	=	+	17	+	17
5	+	1.83	+	0.35	=	-	70	+	17	-	15	=	+	2	-	72
6	+	1.29	+	1.35	=	-	65	+	12	=	31	=	-	19	-	76
7	+	0.97	+	1.59	=	+	21	+	9	-	37	=	-	28	+	79
8		0.00	+	1.86	=	+	22	+	0	-	73	=	-	73	+	65

$$+16.18 - 0.20 = +15.98 + 9.55 \text{ Average } 24.4$$

$$- 0.20 + 13.63 = -318.9 + 1.26 \Delta$$

$$+ [] - 0 = +1.9$$

$$+13.63 = -317.0$$

$$+16.18 = +15.98 - 7.6 = +199.9$$

$$+ 10.099 \Delta$$

$$b = -23.2$$

$$a + 9.2$$

$$+ 0.59 \Delta$$

Arc Measured 152.0

$$\frac{P}{h} .17$$

$$\frac{EV}{h} = +16$$

$$R = 7 \quad R = 1.86$$

$$\frac{+16}{.175} = .97$$

$$\Delta R = +1.2$$

$$-2RC = -0.79$$

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

$$\Delta b = -0.07$$

$$\Delta s = -0.0$$

$$\Delta R = +1.0$$

$$\Delta a = -0.49$$

$$\Delta q = -0.02$$

1120 L

Conditional Equations

U-C

1	+10.87	- 1.65	= + 136	+ 8	+ 38	= +96 + 96
2	+ 0.97	- 12.9	= + 21	+ 9	+ 37	= +96 -25
3	+ 1.75	- 0.65	= + 51	+ 16	+ 15	= +31 + 20
4	+ 1.87	0.00	= + 39	+ 17	0	= +17 +17
5	+ 1.83	+ 0.35	= - 90	+ 17	- 15	= + 2 - 92
6	+ 1.29	+ 1.35	= - 65	+ 12	+ 31	= -19 -96
7	+ 0.97	+ 1.59	= + 21	+ 9	- 37	= -28 +99
8	0.00	+ 1.86	= + 22	+ 0	- 93	= -93 +65

$$+ 16.18 - 0.20 = +159.5$$

$$+ 241 - 113$$

$$- 0.20 + 13.63 = -318.9$$

$$+ 6.3 - 0 = +1.9$$

$$+ 13.63 = -317.0$$

$$b = -23.2$$

$$+ 16.18 = +159.5 - 9.6 = +149.9$$

$$a = +9.2$$

Arc Measured 152.0

$$\frac{P}{h} = 1.75$$

$$\frac{\Sigma V}{h} = +16$$

$$\frac{+16}{1.75} = 1843$$

$$\Delta R = +1.25$$

11202

Moon's Mean Position

27

$$\begin{array}{r} \gamma_0 \quad 23.0280'' \\ \quad \quad + 5'' \\ \hline 23.0285'' \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 16.6540'' \\ \quad \quad - 12'' \\ \hline 16.6328'' \end{array}$$

From Plate Constants.

$$\gamma \quad 22.9815''$$

$$\gamma \quad 17.2975''$$

$$\gamma \quad +0.9815''$$

$$\gamma \quad -0.7025''$$

$$\log \gamma \quad 9.99189''$$

$$\log \tan \delta \quad 9.6840''$$

$$\log \delta \quad 9.95787''$$

$$\gamma'' \quad 9.9838''$$

$$8.50727''$$

$$7.0537''$$

$$1.53029''$$

$$6.7212''$$

$$\alpha - A \quad +33.90''$$

$$\eta_1 \quad +0.0005''$$

$$A \quad \gamma \quad 56 \quad 30''$$

$$\log 409.89696''$$

$$7.33115''$$

$$\alpha_0 \quad \gamma \quad 57 \quad 03.90''$$

$$2.51581'' - 328.0''$$

$$\text{Red} \quad +3.98''$$

$$\delta - D \quad -5'' 28.0''$$

$$\alpha' \quad \gamma \quad 57 \quad 07.88''$$

$$D \quad 25'' 53 \quad 20.0''$$

$$\alpha_0 \quad 25'' 47 \quad 52.0''$$

$$\text{Red} \quad +9.2''$$

$$\delta' \quad 25'' 48 \quad 01.2''$$

11202

Moon's Mean Position

27

$$\begin{array}{r} \gamma_0 \quad 23.0280'' \\ \quad \quad + 5'' \\ \hline 23.0285'' \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 16.6590'' \\ \quad \quad - 12'' \\ \hline 16.6528'' \end{array}$$

From Plate Constants.

$$\gamma \quad 22.9815''$$

$$\gamma \quad 17.2975''$$

$$\zeta \quad +0.9815''$$

$$\eta \quad -0.7025''$$

$$\log \zeta \quad 9.99189''$$

$$\log \tan \delta \quad 9.6890''$$

$$\cos \delta \quad 9.95791''$$

$$\zeta'' \quad 9.9838''$$

$$8.50729''$$

$$7.0539''$$

$$1.53029''$$

$$6.7212''$$

$$\gamma - A \quad +33.90''$$

$$\eta_1 \quad +0.0005''$$

$$A \quad \gamma \quad 5.6 \quad 30''$$

$$\log 409.89696''$$

$$7.33115''$$

$$\gamma_0 \quad \gamma \quad 57 \quad 03.90''$$

$$2.515814'' - 328.0$$

$$Red \quad +3.98''$$

$$\delta - D \quad -5'' 28.0''$$

$$\gamma' \quad \gamma \quad 57 \quad 07.88''$$

$$D \quad 25'' 53 \quad 20.0''$$

$$\delta_0 \quad 25'' 97 \quad 5.20''$$

$$Red \quad +9.2''$$

$$\delta' \quad 25'' 98 \quad 01.2''$$

1120.2

Lunar Parallax

28

$$\begin{array}{r}
 \alpha' \quad 9 \quad 57 \quad 07.88'' \\
 \delta \quad 9 \quad 26 \quad 58.3'' \\
 9 - \alpha' \quad - \quad 30 \quad 09.58'' \\
 = \quad -7 \quad 32 \quad 23.70'' \\
 \quad \quad -2 \quad 58.17'' \\
 -7 \quad 29 \quad 25.56'' \\
 9.95727 \\
 0.00000 \\
 0.00372'' \\
 \hline
 9.96099''
 \end{array}$$

$$\delta \quad 92 \quad 25 \quad 48.5''$$

$$\delta \quad 25 \quad 48 \quad 01.2''$$

$$\delta - \delta' \quad 16 \quad 37 \quad 47.3''$$

$$\begin{array}{r}
 \log \sin 9 \quad 9.82670 \\
 8.20368'' \\
 9.95667'' \\
 0.17090'' \\
 \hline
 7.65762''
 \end{array}$$

$$\delta - \delta' \quad 15 \quad 37.7''$$

$$\delta \quad 26 \quad 03 \quad 38.9''$$

$$\text{Eph } \delta \quad 26 \quad 03 \quad 39.6''$$

$$O - C \quad -0.7''$$

$$\begin{array}{r}
 \text{Curv. Corr} \quad -0.6 \\
 \text{2nd Order Ref} \quad 0.0
 \end{array}$$

$$\text{In Corr} \quad -0.0$$

$$\delta \quad +26 \quad 03 \quad 38.9''$$

$$O - C \quad -0.7''$$

$$\pi \quad 57 \quad 56.99''$$

$$9.86913$$

$$8.20368''$$

$$9.11798''$$

$$0.04657''$$

$$7.23736''$$

$$\alpha - \alpha' \quad -5 \quad 56.28''$$

$$= \quad -23.75''$$

$$\alpha \quad 9 \quad 56 \quad 47.13''$$

$$\text{Eph } \alpha \quad 9 \quad 56 \quad 47.21''$$

$$O - C \quad +0.92''$$

$$-0.05''$$

$$-0.02''$$

$$\alpha \quad 9 \quad 56 \quad 47.11''$$

$$+0.90''$$

11202

Lunar Parallax

25

$$\begin{array}{r}
 \alpha' \quad 9 \quad 57 \quad 07.48'' \\
 \mu \quad 9 \quad 26 \quad 58.3'' \\
 \delta - \alpha' \quad - \quad 30 \quad 09.58'' \\
 = \quad -7 \quad 32 \quad 23.70'' \\
 \quad \quad -2 \quad 58.19'' \\
 -7 \quad 29 \quad 25.56'' \\
 9.95727 \\
 0.00000 \\
 0.00372 \\
 \hline
 9.96099
 \end{array}$$

$$\delta \quad 72 \quad 25'' \quad 18.5''$$

$$\delta \quad 25'' \quad 48'' \quad 01.2''$$

$$\delta - \delta \quad 16 \quad 37 \quad 47.3''$$

$$\begin{array}{r}
 \log \sin \mu \quad 9.82670 \\
 8.20368 \\
 9.95669 \\
 0.17090 \\
 \hline
 7.65762
 \end{array}$$

$$\delta - \delta' \quad 15 \quad 37.7''$$

$$\delta \quad 26 \quad 03 \quad 38.9''$$

$$\text{Eph } \delta \quad 26 \quad 03 \quad 39.6''$$

$$O-C \quad -0.7''$$

$$\begin{array}{r}
 0.6 \\
 0.0
 \end{array}$$

2nd Order Ref

$$\pi \quad 59 \quad 56.99''$$

$$9.86913$$

$$8.20368''$$

$$9.11798''$$

$$0.04657''$$

$$7.23736''$$

$$\alpha - \alpha' \quad -5'' \quad 56.28''$$

$$= \quad -23.75''$$

$$\alpha \quad 9 \quad 56 \quad 49.13''$$

$$\text{Eph } \alpha \quad 9 \quad 56 \quad 43.21''$$

$$O-C \quad +0.92''$$

$$0.3''$$

