

KG
11366
v.1044



Plate	Date	Page
✓ 13717	Oct. 6. 1917	1
✓ 13935	" 30 "	11
✓ 13936	" " "	21

0.1
1
2
26
23
3
30
1
1
20
14
3
25
14
3
25
15

13717

Star Measures

1

1	18910	16582	16406	16915
12.7	11040	14460	1132011	11990
12.5	40	60	08	90
	10	82	06	15
	<u>127870</u>	<u>127878</u>	<u>125095</u>	<u>125075</u>

2	16208	17600	16440	16210
26A	12138	11670	10995	1165456
23.6	38	70	85-90	5-8
	08	00	40	10
	<u>264070</u>	<u>264070</u>	<u>235450</u>	<u>235446</u>

3	17290	16804	16842	16860
34.6	1016058	1395048	11362	12342
17.6	56	46	02	42
	90	04	42	60
	<u>347132</u>	<u>347144</u>	<u>175480</u>	<u>175482</u>

Moon

1		16360	16862
24.0		14600	8618
14.2		00	18
		60	62
		<u>141760</u>	<u>141756</u>

2		16596	16710
25.0		949694	1380267
14.8		92	12
		96	10
		<u>147102</u>	<u>147097</u>

3	16848	17522	
25.3	1450608	9860	
15.0	10	6462	
	48	22	
	<u>252340</u>	<u>252340</u>	

13717

Star Measures.

1

1 18910

16582

16406

16915

12.7 11040

14460

11320.1

11990

12.5 40

60

08

90

10

82

06

15

12787012.7878125095125085

2 16208

17600

16440

16210

26.4 12138

11670

10995

11354.56

23.6 38

70

85.90

5.8

08

00

40

10

26.407026.407023.548023.5446

3 17290

16804

16842

16860

34.6 10160.58

13950.48

11342

12342

17.6 56

46

02

42

90

04

42

60

34.713234.714417.548017.5482

Mean

1

24.0

14.2

16360

16862

14600

8618

00

18

60

62

14.176014.1756

2

25.0

14.8

16596

16710

9496.94

13802.07

92

12

96

10

14.710214.7097

3

25.3

15.0

16848

17522

14506.08

9860

10

6462

48

22

25.234025.2340

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Moon

2

4
25.5
15.4
1.6 8 8 0
1 2 3 3 6 34
32
80
2 5 4 5 4 6

1 6 4 1 2
1 1 6 8 4 8 1
7 8
1 2
1 5 4 7 3 1

5
25.6
16.0
1.6 6 3 0
1 1 2 5 8 60
62
30
2 5.5 3 9 0 2 5.5 3 9 2
1 7 5 7 8
1 2 9 7 0
70
7 8

6
25.4
16.5
1.6 1 2 2
1 1 4 6 4 6 1
5 8
2 2
2 5.4 6 6 1 2 5.4 6 6 5
1 6 0 9 0
1 0 7 8 0 55
50
90

1 6 4 6 4 1 6 4 0 0
1 0 9 3 8 1 1 9 3 0 25
30 20
64 00
1 6.5 5 3 4 1 6.5 5 2 5

7
25.2
17.0
1.6 6 8 2
1 3 9 6 5 6 6
67
8 2
2 5.2 7 1 6 2 5.2 7 1 2
1 6 1 1 2
8 8 2 2 24
26
1 2

1 8 0 2 4 1 7 9 2 9
1 4 5 2 4 22 1 1 4 3 9
20 39
24 29
1 7.3 5 0 2 1 7.3 5 1 0

8
24.0
17.9

1 6 6 6 0 1 7 6 5 6
7 7 7 4 80 1 6 8 2 6
86 26
60 56
1 7.8 8 8 0 1 7 8 8 7 0

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Moon

2

4
25.5
15.4
1.6 8 8 0
1 2 3 3 6 3 4
3 2
8 0
2 5 4 5 4 6

1 6 4 1 2
1 1 6 8 4 8 1
7 8
1 2
1 5 4 7 3 1

5
25.6
16.0
1.6 6 3 0
1 1 2 5 8 6 0
6 2
3 0
2 5 5 3 9 0
1 7 5 7 8
1 2 9 7 0
7 0
7 8
2 5 5 3 9 2

2
5.4
16.5
1.6 1 2 2
1 1 4 6 4 6 1
5 8
2 2
2 5 4 6 6 1
1 6 0 9 0
1 0 7 8 0 5 5
5 0
9 0
2 5 4 6 6 5

1 6 4 6 4
1 6 4 0 0
1 6 4 3 1
1 1 9 3 0 2 5
3 0
2 0
6 4
0 0
1 6 5 5 3 4
1 6 5 5 2 5

I
25.0
17.0
1.6 6 8 2
1 3 9 6 5 6 6
6 7
8 2
2 5 2 7 1 6
1 6 1 1 2
8 8 2 2 2 4
2 8
1 2
2 5 2 7 1 2

8
15.0
17.3
1 8 0 2 4
1 4 5 2 4 2 2
2 0
2 4
1 7 3 5 0 2
1 7 9 2 9
1 1 4 3 9
3 9
2 9
1 7 3 5 1 0

9
24.0
17.9
1.6 6 6 0
7 7 7 4 8 0
8 6
6 0
1 7 8 8 8 0
1 7 6 5 6
1 6 8 2 6
2 6
5 6
1 7 8 8 7 0

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Date Oct. 6/1917

Times Etc

Exp to Stars	5	48	"	6	0.0	"
" " Moon	5	53	30.1	5	53	30.4
Clock slow		0	49.6			
H. Sid. Time	5	54	19.85			$\theta = -0^{\circ} 39^m$
H. Long	4	44	31.05			
G. Sid. Time	10	38	50.90			
" " " M.N	12	58	18.02			
Interval	21	40	32.88			
Red		03	33.06			
G. M. T	21	36	59.82			$21^h 6166$

Trans. Mont. Alman.			R. A.			Dec.
Moon	21	06	3.1	33.10	+23	05 13.1
Motion 1 ^m				2.2362		-44.7
Motion 36 ^m 997		01	22.73		-02	45.4
Tabular Place	06	32	55.83	+23	02	27.7

$$934'' = 14.7$$

Means age 21d

$$\begin{aligned} q &= -502 \\ &+ 24.0 \\ &- 478.0 \end{aligned}$$

Parallax	55	40.6
Semi-dian	15	21.9
R		9 11.9
Aug		14.0
Int 5		-03
R		9 25.6
R		1.9841
a R		- 949
(+a) R		1.8892
R2		3.5691

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Rate Oct 6/1917

Times Etc.

Exp to Stars	5	48		6	0.0	
" " Moon	5	53	30.1	5	53	30.4
Clock slow		0	49.6			
H Sid Time	5	54	19.85			$\theta = -0^{\circ} 39^m$
H Long	4	44	31.05			
G Sid Time	10	38	50.90			
" " " M.N	12	58	18.02			
Interval	21	40	32.88			
Ad		03	33.06			
G. M. T	21	36	59.82			$21^h 6166^s$

From Naut Alman.	R. A	Dec.
Moon 21 06 31	33.10	+23 05 13.1
Motion 1 ^m	2.2362	-44.71
Motion 36 ^m 999	01 22.73	-02 45.4
Tabular Place 06 32	55.83	+23 02 27.7

$$934'' = 14.7$$

Moon age 21d

$$\begin{aligned} q &= -502 \\ &+ 24.0 \\ &= -478.0 \end{aligned}$$

Parallax	55	40.6
Semi-diam	15	11.9
R		9 11.9
any		14.0
Int 5		-03
R		9 25.6
R		1 98.41
a R		- 9.49
(1+a) R		1 88.92
R ²		3.56 91

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Plate Constants.

4

X	12.7874	26.4070	34.7138
S	12.2812	26.5990	35.3148
	+5062	-1920	-6010

y	12.5085	23.5448	17.5481
γ	12.7432	24.3191	18.0099
	-.2347	-.7743	-.4618

X-S	+500X	+13.3y	+2X	-11645
+5062	+6394 = 11456	+164 = 11620	+25 = 11645	
-.1920	+13204 = 11284	+308 = 11592	+53 = 11645	
-6010	+17357 = 11347	+230 = 11577	+69 = 11646	
23.6498	+11825	+214	47 = 23.6939	

y-γ	+500y	-12.4X	+4.2y	-3799
+.2347	+6254 = 3907	-159 = 3748	+52 = 3800	
-.7743	+11772 = 4029	-328 = 3701	+98 = 3799	
-4618	+8774 = 4156	-431 = 3725	+74 = 3799	
16.0311	+8016	-293	+67 = 16.4302	

Tables	a = -1.0	l = -1.0	a-l = 0.0	t+d = 0.0
	-502.0	-504.2	+2.2	-0.9
	-501.0	-503.2	+2.2	-0.9

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Plate Constants.

4

$$\begin{array}{r}
 x \quad 12.7874 \\
 S \quad 12.2812 \\
 \hline
 + 5062 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 264070 \\
 265990 \\
 \hline
 - .1920 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 347138 \\
 353148 \\
 \hline
 - .6010 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 y \quad 12.5085 \\
 \gamma \quad 12.7432 \\
 \hline
 - .2347 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 24.5448 \\
 24.3191 \\
 \hline
 - .7743 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 17.5481 \\
 18.0099 \\
 \hline
 - .4618 \\
 \hline
 \end{array}$$

$$\begin{array}{l}
 x-S \quad +500x \\
 +5062 + 6394 = 11456 \quad + 13.3y \quad + 2x \quad -11645 \\
 -1920 + 13204 = 11284 \quad + 164 = 11620 \quad + 25 = 11645 \\
 -6010 + 17357 = 11347 \quad + 308 = 11592 \quad + 53 = 11645 \\
 23.6498 + 11825 \quad + 230 = 11577 \quad + 69 = 11646 \\
 \quad \quad \quad + 214 \quad \quad \quad 47 = 23.6939
 \end{array}$$

$$\begin{array}{l}
 y-\gamma \quad +500y \\
 +2347 + 6254 = 3907 \quad - 12.4x \quad + 42y \quad -3799 \\
 -7743 + 11772 = 4029 \quad - 15.9 = 3748 \quad + 52 = 3800 \\
 -4618 + 8774 = 4156 \quad - 328 = 3701 \quad + 98 = 3799 \\
 16.0311 + 8016 \quad - 431 = 3725 \quad + 74 = 3799 \\
 \quad \quad \quad - 293 \quad \quad \quad + 67 = 16.4302
 \end{array}$$

$$\begin{array}{l}
 \text{Tables} \quad a = -1.0 \quad b = -1.0 \quad a-b = -0.0 \quad A+d = 0.0 \\
 \quad \quad \quad -5.02.0 \quad -5.04.2 \quad \quad \quad + 2.2 \quad \quad \quad -0.9
 \end{array}$$

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Mean Center

 $\Delta R = 1$ $\Delta - C$

	X					
1	24.0000	+ 0.3520	0.1239	3.5660	- 131	
2	25.0000	+ 1.3520	1.8279	3.5726	+ 25	
3	25.2340	+ 1.5860	2.5154	3.5784	+ 93	
4	25.5391	+ 1.8911	3.5763	3.5763	+ 72	
5	25.4663	+ 1.8183	3.3062	3.5787	+ 96	
6	25.2714	+ 1.6234	2.6354	3.5744	+ 33	
7	25.0000	+ 1.3520	1.8279	3.5695	+ 4	
8	24.0000	+ 0.3520	0.1239	3.5708	+ 17	

 $R^2 = 3.5767$ cor $R^2 = 3.5691$

arc.

	y	Δy			
1	14.1758	-1.8552 - 1	3.4421	1.69	
2	14.7100	-1.3210 - 1	1.7447	1.34	
3	15.0000	-1.0310 - 0	1.0630	1.23	
4	16.0310	0.0000 0	0.0000	90	
5	16.5530	+0.5220 + 0	0.2725	74	
6	17.0000	+0.9690 + 0	0.9390	59	
7	17.3506	+1.3196 + 1	1.7416	46	
8	17.8875	+1.8565 + 1	3.4469	11	

2.6498

Range 158

X = 24 y = 14.1758

17.8875

32.0633

y₀ 16.0317

X = 25 y = 14.7100

17.3506

32.0606

y₀ 16.0303

X max 25.5391

corr. R 1.8892

X₀ 23.6479

Mean Center

X₀ 23.6480y₀ 16.0310

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Moon Center

 $\triangle ABC$

0 - C

5-

	X	Δx	0-C
1	24.0000	+ 0.3520	0.1239
2	25.0000	+ 1.3520	3.5660
3	25.2340	+ 1.5860	- 3.7
4	25.5391	+ 1.8911	+ 3.5
5	25.4663	+ 1.8183	+ 9.3
6	25.2714	+ 1.6234	+ 7.2
7	25.0000	+ 1.3520	+ 4.6
8	24.0000	+ 0.3520	+ 5.3
			+ 7.4
			+ 1.7

23 5 7 6 7

cor R^2 3.5 6 9 1

авс.

	y	Δy	
1	14.17 58	+1.8 552	-1 3 44 21
2	14.7 2 00	-1.3 2 10	-1 1.7 4 47
3	15.0 0 0 0	-1.0 3 10	-0 1.0 6 30
4	16.0 3 10	0.0 0 00	0 0.0 0 00
5	16.5 5 30	+0.5 2 20	+0 0.2 7 25
6	17.0 0 0 0	+0.9 6 90	+0 0.9 3 90
7	17.3 5 06	+1.3 1 96	+1 1.7 4 16
8	17.8 8 75	+1.8 5 65	+1 3 44 69

Range 158

$$Y = 24$$

4. 14. 17 58

17. 88 75

3 2 0 6 3 3

$\frac{9}{10} \quad 16 \quad 0.317$

$$X = 25$$

72 14. 71 00

17. 35 06

3 2 0 6 0 6

9. 16 03 03

X max

25.5391

Совм. R

1. 8 8 9 2.

X_0 23 64 79

X_0 2 3 6 4 8 0

Moon Center

4 16 0 3 1 0

Formation of Normals

1 - - 0.65
 2 - - 1.78
 3 - - 1.63
 4 0.00
 5 + 0.95
 6 + 1.57
 7 + 1.78
 8 + 0.65
+4.95
-4.06
 +0.89

- 37.4
 - 55.4
 + 27.0
 - 7.6
 + 36.5
 - 37.3
 - 97.2
 - 20.7
+63.5
-255.6
 -192.1
 corr +784.3
 +592.2

+ 199.0
 + 54.0
 - 17.5
 0.0
 + 10.4
 - 22.3
 - 95.0
 - 109.8
+263.4
-244.6
 +18.8
 corr +35.0
 +53.8

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Conditional Equations

6

1	+ 0.35	- 1.86	= - 1.07	- 4	- 4	= - 8	- 99
2	+ 1.35	- 1.32	= - 41	- 16	- 3	= - 19	- 22
3	+ 1.59	- 1.03	= + 17	- 19	- 2	= - 21	+ 38
4	+ 1.89	0.00	= - 4	- 23	0	= - 23	- 19
5	+ 1.82	+ 0.52	= + 20	- 22	+ 1	= - 21	+ 41
6	+ 1.62	+ 0.97	= - 23	- 20	+ 2	= - 18	- 5
7	+ 1.35	+ 1.32	= - 72	- 16	+ 3	= - 13	- 59
8	+ 0.35	+ 1.86	= - 59	- 4	+ 4	= 0	- 59

$$+15.94 + 0.89 = +592.2$$

$$+0.89 + 12.65 = +53.8$$

$$- () - 0.05 = -33.0$$

$$+12.60 = +20.8$$

$$+79 - 263$$

$$\text{ar } 43$$

$$t = +1.65^{\circ}$$

$$+15.94 = +592.2 - 1.5 = +590.7 \quad a = +37.1^{\circ}$$

arc 15-8

$$\frac{p}{n} = .21^{\circ}$$

$$\frac{\Sigma K}{n} = -5.6^{\circ}$$

$$\frac{-5.6}{.21} = -26.7^{\circ}$$

$$\Delta R = -0.3^{\circ}$$

			0-c
+13	-3	= +10	-41
+50	-2	= +48	-13
+59	-2	= +57	+36
+70	0	= +70	+2
+67	+1	= +68	+28
+61	+2	= +63	-10
+50	+2	= +52	-48
+13	+3	= +16	+1

$$-112 + 67$$

$$\text{ar } 22$$

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Conditional Equations

6

O-C

1	+0.35	-1.86	= -1.07	-4	-4	= -8	-9.9
2	+1.35	-1.32	= -4.1	-16	-3	= -19	-2.2
3	+1.59	-1.03	= +1.7	-19	-2	= -21	+3.8
4	+1.89	0.00	= -4	-23	0	= -23	-1.9
5	+1.82	+0.52	= +2.0	-22	+1	= -21	+4.1
6	+1.62	+0.97	= -2.3	-20	+2	= -18	-5
7	+1.35	+1.32	= -7.2	-16	+3	= -13	-5.9
8	+0.35	+1.86	= -5.9	-4	+4	= 0	-5.9

+7.9 -26.3

av 4.3

$$+15.94 +0.89 = +592.2$$

$$+0.89 +12.65 = +53.8$$

$$-1 -0.05 = +33.0$$

$$+12.60 = +20.8$$

$$t = +165$$

$$+15.94 = +592.2 - 1.5 = +590.7$$

$$Q = +37.1$$

Arc 15-8

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

$$\frac{\Sigma K}{n} = -5.6$$

$$\frac{-23}{.21} = -26.7$$

$$\Delta R = -0.3$$

O-C

+13	-3	= +10	-41
+50	-2	= +48	-13
+59	-2	= +57	+36
+70	0	= +70	+2
+67	+1	= +68	+28
+61	+2	= +63	-10
+50	+2	= +52	-48
+13	+2	= +16	+1

-112 + 67

av 22

13717

Mean Mean Position

7

$$\begin{array}{r}
 Y_0 \quad 23.6480^{\circ} \\
 \quad \quad + 18 \\
 \quad \quad 23.6498^{\circ}
 \end{array}$$

$$\begin{array}{r}
 y_0 \quad 16.0310^{\circ} \\
 \quad \quad + 1 \\
 \quad \quad 16.0311^{\circ}
 \end{array}$$

From Plate Constants.

$$\begin{array}{r}
 23.6939 \\
 22. \\
 \hline
 + 1.6939^{\circ}
 \end{array}$$

$$\begin{array}{r}
 16.4302^{\circ} \\
 18. \\
 \hline
 - 1.5698^{\circ}
 \end{array}$$

$$\begin{array}{r}
 \cos \delta_0 \quad 0.22888 \\
 \quad \quad 996489^{\circ} \\
 \quad \quad 8.50724 \\
 \sin \alpha - A \quad 1.75675^{\circ}
 \end{array}$$

$$\begin{array}{r}
 9.6218^{\circ} \\
 0.4578 \\
 7.0534 \\
 7.1330
 \end{array}$$

$$\alpha - A \quad 57.11^{\circ}$$

$$\begin{array}{r}
 \eta_1 \quad +0.0014^{\circ} \\
 \eta_0 \quad -1.5712^{\circ}
 \end{array}$$

$$A = 06 \quad 32 \quad 25.92^{\circ}$$

$$\alpha_0 \quad 06 \quad 33 \quad 23.03^{\circ}$$

$$\text{Red} \quad + 4.12^{\circ}$$

$$\alpha' \quad 06 \quad 33 \quad 27.15^{\circ}$$

$$\begin{array}{r}
 0.19623^{\circ} \\
 7.33115 \\
 2.86508^{\circ} \\
 \delta - \delta_0 \quad -733.0
 \end{array}$$

$$-12 \quad 13.0^{\circ}$$

$$\delta + 22 \quad 55 \quad 55.7^{\circ}$$

$$\delta_0 + 22 \quad 43 \quad 42.7^{\circ}$$

$$\text{Red} \quad -1.7^{\circ}$$

$$\delta' + 22 \quad 43 \quad 41.0^{\circ}$$

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Mean Mean Position

7

γ_0 23.6480
 + 18
 23.6498^v

γ_0 16.0310
 + 1
 16.0311^v

From Plate Constants.

23.6939
 22.
 + 1.6989^v

16.4302^v
 18.
 - 1.5698^v

α_0 0.22888
 9.96487^v
 8.50724
 Sin $\alpha - A$ 1.75675^v

9.6218^v
 0.4588
 7.0534
 + 570.77.1330^v

$\alpha - A$ 57.16^v

η_1 +0.0014^v
 η_0 -1.5712^v

$A = 06 \ 32 \ 25.92$ ^v

$\alpha_0 \ 06 \ 33 \ 23.03$ ^v

Red + 4.12

$\alpha' \ 06 \ 33 \ 27.15$ ^v

0.19623^v
 7.33115^v
 2.86508^v

$S - R$ - 733.0

- 12 13.0^v

$\delta + 22 \ 55 \ 55.7$ ^v

$\delta_0 + 22 \ 43 \ 42.7$ ^v

Red - 1.7

$\delta' + 22 \ 43 \ 41.0$ ^v

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Lunar Parallax

8

α'	0 6 33	27.15"
θ	0 5 54	19.85"
$\theta - \alpha'$	- 39	07.30"
$=$	- 90 46'	49.50"
$\frac{1}{2}\alpha\alpha'$	- 3	48.10"
$\theta - \frac{1}{2}\alpha\alpha'$	- 90 43	1.40"

$\cos \frac{1}{2}\alpha\alpha'$	9.95727
$\sec \theta - \frac{1}{2}\alpha\alpha'$	0.00000"
$\tan \gamma$	0.00628"
	9.96355"

γ	42° 35'	55.2"
δ'	22 43	41.0"
$\gamma - \delta'$	19° 52'	14.2"
	9.82640	
$\sin \pi$	8.20938"	
$\sin \gamma - \delta'$	9.53134"	
$\csc \gamma$	0.16950"	
$\sin \delta - \delta'$	7.73662"	

$\delta - \delta'$	18	44.7"
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$\delta + 23$	0 2	25.7"
$\phi \delta + 23$	0 2	27.7"
$\delta - c$	-	2.0"

corr	+ 0.3"
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2nd Arit. Ref. 0.0

$\delta + 23$	0.2	26.0
---------------	-----	------

$\delta - c$	-	1.7
--------------	---	-----

π	55	40.6
	9.86913	
$\sin \pi$	8.20938"	
$\theta - \alpha'$	9.23010"	
$\sec \delta$	0.03612	
$\sin \alpha \alpha'$	7.34473"	
$\alpha - \alpha'$	- 7	36.20"
$=$	-	36.41"

α	6 32	56.74"
$\phi \alpha$	6 32	55.83"
$\alpha - c$	-	0.91"

corr	- 0.02"
---------------	---------

α	6 32	56.72
----------	------	-------

$\alpha - c$	-	0.89
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13717

Lunar Parallax

8

x'	0 6 33	27.15"	π	55	40.6
θ	05	54	19.85"		
$4-x'$	-39	07.30"		9 86 913	
$=$	-90 46	49.50"	$\sin \pi$	8.20938"	
$\frac{1}{2}x \cdot x'$	-3	48.10"	$\theta - x'$	9.23010"	
$\theta - x' - \frac{1}{2}x \cdot x'$	-90 43	1.40"	$\sec \delta$	0.03612	
			$\sin x \cdot x'$	7.34473"	
	9 95 727				
$\cos \frac{1}{2}x \cdot x'$	0 0 0 0 0		$x \cdot x'$	-7	36.20"
$\sec \theta - x' - \frac{1}{2}x \cdot x'$	0 0 0 6 28"		$=$	-	36.41"
$\tan y$	9.96355"				
y	42° 35'	55.2"			
δ'	22 43	41.0"			
$y - \delta'$	19° 52'	14.2"			
	9.82640				
$\sin \pi$	8.20938"				
$\sin y - \delta'$	9.58134"				
$\csc y$	0.16950"				
$\sin \delta - \delta'$	7.73662"				
$\delta - \delta'$	18	44.7"			
$\delta + 23$	0 2	25.7"	α	6 32	56.74
$\sin \delta + 23$	0 2	27.7"	$\sin \alpha$	6 32	55.83"
$\delta - \epsilon$		-2.0"	$\delta - \epsilon$		+0.91
$\cos \delta$		+0.3	$\cos \delta$		-0.02
2nd Obs. Ref.		0.0			
$\delta + 23$	0 2	26.0	α	6 32	56.7
$\delta - \epsilon$		-1.7	$\delta - \epsilon$		+0.8

13935

Jan 29

11

1	19563	16943
11.8	115357	1496057
12	39	54
	63	43
	11.8026	11.8014

18120	16540
16460	8192
68	92
20	40
12.1656	12.1652

2	16106	16118
20.2	14642	756870
28.2	42	72
	06	18
	20.1464	20.1452

17420	16810
14148	1009091
42	92
30	10
28.3285	28.3281

3	17976	16336
32.2	16230	808483
15.2	30	82
	76	35
	32.1746	32.1742

17340	16322
14950	869496
58	98
40	22
15.2386	15.2374

Moon.

1		
24.0		
14.9		
2	17281	17722
24.6	11221	1378086
160	21	92
	81	22
	24.6060	24.6064

16912	17224
9082	15044
78	44
12	24
14.7832	14.7820

3	17322	17282
24.6	11060	1352826
16.4	60	24
	22	82
	24.6238	24.6244

13935

14

	19563	16943
8	11535 ²⁷	14960 ⁵⁷
21	39	54
	63	43
	<u>11.8026</u>	<u>11.8014</u>

18120	16540
16460 ⁶⁴	8192
68	92
20	40
<u>12.1656</u>	<u>12.1652</u>

	16106	16118
2	14642	7568 ⁷⁰
2	42	72
	06	18
	<u>20.1464</u>	<u>20.1452</u>

17430	16810
14148 ⁴⁵	10090 ⁹
42	92
30	10
<u>28.3285</u>	<u>28.3281</u>

	17976	16335
2	16230	8084 ⁸³
2	30	82
	76	35
	<u>32.1746</u>	<u>32.1748</u>

17340	16322
14950 ⁵⁴	8694 ⁹
58	98
40	22
<u>15.2386</u>	<u>15.2374</u>

Moon.

0	16912	17224
9	9082	15044
	78 ⁸⁰	44
	12	24
	<u>14.7832</u>	<u>14.7720</u>

	17281	17722
0	11221	13880 ⁶⁶
0	21	92
	81	22
	<u>24.6060</u>	<u>24.6064</u>

	17322	17282
1	11060	13528 ²⁶
1	60	24
	22	82
	<u>24.6238</u>	<u>24.6244</u>

13935

12

4	16338	17828	
34.4	11610.4	1255.0	48
17.0	18	46	
	38	28	
	<u>24.4724</u>	<u>24.4720</u>	

5

24.

17.6

6

23.0

18.2

7

22.6

18.8

8

22

18.1

1665.2	16174
9898.02	13018
06	18
52	74
<u>17.6850</u>	<u>17.6844</u>

16042	16022
14070	7998
70	98
42	22
<u>18.1972</u>	<u>18.1976</u>

16420	16162
14058.56	8522
54	22
20	62
<u>18.2364</u>	<u>18.2360</u>

16753	16042
15420.18	7378.75
16	72
53	42
<u>18.1335</u>	<u>18.1333</u>

13935

12

4	16338	17828	
54.4	11610.4	1255.0	48
17.0	18	46	
	38	28	
	<u>24.4724</u>	<u>24.4720</u>	

-
 4.
 7.6

30
 82

2.6
 18.8

8/
 22
 18.1

1665.2	16174
9898.2	13018
06	18
52	74
<u>17.6850</u>	<u>17.6844</u>
16042	16022
14070	7998
70	58
42	22
<u>18.1972</u>	<u>18.1976</u>
16420	16162
14058.56	85.22
54	22
20	62
<u>18.2364</u>	<u>18.2360</u>
1675.3	16042
15420.18	7378.75
16	72
53	42
<u>18.1335</u>	<u>18.1333</u>

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Times Etc.

13

Date Oct. 30, 1917

Exp. & Stars 05 48

6 00

Moon 05 54 20.4

5 54 20.7

Clock Slow 01 20.4

H. Sid Time 5 55 40.95

" Yang 4 44 31.05

 $\theta = +2^h 42^m$

G. S. T. 10 40 12.00

" " " M. N. 14 32 55.31

Interval 20 07 16.69

Red 03 17.78

G. M. T. 20 03 58.91

20^h 06.636

From Naut. Almanac

R.A.

Dec.

Moon 20^h 3 12

50.37 +21 24 49.1

Motion 1^h

2.4782

+ 7.089

3.9818

9.87

28.2

Tabular Place 3 13

00.24

21 25 17.3

934" = 12"

Moon Age 15^d

a = -504.5

+24.0

-480.5

Parallax

5.9 0.6

Semi-diameter

1.16 06.8

R

966.3

Aug

12.8

Semi. 3

-0.5

R

978.6

R

209.77

= a R

-1008

(1+a) R

1.9969

R²

3.9876

13935

Zinner Etc.

13

Date Oct. 30, 1917

Exp h Stars	05	48		6	00	
" " Moon	05	54	20.4	5	54	20.7
Clock Slow		01	20.4			

H. Sid Time	5	55	40.95		
" " Young	4	44	31.05		$\theta = +2^h 42$
G. S. T	10	40	12.00		
" " " M. N	14	32	55.31		
Interval	20	07	16.69		
Red		03	17.78		
G. M. T.	20	03	58.91		$20^h 06.636$

From Naut Alman	RA	Dec.
Moon 20 ^h 3 12	50.37	+21 24 49.1
Motion 1 ^h	24782	7.089
" 3.9818	987	28.2
Tabular Place 3 13	00.24	21 25 17.3

934" = 12

Moon Age 15^d

$$\begin{array}{r}
 A = -504.5 \\
 + 24.0 \\
 \hline
 -480.5
 \end{array}$$

Parallax	59	0.6
Semi-diam	16	06.3
R		966.3
Aug		12.8
Dec. 3		-0.5
R		978.6
R		209.77
a R		-1001
11+a R		19969
R ²		39876

S_0	π_0	ΔS	-3.35	-2.1	$+3$
-10.65	-6.13	-38	$+35 = -3$	$+0 = -3$	
-1.81	$+10.85$	-6	$+4 = -2$	$-1 = -3$	
$+10.75$	-3.01	$+31$	$-36 = -5$	$+1 = -4$	
m	$+0.73$	-1.86	-2	$+4 = +5$	$= +0.02$

$\Delta \eta$	-3.27	-25	$+3$
-24	$+19 = -5$	$+2 = -3$	
$+32$	$-35 = -3$	$+0 = -3$	
-70	$+10 = 0$	$-2 = -2$	
	$+6$	$-0 = +9$	$= +0.4$

13935

Standard Coordinates

14

Cape No. 459 Aug 67

Cape No 468 Aug 69

Cape No 489 Aug 3:1

C	03	03	35.94	03	08	27.77	03	15	27.13
q			36.02			27.85			27.13
E			36.02			27.83			27.14
m	03	03	35.99	03	08	27.82	03	15	27.13
Prec			58.35			59.18			58.78
A	03	04	34.34	03	09	27.00	3	16	25.91
A	03	10	28.00	03	10	28.00	3	10	28.00
A-A	-	5	53.66	-	1	01.00	+	35	57.91
Sum			-353.62			-61.00			+357.91
log	2.54854	m		1.78533	m		2.55377		
log	9.97175			9.96516			9.97059		
"	1.02753	m		0.25773	m		1.03160		
S ₀	-106544			-18102			+107548		
S	-	40		-	5		+	32	
S	11.3416			201893			32.7580		
X	11.8020			201438			32.1747		
X-S	+4604			-0435			-	5833	
C	+20	22	44.0	22	34	48.6	20	47	11.8
q			43.9			49.0			12.0
E			43.6			49.6			12.0
m	2.0	22	43.8	22	34	49.1	20	47	11.9
Prec		+03	57.1		+03	51.4		+03	43.2
δ	20	26	40.9	22	38	40.5	20	50	55.1
δ	21	14	19.0	21	14	19.0	21	14	19.0
δ-δ		-47	38.1		1	24	21.5	-	23
Sum			-2858.3			+5062.5			1403.9
log	3.45610			3.70436			3.14734		
"	078725	m		1.03351			0.47849		
tan δ	9.5715			7.6203			9.3807		
S ₂	2.0551			0.5155			2.0632		
log n	8.6800			7.1892			8.6973		
n ₀	-6.1270			+10.8520			-3.0095		
n ₁	+	479		+	15		+	498	
n	11.9209			28.8535			15.0403		
y	12.1654			28.3283			15.2380		
y-n	+2445			-5252			+	1977	

13935			Standard Coordinates						14		
Cape No. 45° 9' 4" 6.7			Cape No. 46° 8' 4" 6.9			Cape No. 48° 9' 4" 5.1					
C	03	03	35.94	03	08	27.77	03	15	27.13		
γ			36.02			27.85			27.13		
ε			36.02			27.83			27.14		
m	03	03	35.99	03	08	27.82	03	15	27.13		
Pres			58.35			59.18			58.78		
α	03	04	34.34	03	09	27.00	3	16	25.91		
A	03	10	28.00	03	10	28.00	3	10	28.0		
α-A		5	53.66		-1	01.00		+5	57.91		
Sm		-3	53.62	0		-61.00		+3	57.91		
log	2.54854			1.78533			2.55377				
cos δ	997.175			996.516			997.059				
" δ	1.02753			0.25773			1.03160				
S ₀	-10.6544			-1.8102			+10.7548				
δ	-40			-5			+32				
S	11.3416			20.1893			32.7580				
A	11.8020			20.1458			32.1747				
X-S	+4604			-0.435			-5833				
C	+20	22	43.0	22	34	48.6	20	47	11.8		
γ			43.9			49.0			12.0		
ε			43.6			49.6			12.0		
m	2.0	22	43.8	22	34	49.1	20	47	11.9		
Pres		+03	57.1		+03	51.4		+03	43.2		
δ	20	26	40.9	22	38	40.5	20	50	55.1		
θ	21	14	19.0	21	14	19.0	21	14	19.0		
δ-θ		-47	38.1		1	24	21.5		-23	23.9	
tan "		-28	58.3		+50	62.5		-140	3.9		
log "	3.45610			3.70436			3.14734				
" n ₀	0.78725			1.03551			0.47449				
tan δ	9.5715			9.6203			9.5807				
δ	2.0550			0.5155			2.0632				
log n ₁	8.6800			7.4892			8.6973				
n ₀	-61270			+108520			-30095				
n ₁	+479			+15			+498				
n	119209			28.8535			150403				
γ	12.1654			28.3283			15.2380				
γ-n	+2.445			-5252			+1977				

+
-
2
+
-
+
/

13935

15

$$\begin{array}{r}
 20.1458 \quad 28.3283 \quad 03 \quad 09 \quad 27.00 \quad 22 \quad 38 \quad 40.5 \\
 22. \quad 18 \quad 01 \quad 01.19 \quad 01 \quad 24 \quad 20.9 \\
 + 1.8542 \quad 10.3283 \\
 \quad 33 \quad 490 \\
 + 61.19 \quad - 5060.9
 \end{array}$$

Plate Center

$$A = .03 \quad 10 \quad 28.19$$

$$B = -21 \quad 14 \quad 19.6$$

$$\begin{array}{l}
 X-S \quad + 500 Y \quad + 51.2 Y \quad + 45 X - 11178 \\
 + 4004 + 59.015 = 10505 + 621 = 11126 + 53 = 11179 \\
 - 0435 + 10073 = 9638 + 1450 = 11088 + 90 = 11178 \\
 - 5833 + 16087 = 10254 + 780 = 11034 + 144 = 11178 \\
 22.6262 + 11313 = \quad + 831 \quad + 102 = 22730
 \end{array}$$

$$\begin{array}{l}
 Y-\eta \quad + 500 Y \quad - 53 X \quad + 3.7 Y \quad - 7948 \\
 + 2445 + 6083 = 8528 - 625 = 7903 + 45 = 7948 \\
 - 5252 + 14164 = 8912 - 1068 = 7844 + 105 = 7949 \\
 + 1977 + 7619 = 9596 - 1705 = 7891 + 57 = 7948 \\
 16.2371 + 8118 = \quad - 1199 \quad + 60 = 16.1402
 \end{array}$$

$$\begin{array}{l}
 \text{Tables} \quad a = -1.2 \quad b = -1.1 \quad a-b = -0.1 \quad b+d = -1.8 \\
 \text{cts} \quad -504.5 \quad -503.7 \quad -0.8 \quad = +1.8 \\
 \quad -503.3 \quad -502.6 \quad -0.7 \quad +3.6
 \end{array}$$

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15

20 145.8	28.3283	03	09	27.00	22	38	40.5
22.	18.		01	01.19	01	24	20.9
+ 1.8542	10.3283						
33	490						
+ 61.19	- 5060.9						

Plate Center

$$A = 03 \quad 10 \quad 28.19$$

$$B = +21 \quad 14 \quad 19.6$$

$x - S$	$+ 500 x$	$+ 51.2 y$	$+ 4.5 x - 11178$
$+ 40.04$	$+ 59.01$	$= 105.05 + 621$	$= 111.26 + 53 = 111.7$
$- 0.435$	$+ 100.73$	$= 96.38 + 145.0$	$= 110.88 + 90 = 111.7$
$- 5.833$	$+ 160.87$	$= 102.54 + 78.0$	$= 110.34 + 144 = 111.7$
22.6262	$+ 113.13$	$+ 831$	$+ 102 = 2273$

$y - \eta$	$+ 500 y$	$- 53 x$	$+ 3.7 y - 7948$
$- 2445$	$+ 6083$	$= 85.28 - 625$	$= 79.03 + 45 = 79.48$
525.2	$+ 141.69$	$= 84.12 - 1068$	$= 72.44 + 105 = 79.49$
$- 1977$	$+ 76.19$	$= 95.96 - 1705$	$= 78.91 + 57 = 79.48$
16.2371	$+ 81.18$	$- 1199$	$+ 60 = 161402$

Tables	$a = -1.2$	$b = -1.2$	$a - b = 0.1$	$b + d = -1.8$
Obs	-504.5	-503.7	-0.8	$+1.8$

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Mean Center

16

O-C

1	24.0000	+1.8750	-3	1.8898	3.9987	+	111
2	24.6062	+1.9812	-0	3.9252	3.9814	-	62
3	24.6241	+1.9991	0	3.9964	3.9964	+	88
4	24.4722	+1.8472	+1	3.4125	3.9947	+	71
5	24.0000	+1.3750	+3	1.8914	3.9901	+	25
6	23.0000	+0.3750	+4	0.1409	3.9841	-	35
7	22.6250	0.0000	+4	0.0000	3.9968	+	92
8	22.0000	-0.6250	+4	0.3901	3.9864	-	12

R2

39876

6.463

arc.

1	14.7848	-1.4522	-0	2.1089	137
2	16.0000	-0.2370	0	0.0562	97
3	16.2370	0.0000	0	0.0000	90°
4	17.0000	+0.7630		0.5822	68
5	17.6857	+1.4487		2.0987	44
6	18.1974	+1.9604		3.8432	11
7	18.2362	+1.9992		3.9968	0
8	18.1334	+1.8964		3.5963	-18

2823

Range 155

x = 24 y = 14.7848 (mean pt.)

17.6857

32.4705

y₀ 16.2352

y max 18.2362

R 2.0010

Cum R 1.9969

y max 24.6241

22.6231

x₀ 22.6250

Mean Center

y₀ 16.2370

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Moon Center

16

O-C

1	24.0000	+1.3750	-3	1.8898	3.9987	+	1.11
2	24.6062	+1.9812	-0	3.9252	3.9814	-	6.2
3	24.6241	+1.9991	0	3.9964	3.9964	+	8.8
4	24.4722	+1.8472	+1	3.4125	3.9947	+	7.1
5	24.0000	+1.3750	+3	1.8914	3.9901	+	2.5
6	23.0000	+0.3750	+4	0.1409	3.9841	-	3.3
7	22.6250	0.0000	+4	0.0000	3.9968	+	9.2
8	22.0000	-0.6250	+4	0.3901	3.9864	-	1.2
				R ²	3.9876		

Arc

1	14.7848	-1.4522	-0	2.1089	1.37
2	16.0000	-0.2370	0	0.0562	97
3	16.2370	0.0000	0	0.0000	90°
4	17.0000	+0.7630		0.5822	68
5	17.6857	+1.4487		2.0987	44
6	18.1974	+1.9604		3.8432	11
7	18.2362	+1.9992		3.9968	0
8	18.1334	+1.8964		3.5963	18

Range 1.55

$$x = 24 \quad y = 14.7848 \quad (\text{from } y)$$

$$17.6857$$

$$32.4785$$

$$y_0 = 16.2352$$

$$y_{\max} = 18.2362$$

$$R = 2.0010$$

$$\text{Cum } R = 1.9969$$

$$x_{\max} = 24.6241$$

$$22.6231$$

Moon Center

$$x_0 = 22.6250$$

$$y_0 = 16.2370$$

$$\begin{array}{r}
 1 \quad - 1.99 \\
 2 \quad - 0.47 \\
 3 \quad 000 \\
 4 \quad + 1.41 \\
 5 \quad + 1.99 \\
 6 \quad + 0.73 \\
 7 \quad 000 \\
 8 \quad - 1.18 \\
 \hline
 + 4.13 \\
 - 3.64 \\
 \hline
 + 0.49
 \end{array}$$

$$\begin{array}{r}
 + 152.0 \\
 - 122.8 \\
 + 176.0 \\
 + 131.3 \\
 + 34.2 \\
 - 13.0 \\
 0.0 \\
 + 7.4 \\
 \hline
 + 500.9 \\
 - 135.8 \\
 \hline
 + 365.1
 \end{array}$$

$$\begin{array}{r}
 - 160.8 \\
 + 14.9 \\
 00 \\
 + 54.0 \\
 + 34.5 \\
 - 68.6 \\
 + 184.0 \\
 - 22.8 \\
 \hline
 + 287.4 \\
 - 252.2 \\
 \hline
 + 35.2
 \end{array}$$

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Conditional Equations.

0-c

17

1	+ 1.37	- 1.45	= + 111	+ 32	- 2	= + 30	+ 81
2	+ 1.98	- 0.24	= - 62	+ 46	- 0	= + 46	- 108
3	+ 2.00	0.00	= + 88	+ 46	+ 0	= + 46	+ 42
4	+ 1.85	+ 0.76	= + 71	+ 43	+ 1	= + 44	+ 27
5	+ 1.37	+ 1.45	= + 25	+ 32	+ 2	= + 34	- 9
6	+ 0.37	+ 1.96	= - 35	+ 9	+ 3	= + 12	- 47
7	0.00	+ 2.00	= + 92	+ 0	+ 3	= + 3	+ 89
8	- 0.62	+ 1.90	= - 12	- 14	+ 3	= - 11	- 1

+ 239 - 165
ar. 50

$$+ 15.65 + 0.49 = + 365.1$$

$$+ 0.49 + 16.28 = + 35.2$$

$$- () - 10.01 = - 11.4$$

$$+ 16.27 = + 23.8$$

$$L = + 1.5$$

$$+ 15.65 = + 365.1 - 0.7 = + 364.4$$

$$a. + 23.2$$

arc 15.5

$$\frac{P}{m} 19^{\circ}$$

$$\frac{K}{m} = + 9.3^{\circ}$$

$$+ \frac{9.3}{19} = + 490^{\circ}$$

$$\Delta R = + 0.6^{\circ}$$

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Conditional Equations.

0 - C

17

1	+ 1.37	- 1.45	= + 1.11	+ 32	- 2	= + 30	+ 81
2	+ 1.98	- 0.24	= - 6.2	+ 46	- 0	= + 46	- 108
3	+ 2.00	0.00	= + 8.8	+ 46	+ 0	= + 46	+ 42
4	+ 1.85	+ 0.76	= + 7.1	+ 43	+ 1	= + 44	+ 27
5	+ 1.37	+ 1.45	= + 2.5	+ 32	+ 2	= + 34	- 9
6	+ 0.37	+ 1.46	= - 3.5	+ 9	+ 3	= + 1.2	- 47
7	0.00	+ 2.00	= + 9.2	+ 0	+ 3	= + 3	+ 89
✓	+ 0.62	+ 1.90	= - 1.2	- 14	+ 3	= - 11	- 1

+ 239 - 165
 av. 5.0

$$+ 15.65 + 0.49 = + 365.1$$

$$+ 0.49 + 16.28 = + 35.2$$

$$- 1 - 10.01 = - 11.4$$

$$+ 16.27 = + 23.8$$

$$L: + 1.5$$

$$+ 15.65 = + 365.1 - 0.7 = + 364.4$$

$$L: + 23.2$$

arc 15.5

$$\frac{P}{h} = 19$$

$$\frac{8.5}{19} = + 9.3$$

$$+ \frac{9.3}{19} = + 49.0$$

$$\Delta R = + 0.6$$

13935

Moon's Mean Position

18

$$\begin{array}{r} 22.6250 \\ + 12 \\ \hline 22.6262 \end{array}$$

$$\begin{array}{r} 16.2370 \\ + 1 \\ \hline 16.2371 \end{array}$$

From Plate Constants.

$$\begin{array}{r} 22.7330 \\ 22. \\ \hline + 0.7330 \end{array}$$

$$\begin{array}{r} 16.1402 \\ 18. \\ \hline - 1.8598 \end{array}$$

$$\begin{array}{r} 9.86510 \\ 9.97014 \\ 8.50724 \\ 1.38772 \end{array}$$

$$\begin{array}{r} 9.5843 \\ 9.7302 \\ 7.0534 \\ 6.3679 \end{array}$$

$$+ 24.42$$

$$\begin{array}{r} + 00002 \\ 70 - 1.8600 \end{array}$$

$$\Delta = 0.3 \quad 10 \quad 28.00$$

$$\begin{array}{r} 0.26951 \\ 7.33115 \\ 2.93836 \end{array}$$

$$\alpha_0 \quad 0.3 \quad 10 \quad 52.42$$

$$2.93836$$

$$\text{Red} \quad + 5.31$$

$$- 867.7$$

$$\delta \quad 0.3 \quad 10 \quad 57.73$$

$$- 14 \quad 27.7$$

$$\theta = +21 \quad 14 \quad 19.0$$

$$\delta_0 + 20 \quad 59 \quad 51.3$$

$$\text{Red} \quad + 21.1$$

$$\delta \quad + 21 \quad 00 \quad 12.4$$

13935

Moon's Mean Position

18

$$\begin{array}{r} 22.6250 \\ + 12 \\ \hline 22.6262 \end{array}$$

$$\begin{array}{r} 16.2370 \\ + 1 \\ \hline 16.2371 \end{array}$$

From Plate Constants.

$$\begin{array}{r} 22.7330 \\ 22 \\ \hline + 0.7330 \end{array}$$

$$\begin{array}{r} 16.1402 \\ 18 \\ \hline - 1.8598 \end{array}$$

$$\begin{array}{r} 9.86510 \\ 9.97019 \\ 8.50724 \\ 1.38772 \end{array}$$

$$\begin{array}{r} 9.5843 \\ 9.7302 \\ 7.0534 \\ 6.3679 \end{array}$$

$$+ 2442$$

$$\begin{array}{r} + 00002 \\ 70 \\ - 1.8600 \end{array}$$

$$A : 03 \quad 10 \quad 28.00$$

$$\alpha_0 \quad 03 \quad 10 \quad 52.42$$

$$\text{Red} \quad + 5.31$$

$$\alpha' \quad 03 \quad 10 \quad 57.73$$

$$\begin{array}{r} 0.26951 \\ 7.33115 \\ 2.93836 \end{array}$$

$$- 867.7$$

$$- 14 \quad 27.7$$

$$\delta = +21 \quad 14 \quad 19.0$$

$$\delta_0 + 20 \quad 59 \quad 51.3$$

$$\text{Red} \quad + 21.1$$

$$\delta' + 21 \quad 00 \quad 12.4$$

$$\begin{array}{r}
 1 \quad 03 \quad 18 \quad 30.136 \\
 \underline{23.335} \\
 + 6.801 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 + 49 \quad 34 \quad 17.62 \\
 \underline{0.45} \\
 + 17.17 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 2 \quad 03 \quad 20 \quad 25.637 \\
 \underline{20.663} \\
 + 4.974 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 8 \quad 44 \quad 36.54 \\
 \underline{15.33} \\
 + 21.21 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 3 \quad 03 \quad 26 \quad 22.363 \\
 \underline{17.304} \\
 + 5.059 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 12 \quad 39 \quad 31.54 \\
 \underline{11.11} \\
 + 20.43 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 5.059 \\
 \underline{4.974} \\
 0.085
 \end{array}$$

$$\begin{array}{r}
 6.801 \\
 \underline{4.945} \\
 1.806
 \end{array}$$

$$5.7 \quad 0.78$$

$$45$$

$$+0$$

$$35$$

$$30$$

$$25$$

$$20$$

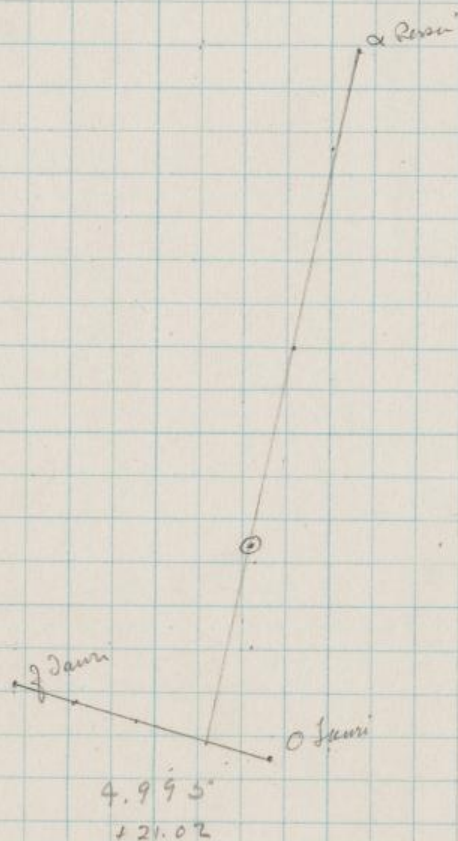
$$15$$

$$10$$

$$5$$

$$0$$

$$30 \quad 28 \quad 26 \quad 24.22 \quad 20 \quad 18 \quad 16 \quad 14 \quad 12 \quad 10 \quad 8$$



13935-

19

Reduction to Apparent Place

$H + \alpha_0$	06	31.7	97	55.5	$\delta_0 + 2''0$	59	51.9
H	03	20.8			$\cos \delta_0$	99702	
α_0	03	10.9			$\log i$	0.8112	
G	23	51.1			$\log (l)$	0.7814	
$G + \alpha_0$	03	02.0	45	30.0			

$\log \cos G + \alpha_0$	9.8457	
q	1.3598	
$\sin G + \alpha_0$	9.8532	
$\tan \delta_0$	9.5841	
	88239	

$\log \sin \delta_0$	9.5543	
$\cos H + \alpha_0$	9.1394	
h	1.2882	
$\sin H + \alpha_0$	9.9958	
$\sec \delta_0$	0.0298	
	88.239	

$\log q'$	1.2055	
g	9.6210	

$\log h'$	9.9819	
h	0.1377	

q	+3.519	
g	+0.418	
h	+1.373	
Red	+5.310	

$q' + 16.050$	
$h' - 0.959$	
$l + 6.045$	
Red + 21.136	

13935-

19

Reduction to Apparent Place.

$H + \alpha_0$	06	31.7	97	55.5	$S_0 - 20$	59	51.9
H	03	20.8			$\cos S_0$	99702	
α_0	03	10.9			$\log i$	08112	
G	23	56.1			$\log(l)$	0.7814	
$G + \alpha_0$	03	02.0	45	30.0			

$\log \cos G + \alpha_0$	9.8457	
q	1.3598	
$\sin G + \alpha_0$	9.8532	
$\tan S_0$	9.5841	
	88239	

$\log q'$	1.2055	
q	9.6210	

q	+3.519	
q	+0.418	
h	+1.373	
Red	+5.310	

$\log \sin S_0$	9.5543	
$\cos H + \alpha_0$	9.1394	
h	1.2882	
$\sin H + \alpha_0$	9.9958	
$\sec S_0$	0.0298	
	88239	

$\log h'$	9.9819	
h	0.1377	

$q' - 16.050$	
$h' - 0.959$	
$l + 6.045$	
Red = 21.136	

13935-

Lunar Parallax.

20

$$\begin{array}{rcl}
 \alpha & 03 & 10 & 57.73 \\
 \theta & 05 & 55 & 40.95 \\
 \theta - \alpha & +02 & 44 & 43.22 \\
 = & +41 & 10 & 48.30 \\
 \frac{1}{2}(\alpha - \alpha') & & +15 & 26.28 \\
 \theta - \alpha - \frac{1}{2}(\alpha - \alpha') + 40'' & & 55 & 22.02
 \end{array}$$

$$\begin{array}{rcl}
 \pi & 59 & 00.6 \\
 & 9.86913 \\
 \log \sin \pi & 8.23463 \\
 \sin (\theta - \alpha') & 9.81851 \\
 \sec \gamma & 0.03108 \\
 \sin (\alpha - \alpha') & 7.95335
 \end{array}$$

$$\begin{array}{rcl}
 & 9.95727 \\
 \cos \frac{1}{2} \alpha - \alpha' & 0.00000 \\
 \sec (\theta - \alpha') - \frac{1}{2}(\alpha - \alpha') & 0.12171 \\
 \log \tan \gamma & 0.07898
 \end{array}$$

$$\begin{array}{rcl}
 \alpha - \alpha' & +30' & 52.56 \\
 = & +2'' & 3.50
 \end{array}$$

$$\begin{array}{rcl}
 \gamma & 50 & 10 & 53.1 \\
 \delta' + 21 & 00 & 12.4 \\
 \gamma - \delta' & 29 & 10 & 40.7
 \end{array}$$

$$\begin{array}{rcl}
 & 9.82640 \\
 \log \sin \pi & 8.23463 \\
 \sin (\gamma - \delta') & 9.68798 \\
 \cos \gamma & 0.11459 \\
 \sin (\delta - \delta') & 7.86360
 \end{array}$$

$$\begin{array}{rcl}
 \delta - \delta' & +25 & 06.8 \\
 \delta & +21 & 25 & 19.2 \\
 \gamma \delta & +21 & 25 & 17.3 \\
 O - C & & & +1.9
 \end{array}$$

$$\begin{array}{rcl}
 \text{curr.} & & +0.4 \\
 \text{2nd Ord Ref.} & & 0.0
 \end{array}$$

$$\delta + 21 \quad 25 \quad 19.6$$

$$O - C + 2.3$$

$$\begin{array}{rcl}
 \alpha & 03 & 13 & 01.23 \\
 \gamma \alpha & 03 & 13 & 00.24 \\
 O - C & & & +0.99 \\
 \text{curr} & & & +0.01
 \end{array}$$

$$\alpha \quad 03 \quad 13 \quad 01.24$$

$$O - C = +1.00$$

13933-

20

Lunar Parallax.

$$\begin{array}{rcl}
 \alpha & 03 & 10 \quad 57.73 \\
 \theta & 05 & 55 \quad 40.95 \\
 \theta - \alpha & 02 & 44 \quad 43.22 \\
 = & +41 & 10 \quad 48.30 \\
 \frac{1}{2}(\alpha - \alpha') & & +15 \quad 26.28 \\
 \theta - \alpha' - \frac{1}{2}(\alpha - \alpha') + 40^\circ & 55 & 22.02
 \end{array}$$

$$\begin{array}{rcl}
 \pi & 59 & 00.6 \\
 & 986913 \\
 \log \sin \pi & 823463 \\
 \log \sin (\theta - \alpha') & 981851 \\
 \log \sec \gamma h \delta & 003108 \\
 \sin (\alpha - \alpha') & 795335
 \end{array}$$

$$\begin{array}{rcl}
 & 9.95727 \\
 \cos \frac{1}{2} \alpha - \alpha & 0.00000 \\
 \sec \frac{1}{2} (\alpha - \alpha') - \frac{1}{2} (\alpha - \alpha') & 0.12171 \\
 \log \tan \gamma & 0.07898
 \end{array}$$

$$\begin{array}{rcl}
 \alpha - \alpha' & +30 & 52.56 \\
 = & +2 & 3.50
 \end{array}$$

$$\begin{array}{rcl}
 \gamma & 50 & 10 \quad 53.1 \\
 \delta' + 21 & 00 & 12.4 \\
 \gamma - \delta' & 29 & 10 \quad 40.7
 \end{array}$$

$$\begin{array}{rcl}
 & 9.82640 \\
 \log \sin \pi & 823463 \\
 \sin (\gamma - \delta') & 968798 \\
 \cos \gamma & 0.11459 \\
 \sin (\delta - \delta') & 7.86360
 \end{array}$$

$$\begin{array}{rcl}
 \delta - \delta' & +25 & 06.8 \\
 \delta & +21 & 25 \quad 19.2 \\
 \gamma h \delta + 21 & 25 & 17.3 \\
 O - C & & +1.9 \\
 curr. & & +0.4 \\
 240 (incl Ref) & & 0.0 \\
 \delta & +21 & 25 \quad 19.6 \\
 O - C & & +2.3
 \end{array}$$

$$\begin{array}{rcl}
 \alpha & 03 & 13 \quad 01.23 \\
 \gamma h \alpha & 03 & 13 \quad 00.24 \\
 O - C & & +0.99 \\
 curr. & & +0.04 \\
 \alpha & 03 & 13 \quad 01.24 \\
 O - C = & & +1.00
 \end{array}$$

4
11
12
2
19
2
31
1
2
18
2
24
15
3
2
1

13936

Star measures

21.

1	18702	1888.6	16138	18610
11.5	12994.2	14590.2	14762	9992.90
12.1	90	94.2	62	88
	02	86	38	10
	<u>11.5710</u>	<u>11.5706</u>	<u>12.1376</u>	<u>12.1380</u>

2	17396	16602	1683.0	16452
19.9	8380	15622	13760.56	954034
28.3	80	22	52	28
	96	02	30	52
	<u>19.9016</u>	<u>19.9020</u>	<u>28.3074</u>	<u>28.3082</u>

3	18128	16630	16890	16172
31.9	8722.26	16042.44	14624.26	843032
15.3	30	46	28	34
	28	30	90	72
	<u>31.9402</u>	<u>31.9414</u>	<u>15.2264</u>	<u>15.2260</u>

Moon

1	17810	16740
24.6	11748.54	12790.88
15.0	60	86
	10	40
	<u>24.6056</u>	<u>24.6048</u>

3		18366	16452
25		11848.52	12958
15.7		56	58
		66	52
		<u>15.6514</u>	<u>15.6506</u>

3	18533	16980
25	17538.39	796266
16.0	40	70
	33	80
	<u>25.0994</u>	<u>25.0986</u>

13936

Star Measures

21

1	18702	18886	16838	18610
11.5	1299492	1459092	14762	999290
12.1	90	94	62	8890
	02	86	38	10
	<u>11.5710</u>	<u>11.5706</u>	<u>12.1376</u>	<u>12.1380</u>

2	17396	16602	16830	16452
19.9	8380	15622	1376052	954034
28.3	80	22	52	28
	96	02	30	52
	<u>19.9016</u>	<u>19.9020</u>	<u>28.3074</u>	<u>28.3082</u>

3	18128	16630	16890	16172
31.9	872226	1604244	1462426	843032
15.3	30	46	28	34
	28	30	90	72
	<u>31.9402</u>	<u>31.9414</u>	<u>15.2264</u>	<u>15.2260</u>

Moon

1	17810	16740
46	1174854	1279088
5.0	60	86
	10	40
	<u>24.6056</u>	<u>24.6048</u>

5	18366	16452
5.7	1184852	12958
	56	58
	66	52
	<u>15.6514</u>	<u>15.6506</u>

3	18533	16980
25	1753839	796266
16.0	40	70
	33	80
	<u>25.0994</u>	<u>25.0986</u>

2
1
5
25
17
6
28
18
7
25
1
2
1

13930

Moon

22

4	16830	17624
25	1555256	8908
16.5	60	0204
	30	24
25	1274	251280

5
25.0
17.0

18268	17438
17810	7896
10	96
68	38
17.0458	17.0458

6
24
18!

17804	16002
1637476	743032
78	34
04	02
18.1428	18.1430

7
23.2
18.2

17210	16188
1376570	9628
75	28
10	88
18.3440	18.3440

8
23
18.2

17572	16150
14140	9570
4442	70
72	50
18.3430	18.3420

13936
 4 16830 17624
 25 15552 58 5908
 16.5 60 0809
 30 24
25.1274 25.1280

Moon

22

5
 25.0
 17.0

18268 17438
 17870 7896
 10 96
 68 38
17.0458 17.0458

6
 24
 81

17804 16002
 1637476 743032
 78 34
 04 02
18.1428 18.1430

7
 23.2
 18.2

17210 16188
 1376570 9628
 7570 58
 10 88
18.3440 18.3440

8
 23
 18.2

17572 16150
 14140 9570
 4442 70
 72 50
18.3430 18.3430

13936

Juno

23

Date Oct. 30. 1917

Exp. to Stars	6	02	-	6	14	-
" " Moon	6	07	59.5	6	07	59.7
Clock Slow		01	20.4			
H. Sid. Time	6	09	20.0			
" Long	4	44	31.05			
G. Sid. Time	10	53	51.05			
" " " M.N.	14	32	55.31			
Interval	20	20	55.74			
Red		03	20.02			
G. M. T	20	17	35.72	20 ^h	29	32.55

" $\theta = +2^h 56$

From Naut. Alman

R. A.

Dec.

Moon 20 ^h	3	12	50.37	+21	24	49.1
Moon 1 ^h			2.4784			+7.073
17 ^h 59.53			43.61	+02		04.4
Latular Place	3	13	33.98	+21	26	53.5

934 " = 11.6

Moon Age 15^d

$$\begin{aligned}
 9 &= -504.7 \\
 &+ 24.0 \\
 &= -480.7
 \end{aligned}$$

Parallax	59	0.2
Semi-dian	16	06.2
R		966.2
Aug		12.4
Dr. 3		-0.5
R		978.1
R		2096.7
AR		100.8
(1+AR)		1995.9
R ²		3983.6

13936

Times

23

Date Oct 30, 1917

Exp to Stars	6	02		6	14	
" Moon	6	07	59.5	6	07	59.7
Clock Slow		01	20.4			

H. Sid Time	6	09	20.0			
" Long	4	44	31.05	"	$\theta = +2^h 5^m 6^s$	
G. Sid Time	10	53	51.05			
" M.N.	14	32	55.31			
Interval	20	20	55.74			
Red		03	20.02			
G. M.T	20	17	35.72	20 ^h	293	25.5

From Naut Alman.		RA		Dec	
Moon 20 ^h	3	12	50.37	+21	24 49.1
Moon 1 ^h			2.4784		+7.073
17 ^h 59.53			43.61	+02	09.4
Latular Place	3	13	3398	+21	26 53.5

934 " - 11.6

Moon Age 15^d

$$\begin{aligned} 9 &= -509.7 \\ &+ 24.0 \\ &\hline &= -480.7 \end{aligned}$$

Parallax	5.9	0.2
Semi-diam	16	06.2
R		966.2
Aug		12.4
2 nd	3	-0.5
R		978.1
R		2096.7
aR		1008
11+AR		1.9959
= R ²		3.9836

13936

24

$$\begin{array}{r}
 X \quad 11.5708 \\
 S \quad 11.3416 \\
 X-S \quad +2292
 \end{array}
 \qquad
 \begin{array}{r}
 19.9018 \\
 20.1893 \\
 - .2875
 \end{array}
 \qquad
 \begin{array}{r}
 31.9408 \\
 32.7580 \\
 - .8172
 \end{array}$$

$$\begin{array}{r}
 y \quad 12.1378 \\
 y \quad 11.9228 \\
 y-y \quad +.2150
 \end{array}
 \qquad
 \begin{array}{r}
 28.3078 \\
 28.8535 \\
 - .5457
 \end{array}
 \qquad
 \begin{array}{r}
 15.2262 \\
 15.0403 \\
 + 1859
 \end{array}$$

$$\begin{array}{r}
 Y-S + 500 X \\
 + 2292 + 5785 = 8077 + 725 = 8802 + 54 = 8856 \\
 - 2875 + 9954 = 7076 + 1687 = 8763 + 93 = 8856 \\
 - 8172 + 15970 = 7798 + 908 = 8706 + 150 = 8856 \\
 23,1313 + 11566 \qquad + 974 \qquad + 109 = 23,5106
 \end{array}$$

$$\begin{array}{r}
 Y-y + 500 X \\
 + 2150 + 6069 = 8219 - 715 = 7504 + 28 = 7532 \\
 - 5457 + 14154 = 8697 - 1230 = 7467 + 65 = 7532 \\
 + 1859 + 7613 = 9472 - 1974 = 7498 + 34 = 7532 \\
 16,3481 + 8174 \qquad - 1429 \qquad + 37 = 16,2731
 \end{array}$$

$$\begin{array}{r}
 \text{Tables} \quad a = -1.4 \quad l = -1.2 \quad a-l = -0.2 \quad t+d = -2.2 \\
 \text{abs.} \quad -504.7 \quad -502.3 \quad -2.4 \quad = +2.2 \\
 \qquad \qquad -503.3 \quad -501.1 \quad -2.2 \quad +4.4
 \end{array}$$

13936

24

X	11.5708	19.9018	31.9408
S	11.3916	20.1893	32.7580
X-S	+2292	-2875	-8172

Y	12.1378	28.3078	115.2262
Y	11.9228	28.8535	15.0903
Y-Y	+2150	-5457	+1859

X-S	+500X		+59.64	+47Y-8856
+2292	+5785	=	8077	+725 = 8802
-2875	+9951	=	7076	+1687 = 8763
-8172	+15970	=	7798	+908 = 8706
23.1313	+11566		+974	+109 = 23.5106

Y-Y	+500Y		-61.8X	+2.3Y-7532
+2150	+6069	=	8219	-715 = 7504
-5457	+14154	=	8697	-1230 = 7467
+1859	+7613	=	9472	-1474 = 7498
16.3481	+8174		-1429	+37 = 16.2731

Tables	a = -1.4	b = -1.2	G-R = -0.2	+d = -2.2
Obs.	-504.7	-502.3	-2.4	+2.2

13 936

Moon Center

25-
0-2

1	24.6052	+1.4732	-3	2.1694	3.9865	+29
2	25.0000	+1.8680	-2	3.4887	3.9745	-91
3	25.0990	+1.9670	-1	3.8687	3.9898	+62
4 ^x	25.1275	+1.9955	0	3.9820	3.9820	-16
5	25.0000	+1.8680	+2	3.4902	3.9771	-65
6	24.0000	+0.8680	+4	0.7541	3.9757	-79
7	23.1320	0.0000	+4	0.0000	3.9840	+4
8	23.0000	-0.1320	+4	0.0173	3.9953	+117

R² 3.9836

17 7704

D4

arc.

1	15.0000	-1.3480	0	1.8171	132-
2	15.6510	-0.6970	0	0.4858	110-
3	16.0000	-0.3480	0	0.1211	100
4	16.3480	0.0000	0	0.0000	90°
5	17.0458	+0.6978	0	0.4869	70
6	18.1429	+1.7949	0	3.2216	26
7 ^{by}	18.3440	+1.9960	0	2.9840	0
8	18.3425	+1.9945	0	3.9780	-4°

13.0945

Range 136°

x = 25° y = 15.6510

17.0458

3.26968

y₀ 16.3484

y max 18.3440

R = 1.9956

Cm R 1.9959

y max 25.1275

x₀ = 23.1320

Moon Center

y₀ = 16.3480

13 936

Moon Center

25°
0-0

1	24.6052	+1.4732	-3	2.1694	3.9863	+29
2	25.0000	+1.8680	-2	3.4887	3.9745	-91
3	25.0990	+1.9670	-1	3.8687	3.9898	+62
4	25.1275	+1.9955	0	3.9820	3.9820	-16
5	25.0000	+1.8680	+2	3.4902	3.9771	-65
6	24.0000	+0.8680	+4	0.7541	3.9757	-79
7	23.1320	0.0000	+4	0.0000	3.9840	+4
8	23.0000	-0.1320	+4	0.0173	3.9953	+117
					R ² 3.9836	

D⁴

arc.

1	15.0000	-1.3480	0	1.8171	132
2	15.6510	-0.6970	0	0.4858	110
3	16.0000	-0.3480	0	0.1211	100
4	16.3480	0.0000	0	0.0000	90°
5	17.0458	+0.6978	0	0.4869	70
6	18.1429	+4.7949	0	3.2216	26
7	18.3440	+1.9960	0	2.9840	0
8	18.3425	+1.9945	0	3.9780	-4

Range 136

$$x = 25^\circ \quad y = 15.6510$$

$$17.0458$$

$$3.26968$$

$$y_0 = 16.3484$$

$$y_{\max} = 18.3440$$

$$R = 1.9959$$

$$\text{Chm } R = 1.9959$$

$$y_{\max} = 25.1275$$

Moon Center

$$x_0 = 23.1320$$

$$y_0 = 16.3480$$

Formation of Normals

1	-	198
2	-	131
3	-	069
4		000
5	+	131
6	+	156
7		000
8	-	026
	+	287
	-	424
	-	137

+	42.6
-	170.0
+	121.8
-	32.0
-	121.2
-	68.8
	0.0
-	15.2
+	164.4
-	407.2
-	242.8

-	39.3
+	63.7
-	21.7
	0.0
-	45.5
-	141.1
+	8.0
+	232.2
+	303.9
-	247.6
+	56.3

13436

Conditional Equations -

26

0 - e

1	+1.47	-1.35	= +	29	- 20	- 4	= - 24	+ 53
2	+1.87	-0.70	= -	91	- 25	- 2	= - 27	- 64
3	+1.97	-0.35	= +	62	- 26	- 1	= - 27	+ 89
4	+2.00	0.00	= -	16	- 27	0	= - 27	+ 11
5	+1.87	+0.70	= -	65	- 25	+ 2	= - 23	- 42
6	+0.87	+1.79	= -	79	- 12	+ 5	= - 7	- 72
7	0.00	+2.00	= +	4	0	+ 6	= + 6	- 2
8	-0.13	+1.99	= +	11.7	+ 2	+ 6	= + 8	+ 109

+262 - 180

av 55

$$+17.77 - 1.37 = -242.8$$

$$- 1.37 + 13.09 = + 56.3$$

$$+ - 0.09 = - 18.7$$

$$+ 13.00 = + 37.6 \quad t = + 2.89$$

$$+17.77 = -242.8 + 4.0 = -238.8 \quad e = -13.4$$

Arc 136

$$\frac{P}{m} = 0.8^{\circ}$$

$$\frac{\Sigma Y}{n} = +10.3^{\circ}$$

$$\frac{+10.3}{0.8} = +12.9^{\circ}$$

$$\Delta R = +1.6^{\circ}$$

1
2
3
4
5
6
7
8

13936

Conditional Equations.

26

1	+1.47	-1.35	= +	29	- 20	- 4	= - 24	+ 53	
2	+1.87	-0.70	= -	91	- 25	- 2	= - 27	- 64	
3	+1.97	-0.35	= +	62	- 26	- 1	= - 27	+ 89	
4	+2.00	0.00	= -	16	- 27	0	= - 27	+ 11	
5	+1.87	+0.70	= -	65	- 25	+ 2	= - 23	- 42	
6	+0.87	+1.79	= -	79	- 12	+ 5	= - 7	- 72	
7	0.00	+2.00	= +	4	0	+ 6	= + 6	+ 12	
8	-0.13	+1.99	= +	117	+ 2	+ 6	= + 8	+ 109	

+262 - 180

av 55

$$+17.77 - 1.37 = -242.8$$

$$- 1.37 + 13.09 = + 56.3$$

$$+ - 0.09 = - 18.7$$

$$+ 13.00 = + 37.6$$

$$t = +289$$

$$+17.77 = -242.8 + 40 = -238.8 \quad \epsilon = -13.4$$

arc 136

$$\frac{P}{n} = 0.8$$

$$\frac{EV}{n} = +10.3$$

$$+\frac{10.3}{0.8} = +12.9$$

$$\Delta R = +1.6$$

13936

27

Moon's Mean Position

$$\begin{array}{r} \chi_0 \quad 23.1320'' \\ \quad \quad \quad \quad \quad 7 \\ \hline 23.1313 \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 16.3480'' \\ \quad \quad \quad \quad \quad + 1 \\ \hline 16.3481 \end{array}$$

From Plate Constants.

$$\begin{array}{r} 23.5106'' \\ 22. \\ \hline + 1.5106 \end{array}$$

$$\begin{array}{r} 16.2731'' \\ 18. \\ \hline - 1.7269 \end{array}$$

$$\begin{array}{r} 0.17915'' \\ 9.97010'' \\ 8.50724 \\ 1.70181'' \end{array}$$

$$\begin{array}{r} 9.5844'' \\ 0.3583'' \\ 7.0534 \\ 6.9961'' \end{array}$$

$$+ 50.33''$$

$$\begin{array}{r} + 0.0010'' \\ - 1.7279'' \end{array}$$

$$A \quad 03 \quad 10 \quad 28.00''$$

$$\begin{array}{r} 0.23751'' \\ 7.33115'' \end{array}$$

$$\alpha_0 \quad 03 \quad 11 \quad 18.33''$$

$$2.90636''$$

$$+ 5.31$$

$$- 806.0''$$

$$\alpha' \quad 03 \quad 11 \quad 23.64''$$

$$- 13 \quad 26.0''$$

$$\delta = + 21 \quad 14 \quad 19.0''$$

$$\delta_0 \quad + 21 \quad 0 \quad 53.0''$$

$$+ 21.1$$

$$\delta' \quad + 21 \quad 01 \quad 14.1''$$

13936

27

Moon's Mean Position

$$\begin{array}{r} \chi_0 \quad 23.1320 \\ \quad \quad \quad 7 \\ \hline 23.1313 \end{array}$$

$$\begin{array}{r} \gamma_0 \quad 16.3480 \\ \quad \quad \quad + 1 \\ \hline 16.3481 \end{array}$$

From Plate Constants.

$$\begin{array}{r} 23.5106 \\ 22. \\ \hline + 1.5106 \end{array}$$

$$\begin{array}{r} 16.2731 \\ 18. \\ \hline - 1.7269 \end{array}$$

$$\begin{array}{r} 0.17915 \\ 997010 \\ 850724 \\ 170181 \end{array}$$

$$\begin{array}{r} 95844 \\ 03583 \\ 70534 \\ 69961 \end{array}$$

$$+ 50.33$$

$$\begin{array}{r} + 0.0010 \\ - 1.7279 \end{array}$$

$$A \quad 03 \quad 10 \quad 28.00$$

$$0.23751 \sim$$

$$\alpha_0 \quad 03 \quad 11 \quad 18.33$$

$$7.33115 \sim$$

$$2.90636 \sim$$

$$+ 5.31$$

$$- 806.0$$

$$\alpha' \quad 03 \quad 11 \quad 23.64$$

$$- 13 \quad 26.0$$

$$\delta_0 \quad + 21 \quad 14 \quad 19.0$$

$$\delta_0 \quad + 21 \quad 0 \quad 53.0$$

$$+ 21.1$$

$$\delta \quad + 21 \quad 01 \quad 14.1$$

13936

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Lunar Parallax.

α'	03	11	23.64 ✓
δ	06	09	20.00 ✓
$\delta - \alpha$	02	57	56.36 ✓
$=$	+44	29	05.40 ✓
$\frac{1}{2}\alpha - \alpha$		76	25.82
$\delta - \alpha - \frac{1}{2}\alpha - \alpha$	+44	12	39.58

9.95727

9.99999

0.14461

0.10187

 γ 51 39 32.3 δ +21 01 14.1 ✓ $\gamma - \delta$ 30 38 18.2

9.82640

8.23458 ✓

9.70724

0.10550

7.87372

 $\delta - \delta$ 25 42.2 δ 21 26 56.3 $\frac{1}{2}\delta - \delta$ +21 26 53.5 ✓ $\delta - \delta$ +2.8

Curr. + 0.4 ✓

2nd Quad Ry. 0.0

 δ +21 26 56.7 $\delta - \delta$ + 3.2 π 59 0.2 ✓

9.86913

8.23458 ✓

9.84354 ✓

0.03116 ✓

7.98041

 $\alpha - \alpha' =$ +32 51.65 $=$ + 2 11.44 α' 03 13 35.08 ✓ $\frac{1}{2}\alpha$ 03 13 33.98 ✓ $\delta - \delta$ + 1.10

Curr. + 0.01 ✓

 α 03 13 35.09 $\delta - \delta$ + 1.11

13736

Lunar Parallax

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α' 03 11 23.64
 δ 06 09 20.00
 $\delta - \alpha$ 02 57 56.36
 $=$ +44 29 05.40
 $\frac{1}{2}(\delta - \alpha)$ 16 25.82
 $\delta - \frac{1}{2}(\delta - \alpha) + 44$ 12 39.58

995727

999999

014961

010187

γ 51 32 32.3
 δ' +21 01 14.1
 $\gamma - \delta'$ 30 33 18.2

982640

823458

970824

010550

787372

$\delta - \delta'$ 25 42.2
 δ 21 26 56.3
 $\gamma - \delta + 21$ 26 53.5
 $O - C$ +2.8
 $Cur.$ +0.4
 2^{nd} Alt Ref 0.0
 $\delta + 21$ 26 56.7
 $O - C$ +3.2

π 59 0.2
986913
823458
984354
003116
798041
 $\alpha - \alpha'$ +32 51.65
 $=$ +2 11.44

α' 3 35.08
 $\gamma - \alpha$ 03 13 33.98
 $O - C$ +1.10
 $Cur.$ +0.01
 α 03 13 35.09
 $O - C$ +1.11

