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KG
11364
v.1000

CXLVIII

148

Plate	Date	Page
10533	Mar. 11, '16	1
10604	" 25, '16	11
10760	May 20 "	21

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1853

Star Measures

1
12.4
16.9

16730 175-58 16770 18362
13280 } 83 11001 } 02 8066 } 67 17846
86 03 68 46
26 75-58 70 8364
12.3446 12.3444 6.8703 6.8682

23.2
25.4

16102 18198 16615 18960
14312 } 93 9996 } 90 12562 } 61 13014 } 12
12 90 60 10
06 8194 21 8962
23.1791 23.1799 25.4056 25.4050

3
29.7
12.6

29.6391 29.6395 12.5324 12.5312

Moon Measures

1
24
16.1

17546 17546
16821 } 80 7668 } 80
79 79
42 42
16.0868 16.0858

2
23.
16.9

16168 18765
7796 } 97 17186 } 34
98 32
72 8763
16.8374 16.8371

3
22.9
17

16361 17206
7295 } 94 16280 } 82
93 84
03 7204
22.9069 22.9078

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Diffraction images of star 3

17622	18590	16137	17100
11235 } 37	14980 83	10080 } 82	13138 } 40
39	86	84	42
20	8594	39	7106
29.6384	29.6390	12.6056	12.6034

15474	18598	18740	17622
9074	15000	14149 } 49	12211
74	00	45	113 12
70	8606	42	22
29.6398	29.6399	12.4593	12.4590

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1 1 5 3 3

Star Measures

1
12.4
16.9

1 6 7 3 8 0 | 1 7 5 5 8
1 3 2 8 0 | 1 1 6 0 1 2
8 6 | 8 3 | 1 3 | 0 2
2 6 | 7 5 5 8
1 2 9 4 4 2 | 1 2 9 4 4 4

1 6 7 7 0 | 1 8 3 6 2
8 0 6 | 6 7 | 7 7 0 4 6
6 8 | 4 6
7 0 | 8 3 6 4
6 8 7 0 3 | 6 8 6 8 2

2
23.2
25.4

1 6 1 0 2 | 1 8 1 9 8
1 4 3 1 2 | 9 9 9 6
1 2 | 9 0 | 9 3
0 6 | 8 1 9 4
2 3 1 7 9 1 | 2 3 1 7 9 9

1 6 6 1 5 | 1 8 9 8 0
1 2 5 6 2 | 1 1 | 1 3 0 1 4 | 1 2
6 0 | 1 0
2 1 | 9 8 2
2 5 4 0 5 6 | 2 5 4 0 5 8

3
29.7
12.6

1 2 5 3 2 4 | 1 2 5 3 1 2

2 9 6 3 9 1 | 2 9 6 3 9 5

Mean Measures

1
24
16.1

1 7 5 4 6 | 1 8 0 8 0
1 6 6 8 1 | 8 9 3 6 | 3 8
7 9 | 8 0 | 4 0
4 2 | 8 0 8 0
1 6 0 8 6 8 | 1 6 0 8 5 8

2
23.
16.9

1 6 1 6 8 | 1 8 7 6 5
7 7 9 6 | 1 7 1 8 4 | 3 4
9 8 | 7 7 | 3 2
7 2 | 8 7 6 3
1 6 8 3 7 4 | 1 6 8 3 7 1

3
22.9
17

1 6 3 6 1 | 1 7 2 0 6
7 2 4 5 | 1 6 2 8 8 | 4 2
9 3 | 9 4 | 4
0 3 | 7 2 0 4
2 2 9 0 6 9 | 2 2 9 0 7 8

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Moon Measures.

4
22.7
17.6

18656 — 12571 (73) — 75 — 52 — 22.7081

16742 — 13833 — 35 — 6746 — 22.7089

5
22.7
18

17665 — 10539 (37) — 35 — 71 — 22.7132

17727 — 14835 — 52 — 7727 — 22.7125

6
23
18.9

17404 — 8969 (65) — 61 — 10 — 18.8443

18282 — 16708 (10) — 12 — 8282 — 18.8428

7
23.1
19

18327 — 17192 (90) — 88 — 27 — 23.1137

18535 — 9668 — 68 — 40 — 23.1127

8
~~1.5~~

16891 — 8548 (49) — 50 — 91 — 23.8342

18116 — 16468 (70) — 72 — 14 — 23.8351

17583 — 12146 (47) — 48 — 87 — 19.5438

18840 — 14252 — 52 — 40 — 19.5412

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Moon Measures.

4
22.7
17.6

18656 — 16742
12571 } 73 — 13833
75 — 35
52 — 6746
22708.1 — 22708.9

5
22.7
18

17665 — 17727
10539 } 37 — 14835 } 40
35 — 52
71 — 7727
22712.2 — 22712.5

6
23
18.9

17404 — 18252
8769 } 65 — 16708 } 10
61 — 12
10 — 5282
18.8473 — 18.8428

7
23.1
19

18327 — 18535
17192 } 90 — 9668
55 — 65
27 — 40
23113.7 — 23112.7

8
24
19.5

18891 — 18116
8548 } 49 — 16468 } 70
50 — 72
91 — 14
23834.2 — 23832.4

17583 — 18840
12146 } 47 — 14252
48 — 52
87 — 40
19.5438 — 19.5418

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Times Etc

105 33

March 11. 1916.

Exp. to Stars	07	17			07	29	"
" " Moon	07	22	51.5	s	07	22	51.6 L
Clock fast		05	24.9	L			
H. Sid. Time	07	17	26.65	L	Θ	+1 h	44 m
H. Long	04	44	31.05			m	
G. Sid Time	12	01	57.70				
Sid. Time Mean Noon	23	15	15.11				
Interval	12	46	42.59			h	
Reduction		02	05.61			12.7436	
G. M. T	12	44	36.98	L			

From Naut. Almanac

			R.A.		Decl.	
Moon 12 h	05	31	10.19 L	+26	51	41.4 L
Motion 1 m			2.126 L			-0.503 L
" 44.6163		01	38.72 L			-22.4 L
Tabular Place	05	32	48.91 L	+26	51	19.0 L

Moon's Age 8d

Parallax	54	15.9 L
Semi-diam	14	48.8
R		888.8
Aug		13.1
Dup s		-0.8
R		901.1
R		1.93164
(1+q) R		-920
R		1.83964
R²		3.38414

934" = 14.45

a = -500.3
+24
-476.3

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Times etc

105-33

March 11, 1916

Exp. & Stars	07	17		07	29	"
" " Moon	07	22	51.5s	07	22	51.6
Clock fast		05	24.9			
H. Sid Time	07	17	2665s	⊕ 71°	44'	
71 Long	04	44	31.05s		"	
G Sid Time	12	01	57.70			
Sid Time Mean Noon	23	15	15.11			
Interval	12	46	42.59		h	
Reduction		02	05.61	12	7	4
G M T	12	44	36.98			

From Mount Almanac				RA			Decl.		
Moon 12h	05	31		10.19	26	51	41.4		
Motion 1m				2.126			-0.503		
" 44.6163		01		38.72			-24		
Tabular Place	05	32		48.91	26	51	19.0		

Moon's Age 8d

	Parallax	54 15.9
	Semi-diam	14 48.8
	R	888.8
	Corr	13.1
	Corr 5s	-0.8
	R	901.1
	R	1.9316
	(1+q) R	-920
	R	1.8396
	R^2	3.3841

934" = 14.45s

C = -500.3
+ 24
-476.3

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10533 Plate Constants. 4

X	12 34 45	23 17 95	29.6393
S	-12.4618	-23.8685	-30.6310
X-S	-.1173	-.6890	-.9917

y	6.8692	25 40 53	12.5318
η	-5.3352	-24 78 02	-11.2539
y-η	+1.5340	+.6251	+1.2779

X-S	+500X	+16y	+3X	-5.113
-.1173	+6142 = 4999	+110 = 5109	+4 = +5.113	
-.6890	+11590 = 4700	+406 = 5106	+7 = +5.113	
-.9917	+14820 = 4903	+200 = 5103	+9 = +5.112	
24.5442	+12272	+285 v	+7 v	25.2893 v

y-η	+500y	-15.5X	-.64y	-1.85-80
+1.5340	+3435 = 18775	-191	-18584-4	= +18580
+0.6251	+12503 = 18954	-359	-18595-15	= +18580
+1.2779	+6266 = 19045	-459 =	18586-7	= ±18579
17.8432	+8922	-380 v	-11 =	16.8383 v

Tables a = +1.0 e = +1.0 a-e = 0.0 b+d = -0.5
= -500.3 = -499.4 = -0.9 = -0.5

O-C -501.3 -500.4 +0.

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1593 Plate Constants. 4

x	12 34 45ˢ	23 17 95ˢ	.29 63 93
s	12 46 18	23.86 85ˢ	30.63 10
x-s	− .11 73	−.68 90	−.99 17

y	6.88 92	25ˢ 40 53ˢ	12 53.18
η	5.33 52	24 78 02	11.25ˢ 39
y-η	+1 53 40	+.62 51	+1.27 79

x-s	+500x	+16y	+3x	−5ˢ113
−.1173	+6172 =	4999 + 110 =	5109 + 4 =	+5113
−.6891	+11590 =	4700 + 406 =	5106 + 7 =	+5113
−.9917	+14820 =	4903 + 200 =	5103 − 9 =	5112
24.5442	+12272	+285ˢ	+7	25.2893

y-η	+500y	−15.5ˢx	−.6y	−1.85ˢ80
1.5341	+3435ˢ =	18775ˢ − 191	− 18584 − 4 =	+18580
.6251	+1273 =	18954 − 359	− 18593 − 15ˢ =	+18580
1.2779	+6266 =	19045ˢ − 459 =	18586 − 7 =	+18579
17.8432	+8922	− 380	− 11 =	16.8383

Tables a = +1.0 e = +1.0 a − c = 0.0 b + d = −0.5ˢ
= −500.3 = −499.4 = −0.9 = −0.5ˢ

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10533 Moacis Center 5-

		$X - X_0$	Δx	$(X-X_0)^2$	$+(4-4_0)^2$	O-C
1	24.00000	−.54801	−1	0.30002	3.37556	− 85
2	23.00000	−1.54801	−0	2.39623	3.40119	+ 178
3	22.90774	−1.64406	−0	2.69715	3.39771	+ 130
4 min	22.70855	−1.83955	−0	3.38338	3.38338	− 3
5	22.71128	−1.83552	+0	3.36794	3.39935	+ 94
6	23.00004	−1.54801	+0	2.39623	3.40333	+ 192
7	23.11332	−1.43348	+1	2.05589	3.40455	+ 204
8	23.83347	−0.71333	+1	0.50900	3.40755	+ 234

$R^2 = 3.38341$

		$4 - 4_0$	Δy		
1	16.08633	−1.75397	0	3.07554	197°
2	16.83722	−1.00028	0	1.00056	237
3	17.00000	−0.84000	0	0.70556	243
4	17.84000	0.00000	0	0.00000	270
5	18.00000	+0.16000	0	0.02556	275
6	18.84355	+1.00035	0	1.00070	303
7	19.00000	+1.16008	0	1.34556	309
8	19.54255	+1.70255	0	2.89855	337

Range 140.

Approx. Center.

$X = 23$ y 16.83722
18.84355
35.68077
4_0 17.84039

Com. R = 1.8396

X min = 22.70855

X_0 = 24.54811

Moacis Center { X_0 24.54800 = ; 4_0 17.84000

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Moons Center

		$x - x_0$	Δx	$(x-x_0)^2$	$+(y-y_0)^2$	O-C
1	24.00000	− .5480	− 1	0.30002	3.37556	− 85
2	23.00000	+1.5480	− 0	2.39663	3.40179	+ 175
3	22.90074	−1.6406	− 0	2.69115	3.39971	+ 130
4 mm	22.70855	−1.8395	− 0	3.38338	3.38338	− 3
5	22.71128	−1.8352	+ 0	3.36791	3.39935	+ 94
6	23.00000	−1.5488	+ 0	2.39663	3.40333	+ 192
7	23.11132	−1.4348	+ 1	2.05789	3.40455	+ 204
8	23.53347	−0.7133	+ 1	0.50900	3.40755	+ 234

R^2 33841

		$y - y_0$	Δy		
1	16.08637	−1.7537	0	3.07554	197°
2	16.83722	−1.0028	0	1.00556	237
3	17.00000	−0.8400	0	0.70556	243
4	17.84008	0.00008	0	0.00000	270
5	18.00000	+0.1600	0	0.02556	275
6	18.84335	+1.0035	0	1.00070	303
7	19.00000	+1.1601	0	1.34556	309
8	19.54235	+1.7025	0	2.89855	337

Range 140.

Approx Center.

$x = 23$ y 16.83722

18.84335

35.68057

y_0 17.84028

Corr. R = 1.8396

x_{mm} 22.70855

x_0 = 24.54811

Moon Center $\begin{cases} x_0 & 24.54800 \\ y_0 & 17.84000 \end{cases}$

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Normals

1	+ 0.96	+ 46.8	+ 149
2	+ 1.55	− 276.0	− 178
3	+ 1.38	− 210.4	− 109
4	+ 0.00	+ 5.5	+ 000
5	− 0.16	− 172.0	+ 15
6	− 1.55	− 288.0	+ 192
7	− 1.66	− 292.0	+ 236
8	− 1.21	− 166.0	+ 397
	+ 3.89	+ 52.3	+ 981.
	− 4.58	− 1404.4	− 287
	− 0.69	− 1352.1	+ 702.

		−37
−a	−b	+ΔC
+ 13	0	− 24
+ 36	0	− 1
+ 38	0	+ 1
+ 42	0	+ 5
+ 42	0	+ 5
+ 36	0	− 1
+ 33	0	− 4
+ 16	0	− 21

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1905.33 Conditional Equations O-C 6

1	-0.55'	-1.75	-85'	+42	-112	= -70	-15'	
2	-1.55'	-1.00	+178'	+118	-64	= +54	+124	
3	-1.64	-0.84	+130	+125'	-54	= +71	+59	
4	-1.84	-0.00	-3	+140	-00	= +140	-143	
5'	-1.83	+0.16	+94	+139	+10	= +149	-55'	
6	-1.55'	+1.00	+192	+118	+64	= +182	+10	
7	-1.43	+1.16	+204	+109	+74	= +183	+21	
8	-0.71	+1.70	+234	+54	+110	= +164	+70	
		+4.02					+284	-213
		-359						

Corr O-C
-39'
+123'
+60'
-138'
-50'
+9'
+17'
+49'

17.10 - 0.69 = -1352. -10.55'

- 0.69 + 10.06 = +702 + 0.43

+ 0.69 - 0.03 = - 54.48 -1.43

+ 10.03 = +647.52 0 f = +64.55' + c

17.10 = -1352 + 4453 = -1307.47 a = -76.5' - 0.62 Δ

arc 140°

$\frac{\Sigma}{n}$

$\frac{\Sigma}{n}$ = .11 +9 $\frac{+9}{11}$ = +.82

ΔR = +1.0
Corr = +0.5
ΔR = +0.5

-2RC = -1.83 -37

Δb = 0 $\Delta \delta$ = 0

Δa = +1.13 Δa = +0.04
+23

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1533 Conditional Equations O-C 6

1	-0.53"	-1.75	-85"	+42	-112	= -70	-15"
2	-1.53"	-1.00	+178"	+118	-64	= +54	+124
3	-1.64	-0.84	+130	+125"	-54	= +71	+59
4	-1.84	-0.00	-3	+140	-00	= +140	-143
5"	-1.83	+0.16	+94	+139	+10	= +149	-55"
6	-1.55"	+1.00	+192	+118	+64	= +182	+10
7	-1.43	+1.16	+204	+109	+74	= +183	+21
8	-0.71	+1.70	+234	+54	+110	= +164	+70
						+284	-213

17.10 - 669 = -1352

-669 +10.06 = +702

+669 - 003 = -5448

+10.03 = +647.52 k = +64

17.10 = -1352 + 44.53 = -1307.47 a = -76

arc 140°

$\frac{\Sigma}{n}$ = 11 +9 $+\frac{9}{11}$ = +.82 ΔR = +1.0

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Moon's Mean Position

X_0 24.5480
− 38
24.5442

Y_0 17.8400
+32″
17.8432

From Plate Constants.

25.2893
22
ξ_0 +3.2893

16.8383
18″
−1.1617

$\log \xi_0$ 0.517104
$\log \cos \delta_0$ 9.995150
8.507254
$\log \sin(\alpha - A)$ 2.058356

$\sin(\alpha - A)$ +114.38″

$\alpha - A$ +01 54.38″

A 05 29 33.60″

α_0 05 31 27.98″

Red +1.81″

α' 05 31 29.79″

$\log \tan \delta$ 9.69900
$\log \delta_0''$ 1.03422
7.05534
$\log \eta_1$ 7.78666

η_1 +0.00061
η_0 −1.16778

$\log \eta_0$ 0.067373
7.331115
$\tan(\delta - D)$ 2.736222

$\delta - D$ −544.77″
− 09 04.8″
D +26 43 49.6″

δ_0 +26 34 44.8″

Red +8.2″

δ' +26 34 53.0″

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1915-33 Thetis Mean Positions 7

X_0 24.5480
− 38
24.5442

Y_0 17.8400″
+ 32
17.8432

From Plate Constants.

25.2893
22
+3.2893

16.8853
18
−1.1617

log ξ	0.51710	log tan ξ	9.69790
log cos ξ	9.95150	log ξ″	1.03422
	8.56724		7.05534
log Σa(x−A)	2.05836	log η	7.78866

Σa(x − A) + 114.38

				ζ +0.0061
x − N		+01	54.38	η₀ −1.1678
A	05	29	33.60	log η₀ 0.06737
X_0	05	31	27.98	7.33115
Red			+1.81	tan(δ−ξ) 2.73622
X′	05	31	29.79	δ−ξ −5.4+77
				− 09 04.8
				E +26 43 49.6
				δ_0 +26 34 44.8
				Red. + 8.2
				δ′ +26 34 53.0

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10533. Reduction to Apparent Place

H + α	24h	9.9	2° 28.5′	
H	18	38.4		
α	05	31.5		
G	21	53.7		
G + α	27	25.2	51° 18′	

log cos (G + α)	9.7960	
log q	1.0494	
" sin (G + α)	9.8861	
" tan δ₀	9.6992	
	8.8239	

log (q)	0.8454	
" (q)	9.4586	
f	+1.465	
(q)	+0.287	
(k)	0.060	
	+1.812	

δ₀	26	34.7
log cos δ₀	9.9515	
log i	−0.9057ₙ	
log (l)	0.8572ₙ	
log sin δ₀	9.6507	
" log (H + α)	9.9996	
log h	1.2746	
" sin (H + α)	8.6353	
Sec δ₀	0.0485	
	8.8239	

log (f)	0.9249	
(k)	8.7823	
q′	+7.005	
k′	+8.412	
i	−7.198	
	+8.219	

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1910phae.proj.

10533. Reduction to Apparent Place

t + λ	24	9.9	2′	28.5″
H	7	8	38.4	
g	0	5°	31.5″	
G	21		53.7	
t + λ	27		25.2	51° 18′

log(G + λ)	9.7960
log g	1.0494
∴ sin(G + λ)	9.8861
∴ tan δ₀	9.6992
	8.8239

log f′	0.8754
∴ (f)	9.4586

f	+1.465″
(f)	−0.287
(k)	0.060
	+1.812

δ₀ 26 34 7

log cos δ₀	9.9515
log i	−0.9157
log (l)	0.8572

log sin δ₀	9.6507
log (H + λ)	9.9996
log k	1.2746
∴ sin (H + λ)	2.6353
Sec δ₀	0.0435
	8.8239

log (k)	0.9249
(k)	8.7823

g′	+7.003″
k′	+8.212
i	−7.198
	+8.219

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10533 Lunar Parallax. 9

α'	05	31	29.79 ✓
θ	07	17	26.65 ✓
$\theta-\alpha'$	+ 1	45	56.86 ✓
=	26°	29'	12.9 ✓
$\frac{1}{2}(\alpha-\alpha')$		10'	02.05 ✓
$\theta-\alpha'-\frac{1}{2}(\alpha-\alpha')$	26°	19	10.85 ✓

	9.957277 ✓
log cos $\frac{1}{2}(\alpha-\alpha')$	0.000000
Sec $\theta-\alpha'-\frac{1}{2}$	0.047537 ✓
log tan χ	0.000480 ✓

χ 45° 19' 00.0 ✓

δ' 26 34 53.0 ✓

$\chi-\delta'$ 18 44 07.0 ✓

	9.826400
log sin π	8.198823 ✓
Sin $\chi-\delta'$	9.506777 ✓
Cosec χ	0.148813 ✓
Sin $(\delta-\delta')$	7.679537 ✓

$(\delta-\delta')$ +16' 26.18 ✓

δ +26 51 19.2 ✓

Eph δ +26 51 19.0 ✓

O-C +0.2 ✓

Curv. +0.8

2nd order eq. 0.0

Inv. 0.0

Screen cut off from Moon - arc 139°. Image very good.

δ + 26 51 19.2

O-C + 92

π 54' 15.9 ✓

9.869133 ✓

log sin π 8.198823 ✓

" Sin $\theta-\alpha'$ 9.649326 ✓

" Sec δ' gk 0.049566 ✓

Sin $(\alpha-\alpha')$ 7.766244 ✓

$\alpha-\alpha'$ + 20' 4.1 ✓

= + 1m 20s.27 ✓

α	05	32	50.06 ✓
Eph α	05	32	48.91 ✓
O-C			+ 1.15 ✓
Curv.			- 0.01
Inv.			+ 0.04
α	05	32	50.10
O-C			+ 1.19

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105-33 Lunar Parallax. 9

α'	05	31	29.79
θ	07	17	26.45
$\theta - \alpha'$	+ 1	45	56.86
=	26°	29'	12.9
$\frac{1}{2}(x - x')$		10'	02.05
$-\lambda' - \frac{1}{2}(x-x')$	26°	19	10.85

9.945727
log cos ½(x-x') 0.000000
log (θ-x') " 0.047553
log tan y 0.000480

y 45° 19

δ' 26 34 53.0

y - δ' 18 44 01.0

9.826440
log sin π 8.194823
Sin y - δ' 9.506777
Cosec y 0.148813
Sin (δ-δ') 7.679953

(δ-δ') +16' 26.18

δ 26 51 19.2

δ/k δ 26 51 19.0

O-C +0.2
Curv. +0.8
2nd order eq. 0.0
Corr. 0.0

δ. + 26 51 19.2
O-C + 0.2

π 54 35.9

9.864913
log sin π 8.194823
" Sin θ-x' 9.649932
" Sec δ'/k 0.049956
Sin (x-x') 7.766624

x-x' + 20' 4.1

= + 1m 20s.27

α 05 32 50.06

α/k α 05 32 48.91

α-C +1.15
Curv -0.01
+0.04
x 05 32 50.10
O-C +1.19

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2203.

18242	18981	18749	18569
17821	9406	17577 79	9732 34
21	9406	81	36
42	8981	49	8569
30.04421	30.04255	29.11770	29.11655

(2186)

18957	17875	18408	16878
1269397	141355	102388	150550
01	35	32	550
61	7873	06	6880
18.62662	18.62662	19.81773	19.81770

(2209)

18709	16650	16466	18930
17441	7910	112052	14195
41		02	95
05	6654	68	8930
33.12688	33.12556	4.52664	4.52665

(1257)

17090	16308	18688	17705
8294	150900 95	17176	92255
94	100	76	25
94	6308	88	7705
14.87997	14.87877	11.15512	11.15520

(1367)

17130	16510	18109	16967
101000	135300 35	12850	122111,2
00	40	50	13
30	6510	09	6967
32.70300	32.70205	19.52359	19.52455

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Star. Measures.

4	L	18281	18065	18102	17061 .. 2177
	11.2	16262	10082	8246	16919 } 16
	17.9	62	82	46	13 }
		81	67	02	7059
		11.2019	11.2015	17.9856	17.9859
	2.	19564	18593	19127	18461
	19.6	13681	14486	17499 } 00	10068 } 66 2188
	28.1	78	86	01 }	64 }
		62	8593	21	84681
		19.5885	19.5893	28.1626	28.1606
		recurs. (02)			
	3.	18149	18728	18530	16625
	32.	17453	8957	16181 } 77	8977 2206.
	10.2	21	56	73 }	77
		49	24	24	23
		32.0227	32.0282	10.2352	10.2354

Moon

L		16220	16898
22.5		8527 } 26	14591 } 92
13.8		25 }	93 }
		16	6900
		13.7691	13.7692
2.		17.629	17382
23		9121	15870
13.9		21	70
		29	7378
		13.8508	13.8492
3.		18120	17530
24		12763	12870
14.6		63	70
		18	75.28
		14.5356	14.5342

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10604 2 rev. S- Tycho 11

Star Measures.

L 18284	15165	18102	17061
12 16262	11082	8246	16919 } 14
185 62	52	46	13 }
81	67	02	7059
11.21129	11.21115	17.98556	17.98559
2 19564	18593	19127	18461
26 13681	14486	17499 } 00	10688 } 66
181 74	84	01 }	64 }
62	8593	21	8461
19.58885	19.58893	28.16226	28.16206
2 18149	18728	18530	16625
2 17453	8457	16181 } 77	8477
2 21	57	73 }	77
49	24	24	23
32.12227	32.02332	10.23552	10.23554

Moon

L		16220	16898
25		8527 } 26	14591 } 92
34		25 }	93 }
		16	6400
		13.76491	13.76492
3		17629	17382
23		9121	15870
39		21	70
		24	7378
		13.85508	13.84932
3		18120	17530
14		12763	12870
1 Hz		63	70
		18	7528
		14.53356	14.53432

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4
24.
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4	16386	16208
24.2	13691	8885
15.0	99	89
	86	6208
	24.2691	24.2679

5	16492	16807
24.5	12301	10989
15.5	01	89
	92	05
	24.4191	24.4184

6	16386	18498
24.4	12308	12578
16.	08	78
	88	8496
	24.4078	24.4082

7		17719
24.0		8002
17.0		7994
		16
		16.9718

18404	
18129	
29	
02	
16.9727	

8	17207	17765
23.3	14036	10942
17.5	32	36
	02	7763
	23.3168	23.3168

17284	
12008	04
08	
84	
17.5280	

19070	
14338	35
32	
9066	
17.5269	

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4	16386	16208
42	13691	8885
10	99	89
	86	6218
	24.26491	24.26479

2	16492	16807
45	12301	10989
05	01	89
	92	05
	24.41991	24.41884

6	16386	18498
244	12208	12678
16	08	78
	88	8496
	24.41978	24.41882

7	17719	18404
140	8002	18129
70	7994	29
	16	02
	16.99718	16.99727

8	17207	17765
238	14036	10942
17.5	32	36
	02	7763
	23.31668	23.31668

	17284	19070
	12000 | 04	14338 | 35
	08	32
	84	9066
	17.52804	17.52764

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10604 Times Etc.

Date March 23, 1916.

Exp to Stars -	16h	46m		16h	58	
" " Moon	16	51	52.6 ✓	16	51	52.9 ✓
Clock fast		05	27.1 ✓			
H. Sid. Time	16	46	25.65 ✓			
H. Long.	04	44	31.05 ✓	Θ = +0h	45m	
G. Sid Time	21	30	56.70 ✓			
Sid Time M. Noon.	0	02	33.75 ✓			
Interval	21	28	22.95 ✓			
Reduction		03	31.07 ✓			
G. M.T.	21	24	51.88 ✓	21.4144		

From Naut. Almanac

δ

Moon 21h	16h	00	10.08 ✓	-25	14	37.6
Motion 1m			+2.5642 ✓			-5.604
" 24.8647		+01	03.76 ✓		-02	19.3
Tabular Place	16	01	13.84 ✓	-25	16	56.9 ✓

Moons Age 20 19d

934" = 15.8 ✓

a = 505.7
+ 24
-481.7

Parallax	59	03.8 ✓
Semi-Diam	16	07.1 ✓
R		967.1 ✓
Aug		6.2
Irr 4.5"		-0.7 ✓
R		972.6 ✓
R		2.0849 ✓
(1+a) R		-1004 ✓
R		1.9845 ✓
R²		3.9383 ✓

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10604

Date March 23.1916

Indices Etc.

exp th. stars.	16h	46m		16h	58m
" Moon	16	51	52.6	16	51 52.9
Clock fast		05	27.1		
	16	46	25 65		
	04	44	31.05		
	21	30	56 70		
	0	02	33 75		
	21	28	22.95		
		03	31.07		
	21	24	51.88	21	41441

$\Theta = +0^{\circ}\ 45'$

Moon 21h	16h	00	10.08	+25	14 37.6
Motion 1m			+2.5642		−5.604
" 24.8446		+01	03.76	−02	19.3
Tabular Place	16	01	13.84	−25	16 56.9

Moons Age 19d

Parallax	59, 03.82
Semi-Diam	16 07.4
R	967.1
Aug	6.2
Sup. 7.5'	−0.7
R	972.6
R	2.0849
(1+a) R	−1004
R	19845
R^2	39383

934 = 158

a = 505.7
+ 24
−4817

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10604

Plate Center Constants. 14

X	Y					
11.2017	17.9857	15 53	46.01	−25	52	23.5
19.5889	28.1616	15 58	48.63	−24	29	42.8
32.0230	10.2353	16 06	24.77	−26	55	56.5
3|62.8136	3|56.3826	3|47 58	59.41	3|−77	18	028
20.9379	18.7942	15 59	39.80	−25	46	0.9
22	18		+ 32.92	=	06	10.5
+1.0621	−0.7942	16 0	12.72	−25	52	11.4
31	46.5					
+32.92	−06 10.5					

Plate Center { A = 16 00 12.72
D = −25 52 11.4

X−ξ +500X +5.7x +17.y −9125

+ .3129	+ 5601	=	8730	+ 64	+ 304	=	9100	
+ 0629	+ 9318	=	8684	+ 106	+ 335	=	9128	
− .1231	+ 9794	=	8563	+ 112	+ 476	=	9155	
− 6588	+ 15021	=	8433	+ 171	+ 492	=	9099	
− 7237	+ 16012	=	8775	+ 182	+ 173	=	9132	
− 7681	+ 16563	=	8882	+ 189	+ 76	=	9147	✓
22.4340	+ 1121 7			+ 127	+ 268	=	22.6826	
				(8)				

y−η +500y −9.5x +26y −10389

+ 1042	+ 8993	=	10035	− 106	+ 468	=	10397	
+ .0101	+ 9909	=	10010	− 177	+ 517	=	10350	
+ 4211	+ 14081	=	19870	− 186	+ 735	=	10419	
− 4637	+ 14558	=	9921	− 285	+ 760	=	10396	
+ .5266	+ 5118	=	10384	− 304	+ 267	=	10347	
+ .8358	+ 2263	=	10621	− 314	= + 118	=	10425	
15.7509	+ 7875	=		− 214	+ 410	=	15.5191	
				(3)				

Table a = −0.8 e = −17.8 a − e = +17.0 b + d = −6
= −505.7 = −526 = +20.3 = −7.5

= −504.9 = −508.2 = −1.5

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Plate Center = Constants. 14

112017	179858	15 53	+6 01	-25	52	23.5
195889	28.1616	15 58	43.63	-24	29	42.8
320230	10 2358	16 06	24 77	-26	55	56.5
28136	3|56 3826	3|49 58	59 41	3|-77	18	028
09379	18 7742	15 59	39 81	-25	46	3077
22	18		+ 32.92	=	06	10.5
+1.06 21	-07742	16	0 12 72	-25	52	11.4
31s	44k.5					
+3292	-06 10.5					

Plate center { A = 16 00 12.72
D = -25 52 11.4

x-3 +5700x +5.7x + 17.y -9125

+.3129 + 5601 = -8730 + 64 + 304 = 1040
+.0629 + 9318 = 6684 + 116 + 335 = 128
-.1231 + 9794 = 8563 - 112 + 476 = 1355
-.6538 + 15022 = 8433 - 171 + 492 = 0949
-.7237 + 16012 = 8775 - 182 + 173 = 9132
-.7681 + 16563 = 8882 - 184 + 76 = 9147
2.43401 + 11217 + 127 + 264 = 22.6826

y-my +5004y -9.5x +26y -10389

+.1042 + 8993 = 10035 - 106 + 448 = 10377
+.0101 + 9906 = 10010 - 177 + 517 = 10350
-.4211 + 14081 = 09870 - 186 + 735 = 10419
-.4639 + 14558 = 9921 - 265 + 760 = 10346
+.5268 + 5118 = 10384 - 304 + 267 = 10347
+.4358 + 2263 = 10621 - 314 + 118 = 10425
.04 + 7875 = 2.14 + 410 = 15.3741

Table a = -2 a - e = +15 b + d = -11
-505.7 -526 = 21.3 = -7.5

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2187

2289 mg 46

used stars on account of faint

α	15	05 58	15.80	16	07	07.54
Δ	16	00	12.72	16	00	11.73
		−01	56.92		+06	55.81
			−116.92			+475.75
		2.067888				2.618823
		9.995501				9.947190
log S_0		0.530138				1.073176
						+11.8335
S_0		−3.3895				+.196
S_1		−.0001				33.8447
S		18.6104				33.1262
X		18.6262				−.7185
X−S		+.0158				

	−25	35	11.1			
		−2	43.7			
S	−25	37	54.8	−27	42	33.8
	−25	52	11.4	−25	53	17.7
		+14	16.6		−1 49	16.1
			+856.6			−6553.8
		2.932782				3.816794
π_1		0.263933				1.147944
tan δ_0		9.6810				9.7203
S_0^2		1.0603				2.1463
π_1		7.7947				8.9196
π_0		+1.8363				−14.0584
π_1		−0.0062				−.0837
π		19.8301				3.8588
g		19.8172				4.5264
S−π		−.0129				+.6679

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10604 Standard Coordinates. 15.

	Cafe No. 2177 mg 3	Cafe No. 2188 mg 6.4	Cafe No 2206 mg 6.5
C	15 52 48.04	15 57 54.24	16 05 26.08
Q	48.05	54.28	26.07
E.	Boss 48.07	54.32 avg	26.15 avg
Mean	15 52 48.05	15 57 54.28	16 05 26.10
Prec	+57.96	+57.55	+58.69
α	15 53 46.01	15 58 51.83	16 06 24.79
A	16 00 12.72	16 00 12.72	16 00 12.72
α-A	− 06 26.71	− 01 20.89	+ 06 12.05
Sin(α-A)	− 386.66	− 80.89	+ 372.00
log	2.587333	1.907899	2.570554
" Cos δ	9.954139	9.995904	9.950114
" S₀	1.048700	0.374117	1.027922
S₀	−11.18677	−2.36668	+10.66640
S₁	− .00355	− .0007	+ .00502
S	10.80098	19.63255	32.66902
X	11.2017	19.5889	32.0230
X-S	+ .3919	− .0436	− .6460
C	−25 49 34.5	−24 27	0.10 −26 53 29.3
Q	34.2		0.50 23.6
E	Boss 34.6		0.90 avg 23.2 avg
Mean	−25 49 34.4	−24 27	0.50 −26 53 23.4
Prec	− 02 49.1	− 02 42.3	− 02 33.1
S	−25 52 23.5	−24 29 42.8	−26 55 56.5
D	−25 52 11.4	−25 52 11.4	−25 52 11.4
δ-D	− 12.1	+1 22 28.6	−01 03 45.1
tan(δ-D)	− 12.1	+ 4949.5	− 3825.5
log	1.082794	3.694577	3.582688
" N₀	8.413944	1.025772	0.913883
log tan δ	9.685733	9.658604	9.705904
" S_0^2	2.097400	0.782044	2.055844
" η₁	8.83655	7.49404	8.81511
η₀	− 0.02594	10.61004	−8.20054
η₁	− 0.00686	− .00031	− .06533
η	17.90555	28.60694	9.73422
y	17.98357	28.16163	10.23533
y-η	+ .0802	− .4453	+ .5011

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10604 Standard Coordinates. 15.

	Cape no 2179 mg 3.		Cape no. 2188 mg 64		Cape no 2206 mg 65	
C	15 52	48.04	15 57	54.24	16 05	26.08
4		48.05		54.28		26.09
ε	Boss	48.07		54.32 arg		26.15 Targ
Mean	15 52	48.05	15 57	54.28	16 05	26.10
Prec		+57.96		+57.55		+57.69
α	15 53	46.01	15 58	51.83	16 06	24.79
A	16 00	12.72	16 00	12.72	16 00	12.72
α-A	− 06	26.71	− 01	20.89	+ 06	12.05
Tan(α-A)	−	38666	−	80.87	+	372.00
log		2.587336n		1.908789n		2.570544
" Cos δ		9.955413		9.995404		9.950174
" Sec δ		1.048810n		0.037417n		1.027921
S		−11.17869		−2.36688		+10.66400
S		−.0035		−.0007		+.0050
S		10.80938		1.96325		3.26690
X		11.2017		1.95899		3.20230
X-S		+.3919		−.0436		−.6460
C	−25 49	34.5	−24 27	0.110	−26 53	23.3
4		34.2		0.50		23.6
ε	Boss	34.6		0.90		23.2 arg ε
Mean	−25 49	34.4	−24 27	1.50	−26 53	23.4
Prec	− 02	49.1	− −02	42.3	− 02	33.1
S	−25 52	23.5	−24 29	42.8	−26 55	56.5
D	−25 52	11.4	−25 52	11.4	−25 52	11.4
δ-ε	− 05	12.1	+1 22	28.6	−01 03	43.1
tan δ'	− +	3121	− +	44495	− −	38255
log		2.022791n		3.649455		3.582268n
" No		8.413974n		1.025712		0.913383n
log tan S		.968593n		9.655860n		9.705904n
" T_0^2		2.097740		0.782047		2.056884
" η_1		8.83365n		7.49740n		7.81514n
η_0		−.00259		+0.61007		−8.20083
η_1		−0.06846n		−.00031n		−.06538
η		17.90555		28.66064		9.13344
y		17.98557		28.16164		10.2353
y-η		+.08002		−.49953		+1.10007

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10604 Moons Center

		$X-X_0$	ΔX	$(X-X_0)^2$	$+(Y-Y_0)^2$		O-C
1	22.4340	0.0000	-10	0.0000	3.9509	+	126
2	23.0000	+0.5660	-9	0.3193	3.9548	+	165
3	24.0000	+1.5660	-6	2.4505	3.9406	+	23
4	24.2685	+1.8345	-9	3.3640	3.9337	−	46
5	24.4187	+1.9847	+0	3.9390	3.9390	+	7
6	24.4048	+1.9708	+1	3.8844	3.9449	+	66
7	24.0000	+1.5660	+6	2.4543	3.9343	−	40
8	23.3192	+0.8852	+9	0.7852	3.9287	−	96
					3.9383		

	Y	$Y-Y_0$	ΔY		
1	13.7692	-1.9843	-34	3.9509	180°
2	13.8500	-1.9035	-32	3.6355	164°
3	14.5349	-1.2186	-21	1.4901	128°
4	13.0000	-0.7535	-13	0.5697	112
5	15.7535	+0.0000	-0	0.0000	90
6	16.0000	+0.2465	-4	0.0605	83
7	16.9722	+1.2187	-21	1.4801	52
8	17.5295	+1.7760	-30	3.1435	25

155

Approx. Center

$X = 24$ $Y = 14.5349$

16.9722

31.5071

Y_0 15.7535

Y_{mm} 13.7692

1.9843

Corr R 1.9845

X_{max} 24.4187

X_0 22.4342

Very poor image

Moons Center X_0 22.4340

Y_0 15.7535

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10605 Morris Center 11

		X-X₀	ΔX	(X-X₀)²	+(Y-Y₀)²	O-C
1	22.4340	0.0000	-80	0.0000	3.9509	+ 126
2	23.0000	+0.5660	- 9	0.3193	3.9548	+ 163
3	24.0000	+1.5660	- 6	2.4505	3.9406	+ 23
4	24.2685	+1.8345	- 9	3.3640	3.9337	- 46
5	24.4187	+1.9847	+ 0	3.9390	3.9390	+ 7
6	24.4078	+1.9708	+ 1	3.8844	3.9749	+ 66
7	24.0000	+1.5660	+ 6	2.4543	3.9343	- 40
8	23.3192	+0.8852	+ 9	0.7852	3.9257	- 96
					3.9383	

	Y	Y-Y₀	ΔY		
1	13.7692	-1.9843	-34	3.9509	180°
2	13.8500	-1.9035	-32	3.6355	164°
3	14.5349	-1.2186	-21	1.4901	128°
4	13.0000	-0.7535	-13	0.5697	112
5	15.7535	+0.0100	- 0	0.0000	90
6	16.0000	+0.2465	- 4	0.0605	83
7	16.9722	+1.2187	-21	1.4801	52
8	17.5295	+1.7760	-30	3.1935	25
					155

Approx Centre

X = 24 Y = 14.5349
16.9722
31.5071
Y₀ 15.7535
Y mm 13.7692
1.9843
Com R 1.9845
X max 24.4187
X₀ 22.4342

Must form mean

Mean Centre { X₀ 22.4340
Y₀ 15.7535

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Normals.

1	− 0.00	+ 0.0.0	− 250.0
2	− 1.08	+ 94.8	− 314.0
3	− 1.91	+ 31.2	− 28.1
4	− 1.37	− 84.2	+ 33.6
5	+ 0.06	+ 13.9	+ 0.0
6	+ 0.49	+130.0	+ 16.5
7	+ 1.92	− 62.8	− 48.8
8	+ 1.58	− 85.4	− 171.0
	+3.99	+269.1	+ 50.1
	−4.36	−232.4	−81.9
	−0.37	+28.7	−761.8

−a	−b	+Δc (−16)
+ 0	+ 6	− 10
+ 5	+ 6	− 5
+ 14	+ 4	+ 2
+ 16	+ 2	+ 2
+ 18	− 0	+ 2
+ 18	− 1	+ 1
+ 14	− 4	− 6
+ 8	− 5	− 13

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10604 Conditional Equations

						O − C	Corr
1	+0.00	−1.98 = +126	+0	+105	+105	+21	+11
2	+0.57	−1.98 = +165	+0	+101	+101	+64	+59
3	+1.57	−1.22 = +23	+1	+65	+66	−43	−41
4	+1.83	−0.75 = −46	+1	+40	+41	−87	−85
5	+1.98	+0.00 = +7	+1	−0	+1	+6	+8
6	+1.97	+0.25 = +66	+1	−13	−12	+78	+79
7	+1.57	+1.22 = −40	+1	−65	−64	+24	+18
8	+0.89	+1.78 = −96	+0	−95	−95	−1	−14
	+10.38					+193 −131	
						or 4.0	

+17.20 −0.37 = +287 +10.38

−0.37 +14.33 = −761.8 −2.60

+0.37 +0.0 = +0.6 +0.22

+1433 = −761.2 −238

−0.17

+17.20 = +28.7 − 19.6 = +9.1 b = −53.1

+0.60

a = +0.5

are Meas 155 $\frac{\Sigma k}{2}$

$\frac{p}{2}$ = .18 +7.8 $\frac{+17.8}{.18}$ = +743

ΔR = +0.53
Corr +0.35
ΔR = +0.18

−2RC = −0.79 −16

+3

Δb = +0.13 Δ5 = +0.1

Δa = −0.47 Δα = −0.02

−9

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Conditional Equations

								O − C
1	+0.00	−1.98	= +126	0	+115″	+105″		+21
2	+0.57	−1.98	= +165	0	+101	+101		+64
3	+1.57	−1.22	= + 23	0	+ 65″	+ 66		− 43
4	+1.83	−0.75″	= − 46	+1	+ 40	+ 41		− 87
5	+1.98	+0.00	= + 7	+1	− 0	+ 1		+ 6
6	+1.97	+0.25″	= + 66	+1	− 13	= 12		+ 78
7	+1.57	+1.22	= − 40	+1	− 65″	− 64		+ 24
8	+0.89	+1.78	= − 96	+1	− 95″	− 95″		− 1
						+193	−134	
						av 40″		

+17.20 −0.37 = +287

−1.37 +14.33 = −761.8

+0.37 + 0.0 = + 0.6

+1433 = −761.2 f = −53.1

+17.20 = +28.7 − 19.6 = + 91 a = + 0.5″

are meas 155″ $\frac{\Sigma k}{2}$

$\frac{f}{k}$ .18 + 7.8 $\frac{+17.8}{.18}$ = + 43 AR = +0.53

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S	η	ΔS		−0.5η		−4.98		−11
−11.11	−0.05	= −34	+	0	= −34	+ 54	=	+20
− 3.31	+1.81	= − 1	−	1	= − 2	+ 16	=	+14
− 2.29	+10.58	= − 7	−	5	= −12	+ 11	=	− 1
+ 8.69	+11.62	= +36	−	6	= +30	− 42	=	−12
+10.74	− 8.22	= +48	+	4	= +52	− 53	=	− 1
+11.88	−14.22	= +98	+	7	= +105	− 58	=	+47
			+	1		− 3	=	−13
+ 0.68	−2.48							

Δη		+.28		−5.2η		+12	
= − 0	−	2	= − 2	+ 0	= − 2	+12	+10
= + 0	−	1	= − 1	− 9	= −10		+ 2
= +31	−	0	= +31	− 55	= −24		−12
= +58	+	2	= +60	− 60	= − 0		+12
= − 38	+	2	= − 36	+ 43	= + 7		+19
= −118	+	2	= −116	+ 74	= −42		−30
		0		+ 13	= +25		

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11257	10604	11367	
	2186		
	15 57 17.96		
	15 54 58.84	16 05 47.86	
Prec.	58.41	57.89	+ 58.19
α	15 55 57.25	15 58 15.80	16 06 46.05
A	16 00 10.00	16 00 10.00	16 00 10.00
α - A	- 4 12.75	- 1 54.20	+ 06 36.05
Sin	- 252.74	- 114.20	+ 396.00
log	2.402685	2.057677	2.559770
cos δ	9.995061	9.995501	9.995487
sin δ	0.860532	0.519922	1.059811
S_0	- 7.2531	- 3.3107	+ 11.4766
S_1	- .0018	- .0002	+ .0039
S	1.474511	1.868911	33.4805
X	14.8792	18.6262	32.7029
XS	+ .1341	- .0629	- .7776
		9313 / 0629 / 8684	16.351 / 7776 / 8575
ε			
C	- -26 45 52.0	-25 35 10.9	
Mean			-25 37 20.7
Prec	- 02 45.9	- 2 43.7	- 02 32.7
δ	- 26 48 37.9	-25 37 54.2	-25 39 53.4
δ	25 52 00	-25 52 00	-25 52 00.0
δ - δ	- 56 37.9	+ 14 05.8	+ 12 06.6
Sin	- 3398.2	+ 845.8	+ 726.6
log	3.531125	2.927227	2.861301
cos δ	0.886240	0.258422	0.192455
log S	9.70360	9.68100	9.68094
S_2	.17211	.10398	.21196
x_1	8.47781	7.77742	8.85399
x_2	- 7.2845	+ 1.8130	+ 1.5574
x_1	- .0301	- .0059	- .0714
x	1.06854	19.80711	1.94860
y	11.1516	19.81172	19.52522
y - x	+ .4662	+ .01811	+ .03922
		9909 / 0101 / 10010	9763 / 0392 / 10155

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3503.

C	16	04	09.08	
4			09.10	
2			09.13	
m	16	04	09.10	
Dec			57.63	57.55
α	16	05	06.73	15 58 51.83
A	16	00	10.00	16 00 10.00
α-A	+	04	56.73	− 01 18.17
	+	296.71		− 78.17
sin x-A		2.472233		1.893044
log cos δ		9.995905		9.995904
log S_0		0.939071		0.359324
S_0	+	8.6910		−2.2873
S_1	+	45		− 7
S		30.6955		19.7120
X		30.0423		19.5889 9794
X-S	−	6532		− 1231 −1.231
				8563

C	−24	19	05.9	
4			07.0	
2			05.6	
m	−24	19	06.2	
Ø		−02	34.7	− 2 42.3
δ	−24	21	40.9	← −24 29 42.8
D	−25	52	00.0	−25 52 00.0
8.8	+ 1	30	19.1	+ 1 22 17.2
tan δ-D		+5420.3		+ 4938.1
log tan δ-D		3.734022		3.693356
log n_0		1.065.17		1.024711
tan δ		9.65599		9.65586
S_0^2		1.87847		0.7186
log n_1		8.5874		7.4306
n_0	+1	1.6189	+10.5855	
n_1	−	0.0387	− 0.0027	
n		29.5805	28.5828	
y		29.1168	28.1616	14081
y-y_n	−	.4634	− 4212	−4211
				9870

1.7
9.5
7.3

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10604

2206

16 06 24.80
16 00 10.00
+ 06 14.77
+ 374.76
2.573755
9.950155
1.03114

+10.7434
+ .0048
327482
X 32.0230 16112
- .7252 7237
8773

2209

16 07 07.54
16 00 10.00
+ 06 57.54
+ 417.48
9.620647
9.947108
1.07498

+11.8844
+ .0098
338942
33.1261 16563
- .7681 7681
8882

2177

15 52 48.07
48.06
48.07
48.06
57.96

15 53 46.01 (2)
16 00 10.00
- 06 23.99
- 383.94
9.584262
9.954133
1.04563

-11.1079
- 33
108888
11.2017 57601
+ .3129 31298
8713

-25 49 37.5
37.7
37.6
37.6

-2 49.0

δ -26 55 56.5
* -25 52 00.0
- 1 03 56.5
- 3836.9
3.583988
0.915183

9.70599
20692
8.82153

-27 42 33.8
-25 52 00.0
- 1 50 33.8
- 6636.1
3.822192
1.153077

9.72803
2.1499
8.92336

-25 52 23.7 (6)
-25 52 00.0
- 23.7
1.374755
8.705901

9.68577
28913
8.83304

.no - 8.2248
nc - .0663
η 9.7089
y 10.2353 35118
+ .5264 5266
10384

-14.2257
- .0838
3.6905
4.5263 2263
+ .8358 8353
10617

- 0.0508
- 0.0679
17.8815
17.9857 8993
+ .1042 10432
10035

used these Stars & found
Plate Constants.

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10604 Means Mean Position. 18

V_0 22.43400 ✓
0
22.43400 ✓

15: 75 35 ✓
-26 ✓
15.75 09 ✓

From Plate Constants.

22.6826 ✓
22.
S_0 +0.6826 ✓

15.5191 ✓
18
-2.4809 ✓

log z_0 9.83417 ✓
log cos δ_0 9.995-295 ✓
8.507124
log sin $\alpha - A$ 1.373398 ✓

$\alpha - A$ +23.65 ✓

A 16 00 10.00 ✓

α_0 16 00 33.65 ✓

Red +2.50 ✓

α' 16 00 36.15 ✓

log tan δ 9.69200 n ✓
S_0^2 9.66883 ✓
7.05334
log z_1 6.41137 n ✓

z_1 -0.00003 ✓
z_0 -2.4806 ✓

log z_0 0.39456 n ✓
7.331115
log tan $\delta - \Delta$ 3.06341 n ✓
-1157.2 ✓
tan $\delta - \Delta$ -19 17.2 ✓

Δ -25 52 00.0 ✓

S_0 -26 11 17.2 ✓

Red -10.4 ✓

δ' -26 11 27.6 ✓

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Y_0	22.4340		15: 75.35
	0		-26
	22.4340		15.7509

From Plate Constants.

	22.6826		15.5191
	22		15
S_0	+0.6826		-2.4809

$\log D_0$	9.8341 7	$\log \tan \delta$	9.6920n
$\log \cos \delta_0$	9.9529 5	S_0^2	9.6683
	8.5072 4		7.0534
$\log \sin \chi - \eta$	1.3739 8	$\log \eta_1$	6.4137n

$\alpha - A$ 2 +23.65

η_1 -0.0003

η_0 -2.4806

A 16 00 10.00

$\log \eta_0$ 0.3945 6n

7.3311 5

α_0 16 00 33.65

$\log \frac{1}{2} \delta \varepsilon$ 3.0634 1n

= 11572

Red +2.50

$\tan \frac{1}{2} \chi$ -19 172

α' 16 00 36.15

ε -25 52 000

δ_0 -26 41 172

Red -104

δ' = 26 11 276

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10604 Lunar Parallax

α'	16	00	36.15
θ	16	46	25.65
$\theta - \alpha'$	+	45	49.50
$\frac{1}{2}(\alpha + \alpha')$	+11	27	22.50
$\theta - \alpha = \frac{1}{2}\alpha'$	+	4	47.93
	+11	22	34.57

	9.957127
log Cos $\frac{1}{2}(\alpha + \alpha')$	0.000000
Sec $\theta - \alpha'$	0.000862
log tan Y	9.965989

Y	42	45	07.2
δ'	−26	11	27.6
$Y - \delta'$	68	56	34.8

	9.826401
log Sin π	8.235502
Sin $Y - \delta'$	9.969999
Cosec Y	0.168241
Sin $\delta - \delta'$	8.199651

$\delta - \delta'$		+54'	26.6
δ	−25	17	01.0
Eph δ	−25	16	56.9
O − C		−	4.1
Curv.		+	1.2
2nd Ord Cf.		+	0.6
Err.		+	0.1
δ	−25	17	0.3
O − C		−	3.4

π		59'	03.8
			9.869913
log Sin π			8.235502
∴ Sin $\theta - \alpha'$			9.298021
∴ Sec δ'			0.043733
log Sin $\alpha - \alpha'$			7.445906
$\alpha - \alpha'$		+ 9'	35.87
		+	38.39

α	16	01	14.54
Eph α	16	01	13.84
O − C			+0.70
Curv. =			−0.04
Err.			−0.02
α	16	01	14.52
O − C			+0.68

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α'	16	00	36.15
θ	16	46	25.65
$\theta - x'$	+	45	49.50
$\frac{1}{2}x'$	+	11	27 22.50
$\theta - x' - \frac{1}{2}x'$	+	4	47 9.3
	+	11	23 34.57

9.945727

log Cos $\frac{1}{2}x'$	0.000000
Sec $\theta - x'$	0.001262
log tan Y	9.965589

Y 42 45 07.2

δ' −26 11 27.6

Y − δ' 68 56 34.8

9.826480

log Sin π	8.235022
Sin Y − δ'	9.969999
Cosec Y	0.168241
Sin $\delta\delta'$	7.199652

$\delta - \delta'$ + 54 12.68

δ − 25 17 01.0

Eph δ −25 16 56.9

O − C − 4.1

Curv.

2nd Ord. Eq. + 0.6

Inv. + 0.1

δ − 25 17 03

O − C − 3.4

π	59.	03	8

9.869913

log Sin π 8.235022

Sin $\theta - x'$ 9.298021

Sec δ 0.007317

log Sin $x - x'$ 7.445970

$x - x'$ + 9′ 35.″87

+ 34.39

α 16 01 14.54

Eph α 16 01 13.84

O − C + 0.70

Curv. =

Inv. − 0.02

α 16 01 14.52

O − C + 0.68

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10761 Star Measures. Tycho. 22.2 13.8 21.

1	17688	19416	19811	16622
13.8	19341	17760	18619 } 16	7813
14.1	3940	60	13	13
	88	18	13	20
	13.8348	13.8342	14.1195	14.1193
2	17280	19272	17650	16867
21.1	16338 } 37	10212	14953 } 56	9560
23.3	36	12	59	60
	80	72	54	69
	21.0943	21.0940	23.2695	23.2691
3	16578	17363	17486	19662
33.1	15056 } 53	8902	8702 } 01	18443 } 46
10.8	50	02	00	49
	82	67	86	64
	33.1525	33.1535	10.8785	10.8782

Mean Measures.

1	18715	18120	18242	19767
22.6	12960	13886	15492 } 91	12493 } 91
13.3	60	86	90	89
	17	18	42	71
	22.5756	22.5768	13.2751	13.2723
2	[illegible]		16760	18810
23.	[illegible] } 07		11400 } 05	14153 } 58
13.6	[illegible]		11410	63
	[illegible]		60	10
	[illegible]		13.5355	13.5348
3	18954	18710		
23.4	14773 } 75	12880 } 75		
14.0	77	70		
	56	07		
	23.4180	23.4168		

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10760 Star Measures. Tycho 22.2 13.8 21.

1	17688	19416	19811	16622
13.8	17341 40	17760	18619 16	7813
14.1	39	60	13	13
	88	18	13	20
	138848	138342	141195	141193
2	17280	19282	17650	16867
21.1	16338 37	10212	14953 56	9560
23.3	36	12	59	60
	80	72	54	69
	210943	210940	232695	232691
3	16578	17363	17486	19652
3.1	15056 53	8402	8702 01	18443 46
10.8	50	02	00	49
	42	67	86	64
	331525	331535	108785	108782

Mean Measures.

	18715	18120	18242	19767
16	12950	13886	15492 91	12493 91
3	60	86	90	84
	17	18	42	7274
	225756	225768	132751	132723
			14760	13210
			11400 05	14153 58
6			11410	63
			60	10
			135355	135348
	18954	18710		
4	14773 75	12862 75		
8	55	70		
	56	07		
	234180	234168		

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10760 Mean Measures 22

4 18531 17232
23.7 11138 14628
5.1 38 28
36 36
23.73936 23.73922

5 18108 17575
23.5 12782 86 12905 06
6.0 90 07
04 79
23.53320 23.53229

6 19670 19067
23. 12960 57 15993
6.6 54 93
68 9071
16.67112 16.67122

7 18002 16713
22.4 13643 11059
17.0 43 59
02 13
22.43959 22.43946

8 18668 17232
21.7 17380 8513 14
17.1 80 15
68 7232
17.11288 17.11982

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10760 Moon - Measures

H	18531	17232
23.7	11138	14628
5.1	38	28
	36	36
	23.7396	23.7392

S	18108	17575
23.5	12782 (86	12905 (06
6.0	90)	07)
	04	79
	235320	23.5329

L	19670	19067
23	12960 (57	15893
6.6	54)	93
	68	9071
	16.6712	16.6722

I	18002	16713
22.4	13643	10859
17.0	43	59
	02	13
	224359	224346

A	18668	17232
21.7	17680	8513 (14
17.1	80	15)
	68	7232
	17.1288	17.1282

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Date May 20, 1916

Cxf. ☆ Stars	19h	16m			19.	28
" ☾ Moon	19	22	22.1		19	22 22.3
clock fast		05	55.2			
H. Sid. Time.	19	16	27.0			
H. Long.	04	44	31.05			
G. Sid Time	24	00	58.05			
G. Sid Time M.N.	03	51	13.93			
Interval	20	09	44.12			
Reduction		03	18.19			
G. M.T.	20	06	25.93		20h.1072	

$\theta = -0^h\ 19^m$

Amer. Eph.		α			δ		
Moon 21h	19h	34	+6.911	-22	28	20.6	
motion 1m			2.5589			+9.007	
motion 6m.4322			+16.46			+57.9	
Tabular Place	19h	35m	03.37	-22	27	22.7	

Moons Age 19d.

934" = 6.7

a = -502
+24
-478

Parallax	60'	11.68"	
Semi diam.	16	25.6	
R		985.6	
Aug.		7.5	
Dyk 5		-0.8	
R		992.3	
R		2.1271	
(1+a) R		-1.0179	
R		2.0254	
R^2		41022	

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10760 Times Etc.

Date May 20, 1916

Exp. Stars	19h	16m		19	28m	
" " Moon	19	22	22.1	19	22	22.3
clock fast		05	55.2			
H. Sid. Time	19	16	27.0			
H. Long.	04	44	31.05			
G. Sid Time	24	00	58.05			
G. Sid Time M.N.	03	51	13.93			
Interval	20	09	44.12			
Reduction		03	18.19			
G. M.T.	20	06	25.93	20h	1072	

$\epsilon = -0^h\ 19^m$

Amer. Eph.		α		δ	
Moon 20h	19h	34	+6.91	-22	28 20.6
motion 1m			25589		9.007
motion 6.4322			-16.46		+57.9
Tabular Place	19h	35m	03.37	-22	27 22.7

Moons Age 19d.

934" = 6.7

$\alpha = -502$
$+24$
-478

Parallax	60'	11.68
Semidiam.	16	25.6
R		985.6
Aug.		7.5
Dr		-0.8
R		992.3
R		3.1277
Total R		-1019
R		2.0254
R^2		4.1022

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10760 Plate Center and Constants. 24

13.8345	14.1194	19 30	35.81	-23 29	38.6	
21.0942	23.2693	19 34	55.77	-22 15	19.2	
33.1530	10.8783	19 42	04.58	-23 56	27.2	
3|68.0817	3|48.2670	3|58 47	3616	3|69 41	25.0	
22.6939	16.0890	19 35	52.05	-23 13	48.3	
22	18		-21.51	+ 14	51.5	
-0.6939	+1.9110	19 35	30.54	22 58	56.8	
3[2]	466.5					
-21.51	14 51.48					

Plate Center { A = 19 35 30.54
D = -22 58 56.8

+500X +36.8Y +2X -12733

+.5269 + 6917 = 12186 + 519 = 12705 + 28 = 12733
+.1289 + 10547 = 11836 + 856 = 12692 + 42 = 12734
-.4309 + 16576 = 12267 + 400 = 12667 + 66 = 12733
21.7166 + 10858 + 556 + 434 = 21.5890

-36.4X +16.5Y -7835

+1046 + 7061 = 8106 - 504 = 7602 + 233 = 7835
-3416 + 11635 = 8219 - 768 = 7451 + 384 = 7835
+3424 + 5439 = 8863 - 1208 = 7655 + 179 = 7834
15.1068 + 7553 - 790 + 249 15.0245

Tables a = -0.8 c = -13.8 a-c = +13.0 b+d = +1.5
-502.0 = -516.5 - +14.5 = -0.4

O-C -501.2 -502.7 -1.9

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10760 Plate Center and Constants. 24

13.8345	14.1194	19	30	35.81	-23	29	38.6
21.0942	23.2693	19	34	55.77	-22	15	19.2
23.1530	10.8783	19	42	04.58	-23	56	27.2
68.0817	348.2670	358	47	36.16	369	41	25.0
22.6939	16.0890	19	35	52.05	-23	13	48.3
22	18			-21.51		14	51.5
-0.6939	+19110	19	35	30.54	22	58	56.8
31	466.5						
1.51	14 51.48						

∴ Plate Center { A = 19 35 30.54
E = -22 58 56.8

	+500x	+36.8y	+2x -1273
-5269 + 6917	= 12186	+ 519	= 12705 + 28 = 12733
1289 + 10547	= 11836	+ 856	= 12692 + 42 = 12734
4309 + 16576	= 12267	+ 400	= 12667 + 66 = 12733
217166 + 10858		+ 5506	+ 43 = 21.5890

	-36.4x	+16.5y	-783
1046 + 7161	= 8106	- 504	= 7602 + 233 = 7835
3416 + 11635	= 8219	- 788	= 7431 + 384 = 7835
3424 + 5439	= 8863	-1208	= 7655 + 179 = 7834
151068 + 7553		- 790	+ 1494 = 15.0245

also a = -0.8 e = -13.8 a - e = +13.0 b+d = +1.5
-502.0 = -516.5 - +14.5 = -0.

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S	n
−8.69	−3.95
−1.03	+5.61
+11.58	−7.40
M −0.41	−2.97

ΔS	−.345		+.8n	−8
−18	+29	= +11	−3	= +8
−0	+3	= +3	+4	= +7
+53	−39	= +14	+6	= +8
	+1		−2	= −9

Δn	−2.2n		+15	+8
−9	+9	= +0	−9	= −9
+5	−12	= −7	−1	= −8
−36	+16	= −20	+11	= −9
	+6		+0	= +14

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10760 Standard Coordinates. 25

	Capella 2697 mg 7.9			Capella 2709 mg. 7.2			Capella No. 2729 mg 8.5		
C.	19	29	38.03	19	33	58.56	19	41	6.83
4			38.06			58.61			6.86
E		arg.	38.09			58.61		arg	6.82
Mean	19	29	38.06	19	33	58.59	19	41	6.84
Prec			+57.75			+57.18			+57.74
α	19	30	35.81	19	34	55.77	19	42	4.58
A	19	35	30.54	19	35	30.54	19	35	30.54
α-A	-04		54.73	—		34.97	+	06	34.04
Δα-N	—		294.71			-34.77			+393.99
log "	2.469397n			1.541205n			2.595549		
log cos δ	9.996242			9.996638			9.996093		
" S_0	0.939055n			0.014827n			1.063366		
ξ_1	-8.6906			-1.0347			+11.5787		
S_1	-0.0018			-0			.0052		
ξ_2	13.3076			20.9653			33.5839		
X	13.8345			21.0942			33.1530		
X-S	+.5269			+0.1289			-.4309		
C	-23	31	41.1	-22	17	27.7	-23	58	44.5
4			41.6			28.1			44.7
E		arg	41.8			27.4			45.1
Mean	-23	31	41.5	-22	17	27.7	-23	58	44.8
Prec		+02	02.9		+02	08.5		+02	17.6
δ	-23	29	38.6	-22	15	19.2	-23	56	27.2
Φ	-22	58	56.8	+22	58	56.8	-22	58	56.8
δ-Φ	—	30	41.8		+43	37.6	—	57	30.4
Δδ-Φ		-1841.8			+2617.7			-3450.7	
log "	3.265524n			3.417927			3.537904n		
" m_0	0.595639			0.749077			0.869055n		
log tan δ	9.638178n			9.611955n			9.647377n		
" S_0^2	1.878710			0.029644			2.127322		
" η_1	8.569697n			6.694949n			8.828151n		
η_0	-3.94881			+5.611114			-7.39685		
η_1	-0.0371			-0.000005			-0.0673		
η	14.01148			23.61109			10.53559		
η	14.1194			23.2643			11.8783		
$\eta-\eta$	+0.1046			-.3416			+.3424		

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10760 Standard Coordinates.

	Capella 2697 mg 7.9			Capella 2709 mg. 7.2			Capella 2729 mg 8.5		
	19	29	38.03	19	33	58.56	19	41	68.3
			38.06			58.61			68.6
		Avg	38.09			58.61		Avg	68.2
Mean	19	29	38.06	19	33	58.59	19	41	68.4
Red			+57.75			+57.18			+57.74
A	19	30	35.81	19	34	55.77	19	42	45.8
A	19	35	30.54	19	35	30.54	19	35	30.54
A-a		-04	54.73		0	34.77		+06	34.04
A(a-A)			-294.71			-34.77			+393.99
η		246939			154120			2.55549	
η Cos δ		996242			996638			996093	
S_0		0.93905			0.01482			1.06366	
ξ_1		-8.69006			-1.03477			11.55787	
ξ_2		-0.00018			-0			.00052	
ξ		13.30776			20.96553			33.55839	
X		13.83345			21.09942			33.15530	
X-ξ		+.52569			+0.12889			-.43099	
C	-23	31	41.1	-22	17	27.7	-23	58	44.5
Y			41.6			28.1			44.7
E		Avg	41.8			27.4			45.1
Mean	-23	31	41.5	-22	17	27.7	-23	58	44.8
Red C		+02	02.9		+02	08.5		+02	17.6
ζ	-23	29	38.6	-22	15	19.2	-23	56	27.2
Φ	-22	58	56.8	-22	58	56.8	-22	58	56.8
ζ-Φ		30	41.8		+43	37.6		-57	30.4
ζ(ζ-Φ)		-1841.8			+2617.7			-3450.7	
log		3.26524			3.41792			3.53770	
η_0		0.59639			0.74907			0.86905	
log tan δ		9.63818			9.61195			9.64737	
S_0^2		1.87810			0.02964			2.12732	
η_1		8.56997			6.69449			8.82861	
η_0		-3.94881			+5.61114			-7.39685	
η_1		-0.01371			-0.00005			-.20673	
η		14.01148			23.61109			10.53559	
η		14.11194			23.26943			11.87883	
η-η+0.1046					-.34166			+.34324	

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10760. Moores Center.

		$x - x_0$	Δx	$(x-x_0)^2$	$+ (y-y_0)^2$	$O-C$
1	22.5762	+0.8622	+ 4	0.7441	4.0816	− 203
2	23.0000	+1.2860	+ 3	1.6546	4.1064	+ 42
3	23.4174	+1.7034	+ 2	2.9022	4.1157	+ 135
4	23.7394	+2.0254	+ 0	4.1022	4.1022	+ 000
5	23.5325	+1.8185	− 0	3.3069	4.1137	+ 115
6	23.0000	+1.2860	− 3	1.6530	4.1201	+ 189
7	22.4352	+0.7212	− 4	0.5195	4.1276	+ 254
8	21.7140	0.0000	− 4	0.0000	4.1132	+ 110
					4.1022	

		$y - y_0$	Δy	$y - y_0$
1	13.2737	−1.8293	−24	3.3475
2	13.5352	−1.5678	−20	2.4518
3	14.0000	−1.1030	−14	1.2135
4	15.1030	−0.0000	−00	0.0000
5	16.0000	+0.8970	+12	0.8068
6	16.6717	+1.5687	+20	2.4671
7	17.0000	+1.8970	+25	3.6081
8	17.1285	+2.0255	+26	4.1132

155-0
140°
123°
90°
64°
40°
21°
0°

Range 155-0

Approx. Center.

x = 23 y = 13.5352
16.6717
2 | 30.2069
y_0 15.1034

y max 17.1285
R 2.0251
Com R 2.0254
x max 23.7394

Moores Center { x_0 21.7140
y_0 15.1030

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1
3
4
5
6
7
8

1
2
3
4
5
6
7
8

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10760 Moons Center.

		$x - x_0$	Δx	$(x-x_0)^2$	$+ (y-y_0)^2$	$O-C$
	22.57622	+0.86223	+ 4	0.7.4441	408186	− 203
	23.00000.	+1.28660	+ 3	1.6546	41064	+ 42
3	23 41 74	+1.70334	+ 2	2.9022	41157	+ 135
4	23.73394	+2.02554	+ 0	4.1022	41022	+ 000
5	23.53255	+1.81855	− 0	3.3069	41137	+ 115
6	23.00000	+1.28660	− 3	1.6530	41201	+ 189
7	22.43552	+0.72122	− 4	0.5195	41276	+ 254
8	21.71140	00000	+ 4	00000	41132	+ 110
					41022	+ 000

		$y - y_0$	Δy	$y - y_0$	
1	13.27377	−1.82933	−24	3.3975	155.0
2	13.53552	−1.56678	−20	2.4518	141.0
3	14.00000	−1.10330	−14	1.2135	123.0
4	15.10300	−0.00000	−0	00000	90.0
5	16.00000	+0.89700	+12	0.8068	65.0
6	16.67117	+1.56817	+20	2.4671	40.0
7	17.00000	+1.89700	+25	3.6081	21.0
8	17.12855	+2.02555	+26	4.1132	0.0

Range 155.0

approx. Center.

x = 23 y = 13.55352
16.67117
2|30.22469
y_0 15.11234

y max 17.12855
R 2.02551
Corr R 2.02554
x max 23.73394

Moons Center { x_0 21.71140
y_0 15.11030

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Normals.

1	− 1.57	− 175	+ 371
2	− 1.99	+ 53	− 66
3	− 1.87	+ 230	− 148
4	− 0.00	+ 000	− 000
5	+ 1.62	+ 201	+ 103
6	+ 2.02	+ 244	+ 297
7	+ 1.37	+ 183	+ 482
8	+ 0.04	+ 000	+ 222
	+ 5.01	+ 911	+ 1475
	− 5.43	− 175	− 214
	− 0.42	+ 736	+ 1261

			−40
− a		− b	+ Δc
	+ 22	− 9	− 27
	+ 33	− 8	− 15
	+ 44	− 5	− 1
	+ 52	− 0	+ 12
	+ 47	+ 4	+ 11
	+ 33	+ 8	+ 1
	+ 18	+ 9	− 13
	+ 0	+ 10	−30

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Conditional Equations.

									O − e	Corr
1	+0.86	−1.83	−203	+	44	− 139	= − 9.5	−	−108	−135″
2	+1.27	−1.57	+ 42	+	65	− 120	= − 55	+	+ 97	+82″
3	+1.70	−1.10	+135	+	87	− 84	= + 3	+	+132	+131″
4	+2.02	−0.00	+000	+	103	− 0	= +103	−	− 103	−41″
5	+1.82	+0.90	+115	+	93	+ 68	= +161	−	− 46	−35″
6	+1.29	+1.57	+189	+	66	+ 120	= +186	+	+ 3	+4″
7	+0.72	+1.90	+254	+	37	+ 145	= +182	+	+ 72	+59″
8	+0.00	+2.02	+110	+	0	+ 154	= +154	−	− 44	−74″
		+639							+304−301	
		450							ar 75′	

1498 − 0.42 = +736 + 9.68

−0.42 + 18.00 = +1261 + 1.89

+0.42 − 1.18 + 20.6 + 0.27

+16.82 = +1281.6 + 2.16 t = +76.2″ + 0.13

14.98 = +736 + 31.9 = +767.9 a = +51.2″ + 0.64

arc meas. 155′

$\frac{P}{2}$ = .18 $\frac{\Sigma v}{2}$ = +0.4

$\frac{+0.4}{.18}$ = +2.2 ΔR = +0.

Corr +0.5′

ΔR = −0.5′

−2RC = −2.02 −40

−5

Δb = −0.26 $\Delta \delta$ = −0.1

Δa = −1.28 $\Delta \alpha$ = −0.05″

−26

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10760 Conditional Equations 27

							o − c
1	+0.86	−1.83	−203	+44	−139	= −95	−108
2	+1.27	−1.57	+4	+65	−120	= −55	+97
3	+1.70	−1.10	+135	+87	−84	= +3	+132
4	+2.12	−0.00	+000	+103	−0	= +103	−103
5	+1.82	+0.90	+115	+93	+68	= +161	−46
6	+1.29	+1.57	+189	+66	+120	= +186	+3
7	+0.72	+1.90	+254	+37	+145	= +182	+72
8	+0.00	+2.02	+110	+0	+154	= +154	−44

+304 −311

av 75

1498 −0.42 = +736

−0.42 +18.00 = +1261

+0.42 − 1.18 = + 20.6

+16.82 = +1281.6 t = +76.2

1498 = +736 + 31.9 = +767.9 a = +51.2

arc meas 155

$\frac{p}{n}$ = .18 $\frac{\Sigma v}{n}$ = +0.4

$\frac{+0.4}{18}$ = +2.2 ΔR = +0.2

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0760 Morris Mean Position. 28

X_0 21.7140
+26
21.7166

Y_0 15.1030
+38
15.1068

From Plate Constants.

21.5890
−22
− 0.4110

15.0245
18
−2.9755

log s	9.613844		log tan δ	9.63555	
log Cos δ_0	9.962844		log s_1^2	9.22777	
	8.507244			7.05334	
log Sin(α − A)	1.143766		log η'	5.91166	
Sin(α − A)	−13.92		η_1	−0.00001	
			η_0	−2.97554	
α − A		−13.92	log η_0	0.47356	
				7.33115	
A	19	35 30.54	log tan δ − Θ	3.14241	
α_0	19	35 16.62	δ − Θ	−1388.0	
Red		+ 03.28		− 23	08.0
α'	19	35 19.90	Θ	−22	58 56.8
			δ_0	−23	22 04.8
			Red		+ 03.3
			δ'	−23	22 01.5

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1916 ED Morris Mean Position. 28

X_0 21.7140
+24
21.7166

Y_0 15.1030
+38
15.1068

From Plate Constants

21.5890
−22
−0.4110

15.2245
18
−2.4755

log S 9.6188 4n
log Cos δ_0 9.9628 4
8507241
log Sin(α−A) 1148766n

log tan S 9.6355n
log S² 9.2277
7.0534
log η' 591.66n

Sin(α−A) −139R

η, −0.0001
η, −2.9755

(α−A) 1° −13.9R

log η, 0479560n
7.3311.5
log tan S-ξ 3.1424 1n

A 19 35 30.54

α_0 19 35 16.62
Red + 03.28
α' 19 35 19.90

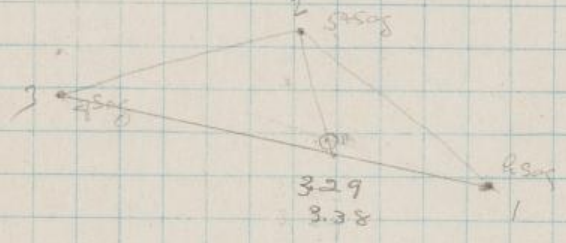
S-ξ −13880
−23 08.0
ξ −22 58 56.8

S_0 −22 22 04.8
Red + 07.3
S' −23 22 01.5

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1	19	31	39.17		−25	04	08.31
	19	31	35.81		−25	04	11.96
			+3.36				+3.65
			57.86				10.86
2	19	35	54.73		−16	29	12.42
			+3.19				+1.56
			90.97				47.09
3	19	41	27.79		−19	57	50.06
			+3.18				+2.97



−7
−12
−17
−22
−27
−32
−37
−42

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17060 Reduction to apparent Place. 29.

H+α	8	3	27.0	141°	45′
H	13	51.7			
α_0	19	35.3			
G	22.	42.3			
ϑ+α	42	17.6		274°	24′

log cos G+α { 8.8849 n
log g { 1.1437
" sin(G+α) 9.9987 m
" tan δ_0 9.6193 m
8.8239 }

log g' 0.0286
log f 9.5856

Δ +2.003
b +0.385 n
h +.897
Red. +3.285

−23° 22.0 Should be
δ_0 −22° 35.8

log cos δ_0 9.9653 n
log i 0.6101 m
log(i) 0.5754 m

log sin δ { 9.5846 m
Cos(H+α)$_0$ { 9.8950 m n
log h { 1.3022 n
log sin(H+α) 9.7918 n
Sec δ_0 0.0347
8.8239 }

log k' 0.7818
" k 9.9526

g' +1.068 −
k' +6.051
i −3.762
Red +3.357

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1760 Reduction to apparent Place. 29.

$+\eta$	33	270		141°	45′
H	13	51.7			
λ	19	35.3			
G	22	42.3			
$\odot+\lambda$	42	176		274°	24′

$\log \cos G+\lambda$ 8.8849
$\log q$ 1.1437
$\log \sin(G+\lambda)$ 9.9987 n
$\log \tan \delta_0$ 9.6193 n
8.8239

$\log q'$ 0.0286
$\log q$ 9.5856

η + 2.003
q − 0.385
h − 0.897
Red. + 3285

−23 22. Should be
δ_0 −22° 35′.8

$\log \cos \delta_0$ 9.9653
$\log i$ 0.6101 n
$\log(11')$ 0.7754 n

$\log \sin \delta$ 9.5846 n
$\log(H+\lambda)$ 9.8495 n
$\log h$ 1.3022
$\log \sin(H+\lambda)$ 9.7918
$\log \sec \delta_0$ 0.0347
8.8239

$\log h'$ 0.7818
$\log a$ 9.9526

η' + 1.068
h' + 6.051
i − 3.762
Red + 3.357

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10760 Lunar Parallax 30

α'	19	35	19.90
Θ	19	16	27.00
$\Theta-\alpha'$		−18	52.90
$=$	−4°	43′	13.50
$\frac{1}{2}(\alpha-\alpha')$		−01	58.96
$(\Theta-\alpha')-\frac{1}{2}(\alpha-\alpha')$	−4°	41′	14.64

	9.995727
log cos $\frac{1}{2}(\alpha-\alpha')$	0.000000
sec $(\Theta-\alpha')-\frac{1}{2}(\alpha-\alpha')$	0.000145
log tan Y	9.995872

Y 42° 16′ 52.80″

δ' −23 22 01.5

$Y-\delta'$ 65 38 54.3

	9.826400
log sin π	8.243226
sin $(Y-\delta')$	9.995943
cosec Y	0.172144
sin $(\delta-\delta')$	8.201393

$(\delta-\delta')$ + 54 39.2

δ −22 27 22.3

Eph δ −22 27 22.7

O−C	+0.4
Curv.	+0.7
2nd ord. reqd.	+0.2
Dur.	−0.1

δ −22 27 22.2

O−C +0.5

π	60′	11.68″	
		9.986913	
log sin π		8.243226	
1′ sin $(\Theta-\alpha')$		8.915371	m
1″ sec Eph δ		0.034255	
sin $(\alpha-\alpha')$		7.062001	m
$\alpha-\alpha'$	3′	57.92	
$=$		−15.86	

α	19	35	04.03
Eph α	19	35	03.37
O−C			+0.67
Curv.			−0.03
Dur.			−0.05
α	19	35	03.98
O−C			+0.61

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1916 b

Lunar Parallax

α'	19	35'	19.80
θ	19	16	27.00
$\theta - \alpha'$		−18	52.90
=		−4°	43' 13.50
$\frac{1}{2}(\alpha - \alpha')$		−01	58.96
$\frac{1}{2}(\alpha + \alpha') - \frac{1}{2}(\alpha - \alpha')$		−4°	41' 14.64

	9.957127
$\log \cos \frac{1}{2}(\alpha - \alpha')$	0.000000
$\sec \frac{1}{2}(\alpha + \alpha') - \frac{1}{2}(\alpha - \alpha')$	0.001457
$\log \tan Y$	9.958572

Y +42° 16' 52.80"

δ' −22 27 01.5

$Y - \delta'$ 65 38 54.3

	9.876400
$\log \sin \pi$	8.243262
$\sin (Y - \delta')$	9.959543
$\operatorname{cosec} Y$	0.172141
$\sin (\delta - \delta')$	8.201336

$(\delta - \delta')$ 54 39.2

δ −22 27 22.3

δ −22 27 22.7"

O−C + 0.4

+ 0.7

0.2

− 0.1

δ −22 27 22.2

O−C + 0.5"

π 60' 11.68

	9.869913
$\log \sin \pi$	8.243262
$\log \sin (\theta - \alpha')$	8.915377
$\log \sec \frac{1}{2}(\alpha + \alpha') - \frac{1}{2}(\alpha - \alpha')$	0.001457
$\log \sin (\alpha - \alpha')$	7.062047

$\alpha - \alpha'$ 3' 57.92

= −15.86

α

α 19 35' 04.0"

α 19 35' 03.7

O−C + 0.67

− 0.03

− 0.05

α 19 35' 03.98

O−C + 0.61

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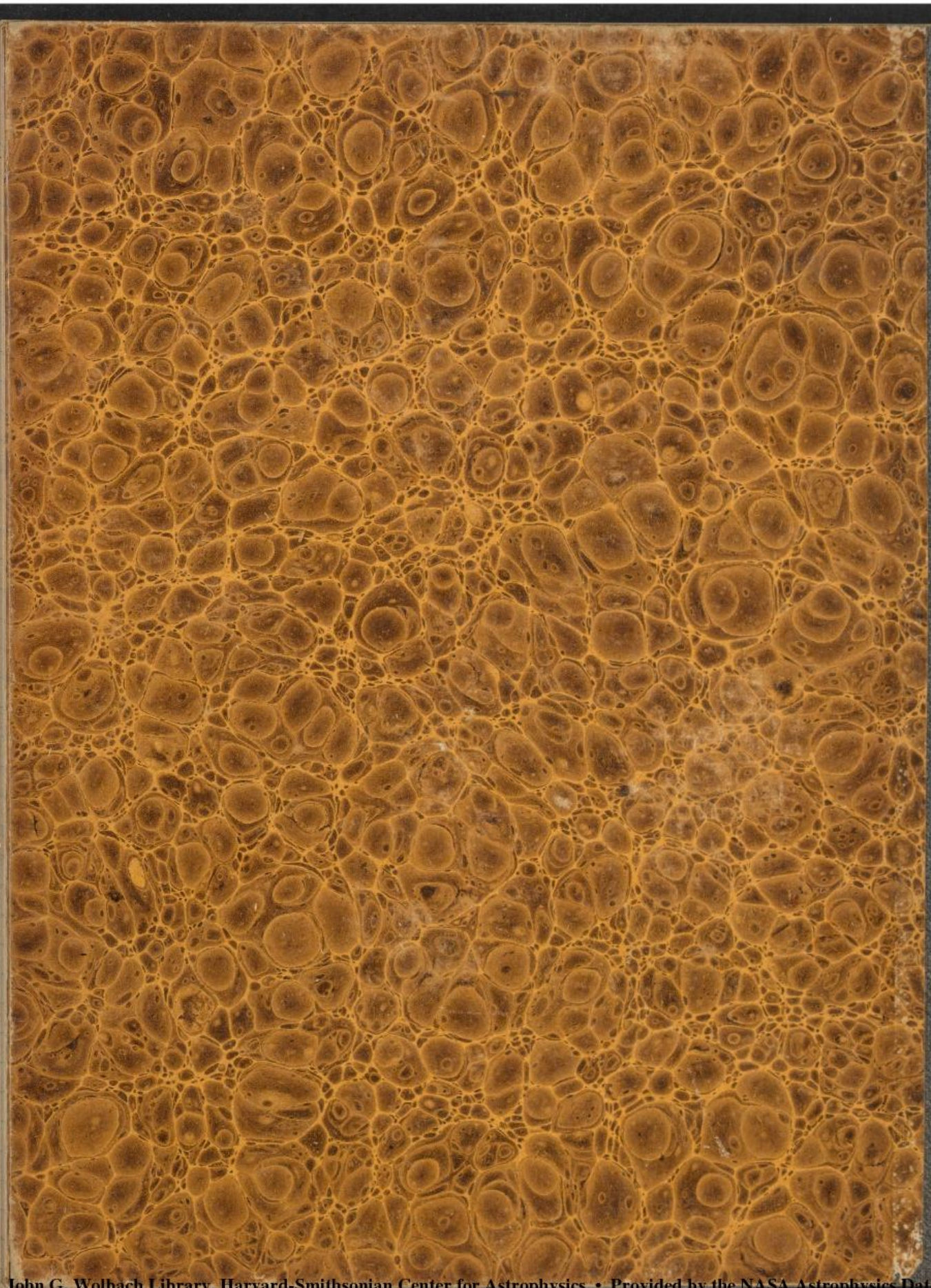
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