

KG
11366
v.1840

CLXXXIX

189

13609

13611

13626

13610

Star Measures

Err. 6

	d		d		d
1	20 26 1	20 3 48	15 5 53	1 19 50	
14.9	11 40 6	19 1 77 9	15 1 52	12 3 30	
9.1	10 18	8 1 1	58 55	30	
	62	32	9.0398	9.0380	
	<u>14.8857</u>	<u>14.8834</u>			

2	19 4 39	1 38 0 2	16 8 28	14 3 68	
22.1	13 2 79	14 9 52	15 8 26 24	15 3 00	
23.1	78	52	22	30	

22.1161 22.1150 23.1004 23.0962

3	20 0 26	20 14 2	20 2 38	18 6 36	
34.0	19 0 20 17	11 1 30 32	10 7 00 98	18 4 69 66	
30.9	14	34	3 95 98	63 66	
	999	22	228	20	
	<u>34.1006</u>	<u>34.1008</u>	<u>30.9831</u>	<u>30.9830</u>	

Moon Measures

1	20 57 6	20 5 0 2	19 0 50		
27.0	11 6 70	1 6 0 0 95	17 9 50 76		
13.9	78 74	59 0 95	72 76		
-4	70	48 2	50		
	<u>13.8896</u>	<u>13.8790</u>	<u>13.8876</u>		

2	20 0 34	9 0 58			
24	10 4 78 95	18 5 90 89			
13.9	92 95	88			
	10	19 0 60			
	<u>13.9516</u>	<u>13.9530</u>			

3	19 0 12	19 5 6 2	19 5 70		
23	13 4 16 21	14 0 9 2	15 1 42 49		
14.6	26 21	7 92	56 49		
	08	47	88		
	<u>14.5588</u>	<u>14.5460</u>	<u>14.5580</u>		

13610		Star Measures		Err 6	
d	n	d	n	d	n
L	20 261	20 398	15 553	1 1950	
19.9	11 406	19 177	15 152	7 2330	
9.1	10 ⁰⁸	81	58 ⁵⁵	30	
	62	32	9.0398	9.0380	
	<u>19.8859</u>	<u>19.8839</u>			

2	19 439	1 3802	16 828	14 368	
22.1	13 279	14 952	15 826	15 330	
23.1	78	52	22	30	
	<u>221161</u>	<u>22.1150</u>	<u>23.1009</u>	<u>230962</u>	

3	20 026	20 142	20 238	18 636	
39.0	19 020	11 130	10 909	18 469	
30.9	14	34	3 9598	6866	
	999	22	228	28	
	<u>39.1006</u>	<u>39.1008</u>	<u>30.9836</u>	<u>30.9830</u>	

		Moon Measures			
1		20 576	20 502	19 050	
29.5		11 670	11 600	17 950	
13.9		78	590	7296	
-9		70	582	50	
		<u>13.8896</u>	<u>13.8790</u>	<u>13.8896</u>	

2		20 039	9058		
29		10 498	18 590	89	
13.9		92	19060		
		10	13.9516	13.9530	

3	1	19 012	19 562	19 570	
23		13 416	14 092	15 192	
19.6		2621	92	56	
		08	47	68	
		<u>14.5588</u>	<u>14.5460</u>	<u>14.5580</u>	

Wolbach Measures

2

$$\begin{array}{r}
 4 \\
 22.7 \\
 15 \\
 \hline
 18900 \\
 11948 \\
 9642 \\
 00 \\
 \hline
 22.6958
 \end{array}
 \quad
 \begin{array}{r}
 19538 \\
 1648281 \\
 79 \\
 32 \\
 \hline
 22.6945
 \end{array}$$

$$\begin{array}{r}
 5 \\
 22.6 \\
 15.9 \\
 -x \\
 \hline
 19913 \\
 15006 \\
 1611 \\
 08 \\
 \hline
 22.4900
 \end{array}
 \quad
 \begin{array}{r}
 19518 \\
 1439289 \\
 86 \\
 10 \\
 \hline
 22.4876
 \end{array}$$

$$\begin{array}{r}
 6 \\
 22.8 \\
 17 \\
 \hline
 19800 \\
 115106 \\
 0206 \\
 794 \\
 \hline
 22.8289
 \end{array}
 \quad
 \begin{array}{r}
 20494 \\
 1876260 \\
 5860 \\
 88 \\
 \hline
 22.8266
 \end{array}$$

$$\begin{array}{r}
 7 \\
 23 \\
 17.2 \\
 \hline
 18280 \\
 1609086 \\
 8286 \\
 1609 \\
 \hline
 17.2194
 \end{array}
 \quad
 \begin{array}{r}
 1678580 \\
 7480 \\
 17612 \\
 \hline
 17.2168
 \end{array}$$

$$\begin{array}{r}
 8 \\
 24 \\
 17.8 \\
 \hline
 19580 \\
 1135648 \\
 4048 \\
 86 \\
 \hline
 17.8227
 \end{array}
 \quad
 \begin{array}{r}
 19612 \\
 11341 \\
 42 \\
 00 \\
 \hline
 17.8261
 \end{array}
 \quad
 \begin{array}{r}
 20224 \\
 1845047 \\
 44 \\
 20 \\
 \hline
 17.8229
 \end{array}$$

13610

Times etc

Date Sept 25 '17

4p. to Stars	20	52		21	07
" " Moon	20	57	36.4	20	57 36.7
clock slow		0	42.9		

4 sid. time	20	58	19 45	8.5 = +1 ^m	18.5
" long	4	44	31.05		
1 sid. J.	25	42	50.50		
sid. J. M. Moon	12	19	55.94		
	13	27	54.56		
		2	12.36		
	13	25	42.20		

R. a

Dec

19 48	40.37	-19 26	27.0
	24.228		
25.7033	1 02.27	+4	100.7
19 49	42.64	-19 22	26.3

Moon's

Age 10 days

Parallax	59	23.19"
Semi-d	16	12.7"
R		97.27
Aug		7.7
Dr		-0.9
R		97.94
R		
all		
(1/2) R		
R		

939 = 6.8

a =

+2.7

Moon Measures.

2

<u>4</u>	18900	19538
22.7	11948	16982.81
15	3642	79
	00	32
	<u>22.6958</u>	<u>22.6945</u>

<u>5</u>	19913	19518
22.6	15006	17392.89
15.9	1611	86
-1	08	10
	<u>22.4900</u>	<u>22.4876</u>

<u>6</u>	19800	20494
22.8	11510	18762.60
17	0206	58
	794	88
	<u>22.8289</u>	<u>22.8266</u>

<u>7</u>		18280	
23		16090.86	16785.80
17.2		82	19
		1609	19612
		<u>17.2199</u>	<u>17.2168</u>

<u>8</u>	19580	19612	20228
29	11356.48	11391	18780.49
17.8	30	42	48
	86	00	20
	<u>17.8227</u>	<u>17.8261</u>	<u>17.8223</u>

for 13610 times of 13609 times etc.
 Date Sept. 25 '17

13609

Exp. to Stars	20	52		✓ 21	07	
" " Moon	20	57	36.7	20	57	36.7 ✓
Clock slow		0	42.9	✓		

H. Sid. Time	20	58	19.45 ^v	$\theta - \gamma = +1^{\circ} 08^m 5$
H. Long	4	44	31.05 ^v	
G. Sid. T.	25	42	50.50 ^v	
Bid. T. M. Noon	12	14	55.97 ^v	
Interval	13	24	54.56 ^v	
Reduction		2	12.36 ^v	
g.m.t.	13	25	42.20 ^v	

From Naut alms.	R.A.		Loc.
Moon 13 ^h	19	48	40.37 ^v - 19 26 27.0 ^v
Motion in 1 ^m			2.7228
" " 23.7032	1	02.27	+4 00.7
Tabular Place	19	49	41.64 ^v - 19 22 26.3 ^v

Moon's

Age 10 days

Parallax	59' 23.18 ^v
Semid	16 12.7 ^v
R	97.27 ^v
Aug	7.7 ^v
Dr 6	-0.7 ^v
R	979.4 ^v
R	2,099.5 ^v
all	-1006
(1+a)/R	1.9989
R -	3.9956

$$937 = 6.8 +$$

$$a = -503.0$$

$$+24.0$$

$$-479.0$$

(13610) for plat. Times Etc

Date Sept 13 1909

Ept to stars	21	07		21	19
" " Moon	21	13	-11.5"	21	13 " 11.8"
clock slow		0	42.9"		

H Sid Time	21	13	54.55"	$\delta - \gamma = +1^h$	23.5
H Long	4	44	31.05"		
g Sid. T.	25	58	25.60"		
Sid T. M.M.	12	14	55.94"		
Parallax	13	43	29.66"		
Reduction		2	14.91"		
g. M. T.	13	41	14.75"		

From Nant alin.		H. A.		Dec.	
Moon 13"	19	48	40.37	-19	26 27.0
Motion in 1"			2.4225		+ 9.380
" " 41.245-8"		1	39.92		+ 6 26.9
Saturn Place	19	50	20.29	-19	20 00.1
			24.20		1 33

Moon Age 10 days

Parallax	59	23.62
Semid	16	12.6
R		972.6
Aug		7.2
Dr		-0.4
R		979.4
R		2099.3
AR		-10.06
(1+g)R		19989
R		39956

934 6.6 +

a = -5030

+27

479.

Plate 13610 is numbered wrong and
should have the "times" of No 13609
see previous page.

13610	Times	Etc	
Date Sept 25			
Eggs to Stars	21	07	21 19
" " Moon	21	13	11.5 21 13 " 11.8
Clock down		0	92.9
1+ Sid Time	21	13	54.55 8-7 = +1 ^h 23.5
1+ Long	7	47	31.05
9 Sid T	25	58	25.60
Sid T. M. II	12	17	55.97
Interval	13	73	29.66
Reduction		2	19.91
9 M T	13	71	19.75

from Nant alms	R. A.	Dec.	
" Moon 13"	19	48	90.37 -19 26 27.0
" Motion in 1"			2.9225 + 9.380
" " 41.2958"	1		39.92 + 6 26.9
Tabular Place	19	50	20.29 -19 20 00.1

Moon Age 10 days

Parallax	59	23.62
Semid	16	12.6
R		972.6
Aug		7.2
Tr		-0.7
R.		979.8
R		2.0995
alt		-10.06
(1+9)/R		1.9989
R		3.9956

937 6.6

a = -5030

+27

479.

Plate 13610 is numbered wrong and should have the "Times of No 13609 see previous page.

136⁰⁹

Plate Center & Plate Constants

4

X	Y	X	Y
14.8844	9.0389		
22.1155	23.0983	19.47	22.6 - 19.15 27
34.1007	30.9830		
		-0.040	-41 38.2
2.2	18	19.47	18.6 - 19.57 00.2
-11.55	-5.0983		
34.57	7.90		

Center (A) 19.47 18.0
 (D) -19.57 00.0

$$\begin{aligned}
 X-Y &+ 500X & + 68.34 & + 3.0X & - 12355 \\
 + 4256 & + 7442 & + 11728 & + 581 & = + 12309 + 75 = + 12354 \\
 - 253 & + 11658 & - 10865 & + 1485 & = 12290 + 66 = 12356 \\
 - 6790 & + 17050 & - 10360 & + 1992 & = 12252 + 102 = 12354 \\
 24.4885 & + 12247 & + 1021 & + 73 & = 24.5868
 \end{aligned}$$

$$\begin{aligned}
 Y-Y &+ 500Y & - 585X & + 149Y & - 8008 \\
 + 4252 & + 4519 & = + 8771 - 841 & + 7900 + 108 & = + 8008 \\
 - 2522 & + 11549 & = 9027 - 1297 & = 7735 - 275 & = + 8008 \\
 - 5858 & + 15491 & = 9633 - 1995 & = 7638 - 362 & = + 8007 \\
 15.8866 & + 7973 & - 1433 & + 189 & = 15.7557
 \end{aligned}$$

$a = -12 \quad e = -11.2 \quad a-e = +11.0 \quad b+d = -8$
 $b = -503.0 \quad = -511.9 \quad = +8.9 \quad = -5.8$
 $-502.8 \quad -500.7 \quad -2.1 \quad +2.2$

+5

13610 Plate Center & Plate Constants

x	y	x	y
19.8849	9.0389		
22.1155	23.0983	19 47	22.6 -19 15 29
39.1007	30.9830		
		-0.0	0.0 - 41 38.2
22	18	19 47	18.6 -19 57 0.2
-11.55	-5.0983		
39.7	490"		

Center { A 19 47 18.0
D -19 57 00.0

3.0X	-12355
95	5
66	6
102	7
+73	24.5868

$$24.9885 + 12299 + 1021$$

$$5X + 1697 - 8008$$

$$871 = +7900 + 108 = +8008 \quad 0$$

$$1298 = 7733 + 275 = +8008 \quad 0$$

$$1995 = 7638 + 367 = +8007 \quad -1$$

$$15.8866 + 7983 - 1933 + 189 = 15.7557$$

Tables a = -1.2 e = -11.2 a-e = +11.0 b+d = -6
 Ubs = -503.6 = -511.9 = +8.9 = -5.8

+8

S_0 m_0 ΔS -11.25 $+4\eta$ -19

-7.54 -9.36 -28 $+84 = +56 - 37 = +19$
 $+0.14$ $+5.35$ $+0$ $-2 = -2 + 21 = +19$
 $+12.77$ $+13.62$ $+108$ $-143 = -35 + 54 = +19$

$m + 2.59$ -2.24 -29 $-9 = -57$
 $= -0.19$

$\Delta\eta$ $+2.3\eta$ -985 -17
 -35 $-22 = -57$ $+74 = +17$
 $+5$ $+12 = +17$ $-1 = +16$
 $+112$ $+31 = +143$ $-125 = +18$
 -5 $-25 = -47$
 $= -2.3$

13610

Standard Coordinates

5-

Cape W-2733-mg 6.8 Cape W-2744-mg 6.0 Cape W-2757-mg 8.3

C 19 42 06.34 19 46 23.29 19 53 17.22

L 6.38 23.87 17.27

E 19 02.9 6.40 19 01.5 23.36 17.28

Mean 19 42 06.37 19 46 23.33 19 53 17.25

Rise +1 00.12 +59.31 58.80

L 19 43 06.49 19 47 22.67 19 54 16.05

A 19 47 18.0 19 47 18.0 19 47 18.0

A-A -4 11.51 +4.67 +6 58.05

Sun (A-A) -25 1.50 +4.67 +4 17.99

log 2.90 057 0.66 65.2 2.62 117

log 9.96 968 9.97 499 9.97 775

log 0.87 446 9.17 875 1.10 616

30 -75 41.5 +0.14 08 +12.76 91

31 -27 0 +10 8

3 14.75 58 22.17 08 34.77 97

1 17.88 44 22.11 55 34.10 07

X-3 +4.28 6 -25.3 -6.79 0

C -21 12 14.1 -19 17 56.4 -18 13 45.8

L 14.3 56.4 45.3

E 13.2 57.1 47.2

Mean -21 12 13.9 -19 17 56.6 -18 13 46.1

Rise +2 27.5 +2 32.5 +2 42.3

C -21 9 46.4 -19 15 24.1 -18 11 03.8

D -19 57 00.0 -19 57 00.0 -19 57 00.0

A-D -1 12 46.4 +4.1 35.9 +1 45 56.2

Sun-D -4 36.7 +2.49 6.0 +6.3 58.2

log 3.64 019 3.39 724 3.80 333

log 0.97 134 0.72 839 1.13 448

log 9.58 778 9.54 333 9.51 654

log 1.75 49 8.29 75 2.21 23

log 8.39 61 4.89 72 8.78 22

30 -9.36 14 +5.35 05 +13.62 94

31 -0.02 49 20.00 00 20.00 60

3 8.61 34 +23.35 05 31.36 88

1 9.03 89 23.09 83 30.98 30

X-11 +4.25 2 -25.22 -5.85 8

13610

Standard Coordinates

5"

Cape No 2733-mg 6.8 Cape No 2779-mg 6.0 Cape No 2757-mg 8.1

C	19 42	06.34	19 46	23.29	19 53	17.22
L		6.38		23.34	"	17.24
E	19 02.9	6.40	19 01.2	23.36		17.28
Mean	19 42	06.37	19 46	23.33	19 53	17.25
Prec	+1	60.12		+59.31		58.80
L	19 43	06.49	19 47	22.69	19 54	16.05
A	19 47	18.0	19 47	18.0	19 47	18.0
L-A	-4	11.51		+4.64	+6	58.05
Sum (L-A)		-250.50		+4.64		+417.99
log	2.90	059	0.66	652	2.62	517
" log	9.96	968	9.97	999	9.97	775
" log	0.87	546	9.18	875	1.10	616
30	-45	415	+0	1908	+12	7691
31	-27		0		+1	106
3	19 45	58	22	19 08	39	7797
4	19 48	44	22	11 55	39	1007
X-3	+32	86	-	253	-	6790

C	-21	12	19.1	-19	17	56.4	-18	13	45.8
L			14.3			56.4			45.3
E			13.2			57.1			47.2
Mean	-21	12	13.9	-19	17	56.6	-18	13	46.1
Prec	+2		27.5	+2		32.5	+2		42.3
L	-21	9	46.4	-19	15	24.1	-18	11	03.8
D	-19	57	00.0	-19	57	00.0	-19	57	00.0
L-D	-1	12	46.4	+4	1	35.9	+1		45.56.2
Sum L-D			-4367.4			+2496.0			+6358.2
log	3.69	019	3.39	724	3.80	333			
" log	0.97	134	0.72	839	1.13	448			
log L-D	9.5	878	9.5	433	9.5	165			
" 30	1.75	498	8.29	735	2.27	223			
" 1	8.39	614	4.89	722	8.78	222			
h0	-9.36	14	+8.35	03	+13.6	294			
h1	-0.02	49	26	0000	26	0006			
M	8.61	34	+23.35	05	31.5	688			
H	9.03	89	23	09.83	30.9	830			
L-H	+4.25	22	-25	22	-	5888			

136^{0.8}

Moon's Center

6

	x	$x-x_0$	Δx	$(x-x_0)^2$	$(x-x_0)(y-y_0)$	$O-C$
1	24.8880	0.0000	-14	0.0000	4.0024	+6.8
2	24.0000	-0.8880	-13	0.2394	3.9944	-1.2
3	23.0000	-1.8880	-9	2.2168	9.9884	-7.2
4	22.6951	-1.7929	-6	3.2166	4.0069	+1.3
5	22.4888	-1.7992	0	3.9968	3.9968	+1.2
6	22.8278	-1.6602	+8	2.7536	2.9928	-2.8
7	23.0000	-1.4880	+9	2.2115	3.9834	-1.22
8	24.0000	-0.4880	+13	0.2369	3.9873	-8.3

 $\bar{x} = 3.9956$ (Plate 13610)

	y	$y-y_0$	Δy	$(y-y_0)^2$	L	$\checkmark$
1	13.8896	-1.9984	-22	4.0024	180	
2	13.9523	-1.9357	-21	3.7550	194	
3	14.5584	-1.3296	-14	1.7716	228	
4	15.0000	-0.8880	-10	0.7903	244	
5	15.8880	0.0000	0	0.0000	270	
6	17.0000	+1.1120	+12	1.2392	304	
7	17.2181	+1.3301	+14	1.7729	312	
8	17.8225	+1.9345	+21	3.7504	346	166

 $\bar{x} = 23$ $y = 14.5584$ $\bar{x} = 24$ $y = 13.9523$

17.2181

17.8225

3.17765

3.17748

 y_0 15.8882

15.8878

 $\bar{y}_{min}$ 13.8896

1.9986

 $\bar{x}_{min}$ 22.4888

24.4874

{ x_0 24.8880{ y_0 15.8880 $A = +6.8$ $B = +10.8$

13610

Moon's Center

6

	x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	$O - C$
1	24.9880	0.0000	-14	0.0000	4.0024	+68
2	24.0000	-0.9880	-13	0.2394	3.9944	-12
3	23.0000	-1.9880	-9	2.2168	3.9884	-72
4	22.6951	-1.7929	-6	3.2166	4.0069	+113
5	22.9888	-1.7992	0	3.9968	3.9968	+12
6	22.8278	-1.6602	+8	2.7536	3.9928	-28
7	23.0000	-1.9880	+9	2.2115	3.9834	-122
8	24.0000	-0.9880	+13	0.2369	3.9873	-83

 $R = 3.9956$

	y	$y - y_0$	Δy	$(y - y_0)^2$	L
1	-13.8896	-1.9984	-22	4.0029	180
2	13.9523	-1.9357	-21	3.7550	194
3	14.5584	-1.3296	-19	1.7716	228
4	15.0000	-0.8880	-10	0.7903	294
5	15.8880	0.0000	0	0.0000	270
6	17.0000	+1.1120	+12	1.2392	304
7	17.2181	+1.3301	+14	1.7729	312
8	17.8225	+1.9345	+21	3.7504	396

$x = 23$ $y = 14.5584$ $x = 24$ $y = 13.9523$
 17.2181
 317765
 15.8882
 y_0 15.8882
 y_{min} 13.8896
 1.9986
 x_{min} 22.9888
 24.9879

$\left\{ \begin{array}{l} x_0 = 22.9880 \\ y_0 = 15.8880 \end{array} \right.$

 $A = +6.8$ $B = +10.8$

Formation of Normal

1	0.0	-	0	-	136.0
2	+0.95	+	60	+	23.5
3	+1.98	+	107.3	+	96.0
4	+15.9	-	202.0	-	101.0
5	+00.0	-	24.0	-	00
6	-18.4	+	46.5	-	31.0
7	-1.98	+	18.20	-	16.20
8	-0.95	+	40.6	-	160.5
	+4.52	+	382.6	+	419.5
	-4.77	-	226.0	-	590.5
	-0.25	+	156.6	-	471.0

13472

Conditional Equations

7

0-c

1	0.00	-200	= +68	0	+	55	=	+55	+13
2	0.49	-194	= -12	-5	+	53	=	+48	-60
3	1.79	-133	= -72	-15	+	37	=	+22	-94
4	1.79	-089	= +113	-18	+	25	=	+7	+106
5	2.00	0.00	= +12	-20		0	=	-20	+32
6	1.66	+1.11	= -28	-17	-	30	=	-47	+19
7	1.79	+1.33	= -122	-15	-	37	=	-52	-70
8	0.49	+1.93	= -83	-5	-	53	=	-58	-25

$$14.87 - 0.25 = +156.6$$

+170

-249

$$-0.25 + 17.08 = -771.0$$

$$+5.7 - 0 = +2.6$$

$$+17.08 = -768.7$$

$$b = -27.5$$

$$14.87 = +156.6 - 6.9 = +149.7$$

$$a = +10.1$$

arc 166

$$\frac{P}{m} = 26^v$$

$$\frac{\sum V}{m} = -10^v$$

$$\frac{-10}{26} = -38.6^v$$

$$\Delta R = -0.5^v$$

13610

Conditional Equations

7

O.C

1	0.00	-200	= +68	0	+ 35	= +55	+13
2	0.49	-194	= -12	-5	+ 33	= 748	-60
3	1.49	-133	= -72	-12	+ 37	= +22	-94
4	1.19	-089	= +113	-18	+ 25	= +7	+106
5	2.00	000	= +12	-20	0	= -20	+32
6	1.66	+1.11	= -28	-17	- 30	= -97	+19
7	1.49	+1.33	= -122	-15	- 37	= -52	-80
8	0.49	+1.93	= -83	-5	- 33	= -58	-25

$$19.87 - 0.25 = +156.6$$

$$-0.25 + 17.08 = -871.0$$

$$+67 - 0 = +2.6$$

$$+17.08 = -968.9$$

$$b = -27.5$$

$$19.87 = +156.6 - 6.9 = +149.7$$

$$a = +10.1$$

ave 1.66

$$\frac{P}{m} = 2.6$$

$$\frac{\Sigma V}{m} = -1.0$$

$$\frac{-10}{1.26} = -3.86$$

$$\Delta R = -0.5$$

136 10

Mott's Mean Position

8

 X_0 24.4880 Y_0 15.8880

+5"

-17"

24.4885"

15.8866"

From Plate Constants

 X 24.5868" Y 15.77557" Z +2.5868" W -2.2443"

20 29

log γ 0.41277"log $\tan \delta$ 9.5665"" $\log$ 2997232" γ 0.8255"

8.50724"

 γ 7.0534"

1.93321"

7.4454"

 $d-A$

83.75"

 η_1 -0.0028" η_0 -2.2415" A 19 47 18.00"log η_0 0.35054"

7.33115"

 Δ_0 19 48 43.75"3.01937" F -10x5.7"

Red

+7.33"

 $S-D$

-14 25.7"

 γ 19 48 48.08" D -19 57 00.0" Δ_0 -20 14 23.4"

Red +10.1"

 Δ' -20 14 15.6"

136 10

Moons Mean Position

8

 λ_0 24.4880

+5"

24.4885"

 γ_0 15.8880

-17"

15.8866

From Plate Constants

 λ 24.5868 γ 15.7557 z +2.5868 h -2.2443

20 17

 $\log \gamma$ 0.41277 $\log \tan \delta$ 9.5665ⁿ" $\cos \delta$ 997.232 z -0.8253ⁿ

8.50729

 γ 7.0539

1.93321

7.9454

 $\delta - A$

85.76"

 h_1 -0.0024 h_0 2.2415 A 19 47 18.00" $\log h_0$ 0.35054ⁿ

7.33115

 γ_0 19 48 43.75"3.01939ⁿ -1095.7

Red

+9.33"

 $\delta - D$

-17 25.7

 γ' 19 48 48.04" D -19 57 00.0 δ_0 -20 17 25.7

Red +10.1"

 δ' -20 17 15.6

$$\begin{array}{r}
 19 \quad 41 \quad 35.31 \\
 31.29 \\
 + 7.22 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -19 \quad 57 \quad 32.17 \\
 57 \quad 41.56 \\
 + 9.39 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19 \quad 48 \quad 18.45 \\
 18.72 \\
 + 3.73 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 +0 \quad 77 \quad 47.00 \\
 30.35 \\
 + 16.65 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19 \quad 57 \quad 37.96 \\
 33.41 \\
 + 4.55 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -27 \quad 56 \quad 21.20 \\
 29.67 \\
 + 8.47 \\
 \hline
 \end{array}$$

+5

.2

0

-5

-10

-15

$$\begin{array}{r}
 4.30 \\
 3.90 \\
 \hline
 \end{array}$$

-20

$$\begin{array}{r}
 4.38 \\
 3.92 \\
 \hline
 \end{array}$$

-25

-300

60

50

40 196

13610

Reduction to Apparent Place

9

$$= 24^{\circ} 31.5'$$

Sept 25 1917

277

$$H+S \quad 1 \quad 38.1$$

$$S \quad -20 \quad 17.4$$

$$H \quad 5 \quad 49.7$$

$$K \quad 19 \quad 48.7$$

$$G \quad 23 \quad 43.0$$

$$G+K \quad 19 \quad 31.7$$

$$= 292^{\circ} 55.5'$$

$$\log \cos \delta \quad 9.9723$$

$$\log \sin \delta \quad 9.9105$$

$$\log \tan \delta \quad 0.8828$$

$$\log \cos(G+K) \quad 9.5965$$

$$q \quad 1.3333$$

$$\sin \quad 9.9643n$$

$$\tan \delta \quad 9.5667n$$

$$8.8239$$

$$\log \sin \delta \quad 9.5390n$$

$$\log(G+K) \quad 9.9589$$

$$\log \sin \quad 1.2737$$

$$\log \sin \quad 9.16181$$

$$\log \sin \quad 0.0277$$

$$8.8239$$

$$\log q' \quad 0.9238$$

$$\log \quad 9.6882$$

$$\log L' \quad 0.7716n$$

$$\log L \quad 9.7434$$

$$f \quad +3.287$$

$$g \quad +0.488$$

$$h \quad +0.553$$

$$+4.328$$

$$g' \quad +8.391-$$

$$h' \quad -5.910$$

$$i \quad +7.635$$

$$+10.116$$

13610

Reduction to Apparent Place

9

$$= 240^{\circ} 31'.5$$

Sept 25 1917 21h

$$H+K \quad 1 \quad 38.1$$

$$\delta \quad -20 \quad 14.4$$

$$H \quad 5 \quad 49.7$$

$$L \quad 19 \quad 48.7$$

$$C \quad 23 \quad 43.0$$

$$G+K \quad 19 \quad 31.7$$

$$= 292^{\circ} 55'.5$$

$$\log \cos \delta \quad 9.9723$$

$$+ 0.9105$$

$$(a) \quad 0.8828$$

$$\log \cos(G+K) \quad 9.5965$$

$$q \quad 1.3333$$

$$\sin \quad 99.643h$$

$$\tan \delta \quad 9.5667h$$

$$8.8239$$

$$\log \sin \delta \quad 9.5390h$$

$$\cos(H+K) \quad 9.9589$$

$$h \quad 1.2737$$

$$\sin \quad 9.6181$$

$$\sec \delta \quad 0.0277$$

$$8.8239$$

$$\log q' \quad 0.9238$$

$$q \quad 9.6882$$

$$\log h' \quad 0.7716h$$

$$h \quad 9.7434$$

$$f \quad +3.287$$

$$q \quad +0.988$$

$$h \quad +0.553$$

$$+4.328$$

$$q' \quad +8.391$$

$$h' \quad -5.910$$

$$r \quad +7.635$$

$$+10.116$$

09
13609 *Lucina Paratellus*

16

δ	19	48	48.08 ^v	π	5.9	23.14 ^v
α	20	58	19.73 ^v			
$\delta - \alpha$	+1	09	31.37 ^v		9.86913 ^v	
γ	+17	22	50.55 ^v		8.23739 ^v	
$\gamma(1-11)$	6		27.37 ^v		9.47526 ^v	
δ	+17	16	23.71 ^v		002532 ^v	
					7.60710	

9.95727^v
 0.00000^v
 0.02004^v
 9.97731^v

$\delta - \alpha$ +13 54.69^v
 = +0 53.65^v

δ 43 30 14.7^v
 δ -20 17 15.6^v
 $\gamma - \delta$ 63 47 30.0

9.82640^v
 8.23739^v
 9.95270^v
 0.16217^v
 8.17866^v

$\delta - \delta'$ +51 52.9^v

δ	-19	22	23.2 ^v	α	19	49	43.73 ^v
$\gamma - \delta$	-19	22	26.3 ^v	$\gamma - \alpha$	19	49	72.67 ^v
$\delta - \alpha$			+3.1 ^v	$\delta - \alpha$			+1.09 ^v

curr. - - 1.9^v
 2nd Clad. Ref. + 0.2
 $\delta - \alpha$ -19 22 24.9
 $\delta - \alpha$ +1.4

curr. - 0.16^v
 α 19 49 43.57
 $\delta - \alpha$ +0.93

This plate has been interchanged with 13609
 so that the stars of 13609 should be used.

13610 Lunar Parallax

χ 19 48 48.08"
 ψ 20 58 19.43"
 $\chi - \psi + 1$ 09 31.34"
 $= + 17$ 22 50.55"
 $\chi (1-1)$ 6 27.39"
 $\psi + 17$ 16 23.71"

π 59 23.67"
 9.86913 "
 8.23739 "
 9.97595 "
 0.02532 "
 7.60710 "

9.95727 "
 0.00000 "
 0.02009 "
 9.97731 "

$\chi - \psi + 18$ 58.69"
 $= + 0$ 50.63"

χ 43 30 19.9"
 ψ -20 18 15.6"
 $\chi - \psi$ 63 47 30.0"

9.82690 "
 8.23739 "
 9.95270 "
 0.16217 "
 8.17866 "

$\psi - \psi$ + 51 52.9

ψ -19 22 23.2

Eph ψ -19 22 26.8"

O-C + 3.4"

Curr. - 1.9
 2nd Clid. Ry. + 0.2
 ψ -19 22 24.9
 O-C + 1.4

χ 19 49 43.73"

Eph χ 19 49 42.67"

O-C + 1.09"

Curr. - 0.16

χ 19 49 43.57
 O-C + 0.93

This plate has been interchanged with 13609 so that 13609 should be used.

13611		Star Measures		926		11	
L	d	x	r	L	d	x	r
13.4	20373		19690	20792		20270	
5.4	15757	58	14317	17179	77	13870	
	59		16		75	7879	
	78		08		88	82	
	<u>13.4617</u>		<u>13.4617</u>	<u>8.3613</u>		<u>8.3601</u>	
2	20218		19967	19932		20682	
20.7	13566		16640	15658	55	14952	
22.5	6465		40	52		52	
	36		82	42		96	
	<u>20.6664</u>		<u>20.6667</u>	<u>22.7281</u>		<u>22.4263</u>	
3	20691		18964	19986		19930	
32.6	14340	45	15318	16704	701	13196	
30.4	5045		1617	698		20098	
	710		62	96		20	
	<u>32.6357</u>		<u>32.6355</u>	<u>30.3288</u>		<u>30.3275</u>	

Moon Measures

L		28848	17064
24.3		15168	15737
13.9		68	2732
-4		13848	
		<u>13.8650</u>	<u>19.8668</u>
3			
24		14629	18320
13.9		24	17518
		13840	26
		<u>13.9211</u>	<u>13.9182</u>
3			
23		20332	19032
14.6		15350	14648
		53	36
		42	48
		<u>14.4986</u>	<u>14.5002</u>

13611		Star Measures		2026	
L	d	L	d	L	d
13.4	20373	19690	20792	20270	
8.4	15757	14317	17179	13870	
	5958	16	7577	7879	
	78	08	88	92	
	<u>13.4617</u>	<u>13.4617</u>	<u>8.3613</u>	<u>8.3601</u>	
2	20218	19967	19932	20682	
20.7	13566	16640	15658	14952	
22.5	6465	40	5255	52	
	36	82	42	96	
	<u>20.6664</u>	<u>20.6667</u>	<u>22.7281</u>	<u>22.7263</u>	
3	20691	18969	19986	19930	
32.6	14340	15318	16709	13196	
30.4	5045	1617	698	20098	
	710	62	96	20	
	<u>32.6357</u>	<u>32.6355</u>	<u>30.3288</u>	<u>30.3275</u>	

Moon Measures

L	d	L	d	L	d
29.3	23888	17069			
13.9	15168	15737			
-4	68	27			
	<u>13.818</u>	<u>13.8668</u>			
	<u>13.8650</u>				
2	14629	18370			
24	29	17548			
13.9	13840	26			
	<u>13.9211</u>	<u>13.9152</u>			
3	20332	19632			
23	15350	14678			
19.6	53	36			
	42	48			
	<u>14.9986</u>	<u>14.5002</u>			

13611

Moon Measures

12

$$\begin{array}{r}
 4 \quad 20362 \quad 20110 \\
 22.6 \quad 13900 \quad 16583 \\
 15 \quad 1005 \quad 8986 \\
 \quad 84 \quad 24 \\
 \hline
 22.6470 \quad 22.6470
 \end{array}$$

$$\begin{array}{r}
 5 \quad 19382 \quad 20098 \\
 22.5 \quad 1488680 \quad 14600 \\
 16.1 \quad 7480 \quad 592596 \\
 -X \quad 99 \quad 110 \\
 \hline
 22.4510 \quad 22.4492
 \end{array}$$

$$\begin{array}{r}
 6 \quad 20408 \quad 20070 \\
 22.7 \quad 12390396 \quad 1810299 \\
 17 \quad 702 \quad 9699 \\
 \quad 26 \quad 88 \\
 \hline
 22.8026 \quad 22.8026
 \end{array}$$

$$\begin{array}{r}
 7 \quad 20493 \quad 19380 \\
 23 \quad 1809289 \quad 1176067 \\
 17.2 \quad 8689 \quad 68 \\
 \quad 510 \quad 80 \\
 \hline
 17.2408 \quad 17.2389
 \end{array}$$

$$\begin{array}{r}
 8 \quad 19940 \quad 19370 \quad 20060 \quad 20402 \\
 22.8 \quad 1353843 \quad 1576163 \quad 1318075 \quad 17282 \\
 17.7 \quad 4843 \quad 6363 \quad 7075 \quad 82 \\
 \quad 56 \quad 82 \quad 76 \quad 10 \\
 \hline
 23.6408 \quad 23.6388 \quad 17.6896 \quad 17.6878
 \end{array}$$

13611

Moon Measures

12

<u>4</u>	20362	20110
22.6	1390005	16583
15	1005	8986
	98	24
	<u>22.6970</u>	<u>22.6970</u>

<u>3</u>	19382	20098
22.5	1988680	19600
16.1	7480	592596
-X	99	110
	<u>22.9510</u>	<u>22.9492</u>

<u>6</u>	20908	20070
22.7	12390396	1810299
17	402	9699
	26	88
	<u>22.8026</u>	<u>22.8026</u>

<u>7</u>		20493	19380
23		1809289	1186064
17.2		86	68
		510	80
		<u>17.2408</u>	<u>17.2389</u>

<u>8</u>	19990	19370	20060	20402
23.8	1353843	1576163	13180	17282
17.7	48	65	7075	82
	56	82	76	10
	<u>23.6408</u>	<u>23.6388</u>	<u>17.6896</u>	<u>17.6878</u>

13611 *Venus* Etc.

13

Sept 25 '17 ✓

Exp. to Stars	21	21	✓	21	33
11.11 Noon	21	26	40.9	21	26 71.3
clock slow		0	72.9		

14. Sid Time	21	27	24.0	✓	4-4-+1 ^h	37 ^m
H. Long	4	44	31.05	✓		
9. Sid T.	26	11	55.05	✓		
Sid T. M. Noon	12	17	55.98	✓		
Interval	13	56	59.11	✓		
Reduction		2	17.12	✓		
9. M. T.	13	54	41.99	✓		

From Naut. Alm.	19	48	40.37	✓	-19	26	27.0
Mean			24223				9.395
Michon m ¹ m		2	12.50				
" 57.6998						8	33.9
Tabular Place	19	50	52.84	✓	-19	17	53.1 (0)

M. 10 days ✓

Parallax	59	24.06
Sun. id.	16	12.7
R		972.7
Aug		7.1
R ₁ 6		-0.4
R		979.4
R		2.0995
alt		-1010
(1+2) R		19985
R		39970

$$9.39 = 6.5$$

$$\begin{array}{r} a - 5052 \\ + 28 \\ \hline - 4812 \end{array}$$

13611 Times Etc.

13

Sept 25 '17

Exp. to Stars	21	21		21	33
" 1100m	21	26	40.9	21	26 91.3
Clock phase		0	92.9		

H. Sid Time	21	27	29.0	$\delta - \gamma = +1^h$	37 ^m -
H. Long	9	99	31.05		
g. Sid T	26	11	55.05		
Sid T 1100m	12	19	55.99		
Interval	13	56	59.11		
Reduction		2	17.12		
g. M. T	13	54	41.99		

From Naut. Alm.	19	48	40.37	-19	26	27.0
Moon			24223"			9.395
Moon m/m		2	12.50			
" " 59.6998					8	53.9
Jupiter Phase	19	50	52.87	-19	19	53.1

Moon's Age 10 days

Parallax	59	27.0
Sund.	16	12.7
R		972.1
Aug		7.1
Err		-0.9
R		979.9
R		2.0993
at R		-1810
(1+at)R		1.9935
R ₂		3.9970

$$9.39 = 6.5$$

$$\begin{array}{r} a - 50.572 \\ + 29 \\ \hline - 481.2 \end{array}$$

13611

Plate constants

14

x	13.7617	20.6666	32.6356
y	14.4558	22.1408	34.7797
x-y	-9971	-17742	-21741

u	8.3607	22.9272	30.3281
v	8.6137	23.3505	31.5688
u-v	-2530	-9233	-12407

$$\begin{aligned}
 & \quad \quad \quad + 82.67 \quad \quad \quad + 5.2x \quad \quad \quad + 2779 \\
 & -9971 + 6731 = -3240 + 691 = -2549 + 70 = -2479 \quad 0 \\
 & -17742 + 10303 = -7409 + 1853 = -5556 + 107 = -5449 \quad 0 \\
 & -21741 + 16318 = -5423 + 2505 = -2918 + 170 = -2748 \quad +1 \\
 & 27.7798 + 12223 = 15002.7798 \quad + 1310 = 16312.7798 \quad + 127 = 16440.7798
 \end{aligned}$$

$$\begin{aligned}
 & \quad \quad \quad - 77.3x \quad \quad \quad + 17.77y \quad \quad \quad - 770 \\
 & -2530 + 7180 = +4650 - 1000 = +3650 + 120 = +3770 \quad 0 \\
 & -9233 + 11217 = +1984 - 1535 = +449 + 326 = 775 \quad +2 \\
 & -12407 + 15167 = +2760 - 2425 = +335 + 937 = 1272 \quad -1 \\
 & 15.8675 + 7932 = 9518.75 \quad - 1817 = 7701.75 \quad + 228 = 7929.75 \quad 16.4218
 \end{aligned}$$

$$\begin{aligned}
 & \text{Tables} \quad a = -0.7 \quad e = -11.0 \quad a-e = +10.3 \quad b+d = -9 \\
 & \text{Obs} \quad = -505.2 \quad = -517.7 \quad = +9.2 \quad = -8.3 \\
 & \quad \quad -504.5 \quad -503.4 \quad - \quad 1.1 \quad +0.7
 \end{aligned}$$

+1.9

13611

Plate Constants

19

x	13.7617	20.6666	32.6356
y	14.7558	22.1908	39.7797
$x-y$	-9971	-18772	-21791

u	8.3607	22.9272	30.3281
v	8.6137	23.3505	31.5688
$u-v$	-2530	-9233	-12907

$$\begin{array}{rcll}
 x-y & +82.6y & +5.2x & +2999 \\
 -9971 + 6731 & = -3210 + 691 & = -2519 + 70 & = -2949 \\
 -18772 + 103.33 & = -9909 + 1853 & = -2556 + 107 & = -2949 \\
 -21791 + 16318 & = -5123 + 2500 & = -2618 + 170 & = -2948 \\
 29.7998 + 12223 & & +1310 & +127 \quad 26.0609
 \end{array}$$

$$\begin{array}{rcll}
 u-v & -79.3x & +18.9y & -776 \\
 -2530 + 8180 & = +1650 - 1000 & = +650 + 120 & = +770 \quad 0 \\
 -9233 + 11219 & = +1981 - 1535 & = +446 + 326 & = 772 \quad + \\
 -12907 + 15169 & = +2757 - 2925 & = +332 + 937 & = 769 \quad -1 \\
 15.8695 + 7932 & & -1817 & +228 \quad 16.4218
 \end{array}$$

$$\begin{array}{rcll}
 \text{Tables} & a = 0.7 & e = -11.0 & a \cdot e = +10.3 \quad b \cdot d = -9 \\
 \text{Obs} & = -505.2 & = -518.9 & = +9.2 \quad = -8.3
 \end{array}$$

+9

1361.1

Approximate Center

15-

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0) + (y - y_0)^2$	$O - C$
1 22.7500	0.0000	-17	0.0000	4.00052	+1.12
2 22.0000	-0.7500	-17	0.2040	3.9967	+27
3 23.0000	-1.7500	-12	2.1060	3.9750	-1.90
4 22.6770	-1.8030	-7	3.2533	4.0033	+93
5 22.7501	-1.9999	0	3.9996	3.9996	+3.6
6 22.8026	-1.6474	+10	2.7106	4.0016	+76
7 23.0000	-1.4500	+12	2.0990	3.9927	-13
8 23.6898	-0.8102	+16	0.6539	3.9871	-69

 $R = 3.9970$

y	$y - y_0$	Δy	$(y - y_0)^2$	L	$\checkmark$
1 13.8659	-1.9991	-22	4.0052	180	
2 13.9196	-1.9454	-21	3.7927	193	
3 14.7997	-1.3656	-15	1.8690	227	
4 15.0000	-0.8650	-10	0.7500	244	
5 15.8650	0.0000	0	0.0000	270	
6 17.0000	+1.1350	+12	1.2910	304+	
7 17.2396	+1.3746	+15	1.8937	313	
8 17.6887	+1.8237	+20	3.3332	336	15%

Approximate Center

 $x = 23.$ $y = 17.4997$

17.2396

31.7390

 $y_0 = 15.8650$ $y_{\min} = 13.8659$ $R = 2.0036$

1.9980

 $x_{\min} = 22.7501$ $x_0 = 24.7500$

$$\begin{cases} x_0 & 24.7500 \\ y_0 & 15.8650 \end{cases}$$

 $A = +8.6$ $B = +11$

13611

Minimum Center

15

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0) + (y - y_0)$	$O - C$
1 24.9500	0.0000	-17	0.0000	4.0052	+112
2 24.0000	-0.9500	-17	0.2040	3.9967	+27
3 23.0000	-1.9500	-12	2.1060	3.9750	-190
4 22.6970	-1.8030	-7	3.2533	4.0033	+93
5 22.9501	-1.9999	0	3.9996	3.9996	+56
6 22.8026	-1.6474	+10	2.7106	4.0016	+76
7 23.0000	-1.9500	+12	2.0990	3.9927	-13
8 23.6898	-0.8102	+16	0.6539	3.9871	-69

 $R = 3.9980$

y	$y - y_0$	Δy	$(y - y_0)^2$	L
1 13.8659	-2.8991	-22	9.0052	180
2 13.9196	-2.9454	-21	3.7927	193
3 19.9994	-1.3656	-15	1.8690	227
4 15.0000	-0.8650	-10	0.7500	244
5 15.8650	0.0000	0	0.0000	270
6 17.0000	+1.1350	+12	1.2910	304+
7 17.2396	+1.3746	+15	1.8937	313
8 17.6887	+1.8237	+20	3.3882	336

Approximate Center

 $x = 23$ $y = 17.4994$

17.2396

31.7390

 $y_0 = 15.8695$ $y_{\min} = 13.8659$ $R = 2.0036$

19985

 $x_{\min} = 22.9501$ $x_0 = 24.9500$

$$\begin{cases} x_0 = 24.9500 \\ y_0 = 15.8650 \end{cases}$$

 $A = +8.6$ $B = +11$

Formation of Normals

1 0.00

2 + 0.87

3 + 1.99

4 + 1.55

5 0.0

6 - 1.86

7 - 1.99

8 - 1.78

+ 8.41

- 5.33

- 0.92

0.00

- 12.0

+ 275.5

- 167.5

- 112.0

- 123.5

+ 19.0

+ 56.0

+ 350.5

- 417.0

- 66.5

- 227.0

- 52.5

+ 260.0

- 80.0

0.0

+ 86.0

- 18.0

- 123.5

+ 376.0

- 500.0

- 157.5

13611 Conditional Equations

16

1	0,0	-200	=	+112	0	+19	=	+19	+93
2	0,45	-1,98	=	+27	+2	+18	=	+20	+7
3	1,75	-1,37	=	-190	+7	+13	=	+20	-210
4	1,80	-0,86	=	+93	+9	+8	=	+17	+76
5	2,00	0,00	=	+56	+10	0	=	+10	+46
6	1,65	+1,13	=	+76	+8	+11	=	+19	+57
7	1,75	+1,37	=	-13	+7	+13	=	+20	-33
8	0,81	+1,82	=	-69	+7	+17	=	+21	-90

$$15,01 - 0,92 = -66,5$$

$$+279$$

$$-338$$

$$-0,92 + 16,93 = -157,0$$

$$+ [] - 0,66 = -7,1$$

$$+ 16,87 = -158,1$$

$$b = -9,7$$

$$15,01 = -66,5 - 8,6 = -75,1$$

$$a = -5,0$$

ave 15-6

$$\frac{P}{n} = 20^v$$

$$\frac{\Sigma V}{n} = -6,7^v$$

$$\frac{-6,7}{20} = -33,5^v$$

$$\Delta R = -0,4^v$$

13611 Conditional Equations

16

				O.C
1	0.0	-200	= +112	+93
2	-0.95	-198	= +27	+7
3	-1.95	-137	= -190	-210
4	-1.80	-0.88	= +93	+76
5	-2.00	0.00	= +56	+86
6	-1.65	+1.13	= +76	+57
7	-1.95	+1.37	= -13	-33
8	-0.81	+1.82	= -69	-90
			0 + 19 = +19	
			+2 + 18 = +20	
			+7 + 13 = +20	
			+9 + 8 = +17	
			+10 0 = +10	
			+8 + 11 = +19	
			+7 + 13 = +20	
			+7 + 17 = +21	

$$15.01 - 0.92 = -66.5$$

$$-0.92 + 16.93 = -159.0$$

$$+ [] - 0.06 = -9.1$$

$$+ 16.87 = -158.1$$

$$b = -9.9$$

$$15.01 = -66.5 - 8.6 = -75.1$$

$$a = -5.0$$

$$\text{arc } 15.6$$

$$\frac{P}{n} = .20$$

$$\frac{S.V.}{n} = -6.7$$

$$\frac{-6.7}{.20} = -33.5$$

$$O.R. = -0.9$$

13611 Moon's Mean Position

17

$$X_0 = 24.4500''$$

$$Y_0 = 15.8650''$$

$$24.4498''$$

$$15.8645''$$

From Plate Constants

$$X = 26.0609''$$

$$Y = 16.4218''$$

$$Z = +4.0609''$$

$$h_1 = -1.5782''$$

$$\log Z = 0.60862''$$

$$\log \tan \delta = 9.5611''$$

$$\log S = 99.7256''$$

$$Z = 12172''$$

$$8.50727''$$

$$7.0534''$$

$$2.12882'' = 137.53''$$

$$78317''$$

$$\delta - A = +2 \quad 14.53''$$

$$h_1 = -0.068''$$

$$A = 19.47 \quad 18.0''$$

$$h_0 = -1.5714''$$

$$X_0 = 19.49 \quad 32.39''$$

$$\log h_0 = 0.19629''$$

$$7.33113''$$

$$\text{Red} \quad +4.33''$$

$$2.86514'' = -733.1''$$

$$\delta' = 19.49 \quad 36.86''$$

$$\delta - D = -12 \quad 13.1''$$

$$D = 19.57 \quad 00.0''$$

$$S_0 = 20.09 \quad 13.1''$$

$$\text{Red} \quad +10.1''$$

$$\delta' - 20.09 \quad 03.0''$$

13611 Moon's Mean Position

17

$$\lambda_0 = 29.9500^\circ$$

$$29.9498^\circ$$

$$\gamma_0 = 15.8650^\circ$$

$$15.8645^\circ$$

From Plate Constants

$$x = 26.0609$$

$$y = 16.9218$$

$$9.35 + 9.0609$$

$$h_1 = -1.5782$$

$$\log 3 = 0.60862$$

$$\log 2 = 99.7256$$

$$8.50727$$

$$2.12882 = 139.53$$

$$\log \tan 9.5611^\circ$$

$$= 1.2172$$

$$7.0539$$

$$7.8317$$

$$x - A + 2 = 17.53$$

$$h_1 = -0.068$$

$$x - A = 19.97 = 18.0$$

$$h_0 = -1.5717$$

$$x_0 = 19.049 = 32.33$$

$$\log h_0 = 0.19629$$

$$7.33115$$

$$2.86319 = -733.1$$

$$\text{Red.} + 7.33$$

$$x' = 19.99 = 36.86$$

$$\delta - D = -12 = 13.1$$

$$D = 19.57 = 00.0$$

$$\delta_0 = 20.09 = 13.1$$

$$\text{Red.} + 10.1$$

$$\delta' = 20.09 = 03.0$$

13611

Lunar Parallax

$$\begin{array}{rcl}
 \alpha' & 19 & 49 \quad 36.86'' \\
 \delta & 21 & 27 \quad 24.0'' \\
 \delta - \alpha' & +1 & 37 \quad 47.18'' \\
 & +24 & 26 \quad 47.10'' \\
 \frac{1}{2}(\delta - \alpha') & +9 & 38.06'' \\
 2 & +24 & 17 \quad 09.08''
 \end{array}$$

$$\begin{array}{rcl}
 \pi & 59 & 27.06'' \\
 & & 9.86913'' \\
 & & 8.23750'' \\
 & & 9.61683'' \\
 & & 0.02512'' \\
 & & 7.74858''
 \end{array}$$

$$\begin{array}{rcl}
 & & 9.95727'' \\
 & & 0.00000'' \\
 & & 0.07024'' \\
 \hline
 & & 9.99751''
 \end{array}$$

$$\begin{array}{rcl}
 \delta - \alpha' & +19 & 16.13'' \\
 & +1 & 17.08''
 \end{array}$$

$$\delta \quad 49 \quad 50 \quad 9.2''$$

$$\delta - 20 \quad 09 \quad 03.00''$$

$$\delta - \alpha' + 64 \quad 59 \quad 12.2''$$

$$\begin{array}{rcl}
 & & 9.82670'' \\
 & & 8.23750'' \\
 & & 9.95723'' \\
 & & 0.15176'' \\
 \hline
 & & 8.17289''
 \end{array}$$

$$\delta - \delta' \quad +51 \quad 11.3''$$

$$\delta \quad -19 \quad 17 \quad 51.7''$$

$$\text{Eph } \delta \quad -19 \quad 17 \quad 53.1''$$

$$\delta - \epsilon \quad +1.4''$$

$$\text{curr.} \quad -1.9''$$

$$\text{2nd Obs. Ref.} \quad +0.2''$$

$$\delta = -19 \quad 17 \quad 53.4''$$

$$\delta - \epsilon \quad -0.3''$$

$$\alpha \quad 19 \quad 50 \quad 53.94''$$

$$\text{Eph } \alpha \quad 19 \quad 50 \quad 52.87''$$

$$\delta - \epsilon \quad +1.07''$$

$$\text{curr.} \quad -0.16''$$

$$\alpha \quad 19 \quad 50 \quad 53.78''$$

$$\delta - \epsilon = +0.91''$$

13611

Lunar Parallax

18

α 19 49 36.86
 δ 21 27 29.0
 $\delta - \alpha + 1$ 37 47.19
 $= + 24$ 26 47.10
 $\frac{1}{2}(\alpha - \delta)$ + 9 38.06
 $\alpha + 24$ 17 09.04

π 59 27.06

9.86913
 8.23750
 9.61683
 0.02512

 7.74858

9.95727
 0.00000

 0.04029
 9.99731

$\alpha - \delta$ 19 16.13
 $=$ 1 17.08

δ 49 50 9.2

$\delta - 20$ 09 03.00

$\delta - \delta + 64$ 59 12.2

9.82670
 8.23750
 9.95722

 0.15176
 8.17239

$\delta - \delta$ + 51 17.3

δ - 19 17 54.7

Eph δ - 19 17 53.1

O-C + 1.6

Curr. + 7.9

340 Aul. Ry + 0.2

δ - 19 17 53.4

O-C - 0.3

α 19 50 53.94

Eph α 19 50 52.87

O-C + 1.07

Curr. - 0.16

α 19 50 53.78

O-C = + 0.91

13426	x	Star	Measure	17
d		d		d
1	19812	19831	18988	20646
15.3	17461	12198	1647071	13140
12.3	59	200	72	40
	12	36	90	48
	<u>15.2352</u>	<u>15.2367</u>	<u>12.2518</u>	<u>12.2492</u>

2	20078	19108	19847	20280
15.4	12860	16328	15002	15112
31.6	66	30	08	12
	79	08	48	82
	<u>25.7216</u>	<u>25.7221</u>	<u>31.4841</u>	<u>31.4831</u>

3	19812	19880	18498	19862
27.9	11070	18668	1590608	12440
11.3	40	7270	10	40
	18	80	8502	76
	<u>27.8777</u>	<u>27.8790</u>	<u>11.2591</u>	<u>11.2567</u>

Moon Measures

1	15814	20474	19730
(20)	14142	14268	13960
15.9	4845	68	7869
25.1		12622	30
16	<u>25.1669</u>	<u>25.1646</u>	<u>15.4329</u>

2	15398	14978
25.3	13592	6873
16.2	98	
FX		13180
	<u>25.1803</u>	<u>25.1793</u>

3	15100	1510
25.1	1767270	14590
17.0	69	60095
		14161
	<u>25.0440</u>	<u>25.0434</u>

13626

Star Measures

19

	d	r	d	r
L	19812	19831	18988	20646
15.3	17461	12198	16470	13140
12.3	59	200	72	40
	12	36	90	48
	<u>15.2352</u>	<u>15.2364</u>	<u>12.2518</u>	<u>12.2992</u>

2	20078	19108	19848	20280
25.7	12860	16328	15002	15112
31.6	66	30	08	12
	79	08	48	82
	<u>25.7216</u>	<u>25.7221</u>	<u>31.9891</u>	<u>31.9831</u>

2	19812	19880	18498	19862
27.9	11090	18668	15906	12490
11.3	40	72	10	40
	18	80	85	76
	<u>27.8777</u>	<u>27.8790</u>	<u>11.2591</u>	<u>11.2567</u>

Moon Measures

1	15814	20479	1730
20	14192	14268	13960
15.9	9.89	68	78.69
25.1		12622	30
16	<u>25.1669</u>	<u>25.1696</u>	<u>15.4329</u>

2	15388	19978
25.3	13592	6873
16.2	98	
17		13150
	<u>25.1803</u>	<u>25.1793</u>

1510

3	15100	19590
25.0	17672	60095
17.0	69	14161
	<u>25.0840</u>	<u>25.0839</u>

13626

Moon Measures

20

4 16418

24.2 19328

18.0 32

24,208821,2088

15650

150

13677

24,200821,2008slant.
check previous
readings

5

24.

18.1

18282

1712320

1720

18,1162

15580

9292

14470

18,1154

6

23.1

18.2

fy

20532

17412

1815

32

18,3117

20176

13296 299

302

80

18,3119

7 15220

22.1 14840

18.0 40

22,0380

15270

15632

32

22,0362

8 19208

21.2 17122

17.0 18

00

21,2086

20356

1244246

4876

60

21,2087

13626

Moon Measures

20

9 16418
 24.2 14328.3
 18.0 32

24,208.8

24,208.8

15650

141350

13644

124,200.4

24,208.8

blank -
 Check previous
 readings

24,208.8

5
 24.
 18.1

18282
 1712320
 1720

15580
 9292

14440
 18.1152

181162

20532

17412

1812

32

18.3117

20176

13296

302

80

18.3119

6
 23.1
 18.2
 +7

7 15220
 22.1 14840
 18.0 40

22,038.0

15270
 15632
 32

22,036.2

8 19208
 21.2 17122
 17.0 18
 00

21,208.6

20356
 12442
 4846
 60

21,208.7

13626 Juncos Etc.

21

Date Sept 30 '17

Exp. to stars	3	07	03	16
" " Moon	3	09	32.0	3 09 32.3
clock slow		0	76.2	

H. Sid Time	3	10	18.35	$\theta - \gamma = +2^{\circ} 27^m$
H. Long	4	47	31.05	
G. Sid Time	7	34	49.40	
Sid T. M. Noon	12	37	38.71	
Interval	19	20	10.69	
Reduction		3	10.07	
G. M. T.	19	17	00.62	

From Naut Alman.	0	42	29.73	+9 57	357.5
Moon					14.257
Motion in 1 ^m			2.3381		
" " 17.0103			39.77	+4	02.5
Tabular Place	0	43	09.22	+10 01	38.0

Moon's age 15 days

Parallax	60	42.62
Semid.	16	34.0
R		994.0
ang.		12.4
Arr (4)		-0.4
R		1006.0
R		2.1565
AR		-1036
(1+2)/R		20529
R		4.2147

937 - 11

$$a = -507.6$$

$$+ 27$$

$$- 480.6$$

13626 Juncos Etc.

21

Date Sept 30 '17

Exp. to Stars	3	09	03	16
" " Moon	3	09	32.0	3 09.32.3
Clock slow		0	76.2	

H. Sid Time	3	10	18.35	8-7 = +2 ^h 27 ^m
H. Long	4	49	31.05	
G. Sid Time	7	54	49.40	
Sid T. M. Noon	12	39	38.71	
Interval	19	20	10.69	
Reduction		3	10.07	
G.M.T.	19	17	00.62	

From Naut Alman.	0	42	29.95	+9 57	35.5
Moon					19.257
Motion in 1 ^m			2.3381		
" " 17.0103			39.77	+9	02.5
Tabular Place	0	43	09.22	+10 01	38.0

Moon's age 15 days

Parallax	60	42.62
Semid	16	34.0
R		994.0
ang		12.4
arr (4)		-0.4
R		1006.0
R		2.1565
arr		-1036
(1+a)/R		20529
R ²		4.2149

937 - 11

$$\begin{array}{r}
 a = -504.6 \\
 + 28 \\
 \hline
 = -480.6
 \end{array}$$

13626

Plate Center & Constants

x

y

15,2358	12,2505								
25,7218	31,9836								
27,8789	11,2379	0	43	52,35	+8	46	08,8		
22,	18,		-3	17,0		+55	03,6		
-5,878	+6,7721	0	40	38,35	+9	41	12,7		
33 ^s	490"								
-193,97	3303"								

$$\begin{cases} A & 0 & 40 & 40,00 \\ D & 9 & 41 & 00,0 \end{cases}$$

$$\begin{aligned} x-y &+ 500x & -8,64 & +86x & -11619 \\ +8036 & +7618 & =+11654 & -105 & =+11549 & +70 & =+11619 & 0 \\ -1089 & +12861 & =11772 & -271 & =11501 & +118 & = & 19 & 0 \\ -2350 & +13939 & =11589 & -97 & =11492 & +128 & = & 20 & +1 \\ 23,1267 & +11563 & & -170 & & +106 & & 23,1177 & \end{aligned}$$

$$\begin{aligned} y-y &+ 500y & +11,6x & +3,2y & -9057 \\ +2716 & +6125 & =+8841 & +177 & =+9018 & +39 & =+9057 & 0 \\ -7084 & +15772 & =8658 & +298 & =8956 & +101 & = & 57 & 0 \\ +3070 & +5629 & =8689 & +323 & =9022 & +36 & = & 58 & +1 \\ 16,2589 & +8129 & & +268 & & +52 & & 16,1981 & \end{aligned}$$

$$\begin{aligned} \text{Table} & a = -1.4 & c = -2.9 & a-c = +1.0 & b+d = -3.2 \\ \text{Obs} & = -509.6 & = -503.2 & = -1.7 & = -3.0 \\ & -503.2 & -500.8 & -2.4 & +0.2 \end{aligned}$$

-1

13626

Plate center X Constants

X

Y

15.2358

12,25.05

25.7218

31.9836

27.8789

11,25.79

0

43

52.35

+8

46

08.8

22.

18.

-3

19.0

+55

03.6

-5.878

+6.7721

0

40

38.35

+9

41

12.7

33^s

490"

-193.97

3303"

$$\begin{cases} A & 0 & 40 & 40.00 \\ D & 9 & 41 & 00.0 \end{cases}$$

X - Y + 500 X

-8.64

+8.61

-11619

+9056 + 7618

= +11654 - 105

= +11589 + 70

= +11619

0

-1089 + 12861

= 11772 - 271

= 11501 + 118

= 11619

0

-2350 + 13939

= 11589 - 97

= 11492 + 128

= 11620

+1

73.1267 + 115.63

= 189

+106

23.1177

0

Y - X + 500 Y

+11.64

+3.24

-9057

+2716 + 6125

= +8841 + 177

= +9018 + 39

= +9057

0

-7089 + 12792

= 8658 + 298

= 8956 + 101

= 9057

0

+3070 + 5629

= 8699 + 1323

= 9022 + 36

= 9058

+1

16.2589 + 8129

= 268

+52

16.1981

0

Table a = -1.9 c = -2.9 a-c = +1.0 l+d = -3.2
 Obs = -509.6 = -503.2 = -1.9 = -3.0

S_0	m_0	ΔS	-2.25	-7.7	-3
-7.17	-6.03	-17	$+16 = -1$	$+4 = +3$	
$+3.83$	$+14.19$	$+22$	$-8 = +10$	$-8 = +2$	
$+6.11$	-7.05	$+13$	$-15 = -2$	$+5 = +3$	
M	$+1.12$	-1.80	-2	$+1 = -4$	$= -0.01$

$$\begin{array}{rcl}
 \Delta \eta & -4.23 & -13 \\
 -13 & +25 = & +12 \\
 +73 & -60 = & +13 \\
 -16 & +29 = & +13 \\
 & +8 = & -5 = -0.2
 \end{array}$$

13626	Standard	Coordinates	23
Cape 81-mg 6.5	Cape 91-mg 5.7	Cape 93-mg 7.7	
C	0 36 0 1.76	0 41 48.39	0 42 59.48
L	1.75	48.48	59.50
E	1901.3 1.75	1902.1 48.40	1902.9 59.43
Mean	0 36 0 1.75	0 41 48.42	0 42 59.46
Puc	+ 52.65	53.10	52.89
X	0 36 58.70	0 42 71.52	0 43 52.35
A	0 40 40	0 40 40	0 40 40
1-A	- 0 03 7560	+ 2 0152	+ 3 1235
sin(1-A)	- 225.59	+ 121.52	+ 192.33
log "	2.35 332 n	2.08 465	2.28 405
" cos	9.99 474	9.99 116	9.99 790
" tan	0.85 530 n	0.58 305	0.78 619
70	- 7 16 63	+ 3 82 87	+ 6 11 21
71	- 15	+ 20	+ 13
72	17 83 22	25 83 07	28 11 34
73	15 23 58	25 72 18	27 87 88
74	+ 70 36	- 10 89	- 23 50
C	+ 8 78 32.2	+ 11 25 41.9	+ 8 70 37.7
L	32.0	42.5	37.2
E	32.0	41.3	33.6
Mean	+ 8 78 32.2	+ 11 25 41.9	+ 8 70 37.1
Puc	+ 5 35.0	+ 5 37.8	+ 5 37.7
S	+ 8 57 07.1	+ 11 31 16.7	+ 8 76 08.8
D	+ 9 71 00.0	+ 9 71 00.0	+ 9 71 00.0
1-D	- 76 52.9	+ 1 50 16.7	- 54 51.2
tan(1-D)	- 2813.1	+ 6619.0	- 3291.5
log "	3.47 917 n	4.82 079	3.51 739 n
" "	0.78 032 n	2.15 194	0.84 854 n
log tan	9.19 49	9.30 93	9.18 82
" 90	1.71 06	1.16 61	1.57 24
" "	7.95 89	7.52 88	7.81 40
70	- 6 03 00	+ 14 18 86	- 7 05 56
71	+ 0 00 91	+ 0 00 34	+ 0 00 65
72	11 97 91	32 19 20	10 95 09
73	12 25 05	31 78 36	11 25 79
(7-7)	+ 27 16	- 70 87	+ 30 70

13626	Standard	Coordinates	23
Cape 81-Mg 6.5	Cape 91-Mg 5.7	Cape 93-Mg 7.7	
C	0 36 01.76	0 41 48.39	0 42 59.47
L	1.75	48.48	59.51
E	1901.3 1.75	1902.1 48.40	1902.9 59.91
Mean	0 36 01.75	0 41 48.42	0 42 59.46
Prec	+52.65	53.10	52.89
x	0 36 5470	0 42 41.52	0 43 52.33
A	0 40 40	0 40 40	0 40 40
A-A	-0 03 4560	+ 2 01.52	+ 3 12.35
Tan(1-A)	-22559	+121.52	+192.33
log "	2.353324	2.08465	2.28405
log A	9.99474	9.99116	9.99490
" 70	0.855304	0.58305	0.78619
70	-71663	+38287	+61121
71	-15	+20	+13
7	178322	258307	281134
X	152358	257218	278788
X-7	+7036	-1089	-2350
C	+8 48 32.2	+11 25 41.9	+8 40 37.4
L	32.0	42.5	37.2
E	32.0	41.3	33.6
Mean	+8 48 32.2	+11 25 41.9	+8 40 37.1
Prec	+5 35.0	+5 37.8	+5 37.7
d	+8 54 071	+11 31 16.7	+8 46 08.8
D	+9 41 00.0	+9 41 00.0	+9 41 00.0
d-D	- 46 52.9	+1 50 16.7	- 54 51.2
Tan(d-D)	-2813.1	+6619.0	-3291.5
log "	3.449174	4.82079	3.517394
" h.	0.780324	2.15194	0.848544
logland	9.1949	9.3093	9.1882
" 90	1.7106	1.1661	1.5724
" h.	7.9589	7.5288	7.8140
h0	-6.0300	+14.1886	-7.0556
h1	+0.0091	+0.0034	+0.0065
h	11.9791	32.1920	10.9509
h	12.2505	31.7836	11.2579
(7-h)	+2716	-7084	+3070



13626 *Moons Center*

28

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0) + (y - y_0)^2$	$0 - c$
1 25.1658	+2.0428	-1	4.1726	4.2392	+2.48
2 25.1798	+2.0568	0	4.2304	4.2304	+1.60
3 25.0737	+1.9207	+2	3.6898	4.2405	+2.61
4 24.2047	+1.0817	+5	1.1711	4.2060	- .84
5 24.0000	+0.8770	+5	0.7700	4.2214	+ .70
6 23.1230	0.0000	+6	0.0000	4.2185	+ .41
7 22.0371	-1.0859	+5	1.1781	4.2130	- .14
8 21.2086	-1.9144	+2	3.6642	4.2149	+ .5

$$R = 4.2149$$

y	$y - y_0$	Δy	$(y - y_0)^2$	L	$\checkmark$
1 16.0000	-0.2580	0	0.0666	97	
2 16.2580	0.0000	0	0.0000	90	
3 17.0000	+0.7420	+1	0.5507	69	
4 18.0000	+1.7420	+1	3.0349	32	
5 18.1157	+1.8577	+1	3.4514	25	
6 18.3118	+2.0538	+1	4.2185	0	
7 18.0000	+1.7420	+1	3.0349	328	
8 17.0000	+0.7420	+1	0.5507	291	162

Approx. Center

$$y = 17 \quad x = 25.0737$$

$$21.2086$$

$$46.2523$$

$$x_0 = 23.1261$$

$$x_{max} = 25.1798$$

$$R = 2.0537$$

$$y_{max} = 18.3118$$

$$y_0 = 16.2581$$

$$y = 18$$

$$x = 24.2015$$

$$22.0371$$

$$46.2386$$

$$x_0 = 23.1193$$

$$\begin{cases} x_0 = 23.1230 \\ y_0 = 16.2580 \end{cases}$$

$$A = +2.9$$

$$B = +0.7$$

15626 Morris Center

28

x	$x - x_0$	Δx	$(x - x_0)^2$	$(x - x_0)(y - y_0)$	$y - y_0$
1 25.1658	+2.0728	-1	4.1726	4.2392	+2.98
2 25.1798	+2.0568	0	4.2304	4.2304	+1.60
3 25.0937	+1.9207	+2	3.6898	4.2405	+2.61
4 24.2095	+1.0347	+5	1.1741	4.2060	- .89
5 24.0000	+0.8770	+5	0.7900	4.2214	+ .70
6 23.1230	0.0000	+6	0.0000	4.2185	+ .91
7 22.0371	-1.0859	+5	1.1781	4.2130	- .19
8 21.2086	-1.9174	+2	3.6642	4.2149	+ .5

$$R = 4.2149$$

y	$y - y_0$	Δy	$(y - y_0)^2$	L
1 16.0000	+0.2580	-0	0.0666	97
2 16.2580	0.0000	0	0.0000	90
3 17.0000	+0.7420	+1	0.5507	167
4 18.0000	+1.7420	+1	3.0349	32
5 18.1157	+1.8577	+1	3.4514	25
6 18.3118	+2.0538	+1	4.2185	0
7 18.0000	+1.7420	+1	3.0349	328
8 17.0000	+0.7420	+1	0.5507	291

Approx. Center

$$\begin{aligned}
 y = 17 \quad x &= 25.0937 \\
 &21.2086 \\
 &46.2523 \\
 x_0 &23.1261 \\
 x_{max} &25.1798 \\
 R &2.0537 \\
 y_{max} &18.3118 \\
 y_0 &16.2581
 \end{aligned}$$

$$\begin{aligned}
 y = 18 \quad x &= 24.2015 \\
 &22.0371 \\
 &46.2386 \\
 x_0 &23.1193
 \end{aligned}$$

$$\begin{cases}
 x_0 = 23.1230 \\
 y_0 = 16.2580
 \end{cases}$$

$$\begin{aligned}
 A &= +2.9 \\
 B &= +0.7
 \end{aligned}$$

Formation of Normals.

1 - 6.53	+ 506.0	- 64.5
2 0.00	+ 330.0	0.0
3 + 1.70	+ 501.0	+ 193.0
4 + 0.94	- 45.3	- 73.0
5 + 1.67	+ 61.6	+ 130.2
6 0.0	0.0	+ 82.0
7 - 1.90	+ 15.2	- 24.7
8 - 1.71	- 9.5	+ 3.7
+ 398	+ 1413.8	+ 410.9
- 384	- 528	- 161.9
+ 0.17	+ 1359.0	+ 249.0

 $\frac{1}{4}W$

13626 Conditional Equations

1	+20.7	-0.26	= +298	1	+151	-5	= +176	+102
2	+206	0.00	= +160		+156	0	= +156	+4
3	+192	+0.77	= +261		+192	+13	= +155	+106
4	+108	+1.77	= -87	4	+80	+31	= +111	-195
5	+0.88	+1.86	= +70		+65	+33	= +98	-28
6	0.00	+2.05	= +71		0	+36	= +36	+5
7	-109	+1.77	= -17		-81	+31	= -50	+36
8	-191	+0.77	= +5		-142	+13	= -129	+137

$$+387$$

$$-223$$

$$18.29 + 0.17 = +1359.0$$

$$+0.17 + 13.39 = +249.0$$

$$+ \boxed{} + 0 = +10.7$$

$$+13.39 = +238.6$$

$$b = +17.8$$

$$+18.29 = +1359.0 - 2.5 = +1356.5 \quad a = +79.2$$

ARC 166

$$\frac{P}{m} = 26^\circ$$

$$\frac{\Sigma K}{m} = +21.5^\circ$$

$$+20.5 = +78.8^\circ$$

$$26$$

$$\Delta R = +1.0^\circ$$

13626 Conditional Equations

25-
0.0

1	+ 2.07	- 0.26	= + 298	+ 151	- 5	= + 146	+ 102
2	+ 2.06	0.00	= + 160	+ 156	0	= + 156	+ 9
3	+ 1.92	+ 0.77	= + 261	+ 192	+ 13	= + 155	+ 106
4	+ 1.08	+ 1.77	= - 87 $\frac{1}{4}W$	+ 80	+ 31	= + 111	- 195
5	+ 0.88	+ 1.86	= + 70	+ 65	+ 33	= + 98	- 28
6	0.00	+ 2.05	= + 91	0	+ 36	= + 36	+ 5
7	- 1.09	+ 1.77	= - 19	- 81	+ 31	= - 50	+ 36
8	- 1.91	+ 0.77	= + 5	- 192	+ 13	= - 129	+ 139

+ 387

- 2.3

$$18.29 + 0.17 = + 1359.0$$

$$+ 0.17 + 13.39 = + 279.0$$

$$+ [] + 0 = + 10.7$$

$$+ 13.39 = + 238.6$$

$$b = + 17.8$$

$$+ 18.29 = + 1359.0 - 2.5 = + 1356.5 \quad a = + 79.2$$

ARC 1.66

$$\frac{P}{n} = 26$$

$$\frac{\Sigma V}{n} = + 20.5$$

$$+ \frac{20.5}{.26} = + 78.8$$

$$A R = + 4.0$$

13626 *Micromean Position*

26

$$\begin{aligned} X_0 & 23.1230'' \\ & +37'' \\ & 23.1267'' \end{aligned}$$

$$\begin{aligned} Y_0 & 16.2580'' \\ & +9'' \\ & 16.2589'' \end{aligned}$$
From Plate Constants

$$X \ 23.1177''$$

$$Y \ 16.1981''$$

$$Z \ +1.1177''$$

$$h \ -1.8019''$$

$$\begin{aligned} \log \gamma & 0.04832'' \\ \log \delta & 9.99407'' \\ & 8.50728'' \\ & 1.58701'' \end{aligned}$$

$$\begin{aligned} \log \tan \delta & 9.2205'' \\ & \gamma \ 0.0966'' \\ & 7.0537'' \\ & 6.3703'' \end{aligned}$$

9 26

$$d-A \quad +35.24''$$

$$n \ +0.0002''$$

$$A \ 0 \ 40 \ 40.00''$$

$$n_0 \ -18021''$$

$$q_0 \ 0 \ 41 \ 15.28''$$

$$\log H_0 \ 0.25577''$$

$$7.33115''$$

$$Red \quad +7.61''$$

$$2.92462'' - 870.7''$$

$$q' \ 0 \ 41 \ 19.85''$$

$$S-D \quad -17 \ 00.7''$$

$$D \ +9 \ 41 \ 00.0''$$

$$S_0 \ +9 \ 26 \ 59.3''$$

$$Red \quad +29.4''$$

$$S' \ +9 \ 27 \ 28.7''$$

13626 Micron Mean Position

26

 α_0 23.1230"
 +37"
 23.1267"

 γ_0 16.2580"
 +9"
 16.2589"

From Plate Constants

 X 23.1177" Y 16.1981" Z +1.1177" h -1.8019"
 $\log \gamma$ 0.04832"
 $\cos \delta$ 999407"
 8.50724"
 1.57701"

 $\log \tan \delta$ 89.2205"
 γ 0.0966"
 γ 7.0539"
 6.3705"
 $d-A$ +35.29" n_1 +0.0002" A 0 40 40.00" n_0 -18021" T_0 0 41 15.27"
 $\log H_0$ 0.25577"
 7.33115"
 Red +7.61"2.92462 n -870.7 α' 0 41 19.85" $\delta-D$ -17 00.7" D +9 41 00.0" δ_0 +9 26 59.3" Red +29.3" δ' +9 27 28.7"

$$\begin{array}{r}
 0 \quad 30 \quad 63.10 \\
 \underline{58.52} \\
 + 4.58 \\
 \hline
 \end{array}$$

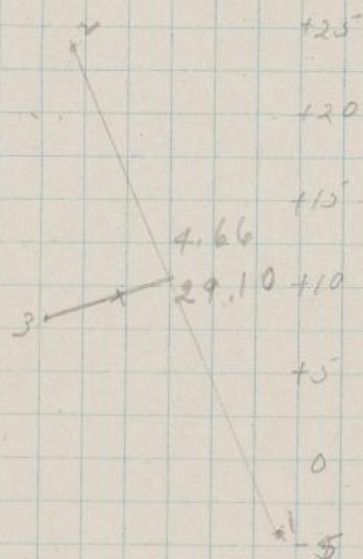
$$\begin{array}{r}
 0 \quad 42 \quad 60.90 \\
 \underline{56.15} \\
 + 4.75 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 0 \quad 44 \quad 27.07 \\
 \underline{22.47} \\
 + 4.60 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 - 8 \quad 02 \quad 28.70 \\
 \underline{58.38} \\
 + 29.64 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 + 23 \quad 48 \quad 85.63 \\
 \underline{57.18} \\
 + 28.49 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 + 7 \quad 08 \quad 30.33 \\
 \underline{00.98} \\
 + 29.35 \\
 \hline
 \end{array}$$



50 45 40 35 30
0

13626 Reduction to Apparent Place

$$\begin{array}{rcl}
 92^\circ & 3.0 & \checkmark \\
 H + 9 & 6 & 08.2 \checkmark \\
 H & 5^- & 27.0 \checkmark \\
 \alpha & 0 & 41.2 \checkmark \\
 \delta & 23 & 42.6 \checkmark \\
 Q + 9 & 0 & 23.8 \checkmark \\
 & = 5^\circ & 57.0 \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 \text{Sept 30} & 34 & \checkmark \\
 S + 9 & 27 & \checkmark \\
 \log \cos \delta & 9.9971 & \checkmark \\
 & + 0.9072 & \checkmark \\
 (L) & 0.9013 & \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 \log \cos(GH) & 9.9976 & \checkmark \\
 & 1.3354 & \checkmark \\
 \text{" Sin " } & 9.0156 & \checkmark \\
 \text{" Tan } \delta & 9.2213 & \checkmark \\
 & 8.8239 & \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 \log \sin \delta & 9.2153 & \checkmark \\
 \text{" cos(HW) } & 8.5535 & \checkmark \\
 \text{" h } & 1.2777 & \checkmark \\
 \text{" Sin(Htd) } & 9.9997 & \checkmark \\
 \text{" Sec } \delta & 0.0059 & \checkmark \\
 & 8.8239 & \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 \log 9' & 1.3330 & \checkmark \\
 \text{" 9} & 8.3962 & \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 \log h' & 9.0432 & \checkmark \\
 \text{" h} & 0.1039 & \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 f & +3.318 & \checkmark \\
 9 & +0.025 & \checkmark \\
 h & +1.270 & \checkmark \\
 \hline
 & +4.613 & \checkmark
 \end{array}$$

$$\begin{array}{rcl}
 g' & +24.53 & \checkmark \\
 h' & - 0.135 & \checkmark \\
 i' & + 7.976 & \checkmark \\
 \hline
 & +29.366 & \checkmark
 \end{array}$$

13626 Reduction to apparent place,

72° 3.0"

Sept 30

3"

H + 1 6 08.2"

S + 9 27"

H 3 27.0"

x 0 41.2 15.29

G 23 42.6"

G + 2 0 23.3"

= 5° 57.0"

log Cos δ 9.9991

" h + 0.9072"

(h) 0.9013"

log Cos (Gx) 9.9976"

" g 4.3359"

" Sin " 9.0156"

" Tan δ 9.2213"

8.8239

log Sin δ 9.2153"

" Cos (Hx) 8.5339"

" h 1.2799"

" Sin (Hx) 9.9999"

" Sec δ 0.0059"

8.8239

log g 1.3330"

" 9 8.3962"

log h' 9.0422"

" h 0.1039"

f + 3.318"

g + 0.025"

h + 1.270"

+ 4.613"

g' + 21.58"

h' - 0.135"

+ 7.998"

+ 29.386"

13626

Lunar Parallax

28

λ'	0	41	19.85 ^v	π	60	42.62 ^v
δ	3	10	18.35 ^v			
$\delta - \lambda' + 2$	28		58.60 ^v		9.869	13 ^v
$= + 37$	14		37.50 ^v		8.276	96 ^v
	13		48.04 ^v		9.781	90 ^v
37	00		58.93 ^v		0.006	68 ^v
					7.904	67 ^v

9.95724^v
 0.00000^v
 0.09775^v
 0.05502^v

$\lambda - \lambda' + 27$ 36.15^v
 $= + 1$ 50.84^v

γ 48 37 11.5^v

$\delta + 9$ 27 28.7^v

$\gamma - \delta$ 39 09 42.8^v

9.82670^v
 8.27696^v
 9.80038^v
 0.12774^v
 7.99898^v

$\delta - \delta' + 37$ 15.5^v

δ 10 07 44.2^v

α 0 43 10.26^v

Eph $\delta + 10$ 01 38.0^v

Eph α 0 43 09.22^v

$\delta - \alpha$ + 6.2^v

$\delta - \alpha$ + 1.04^v

curr. - 0.2^v

curr. - 0.01^v

2nd Quad Ref. - 0.0

α 0 43 10.25^v

$\delta + 10$ 01 44.0

$\delta - \alpha$ + 1.03

$\delta - \alpha$ + 6.0

136 24

Lunar Parallax

28

λ'	0	41	19.85 ["]	μ	60	42.62 ["]
δ	3	10	18.35 ["]			
$\delta - \lambda' + 2$	28		58.50 ["]		9.869	13 ["]
$= + 37$	17		37.50 ["]		8.296	96 ["]
	13		9.804 ["]		9.781	90 ["]
37	00		58.93 ["]		0.006	68 ["]
					790	967 ["]

9.95727["]
 0.00000["]
 0.09785["]
 0.05502["]

$\lambda - \lambda' + 27$ 36.15["]
 $= + 1$ 50.34["]

 γ 98 39 11.0["] $\delta + 9$ 27 28.9["] $\gamma - \delta$ 39 09 42.8["]

9.82690["]
 8.29696["]
 9.80038["]
 0.12978["]
 799899["]

 $\delta - \delta'$ + 39 15.5["] δ 10 07 94.2["] α 0 43 10.24["]Eph $\delta + 10$ 01 38.0["] Eph α 0 43 09.22["]O-C + 4.2["] O-C + 4.04["]

Cirr. - 0.2 Cirr. - 0.01

2nd Aid Ry - 0.0 α 0 43 10.25["] $\delta + 10$ 01 94.0 O-C + 10.3

O-C + 6.0

