1917phae.proj.2

KG
11366
#1029

CLXXVII
177

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12323

Star Measures

1	18748		17283		16760		16604
15.5	1378	91	12238	43	7306	019	16053
7.9	93		48		12		51
	48		83		60		04
	154957		154960		794551		794448
2	17737		16915		17183		16138
21.7	10228	32	14418		12617	14	10689
22.5	36		18		11		91
	37		15		83		38
	217505		217503		224569		224552
3	16260		17036		17212		17602
27.9	7088	87	16205		11719	17	13082
14.5	86		05		15		92
	60		36		12		02
	279173		279169		145495		145485
4	17870		17068		18150		16604
33.3	15268	64	9670		12581		12184
24.5	70		6065		83		92
	70		68		70		08
	332601		332597		245579		245580

Moon

1							
23.3	17726		16864				
17	13851/56		10731				
	61		31				
	26		64				
	233870		233867				
2	16658		16915				
23.7	9233	31	14340				
16	29		40				
	58		15				
	237427		237425				

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12323 Star Measures 1

1	16748		17283		16760		16604
15.5	13789	91	12238	43	7306	94	16053	53.2
7.9	93		48		12		51	
	48		43		60		04	
	154957		154740		79451		79448	
2	17737		16415		17183		16138	
21.7	10228	32	14418		12617	14	10689	90
25	36		14		11		91	
	31		15		83		38	
	21.75.05		21.7503		22456.9		22455.2	
3	16260		17036		17212		17602	
7.9	7088	87	16205		11719	11	13072	87
14.5	86		05		15		92	
	60		36		12		02	
	219173		219169		14.5.495		14.5.495	

Moon

1							
23.3	17726		16564				
17	13857	56	10731				
	61		31				
	26		64				
	23.3870		2303967				
2	16658		16915				
3.7	9233	31	14340				
6	29		40				
	58		15				
	23.7427		2319235				

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Moon

3

	17574	17365
234	12649 50	12392
15	57	92
	74	65
	23.4924	23.4927

4.

23.0
14.5

	17806	18636
	13332 36	13122 17
	48	12
	06	36
	14.4470	14.4481

5

22
14.1

	18139	18099
	17192	9052
	92	52
	39	99
	22.0947	14.0953

6

21.0
14.3

	18641	18570
	15196	12025
	96	25
	41	70
	14.3445	14.3455

7

20.3
15.0

	18614	18361
	15183 78	11790 91
	73	92
	14	61
	20.3436	20.3430

8

20.1
16.

	18683	18312
	17153 54	9247
	55	47
	82	12
	20.0929	20.0925

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Moon

3
234 15°
17 5° 7 9 — 1 2 6 4 7 — 5 7 — 7 4 — 50 — 2 3 4 9 2 4
17 3 6 5° — 1 2 3 9 8 — 9 2 — 6 5° — 2 3 4 9 2 7

4
13.0
14.5°
17 8 0 6 — 1 3 3 3 2 — 4 8 — 0 6 — 36 — 1 4 4 4 7 0
1 8 6 3 6 — 1 3 1 2 2 — 1 2 — 3 6 — 17 — 1 4 4 4 4 1

5
2 — 1 7 1 9 2
41 — 9 2 — 3 9
1 8 1 3 9 — 2 2 0 9 4 7
1 8 1 3 4 — 1 7 1 9 2 — 9 2 — 3 4 — 1 4 0 9 4 7
1 8 0 9 4 — 9 0 5° 2 — 5° 2 — 9 9 — 1 4 0 9 5° 3

6
21.0
14.3
1 8 6 4 1 — 1 5° 1 9 6 — 9 6 — 4 1 — 1 4 3 9 4 5°
1 8 5° 7 0 — 1 2 0 2 5° — 2 5° — 7 0 — 1 4 3 4 5° 5°

7
0.3
15.0
1 8 6 1 4 — 1 5° 1 8 3 — 7 3 — 14 — 78 — 2 0 3 4 3 6
1 8 3 6 1 — 1 1 7 9 0 — 9 2 — 6 1 — 41 — 2 0 3 4 3 1

8
20.1
16
1 8 6 8 3 — 1 7 1 5° 3 — 5 5° — 5 3 — 54 — 2 0 0 9 2 9
1 8 3 1 2 — 9 2 4 7 — 4 7 — 1 2 — 2 0 0 9 2 5°

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12323 Times Etc

Date Feb 6. 1917

2 x 3 x Stars	12	17		12	29	
☾ ☌ Moon	12	23	29.0	12	23	29.3
Clock fast		13	39.5			
H. Sid. Time	12	09	49.65			
H. Long	04	44	31.05			
G. Sid Time	16	54	20 70			
G Sid Time M.N	21	04	11.70			
Interval	19	50	09.00			
Red		03	14.98			
G. M. T.	19	46	54.02			

Θ = +2h 43m

19h 78 17s

Lunar Naut. Alm.			α		δ
Moon 19h	09	24	30.90	+12	29 31.3
Motion 1m			1.8679		−11.412
" 46.90 03		01	27.61	−08	55.2
Tabular Place.	09	25	58.51	+12	20 36.1

Moon's Age 15d

934 = 10.8

α = +5 01.5
+24.
−477.5

Parallax	53'	59.16
Semi-diam	14	44.35
R		844.35
Aug		9.7
Dec 45°		−9.35
R		893.7
R	1.9157	
aR		−9.15
(1+a)R	1.8242	
R2	3.3277	

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1223 P 3 — Times Etc

Date Feb 6. 1918

Exp't Stars	12	17		12	29	
" Moon	12	23	29.0	12	23	29.3
Clock fast		13	39.5			
H. Sid Time	12	09	49.65			
H Long	04	44	31.05			
G Sid Time	16	54	20.70			
Grid Time M N	21	04	11.70			
Interval	19	50	09.00			
Red		03	14.98			
G M T.	19	46	54.02	19.	7	17

Lunar Mount Wilson.

			α			δ
Moon	19	09	24 30.90.	12	29	31.3
Motion 1m			1.5679			-11.412
46.90 086		01	27.61	-	08	55.2
Tabular Place.	09	25	58.51	12	20	36.1

Moon's Age

G 34 = 10.8

α = -5 01.5
+24.
-477.5

Parallax 53' 57.6
Semi-diam 14 44.35
R 844.35
Aug 9.7
Dec 45 -0.35
R 843.7
R 1915.7
a R -9.15
(1+a)R 1.8242
R² 3.33277

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12323 Plate Center + Constants. 4

21.75504 22.45560 9 24 03.58 -12 44 57.8
22. 18. +7.74 -34 38.7
+0.2496 -4.45560
31s 4665
7.74 2078.72

Plate Center { A = 9 24 11.32
D = +12 10 13.1

X-s +s0ox +31.9y +1,5x -11549
+3525+7748 = 11273 +253 = 11526 +23 = 11549
-0069+10895 = 10.806 +716 = 11522 +32 = 11554
-2909+13958 = 10.049 +464 = 11513 +42 = 11555
-5914+16630 = 10716 +783 = 11499 +50 = 11549
21.9177+1095.9 +508 +33 = 21.9128

y-η +s0oy -27.2x +6.6y -10784
+7181+3972 = 11153 -421 = 10732 +52 = 10784
-0001+11228 = 11227 -542 = 10635 +148 = 10783
+4174+7274 = 11448 -759 = 10689 +96 = 10785
-0752+12279 = 11527 -905 = 10622 +162 = 10784
15.9192+7959 -596 +105 = 15.5876

Tables a = -1.5 l = -2.3 a-l = +0.8 l+d = -3.2
Obs. -501.5 -506.6 +5.1 = -4.7

O-C 0 -4.3 +4.3 -1.5

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12323 Plate Center + Constants. 4

21.75°04 22.45°60 9 24 03.58 +12 44 57.8
22 18 +1.74 -34 38.7
+ 0.2496 -44560
31⁵ 4645
7.74 2078.72

Plate Center { A = 9 24 1132
D = +12 10 131

X-3 +50cX +31.9Y +1,5X -11541
+3525+7748 = 11273 +253 -11526 +23 = 1154
-0069+10885 = 10816 +716 = 11522 +32 = 1155
-2969+13958 = 10989 +464 = 11513 +42 = 1155
+5914-16630 = 10716 +783 = 11499 +57 = 1154
21.9176+10959 -508 +33 = 21.9121

Y-η +50cY -27.2X +6.6Y -10754
+7181+3972 = 11153 -421 = 10732 +52 = 10784
-0001+11228 = 11227 -592 = 10635 +148 = 10783
+4171+7274 = 11448 -759 = 10689 +96 = 10785
-0752+12279 = 11527 -915 = 10622 +162 = 10784
15.9191+7959 -596 +105 = 15.5895

Tables a = -1,5 b = -2.3 a-b = +0.8 b+d = -3.
5015 -5066 +51 = -4.7

-1.5

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Cafe No. 1314 mag. 6.7

09 29 34.11
34.11
34.07
09 29 34.10
55.42
α 9 30 29.52
A 9 24 11.32
+6 18.20
+ 378.15
2.577666
9.988688
log S_0 1.073518

S_0 +11.84.62
S_1 52
S 33.85514
X 33.26000
X−S −.59114 .10716

13 06 01.0
01.4
00.8
13 06 00.9
−04 30.7
δ 13 01 30.2
β 12 10 13.1
+51 17.1
3077.3
3.488147
0.819326

9.3642
2.1472
8.5648

η_0 +65.9655
η_1 +.0367
η 24.63932
y 24.55580
y−η −.07352

S	η
−6.85	−10.78
−0.24	+14.46
+6.21	−3.88
+11.85	+6.60
M −0.09	−2.41

ΔS	−3S	−1.2η	0
−28	+20 = −8	+13 = +5	
−0	+1 = +1	−5 = −4	
+9	−19 = −10	+5 = −5	
+50	−36 = +14	−8 = +6	
	0	+3 = +3	= +0.01

Δη	−2.3η	−1.8S	+6
−42	+25 = −17	+12	= −5
+3	−10 = −7	+0	= −7
−5	+9 = +4	−11	= −7
+30	−15 = +15	−21	= −6
	+5	0	= +11 = +0.5

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12323 Standard Coordinates. 5

	Cafe No. 1294 mag 8.9			Cafe No. 1298 mag. 6.9			Cafe No. 1307 mag. 5		
C	09	19	39.31	9	23	08.11	9	26	33.41
q			39.31			08.10			33.36
ε			39.32			08.08			33.38
m	9	19	39.31	9	23	08.10	9	26	33.38
Prec			55.02			55.48			55.05
α	9	20	34.33	9	24	03.58	9	27	28.43
A	9	24	11.32	9	24	11.32	9	24	11.32
α-A	−	03	36.99	−		07.74	+	03	17.11
Sin(α-A)			−216.98			− 7.74			+ 197.11
log "			2.336427n			0.888674n			2.294722
" Cos δ			9.992288			9.998917			9.999093
" ξ_0			0.833594n			9.385153n			0.792889
ξ_0			− 6.8540			−0.2427			+ 6.2071
ξ			− 27			− 00			+ 9
ξ			15.1433			21.7573			28.2080
X			15.4958			21.7504			27.9171
X-ξ			+ .3525			− 0069			− .2909
C	+ 10	50	45.0	12	49	16.6	11	44	33.6
q			44.9			16.4			33.2
ε			44.9			15.8			32.9
m	10	50	44.9	12	49	16.3	11	44	33.2
Prec		− 04	21.2		− 04	24.5		− 04	28.9
δ	+ 10	46	23.7	12	44	51.8	11	40	04.3
D	12	10	13.1	12	10	13.1	12	10	13.1
δ-D	− 01	23	49.4	+	34	38.7	−	30	08.8
log "			− 5030.4			+ 9078.8			− 1808.8
log "			3.701600n			3.317812			3.257399n
" n_0			1.032755n			0.648962			0.588534n
log tan δ			9.27944			9.35466			9.31496
log ξ_0			1.67199			8.77033			1.58558
log n_1			8.00477			5.17833			7.95411
n_0			−10.78326			+ 4.45612			− 3.87744
n_1			+ 0.01012			0000			+ 00090
n			7.22699			22.45612			14.13162
y			7.94550			22.45600			14.54900
y-n			+ .71851			− 0001			+ 41774

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12323 Standard Coordinates 5

	Cafe No 1294 mag 8.9	Cafe No 1298 mag 6.9	Cafe No 1307 mag 5
C	09 19 39.31	9 23 08.11	9 26 33.41
9	39.31	08.10	33.36
E	39.32	08.08	33.38
m	9 19 39.31	9 23 08.10	9 26 33.38
Prec	55.02	55.48	55.05
X	9 20 34.33	9 24 03.58	9 27 28.43
A	9 24 11.32	9 24 11.32	9 24 11.32
X-A	− 03 36.99	− 07.74	+ 03 17.11
Sin(X-A)	−.21698	− .7.74	+ .19711
log "	2.336427	0.888674	2.294972
" Cos δ	9.999228	9.998917	9.999043
δ₀	0.833394	9.889757	0.794289
ξ₀	− 6.8540	−.02427	+ .62071
S	− 27	− 08	+ 9
ξ	15.14833	21.75273	28.20680
X	15.49558	21.75504	28.27171
X-ξ	+ .35225	− .00769	− .29509
C	+ 10 50 45.0	12 49 16.6	11 44 33.6
9	44.9	16.4	33.2
E	44.9	15.8	32.9
m	10 50 44.9	12 49 16.3	11 44 33.2
Prec	− 04 21.2	− 04 24.5	− 04 26.1
δ	+ 10 46 23.7	12 44 51.8	11 40 07.3
D	12 10 13.1	12 10 13.1	12 10 13.1
D-δ	− 01 23 49.4	+ 34 38.7	− 30 05.8
log "	− 5.0304	+ 2.0788	− 1.8088
log ρ	3.701607	3.317817	3.251397
" n₀	1.032757	0.648966	0.583454
log tan δ	9.27994	9.93546	9.31499
log ξ	1.67119	1.77103	1.58558
log η	8.00477	5.17183	7.95941
n₀	−10.78324	+ 4.45561	− 3.47774
n₁	+ 0.01011	0.00000	+ 0.00090
n	7.22669	22.45561	1.41316
η	7.49450	22.45560	1.45490
(η-η)	+ 1.4841	− 0.0001	+ 4174

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12323 Mean Center. 6

			Δx	$(x-x_0)^2$	$+(y-y_0)^2$	O − C
1	23 3868	+ 1.4688	+ 3	2.1583	33269	− 8
2 X^M	23.7426	+ 1.8246	+ 0	3.3292	33292	+ 15
3	23.4926	+ 1.5746	− 3	2.4784	33230	− 47
4	23.0000	+ 1.0820	− 4	1.1698	33351	+ 74
5	21.9180	0.0000	− 5	0.0000	33274	− 3
6	21.0000	− 0.9180	− 4	0.8435	33213	− 64
7	20.3433	− 1.5747	− 3	2.4806	33252	− 25
8	20.0927	− 1.8253	+ 0	3.3317	33383	+ 106
					33277	

			Δy		
1	17.0000	+ 1.0810	+ 0	1.1686	53°
2	15.9190	0.0000	+ 0	0.0000	90°
3	15.0000	− 0.9190	− 0	0.8446	120°
4	14.4476	− 1.4714	− 1	2.1653	144°
5	14.0950	− 1.8240	− 1	3.3274	180°
6	14.3450	− 1.5740	− 1	2.4778	210°
7	15.0000	− 0.9190	− 0	0.8446	240°
8	16.0000	+ 0.0810	+ 0	0.0066	273

Range 220°

$y = 15^-$ $x = 23.4926$
20.3433
43.8359
x_0 21.9180
x_{max} 23.7426
R 1.8246
Corr R 1.8242
y_{min} 14.0950
y_0 15.9190

Approx. Center { x_0 21.9180
y_0 15.9190

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12323 Moon Center. 6

	x	x-x₀	+(y-y₀)²	O-C
1	23.3868 + 1.4688 + 3	21583	33269	− 8
2	23.7426 + 1.8246 + 0	33292	33292	+ 15
3	23.4926 + 1.5746 − 3	24784	33230	− 47
4	23.0000 + 1.0820 − 4	11698	33351	+ 74
5	21.9180 0.0000 − 5	00000	33274	− 3
6	21.0000 − 0.9180 − 4	08435	33213	− 64
7	21.3433 − 1.5747 − 3	24606	33252	− 25
8	21.9427 − 1.8253 + 0	33317	33383	+ 106
			33277	

	y	Δy		
1	17.0000	+ 1.0810 + 0	11686	53
2	15.9190	0.0000 + 0	00000	90
3	15.0000	− 0.9190 + 0	16446	120
4	14.4476	− 1.4714 − 1	21653	144
5	14.0950	− 1.8240 − 1	33274	180
6	14.2450	− 1.5741 − 1	24778	210
7	15.0000	− 0.9190 − 0	08446	240
8	16.0000	+ 0.0810 + 0	00066	273

Range 220

y = 15° x − 23.4926
20.3433
4.3493

x₀ 21.9180
λ max 23.7426
R 1.8246
Cim R 1.8242
y min 14.0950
y₀ 15.9190

Cyffroy Centre { x₀ 21.9180
y₀ 15.9190

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1	+1.58	− 11.7	− 8.6
2	+0.00	+ 27.4	+ 0.0
3	−1.45	− 74.0	+ 43.3
4	−1.59	+ 80.0	− 108.6
5	+0.00	+ 0.00	+ 5.4
6	+1.45	+ 58.9	+ 100.0
7	+1.45	+ 29.3	+ 23.0
8	+0.15	− 193.8	− 8.5
	+4.63	+205.6	+171.7
	−3.04	−279.5	−125.7
	+1.59	− 73.9	+ 46.0

	a	b	c	Cor O-C
a −3	− 4	+ 13	+ 31	+ 26
b +12	− 5	+ 0	+ 17	+ 41
c +22	− 5	− 11	+ 6	− 29
	− 3	− 18	+ 1	+ 88
	0	− 22	0	+ 6
	+ 3	− 19	+ 6	− 55
	+ 5	− 11	+ 16	− 13
	+ 5	− 1	+ 26	+ 133

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1 2 3 2 3 Conditional Equations. 7

			O − C				O − C
1	+1.47	+1.08	= −8	− 10	+ 2	= −8	0
2	+1.82	+0.00	= +15	− 13	+ 0	= −13	+28
3	+1.57	−0.92	= −47	− 11	− 1	= −12	−35
4	+1.08	−1.47	= +74	− 8	− 2	= −12	+86
5	0.00	−1.82	= − 3	+ 0	− 3	= − 3	0
6	−0.92	−1.57	= − 64	+ 6	− 2	= + 4	−68
7	−1.57	−0.92	= − 25	+ 11	− 1	= + 10	−35
8	−1.83	−0.08	= +106	+ 13	− 0	= + 13	+93

+207 −138
or 43

+75.79 +1.59 = − 73.9 +1.62

+ 1.59 +10.83 = + 46.0 −5.70

− ( ) − 0.16 = + 7.4 − .16 −0.550

+10.67 = + 53.4 b = +5.0
+0.16 Δ

+15.79 = −73.9 − 8 = −81.9 a = − 5.2

arc 220

$\frac{P}{n} = .60$ ″

$\frac{\Sigma r}{n} = +10.5$ ″

$\frac{+10.5}{.60} = +17.5$″

			O − C	
−	8	+ 5	= − 3	− 5
−	9	+ 0	= − 9	+24
−	8	− 4	= −12	−35
−	6	− 7	= −13	+87
+	0	− 9	= − 9	+ 6
+	5	− 8	= − 3	−61
+	8	− 4	= + 4	−29
+	9	− 0	= +9	+97

+214 −130
or 43

R = 1.82

ΔR = +0.2

−2RC = +1.09

Corr + 0.5″

True ΔR = −0.3

Δf = −0.60 Δδ = −0.3

Δa = +0.17 Δα = +0.00

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1 2 3 2 3 — Conditional Equations. — 1

			O − C					O − C
1	+1.47	+1.08	= −6	−1.0	+ 2	= −8		0
2	+1.82	+0.01	= +15	−13	+ 0	= −13		+28
3	+1.57	−0.92	= −47	−11	− 1	= −12		−35
4	+1.08	−1.47	= +74	− 8	− 2	= −12		+84
5	0.00	−1.62	= − 3	+ 0	− 3	= − 3		0
6	−0.92	−1.57	= − 64	+ 6	− 2	= + 4		−68
7	−1.57	−0.92	= − 25	+11	− 1	= +10		−35
8	−1.83	−0.08	= +116	+13	− 0	= +13		+93
								+207 −138
								a = 43

+15.79 + 1.59 = − 73.9 + 1.62

+ 1.59 + 10.83 = + 46.0 − 5.70

− ( ) − 0.16 = + 17.4 − 0.16 = −0.55 − 0

+10.67 = + 133.4 h = +15°0
−0.16

+15.79 = −73.9 − 8 = −81.9 a = −15°.24

arc 220

$\frac{P}{n}$ = 60″

$\frac{\Sigma v}{n}$ = +10.5″

$\frac{+10.5''}{60}$ = + 17.5″

R = 1.82

ΔR = +0.2

−2RC = +1.09

Corr + 0.5″

Δh = −0.60 Δδ = −0.3

True ΔR = −0.3

Δa = +0.17 Δq = +0.00

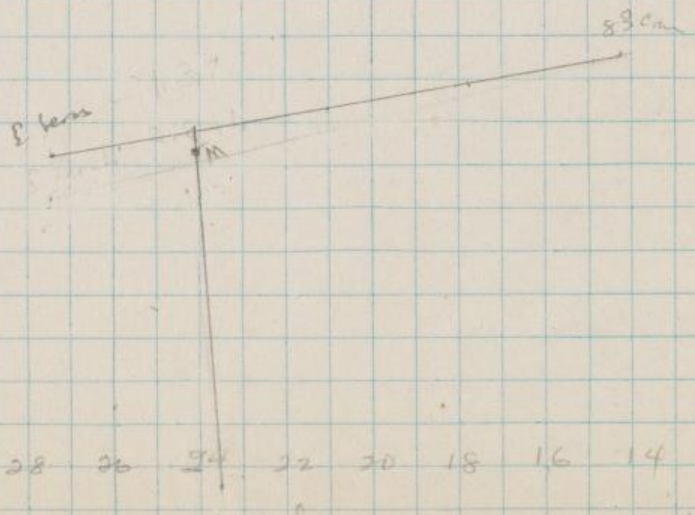
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1.	9	14	24.065		18°	3	17.48	
			21.132				28.33	
			+2.933				−10.85	
2.	9	23	33.168		−8	18	4.24	
			30.551		−8	17	53.44	
			+2.617				10.80	
3.	9	27	31.264		+11	39	53.30	
			28.447			40	4.89	
			+2.817				11.59	

2.933
2.817
.116

11.54
10.85
.69



36 34 32 30 28 26 24 22 20 18 16 14

36
31
26°
21°
16°
11°
6°
1
-4
-9

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12323 Moons Mean Position 8

x_0 21,9180
−3
21.9177

y_0 15.9190
+2
15.9192

From Plate Constants.

21.9128
22
−0.0872

15.5876
18
−2.4124

log S_0 8.94052
log Cos δ 9.99063
8.50724
log sin (A−a) 0.44260
α − A −2.77

A 9 24 11.32
α_0 9 24 8.55
Red +2.83
α 9 24 11.38

log tan δ_0 9.3218
log S_0^2 7.8810
7.0534
log η_1 4.2562
η_1 00000
η_0 −2.4125

log η_0 0.38245
7.33115
log tan (δ−D) 3.05130
δ−D −1125.4
−18 45.4
D +12 10 13.1

δ_0 +11 51 27.7
Red −11.5
δ +11 51 16.2

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12323 Means Mean Position

X_0 21 9180
− 3
21 9177

y_0 15 9190
+ 2
15 9192

From Plate Constants.

21 9121
29
− 0.0873

15 5875
18
− 2.4125

log tan δ 9 3218
log S_0 8 5524
7 0534
log 4. 4 9276
n. 0 0 0 0 0
n_0 − 0 4125
n
log n_0 0.3 8247 n
7 3 3115
log tan i · E 3.0 5132 n
S − E − 1125 4
− 18 45.4
E + 12 10 13.1
S_0 + 11 50 27.7
Red −11.5
S' 11 51 16 2

log $\frac{1}{\rho}$ 8.9 4052 n
log cos i 9 9 9 0 6
8 5 0 1 2 4
log sin (A − a) 0.4 4 3 1 4 n
A − a 2.7 7

A 9 24 11.32
X_0 9 24 8.55
Red + 2.83
X' 9 24 11 38

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12323 Reduction to Apparent Place 9

H+α	6	21.9	95°	28.5″	δ₀	+17° 50′ 0.5″
H	20	57.8				
α	9	24.1				
G	22	45.9			log cos δ₀	9.9906
G+λ	8	10.0	122°	30′	log f′	0.7821n
					f	0.7727n
log cos G+λ	9.7303 n				log sin δ₀	9.3132
log g	0.9833				cos H+α₀	8.9796 n
∴ sin G+σ	9.9260				log g	1.2912
∴ tan δ₀	9.3215				∴ sin H+α₀	9.9980
	8.8239				sec δ₀	0.0094
						8.8239
log g′	0.7136n					
g′	9.0547				log h	9.5840n
					h	0.1225
g	1.3911				g′	−5.1711
g	0.1113				h′	−0.3844
h	1.3326				f′	−5.9225
Red.	+2.8330				Red.	−11.4780

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12323 Reduction to Apparent Place 9

H+χ	6	21.9	95°	28.5"	δ₀	+17°	50.5"	
H	20	57.8						
χ	9	24.1			log cos δ₀	99906		
G	22	45.9			log f	0.78211n		
G+χ	8	20.0	122°	30'	f	0.77217n		
log cos G+χ	9.91303n				log sin δ₀	93132		
log g	0.98333				cos H+χ₀	8.99796n		
∴ sin G+χ	9.92636				log g	1.29112		
∴ tan δ₀	9.32155				∴ sin H+χ₀	9.99980		
	8.82339				sec δ₀	0.00094		
						8.82339		
log g'	0.71336n							
∴ g	9.05347							
					log h	9.58840n		
					∴ h	0.12225		
g	1.3941							
g	0.1133				g'	-5.1711		
h	1.3266				h'	-0.3884		
Red.	+2.8330				f	-5.9225		
					Red.	-11.4800		

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12323

Lunar Parallax

10

α'	9	24	11.38 ✓
θ	12	09	49.65 ✓
$\theta - \alpha$	+2	45	38.27 ✓
=	41°	24	34.05 ✓
$\frac{1}{2}\alpha - \alpha'$		+13	31.39
$\theta - \alpha - \frac{1}{2}\alpha\alpha'$	41	11	02.66

	9.95727
log cos $\frac{1}{2}\alpha\alpha'$	0.000000
log $\theta - \alpha - \frac{1}{2}\alpha\alpha'$	0.12343
log tan γ''	0.08070

γ 50 17 34.6 ✓

δ' 11 51 16.2 ✓

$\gamma - \delta'$ 38 26 18.4

	9.82640
log Sin π	8.19605 ✓
Sin $\gamma - \delta'$	9.79356
cosec γ	0.11389
Sin $\delta - \delta'$	7.92990 ✓

$\delta - \delta'$	+	29	15.2 ✓
δ	12	20	31.4 ✓
Eph δ	12	20	36.1 ✓
O-C			−4.7 ✓
Sun Cel. Ref.			0.0
corr.			−0.5
δ	12	20	31.9
O-C			−4.2

π	53 59.6
	9.86913
log sin π	8.19605 ✓
Sin $(\theta - \alpha')$	9.82049 ✓
Sin $\theta - \alpha$	0.01016 ✓
Sin $(\alpha - \alpha')$	7.89583

$\alpha - \alpha'$ +27′ 02.″78

= +1ᵐ 48ˢ.18

α	9	25	59.56 ✓
Eph α	9	25	58.51 ✓
O-C			+1.05 ✓
corr.			+0.01
α	9	25	59.57
O-C			+1.06

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12323 Lunar Parallax 10

α' 9 24 14.38

θ 12 09 49.65"

$\theta - \alpha'$ +2 45' 35.27

= 41° 24' 34.05"

$\frac{1}{2}\alpha \cdot \alpha'$

$-\frac{1}{2}\alpha \cdot \alpha'$ 91 11

995127

Cos ½ kk' 0.000000

A - ½ - ½ kk' -0.123862

tan y° 0.086079

y 5° 17' 36.4"

5' 11' 51.162

ι - 5' 38 26 39.2

982640

ι Sin π 8.19615"

y - 5' 9.79361

sec y 1.00386

ι - 5' 7.92494

55' + 29.153

δ 12 20 31.9

ph δ 12 20 36.1

O - C - 4.6"

Sun (Ecl. Ref 0.0

corr - 40.5"

δ 12 20 31.9

O - C - 4.2

π 53 5' 9.6"

9.66913

log sin π 8.16605"

ι - α' 9.82049

sec γ 0.00116

log α 7.89588

$\alpha - \alpha'$ + 1' 02.78

= + 1' 18.18

α 9 25' 59.56

ph α 9 25' 58.51

O - C + 1.05"

corr. +0.01

α 9 25' 59.57

O - C + 1.04

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Star Measures

+	17446	16190	17404	16240
158	12655 58	10979 81	17328 30	6314 16
2.0	61	83	32	18
	46	90	04	48
	15.4788	15.4791	8.0074	8.0068
	18818	16327	18970	17808
1.7	11297 94	13840 45	13903 02	12859 66
225	91	50	01	70
	24	27	70	08
	21.7528	21.7518	22.5068	22.5058
	17232	16736	18862	16517
27.9	8181 84	15805	12972 76	12414 13
14.6	86	05	80	12
	42	36	68	17
	27.9057	27.9069	14.5890	14.5896
	16850	17370	17285	17949
33.4	14178	10049 50	11382 85	13846 57
24.6	74 76	51	88	56
	50	70	91	49
	33.2674	33.2680	24.5904	24.5920

Moon

+	17653	16057
243	15045 50	8655 57
15.5	55	59
	53	57
	24.2603	24.2600
	17630	16089
24.2	11645	7582 77
1.5	45	72
	30	90
	24.1485	24.1488

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12324

Star Measures

+	17446	16460	17404	16240
158	126555-54	109779 61	173288 30	63814 16
8.0	61	73	32	17
	96	90	04	48
	154788	154891	80074	80068
2	18818	16327	17970	17808
21.7	112977 94	13740 45	13403 12	12559 66
225	91	57	01	70
	24	27	70	08
	217528	217518	225068	225058
3	17232	16736	14462	16517
27.4	51881 84	15605	29726	12414 13
146	86	05	80	12
	42	36	68	17
	279048	279069	145890	145896
4	16853	17370	17265	17949
334	14178	10049 57	11382 85	13846 57
246	74 76	51	58	56
	50	70	91	49
	332674	332680	245904	245920

Mean

1	17683	16827
243	150435 60	12625 57
15.5	63	59
	48	07
	242503	242900
2	17681	16089
243	116411 51 60	17582 77
15	45	72
	31	59
	241495	241488

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17312
14670 73
76.
12
23.2639

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12324

Moon

12

3
24
148

17208 16680
10278 15625
78 95
08 80
14.6930 14.6930

4 16279 16297
32 13692 8883
4.0 92 83
79 97
23.2587 23.2586

5 17964 16699
22.4 9916 14740
13.8 9916 42
64 99
13.8048 13.8042

6 17910 16220
21.7 10798 12332
14.0 98 36
12 20
21.6112 21.6114

7 16078 16140
21.0 11027 11580
14.6 2928 80
70 40
14.5042 14.5040

8 16335 17006
20.7 9060 14278
15.0 62 78
35 06
20.7274 20.7272

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12324

3
4
48

Moon

17208		16680	
12678	58	13625	10
678		905	
98		50	
14.6930		14.6930	

15988		12367	
13692	24	16883	32
92		83	
78		71	
23.2588		23.2581	

17946		16699	
9976	00	14748	41
9906		92	
40		99	
13.8048		13.8042	

17900		15328	
11037	45	12332	64
98		82	
102		00	
21.6617		21.6154	

16078		14688	
14927	25	18588	58
28		63	
98		31	
14.5843		14.5920	

18035		17056	
9800	89	14538	53
62		78	
35		66	
20.7299		20.7278	

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12324

Date Feb 6. 1917.

Exp to Stars	12	31			12	43	
" " Moon	12	36	28.6		12	36	28.9
Clock fast		13	39.5				
H. Sid Time	12	22	49.23	ν	$\Phi = +2^h\ 56'$		
H. Long	04	44	31.05		"		
G. Sid. Time	17	07	20.30	ν			
G Sid Time N.N	21	04	11.70	ν			
Interval	20	03	08.60	ν			
Red.		03	17.11	ν			
G. M.T	19	59	31.49	ν	19.99764		

From Naut. Alman.		R A			Dec.		
Moon	9	24	30.90	ν	12	29	31.3 ν
Motion 1m			1.8677	ν			−11.418 ν
Motion 59.85817		01	51.80	ν			−11 23.5
Tabular Place	9	26	22.70	ν	+12°	18	07.8 ν

Moon's age 15.4d

934" = 10.4

Parallax	53	59.6 ν
Semi-diam	14	44.4 ν
R		8 84.4 ν
Corr		9.3
Dec. 4		−04
R		893.5 ν
R		19149 ν
a R		−916 ν
(1+d R		1.8233 ν
R 2		33244 ν

a = .5023
+24
4783

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Lunes etc

1 2 3 2 4

Date Feb 6 1917

Expt Stars	12	31		12	43	
Mean	12	36	28.6	12	36	28.9
Clock fast		13	39.5s			
H Sid Time	12	22	49 25			
Eq. Equ	04	44	31 05			
G Sid Time	17	07	20 30			
G Sid Time M.N	21	04	11.70			
Interval	20	03	04.60			
Red		03	00.11			
G M T	19	59	51 49			

$\theta = +2^{\circ}\ 5'.6$

19.997.64

Trans	Mean	Mean	R A		Dec	
Moon	9	24	30.90	12	29	31.3
Motion 1st			1.4677		-11	-11.418
Motion 59 Cl 5887		01	51.80		-11	23.57
Tabular Place 9		26	22.70	+12°	18	07.8

Mean Age 15.4

934 = 11.4

$C_0 = 502.3$

$+24$

-478.3

Parallax 53 57.6

Sun-diam 14 44.4

R	1 844
Equ	93
D	-04
R	893.3
R	1.1144
a R	-916
11 + a R	1.8233
R =	33244

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12324 Plate Constants 4

X	15.4790	21.7523	27.9063	33.2677
S	15.1433	21.7573	28.2080	33.8514
X-S	+ 3357	- 0050	- 3017	- 5837

y	8.0071	22.5063	14.5893	24.5912
m	7.2269	22.4561	14.1316	24.6332
y-m	+ 7802	+ 0502	+ 4577	- 0420

X-S +500X		+15.5y	+2.3X -11241
+3357 + 7740	→ 11097	+ 124 = 11221	+ 36 = 11257
- 0050 + 10876	= 10826	+ 350 = 11176	+ 50 = 11226
- 3017 + 13453	= 10936	+ 227 = 11163	+ 64 = 11227
-5837 + 11634	= 10797	+ 381 = 11178	+ 77 = 11255
22.4364 + 11218		+ 242	+ 52 = 22.4635

y-m +500y	-10.3X	+6.77y -11691
+7802 + 4005 = 11805	- 159 = 11646	+54 = 11700
+ 0502 + 11253 = 11755	- 224 = 11531	+152 = 11683
+ 4577 + 7295 = 11872	- 289 = 11583	+ 99 = 11682
- 0420 + 12293 = 11875	- 344 = 11531	+166 = 11648
15.6276 + 7814	- 232	+106 = 15.2273

Tables a = -1.8 c = -24 a-c = +0.6 b+d = -3.8
-5023 -5067.7 +4.47 -5.2

-5005 -5064.9 +3.9 -1.4

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12324 Plate Constants 4

	X			
S	15.1433	21.7573	26.2080	33.8514
X-S	+ 3357	- 0050	- .3017	- 5837

Y	80071	22.5063	14.5893	24.5912
η	7.2264	22.4561	14.1316	24.6332
Y-η	+ 7802	+ 0502	+ 4577	- 0420

X-S + 500X		+ 155Y	+ 2.3X - 11241
+ 3357 + 7740	= 11097	+ 124 = 11221	+ 36 = 11257
- 0050 + 10876	= 10826	+ 350 = 11176	+ 50 = 11226
- 3017 + 13453	= 10936	+ 227 = 11163	+ 64 = 11227
- 5837 + 11634	= 10797	+ 381 = 11178	+ 77 = 11255
22.4376 + 11218		+ 242	+ 52 = 22.4635

Y-η + 500Y	- 10.3X	+ 677Y - 11640
+ 7802 + 4007	= 11809 - 159 = 11646	+ 54 = 11700
+ 0502 + 11253	= 11755 - 224 = 11531	+ 152 = 11683
+ 4577 + 7295	= 11872 - 289 = 11583	+ 99 = 11682
- 0420 + 12295	= 11875 - 344 = 11531	+ 166 = 11645
15.6276 + 7814	- 232	+ 106 = 15.2293

Tables a = -18 b = -24 a - b = +06 b + d = -3
- 5023 - 50677 + 447 - 5

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12324 Moon Center

			Δx	$(x-x_0)^2$	$+(y-y_0)^2$	O − C
1	X 24.2602	+ 1.8232	− 0	3.3240	3.3240	− 4
2	24.1486	+ 1.7116	− 2	2.9289	3.3233	− 11
3	24.0000	+ 1.5630	− 3	2.4420	3.3162	− 81
4	23.2586	+ 0.8216	− 6	0.6740	3.3244	00
5	22.4370	0.0000	− 7	0.0000	3.3251	+ 7
6	21.6113	− 0.8257	− 6	0.6828	3.3332	+ 88
7	21.0000	− 1.4370	− 4	2.0661	3.3293	+ 49
8	20.7273	− 1.7097	− 2	2.9238	3.3184	− 60
				Com R^2	3.3244	

			Δy		arc
1	15.6280	0.0000	− 0	0.0000	90°
2	15.0000	− 0.6280	− 0	0.3944	110°
3	14.6930	− 0.9350	− 0	0.8742	121°
4	14.0000	− 1.6280	− 0	2.6504	153°
5	y 13.8045	− 1.8235	− 0	3.3251	180°
6	14.0000	− 1.6280	− 0	2.6504	209°
7	14.5041	− 1.1239	− 0	1.2632	232°
8	15.0000	− 0.6282	− 0	0.3946	250°
					Range 160

Approx Center

y = 15 X = 24.1486
20.7273
44.8759
X_0 22.4380
X_{max} 24.2602
R 1.8222
1.8252
Mean 1.8237
Com R 1.8233
y_{min} 13.8045
y_0 15.6278

y = 14 X = 23.2586
21.6113
44.8699
X_0 22.4350
X_{max} 24.2602
R 1.8252

Moon Center X_0 22.4370
y_0 15.6280

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2324 Mean Center 5"

		Δx	x-x₀	x-x₀²	y-y₀²	O-C
1	x 24.2602	+ 1.8232	- 0	3.3240	3.3240	- 4
2	24.1486	+ 1.7116	- 2	2.9284	3.3233	- 1.1
3	24.0000	+ 1.5630	- 3	2.4420	3.3462	- 8.0
4	23.2586	+ 0.8216	- 6	0.6740	3.3244	0.0
5	22.4370	0.0000	- 7	0.0000	3.3251	+ 7
6	21.6113	- 0.8257	- 6	0.6828	3.3332	+ 5.8
7	21.0000	- 1.4370	- 4	2.0661	3.3273	+ 4.9
8	20.7273	- 1.7097	- 2	2.9238	3.3154	- 6.0

Com R² 3.3244

		Δy		arc
1	15.6280	0.0000	- 0	0.0000	90
2	15.0000	- 0.6280	- 0	0.3944	110
3	14.6930	- 0.9350	- 0	0.8742	121
4	14.0000	- 1.6280	- 0	2.6504	153
5	y 13.8045	- 1.8235	- 0	3.3251	180
6	14.0000	- 1.6280	- 0	2.6504	207
7	14.5041	- 1.1239	- 0	1.2632	232
8	15.0000	- 0.6280	- 0	0.3944	250

Range 160

Apprx. Center

y = 15 x = 24.1486
20.7273
44.8759
X_0 22.4380
X_{max} 24.2602
R 1.8222
1.8252

Mean 1.8237
Com R 1.8283
y_{min} 13.8045
y_0 15.6278

y = 14 x = 23.2586
21.6113
44.8699
X_0 22.4350
X_{max} 24.2602
R 1.8252

Mean Center X_0 22.4370
Y_0 15.6280

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Formation of Normals

1	− 0.00	− 7.2	+ 0.0
2	− 1.08	− 18.8	+ 6.9
3	− 1.45	− 124.9	+ 74.4
4	− 1.33	− 0.0	+ 0.0
5	+ 0.00	− 0.0	− 12.7
6	+ 1.33	− 72.3	− 143.0
7	+ 1.61	− 68.8	− 55.0
8	+ 1.08	+ 102.6	+ 37.8
	+ 4.02	+ 102.6	+ 119.1
	− 3.86	− 2920	− 2107
	+ 0.16	− 189.4	− 91.6

a = + 5

b = − 26

c = −36

a	b	c
+ 9	+ 0	− 27
+ 8	+ 16	− 12
+ 8	+ 24	− 4
+ 4	+ 42	+ 10
0	+ 47	+ 11
− 4	+ 42	+ 2
− 7	+ 29	− 14
− 8	+ 16	− 28

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12324 Conditional Equations 6

			O-C					O-C	
1	+1.82	−0.00	= −4	−23	+ 0	= −23″		+19	−8
2	+1.71	−0.63	= −11	−21	+ 5′	= −16		+ 5′	−7
3	+1.56	−0.93	= −80	−19	+ 7	= −12		−68	−72
4	+0.82	−1.63	= 00	−10	+ 13	= + 3		− 3	+ 7
5′	0.00	−1.82	= + 7	− 0	+ 14	= +14		− 7	+ 4
6	−0.82	−1.63	= +88	+10	+ 13	= +23		+65′	+67
7	−1.44	−1.12	= +49	+18	+ 9	= +27		+22	+ 8
8	−1.71	−0.63	= −60	+20	+ 5′	= +25′		−85′	−113
								+111	−163
									or 34

+15.04 + 0.16 = −189.4 + 1.94

+ 0.16 + 11.55′ = − 9.16 −8.39

− 0.16 − 0.00 + 20 −0.72Δ

+11.55′ = − 89.6 b = −7.8″

+15.04 = −189.4 + 1.2 = −188.2 a = −12.5″

+ 0.14

arc = 160

$\frac{R}{n}$ = .22″

$\frac{\Sigma v}{n}$ = −6.5″

$\frac{-6.5}{.22}$ = −29.6″

ΔR = − 0.4″

corr (4) + 0.5″

True ΔR = − 0.9

R = 1.82

−2RC = −1.82

Δh = +1.31 Δδ = +0.6

Δa = − 0.25′ ΔA = − 0.01

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1
2
3
4
5
6
7
8

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2324 Conditional Equations

			O-C					O-C	
1	+1.82	−0.00	= −4	−23	+ 0	= −23″	+19		−8
2	+1.71	−0.63	= −11	−21	+ 5″	= −16	+ 5″		−7
3	+1.56	−0.93	= −80	−19	+ 7	= −12	−68		−72
4	+0.82	−1.43	= 00	−10	+13	= + 3	− 3		+ 7
5	0.01	−1.82	= + 7	− 0	+14	= +14	− 7		+ 4
6	+0.82	−1.63	= +88	+10	+13	= +23	+65″		+67
7	−1.44	−1.12	= +99	+18	+ 9	= +27	+ 22		+ 8
8	−1.71	−0.63	= −60	+20	+ 5″	= +25″	− 85″		−113
							+111 − 163		
							arc 34		

+15.04 + 0.16 = −1894 +1.94

+ 0.16 + 11.55″ = − 91.6 −839

− 0.16 − 0.00 + 20 −0.720

+11.55″ = − 89.6 b = −7.8

+15.04 = −1894 + 12 = −1882 a = −12.5″

+ 0.14

arc. 160 R = 1.82

$\frac{R}{\Delta_1}$ = .22 −2RC = −1.82

$\frac{\Sigma\nu}{\Delta_1}$ = −6.5″

$\frac{-6.5''}{.22}$ = −29.6 Δb = +1.31 Δs = +0.6

Δa = −0.25″ Δλ = −0.04

ΔR = −0.4

corr (4) + 0.5″

From ΔR = −0.9

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12324 Moon's Mean Position

x_0 22.4370 ✓
− 6 ✓
22.4364 ✓

y_0 15.6280 ✓
− 4
15.6276

From Plate Constants.

22.4635 ✓
22.
S_0 + 0.4635 ✓

15.2273 ✓
18.
− 2.7727 ✓

log ξ_1 9.666605 ✓
log cos δ_0 9.990719 ✓
8.507324
log Sin α−A 1.168610 ✓

log tan δ 9.31999 ✓
log ξ_2 9.33321 ✓
7.06534
log η_1 5.7054 ✓

α−A + 14.72

A 9 24 11.32

α_0 9 24 26.04 ✓

Red + 2.83

α' 9 24 28.87 ✓

η_1 −2.7727
η_0

log η_0 0.442905 ✓
7.331155
log tan δ−D 3.111755 ✓

δ−D − 1293.5 ✓
− 21 33.5 ✓
D +12 10 13.1

δ_0 +11 48 39.6 ✓

Red − 11.5

δ' +11 48 28.1 ✓

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2324 Moons Mean Position

x_0 224370
− 6
224364

y_0 15.6280
− 4
15.6276

From Plate Constants.

22.4635
22
S_0 + 04635

15.2273
18
− 2.7727

log S_0 9.666605
Ad Cmd. 9.990711
8.517124
log Sin x-A 1.165810

log tan i 9.31999
log S^2 9.33321
7.15534
log n 5.7054

η_0 −2.7727
η_0

log n_0 0.442900 n
7.331155
log tan δ-z 3.111755 n

δ-z −1293.5"
− 21 33.5'
z +12 10 13.1

S_0 +11 48 39.6

Red − 11.5"

S' +11 48 28.1

x-A +14.72

A 9 24 11.32

x_0 9 24 26.04

Red +2.63

x' 9 24 26.87

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13324 Lunar Parallax 8

α'	9	24	28.87
θ	12	22	49.25
$\theta-\alpha$	+2	58	20.38
=	44	35	51.70
$\frac{1}{2}\alpha-\alpha'$		14	20.94
$\theta-\alpha'=44°$		20	44.76

9.957127

log cos ½(α α') 0.000000
log cos(θ − α') − ½(α − α') 0.145611
log tan γ 0.102888

γ 5° 43 25.4

δ' +11 48 28.1

γ − δ' 39 54 57.3

9.826400

log sin π 8.196805
log sin(γ − δ') 9.807730
log sec γ 0.105111
log sin(δ − δ') 7.934866

δ − δ' + 29 35.4

δ 12 18 03.5

δ/d +12 18 07.8

O − C − 4.3

2nd Cord Red 0.0

Corr. +0.5

δ +12 18 04.0

O − C − 3.8

π 53 59.6

9.869913

log sin π 8.196805
log sin(θ − α') 9.846311
log sec δ/d 0.010009
log sin(α − α') 7.921158

α − α' +28' 41.88

= +1m 54.79s

α 9 26 23.66

α/d 9 26 22.70

O − C + .96

Corr. +0.01

α 9 26 23.67

+ 0.97

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Lunar Parallax

α'	9	24	28.87
α	12	22	49.25
$\alpha - \alpha'$	+2	58	20.38
$= \Delta\alpha$		44	35.7
$\frac{1}{2}\alpha - \alpha'$		14	21.94
$x' - \frac{1}{2}\alpha - \alpha'$	44°	20	44.7

	9.955727
log cos $\frac{1}{2}\alpha - x'$	0.100000
log $\sin x' - \frac{1}{2}\alpha$	0.145561
log tan γ	0.102888

γ	51	43	25.4
δ'	+11	48	28.1
$\gamma - \delta'$	39	54	57.3

	9.826400
log sin π	8.196035
col $\gamma - \delta'$	9.807720
Corr. γ	0.105111
$\sin \delta - \delta'$	7.934856

$\delta - \delta'$	+	29	35.4
δ	12	18	03.5
Obs'd	+12	18	07.8
O-C			−4.3
2nd Corr Ref.			00
Corr			+0.5
δ	+12	18	04.0
O-C			−3.8

π		53	57.6

	9.866913
log sin π	8.196035
log sin $\theta - x'$	9.884631
log ρ	0.010009
$\sin x - x'$	7.921588

$x - x'$	+	28	4.88
$=$	+	1m	54.s79

α	9	26	23.676
Obs'd α	9	26	22.70
O-C			+.976
Corr.			+0.01
α	9	26	23.67
			+0.97

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Star Memories

1	17713	16976
16.9	8058	16632 35
13.7	58	38
	13	76
	16.96 55	16.96 59

	16288	17450
	9494	14242 40
	88	38
	90	50
	13.67 97	13.67 90

2	16000	17915
28.1	15313	85 90 95
13.6	13	00
	01	15
	28.06 87	28.06 80

	17258	16910
	12163	12005
	63	05
	58	6910
	13.50 95	13.50 95

2	17377	16936
29.5	12600	11702
21.2	00	02
	77	36
	29.47 77	29.47 66

	18502	16200
	16700	7989 90
	00	91
	02	00
	20.18 02	20.17 90

	18743	16220
	16326	8642
	26	4443
	43	20
	15.24 17	15.24 23

	16707	16233
	7703 06	15630
	09	32 31
	07	6233
	24.94 01	24.93 98

Uranus

2	17104	18890
29	7986	18008
14.9	80	08
	04	8890
	14.91 18	14.91 18

3	17091	17445
21.9	7647 42	16902
15	39	02
	91	7445
	21.94 49	21.94 57

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1246·4

Star Measures

1	17213	16976
16.9	80558	-16 32 35"
13.7	58	38
	13	76
	16965.5	16965.9

	16288	17455
	9494	14282 40
	88	38
	94	50
	18.6797	13.6790

2	16000	17915"
288	15313	85 90 95"
188	13	00
	00	15"
	28.0657	28.0681

	17258	16910
	12163	-18005"
	68	05
	58	6910
	13.5095	13.5095"

3	17877	16936
285°	12.630.0	12802
286	00	02
	77	36
	29.4777	29.4766

	18502	16200
	16700	79890
	80	91
	02	00
	201802	201790

	15743	16220
	163260	5642
	26	4443
	43	20
	15-2417	15-2423

	16707	16233
	77305	163630
	09	0821
	07	83
	249401	24938

Moon

	17104	15590
	79286	15008
	80	08
	04	8590
	14.9118	14.9118

2		
9		

	17091	17445"
2.19	76477 42	16502
51	39	02
	91	7945"
	21.9449	21.9457

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Moon Measures

1

4 17318 17348

21.6 10618,17 14052

16 5-45 5-3

18 7348

21.67001 21.67033

5 17371 17262

21.9 7428 25 7216 15

17 22 14

71 7262

21.99946 21.99953

6

22

17

18682 18791

18616 19 8870 78

22 80

82 8791

17.0063 17.0084

1

23.0

17.6

17008 16927

9783 87 14140

91 40

08 6927

17.7221 17.7213

4

23.5

17.7

17367 16656

9434 32 14593

30 93

67 56

17.7935 17.7937

Scratch y direct

1.6070 17238

11975-96 11240

97 40

10 7238

14.4004 22.4002

X X reverse

16512 16772

11100 12186

00 86

12 6772

22.54112 22.54114

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Moon Measures.

4
4 17318 17348
21.6 10618 17 14052
16 16 54 53
18 17348
21.67001 21.67033

5 17371 17262
21.9 7428 25' 7216 15'
17 22 14
71 1262
21.99946 21.99953

6
22
17

18682 18791
18616 19 8870 75'
22 80
82 8791
17.0063 17.0084

1
230
17.6

17008 16927
9183 87 14140
91 40
08 6927
17.7221 17.7213

2
235'
17.7

17367 16656
9434 32 14593
30 93
67 56
17.7935' 17.7927

Scratch y dust

10010 17208
11975' 11240
77 16 40
10 7.208
14.7034 23.40.32

x x verse

16512 16772
11100 12146
00 56
12 6772
22.5412 22.5414

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R = 1.83

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12469

Saiues Etc

Date Mar. 6. 1917

Exp to Stars	12	01			12	13	
" " Moon	12	07	04.0		12	07	04.3
Clock fast		14	16.9				
H. Sid Time	11	52	47 25	✓			
H. Long.	04	44	31.05				
G. Sid. Time	16	37	18.30	✓			
" Sid. Time M.N. 22		54	35.22	✓			
Interval	17	42	43.08	✓			
Red		02	54.10	✓			
G. M.T.	17	39	48.98	✓	17h	6636	✓

$\Theta = +1^h 58^m$

From Naut. Alm.			R.A.		Dec.		
Moon	17h	09	53	28.49 ✓	+9	25	02.9 ✓
Motion	1m			1.8409 ✓			-12.03 ✓
	39.8163 ✓		01	13.30 ✓		-07	59.0 ✓
Tabular Place		09	54	41.79 ✓	+9	17	03.9 ✓

Moons age 13d

Parallax		54'	09.1 ✓
Semi-diam		14'	47.0 ✓
R			887.0
aug.			+4.710.6
Dyr.	4		-0.4
R			898.3 897.2
R			1.9256 1.9232
a.R			-924 -923
1+aR			1.8332 1.8309
R2			3.3606 3.3525

934 = 11.7

a = -504
+240
-.480

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Juices Etc

Date Mar 6. 1917

Exp to Stars	12	01			12	13	
Moon	12	07	040		12	07	043
Clock fast		14	16.9				
☉ Sid Time	11	52	47.25				
☉ Long	04	44	31.05				
♑ Sid Time	16	37	18.30				
" Sid Time MN	22	54	35.22				
Interval	17	42	43.08				
Red		02	54.10				
♑ M.T.	17	39	48.98				

$\Theta = +1^h 58^m$

17h 6636

From Naut Alm.			RA		Dec.
Moon	17h	09	53 28.49	+9	25° 08.9
Motion 1m			1.8409		-12.03
39.8163		01	13.30		07 59.0
Tabular Place		09	54 41.79	+9	17 03.9

Moon age 13d

Parallax	54'	09.1
Semi diam	14'	47.0
R		8870
aug		11.7 106
Dir. +		-04
R		8983 9972
R	19256	14232
aR		-924 923
1+aR	18332	13309
R2	33606	23522

934 =

a: -504
+240
-480

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ξ_0	η_0		-1.4ξ	$-.3\eta$	-1
-566	-4.31	-8	+ 8 = 0	+ 1 = +1	
+6.00	-4.49	+7	- 8 = -1	+ 1 = 0	
+7.48	+2.51	+12	- 10 = +2	- 1 = +1	
+ 1.20	-1.91		- 2	+ 1 = -2 =	-0.01

	-1.5η	0
-6	+ 6 =	0
-7	+ 7 =	0
+4	- 4 =	0
	+ 3 = +3 =	+0.1

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Plate Constants, Center etc.

24

X	Y					
28.0684	13.5095	09	55	49.33	8 26	34.7
22	18		03	08.12+	34	54.8
- 6.0684	+4.4905					
319	466.5					
-188.12	+2094.82					

Plate Center: α 9h 52m 41.21s

δ +9° 01' 29".5

X-5 +500X +93Y +4X -14991

+6313 +8483 = 14796 +127 = 14923 +68 = 14991

+0719 +14034 = 14753 +126 = 14879 +112 = 14991

-0053 +14738 = 14685 +188 = 14873 +118 = 14991

235.017 + 11751 +148 +94 = 23.2019

Y-n +500Y -57X +58Y -6615

-0202 +6835 = 6633 -97 = 6536 +79 = 6615

-0058 +6755 = 6697 -160 = 6537 +78 = 6615

-3423 +10090 = 6667 -168 = 6499 +117 = 6616

15.9608 + 7980 -134 +93 16.0932

a = -0.1 a = -1.6 a - a = +1.5 b+d = -2.0

-504.0 = -505.8 +1.8 -3.6

-5039 -5042 +0.3 -1.6

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Plate Constants Center Tg

24

x	y	α	δ
28 0684	13.5095	09 55 49.393	8 28 37
22	18.	03 08 12+	34 54.8
- 60684	+44905		
319	466.5		
88.12	+2144 82		

Plate Centers. { A 9h 52m 41.21 ; δ +9° 01' 29".5

-5 +500x +934 +4x -1499.

+6313 +8483 = 14796 +127 = 14923 +68 = 14991
+0719 +14034 = 14753 +126 = 14879 +112 = 14991
-0053 +14738 = 14685 +188 = 14873 +118 = 14991
23.5071 +11751 +148 +94 = 23.820

-η +500y

-571x +538y -6615

-0202 +6835 = 6633 -97 = 6536 +79 = 6615
-0058 +6755 = 6697 -160 = 6537 +78 = 6615
-3423 +10090 = 6667 -168 = 6499 +117 = 6616
15.9608 +7780 -135 +93 16.093

a. -0.1 a = -2.7 a - a = +15 And = -2
-5704.0 = -505.8 +18 -36

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Cape no. 1350 mg 9

9	47	51.09
		51.14
		51.11
9	47	51.11
		54.42
9	48	45.53
9	52	41.21
α − A	− 03	55.68
	−	235.67
	2.37231 m	
	9.99933 s	
log S_0	.087290 m	
	− 7.4628	
	− 21	
ξ	14.53511	
X	15.24220	
X − ξ	.7069	14690

Did not use

	+ 10	04	43.8
			43.3
			42.8
	+ 10	04	43.3
		− 04	46.1
δ	+	9 59	57.2
D		9 01	29.5
δ − D		+ .58	27.7
			35080
		3.54506	
log H_0		0.87621	
		9.2462	
		1.7458	
		8.0454	
η_0		+ 7.5198	
η_1		.00111	
η		25.5309	
ψ		24.9400	
$\psi - \eta$		− .5909	6561

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12469 Standard Coordinates. 25

	Cafe Wo 1353 Mag. 7.1		Cafe Wo 1365 Mag. 5.0		Cafe Wo 1368 Mag. 8.2	
C	09 48	49.01	9 54	55.78	9 55	42.84
4		49.04		55.78		42.91
E		48.99		55.79		42.83
M	09 48	49.01	9 54	55.78	9 55	42.86
Prec		54.06 ✓		53.94		54.16
α	09 49	43.07	9 55	49.72	9 56	37.02
A	09 52	41.21	9 52	41.21	9 52	41.21
α-A	− 02	58.14	+ 03	08.51	+ 03	55.81
Sin "		−178.14	+	188.50	+	235.80
log "	2.250176n ✓		2.275311 ✓		2.372554 ✓	
log cos δ	9.99524		9.99527		9.99419	
log S_0	0.753244 ✓		0.777782 ✓		0.873977 ✓	
S_0	− 5.6648		+5.9956 ✓		+ 7.4811	
S_1	− 8.		+ 9		+ 12	
S	16.33.44		27.99.65		29.48.23	
Y	16.96.57		28.06.84		29.47.70	
X-S	+ .6313		+ .0719 ✓		− .0053	
C	+8 32 47.9		8 31 26.7		9 25 53.6	
4		47.8		26.9		53.6
E		47.0		26.5		52.6
M	8. 32	47.6	8 31	26.7	9 25	53.3
Prec	−04	46.7 ✓	− 04	52.0	− 04	52.2
S	+8 28	00.9	+8 26	34.7	+9 21	01.1
☉	9 01	29.5	9 01	29.5	9 01	29.5
S-☉	− 33	28.6	− 34	54.8	+ 19	31.6
tau "		−2008.7		−2094.9	+	1171.6
log "	3.30291n		3.32116n		3.06878	
log μ_0	0.63406n		0.65231n		0.39993	
log tau δ	9.17278		9.17152		9.21658	
log S_0^2	1.50636		1.55384		1.74794	
log h_1	7.73235		7.77788		8.01799	
n_0	−4.3059		−4.4907		+ 2.5115	
n_1	+ 0054		+ 0060		+ 0104	
n	13.6995		13.5153		20.5219	
y	13.6793		13.5095		20.1796	
y-n	− .0202		− .0068		− 0.3423	

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Cafe 140 1353 Aug 71 | Cafe 140 1365 Aug 30 | Cafe 140 1368 Aug 22

C	09 48 49.01	9 54 55.78	9 55 42.34
1	49.04	55.78	42.91
2	48.99	55.79	42.83
M	09 48 49.01	9 54 55.78	9 55 42.86
Prec	54.06	53.94	54.16
λ	09 49 43.07	9 55 49 1.2	9 56 37 02
A	09 52 41.21	9 52 41.21	9 52 41.21
x-A	− 02 58.14	+ 03 08.31	+ 03 55.81
Δm	− 1 7 8.14	+ 50	+ 2 3 5 8 0
log Δ	2.25 0 1 6 m	2.21 58 1 1	2.37 2 5 4
log cosδ	9.99 5 2 4	9.99 5 2 7	9.99 4 1 9
log S₀	0.7 5 3 8 4 m	0.7 7 8 8 2	0.8 7 3 9 7
ξ	− 5.6648	+ 3.9935	+ 7.4511
ξ₀	− 8.4153	+ 4	+ 12
ξ	16 33 44	27.9968	29.4823
η	16 9 6 5.7	25 0 6 8 4	29 4 7 7 0
x-ξ	+ 6.3 1 3	+ 0.7 4 8	− .0 0 5 3

C	8 32 47.9	8 31 26.7	9 25 53.6
1	47.8	26.9	53.6
2	47.0	26.5	52.6
M	8. 32 47.6	8 31 26.7	9 25 53.3
Prec	−04 46.7	−04 52.0	−04 52.2
δ	−8 28 00.9	−8 26 34.7	+9 21 01.4
Q	9 01 29.5	9 01 29.5	9 01 29.5
δ-Q	− 33 22.6	− 34 54.8	+ 19 31.6
tan	− 10 08.7	− 2 0 9 4.8	+ 11 7 1.6
log Δ	3.30 2 9 1 m	3.32 1 1 6 m	3.46 5 7 5
log r₀	0.6 3 4 0 6 m	0.6 5 2 3 1 m	0.3 8 9 9 3
log tan δ	9.1 7 2 7 8	9.1 7 1 5 2	9.2 1 6 5 8
log S₀²	1.5 0 6 3 6	1.5 3 3 8 4	1.7 4 7 9 4
log H₀	7.7 3 2 3 5	7.7 1 5 4 8	7.9 0 1 7 9
η₀	−4 30 5 7	−4 4 9 0 7	+ 2 5 1 1 5
η₀	+ .0 0 5 4	+ .0 0 4 0	+ 0 1 1 4
η	13 6 9 9 5	13 5 1 5 3	20 5 2 1 9
ξ	13 6 7 9 3	13 5 0 9 5	20 1 7 9 6
ξ−η	− .0 2 0 2	− .0 0 5 8	− 0.3 4 2 3

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	x	$(x-x_0)$		Means	Centers	$x-x_{12}$	$+(y-y_0)^2$	O-C	+84
1	22:54 12	− 0.96 27	− 3	0.9274		3.3576	−	30	
2	22.0000	− 1.5040	− 2	2.2626		3.3594	−	12	
3	21.9453	− 1.5587	− 2	2.4302		3.3501	−	105	
4	21.6702	− 1.8338	− 0	3.3629		3.3629	+	23	
5	21.9050	− 1.5090	+ 2	2.2765		3.3604	−	2	
6	22.0000	− 1.5040	+ 2	2.2614		3.3608	+	2	
7	23.0000	− 0.5040	+ 3	0.2537		3.3612	+	6	
8	23.5040	− 0.0000	+ 4	0.0000		3.3665	+	59	

Om ~~3.3606~~ 3.3522

	y	$y-y_0$				New O-C
1	14.4003	− 1.5587	− 2	2.4302		+ 54
2	14.9118	− 1.0472	− 1	1.0968		+ 72
3	15.0000	− 0.9590	− 1	0.9199		− 21
4 y_0	15.9590	− 0.0000	− 0	0.0000		+ 107
5	17.0000	+ 1.0410	+ 1	1.0839		+ 82
6	17.0074	+ 1.0484	+ 1	1.0994		+ 86
7	17.7217	+ 1.7627	+ 2	3.1075		+ 90
8	17.7936	+ 1.8346	+ 2	3.3665		+ 143

x = 22 y = 14.9118

17.0074

31.9192

15.9596 y_0

17.7936 y_{mag}

R = 1.8340

Corr R = ~~1.8338~~ 1.8309

Xmag 21.6702

Offset centers { x_0 23.5040 / y_0 15.9590

arc.
212°
235
239
270
304
305
344
360
Range 148

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Moon Center

	x	$(x-x_0)^2$		$(x-x_0)^2+(y-y_0)^2$		O-C	
1	22.5413	- 0.9627	- 3	0.9274	3.3576	-	30
2	22.0000	- 1.5040	- 2	2.2626	3.3594	-	12
3	21.9453	- 1.5587	- 2	2.4302	3.3501	-	105
4	21.6702	- 1.8338	- 0	3.3629	3.3629	+	23
5	21.9050	- 1.5990	+ 2	2.7665	3.3604	-	2
6	22.0000	- 1.5040	+ 2	2.2614	3.3608	+	.2
7	23.0000	- 0.5040	+ 3	0.2537	3.3612	+	6
8	23.5040	- 0.0000	+ 4	0.0000	3.3665	+	59

Corr 3.3666
3.3522

	y	$y-y_0$		$(y-y_0)^2$		New O-C	
1	14.4003	- 1.5587	- 2	2.4302		+	54
2	14.9118	- 1.0472	- 1	1.0965		+	12
3	15.0000	- 0.9590	- 1	0.9199		-	21
4	15.9590	- 0.0000	- 0	0.0000		+	107
5	17.0000	+ 1.0410	+ 1	1.0839		+	82
6	17.0074	+ 1.0484	+ 1	1.0994		+	56
7	17.7217	+ 1.7627	+ 2	3.1075		+	90
8	17.7936	+ 1.8346	+ 2	3.3665		+	143

x = 22 y = 14.9118
17.0074
31.9192
y_0 15.9596
y_{max} 17.7936
R. 1.8340
Corr R. 1.8309
Approx 21.6702

Approx center x_0 23.5040
y_0 15.9590

arc.
212°
235
239
270
304
305
344
360
Range 148

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Formation of Normals.

1	+ 1.5	+ 28.8	+ 46.8
2	+ 1.5	+ 18.0	+ 12.6
3	+ 1.5	+ 164.0	+ 101.0
4	+ 0.0	- 42.0	- 00.0
5	- 1.5	+ 3.0	- 2.1
6	- 1.5	- 3.0	+ 2.1
7	- 0.8	- 3.0	+ 10.5
8	- 0.0	- 0.0	+ 108.0
	+ 4.5	+213.8	+278.9
	- 4.0	- 48.	+ 177.2
	+ 0.5	+165.8	+456.1
		-7862	
		-620.4	

R = 1.83 ΔR = +1.0

corr. +0.5

True ΔR = +0.5

$-2Rc = -1.83$

Δh = − 0.35 ΔS = − 0.2

Δq = + 1.26 Δa = + 0.04

	a	h	e	Cor O-C
a − 25	+ 24	− 11	− 24	+ 42
h + 7	+ 37	− 7	− 7	+ 34
e − 37	+ 39	− 7	− 5	− 63
	+ 46	0	+ 9	+ 31
	+ 38	+ 7	+ 8	− 18
	+ 37	+ 7	+ 7	− 16
	+ 12	+ 12	− 13	− 10
	1 0	1 13	− 24	+ 52

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12469 Conditional Equations. 27

	$x-x_0$	$y-y_0$			O − C			
				+84				
1	− 0.96	− 1.56	=	− 30	− 10	− 33	− 43	+ 13
2	− 1.50	− 1.05	=	− 12	− 16	− 22	− 38	+ 26
3	− 1.56	− 0.96	=	− 105	− 17	− 20	− 37	− 68
4	− 1.83	− 0.00	=	+ 23	− 20	− 0	− 20	+ 43
5	− 1.51	+ 1.04	=	− 2	− 16	+ 22	+ 6	− 4
6	− 1.50	+ 1.05	=	+ 2	− 16	+ 22	+ 6	− 4
7	− 0.50	+ 1.76	=	+ 6	− 5	+ 37	+ 32	− 26
8	− 0.00	+ 1.83	=	+ 59	− 0	+ 39	+ 39	+ 20
	− 9.36							

13.77 + 0.55 = + 159.8

+ 0.55 + 13.10 = + 283.1

− 0.55 − 0.02 = − 6.4

+ 13.08 = + 276.7 b = + 21.1

+13.77 = + 159.8 − 11.6 = + 148.2 a = + 10.8

+13.77 + 0.55 = − 620.4 ✓ − 9.36

+ 0.55 + 13.10 = + 456.1 ✓ + 2.11

−( ) − .02 + 24.8 ✓ ± 0.34

+ 0.19 △

+13.08 = + 480.9 ✓ b = + 36.7

− 0.69 △

+13.77 = − 620.4 − 20.2 = − 640.6 a = − 46.5

			O − C	
+	45	− 57	= − 12	+ 66
+	70	− 39	= + 31	+ 41
+	72	− 35	= + 37	− 58
+	85	− 0	= + 85	+ 22
+	70	+ 38	= + 108	− 26
+	70	+ 39	= + 109	− 23
+	23	+ 64	= + 87	+ 3
	0	+ 67	= + 67	+ 76

arc 148

$\frac{R}{n} = 1.5$ ✓

$\frac{\Sigma x}{n} = + 12.6$ ✓

$\frac{+12.6}{1.5} = + 84$ ✓

△ R = + 1.0 ✓

or 39

+305 = 107

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Conditional Equations.

$\alpha - \alpha_0$	$\delta - \delta_0$		$+\Delta\alpha$	O - C			
- 0.96	-1.5"6	=	- 30	- 10	- 33	- 43	+ 13
- 1.50	-1.05"	=	- 12	- 16	- 22	- 38	+ 26
- 1.56	- 0.96	=	-1.05"	- 17	- 20	- 37	- 68
- 1.83	- 0.00	=	+ 23	- 20	- 0	- 20	+ 43
- 1.51	+ 1.04	=	+ 2	- 16	+ 22	+ 6	- 4
- 1.50	+ 1.05"	=	+ 2	- 16	+ 22	+ 6	- 4
- 0.50	+ 1.76	=	+ 6	- 5	+ 37	+ 32	- 26
- 0.00	+ 1.83	=	+ 5"9	0	+ 39	+ 39	+ 26
-							

13.77 + 0.5"5" = + 1.5"9 8

+ 0.5"5" + 13.10 = + 253.1

+ 0.5"5" - 0.02 = + 24

+ 13.04 = + 2767

+13.77 = +1.5"9 8 - 11.6 = + 148.2

b = + 21.1

a = + 10.8

+13.77 + 0.5"5" = - 620.4

+ 0.5"5" +13.10 = + 456.1

-( ) - .02 + 24.8 + 0.34

+0.190

+13.04 = +4809 b = + 36.7

-0.694

+13.77 = - 6204 - 202 = -6406 a = - 46.5"

				O - C
+	45"	- 57	= - 12	+ 66
+	70	- 39	= + 31	+ 41
+	72	- 35"	= + 37	- 58
+	85"	0	= + 85"	+ 22
+	70	+ 38	= +108	- 26
+	70	+ 39	= + 109	- 23
+	23	+ 69	= + 92	+ 3
	0	+ 67	= + 67	+ 76

arc 148

$\frac{P}{n} = .15"$

$\frac{\Sigma x}{2} = +12.6'$

$\frac{+12.6}{.15"} = +84'$

$\Delta R = +1.0'$

av 3

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12469 Moons Mean Position. 28

x_0 23.5040
−23
23.5017

y_0 15.9590
+18
15.9608

From Plate Constants.

23.2019
22.
ξ_0 + 1.2019

16.0932
18
− 1.9069

log ξ_0 0.079866
log cos δ_0 9.999488
8.507324
log Sin (α − A) 1.577774
Sin α − A' +37.82

log tan δ 9.18811
log ξ_0^2 0.15977
7.05334
log η 6.40122

η_1 + 0.00002
η_0 − 1.90711

α − A +37.82

A 9 52 41.21

log η_2 0.280388
7.331155
log tan δ − β 2.949233

α_0 9 53 19.03

Red +2.90

tan δ − β − 889.7

α' 9 53 21.93

δ − β −14 49.7

β +9° 01 29.5

δ_0 +8° 46 39.8

Red −14.3

δ' +8 46 25.5

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12469 Moons Mean Position.

x_0 23.5040
−23
23.5018

y_0 15.9590
+18
15.9608

From Plate Constants.

23201.9
22
ξ_0 +12019

16093.4
18
−19069

log ξ_0 0.0804986
log cos δ_0 9.9944888
8.5071274
log Sm K-A 15.7717.4
Sm x 17 +37.82

log tan ζ 9.1884.1
log S_0^2 0.1599.7
7.0533.4
log η_0 6.4012

η_1 +0.0002
η_0 −1.9071

x-A +37.82

A 9 52 41.21

log η_1 0.2803.8n
7.3311.5
x_0 9 53 19.03 log tan i-s 2.7492.3n

Red +2.90 tan i-s −.5997

x' 9 53 21.93 S.S −14 49.1

Θ +9° 01 29.5

δ_0 +8° 46 39.8

Red −14.3

δ' +8 46 25.5

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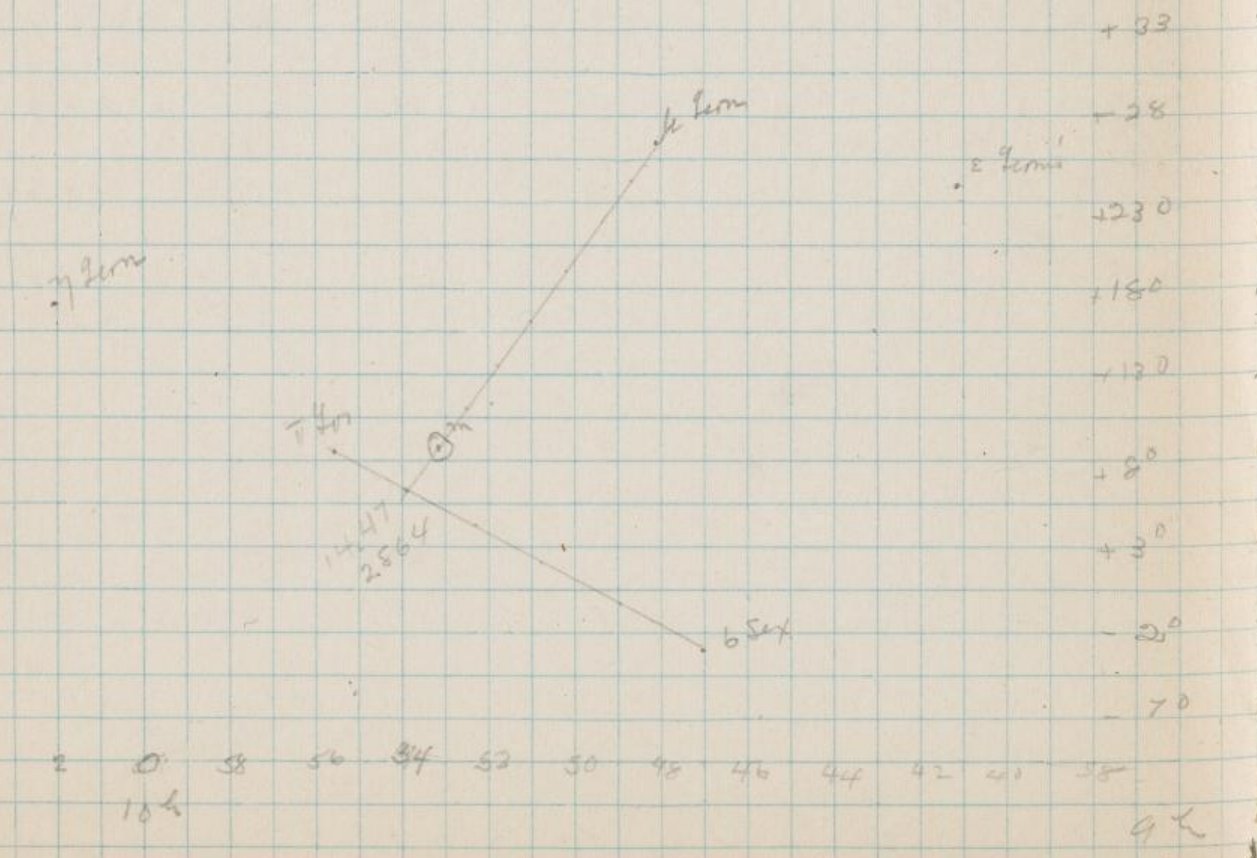
1. 9 47 58.86 | −3 51 28.84
9 47 3.136 | 13.59
+ 2.750 | − 15.25

2 9 48 5.955 | +26 23 43.12
2.755 | 54.51
+ 3.200 | − 11.39

3. 9 55 52.613 | + 8 26 20.42
49.720 | 34.70
+ 2.893 | − 14.28

2.893
2.750
.143

−15.25
−14.28
0.97



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Red to apparent Place

12469

H+α	4	53.5	73°	22.5'
H	19	00.2		
α	4	53.3		
Q	22	50.1		
Q+α	8	43.4	131°	51'

log cos δ_0	9.99948
log i	0.89828n
(i)	0.89828n
log sin δ_0	9.18336
log (H+α_0)	9.45569
log h	1.27760
Sin H+α_0	9.98114
sec δ_0	00052
	8.82239

log Cos C+α_0	9.82422n
log g	1.03499
" Sin C+α_0	9.87211
" tan δ_0	9.18587
	8.82239

log g'	0.86411n
log g	8.92246

g	+1.596
(g)	+0.084
(i)	+1.220
Red.	+2.900

log h'	9.91655
h	0.08265

g'	−7.313
h'	+0.825
i	−7.813
Red.	−14.301

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Red 7 apparent Place

12469

H+α	4	5 3 5	73°	22 5'	
H	19	00.2			
α	9	53 3			
G	22	50.1			
G+π	8	43.4	131°	51'	

log Cos (G+π)₀	9 8 2 4 2 n		
log g	1 0 3 4 9		
log Sin (G+π)₀	9 8 7 9 1		
tan δ₀	9 1 8 8 7		
	8 8 2 3 9		
log g'	0 8 6 4 1 n		
log g	8 9 8 9 6		
g	+ 1.5 9 6		
δg'	+ 0 0 8 9		
δλ'	+ 1 2 2 0		
Red.	+ 2 9 0 0		

δ₀		8° 4 6.7	
log Cos δ₀		9 9 9 4 8	
log i		0 8 9 8 8 n	
i		0.8 1 2 8 n	
log Sin δ₀		9 1 8 3 6	
Cos (H+α)₀		9 9 5 6 9	
log h		1 2 7 6 0	
Sin H+α₀		9 4 8 1 7	
Sec δ₀		0 0 0 5 2	
		8 8 2 3 9	
log h'		9 9 1 6 5	
h		0.0 8 6 5	
g'	- 7 3 1 3		
h'	+ 0.8 2 5		
G	- 7 8 1 3		
Red	-14.3 0 1		

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Lunar Parallax.

α	9	53	21.93 ✓
Θ	11	52	47.25 ✓
$\Theta-\alpha'$	+1^h	59^m	25.32
=	29°	51′	19.80″
$\frac{1}{2}(\alpha-\alpha')$		10	06.23
$(\Theta-\alpha')-\frac{1}{2}(\alpha-\alpha')$	29°	41′	13.57″ ✓

	9.995727
log Cos $\frac{1}{2}(\alpha-\alpha')$	0.000000
Sec $(\Theta-\alpha')-\frac{1}{2}(\alpha-\alpha')$	0.006111 ✓
log tan γ	0.001838 ✓

γ 46 12 43.2 ✓

δ' 8 46 25.5 ✓

$\gamma-\delta'$ 37 26 17.7 ✓

	9.825640
log Sin π	8.197332
Sin $\gamma-\delta'$	9.783842 ✓
Cosec γ	0.141520 ✓
Sin $(\delta-\delta')$	7.949080 ✓

$\delta-\delta'$ + 30 34.5 ✓

δ +9 17 0.0

Eph δ +9 17 03.9 ✓

O-C − 3.9 ✓

Iwo Cord. Red. 0.0

Curv. +0.1″

δ +9 17 0.1

O-C −3.8

π 54′ 09.1 ✓

	9.864131
log Sin π	8.197332 ✓
Sin $(\Theta-\alpha')$	9.697065 ✓
Sec δ' Eph	0.000573 ✓
Ω $\alpha-\alpha'$	7.769924 ✓

$\alpha-\alpha'$ = 21′ 12.47″ ✓

= = +1^m 25.83 ✓

α 9 54 42.76 ✓

Eph α 9 54 41.79 ✓

O-C + 0.97 ✓

Curv. −0.01″

α 9 54 42.75

O-C = +0.96

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Lunar Parallax.

α	9	53	21.93
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$\theta - \alpha'$	+ 1^h	59^m	25.32
=	29°	51′	19.80″
$\frac{1}{2}(\alpha - \alpha')$		10	06.23
$(\theta - \alpha') - \frac{1}{2}(\alpha - \alpha')$	29°	41	13.57

	9.995727
log Cos $\frac{1}{2}(\alpha - \alpha')$	0.000000
Sec $(\theta - \alpha') - \frac{1}{2}(\alpha - \alpha')$	0.006111
log tan γ	0.001838

γ 46 12 43.2

δ' 8 46 25.5

$\gamma - \delta'$ 37 26 17.7

	9.825640
log Sin π	8.197332
Sin $\gamma - \delta'$	9.783844
Cosec γ	0.141520
Sin $(\delta - \delta')$	7.949008

$\delta - \delta'$ + 30 34.5

δ +9 17 0.0

Eph δ +9 17 03.9

O-C − 3.9

Iwd Cord. Ref. 0.0

Curv. +0.1

δ +9 17 0.1

O-C −3.8

π 54′ 09.1″

	9.864131
log Sin π	8.197332
" Sin $(\theta - \alpha')$	9.697106
" Sec δ' Eph	0.005743
Ω $\alpha - \alpha'$	7.769924

$\alpha - \alpha'$ = 21′ 12.47″

= = +1^m 25.83^s

α 9 54 42.76

Eph α 9 54 41.79

O-C + 0.97

Curv −0.01

α 9 54 42.75

O-C = +0.96

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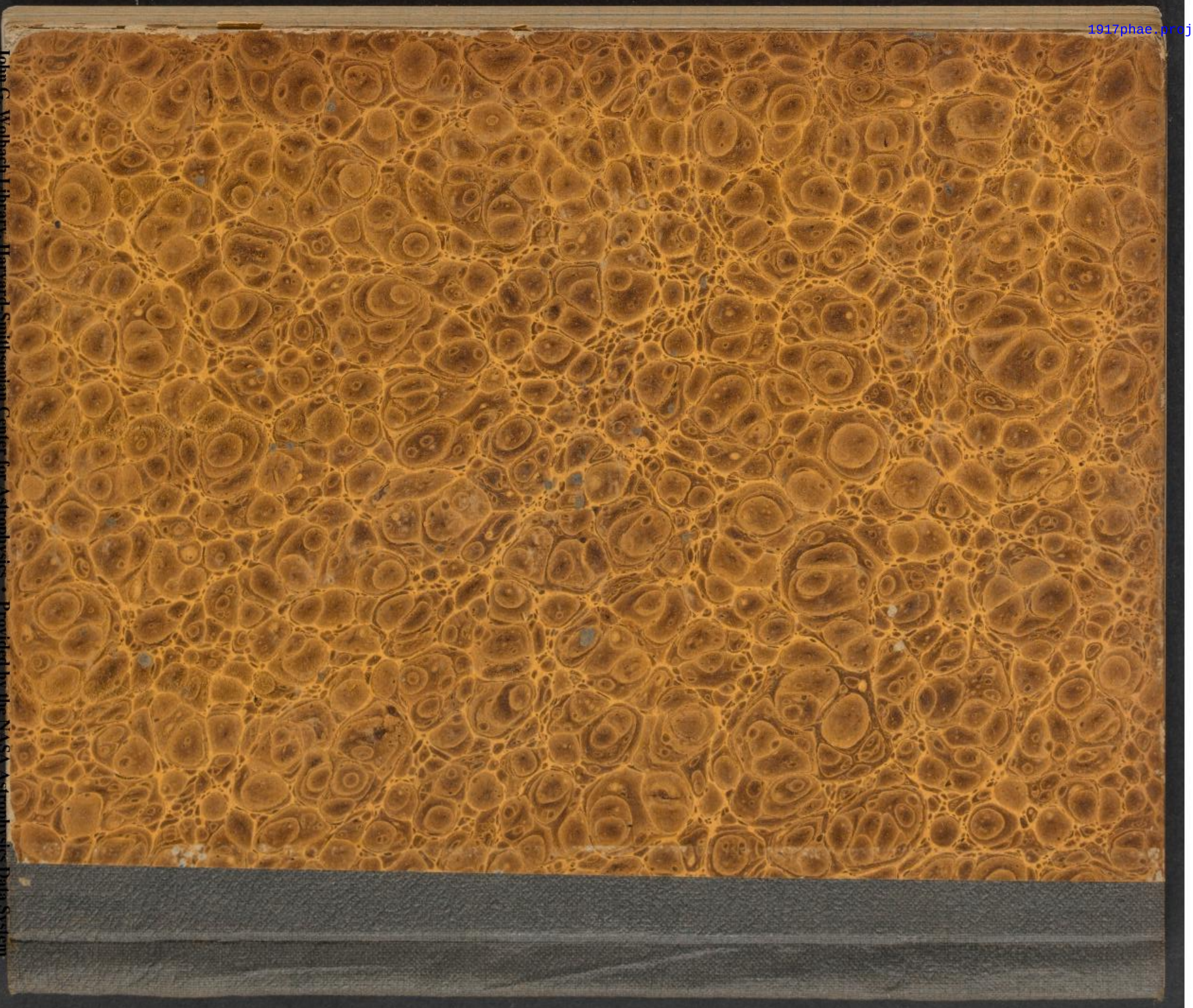
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