1916phae.proj.20

KG
11366
v.1002

CL

150

Plate	Date	Page
10702	Apr. 13 '16	1
10716	Apr 15, '16	21
10718	"	11

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10702 Star Measures

	d	x	r	d	M	d
1	28678		19076	20168		19926
13.9	8934		18820	14730		15656
8.6	38		18	38		50
	68		80	70		38
	13.9733		13.9743	4.5735		4.5721
2	18716		18748	20588		20012
27.6	12760		14676	18174		12402
28.2	50		76	94		394
	20		716	92		12
	29.5963		27.5961	28.2915		28.2386
3	18784		18610	18152		19537
29.1	17853		9532	13520		14158
10.6	59		34	26		52
	88		12	62		36
	29.0928		29.0921	10.9635		10.9619

Moon Measures

1	17606		19820	20028		20062
22.6	12526		14906	14712		13698
13.6	20		04	02		98
dc	08		28	34		80
	22.5084		22.5082	13.5624		13.5626
2				20010		20004
22				10880		19152
13.9				80		50
				22		10
				13.9181		13.9187
3	20401		19624			
21.6	15892		14138			
15	902		32			
	04		32			
	21.4503		21.4507			

fairly good image

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10702 Star Measures

	d	r	d	d
1	18678	19076	20168	19926
13.9	8939	18820	19920	19356
9.6	38	18	38	30
	68	80	90	38
	13.9733	13.9793	9.5735	9.5721
2	18716	18788	20588	20012
27.6	12760	14676	15179	12902
28.2	50	76	99	394
	20	716	92	12
	27.5963	27.5961	28.2915	28.2386
3	18789	18610	18152	19539
29.1	17853	9532	13520	14138
10.6	59	39	26	52
	88	12	462	36
	29.0928	29.0921	10.9635	10.9619

Moon Measures

1	17606	19820	20028	20062
22.6	12526	19906	19912	15699
13.6	20	09	02	98
4c	08	28	39	80
	22.5084	22.5082	13.5629	13.5626
4			20010	20009
22			10880	19132
13.9			80	50
			22	10
			13.9191	13.9197
8	20401	19629		
21.6	15892	19138		
15	902	32		
	09	32		
	21.7505	21.7507		

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Moon Measures

10702

	d	r	d	r
4	19438	19578		
21.4	15126	13890		
15.3	24	94		
-X	48	84		
	21.43174	21.43111		
5	19446	20098		
21.7	13648	15894		
16	48	98		
	40	108		
	21.57935	21.57893		
6		19752	20668	19572
22		13960	14382	15798
16.7		54	82	86
		46	80	86
		16.62741	16.62779	16.62149
7		19680	19830	19368
23		18344	18774	17112
17.1		36	68	712
		708	48	400
		17.13444	17.13681	17.13116
8			19740	19438
23.4			18076	11088
17.2			68	20
6+			50	37
			17.11663	17.11583

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10702 Moon Measures

	d	x	z	d	z
4.	19438		19378		
21.5	15126		13890		
15.3	29		94		
-x	48		89		
	21.9317		21.9311		
5	19496		20098		
21.7	13648		15899		
16	98		98		
	90		108		
	21.9793		21.9793		
6			19732	20668	19372
22			13960	14382	15795
16.7			39	82	86
			46	80	86
			16.6291	16.6279	16.6219
7			19680	19830	19368
23			18349	18479	11067
17.1			36	68	712
			708	98	900
			17.1394	17.1301	17.1316
8				29790	19938
23.9				18076	11085
17.2				68	80
9+				50	37
				17.1663	17.1699

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10702 Jennes Eta.

Apr. 13

Eq. to Stars	11	40		11	52	
" " Moon	11	45	34.3	11	45	34.5
Clock fast		5	36.7			
M. Sid Time	11	39	58.0	$\delta\alpha = +1^h$	23.5	
M Long	7	44	31.05			
G. Sid T.	16	24	29.05			
Sid T. M. Noon	1	25	21.38			
Interval	17	59	07.67			
Reduction		2	27.30			
G. M. T.	17	56	40.37			

From Naut. Alm.			R. A.		Dec	
Moon - 14^h	10	17	40.17	+8	22	10.6
Motion in m			1.9218			-13.550
" " 56.6728		1	48.91	+	-12	97.9
Tabular Place	10	16	29.06	+8	09	22.7

Moon's age 11.3

Parallax	53'	56.15"
Semid.	15'	16.1"
R		916.1"
Aug		11.8"
Fig 3		-0.3
R		927.6"
R		1.9884"
ΔR		-948"
$(1+q)R$		1.8936"
R'		3.5857"

934 122"

-500.6"
24
-476.6"

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10702 Jennes Etc.

Apr. 13

Epp. to Stars	11	40		11	32	
" " Moon	11	45'	37.3"	11	45'	37.3"
clock fast		5'	36.9"			
H. Sid Time	11	39	580"	9-1 = +1h	23.5m	
H Long	7	99	31.05 -			
G. Sid T.	16	29	2905"			
Sid T. M. Moon	1	25'	21.38 -			
Interval	17	39	07.67 -			
Reduction		2	2730 -			
G. M. T.	17	36	7037 -			

From Naut. Alm. N. A. - Hee

Moon - 19h	10	17	70.17	+8	22	10.6"
Motion 1m			1.9218			- 13.22 -
" " 56.6728		1	18.91 +		-12	97.9.
Tabular Place	10	16	29.06"	+8	09	22.7

Moons age 11.3

Parallax	33'	36.13"
Semid.	15'	16.1 -
R		916.1 -
aug		11.8 -
Lir		- 0.3
R		927.6 -
R		1.9889 -
a/R		- 998"
(1+a)R		1.8936"
R'		3.2857 -

934 1625

- 500.6"
- 29
- 976.6"

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10702 Plate Constants 7

x	13.9738	27.5962	29.0928
ξ	13.1740	27.4743	29.0883
x-ξ	+7998	+1219	+741

y	4.5728	28.2400	10.7627
η	3.7311	28.5939	9.9249
y-η	+8417	-3539	+5378

x-ξ	+580x	-1.7y	+.6x	-19986
+7998	+6987 = +14985	-8 = +14978	+8 = +14986	0
+1219	+13798 = 15017	-98 = 14969	+17 = 86	0
+741	+14596 = 14987	-18 = 14969	+17 = 86	0
23.3249	+11662	-26	+19	22.9913

y-η	+500y	+5.5x	+2y	-10789
+8417	+2286 = +10703	+77 = +10780	+9 = +10789	0
-3539	+17120 = +13581	+152 = 733	+56 = 89	0
+5378	+5231 = +10609	+160 = 769	+21 = 90	+1
10.2698	+7635	+128	+30	14.9702

Tables a = +7 e = -1.3 a-e = +8.3 b+d = -1.5
Obs = -580.6 = -502.0 = +1.7 = -3.8

6-e = -500.8 -500.7 = -2.3

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10702 Plate Constants

x	13.9738"	27.5962"	29.0927"
y	13.1790"	27.9793"	29.0983"
x-y	+7948	+1219	+991

y	9.5728"	28.2900"	10.7627"
y'	3.7311"	28.5939"	9.9299"
y-y'	+8417	-3039	+5378

x-y	+5808	-1.14	+.6x	-19986
7998 + 6981	= +14979	-x	= +19974	+x	= +19986	0
1219 + 13773	= 14992	-13	= 14979	+17	= 86	0
991 + 13988	= 14979	-13	= 14979	+17	= 86	0
22.3299	+11662	-26	+19	29913

y-y'	+5004	+3.3x	+24	-10789
+8417	+2256	= +10703	+77	= +10780	+9	= +10789	0
3039	+17120	= +10351	+132	= 733	+56	= 89	0
3378	+1231	= +10609	+160	= 769	+21	= 90	+1
12.2698	+7635	+118	+30	19.9711
				19.9702

Tables a = +2 e = -1.3 a·e = +1.3 1+d = -1.5
obs = -500.6 = -502.0 = +1.9 = -3.8

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A +1.2

B +1.2

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10702 Moon's Center

	x	x-x0	Δx	(x-x0)²	(x-x0)²+(y-y0)²	O-C
1	22.5083	-0.8177	-2	0.6689	3.5920	+63
2	22.0000	-1.3260	-2	1.7588	3.6027	+167
3	21.7506	-1.8754	-0	3.5171	3.5911	+51
4	21.7318	-1.8946	0	3.5895	3.5895	+35
5	21.5798	-1.7466	+1	3.0502	3.5803	-57
6	22.0000	-1.3260	+2	1.7578	3.5879	+22
7	23.0000	-0.3260	+2	0.1062	3.5702	-155
8	23.3260	0.0000	+2	0.0000	3.5869	+7

3.5857

	y	y-y0	Δy	(y-y0)²	
1	13.5625	-1.7095	-2	2.9231	206 ✓
2	13.9189	-1.3576	-2	1.8436	224 ✓
3	15.0000	-0.2720	-0	0.0740	262 ✓
4	15.2720	0.0000	0	0.0000	270 ✓
5	16.0000	+0.7280	+1	0.5301	293 ✓
6	16.6276	+1.3556	+2	1.8381	315 ✓
7	17.1330	+1.8610	+2	3.4640	350 ✓
8	+17.1656	+1.8936	+2	3.5868	360 ✓ 157°

Moon's Center

x = 22 y = 13.9189
16.6276
30.5390

y0 15.2695
y max 17.1656
R 1.8961
x min 21.7318
23.3275

Moon's Center { x0 23.3260
y0 15.2720 :

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10702 Moons Center

	x	x-x0	Δx	(x-x0)²	(x-x0)²+(y-y0)²	O-C
1	22.30883	-0.81777	-2	0.66889	3.39720	+63
2	22.00000	-1.13260	-2	1.28388	3.60027	+167
3	21.95206	-1.18759	-0	3.51171	3.39711	+39
4	21.93119	-1.18996	0	3.53895	3.39595	+38
5	21.97794	-1.17466	+1	3.05302	3.39803	-39
6	22.00000	-1.13260	+2	1.28388	3.39879	+22
7	23.00000	-0.13260	+2	0.01060	3.39702	-135
8	23.13260	0.00000	+2	0.00000	3.39869	+7

3.39857

	y	y-y0	Δy	(y-y0)²	
1	13.86255	-1.70975	-2	2.92231	206
2	13.91799	-1.35376	-2	1.83936	224
3	15.00000	-0.27220	-0	0.07790	262
4	15.27220	0.00000	0	0.00000	270
5	16.00000	+0.72280	+1	0.53011	293
6	16.62796	+1.35076	+2	1.83011	315
7	17.13310	+1.86610	+2	3.48040	330
8	17.16556	+1.89936	+2	3.59869	360

Moons Center

x = 22 y = 13.91799

16.62796

30.54595

y_0 15.26795

y_{max} 17.16556

fc 1.89761

x_{max} 21.73117

23.32750

Moons Center { x_0 23.32750

y_0 15.27220

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7 Formation of Normals.

1	+1,40	-315	-108,0
2	+1,81	-2220	-227,0
3	+0,51	-1015	-18,6
4	0,0	-720	0,0
5	-1,28	+945	-39,7
6	-1,79	-292	+29,7
7	-0,60	+312	-288,5
8	+0,0	+0,0	+13,0
	+3,72	+1457	+42,7
	-3,67	-4762	-677,5
	+0,05	-3305	-634,8

		a	b	c	neue o-c
a	+10	-8	+5	+12	-19 V
b	-3	-13	+5	+7	+84
c	+15	-19	+1	-3	-4
		-19	0	-4	-9
		-17	-2	-4	-66
		-13	-4	-2	+50
		-3	-6	+7	-72
		+0	-6	+9	+100 V

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10702 Conditional Equations

								O-C
1	- 0,82	- 1,71	= +63	+ 18	+ 76	= +94		- 31
2	- 1,33	- 1,36	= +167	+ 30	+ 60	= +90		+ 77
3	- 1,88	- 0,27	= +54	+ 83	+ 12	= +55		- 1
4	- 1,89	0,00	= +38	+ 83.	0	= +73		- 5
5	- 1,75	+ 0,73	= -54	+ 40	- 32	= +8		+62
6	- 1,33	+ 1,35	= +22	+ 30	- 60	= -30		+52
7	- 0,33	+ 1,86	= -135	+ 7	- 83	= -76		+79
8	+ 0,00	+ 1,89	= +7	- 0	- 89	= -89		+91
					+ 220	- 178		

Average ±50

14,45 + 0,05 = -330,5 - 9,33

0,05 + 14,25 = -634,8 + 2,79

+[ ] + 0 = - 1,1 +0,17 Δ

+14,25 = -633,7 b = - 44,7

14,45 = -330,5 + 2,2 = = - 328,3 a = - 22,8

- 0,65 Δ

Im 3 R = 1,89

-2RC = + 0,76

Measured Arc 154°

$\frac{p}{h}$ - ,16 + $\frac{\Sigma r}{h}$ = +5,2

$\frac{5,2}{,16}$ = +32,5 ΔR = + 0,40

Corr -0,2

Δ h = + 0,13 Δ S = + 0,1 ΔR = + 0,6

Δ a = - 0,50 Δ T = - 0,02

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10702 Conditional Equations

							O-C
1	- 0.82	- 1.71	+ 63	+ 18	+ 76	+ 99	- 31
2	- 1.33	- 1.36	+ 167	+ 30	+ 60	+ 90	+ 77
3	- 1.88	- 0.27	+ 54	+ 93	+ 12	+ 55	- 1
4	- 1.89	0.00	+ 38	+ 93	0	+ 93	- 5
5	- 1.75	+ 0.73	- 34	+ 90	- 32	+ 4	+ 62
6	- 1.33	+ 1.35	+ 22	+ 30	- 60	- 30	+ 52
7	- 0.33	+ 1.86	- 135	+ 7	- 83	- 76	+ 79
8	+ 0.00	+ 1.89	+ 7	- 0	- 79	- 87	+ 91

+ 320 - 178

Average ± 50

19.95 + 0.05 = - 330.5

0.05 + 19.25 = - 639.8

+ 1.3 + 0 = - 1.1

+ 19.25 = - 633.7 b = - 32.9

19.95 = - 330.5 + 2.2 = = - 328.3 a = - 22.8

Measured arc 15-9°

$\frac{f}{h}$ = .161 $\frac{\Sigma v}{n}$ = + 5.2

$\frac{5.2}{.16}$ = + 32.5" ΔR = - + 0.7"

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10702 Moon's Mean Position

x_0 23.3260
−11
23.3249

y_0 15.2720
−22
15.2698

From Plate Constants

X 229913

Y +.9913

log Y 9.99621
cos δ 9.99617
8.50729
1.49283

y 17.9702
η −3.0298

log tan δ 9.1252
Z 9.9927
7.0537
6.1710
n. +0.00011

δ − A 31.10

A 10 17 56.00

δ_0 10 15 27.10

Red +2.56

δ' 10 15 29.66

log n 0.98196
7.33115
3.15031 14135

S − D −23 33.5

D 8 01 00.0

S_0 7 37.265

Red −12.8

S' +7 37 137

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10702 Moons Mean Position 1

X_0 22.3260
-11
22.3249

Y_0 15.2720
-22
15.2698

From Data Constants

X 2.89913

Y 17.9702

Z +.9913

Y -3.0298

log Z 9.996824
Cos δ 9.996117
8.007241
6.222283

log tan δ 9.12532
Z 9.99727
7.05339
6.17900
n. +0.00001

X-A 31.10

log A 0.981788
7.331135
3.150387 1413.5

A 10 17 56.00

X_0 10 15 27.10

δ-D -23 33.5

Red +2.56

D 8 01 00.0

t. 10 15 29.66

δ. 7 37.265

Red -12.8

δ' +7 37 13.7

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10702 Reduction to Apparent Place 8

H+α	2	32.3	38°	47.5	δ	7	37.47
H	16	16.9					
α	10	15.4					
Θ	22	11.0					
Θ+α	8	26.4	126°	36.0			

Log Cos δ 9.9961
L - 0.8727
(L) 9.8688 n

Log Cos Θ+α 9.7758 n
g 1.0922
Sin " 9.9046
Tang 9.1267 L
8.8239

Log Sin δ 9.1228
Cos (H+α) 9.8962
h 1.2802
Sin " 9.7890
Sec δ 0.0039
8.8239

Log q' 0.8688 n
q 8.9474

Log h' 0.2998
h 9.8970

f	1682	
g	0089	L
h	0789	L
	2560	L

q'	- 7.372	L
h'	1.997	L
L'	- 0.383	L
	- 12.751	L

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1072 Reduction to Apparent Place

H + α	2	32.8	38° 8.5	δ	7 37.99
H	16	16.9			
α	10	15.9			
G	22	11.0			
G + α	8	26.8	126° 36.0		

log cos δ 9.9961
α − 0.37 21
ι 9.86824

log cos G+α 9.7799 n
f 1.0922
Sun " 9.9096
tan δ 9.1267
8.8239

log Sun δ 9.1228
Cos (H+α) 9.8962
th 1.2802
Sun . 9.7890
Sec δ 0.0039
8.8239

log q' 0.8676 n
q 8.9779

log h' 0.2992
h 9.8970

f 1.682
q 0.089 +
th. 0.789
2.560

q' − 7.372
h' 1.497
i' − 7.383
−12.761

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10702 Lunar Parallax

					π	5".5 5".6.15"
α'	10	15	29.66			
α	11	39	58.00		9.869113	
α-α'	1	24	28.34		8.211140	
=	21	7	5.10		9.556666	
½(α-α')		7	31.86		0.007882	
	20	59	33.24		7.644161	

9.957270
0.000000
0.029833
9.987103

α-α' 15 03.73
= 1 00.25

α 11 08 57.6
δ +7 37 13.7
α-δ 36 31 43.9

9.826700
8.211140
9.774469
0.157006
7.969355

δ-δ' 32 03.0

δ 8 09 16.7 α 10 16 29.91

Eph δ 8 09 22.7 Eph α 10 16 29.06

O-C -6.0 O-C +0.85
Curv. Corr +0.3 +0.03
2nd O. Ref. " 0.0
Irr Corr +0.1 -0.02

δ +8 09 16.8 α 10 16 29.89
O-C -5.9 +0.83

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10702 Lunar Parallax 9

				π	5".5	5"6.10"
χ'	10	15	29.68"		
δ	11	39	58.00"	9.869113	
$\delta - \chi'$	1	24	28.32"	4.211740	
=	21	7	56.50	9556666	
$\frac{1}{2}(\chi - \chi')$		7	31.86"	0007992	
χ	20	59	33.29"	7.697161	

9.957127
0.000000
0.029983"
9.987110

$\chi - \chi'$ 15" 03.73
= 1 00.25"

χ 99 08 57.6"

δ +7 37 13.7"

$\chi - \delta$ 36 31 43.9"

9.826790
4.211740"
4.774469"
0.157065"
7.969505"

$\delta - \delta'$ 32 03.0"

δ 8 09 16.7"

Cyl δ 8 09 22.7"

O-C -6.0"
Curve Corr +0.3
2nd O. Ref: 0.0

χ 10 16 29.91"

Cyl χ 10 16 29.06"

O-C +0.85"
+0.03

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10718 1175 Star Measures Dec 3

	d	x	d		d	
1	20291		19898		19700	19512
9.8	12414		17722		14150	19846
13.6	22		24		44	50
	90		44		04	16
	9.7872		9.7876		13.5550	13.5532
2	18656		19418		20000	17378
24.3	15080		12988		11827	15536
3.9	80		94		32	36
	56		20		9998	402
	24.3576		24.3572		3.8170	3.8154
3	20142		18932		19736	20282
29.8	11690		17390		16786	13220
28.3	92		86		84	22
	98		30		98	86
	24.8456		24.8456		28.2954	28.2936

Moon Measures

1			19302	20488
21			18522	11262
13.1			34	56
			12	98
			13.0775	13.0761
2	19542		19637	
20.2	18160		11050	
19	68		38	
	52		48	
	20.1379		20.1398	
3	18878		19210	
19.9	92 ~~76~~		18830	
14.8	80		14	
-X	82		10	
	19.9607		19.9612	

Poor image

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10718 Star Measures Dr 3

	d	x	r	d	
1	20291		19848	17700	19312
98	12414		17722	14150	19846
12.6	22		24	94	50
	90		44	04	16
	9.7872		9.7876	13.5555	13.5535
2	18656		19418	20000	17378
24.3	15080		12988	11827	15536
3.9	80		94	32	36
	56		20	9998	402
	24.3576		24.3572	38170	3.8159
3	20192		15932	19736	20282
29.8	11690		17390	16756	13220
26.3	92		86	89	22
	98		30	98	86
	24.8456		24.8456	28294	28.2936

Moon Measures.

1			19302	20488
21			18522	11262
13.1			39	56
			12	98
			13.0775	13.0761
2	19542		19639	
20.2	18160		11050	
19	68		38	
	52		98	
	20.1379		20.1398	
3	18878		19216	
19.9	92766		18830	
19.8	80		19	
-x	82		10	
	19.9607		19.9612	

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10718 Moon Measures.

4
20.8
16

18936	19860
15066	13700
66	06
40	68
20.38.71	20.38.37

5
21
16.5

19313	19129
14174	19260
68	56
24	98
16.51.78	16.51.22

6
21.9
16.7
+7

19288	19207
11934	16.51.72
32	48
310	22
16.73.70	16.73.70

7
22
16.7

19292	19237
11967	16.51.76
52	70
312	74
16.73.78	16.73.36

8
22.5
16.4

18798	17607
13860	12518
58	20
98	10
22.49.39	22.49.11

19828	20268
13456	16672
13470	70
40	92
16.53.86	16.53.98

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10718 Moon Measures. 12

2	18936	19860
20.8	13066	13700
16	66	06
	90	68
	203871	203837

5	19313	19129
21	14179	19260
16.2	68	56
	29	98
	163198	163122

6	19288	19209
21.9	11939	16359
16.7	32	48
+1	310	22
	167370	167390

7		
22	19292	19234
16.7	11969	16376
	32	70
	312	99
	167398	167336

	18798	17609
8	13860	12518
22.3	58	20
16.6	98	10
	224939	224916

	19328	20268
	13956	16672
	13990	70
	40	92
	166386	166398

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10716 Times Etc 13

Apr. 15-16

Epi. to Stars	13	28			13	36	
" " Moon	13	29	37.6		13	29	37.8
Clock fast		5	37.3				
H. Sid. Time	13	28	00.8		$\phi - \varphi = +1^h\ 31^m$		
H. Long	9	58	31.05				
G. Sid. T	18	08	31.85				
Sid. T. M. Noon	1	33	17.99				
Interval	16	35	16.86				
Reduction		2	73.05				
G. M. T.	16	32	33.91				

From Naut. Alm.		R. A.		Dec.	
Moon 16	11	52	02.27	−3 37	47.1
Motion in 1m		1	2.0036		−14.863
" " 32.5 h 52		+1	5.25	−8	8.0
Interpolated	11	53	07.52	−3 45	48.1

Moon's Age 13.3 days

Parallax	57	28.26
Semid	15	71.1
R		971.1
Aug		10.2
Dip (3)		−0.3
R		951.0
R		2.0386
dR		−981
(1+a)R		1,9405
R		3,7655

939 10.0

a − 5° 05.1
+ 24
− 981.1

For 10718 Times see page 23

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10716 Times Etc

Apr 15-16

Eq. to Stars	13	29		13	36		
Moon	13	29	37.6	13	29	37.8	
Clock fast		5	37.3				
H Sid. Time	13	24	00.9	+ 7 =	+1	31	
H Long	9	99	31.05				
G. Sid T	18	08	31.95				
Sid T M. Noon	1	33	19.79				
Interval	16	35	1,696				
Reduction		2	743005				
G M T	16	32	333.71				

Four Naut Alm	R. A.		Dec.		
Moon 16	11 52	02.27	+3	37	99.1
Correction m		2.036			-19.863
.. 32.5 + 52	+1	5.25		-8	9.1
Jubal Prae	11 53	07.32	-3	45	98½

Moons age 13.3 days

Parallax	57	28.26
Equid	15	91.1
R		991.1
Aug		10.2
Dec		-0.3
R		981.0
R		2.0386
corr		-781
Equ & R		1,99053
R		3,76 55

939 10.0

a - 5° 05.1
+ 24
- 981.1

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Curv. Corr.

ξ	η	Δξ: −3.63		= −3η		= +4
−12.67	−4.56	−53	+47	= −6	+1	= −5
+2.66	−14.76	+1	−10	= −9	+5	= −4
+3.10	+10.96	+10	−11	= −1	−3	= −4
M. +0.05	−3.23	0	0		+1	+5

= +.07

Δη	−7.6η		+.8ξ		+11
−22	+21	= −1	−10	= +11	
−80	+68	= −12	+2	= −10	
+37	−50	= −13	+2	= −11	
	+15		+0		+26

= +1.3

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10718 Standard Coordinates. 19

	Capre No 1612 - Mg - 5,9	Capre No 1628 - Mg. 8, 0	Capre No 1625 - Mg 7.7
C	11 45 55 45	11 53 57,00	11 57 07,29
L	55 57	57.08	7,33
E	55 51	57.00	7.28
Mean	11 45 55 50	11 53 57.03	11 57 07,30
Prec	49,05	49,10	49,25 49,13
α	11 46 47 55	11 58 43,13	11 57 56,55 56.83
A	11 53 20	11 53 20	11 53 20
α-A	- 6 35,45	+ 1.23,13	+ 1 36,55 36,83
Sin(α-A)	- 395,70	+ 83,13	+ 96,55 + 96.83
log "	2,597078	1,919976	1,984755 1,98921
" cos δ	9,999843	9,999747	9,999946 9,99996
" ξ_0	1,102714	0,224447	0,984809 0,99091
ξ_0	- 126,80	+ 2,65,75	+ 3,1006 3,0968
ξ_1	- 53	+01	+10 +10
ξ	93267	24,65,76	25,1016 25,0978
X	97877	27,35,77	27,85,56 27,85,56
X-ξ	+ 4607	- 3002	2560 + 2522
δ	- 7 46 37,7	- 6 05 51,0	- 2 45 55,7
L	380	51,7	55,6
E	38,2	51,1	56,0
Mean	- 7 46 38,0	- 6 05 51,3	- 2 45 55,8
Prec	- 5 20,2	- 5 20,6	- 5 20,6
δ	- 7 51 58,2	- 6 11 11,9	- 2 51 16,4
D	- 7 16 30	- 7 16 30	- 7. 16 30
δ-D	- 35 28,2	- 1 54 41,9	+ 1 25 13,6
tang δ-D	- 2128,3	- 6887,5	+ 5119,7
log "	3,328031	3,837887	3,708826
" η_0	0,639181	6,169021	1,039971
log tang δ	8,93011	9,03650	8,69777
" ξ_0	2,20548	0,88489	0,99297
η_1	81889	693733	6,74740
η_0	- 45622	-147577	+ 109680
η_1	- 0,0159	- 0,0009	- 0,0006
η	136224	32718	289634
η	13,5575	38162	2829735
η-η	+ 1321	+ 5798	- 6689

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10718 Standard Coordinates. 19

	Cape No 1612 - Mg - 3.9	Cape No 1629 - Mg. 5.0	Cape No 1625 - Mg 7.7
C	11 95° 55' 45"	11 53 59.00	11 57 07.29
L	55' 39	54.08	7.33
E	55' 51	59.00	7.28
Mean	11 95° 55' 50	11 53 59.03	11 57 07.30
Trac	99.05"	99.10	99.25" 97.13
L	11 96 99 55	11 59 93.13	11 59 56 55 56.93
A	11 53 20	11 53 20	11 53 20
L-A	- 6 35.45	+ 1 23.13	+ 1 36 55 36.93
Sin(L-A)	- 395.90	+ 83.13	+ 96 55" + 96.93
Log	2.39 709 n	1.91976	1.98975" 1.98921
Cos δ	9.99893	9.99797	9.99996 9.99796
Log ξ₀	1.10271 n	0.92797	0.98971" 0.98917
ξ₀	- 126.80	+ 2.65" 75	+ 3.1006 3.0968
η₀	- 33	+01	+10 +10
ξ	9.3267	29.6576	23.1016 23.0978
x	9.7879	29.3279	29.8756 29.8926
x - ξ	+ .4607	+ .3002	.2560 + .2522

C	- 9 96 37.7	- 6 05 51.0	- 2 95° 55.7
L	380	51.7	55.6
C	382	51.1	56.0
Mean	- 9 96 38.0	- 6 05 51.3	- 2 95° 55.8
Trac	- 5" 20.2	- 5" 20.6	- 5" 20.6
δ	- 9 51 58.2	- 6 11 11.9	- 2 51 16.7
D	- 9 16 30	- 9 16 30	- 9 16 30
δ - D	- 35 28.2	- 1 59 41.9	+ 1 25 13.6
Tan δ - D	- 2128.3	- 6888.5"	+ 5119.7
Log	3.328403 n	3.837887 n	3.708582
H₀	0.63718 n	0.16902 n	1.03997
Sin H₀	8.93011 n	9.03550 n	8.69717 n
ξ₀"	2.2059	0.8488	0.9927 1
η₀	8.1889 n	6.9383 n	6.7990 n
η₀	- 95.622	- 1977.7	+ 10.7690
η₀²	- 0.01579	- 0.00009	- 0.00006
η	13.9229	13.2812	28.7639
η	13.9575	3.8162	28.2975"
η - η₀	+ .1321	+ 5.798	- .6689

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10718 Plate Center & Constants 15

x	y	α	δ
9.7874	13.5375	11 46 45	-7 51 58
27.3574	3.8162	57 83	-6 11 12
24.8756	28.2985	57 57	-2 51 16
58.9904	45.6652	159 185	+12 113 86
19.6635	15.2217	11 52 8.3	-7 38 8.7
22.	18	+ 1 12.3	+21 36.9
+ 2.3365	+ 2.7783	11 53 20.6	-7 16 31.8
31	466.5		
72.3	+21' 36.4	A 11 53 20	
		D -7 16 30	

X-3 +500y −29.64 +3.97 −9130

+7607 +4894	= +9501 − 401	= +9100 + 30	= +9130	0
+3002 +12179	= 9177 − 113	= +9069 + 75	= 9139	−1
−2522 +12723	= 9901 − 837	= +9069 + 77	= 9191	+1
21.9021 + 10951	−738	+68	22.04972	

Y-4 +500y +35.97 +7.77 −85.96

+1321 +6777	= +8098	+ 376 = +8999	+101 = +8575	−1
+5798 +1908	= 7656	+ 862 = 8518	+ 28 = 46	0
−6689 +14147	= 7458	+ 879 = 8337	+209 = 76	0
19.7957 + 7398		+ 775	+110	14.76994
			09	

Tables a=0 c=−3 a−c=+3.0 b+d=−2.8

Obs =−503.1 =−507.7 =+4.3 =−3.8

0−c −503.1 −507.7 −3.0

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16 10718 Moore's Counter

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10718 State Center X Constants

	x	y	z	d
	7.7879	13.5375	11 7695	-7 5138
	24.3577	3.8162	5793	-6 1112
	24.8956	24.2972	27 37	-2 5116
	15.8.7907	7.6.6.2	139 173	113 86
	22 6635	15.2217	11 52 8.3	-7 38 8.7
	22	18	+1 12.2	+21 36.9
	+2 3365	+2,77[illegible]	11 53 20.6	-7 16 31.6
	31	766.5		
	72.3	+21' 36.4	A 11 53 20	
			D -7 16 30	

X-3	+500 x	-27.67	+3.17	-9130
+7607	+9899	= +9501 - 901	= +9100 + 30	= +9130 0
-3002	+12179	= 9177 - 113	= +9069 + 95	= 9139 -1
-2522	+12723	= 9901 - 837	= +9064 + 77	= 9191 +1
21.9021	+10951	-938	+68	22.0972

Y-41	+500 y	+35.9 x	+7.94	=8.96
+1321	+6777	= +8098 + 396	= +8999 +101	= +8532 -1
+3798	+1908	= 7656 + 862	= 8115 +25	= 196 0
-6689	+19197	= 7958 + 219	= 8337 +209	= 196 0
17.7957	+7398	+775	+110	17.7699

Indices a=0 c=-3 a-c=+3.0 b+d=-2.8

Obs =-303.1 =-327.9 =+9.9 =-3.8

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16 10718 Moons Center

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10718 Moore's Center 16

	X	X - X0	ΔX	(X-X0)²	(X-X0)²+(Y-Y0)²	6-C
1	21,0000	-0,9000	-11	0,8120	3,7659	+70
2	20,1389	-1,7611	-5'	3,1032	3,7335'	-234
3	19,9608	-1,9392	0	3,7605'	3,7605'	+16
4	20,3859	-1,5126	+8	2,2916	3,7743	-176
5'	21,0000	-0,9000	+11	0,8080	3,7595'	+6
6	21,9000	0,0000	+12	0,0000	3,7675'	+86
7	22,0000	+0,1000	+12	0,0102	3,7726	+137
8	22,9925'	+0,5925	+11	0,3523	3,7574	-45'

3,7589

	Y	Y - Y0	ΔY	(Y-Y0)²	∠
1	13,0768	-1,7182	-5'	2,9539	208°
2	14,0000	-0,7950	-2	0,6320	246°
3	14,7950	0,0000	0	0,0000	270°
4	16,0000	+1,2050	+3	1,4527	308°
5'	16,5135'	+1,7185'	+5'	2,9515'	332°
6	+16,7355'	+1,9405	+5'	3,7675'	360°
7	16,7342	+1,9392	+5'	3,7629	3°
8	16,6390	+1,8440	+5'	3,4021	18° 170°

Moore's Center

X = 21 y = 13,0768
16,5135'
29,5903

y0 14,7951

y max 16,7355'

R 1,9404 1,9388

X min 19,9608

X0 21,8998

Moore's Center X0 21,9000

Y0 14,7950

ΔX = 6,3

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10718 Moons Center

	x	x - x0	dx	(x-x0)²	(x-x0)²+(y-y0)²	6 - c
1	21.0000	-0.9000	-11	0.81120	3.76579	+10
2	20.1389	-1.7611	-5	3.10132	3.73385	-239
3	-19.9608	-1.9392	0	3.76025	3.76025	+16
4	20.3859	-1.5176	+8	2.29116	3.77493	-176
5	21.0000	-0.9000	+11	0.81080	3.75795	+6
6	21.9000	0.0000	+12	0.00000	3.76725	+86
7	22.0000	+0.1000	+12	0.01002	3.77226	+137
8	22.9925	+1.0925	+11	0.39823	3.75979	-93

3.75589

	y	y - y0	dy	(y-y0)²	c
1	13.0768	-1.7182	-5	2.95239	208
2	14.0000	-0.7950	-2	0.63213	296
3	14.7950	0.0000	0	0.00000	270
4	16.0000	+1.2050	+3	1.45227	308
5	16.5135	+1.7185	+5	2.95315	332
6	+16.7335	+1.9385	+5	3.75973	360
7	16.7392	+1.9392	+5	3.76029	3
8	16.6390	+1.8390	+5	3.38021	18

170°

Moons Center

x = 21 y = 13.0768
16.5135
29.5903
y0 14.7951
y max 16.7335
R 1.9407
x min 19.9608
x0 21.8998

Moons Center x0 21.9000

y0 14.7950

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Formation of Normals.

1	+ 1,55	- 120,0	- 63,0
2	+ 1,39	+ 8 12,0	+ 185,0
3	0,00	- 31,0	00
4	- 1,81	+ 220,5	- 175,5
5	- 1,55	- 5,5	+ 10,5
6	0,0	0,0	+ 167,0
7	+ 0,19	+ 13,5	+ 266,0
8	+ 1,09	- 26,5	- 83,0
	+ 4,22	+ 646,0	+ 628,5
	- 3,36	- 183,0	- 321,5
	+ 0,86	+ 463,0	+ 307,0

+16

	a	b	c	new o-c	
	- 8	+ 9	+ 17	+ 199	v
a + 9	- 16	+ 4	+ 4	- 146	
b - 5	- 17	0	- 1	+ 95	
c + 16	- 14	- 6	- 4	- 105	
	- 8	- 9	- 1	+ 17	
	+ 0	- 10	+ 6	+ 64	
	+ 1	- 10	+ 7	+ 112	
	+ 5	- 9	+ 12	- 88	v

0.077

+0.86 + 18.92 = +6.13

+ [ ] + .07 = -0.49

+18.85 = +6.62

+ 11.14 = - 6.32 - 0.30 = - 6.62

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10718 Conditional Equations.

						O-C
1	-0.90	-1.72	= +70	-37	-25 = -62	+132
2	-1.76	-0.79	= -237	-73	-11 = -84	-150
3	-1.94	0.00	= +16	-80	6 = -80	+96
4	-1.51	+1.20	= -196	-62	+17 = -45	-161
5	-0.90	+1.72	= +6	-37	+25 = -12	+18
6	0.00	+1.94	= +86	0	+28 = +28	+38
7	+0.10	+1.94	= +137	+4	+28 = +32	+105
8	+0.59	+1.84	= -95	+24	+27 = +51	-96
						+409 -347

Average 94

11.14 + 0.86 = +763.0 −6.32

+0.86 + 18.92 = +307.0 +6.13

+[illegible] + .07 = +35.8

+18.85 = +271.2

b = +18.4 +0.35 Δ

a = +71.4 −0.59 Δ

11.14 = +763.0 − 12.4 = +761.6

Arc Measured 170°

$\frac{P}{n}$ = .25 $\frac{\Sigma V}{n}$ = 7.75

R = 3 R 1.94 $\frac{7.75}{.25}$ = 31 ΔR = +0.8

Corr = −0.2

−2RC = +0.78

ΔR = +1.0

Δb = + 0.27 Δd = +0.1

Δg = − 0.46 Δf = −0.02

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10718 Conditional Equations.

					O − C
1	−0.90	−1.72	= +70	−37 − 25 = −62	+132
2	−1.76	−0.79	= −239	−73 − 11 = −84	−150
3	−1.99	0.00	= +16	−80 6 = −74	+96
4	−1.51	+1.20	= −196	−62 + 17 = −45	−101
5	−0.90	+1.72	= +6	−37 + 25 = −12	+18
6	0.00	+1.99	= +86	0 + 28 = +28	+58
7	+0.10	+1.99	= +137	+9 + 28 = +32	+105
8	+0.59	+1.99	= −95	+29 + 27 = +51	−96
					+709 −397
					average 99

11.19 + 0.86 = +963.0

+0.86 + 18.92 = +307.0

+C 3 + 107 = +33.8

+18.85 = +271.2

b = +19.9
a = +91.9

11.19 = +963.0 − 19.9 = +961.6

Arc Measured 170°

$\frac{P}{4}$ = 25″ $\frac{\Sigma v}{4}$ = 7.75″

$\frac{7.75''}{25''}$ = 31 ΔK = +0.8

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10718 Micomia Mean Position

x_0 21.9000
+21
21.9021

y_0 19.7950
+07
19.7957

From Plate Constants

x 22.0972

ξ +.0872

log ξ 8.67394
cos δ 9.99857
8.67251
0.16816

y 19.7697

η −3.2306
9.144

log tan δ 8.83733
ξ^2 7.34799
7.05337
3.2386

$x - A$ + 1.47 η 0

A 11 53 20.

x_0 11 53 21.47

log η_0 0.50928
7.33113
3.17813 15° 07.1

Red +2.78

$\delta - D$ −25 07.1

x' 11 53 24.25

D −4 16 30.0

δ_0 −4 41 37.1

Red −18.9

δ' −4 41 56.0

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10718 Mecom's Mean Position

α_0 21.9000ˢ
+21ˢ
21.9021ˢ

δ_0 19.79 5″0
+07
19.79 57″

From Plate Constants

x 22.0972ˢ

ξ +.0972ˢ

Log ξ 8.67397ˢ
Cos δ 9.99834ˢ
8.67231ˢ
0.16816ˢ

y 19.7697ˢ

η − 3.2306ˢ

Log η 8.8373 3.ₙ
ζ 7.39779ˢ
7.03537
3.23316ˢ

1-A + 1.77ˢ

A 11 53 20.ˢ

α_0 11 53 21.77ˢ

Red +2.78

α' 11 53 24.23ˢ

η_0 0

Log η_0 0.50928ₙ
7.33113
3.17813ₙ 1507.1ˢ

S-D −25′ 07.1ˢ

D −7 16 30.0ˢ

δ_0 −7 41 37.1ˢ

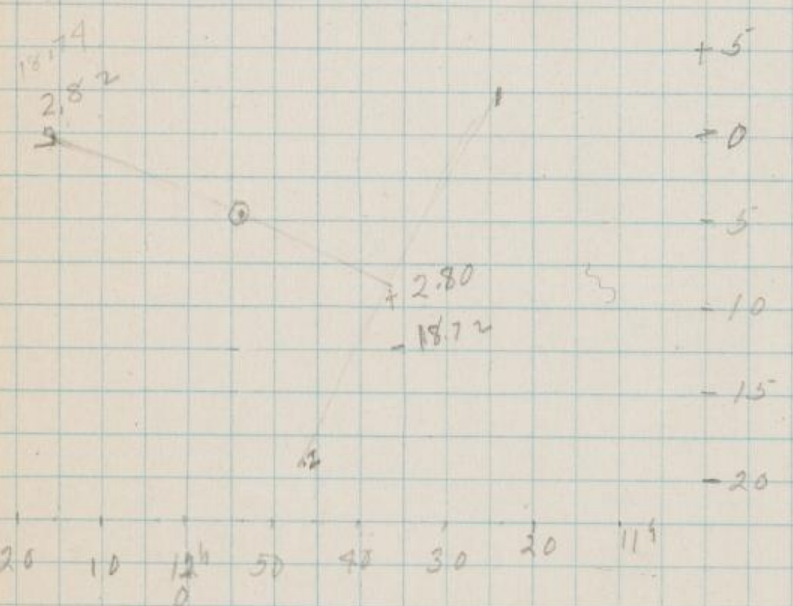
Red −18.9

δ' −7 41 56.0ˢ

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11	23	39.81	
		37.07	
		+ 2.74	
11	40	32.87	
		30.19	
		+ 2.68	
12	15-	39.35-	
		36.50	
		+ 2.85-	
+3	18	51.80	
	19	8.48	
		- 16.68	
-17	53	21.96	
	53	1.28	
		- 20.68	
- 0	12	19.02	
		0.28	
		- 18.74	



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10718 Reduction to Apparent Place. 19

14 α	9	01.7	= 60°	25'.5	δ −4 71 37.
H	16	08.3			
α	11	53.7			log cos δ 9.9985 n
G	22	11.5			4 - 0.8652 n
G+α	10	04.9	= 151°	13.5'	0.8637 n

log Sin δ 8.9130 n
" Sin(H+α) 9.6936 n
4 1.2813 n
Sin(H+α) 9.9399
Sec δ 0.0015 n
8.8239

log Cos(G+α) 9.9827 6 n
9 1.0926 n
Sin " 9.6825 n
Tan δ 8.9147 n
8.8239.

log q' 1.0353 n
" q 8.5137 n

log t' 9.8879 n
" t 0.0456
0.0471

f +1.697
9 −.0.033
L +1.114
+2.778

9' -10.847
t' - 0.772
i - 7.307
-18.926

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1917 Reduction to Apparent Place. 19

$\alpha + z$ 9 01.7 : 60° 25'.5 δ −4 41 37.

α	11	53.9	
G	22	11.5	
$G+z$	10	07.8	: 151° 13.5'

log cos δ 9.9783 n
z 0.0763 n
0.8637 n

log Sin δ 8.9130 n
log(H+z) 9.6934 n
z 1.2813 n
Sin(H+z) 9.9378
Sec δ 0.0015
8.8239

log Cos(G+z) 9.9976 n
9 1.0726
Sin 9.6825 n
Tang 8.9177 n
8.7239.

log q' 1.0333 n
" q 8.5134 n

log z' 9.8899 n
" z 0.0776
0.0971

f +1.697
q −0.033
z +11.118
+12.778

q' −10.877
z' −0.776
i −7.307
−18.960

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10718 Lunar Parallax. 20

α'	11	53	27.25 ⌐
δ	19	27	04.7 ⌐
$\alpha - \alpha'$	2	30	40.15 ⌐
	37	40	2.25 ⌐
$\frac{1}{2}(1-\lambda')$		13	1.76
	37	27	0.49

9.95727
0.00000
0.10024 ⌐
0.05751 ⌐

Δ	-7	41	56.0
π		57'	30.1 ⌐

9.86913
8.22338 ⌐
9.78610 ⌐
0.00107 ⌐
7.87958 ⌐

$\alpha - \alpha'$ 26 03.53.
= + 1 44.24 ⌐

γ	48	46	57.6 ⌐
δ	-7	41	56.0 ⌐
$\gamma - \delta$	53	28	536 ⌐

9.82670
8.22338 ⌐
9.90508 ⌐
0.12365 ⌐
8.07851

$\delta - \delta'$		41	11.7 ⌐
δ	-7	00	44.6 ⌐
Eph δ	-7	00	38.7 ⌐
O-C			- 6.2 ⌐
Cur. Corr			+ 1.3
2nd O. Ref.			+ 0.1
Ir Corr			+ 0.1
δ	-7	00	33.7
O-C			- 6.0

α	11	55'	08.49 ⌐
Eph α	11	55	07.69 ⌐
O-C			+ 0.80 ⌐
			+ 0.02
			- 0.02
α	11	55	08.47

Part 0.78

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10718 Lunar parallax 20

λ'	11	5°8	29.25″
β	19	27	09.7 ″
$\delta - \delta'$	2	30	90.15″
	2π	40	2.25″
$\rho(1+k)$		13	1.76
Δ		37	27	0.99

9.95727
0.000000
0.100294
0.057521

δ	-9	91	56.0
π	57'	30.45″	

9.869913
8.223387
9.786107
0.001077
7779.68″

$\lambda - \lambda'$ 26 09.53
= + 1 17.27″

λ	18	96	57.6″
δ	-9	91	56.0″
$\lambda - \delta$	53	28	536″

9.826790
8.223387
9.905087
0.123655
8.078151

$\delta - \delta'$		91	11.9″
δ	-9	00	796″
Cpt δ	-9	00	38.9″
O-C			-6.2″

λ	11	5°5	08.99″
Cpt λ	11	5°5	07.69″
O-C			+0.80″

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10716 x Star Measures.

	d	r	d	γ
1	19153	19948	19362	~~19867~~
12.6	13456	15644	14272	14935
11.5	50	46	72	35
	52	52	58	60
	12.5699	12.5695	11.5088	11.5074
2	19872	19060	18150	20296
20.6	13840	15088	18000	10752
5.7	70	86	992	48
	68	62	60	320
	20.6030	20.6026	5.0154	5.0130
				20278
3	19860	20270	20422	13238
27.6	14012	16120	17462	36
26.7	12	20	64	82
	64	68	42	26295
	27.5850	27.5852	26.2965	
4	19960	19722	19687	20160
29.8	11684	17999	16610	13222
17.7	86	98	07	22
	70	22	98	76
	29.8283	29.8274	17.3081	17.3051

Moon Measures

1			18920	20426
21.0			18759	10560
13.1			51	68
			30	16
			13.0165	13.0178
			Remeasured	
2	19618 O.K	19388 O.K	18018	
20.3	16508	12320	17907	
19	02	22	12	
	20	92	20	
	20.3117	20.3130	20.3110	

Poor image

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16716 x Star Measures

	d	r	d	γ
1	19153	19948	19362	19862
12.6	13456	12699	14272	14935
11.5	50	96	72	35
	52	52	58	60
	12.56 99	12,56 90	11.50 88	11.50 74
2	19872	19060	18150	20296
20.6	13840	12088	18900	10952
5 +	90	86	992	98
	68	62	68	320
	20.60 30	20.60 26	5.01 59	5.01 30
				20278
3	19860	20270	20422	13235
27.6	17012	16120	17962	36
26.9	12	20	64	82
	69	68	92	26295
	27.58 50	27.58 52	26296	
4	19960	19722	19689	20760
27.8	11689	17999	16610	13222
17.9	86	78	04	22
	70	22	98	76
	29.82 83	29.82 79	17.30 81	17.30 51

Moon Measures

1 2			18920	20926
24.0			13759	10560
13.1			51	68
			30	16
			13.01 65	13.01 78
2	19618	19388	18018	
1.3	16508	12320	17907	
9	02	22	12	
	20	92	20	
	20.31 19	20.31 30	20.31 10	

Remeasured

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10716 Moon Measures

3	19658	19360
20.2	17498	11552
14.5	98	54
" X	60	70
	20.2211	20.2185

4	19682	20336
20.3	16988	12992
15	88	13000
	88	42
	20.2696	20.2656

5	19678	18900	19366	19408
21.0	18290	9700	18032	10682
16.2	300	698	586	72
	32	40	188	18
	1324	16.1263	16.1320	

6		18288	18702
12.0		13222	13748
16.5		12	60
		98	772
		16.5076	16.5040

7		18133	18712
22.2		12992	13860
16.6		88	56
		50	30
		16.5113	16.5137

8	19744	19708	20176	19640
22.7	12188	17268	16990	13860
16.3	78	70	010	42
52	50	719	90	70
	22.7566	22.7560	16.4172	16.4193

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10716 Moon Measures 22

	19658	19360
20.2	17498	11552
19.5	98	54
- X	60	70
	20.2211	20.2185

4	19682	20336
20.3	16988	12992
15	98	13000
	88	92
	20.2696	20.2656

5	19638	18900	19366	19408
21.0	18290	9700	18032	10682
16.2	300	698	596	72
	32	90	188	18
	1324	16.1263	16.1320	

6		
22.0		
16.5		
	19288	19072
	13222	13769
	12	60
	98	772
	16.5076	16.5044

7	18133	18772
22.2	12992	13864
16.6	88	72.6
	50	30
	16.5113	16.5137

8	19749	19708
22.7	12188	17268
16.3	78	70
SC	50	714
	22.7566	22.7560

	20176	19670
	16010	13860
	010	72
	90	70
	16.9172	16.9119

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Cur. Corr

ξ	η	Δξ	−2.63	−.24	+3
−9.85	−6.64	−33	+26 =	−7 + 1	= −6
−1.42	−13.47	− 6	+ 4 =	−2 + 3	= +1
+5.92	+ 8.89	+17	−13 =	+2 − 2	= 0
+8.28	− 0.55	+14	−22 =	− 8 + 0	= −8
M =	+.12	− 1	? (− 1)		= +1 +3
			+ 1		= 0
		Δη	−3.73	+4	
		−23	+23 =	+2	
		−60	+50 =	−10	
		+24	−33 =	−9	
		− 1	+ 2 =	+1	
		M =	−3.93 +13	= +17	
				= +0.8	

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Apr. 15

Exp. to Stars	17	27			17	36	
" " Moon	17	29	41.6		17	29	41.8
Clock fast		5	37.3				
H. Sid Time	17	24	04.4	δ - α = +2h 29			
H. Long	4	44	31.05				
G. Sid T.	19	08	35.45				
Sid T. M. Noon	1	33	17.79				
Interval	17	35	20.96				
Reduction		2	52.89				
G. M. T.	17	32	28.07				

From Naut Alm.		R. A.		Dec.	
Moon 17h	11	54	02.53	- 3 52	35.9
Motion in 1m			2.0070	- 8 -	25.4
" " 32.4678		1	05.16		11.862
Tabular Place	11	55	07.69	- 4 00	38.4

Moon's age 13.3

Parallax	57'	30.15
Semid.	15	41.7
R.		9417
Aug		8.6
Sun (3)		-0.3
R		9500
R		20367
a R		- 976
(1+a) R		19388
R'		37589

934 8.45 +

a -503.1
+24
-479.1

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1916phae.proj.20

Cyg Nw 1612 - Mag 5.8

11 45 55.55
55.59
55.51
11 45 55.50
+49.03
11 46 49.53
11 31 52.0
- 5 07.53
- 307.52
2.987733 n
9.999893
0.999390 n

9.99982
- 33
12.17735
12.36987
+.9222

-9 46 37.75
38.0
38.2
-9 46 38.0
-5 20.2
-9 31 55.2
9 00 21.0
-31 37.2
-30979
3.991000 n
0.822135 n

8.9302 n
1.9868
9.97098 n

6.6397
-0.0093
11.3310
1.3081
+1.3771

Cyg Nw 1996 - Mag 9

11 50 18.68

99.06
11 31 07.74
11 31 52.0
-00 00 44.26
-44.26
1.646601 n
9999781
0.131106 n

-1.41604
-6
20.38319
20.60028
+.199

-5 39 42.8

-5 20.56
-5 45 03.8
-9 00 21.0
-1 44 42.7
-6284.7
3.798327 n
1.129942 n

9.0031 n
0.30211
6.35886 n

-13.9716
-0.00002
9.52821
5.01992
+.9860

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Apr 15

Eqp to Stars	19	27		19	36	
" " Moon	19	29	91.6"	19	29	91.8
Clock fast		5	37.3			
H. Sid Time	19	29	09.7	$\delta - \alpha$:	+2h	29
H. Long	7	57	31.05			
G. Sid T	19	08	35.75			
Sid T M. Moon	1	33	17.99			
Interval	17	35	20.76			
Reduction		2	32.89			
G. M. T.	17	32	28.07			

From Naut Alm.		R. A		Dec	
Moon 17h	11	59	02.53	- 3	52 33.9
Motion in 1m			2.0070		- 8 - 23
" " 32.9678		1	05.16		11.862
Tabular Place	11	55	07.69	- 9	00 38.7

Moons age 13.3

Parallax	57'	30.15
Semid	15	91.7
R.		9917
Aug		8.6
Sm		-03
R		9500
R		2.0369
a R		- 776
(1+a)R		1,9388
R =		37589

934 3.95

a -503.1
+29
-479.1

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1916phae.proj.20

Cape No 1612 - Mag 5.9

11 x5 55.x5
55.54
55.51
11 x5 55.50
+49.05
11 x6 xx.55
11 51 52.0
- 5 07.x5
- 307.x2
2.48773 n
9.99843
0.99340 n

-9.8492
-33
12.1475
12.5697
+.7222

-7 x6 37.75
38.0
38.2
-7 46 38.0
-5 20.2
-7 51 58.2
-7 00 21.0
-51 37.2
-3097.x
3.79100 n
0.82213 n

8.9302 n
1.9868
7.9704 n

-6.6397
-0.0093
11.3510
11.5081
+.1571

@ 9. Mw x x x 6 - Mag 9

11 50 18.68

99.06
11 51 07.7x
11 51 52.0
- 00 00 x x.26
-x x.26
1.6x601 n
999781
0.151106 n

-1.4160
-6
20.5834
20.6028
+.194

-5 39 x2.8

-5 20.56
-5 x5 03.x
-7 00 21.0
-1 9x x2.x
-628x.x
3.798.27 n
1.12942 n

9.0031 n
0.3021
6.3586 n

-13.7716
-0.0002
4.5281
5.0172
+.7860

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1916 Standard Coordinates. 27

Cape No. 1625 - mg 7.7

c	11	57	07.29
1			7.32
2			7.28
Mean	11	57	07.30
Prec			49.13
α	11	57	56.43
A	11	51	52.00
α-A	+	3	04.43
sin(α-A)		+	184.82
log	2.265781		
log	9.999946		
log	0.772551		
	+59226		
	+17		
	27.92743		
	27.58571		
	-.33922		

Cape No. 1628 - mg 8.5 -

	11	55	20.92
a.g.	11	55	21.03
	11	55	20.97
			89.13
	11	56	10.10
	11	51	52.0
	+	4	18.10
		+	258.08
	2.411766		
	9.999890		
	0.911790		
	+8.27755		
	+19		
	30.27889		
	29.82278		
	-.45611		

c	-2.	45	55.7	
1			55.6	
2			56.0	
Mean	-2	45	55.8	
Prec			-5 20.6	
δ	-2	51	16.8	
D	-7	00	21.0	
δ-D	+1	09	07.6	
sin(δ-D)			+71 735.2	
log	3.617578			
log	0.947869			
	8.69778 h			
	1.54350			
	7.29762 h			
	+8.88556			
	-.00020			
	26.88836			
	26.29960			
y-M	-.58876			

using cape above

	-3	59	16.8	
a.g.			18.5	
	-3	59	15.7	-3 59 16.8
		-5	20.7	-5 20.7
	-7	04	36.7	-7 04 37.5
	-7	00	21.0	
		-7	15.7	-7 16.5
			-25 57.7	-25 6.5
	2.480722 n			2.480909
	9.738377 n			9.780278
	8.88529 h			
	1.83358			
	7.77217 h			
	-0.57475			-0.57498
	-0.00355			-.00355
	17.77470			17.77477
	17.30660			17.30616
	-.14041			-.13861

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1916 Standard Coordinates.

Cape No 1625 · Mg 7.7

c	11	57	07.29
1			7.32
c			7.28
Mean	11	57	07.30
Rec			99.13
x	11	57	56.93
A	11	51	52.00
x-A	+	3	07.73
cos(x-A)		+1	89.92
Log		2.26	381
Cos δ		9.99	996
Log ρ		0.77	251
Log		+3.92	26
		+17	
ξ		27.92	43
η		27.38	51
x-ξ		-.33	92

Cape No 1628 · Mg 5.5

	11	55	20.92
a.g.	11	55	21.03
	11	55	20.97
Rec			99.13
	11	56	10.10
	11	51	52.0
	+	4	18.10
		+2	38.05
		2.41	176
		7.99	890
		0.91	790
		+8.27	75
		+19	
		30.27	89
		29.82	78
		-.75	18

c	-2	45	55.7
1			55.6
c			56.0
Mean	-2	45	55.8
Rec		-5	20.6
δ	-2	51	16.7
D	-7	00	21.0
δ-D	+1	09	04.6
Log(δ-D)		+4.19	55.2
Log		3.61	737
Log ρ		0.99	869
Log a		8.69	785
Log c		1.35	50
η		7.29	62
η₀	+8	88	56
η₁	-0	00	20
η	26	88	36
η	26	29	60
η-η	-	58	76

a.g. -3 59 16.8 — Mean of Cape alone

	-3	59	19.5
	-3	59	15.9
		-5	20.7
	-7	04	36.7
	-7	00	21.0
		-4	15.7
		-25	57
Log		2.90	722
Log		9.73	837
Log a		8.85	329
Log c		1.35	38
η		7.14	21
η₀	+8	88	56
η₁	-0	00	20
η	26	88	36
η	26	29	60
η-η	-	58	76

	Cape alone	
	-3 59 16.8	-3 59 16.8
	-5 20.7	-5 20.7
	-7 04 36.7	-7 04 37.
	-7 00 21.0	
	-4 15.7	-4 16.
	-25 57	-25 6.5
Log	2.90722	2.90909
Log	9.73837	9.79027
	-0.5475	-0.5498
	-0.0035	-.0035
	17.9970	17.9947
	17.3066	17.3066
	-.1904	-.1381

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10716 Plate Center 25

	x	y	α	δ
	12.5694	11.5081	11 46 44.55	−7 51 58.2
	20.6028	5.0182		
	27.5851	26.2960		
	29.8278	17.3066	11 56 10.10	−8 09 36.7
2)	12.3975	28.8147	22 102 57.65	−8 55 94.6
	21.1987	17.4073	11 51 27.32	−7 28 17.3
	22	18	+278	+27 56
	+0.8013	+3.5927	11 51 52.12	−8 00 21.3
	31.5	466.5		
	27.8	27 56.		

x−3	+500x	+2.75y	+5.1x	−10608
+7222	+6285	= +10507 + 32	= +10539 + 64	= 10603 = −5
+194	+10301	= 10495 + 14	= 10509 + 105	= 10614 +6
−3392	+13793	= 10401 + 72	= 10473 + 191	= 14 +6
−4511	+14914	= 10403 + 98	= 10501 + 152	= 03 −5
22.1605	+11080	+90	+113	22.2230

y−η	+500y	+1.8x	+3.9y	−7908
+1571	+5754	= +7325 + 23	= +7348 + 45	= +7393 −15
+4860	+2507	= 7367 + 37	= 7404 + 20	= 7424 +16
−3876	+13178	= 7272 + 50	= 7322 + 102	= 7424 +16
−1704	+8653	= 7272 + 57	= 7326 + 67	= 7393 −15
18.5730	+7286	+90	+57	18.5705

Tables. a = 0 e = −2.6 a−e = +2.6 b+d = −3.

Obs. = −505.1 = −503.9 = −1.2 = −4.6

= −1.6

O−C −505.1 −501.3

trouble with the use of standard coordinates
likely on 3rd star - checked everything

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10716 Plate Centers. 25

x	y	x	δ
12.5697	11.5071	11 46 47.33	-7 51 38.2
20.6024	5.0192		
21.5851	26.2960		
29.9217	17.3066	11 56 10.10	-7 09 36.7
12.2725	28.8147	22 102 51.65	-8 35 99.6
21.1747	17.7073	11 51 27.32	-7 28 17.3
22	17	278	+31 56
-0.8013	+35921	11 51 54.15	-8 00 21.3
31.5	166.5		
29.5	21 56.		

V-3 +3224 +2.754 +5.14 -10608

+9222 +6225 = +10307 +32 = +10339 +64 = 10603 = -5
+199 +10361 = 10725 +19 = 10744 +102 = 10847 +6
-3392 +13773 = 10401 +72 = 10473 +191 = 19 +6
-9311 +11914 = 10603 +98 = 10731 +102 = 03 -5
22.1605 +11050 +90 +113 22.2230

Y-7 +3224 +1.85x +3.94 -7908

+1371 +3757 = +7325 +23 = +7348 +95 = +7353 -13
+9760 +2307 = 7367 +37 = 7404 +20 = 7424 +16
-3776 +13173 = 7272 +90 = 7362 +102 = 7464 +16
-1709 +2603 = 7272 +37 = 7326 +67 = 7393 -15
19.5730 +7286 +90 +37 19.7106

Tables. a=0 e= a-e= b+d=-3
Obs. =-363.1 =-363.9 =-1.2 =-9.6

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10716 Wm Morris Center

	x	x-x₀	Δx	(x-x₀)²	(x-x₀)²+(y-y₀)²	G-C
1	21,0000	-1,1610	-4	1,3488	3,7724	+69
2	20,3122	-1,8488	-1 W/4	3,4184	3,7758	-194
3	-20,2198	-1,9412	0	3,7683	3,7683	+28
4	20,2676	-1,8934	+1	3,5853	3,7686	+31
5	21,0000	-1,1610	+4	1,3488	3,7776	+91
6	22,0000	-0,1610	+5	0,0260	3,7675	+20
7	22,1610	0,0000	+5	0,0000	3,7748	+9.3
8	22,7563	+0,5953	+4	0,3548	3,7651	-7

R = 3,7655

	y	y-y₀	Δy	(y-y₀)²	∠	
1	13,0156	-1,5564	-4	2,4236	217°	
2	14,0000	-0,5720	-2 W/4	0,3274	253°	
3	14,5720	0,0000	0	0,0000	270°	
4	15,0000	+0,4280	+1	0,1833	283°	
5	16,1291	+1,5571	+4	2,4258	323°	
6	16,5058	+1,9338	+5	3,7415	355°	
7	16,5144	+1,9424	+5	3,7748	360°	
8	16,7182	+2,1462	+5	4,6103	18°	161°

Approx. Center

x = 21 y = 13,0156
16,1291
29,1447
y_0 14,5723
y_{max} 16,5147
R 1,9721
x_{max} 20,2198
x_0 22,1608

Wm Morris Center { x_0 22,1610 :
y_0 14,5720

Δ: +2,5
δ: +2,7

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10716 Moore's Center

	x	x − x₀	Δx	(x − x₀)²	(x − x₀)² + (y − y₀)²	G	C
1	21.0000	−1.1610	−9	1.3488	3.7729		+69
2	20.3122	−1.8488	−1	3.4189	3.7438		−197
3	20.2198	−1.9412	0	3.7683	3.7683		+28
4	20.2676	−1.8934	+1	3.5850	3.7686		+31
5	21.0000	−1.1610	+9	1.3488	3.7796		+91
6	22.0000	−0.1610	+3	0.0260	3.7675		+20
7	22.1610	0.0000	+3	0.0000	3.7748		+93
8	22.7563	+0.5953	+9	0.3598	3.7651		−9

R = 3.7653

	y	y − y₀	Δy	(y − y₀)²	←
1	13.0156	−3.5564	−9	2.9236	217
2	19.0000	−0.5720	−2	0.3279	253
3	17.5720	0.0000	0	0.0000	270
4	15.0000	+0.2280	+1	0.1833	283
5	16.1291	+1.5571	+9	2.9258	323
6	16.5058	+1.9338	+3	3.7913	353
7	16.5199	+1.9479	+3	3.7995	360
8	16.9182	+1.8962	+3	3.9103	18

1610

Approx. Center

x = 21 y = 13.0156
16.1291
29.1777

y_0 19.5723

y_{may} 16.5199

R 1.9721

x_{bun} 20.2198

x_0 22.1608

Moore's Center $\begin{cases} x_0 & 22.1610 \\ y_0 & 19.5720 \end{cases}$

A +2.5

B +2.7

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Formation of Normals.

1	+ 1.80	− 80.0	− 107.0
2	+ 0.52	+ 182.0	+ 56.0
3	0.00	− 57.5	0.00
4	− 0.81	− 58.5	+ 13.5
5	− 1.81	− 105.5	+ 142.0
6	− 0.31	− 3.0	+ 38.5
7	0.0	0.0	+ 180.5
8	+ 1.11	− 25.	− 7.5
	+ 3.43	+ 182.0	+ 490.5
	− 2.93	− 30.8	− 114.5
	+ 0.50	− 127.2	+ 376.0

	a	b	c +16	new c
a +10	− 12	+ 9	+13 v	+ 99
b − 6	− 18	+ 3	+ 1 v	− 205
c +16	− 19	0	− 3 v	+ 8
	− 19	− 3	− 6 v	− 4
	− 12	− 9	− 5 v	+ 43
	− 2	− 12	+ 2 v	− 17
	0	− 12	+ 8 v	+ 60
	+ 6	− 11	+ 11 v	− 23 v

.071

+0.50 + 16.12 = +5.59 Δ

+[3] + .02 = −0.31 Δ

+16.40 = +5.90 Δ

+12.14 + 0.50 = −7.56 Δ

= −7.56 Δ − 0.18 = − 7.74

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1916 Conditional Equations

1	-1.16	-1.55	= +69	+13	-30	= -17	+86		
2	-1.85	-0.57	= -197	+20	-11	= +9	-206	¼W	
3	-1.99	0.00	= +28	+21	0	= +21	+7		
4	-1.89	+0.43	= +31	+21	+8	= +29	+2		
5	-1.16	+1.56	= +91	+13	+30	= +43	+48		
6	-0.16	+1.93	= +20	+2	+37	= +39	-19		
7	0.00	+1.94	= +93	0	+37	= +37	+56		
8	+0.60	+1.85	= -7	-6	+36	= +30	-37		
						+199	-156		

12.19 + 0.50 = -122.0 − 7.56 Δ

+ 5.59 Δ

+0.50 + 16.12 = +316.0

+[ ] + 102 = -5.1 + 0.37 Δ

+16.10 = +310.9 t = + 19.3

12.14 = -122.0 - 9.6 = -131.6 r = - 10.8

- 0.67 Δ

Arc Measured 161°

$\frac{P}{n} = .20$ $\frac{\Sigma M}{n} = +5.4$

Im 3 R 1.94 $\frac{+5.4}{20} = +27.0$ Δ R = +0.3

-2RC = +0.78 Corr = -0.2

Δ b = +0.29 Δ d = +0.1 Δ R +0.5

Δ a = -0.50 Δ q = -0.02

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10716 Conditional Equations 27

1	-1.16	-1.55	= +69	+13	- 30	= -17	+86		
2	-1.85	-0.57	= -197	+20	- 11	= +9	-206	1/4	
3	1.99	0.00	= +28	+21	0	= +21	+7		
4	-1.89	+0.93	= +31	+21	+8	= +29	+2		
5	-1.16	+1.56	= +91	+13	+30	= +43	+48		
6	-0.16	+1.93	= +20	+2	+37	= +39	+19		
7	0.00	+1.97	= +93	0	+37	= +37	+56		
8	+0.60	+1.85	= -9	-6	+36	= +30	-39		

9

12.19 + 0.50 = -122.0

+0.50 + 16.12 = +316.0

+[ ] + .02 = -5.1

+16.10 = +310.9 t = +19.3

12.19 = -122.0 - 9.6 = -131.6 s = -10.8

+5.4

$\frac{+5.4}{+20}$ = +27.0 ΔR = +0.3

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10716 Moon's Mean Position.

x_0 22.1610
− 5
22.1605

y_0 17.5720
+10
17.5730

From Plate Constants

x 22.2230

ξ +0.2230

y 17.5705

η −3.4295

log ξ 9.34830
cos δ 9.99869
8.51724
0.84237

log tan δ 8.88778 n
ξ² 8.69666
7.05339
9.63778 n

α−A 26.97

A 11 51 52.00

α_0 11 51 58.97

Red +2.77

α' 11 52 01.74

η₁ −.0000

log η₀ 0.53523
7.33115
3.20706 1579.8

δ−D −26 39.8

D −4 00 21.0

δ_0 −4 27 00.8

Red −18.9

δ' −4 27 19.7

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10716 Morris Mean Position 28

x_0 22.1610
- 5
22.1605

y_0 17.5720
+10
17.5730

From Plate Constants

x 22.2230

y 17.5706

ξ +0.2230

η -3.9275

log +9.39783
cos 9.99469
8.39252
9.84237

log tan 8.88715
z 8.6966
70539
9.6378

H .0000

log h 0.53523
7.33115
3.20706 1611.8

x-A 26.97

A 11 51 52.00

x_0 11 51 58.97

Red +2.77

x 11 52 01.74

δ-D -24 39.8

D -1 00 21.0

$δ_0$ -1 27 00.8

Red -18.1

δ -1 27 19.7

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10 7/6 Reduction To Apparent Place 29

H+α 4 00.9 60° 13.5' δ -4 27

H 16 8.4

α 11 52.5'

G 22 11.5'

G+α 10 04.0 15' 0.0

Log Cos δ 9.9987

i -8 6.5 0 n

(i) 0.8637 n

Log Cos (G+α) 9.9418 n

g 1.0926

Sin " 9.6856

tan δ 8.8911 n

8.8239

Log Sin δ -8.8898 n

Cos (H+N) 9.6960

h 1.2813

Sin (H+α) 9.9385'

Sec δ 0.0013

8.8239

Log g' 1.0344 n

g 8.4932 n

Log h' 9.8671 n

h 0.0460

f +1.694

g -0.031

h +1.109

+2.772'

g' -10.825'

h' -0.736

i -7.387

-18.868

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10 7 16 Reduction to Apparent Place 27

H + x 9 00.9 60° 13.5' δ -7 27
H 16 8.9
x 11 3'2.5'
G 22 11.5'
G + x 10 09.0 15° 0.0

log cos δ 9.9987
z -.3630 n
(A) 0.8637 n

log cos (G+x) 9.9918 n
g 1.0926
sin " 9.6836
tan δ 8.3911 n
8.8239

log sin δ -8.8898 n
cos (H+x) 9.9960
h 1.2813
sin (H+x) 9.1358
δ-δ' 0.0013
8.8239

log g' 1.0399 n
g 8.9932 n

log h' 9.8671 n
h 0.0430

f + 1.697
g -0.031
h + 1.107
+2.775

g' -10.825
h' -0.736
i -7.307
-18.868

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10716 Lunar Parallax

α'	11	52	01.77
ϕ	13	27	00.8
$\phi - \alpha'$	1	31	58.7
	22	59	40.5
$\frac{1}{2}(\phi+\alpha')$		8	19.3
	22	51	21.2

π	57 28.3
	9.869913
	8.223316
	9.591478
	0.000084
	7.685301

	9.957127		
	0.000000		
	0.003551		
	9.992778		
$\phi - \alpha'$		16	38.70
		+ 1	6.58

γ	87	31	25.7
$\delta - \phi$	27		19.7
$\gamma - \delta$	48	58	45.1

	9.826900
	8.223316
	9.877684
	0.135715
	8.081365

$\delta - \delta'$		41	27.6
δ	-3	45	52.1
Eph δ	-3	45	48.1
O - C			-7.0
Curv. Corr			+0.8
2nd O. Ref			+0.1
In Corr			+0.1
δ	-3	45	51.9
O - Plate corr			-3.8

not in agreement
Par Image

α	11	53	08.32
Eph α	11	53	07.52
O - C			+0.80
			+.00
			-0.02
α	11	53	08.30
			+0.78

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10716 Lunar Parallax 30

λ'	11	52	01.78"
φ	13	29	00.9"
$\alpha - \lambda'$	1	31	58.7"
	22	59	40.5"
$\frac{1}{2}(\beta+\lambda')$		8	19.3"
π	22	51	21.2"

π	57	28.3"	
9.946913			
8.223316"			
9.591178"			
0.000097"			
7.683501			

9.993727"
0.000000
9.035511"
9.971238"

$\lambda - \lambda'$ 16 38.70"

: 1 6.58"

λ 27 31 25.7"

$\lambda - \odot$ 27 19.7"

$\lambda - \lambda$ 78 58 95.6"

9.826900"
8.223316"
9.876768"
0.015715"
8.078125

$\lambda - \lambda'$ 91 27.6

$\lambda - \lambda$ 95 52.1

Eph $\lambda - \lambda$ 95 78.1"

λ	11	53	08.32"
Eph λ	11	53	07.52"

$\theta - C$ -9.0

Curv Corr +0.8

2nd O. Ref +0.1

$\theta - C$: +0.88
+.00

Plate constants not in agreement

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+4222	+6285	10507 + 63 = 10570	+ 57 =
+ 197	+ 10301	10495 + 103 = 10598	+ 25 =
- 3392	+ 13793	10401 + 138 = 10539	+ 131 =
-7514	+ 14914	~~10398~~ 10403 + 149 = 10547	+ 87 =

10627 - 34	=	10593 + 7 = 10608	+ 7 =
10623 - 15	=	10608 + 12 = 10620	+ 3 =
10670 - 79	=	10591 + 16 = 10607	+ 16 =
10634 - 51	=	10583 + 18 = 10601	+ 10 =

10607 - 2	=	5′	10
10623 - 4	=	19	16
10623 - 5	=	18	
10611 - 6	=	3′	19
			19
			21

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40,16' + 378,1' = 1965'7 = 20908

5'0,43' + 2123,2 = 1963'9 = 20898

+ 10,27 - 15',29 = + 170- = +92

+ E]+ 11,55' = - 89,5'' = - 63,3

+27,09 = - 79,5'' = - 105',3

7 = - 82,76 = - 3,9 -

29,09 +27,09 = -198 = - 178

+79,8 +105',7

28c/34 29,09 : -123,2 = -92,3

x = - 31,1 = - 1,76

240 / 10',1 = 24

+ 48

+ 39

9 / 9'+1,4

916

540

3600

3600 / 2640 / 4214 / 6282,4

2460 / 45,2 / 2505,2

3060 / 37,2 / 3097,2

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12.57 + 11.01 = 10507 = 7325

20.60 + 5.01 = 10495 = 736.7

27.58 + 26.30 = 10901 = 7272

29.83 + 17.31 = 10903 = 7272 changed this

33.37 + 16.52 = 21002 = 14692

57.71 93.61 = 20804 = 14579

24.04 + 27.09 = - 19.8 - 148

24.04 = -198 + 74.5 = -148 + 91.6 = 115.8

= -123.5 = -32.2

x = - 5.13 = - 1.34

40.15 + 37.81 = 20908 = 14597

50.43 + 22.32 = 20898 = 14639

+10.28 - 15.49 = - 10 = + 92

+[ ] + 11.58 = - 84.6 = - 73.4

0 + 27.07 = - 74.6 = - 115.7

y = - 2.75 = - 3.39 4.27

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