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KG
11366
v.1915

CLXIII
163
11523
11571
11571

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17523 Star Measures 1

	1	2	3	4
	20092	20032	20650	20108
11.4	16240	13779	17210	73546
12.1	38	76	12	88
	89	32	80	10
	11.37552	11.37443	12.34452	12.34438
	2			
	20408	18786	19752	20370
18.8	13060	16138	18008	12122
25.2	62	42	02	28
	17	92	72	88
	18.73552	18.73552	25.17479	25.17439
	3			
	20136	19432	19542	19017
31.2	18040	11536	19502	19046
24+	32	30	02	47
	40	24		
	31.21101	31.21072	24.00470	24.00332

Moon Measures

1		18728	19370
24		17363	10732
14.2		70	22
		42	77
		14.13603	14.13539
2		18748	20326
23.7		17426	11668
14.2		28	52
-7		62	46
		14.13211	14.13176
3		19762	20171
23		16626	13320
14.4		32	20
		84	80
		14.31170	14.31172

Their first good

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Star Measures

7	19572	20022	20226	17658
52	18766	17138	12889	17002
11	70	38	98	6798
	80	26	26.	98
	25.0809	25.0812	17350	17796

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1916phae.proj.2

11323 *

Star Measures.

	d								
1/	20092		20032		20650		20708		
11.4	16340		13779		17210		13596		
12.1	38		76		12		98		
	89		32		80		10		
	11.3752		11.3743		12.3492		12.3438		
2/	20408		18786		19752		20392		
18.8	13060		16138		18008		12122		
25.2	62		92		02		28		
	19		92		72		88		
	18.7352		18.7352		25.1799		25.1739		
3/	20136		19432		19542		19039		
31.2	18040		11536		19002		14096		
29+	32		30		02		99		
	40		29						
	31.21101	31.21072	29.0090		29.0032				

Moon Measures.

1/	18728		19370	
29	17363		10732	
19.2	70		22	
	92		79	
	19.1363		19.1353	
2/	18748		20326	
23.7	17426		11668	
19.2	28		52	
-7	62		96	
	19.1321		19.1315	
3/	19762		20171	
23	16626		13320	
19.4	32		30	
	84		80	
	19.3140		19.3182	

Use regular for these two parts

Interdermining below

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Star Measures

7	19572	20322	20226	17658
52	18766	17138	12889	17002
11	70	38	98	4198
	80	26	26.	98
	25.0809	25.0812	47350	47996

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11323 *

Star Measures.

1/	20042	20032	20650	20708
11.4	16340	13779	17210	13596
12.1	38	76	12	78
	84	32	60	10
	11.37562	11.37493	12.34942	12.34838
2/	20408	18786	19752	20392
18.8	13060	16138	18008	12122
25.2	62	72	02	28
	19	72	72	88
	18.73552	18.73552	25.17994	25.17394
3/	20136	19432	19542	19039
31.2	18040	11536	19002	19046
24+	32	30	02	99
	40	29		
	31.21101	31.21072	24.00490	24.00392

Moon Measures.

1/	18728	19370	
24	17363	10732	
19.2	70	22	
	42	78	
	19.13663	19.13532	
2/	18748	20326	
23.7	17426	11668	
19.2	28	52	
-7	62	46	
	19.13214	19.13152	
3/	19762	20171	
23	16626	13320	
19.4	32	20	
	84	80	
	19.31490	19.31182	

Use negative for these two points

I.E. determined below

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Star Measures.

9	19572	20322	20296	19658
25.2	18766	17138	12889	17002
97	70	38	78	6998
	80	26	26	78
	25.0804	25.0812	4.7980	4.7376

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Moon Measures

	x		y	
	d		d	
4	19866		20516	
22.2	17994		12390	
15	94		98	
	68		28	
	22.18 72		22.18 68	
5	19418		20128	
21.8	10896		17657	
16	96		54	
	28		49	
	21.85 30		21.85 14	
6	19424		19740	
21.8	10950		18238	
14.1	92		28	
–	34		50	
	21.84 86		21.84 88	
7	20418		19920	
22.1	19882		10448	
17	82		40	
	28		24	
	22.05 26		22.05 20	
8			20542	16248
23			19300	15460
17.9			82	52
			57	60
			17.92 53	17.92 12

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Moon Measures

	α		δ		γ		2
7	19866		20516				
22.2	17999		12390				
15	94		98				
	68		28				
	22.18772		22.18868				
5	19418		19128				
21.8	10896		17639				
16	76		39				
	28		79				
	21.85330		21.85319				
6	19429		19790				
21.8	10950		18232				
16.1	92		28				
–	39		50				
	21.84986		21.84988				
7	20418		19920				
22.1	19882		10448				
17	82		90				
	28		29				
	22.05326		22.05320				
8					20592		16299
23					19300		15960
17.9					82		52
					59		60
					17.92353		17.92212

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1915 2 3 Hinnes Etc 3.

Nov. 3

Exp. to Stars	22	57		23	06	
" Moon	23	00	16.3ˢ	23	00	16.5ˢ
Clock fast		11	02.2ˢ			
M. Sid Time	22	49	14.2ˢ			
M. Long	4	44	31.03ˢ			
G. Sid T.	27	33	45.25ˢ			
Sid T. M. N.	14	49	38.73ˢ			
Interval	12	44	06.52ˢ			
Reduction		2	01.18ˢ			
G. M. T.	12	42	1.34ˢ			

$\alpha - 9 = +0^h\ 53^m$

From Nautical Alm.

			R. a		Dec.	
Moon	24	21	53ᵐ	13.73ˢ	− 9 35′	13.6″
Variation in 1ʰ				2.1600ˢ		+ 14.30″
	42.02	23	1	30.77	1/0	01.1
Tabular Place	21	56	44.50ˢ		− 9 25′	12.5″

Moon's Age 8 days.

Reduction	58 − 57.75ˢ
Diameter	16 7.8″
P.	9678″
Par.	10.0″
Eq. (6)	− 1.1″
P	9737″
P	2.0872″
Alt	− 1996″
(1+q) P	1.9876″
P″	3.9505″

9.34 = 9.34′

$\alpha - 501.4'$
$+ 23.7$
$- 477.7$

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1916phae..proj.2

11-23 Sunrise Etc 3.
Nov. 3

Eyp. to Stars	22	59		23	06	
" " Moon	23	00	16.3"	23	00	16.5"
Clockfast		11	02.2"			
H Sid Time	22	47	14.2"	$\phi - \chi = +0^h\ 5'\ 3^m$		
H Long	9	44	31.05"			
G Sid T	27	33	45.25"			
Sid T M N	19	49	38.13"			
Interval	12	49	06.52"			
Reduction		2	3.18"			
G.M.T.	12	47	1.37"			

From Naut Alm.			R. a		Dec.	
Moon	12h	21	5'5"	13.73"	-9 35'	13.6"
Motion in 1h				2.1600"		+19.07"
" " 12.0223		1	30.77		+10	11.1
Tabular Place	21	56	44.50"	-9	25	42.5"

Moons Age 8 days.

Phase	5'8	5'4.75"
Semid	16	7.8"
R.		9647.8"
Aug		10.0"
Par		-1.1"
R		9737"
R		20372"
aR		-19962"
(1+q)R		19878"
M		37505"

9 34 = 7.34'

a = - 5014'
+ 234
- 4777.4

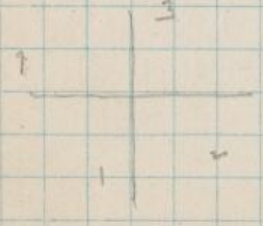
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Curv. Corr.:

ξ	η	Δζ	− 3.7ζ	− 2
+3.53	−18.07	+19	− 13	= +6
−10.85	− 6.07	−21	+ 20	= −1
− 3.11	+ 7.81	− 5	+ 12	= +7
+ 9.99	+ 6.19	+33	− 37	= −4
M = +2.2	−2.1	0	− 8	= −10 = −0.03

	Δη	− 3.9η		+.1ζ	+ 9
	− 72	+ 55	= −17	+ 0	= −17
	− 23	+ 24	= +1	− 1	= 0
	+ 12	− 29	= −17	− 0	= −17
	+ 22	− 29	= − 2	+ 1	= −1
	0	+8		0	= +17
					= +0.8



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1523 Plate Center & Constants

x	y	x	s	
11,377	12,394	2149 066	-10 42	27.6
18,735	25,1747	21 53 12.0	8 57	53.3
31,2104	27.0036	22 0 7.6	9 7	24.0
3)61,3203	61,5220	64 102 232	27 106	104.9
20.44	20.507	21 54 7.7	-9 35	34.9+
22.	18	+484	-19	30.9
+1.56	-2507	21 54 55.8	-9 55	25.8
3K	466.5			

Center {A 21 54 50
B -9 55 30

25,0808 9.7362

with 4th Star

x-x	+500x	+9.99	+1.47	-8078
+2266.	+5687	= +7953 + 116	= +8069 + 16	= +8085 +7
-1558	+9368	= +7810 + 236	= 8046 + 26	= +8072 -6
-7789	+15605	= +7816 + 226	= 8042 + 44	= +8086 +8
-7578	+12570	= +7992 + 44	= 8036 + 35	= +8071 -7
23,8341	+11917	+ 151	+ 33	24,2364

Tables a = +1 e = -3.8 a-e = +4.9 b+d = -2.1

Obs	= -504.7	-506.5	+3.1	= -1.7
O-C	-502.7	-502.6	+0.2	+0.7

+500y -8x +6.5y -10250

+7094 +6172 = +10266 -91 = +10175 +80 = +10255 0
-2344 +12587 = +10243 -150 = +10093 +163 = 56 +1
-1653 +12002 = +10349 -250 = +10099 +156 = 55 0
16,176 +8059 - 191 +105 15.899
+8059 +2368 = 10427 - 201 = +10226 +31 = 10257

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Capella 30 s-1 - Aug 8.8

21 55 50.79
50.81
50.81
21 55 50.80
51.45
21 56 42.25
21 59 50
+ 1 52 25
+ 1 12 25
2.05018
9.99081
0.54823

+ 3.53337
+ 19
23.53356
23.0808
- 7.548

- 11 99 23.3
24.7
24.7
- 11 99 24.9
+ 9 33.1
- 11 99 49.8
- 9 55 30
- 1 99 19.8
- 65 62.0
3.81709
2.14819

9.3179
1.0963
7.4678

- 14.0667
- .0029
3.9304
9.7363
+ .8059

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11523 Plate Center + Constants

	x	y	t		J	
	11.3797	12.3940	21 99 06.6	- 10	92	27.6
	18.7352	25.1799	21 53 12.0	-	8 57	53.3
	31.2102	29.0036	22 0 9.6	-	9 7	24.0
3)	61.3203	61.5220	64 102 23.2	- 27	106	104.9
	20.994	20.507	21 59 7.7	- 9	35	59.7 +
	22.3	18.0	+ 7.87	-	19	30.9
	+1.306	- 2.507	21 59 55.6	- 9	55	25.8
	3K	966.5				

Center { A 21 59 50
D - 9 55 30

25.0808 9.7362

9th Star (4-clock)

23.7335 + 11917 + 79 + 95

With 9th Star.

π-3	+500π	+7.979	+6.917	-π.057π
+2266	+516827	= +779853 + 116	= +780069 + 216	= +780285 +7
-1358	+93687	= +781019 + 236	= +780916 + 216	= +780702 -6
-7789	+1.6605	= +781116 + 226	= +780792 = +79	= +780616 +8
-9398	+12690	= +79912 + 99	= +8036 + 35	= +80716 -7
23.8341	+ 11917	+ 157	+ 33	24.2356

Tables a - +1, e = - 3.8 a - e = +9.8 b + d = - 2.1
Obs = -304.7 = - 302.3 = +5.6 = - 1.0

16.1178 + 8059 - 191 + 105 - 15.8 + 99
+8059 + 2368 = 10427 - 201 = +10226 + 31 = 10257

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Capella 3051 - Aug 8.8

21 55 50.79
50.81
50.81
21 55 50.80
51.45
21 56 42.25
21 57 50
+ 1 52.25
+ 112.25
2.050181
9.990811
0.548233

+ 35.33374
+ .19
25.33356
25.0808
- 7.5488

- - 11 49 25.3
24.7
24.7
- 11 49 24.9
+ 4 33.1
- 11 44 49.8
- 9 55 30
- 1 49 19.8
- 65.620
3.817074
1.148191

9.31791
1.0965
7.4678

- 14.0667
- .0029
3.9304
9.7363
+ .8059

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11523 Standard Coordinates PM 5

	Capella 3038-mg6.5	Pegasus 3045-mg6.6	Cygnus 3060-mg7.2
c	21 48 15.26	21 52 21.18	21 59 13.66
d	15.21	21.20	13.71
e	1902 15.27	1901.3 21.18	1902.8 13.66
Mean	21 48 15.25	21 52 21.19	21 59 13.68
Prec	51.36	50.94	50.89
α	21 49 06.61	21 53 12.13	22 0 04.57
A	21 54 50	21 54 50	21 54 50
α-A	− 5 43.39	− 1 − 37.87	+ 5 14.57
Sin(α-A)	− 343.35	− 97.87	+ 314.54
log	2.535738	1.990638	2.497688
Cos δ	9.992237	9.999466	9.999447
ρ sin φ	1.035384	0.992355	0.999939
ρ cos φ	−1.087786	= 3.10855	+ 9.98860
η	− 81	− 5	+ 33
ξ	11.14881	18.89910	31.98890
χ	11.37747	18.73552	31.21047
χ-ξ	+ 2.2666	− 1.5458	− 7.7843
c	−10 46 57.49	− 9 02 25.79	− 9 12 00.66
d	56.7	25.6	12 0.0
e	57.3	26.2	1.6
Mean	−10 46 57.16	− 9 02 25.79	− 9 12 0.76
Prec	+ 4 29.5	+ 4 32.6	+ 4 38.7
δ	−10 42 27.66	− 8 57 53.39	− 9 7 22.06
D	− 9 55 30	− 9 55 30	− 9 55 30
δ-D	− 46 57.66	+ 57 36.71	+ 48 06.06
Sin(δ-D)	− 2817.85	+ 3457.01	+ 2886.21
log	3.449711	3.538701	3.460331
H	0.781065	0.869855	0.791488
log ρ cos φ	9.276711	9.19580	9.20038
z	20707	09865	19988
H	84008	72379	82580
h	− 60703	+ 79105	+ 61870
h₁	− 0237	− 0017	− 0181
h	11.93746	25.40088	27.16891
H	12.37740	25.17788	27.00036
(H-h)	+ 4094	− 2344	− 1653

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11 3 23 Standard Coordinates 5"

	Pape 3038 - mg 6.5	Pape No 3045 - mg 6.6	Pape No 3060 - mg 7.
c	21 98 15.26	21 52 21 18	21 59 13.66
I	15.21	21.20	13.71
C	15.27	21 18	13 66
Mean	21 98 15.25	21 52 21.19	21 59 13.68
Prec	5"1.36	50.94	50.89
α	21 99 06.61	21 53 1213	22 0 09.57
A	21 59 50	21 59 50	21 59 50
λ-A	- 5 93.39	- 1 - 37.87	+ 5 19.57
Sin(λ-A)	- 393 5	- 97.87	+ 319.59
log	2.535573	1.990665	2.99768
Cos	9.999237	9.999966	9.999997
ξ0	0.535539	0.999256	0.999939
ξ0	-10.8978	-3.1085	+9.9860
ξ	-9.14	-5	+33
ξ	11.9782	18.8919	31.9893
x	11.3797	18.3352	31.2109
x-ξ	+.2266	-.5568	-.7789

C	-10 96 57.9	-9 02 25.9	-9 12 00.6
I	56.7	25.6	12 0.0
C	57.3	26.2	1.6
Mean	-10 96 57.1	-9 02 25.9	-9 12 0.7
Prec	+9 29.5	+9 32.6	+9 36.7
δ	-10 92 27.6	-8 57 53.3	-9 7 29.0
D	-9 55 30	-9 55 30	-9 55 30
δ-D	-96 57.6	+57 36.7	+98 06.0
tan(δ-D)	-2817.8	+39570	+28 86.2
log	3.449911	3.538770	3.460333
H_0	0.781106	0.869855	0.791978
log tan δ	9.27671	9.19780	9.20588
ξ_0	20707	09865	19988
H_1	8.80084	8.23779	8.25870
h_0	-60903	+7.9105	+6.1870
h_1	-.0257	-.0017	-.0181
h	11.97398	25.99588	29.16889
H	12.39770	25.17998	29.00036
(H-h)	+.4098	-.2398	-.1653

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1916phae..proj.2

115-23 Moon's Center

	X	X-X₀	ΔX	(X-X₀)²	(X-X₀)²+(Y-Y₀)²	O-C
1	24.0000	+01660	-4	00274	39561	+79
2	23.8390	00000	-4	00000	39446	-36
3	23.0000	-08390	-4	06962	39495	+13
4	22.1870	-16470	-2	27133	39621	+139
5	21.8522	-19818	-0	39275	39412	-70
6	21.8787	-19853	0	39417	39417	-68
7	22.0523	-17817	+2	31737	39541	+59
8	23.0000	-08390	+4	06979	39601	+119

R² 3.9482 Corr = 3.9505

	Y	Y-Y₀	ΔY	(Y-Y₀)²		
1	14.1358	-19812	-9	39287	175°	
2	14.1318	-19852	-9	39446	180	
3	14.3141	-18029	-8	32533	205	
4	15.0000	-11170	-5	12488	236	
5	16.0000	-01170	-0	00137	267	
6	16.1170	00000	0	00000	270	
7	17.0000	+08830	+4	07804	296	
8	17.9232	+18062	+8	32652	335	160°

Approx Center

X = 23 Y = 14.3141
17.9232
32.2373

Y₀ 16.1186
Y min 14.1318
1.9868 1.9822
Y max 21.8487
23.8309

Center { X₀ 23.8390
Y₀ 16.1170

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1916phae..proj..2

11 5 23 Moons Center

	x	x - x₀	Δx	(x-x₀)²	(x-x₀)²+(y-y₀)²	O-C
1	24.0000	+0.1860	-1	0.0279	3.9561	+79
2	23.8390	0.0000	-1	0.0000	3.9446	-36
3	23.0000	-0.8390	-1	0.6982	3.9495	+13
4	22.1870	-1.6520	-2	2.7133	3.9621	+139
5	21.8522	-1.9818	-0	3.9272	3.9412	-70
6	21.8987	-1.9353	-0	3.9216	3.9419	-68
7	22.0523	-1.7817	+2	3.1737	3.9591	+59
8	23.0000	-0.8390	+1	0.6992	3.9601	+119

R = 3.9582 Corr = 3.9505

	y	y - y₀	Δy	(y-y₀)²	∠	
1	14.1358	-1.9812	-1	3.9287	173	
2	14.1318	-1.9852	-1	3.9446	180	
3	14.3171	-1.8029	-1	3.2533	205	
4	15.0000	-1.1170	-3	1.2485	236	
5	16.0000	-0.1170	-0	0.0137	267	
6	16.1170	0.0000	0	0.0000	270	
7	17.0000	+0.8830	+1	0.7804	296	
8	17.9232	+1.8062	+1	3.2652	335	160°

Approx Center

x = 23 y = 14.3171
17.7232
32.2073

y₀ 16.1178
y from 14.1358
1.9865 1.9822
1 from 21.8987
23.8309

Center { x₀ 23.8390
y₀ 16.1170

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Formation of Normals.

					Corr		Corr
1	-0.33	+	13.5	-4	- 156.5		+46
2	0.00		0.0	+0	+ 71.5		+46
3	+1.50	+	11.0	+19	- 23.5		+41
4	+1.85	+	229.0	+38	- 156.0		+26
5	+0.24	+	138.5	+46	+ 84.0		+3
6	0.	+	135.0	+46	0.		0
7	-1.57	-	105.0	+41	+ 52.0		-20
8	-1.50	-	99.0	+19	+215.5		-12
	+3.59	+	287.0		+123.0		
	-3.40	-	147.0		- 33.0		
	+0.19	-	157.0		+ 89.0		
		+	205		+100.0		
		+	78.0		+189.0		

		a	b	c	new 0.c
		-5	+28	-33	+69
a	-32	0	+28	-28	-71
b	-17	+27	+25	-4	+31
c	-56	+53	+16	+13	+170
		+63	+2	+9	-44 -54
		+64	+0	+8	-54
		+57	-12	-11	+43
		+27	-25	-57	+75 46

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Condutional Equations

	1h 23	Corr − 23					O−C
1	+0.17	−1.98	= +79	+ 0	− 23	= −23	+102
2	0.00	−1.99	= −36	0	− 23	= −23	− 13
3	−0.83	−1.80	= +13	+ 2	− 20	= −22	+35
4	−1.65	−1.12	= +139	+ 5	− 13	= −18	+157
5	−1.98	−0.12	= −70	+ 6	− 1	= −7	− 63
6	−1.99	0.00	= −68	+ 6	0	= −6	−62
7	−1.78	+0.88	= +59	+ 5	+ 10	= +5	+57
8	−0.83	+1.81	= +119	+ 2	+ 21	= +19	+100
					+878	− 138	

Average = 13

+15.17 + 0.19 = ~~−157.0~~ +48.0 − 8.89 Δ

+0.19 + 16.93 = ~~+89.0~~ +189 − 4.32 Δ

+[ ] 0 = + 0.6 − 0.26 Δ

+16.93 = +188.7 b = + 11.7

+15.17 = −2.2 + 48.0 = +85.8 a = + 13.0

− 0.58 Δ

Arc Upsound 160°

$\frac{P}{n}$ .19 $\frac{\Sigma V}{n}$ = +39

Inc 6 R 1.99

−2RC = −2.79 $\frac{+39}{.19}$ = +205 ΔR = +2.5

Corr + 0.7

Δb = +0.″72 Δ δ = +0.″9 ΔR = +1.8

Δa = +1.″62 Δ q = +0.″05

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Conditional Equations

	1123	Corr −23					O-C
1	+0.17	−1.98	= +79	+ a	= 23	= −23	+102
2	0.00	−1.99	= −36		0	= −23	−13
3	−0.83	−1.80	= +13	− 2c	= 20	= −22	−93
4	−1.65	−1.12	= +139	− 5c	= 13	= −18	+157
5	−1.98	−0.12	= +70	− 6c	= 1	= −17	+63
6	−1.99	0.00	= −68	− 6c	= 0	= −6	−62
7	−1.78	+0.88	= +59	− 5c	+ 10 =	+5	+54
8	−0.83	+1.81	= +119	− 2c	+ 21 =	+119	+100

+498 − 135

Average l = 13

+15.17 + 0.19 = ~~−57.0~~ +78.0

+0.19 + 16.93 = + ~~89.0~~ +189

+L J 0 = + 0.1

+16.93 = +~~1189.7~~ b = + 11.9

+15.17 = −2.20 + 78.0 = +75.8 a = + 5.10

Axis Measured 160°

$\frac{B}{A}$ .19 $\frac{\Sigma V}{n}$ = +39

$\frac{+39}{.19}$ = +205 Δi = +2.5°

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11523 Moore's Mean Position

x_0 23.8390 ✓ y_0 16.1170 ✓
+J ✓ +6 ✓
23.8395 ✓ 16.1176 ✓

From Plate Constants

x 24.2369 ✓ y 15.8899 ✓
ξ +2.2367 ✓ −2.1106 ✓
η

log ξ 0.34955 ✓
Cos δ 9.99308 ✓ log Tan δ 9.2550 n
8.50727 ξ = 0.6997 ✓
1.84923 ✓ 7.0537
7.0075 n

δ−A +70.67 ✓ n −.0010 ✓

A 21 57 50 ✓ log n_0 0.32720 ✓
7.33113 n
f_0 21 56 00.67 ✓ 2.99305 n −985.1 ✓
Red +3.98 ✓
−
f_1 21 56 07.65 ✓ δ−D −16 27.1

D −9 55 30 ✓

δ_0 −10 11 57.1 ✓

Red +20.3 ✓

δ' −10 11 33.8 ✓

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11523 Moores Mean Position

α_0 23.8390″ δ_0 16.1170″
+1″ +6″
23.8391″ 16.1176

From Plate Constants

x 24.2363″ y 15.8887″
ξ +2.2367 −2.1108

log ξ 0.349553″
cos δ 9.999308″
8.507271
1.849929″

log Tan δ 9.25504″
ξ 0.61144″
7.05537
7.00075n

A−A +7067″
n −.0010

A 21 59 30″
log n 0.032420
7.331135″
299305 −987.1

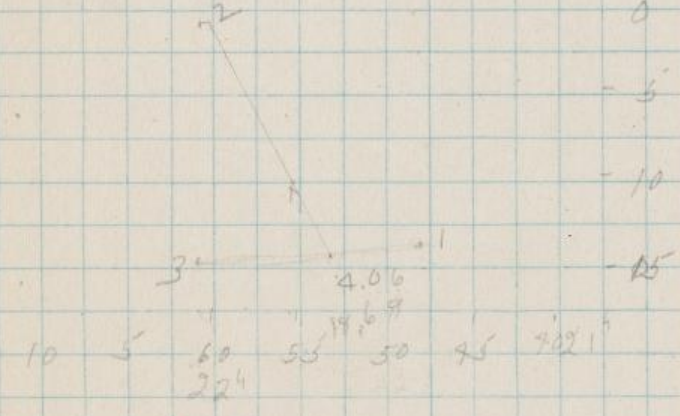
α_0 21 56 0067″
Red +3.95″
α 21 56 07.65″

δ−D −16 29.1
D −9 55 30
δ_0 −10 11 59.1″
Red +20.3″
δ −10 11 39″

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21	18	47.86	-13	56	39.03
		43.07			52.27
		+4.04			+18.24
22	1	32.06	- 0	43	18.45
		28.21			42.09
		+ 3.85			+ 23.59
22	1	58.21	-14	16	20.76
		54.12			39.78
		+4.09			+19.02



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1 1 3 2 3 Reduction to App Place

H + α	1	0	0.8	= 15°	12.0	δ	−	1	0	1	7	5	9.7
H	3		7.8										
α	21	3	6.0			log cos δ		9.9931					
G	23	21	1.3					+ 0.7864					
G + α	21	17	3.3	= 319°	19.5′			0.7795					

log tan (g + ζ) 9.8842
g 1.3611
sin t 9.8081 n
tan ζ 9.2350 n
8.8239

log Sin δ 9.2782 n
cos (H + α) 9.9875 -
h 1.2908
Sin (H + α) 9.4186 -
Sec δ 0.0069
8.8239

log g′ 1.2453
g 9.2981

h′ 0.5235 n
h 9.5402

f + 3.460
g + 0.177
h + 0.347 ✓
+ 3.984

g′ + 17.59
h′ − 3.338
ζ + 6.019
+ 20.271 -

OK

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11 5 23 Reduction to Opp. Place

H + α 1 00 8 = 15° 12.0 δ − 10 1′ 39.7

H	3	9.8	
α	21	56.0	
G	23	21.3	
G + α	21	17 3 =	319° 19.5′

log cos δ 9.9931
α +0.7869
a 0.7795

log cos (G + α) 9.8842
g 1.3611
Sin a 9.8081
tan δ 9.2753
8.8239

log Sin δ 9.2482 n
cos (H + α) 9.9895
h 1.2908
Sin (H + α) 9.9186
Sec δ 0.0067
8.8239

log g' 1.2953
g 9.2981

h' 0.5235 n
h 9.5402

f +3.960
g +0.177
h +0.397
+3.784

g' +17.59
h' −3.338
i +6019
+20.271

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11523 Ferrari Parallax

α'	21 56	09.65	
α	21 56	19.20	
$\alpha - \alpha'$	+ 9	9.55	
=	+13 17	23.25	
	+ 5	4.7	
	13 12	18 5	

9.995727
0.000000
0.001167
9.996894

δ	42 57	2.4	
δ	-10 11	33.8	
$\gamma - \delta$	53 08	36.2	

9.824470
8.233991
9.903105
0.116662
8.130099

$\delta - \delta'$	+46	23.1	
δ	-9 25	10.7	
Eph δ	-9 25	12.5	
O-C		+1.8	
Curv. Corr		+0.8	
2nd Order Ref Corr		+0.1	
Incline		+0.7	
δ	-9 25	10.2	
O-C		+2.3	

π	58	57.75	

9.869113
8.233991
9.361150
0.000589
7.470843

$\alpha - \alpha'$	10	09.37	
=		+10.62	
α	21 56	45.27	
Eph α	21 56	44.50	
O-C		+0.77	
		-0.03	
		+0.05	
α	21 56	45.32	
		+0.82	

Very Thin (cirrus)

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1152 Juno Parallax

α'	21	56	09.66
+	2	2	19.20
$+-\alpha$	+	3	3 9.55
$= +\Delta$	13	17	23.25
	+	3	9.9
	13	17	18.5

9.953727
0.000000
0.001167
9.954894

π 3 8 3 9.75

9.886913
2.323990
9.361850
0.000589
7.771033

$\sqrt{-\alpha'}$ 10 09.28

$=$ 10.62

δ 12 37 2.9

δ −10 11 39.8

$\delta - \delta$ 53 08 36.2

9.826790
2.323990
9.903105
0.166662
8.130099

$\delta - \delta'$ + 46 23.4

δ −9 25 10.1

Eph δ −9 25 02.5

O − C +1.8
Curv Corr +0.8
2nd Order Red Corr +0.1

α 21 56 39.27

Eph α 21 56 39.50

O − C +0.78
−0.03

Very Thin

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1916phae..proj.2

11572 Star Measures. 11

1	20610	20772	20072	20172
17.2	15196	13190	16872	13360
19.4	202	90	72	" 66
	06	78	62	72
	17.2410	17.2419	19.3227	19.3191
2				
23.4	20490	19730	20249	20430
8.7	16064	14166	13647	16987
	64	72	44	88
	88	36	36	26
	23.4425	23.4435	8.6596	8.6538
3				
34.6	19948	20039	20036	19202
20.4	13453	16538	14686	14578
	51	38	80	30
	38	38	22	06
	34.6490	34.6500	20.5346	20.5334

Moon Measures.

1	18920	20606	19779
23	13678	15364	15050
19.6	78	66	50
-4	24	598	80
	14.5242	14.5237	14.5270
2	18910	19672	19797
14	10552	11338	18132
19.8	56	40	42
	19	26	90
	14.8358	14.8290	14.8361
3	20658	19751	
23.8	12918	17520	
15	88	18	
	58	49	
	23.7740	23.7768	

Poor plate

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1916phae.proj.2

19672

Two Measures

L	19280	20230	16579	
8.9	15991	14050	15682	9992
3.1	83	90	90	10002
	70	38		9130
	18.3790	18.3810	30879	30867
	20289	20938	10222	11829
9.4	10382	20360	13880	16202
7.6	82	59	24	09
	84	32	18	20
	21.9702	21.9719	27.6392	27.6381
	20837	20680	19883	20528
9.7	13852	17181	14498	15850
0.6	56	79	94	52
	32	76	82	28
	39.6980	39.6502	20.5340	20.5323

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11292

Star Measures.

1				
17.2	20610	20772	20072	20172
19.9	18196	19190	16892	19380
	202	90	92	66
	06	78	62	72
	17.2410	17.2419	19.3227	19.3191

2				
23.9	20490	19730	20249	20430
8.7	16069	19166	13692	16789
	69	72	49	88
	88	36	36	26
	23.9425	23.9432	8.6596	8.6538

3				
39.6	19948	20039	20036	19202
20.9	13953	16538	19686	19878
	51	38	70	30
	38	38	22	06
	39.6990	39.6500	28.5396	20.5339

Moon Measures.

L				
23.		18920	20606	19779
19.6		13678	15369	15050
-4		78	66	50
		29	578	80
		19.5292	19.5239	19.5270

2				
24		18910	19692	19797
19.8		10532	11338	18132
		56	40	92
		19	26	90
		19.8358	19.8290	19.8391

3		
23.8	20658	19751
15	12918	17520
	18	18
	58	99
	23.7790	23.7768

Poor plate

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19642

Star Measures

1	19280	20230	16520	
18.4	15491	14050	15672	9992
3.1	83	40	40	10002
	70	38		9130
	18.3790	18.3810	30879	B.0867
2	20284	20438	20222	19824
21.9+	10382	20360	13830	16202
27.6	82	59	27	04
	84	32	18	20
	21.9902	21.9919	27.6392	27.6381
3	20337	20681	19843	20528
34.7	13852	17181	17798	15850
20.6	56	79	94	52
	32	76	32	28
	34.6780	34.6502	20.5340	20.5323

18.3800	3.0873
21.9910	27.6386
34.6791	20.5331

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4	19674	19770
23.1	18111	11303
16	03	298
	79	738
	23.1567	23.1561

5	19674	19730
23.7	18734	10670
16.3	38	52
-x	68	32
	23.0938	23.0930

6	18680	20729
23.1	17054	12351
17	50	59
	80	32
	23.1628	23.1624

7	18687	20452
23.8	10610	18529
18	02	19
	86	60
	23.8080	23.8070

8	20290	19949	20172	20036
24.6	17394	12806	17178	12958
18.4	400	98	88	52
5C	96	50	20	36
	24.2894	24.2852	18.2931	18.2921

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4	19679	19790
23.1	18111	11303
16	03	298
	79	738
	23.13567	23.13561

5	19679	19730
23.1	18739	10670
16.3	38	52
-X	65	32
	23.07138	23.09230

6	18680	20729
23.1	17059	12351
17	50	59
	80	32
	23.16628	23.16629

7	18688	20932
23.8	10610	19329
18	02	19
	86	60
	23.80780	23.80770

8	20290	19999	20192	20036
29.6	17399	12806	17178	12958
18.4	900	98	88	32
56	96	50	20	36
	24.27499	24.27852	18.29131	18.2992

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1916phac.proj.2

1915 T 2 Times Eta.

Nov. 6

Equ. to Stars	1	3 6		1 78	
☽ - Moon	1	42	22.6	1 42	22.8
Clock fast		11	06.9		
☉ Sid. Time	1	31	15.8	q - q = + 0h 5.9h	
☽ Long.	9	44	31 05		
☽ Lat. Sun	6	13	46.85		
G. T. M. N.	15	01	28.80		
☽ Interval	15	14	18.45		
Reduction		2	29.79		
G. M. T.	15	11	48.66		

From Naut. Alm.			R.A.		Dec.	
Moon 15h	0	31	59.98	+ 8	49	49.7
Motion m/m			2.0864			13.968
" " 11.8110			24.63		2	45.0
Tabular Place	0	32	24.62	+ 8	52	38.7

Moon's age 11 days

Parallax	57	50.55
Semid.	15	47.2
R		947.2
Aug		13.0
ΔR (16)		- 1.1
R		959.1
R		2.05599
αR		- 974
(1+q/R		1.9585
R		3.8357

934 12.7

a = - 4976
+ 24
- 4736

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Dur. 6"

Exp. to Stars	1	3	6		1	98
" " Moon	1	12	22.6"		1	12 " 22.8"
Clock fast		11	06.9"			
M. Sid. time	1	31	15.8"	9 - γ = + 0h	5m	9s
M. Long.	9	99	31.05"			
G. Sid. time	6	15	46.85"			
G. M. M. N.	15h	01	28.90"			
Interval	15h	14	15.75"			
Reduction		2	27.79"			
G. M. T.	15h	11	48.66"			

From Naut. Alm.			R.A.		Dec.	
Moon	15h	0 31	59.98"	+ 5	99	99.9"
Motion m1m			2.0864"			13.968
" " 11.8110			29.63		2	45.0"
Tabular Place	0	32	29.62"	+ 8	52	37.9"

Moon's age 11 days

Parallax	57	50 55"
Semid.	15'	97.2
R		997.2"
aug		13.0"
Lib (4)		- 1.1"
R		959.1"
R		2.055 9"
a/R		- 979"
1+q/R		1.9585"
R'		3.833 57"

939 12.7"

a = -9976
+ 27
-9736

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Curv. Corr.

			-8.83	-34	+2	
-3.78	-10.68	-25	+17	= -8	+5	= -3
-0.80	+10.17	-1	+2	= +1	-3	= -2
+13.00	+2.88	+56	-57	+1	-1	= -2
M=+3.0	-1.49	0	-13	0	=-11	= -0.09

	-874	-1.43	+19	
-98	+79	= -29	+5	-19
+27	-48	= -21	+1	=-20
+13	-19	= -1	-18	=-19
0	+7	-7	=+22	= +1.1

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+4863 + 8621 - 13484 - 3184 - 41

3225

10259

(61)

-461 + 9665 = 91944 + 2826 + 27

28533

12047

28275
14

28289

10
5

3186.3
12

3198.3

2847.8
17

1916phae.proj.2019B

68.

x 23.7732
x 23.4387
z +1.4387

y 8,65 77
y 8,2586
η -9.7719

log z 0.1587
cos δ 9.9965
8.5072
1.6572

log tan 9.1032
z^2 0.3159
7.0534
6.7775

$\alpha - A$ 45.10

η_1 +.0003

A 0 30 0200

α_0 0 30 47.10

log ρ_0 0.9886
7.3311
3.6577 4500
4577.77

Cape 1916 0 30 47.12

$\delta - D$ -75 77.7

D +8 31 20.0

δ_0 +7 15 35.6

Cape 1916 +7 15 38.3

E 1903.2

Cape 68 mg. 8.3

1916 0 29 57.607 +7 10 20.36
99.516 +5 17.93

0 30 47.123 +7 15 38.29

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1916phae.proj.2

11542 Plate Center and Constants

	x	y	α	δ	
(61)	17.2412	19.3109	0 27 17.0	+8 41 50.8	
(68)	23.4730	8.6577	30 37.1	7 15 38.3	
	34.6495	20.5340	36 54.7	8 53 48.8	
3)	75.3337	48.5026	0 93 15.5	23 109 137.9	
	25.1112	16.167	0 31 38.5	8 17 59.9	
	22	18	-1 36.7	+14 13.69	
	-3.111	+1833	0 30 21.1	8 31 19.68	
	31	766.5			

Center { A 0 30 02.
D +8 31 20

X-ξ +500X −164.9Y −2.7X −10287

+1647 + 9190 = +10837 − 509 = +10328 − 44 = +10284
+3900 + 10995 = 14895 − 4558 = +10337 − 53 = 84
−3571 + 17325 = 13754 − 3386 = +10368 − 83 = 85
25.0517 + 12526 − 2719 − 60 28.9980

Cape 68 23.8732 + 11722 − 1927 − 56 23.8387

Y-η +500Y +163.9X +1.4Y −12174

+7612 + 15449 = +9156 + 3013 = 12169 + 4 = +12173 −1
−5288 + 13819 = +8531 + 3604 = 12135 + 39 = +12174 0
−3801 + 10267 = +6466 + 5679 = 12145 + 29 = +12174 0
16.4862 + 8243 + 7106 + 23 16.5060

Cape 68 8.6577 + 4329 + 3872 + 12 8.2586

Tables a = +.8 e = −1. a − e = +1.8 b + d = −.6
Obs = −497.6 = −501.4 = +3.8 = +1.0

10 − C −498.4 −500.4 +1.6

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1916phae.proj.2

Cyc 63 - Mg 5.7

0 27 14 17
14.14
14.13
0 27 14.15
49.46
0 28 03.61
0 30 02
- 1 58.39
-1 18 39

2.073314
9997 20
0.577735

Cyc 63 Mg - Mg 6.8

0 28 59 76
59.77
59.71
0 28 59.75
99.66
9991
0 30 02
- 12 59
-12 59

1.100034
9993 57
9.600847

Cyc 81

0 36 01.76
1.75
1.75
0 36 01.75
49.59
51.29
0 30 02
+6 49.29
49.23

2.611977
9999735
111396

- 3.7822
-.25
18 21 53
18 38 00
+1647

-0.3989
-1
21 60 10
21 99 10
+ 3900

+ 13.0006 x 552 + 3.K
+ 360 P1P + [illegible]
35 00 62 + 0025 +
39 69 91 + 1722 -
- 3571

6 29 11.92
11.63
11.59
6 29 11.55
+5 18.7
6 29 30 25
8 31 20
2 01 4875
-7312.7

3869.08 h
1195.23 h

+9 95 06.9
06.9
5.9
9 95 06.9
+5 15.9
9 50 223
8 31 20
+1 19 2.3
+ 9793.1

3676.06
1007.21

+8 98 32.2
32.0
32.0
+8 98 32.1
+5 15.3
8 53 97.8
8 31 20
+ 22 27.8
+1397.9

3129.50
0496.05

9.0961
11555
72650

72391
92017
5.4992

91946
22289
84760

5.6757
+.0018
23261
30875
+ 7612

10.1679
+ 0000
28 16 79
27 63 86
- 5.288

+28833
+ 0299
20 91 32
20 53 31
- 3801

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1916phae.proj.2

11592 Plate Center and Constants

	x	y		η		ξ	
	17,2912	19,3109	0	27	17,0	+8	91 50.8
	23,9930	8,6577		30	97,1	7	15 38.3
	39,6992	20,5390		36	57,9	8	53 75.8
3	75,3337	48,5026	10	93	115	23	109 137.9
	25,1112	16,161	0	31	38,5	8	17 5.9
	22	18		-1	36,9		+19 13.6
	-3,111	+1833	0	30	2,1	8	31 19.6
	31	766.5					

Center { A 0 30 02.
D +8 31 20

X-ξ +500x −169.9y −2.9x −102

+1697 + 9190 = +10837 − 509 = +10325 − 77 = +1028
+3900 + 10995 = 14895 − 9558 = +10337 − 53 = 8.
−3571 + 17325 = 13757 − 3386 = +10368 − 80 = 8.
25.0517 + 12526 − 2719 − 60 29.998

Cape68 23.9932 + 11722 − 1427 − 56 23.938

η-η +500y +163.9x +1.7y −1217.

+7612 + 15949 = +91356 + 3013 = 12169 + 4 = +12173
−5288 + 13819 = +85331 + 3604 = 12135 + 39 = +12174
−3301 + 10267 = +64666 + 5679 = 12145 + 29 = +12174
16.4862 + 8243 + 9106 + 23 16.5060

Cape68 8.6577 + 9329 + 3872 + 12 8.2586

Tables a = +.8 e = −1, a-e = +1,8 b+d = −,6
Obs = −997.6 = −501.9 = +3.8 = +1.0

10 - C −998.4 −500.8 +1.6

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1916phae.proj.2

Cape 63-mg 5.17

0 27 17.17
17.19
17.13
0.27 17.15
49.46
0 28 03.61
0 30 02
- 1 58.39
-118.39
2.07331 h
9.99720
0.57775 h

-3.7822
-25
18.2153
18.3800
+1647

+6 24 11.82
11.63
11.59
6 24 11.55
+5 18.7
6 29 30.25
8 31 20
-2.01 49.75
-7312.7
3.86408 h
1.93223 h

9.0561
11535
72650

-15.6757
+1.0018
2.3261
3.0875
+ 7612

Cape 63-mg-mg 6.8

0 28 59.76
59.77
59.71
0 28 59.75
49.66
0 28 03.61
0 29 49.41
0 30 02
- 12.59
-12.59
1.10003 h
9.99357
9.60084 h

-0.3989
-1
2.16010
2.19910
+ 3900

+9 45 06.9
06.7
5.9
9 45 06.7
+5 15.9
9 50 22.3
8 31 20
+1 19 2.3
+ 9743.1
3.67606
1.00721

9.2391
92017
5.4972

10.1674
+ 0000
28.1674
27.6386
- 5288

Cape 81

0 36 01.76
1.75
1.75
0 36 01.75
49.57
0 36 51.29
0 30 02
+6 49.29
49.23
2.61197
9.99475
1.11396

+13.0006
+56
35.0062
34.6491
- 3571

+8 48 32.2
32.0
32.0
+8.48 32.1
+5 15.3
8 53 47.8
8 31 20
+ 22 27.8
+1377.8
3.12950
0.46065

9.1946
22280
8.4760

+28833
+ 0299
2.9132
2.0531
- 3801

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1916phae.proj.2

1916.72 Standard Coordinates.

	Cape No 61 – Mag 7.3	Cape No 68 – Mag 8.3	Cape No 81 – Mag 6.5
c	0 26 27.45	0 29 57.61	0 36 1.76
1	27.43	1903.2	1901.3 1.75
2	PM=-9 27.39		1.75
Mean	0 26 27.45	0 29 57.61	0 36 1.75
Prec.	-49.85	-49.52	-49.69
α	0 27 16.79	0 30 47.13	0 36 51.74
A	0 30 02	0 30 02	0 30 02
α-A	-2 45.01	+45.13	+649.74
Sin(α-A)	-165.01	+45.13	+409.38
log	2.21735 n	1.65447	2.61213
Cos δ	9.99997	9.99650	9.99978
ξ0	0.71972 n	0.15821	0.11411
ξ0	-52474	+143935	+130050
ξ1	-4	+4	+56
ξ2	167549	234399	350106
X	17.24.12	23.47.32	39.69.95
X-ξ	+4863	+10033	-3611
c	+8 36 32.7	+7 10 20.4	+8 48 32.2
1	PM measured 32.4		32.9
2	31.7		32.0
Mean	+8 36 32.3	+7 10 20.4	+8 48 32.1
Prec.	+5.18.3	+5.17.9	5.16.7 -1.7
s	+8 41 50.8	+7 15 38.3	+8 53 48.8
D	+8 31 20	+8 31 20	+8 31 20
s-D	+10 30.8	-15 41.7	+22 28.8
tan(s-D)	+630.8	-45424.7	+13488.8
log	2.79989	3.65729 n	3.12995
h0	0.13104	0.98844 n	0.76110
Stars	9.18496	9.10551	9.19496
ξ2	14394	03164	22282
η0	7.67774	6.47749	8.47622
H0	+13522	-97372	+28913
η1	+00098	+00003	+00299
Y	193570	82631	209212
y	19.31.09	8.65.77	20.53.70
(y-H)	-467	+3946	-3872

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1915 Standard Coordinates. 15

	Cape Nr 61 - Mg 7.3	Cape Nr 68 - Mg 8.3	Cape Nr 61 - Mg 6.5
c	0 26 27.95	0 29 57.61	0 36 1.76
I	27.93	1903.2	1901.3 1.75
E	PM-7 27.99		1.75
Mean	0 26 27.95	0 29 57.61	0 36 1.75
Prec	49.85	49.52	49.69
λ	0 27 16.99	0 30 47.13	0 36 51.44
A	0 30 02	0 30 02	0 30 02
λ-A	- 245.01	+ 45.13	+ 699.99
Sin(λ-A)	- 165.01	+ 45.13	+ 709.38
log	2.21735 n	1.65497	2.61213
cos δ	9.99997	9.99650	9.99979
ξ0	0.71972 n	0.15827	0.11411
η0	- 52997	119395	+ 13.00550
η1	- 9	+ 9	+ 56
η	16.75579	22.13999	35.01106
x	17.24912	22.14332	34.67995
x-η	+ .49863	+ 0.00333	- .3611

c	+ 8 36 32.7	+ 7 10 20.9	+ 8 98 32.2
I	PM Second 32.9		32.0
E	31.7		32.0
Mean	+ 8 36 32.3	+ 7 10 20.9	+ 8 98 32.1
Prec	+ 5 18.5	+ 5 17.9	5 16.7
δ	+ 8 91 50.8	+ 7 15 38.3	+ 8 53 98.8
D	+ 8 31 20	+ 8 31 20	+ 8 31 20
δ-D	+ 10 30.8	- 1 15 41.7	+ 22 28.8
tan b-D	+ 630.8	- 9592.7	+ 1398.8
log	2.79989	3.65729 n	3.12995
ho	0.13104	0.98899 n	0.76110
log tan δ	9.18996	9.10351	9.19976
ξ'	1.9394	0.31169	2.22282
ho	7.67774	6.97799	8.97762
H0	+ 1.3522	- 9.7372	+ 2.8913
H1	+ 0.0998	+ 0.0003	+ 0.0299
H	19.3570	8.2631	20.9212
H	19.3109	8.6577	20.5390
(H-H)	- .961	+ .3994	- .3892

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A + t.5

B = t V.1

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1916phae.proj.2

1154 2

Means Centers

	x	x-x₀	Δx	(x-x₀)²	(x-x₀)²+(y-y₀)²	O-C
1	23.0520	0.00000 - 1	0.00000	38361	+ 4
2	24.0000	- 1.0520 - 1	1.10678	38267	- 90
3	23.7754	- 1.2766 - 1	1.62999	38328	- 29
4	23.1564	- 1.8956 - 0	3.59333	38277	- 80
5	+ 23.0934	- 1.9586 0	3.83361	38361	+ 4
6	23.1626	- 1.8897 + 0	3.56998	38362	+ 5
7	23.8075	- 1.2445 + 1	1.54985	38474	+ 117
8	24.2873	- 0.7647 + 1	0.58476	38528	+ 171

	y	y-y₀	Δy	(y-y₀)²	R=3.8357 ∠
1	- 14.5256	- 1.9584 - 2	3.83361	180°
2	14.8350	- 1.6490 - 2	2.71999	213 -
3	15.0000	- 1.4840 - 2	2.20229	221 -
4	16.0000	- 0.4840 - 1	0.23434	256 -
5	16.4840	0.0000 0	0.00000	270 -
6	17.0000	+ 0.5160 + 1	0.26634	286
7	18.0000	+ 1.5160 + 2	2.29989	320
8	18.2926	+ 1.8076 + 2	3.26822	337 -	15.70

Means Centers

xy-mean 17.5356

R 1.9585

x mean 23.0934

Centers x₀ 23.0520

y₀ 16.4840

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11572 — Moons Center

	x	x-x0	Δx	(x-x0)	(x-x0)²+(y-y0)²	O-C
1	23.0520	0.0000	-1	0.0000	38361	+9
2	24.0000	-1.0520	-1	1.1068	38267	-90
3	23.7759	-1.2766	-1	1.6299	38325	-29
4	23.1569	-1.8956	-0	3.5933	38277	-80
5+	23.0939	-1.9586	0	3.8361	38361	+9
6	23.1626	-1.8894	+0	3.5698	38362	+5
7	23.8073	-1.2448	+1	1.5489	38174	+117
8	24.2573	-0.7947	+1	0.6316	38528	+171

	y	y-y0	Δy	(y-y0)²	R=3.8357 ∠
1	19.5256	-1.9584	-2	3.8361	180°
2	19.8350	-1.6490	-2	2.7199	213
3	15.0000	-1.9840	-2	2.0229	221
4	16.0000	-0.9840	-1	0.9399	256
5	16.9840	0.0000	0	0.0000	270
6	17.0000	+0.0160	+1	0.2664	286
7	17.0000	+1.0160	+2	2.2789	320
8	15.2926	+1.8076	+2	3.2682	337 — 15.7°

Moons Center

xy-min 19.5256

R 1.9584

x min 23.0939

Center x0 23.0520

y0 16.9840

1916phae.proj.2

Formation of Normals.

1 00	00	- 75	
2 + 173	+ 95	+ 1785	
3 + 190	+ 370	+ 430	
4 + 091	+ 1520	+ 385	
5 00	- 75	00	
6 - 098	- 95	+ 25	
7 - 188	- 1450	+ 1780	
8 - 138	- 1300	+ 3100	
+ 4534	+ 1985	+ 7205	
- 424	- 2926	- 75	
+ 130	- 935	+ 7130	

		a	b	c = -55	new O - C
a	- 35	+ 0	+ 10	- 45	+ 46
b	- 5	+ 37	+ 8	- 10	- 33
c	- 55	+ 45	+ 7	- 3	+ 26
		+ 65	+ 2	+ 12	- 61 - 59
		+ 69	0	+ 14	+ 5
		+ 66	- 3	+ 8	- 23
		+ 43	- 8	- 20	+ 21
		+ 27	- 9	- 37	+ 47

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1554 Conditional Equations

					O-C
1	0.00	- 1.96	= +7	0 - 87	= -87 +91
2	-1.05	- 1.65	= -90	+7 - 74	= -67 -23
3	-1.28	- 1.48	= -29	+9 - 67	= -58 +29
4	-1.90	- 0.48	= -80	+13 - 22	= -9 -71
5	-1.96	0.00	= +7	+13 0	= +13 -9
6	-1.89	+0.52	= +5	+13 +23	= +36 -31
7	-1.24	+1.52	= +117	+8 +68	= +76 +41
8	-0.76	+1.81	= +171	+5 +82	= +87 +84

+295 -134

15.86 +0.30 = -93.5 Average 47

-10.08 Δ

+0.30 +15.82 = +713.0 -1.72 Δ

+[ ] + 0 = -1.8 -.096 Δ

15.82 = +711.2 δ = +95.0

15.86 = -93.5 - 13.5 = -107.0 a = - 6.7

-0.63 Δ

Arc Measured 157°

$\frac{p}{h}$ = .18 $\frac{\Sigma v}{h}$ = +13.9

Im b. R 1.96 + $\frac{13.9}{18}$ = +77 ΔR = +1.0

-2pc = -3.74 Corr +0.7

Δ M = +0.3

Δ b = +0.″27 Δ δ = +0.″1

Δ a = +1.^{s}74 Δ q = +0.^{s}06

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1592 Conditional Equations

					O-C		
1	0.00	-1.96	= +9	0	-87	= -77	+91
2	-1.05	-1.65	= -90	+7	-74	= -67	-23
3	-1.28	-1.98	= -29	+9	-67	= -58	+29
4	-1.90	-0.98	= -86	+13	-22	= -9	-71
5	-1.96	0.00	= +9	+13	0	= +13	-9
6	-1.87	+0.52	= +5	+13	+23	= +36	-31
7	-1.29	+1.52	= +117	+8	+68	= +76	+41
8	-0.76	+1.81	= +171	+5	+82	= +87	+89

+295 -139

15.86 +0.30 = -93.5 Average 97

+0.30 +15.82 = +713.0

+[ ] + 0 = -1.8

15.82 = +711.2 b = +95.0

15.86 = -93.5 - 13.5 = -107.0 a = -6.7

Arc Measured 15.7°

$\frac{P}{h} = .18$ $\frac{\Sigma V}{h} = +13.9$

$\frac{+13.9}{.18} = +77$ $\Delta R = +1.0$

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1916 Moon's Mean Position 18

X_0 25, 05 20″
−3″
25 05 17″

Y_0 16, 48 40″
+22″
16 48 62″

From Plate Constants:

x 24.9980″
y +2.9980″
log y 0.47683″
Cos δ 9.99540″
8.50724
1.97419″

y 16.5060″
h −1.7980″
Log tan δ 9.16556″
y″ 0.95537″
7.05539
7.17226

d-A 9423″

h. +0.0013″

A 0 30 02.0″

r_0 0 31 36 23″

log h 0.17478″
7.33115″
2.89363 h″ −697.6″

Red +7.51″

δ-D −11 37.6″

r' 0 31 40.74″

D +8 31 20″

δ_0 +8 19 42.4″

Red +30.6″

δ' 8 20 13.0″

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1916phae.proj.2

1892 Moons Mean Position

γ_0 23 05 20"
-3"
23 05 17"

γ_0 16 49 40"
+22"
16 49 62"

From Plate Constants

ξ 29.9980"
η +2.9950"
log ξ 0.476853"
Cos δ 9.993490"
δ 0 07 29
1.977419"

η 16.3060"
η -1.9990"
log Δ 9.18663"
ξ 0.47537"
7.05339
7.17736

d-A 9.923

A 0 30 02.0"

T_0 0 31 36.23"

Red +9.58"

T' 0 31 40.78"

η_1 +0.0015"

log h_0 0.179775"
7.331112"
2.899363" -697

d-D -11 37.6"

D +0 31 20"

δ_0 +8 19 42.4"

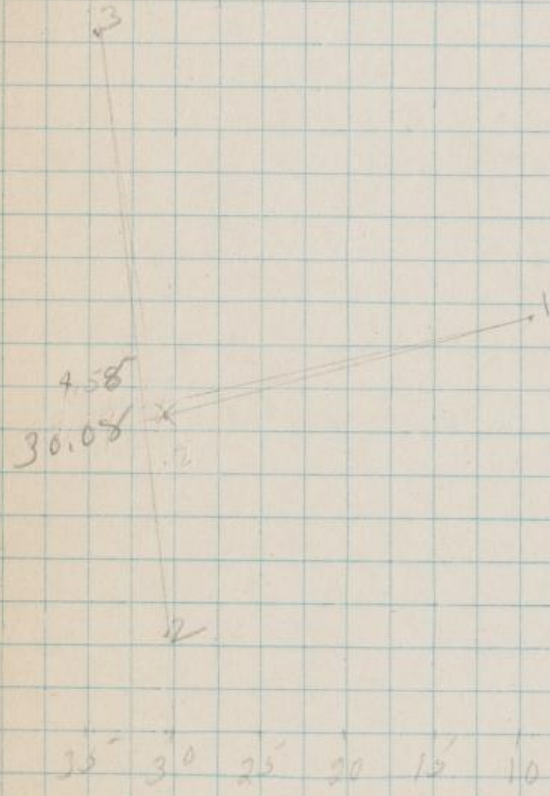
Red +30.6"

δ' 8 20 13.0"

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1916phae.proj.2

0	8	5°8.89		+ 18.	42	91.76	
		59.57				59.83	
		+9.32				+31.93	
0	30	59.96		− 9	2	5°0.29	
		55.43		− 9	3	18.18	
		+9.53				+27.98	
0	34	5°7.62		+30	27	38.93	
		59.95				7.85	
		+7.67				31.08	



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11572 Reduction to Apparent Place. 19

Nov 6 1h.5

H+α 3 24.0 = 5h 0 δ +5 19" 82

H 2 52.4

α 00 31.6

G 23 22.0

G+α 23 53 6 = -1° 36.0' log sin δ 9 9953

log ρ sin φ' 9.76471

log ρ cos φ' 9.76011

log sin δ 9.16091

log cos (H+α) 9.79989

log r 1.2929

log sin (H+α) 9.8905

log sec δ 0.0016

8.8239

l log ρ cos (G+α) 9.9998

g 1.3621

log sin δ 8.4853

tan δ 9.1655

8.8239

g' 1.3619

g 7.7978

l' 0.2527

l 0.0119

l +3.487

g -.006

g' +1.028

+4.509

g' +2.301

g' +1.789

δ +5.753

+30.553

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11392 Reduction to Apparent Place. 19

H+α 3 24.0 = 51°
H 2 52.4
α 00 31.6
G 23 22.0
G+α 23 536 = -1° 34.0

δ +5 19" 92

log a sin δ 9.9953
+ 0.7697
a 0.7601

log sin δ 9.1609
cos (H+α) 9.7989
h 1.2929
sin (H+α) 9.3905
sec δ 0.0046
8.8239

f cos (G+α) 9.9998
g 1.3621
sin 8.4773.9n
tan δ 9.1635
8.8239

g' 1.3619
g 7.7974n

h' 0.2527
h 0.0119

f +3.987
g -.006
h +1.077
+4.309"

g' +2301
h' +1.787
i +5.755
130.534"

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1916phae..proj.2

1915 7 2 Lunar Parallax 20

α' 0 31 40.74 Ti 57 50.55
α 1 31 15.18
α-α' +0 59 34.44 9.869713
= 14 53 45.90 8.225994
½(1-q) 33.99 9.791004
14 48 11.91 0.000523n
7.510234

9.995727
0.000000
0.014466
9.971193

δ-δ' 11 07.98
= +44.53

δ 43 9 00.

δ + 8 20 13.0

δ-δ 34 48 47.0

9.826470
8.225994
9.755655
0.165000
7.973119

δ-δ' +32 22.3

δ 8 52 35.3 α 0 32 25.27

Eph δ +8 52 37.7 Eph α 0 32 27.62

O-C +0.9 O-C +0.65
Curv Corr +1.1 -.04
2nd Order Eff 0.0

Incor +0.1 +0.06

δ +8 52 35.7 α 0 32 25.33

O-C +1.0 Corr +0.71

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1915 7 2 — Lunar Parallax — 20

☾'	0	31	90.78"	T.	57	50.56"	
☾	1	31	15.8"				
☾-☾'	+0	59	35.02"			9.886913	
=		19	53	95.90"		8.225894	
½(☾'-☾)			29	37.99"		9.991004	
		19	48	11.93"		0.000523	
						7.551039	

9.993727
0.000000
0.014666
9.978393

☾-☾' 11 07.98"
= 99.63"

☽ 43 9 00"

☽ + ☉ 20 13.0"

☾-☉ 34 48 47.0"

9.826470
8.225894
9.755633
0.016500
7.997897

☽-☽' 32 23.3"

☽ ☉ 32 36.3" ☾ 0 32 25.28"

Eph ☽ + ☉ 32 37.7" Eph ☾ 0 32 29.62"

O-C +0.9" O-C +0.53"
Curv Corr +1.1 -.09
2nd Order Eq 0.0

poor

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1579 Star Measures. 21

1/	20390	20282	20541	19852
16.7	12410	18270	15876	14508
24.6	10	62	72	18
	86	82	34	50
	16.79777	16.79894	29.46634	29.46622
2/	19548	20408	20032	19733
18.7	12978	16992	14822	14897
8.5	78	88	28	00
	48	10	18	11
	18.65570	18.65580	5.5195	5.5197
3/	20628	18748	19880	20180
29.6	14628	14752	13588	16462
17.7	24	62	82	62
	28	52	74	78
	29.60028	29.60088	17.62911	17.62883

Moon Measures.

1/			19284	19978
24			10264	18903
13.9			74	91
4			212	37
			13.89944	13.89950
2/	20270	20028		
13.2	17430	12868		
14	38	58		
	270	28		
	24.28334	24.28334		
3/			20226	19130
23			18960	10390
14.1			70	402
			30	28
			14.12662	14.12668

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1916phae.proj.2

Star Measures

9-	17379	15219	20478	20669
33.1	16940	17	13558	19768
11.9	70	19760	58	70
			70	68
	33.04559	33.04558	11.91114	11.91109

18-				
3	19832	20061	20062	19976
25.6	13568	16329	10186	19810
6.9+	62	28	82	18
	36	72	66	62
	25.6270	25.6260	6.98883	6.98852

18712	
18898	
39	
30	
6.98798	

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Y	20390	20282	20591	19852
16.7	12410	13270	15878	19508
24.6	10	62	72	18
	86	82	39	50
	16.79977	16.79889	29.96641	29.96622
2/	19548	20408	20022	19733
16.7	12978	16992	19822	19899
5.5	78	88	28	00
	98	10	18	11
	18.65370	18.65380	5.5.195	5.5.197
3/	20628	19798	19888	20180
29.6	19628	19752	13588	16462
16.7	24	62	82	62
	28	52	79	78
	29.60028	29.60088	17.62971	17.62883

Moon Measures.

1/			19248	19998
24			10269	18903
13.7			79	91
-4			212	39
			13.89944	13.89350
3/	20270	20028		
24.2	17430	12568		
14	38	28		
	270	28		
	24.28339	24.28339		
3/			20228	19130
23			18960	10390
14.1			70	902
			30	28
			14.12662	14.12668

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Star Measures.

4	17377	15219	20478	20664
33.1	1.6940	17	11358	19768
11.9	70	14760	58	70
			70	68
	33.0459	33.0458	11.9114	11.9104
78 5	19832	20061	20062	19946
26.6	13568	16329	10186	19810
~~23.7~~	62	28	82	18
6.9+	36	72	66	62
	25.6270	25.6260	6.9883	6.9852

18712
+8898
54
30
6.9878

1916phae..proj.2

Moon Measures.

7.	19512	20540
22.1	17928	12139
15	22	30
	20	32
	22.15882	22.15398
5	20210	20192
21.9	10571	19824
13.9	77	24
- x	28	200
	21.96440	21.9632
6	19580	19708
22.3	16102	13162
17	092	58
	86	08
	22.34885	22.34552

7.	19543	18470
23	13802	14200
17.7	92	198
	38	66
	17.57345	17.57331
8	18220	19928
23.3	15248	12840
17.6	52	32
	20	28
	23.29720	23.29088
	19530	19466
	12540	16457
	30	60
	40	68
	17.70002	17.69990

17962	19542
15048	12471
10	67
70	50
23.29571	23.29221

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Mean Measures.

7	19512	20540
22.1	17928	12198
13	22	30
	20	32
	22.15588	22.12598
5	20210	20192
11.9	10571	19829
3.9	77	29
-X	18	200
	21.97640	21.97632
6	19580	19708
22.3	16102	13162
17	092	58
	86	08
	22.34885	22.34592

7	19543	18970
23	13802	19200
17.7	72	198
	38	66
	17.57945	17.57731
8	18220	19928
23.3	12498	12880
17.6	52	32
	20	24
	23.29770	23.29088
	19530	19466
	12540	16459
	30	60
	98	68
	17.70002	17.69990

17962	19592
15098	12471
10	67
70	50
23.29551	23.29221

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1916phae.proj.2

Curv. Corr.

ξ	η	Δ ξ	-1.8 ξ	+ .8 η	− 3
− 5.37	+ 6.93	− 10	+ 10 = 0	+ 3 =	+ 3
+ 3.79	− 11.48	+ 14	− 7 = + 7	− 4 =	+ 3
+ 8.05	− 0.35	+ 16	− 14 = + 2	0 =	+ 2
+ 2.07	− 2.16	0	− 4	− 1	= − 8 = − 0.03

Δ η	− 0.3 η	− .8 ξ	+ 7
+ 13	− 23	= − 10	+ 4 = − 6
− 42	+ 28	= − 14	− 3 = − 7
− 1	+ 0	= − 1	− 6 = − 7
0	+ 7	− 2	= + 12
			= + 0.6

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11 5 47 Transits Etc.

Nov 6 '16.

Eq. to Stars	3	06		3	18	
" " Moon	3	11	36.8	3	11	37.1
Clock fast		11	07.1			
H. Sid Time	3	00	29.85	$\alpha - \odot = +2^h 25^m$		
H. Long	4	44	31.05			
G. Sid. T.	7	45	00.90			
Sid T. of Moon	15	01	28.40			
Interval	16	43	32.50			
Reduction		2	44.41			
G.M.T.	16	40	48.09			

From Naut Alm

	R. a.	Dec.
Moon 16h	0 34 5.17	+9 03 46.2
Moon 16h	2.0875	+ 13.902
" 40.8015	1, 25.17	9 27.2
Tabular Place	0 33 30.34	+9 13 13.4

W1

Moon's age 11.

Parallax	57 48.97
Semid.	15 46.8
R.	996.8
Aug	11.2
Sdr. (3)	-0.8
R.	957.2
R.	2.0519
a R.	-976
(1+g)R.	1.9543
R	3.8193

937 10.91

a = -499.7
+274
-973.7

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11 5 49 Lemon Etc.

Nov 6 16.

Eq Sh Stars	3	06		3	17		
" Moon	3	11	36.8	3	11	37.1	
Clock fast		11	07.1				
H Sid Time	3	00	29 8.5	H - α =	+ 2	4	25 m
H long	4	44	31 03				
G Sid T	7	45	00 90				
Sid T of Moon	15	01	27.90				
Latitude	16	43	32 30				
Reduction		2	44 11				
G Mn T	16	40	48.09				

From Handbook — R A — Dec

Moon 16h	0	39m	51.7	+ 9	03	46.2	
Moon 1h			2 0 8 72		+ 13	40 2	
10.801		1	25 17		9	27 2	
Intermediate	0	33	20 39	+ 9	13	13.9	

11h — 11 hours ago 11

Pleiades	37	48.97
Second	13	46.8
11		946.8
Aug		11.2
2 Dec		-0 8
11		957.2
11		2 05 19
a/11		-9.76
11 + a/11		1.9 593
11		3.3193

9.34 10.91

a = -9997
+29
-973.7

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means
rechecked

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11544 Plate Center and Constants 29

x	X	y	Y				
16.7980	24.4663	0 29	49.4	+9"	5-0	22.0
18.6575	5.5196	0 30	47.1	7	15	38.3
39.6005	17.6287	0 36	51.3	8	53	47.3
65.0560	47.6196	0 95	147.8	29	118	107.6
21.685	15.871	0 32	29.3	+8	39	55.9
32	18		+ 9.8	+	16	33.2
+0.315	+2.129	0 32	39.1	+8	56	29.1
31.5	266.5					

33.0958 11.9109 Center {A 0 32 38
{D +8 56 30

X-7. +500X +76.9Y -.3X -11676

+1401	+8399	= +9800	+1881	= 11681	- 5	= 11676
-1667	+12813	= 11146	+ 537	= 11683	- 8	= 75
-9771	+14800	= 10329	+ 1356	= 11685	- 9	= 76
23.9199	+11960		+ 1219		- 7	24.0695

Y-Y +500Y -72.8X -.7Y -6305

9688	+12233	= 7535	- 1223	= 6312	- 17	= 6305
+7683	+ 5497	= 8176	- 1866	= 6310	- 5	= 05
- 591	+ 8817	= 8473	- 2155	= 6318	- 12	= 06
15.8784	+7927		- 1741		-11	15.8351

Table a = -.5 e = -1.6 a-e = +1.1 b+d = -3.

Obs	-499.7	- 499.3	-0.4	- -4.1
O-C	-499.2	- 497.7		-1.1

Stars used 65, 78, 81, [Cape]
as found on enclosed loose sheet. 68 caused the trouble

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Cape 52-m56.0

0 23 09.83
9.83
9.80
0 23 9.82
29.46
0 23 3938
0 32 38
- 8 3862
- 518.62

2.71976
4.79370
1215704

-16.1322
-3.121
3.5956

+9 38 31.5
31.0
31.9
9 38 31.3
+5 16.9
9 43 47.7
8 56 30
+47 17.7
12837.9

3.15299
0.78419

9.2091
2.9314
5.7189

+6093
+0523
29.1356

Cape m- 85-87

0 37 53.27
m Pm 53.27
53.21
0 37 53.9
99.66
0 38 72.90
0 31 38
+6 04.90
+364.86

2.56212
9.99563
1.06799

+11.6192
+ 44
33.6191
33.0458
- 5733

+8 01 32.8
m Pm 33.2
32.5
8 01 32.8
+5 16.3
8 06 49.1
8 56 30
-99 40.9
- 2981.2

3.47439
0.80559

9.1590
2.1300
8.3379

-63906
+0.0218
11.6312
11.9109
+ .2797

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1916phae.proj.2

1599 Plate Center and Constants 24

x	y	x	+
16.7980	29.9663	0 29 99.9	49" 50 22.0
18.6575	5.5196	0 30 77.1	7 15 38.3
29.6005	17.6287	0 36 51.3	8 53 17.3
3) 65.0560	97.6196	0 95 1978	129 118 107.6
21.6853	15.8771	0 32 29.3	+8 39 35.9
22	15	+ 9.8	+ 16 32.2
+0.3153	+2.1297	0 32 39.1	+8 56 29.1
21	966		

Centers { A 0 32 38
D +8 56 30

x−y	+.00x	+76.9y	−.3x	−11671
+1901	+8299 : +9860	+1881 : 11671	.3 : 11676	
−1667	+12813 : 11196	+537 : 11683	5 : 76	
−9771	+19806 : 10329	+1356 : 11685	9 : 76	
23.9179	+11960	+1219	−7	29.067

y−y	+.00y	−79.8x	−.7y	−6300
9237	+12233 : 7211	−1223 : 6322	11 : 6305	
+7683	+5993 : 8176	−1866 : 6310	3 : 03	
−391	+8817 : 8873	−2133 : 6318	12 : 06	
15.8784	+7927	−1791	−11	15.8033

Tables a = −.5 e = −1.6 a−e = +1.1 b+d = −3.
Obs = −999.7 = −999.3 −0.8 = −7.1

Stars used 63, 78, 51, L Cep I
as for 1 on closed line sheet. LK 4/20/21

1916phae.proj.2

Capella 2-Mg 6.0

0 23	09.83	
	9.83	
	9.80	
0 23	9.82	
	49.56	
0 23	9.38	
0 32	38	
- 8	38.62	
-	18.57	
2.719764		
9.99370		
1.21570 h		
-16.4323		
- .121		
5.55556		
+9 38	31.5	
	31.0	
	31.4	
9 38	31.3	
+ 5	6.4	
9 43	47.7	
8 56	30	
+ 47	17.7	
+ 2837.9		
3.45299		
0.78414		
9.2041		
2.4314		
8.7189		
+ 60833		
+ 0523		
24.1356		

Capella 2-Mg 6.0

0 37	53.24 v	
mPm	53.27	
	53.21	
0 37	53.24 v	
	49.66	
0 38	72.90 v	
0 32	38	
+ 6	04.90 v	
+ 364.86 v		
2.56212		
9.99563		
1.06499		
+11.6172 v		
+ 49		
33.6191		
33.0458 v		
- .5733		
+8 01	32.8	
mPm	33.2	
	32.5	
8 01	32.8 v	
+ 5	16.3 v	
8 06	49.1 v	
8 56	30	
- 49	40.9 v	
- 2981.1 v		
3.47437 h		
0.80652 h		
9.1540		
2.1300		
8.3374 v		
- 6.3903		
+ 0.0218		
11.6315		
11.9109		
+ .2794		

See enclosed sheet

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1554

Standard coordinates

	Cape no 65 - mag 6.8	Cape no 66 - Mag 6.5	Cape no 81 - Mags 7.5
C	0 28 59.76	0 29 57.61	0 36 01.76
E	59.77		1.75
E	59.71		1.75
Mean	0 28 59.75	0 29 57.61	0 36 01.75
Prec	+ 49.7066	49.97 (8)	49.54 (5)
α	0 29 49.81	0 30 47.08	0 36 51.29
A	0 32 38	0 32 38	0 32 38
α-A	− 2 48.59	− 1 50.92	+ 4 13.29
Sin(α-A)	− 168.59	− 110.92	+ 253.28
log	2.226833	2.045101	2.403601
Cos δ	9.993536	9.999650	9.999474
ξ₀	0.72763	0.54875	0.90358
η₀	− 5.3411	− 3.5379	+ 8.0760
η₁	− 10	− 17	+ 13
ξ	16.6579	18.4604	30.0473
ξ	16.7980	18.6375	29.6005
ξ-ξ₀	+ 1.4401	+ 1.9771	− .4468
C	+ 9 45 6.9	47 10 20.7	+ 8 28 32.2
E	6.7		32.0
E	5.9		32.0
Mean	9 45 6.8	+ 7 10 20.4	+ 8 28 32.1
Prec	+ 5 15.9	+ 5 17.90	+ 5 15.2 (3)
S	+ 9 50 22.3	+ 7 15 38.3	+ 8 53 47.3
D	8 56 30	8 56 30	8 56 30
S-D	+ 53 52.3	− 1 40 51.7	− 2 42.6
tan(S-D)	+ 32 32.6	− 60 53.5	− 162.6
log	3.509555	3.782000	2.211112
η₀	0.840700	1.111315	9.542127
Coffins	9.23917	9.10511	9.19446
ξ²	1.45514	1.09735	1.81120
η₀²	7.74764	7.25604	8.05942
η₀	+ 6.9295	− 12.97647	− 0.34585
η₁	+ 0.00056	+ 0.00018	− 0.01155
η	6.93051	5.02547	1.76630
η	6.93107	5.02565	1.75475
(η-η)	− 56	+ 18	− 1155

Pd enclosed sheet.

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1916phae.proj.2

11549 — Standard Coordinates

	Capella 1916	Capella 1916	Capella 1916
	65 Aug 6.5	65 Aug 8.5	71 Aug 25
C	0 28 59.76	0 29 57.61	0 36 01.76
L	59.77		1.75
C	59.71		1.75
Mean	0 28 59.75	0 29 57.61	0 36 01.75
Prec	+ 99.7066	99.77	99.59
δ	0 29 99.81	0 30 97.08	0 36 51.29
A	0 32 38	0 32 38	0 32 38
δ·A	− 2 98 59	− 1 50 92	+ 4 13 27
Sin(1+1)	− 168.59	− 110 92	+ 253.28
log	2.226833	2.045301	2.403604
log sin	9.993356	9.996530	9.999979
ξ₀	0.727634	0.549875	0.903558
ξ₀	− 5.3988	− 3.5398	+ 8.0760
η₁	− 10	− 17	+ 13
ξ	16.6599	18.1609	30.0773
x	16.7980	15.6273	29.6005
x − ξ	+ .1380	− 2.5336	− .4768

C	+ 9 95 6.9	17 10 20.9	+ 8 98 32.2
L	6.9		32.0
C	5.9		32.0
Mean	9 95 6.9	17 10 20.9	+ 8 98 32.1
Prec	+ 5 15.9	+ 5 17.9	+ 5 15.2
S	+ 9 30 22.3	+ 7 15 38.3	+ 8 53 47.3
D	8 56 30	8 56 30	8 56 30
S − D	+ 53 52.3	− 1 40 51.7	− 2 42.7
tan(S − D)	+ 32 32.6	− 60 53.5	− 162.6
log	3.509553	3.782200	2.211122
η₀	0.849070	1.113155	9.592327

log tan δ	9.23991	9.10351	9.11712
ξ²	1.45517	1.09735	1.81112
η₀	7.77716	7.25604	8.05932
η₀	+ 6.92935	− 12.77769	− 0.34548
η₁	+ 0.00536	+ 0.00015	+ 0.01133
η	29.83811	5.02539	17.66330
η	24.76633	5.51761	17.62787
(η − η)	− .76884	+ .49792	− .13980

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A = + 3.

B +7

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Capella Dec 65° 6.8 Capella Dec 78 Aug 8.5 Capella Dec 81 Aug 6.5

C		0 33 47.36	
I		47.40	
E		47.32	
Mean		0 33 47.36	
Dec		49.57	
α	0 29 49.41	0 34 36.93	0 36 51.29
A	0 32 38.	0 32 38	0 32 38
α-A	- 2 48.59	+ 1 58.93	+ 4 13.29
Sin(α-A)	- 168.59	+ 118.93	+ 253.28
log	2.22683 n	2.07529	2.40360
log cos δ	9.99356	9.99632	9.99878
log 30	0.727634	0.578855	0.905558
30	- 53711	+ 3.7918	+ 8.0760
η	-10	+19	16
ξ	16.6579	25.7932	30.0476
χ	16.7980	25.6265	29.6005
χ-ξ	+ .1401	- .1667	- .9771

C		47 21 56.6	
I		56.9	
E		56.6	
Mean		7 21 56.7	
Dec		57 17.2	
δ	+ 9 50 22.3	+ 7 27 13.9	+ 8 53 47.7
D	8 56 30	8 56 30	8 56 30,
δ-D	+ 53 52.3	- 1 29 16.1	- 2 42.6
log (δ-D)	3232.6	5357.3	- 162.6
log	3.509555	3.728997 n	2.21112 n
log 30	0.847070	1.060097 n	9.547227 n
tan δ	9.23991	9.11167	9.19976
log 30²	1.85553	1.13577	1.81112
log H	7.74478	7.32778	8.05592
H₀	+ 69295	- 118439	- 03986
H₁	+ 0.0056	+ 0.0021	+ 0.0114
H	27.9351	6.3182	17.6628
H	27.8663	6.9865	17.6287
H-H	- .7688	+ .7683	- .3741

16.7980	27.8663
25.6265	6.9865
29.6005	17.6287

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1155-47 Moon's Center 26

	x	x - x₀	Δx	(x-x₀)²	(x-x₀)²+(y-y₀)²	δ-c
1	23.9190	0.0000 - 6	0.0000	3.8236		+ 93
2	23.2837	-0.6353 - 6	0.4048	3.8277		+ 84
3	23.0000	-0.9190 - 5	0.8455	3.8163		- 30
4	22.1593	-1.7597 - 3	3.0976	3.8203		+ 10
5	21.9636	-1.9554 0	3.8236	3.8236		+ 93
6	22.3968	-1.5722 + 3	2.4709	3.7936	¼wt=257	
7	23.0000	-0.9190 + 5	0.8436	3.8154		- 39
8	23.2936	-0.6254 + 6	0.3907	3.8118		- 75

R = 3.8193

	y	y - y₀	Δy	(y-y₀)²	∠	
1	-13.8997	-1.9553 - 1	3.8236	180		
2	17.0000	-1.8500 - 1	3.9229	199		
3	17.1265	-1.7235 - 1	2.9708	208		
4	15.0000	-0.8500 - 1	2.7227	244		
5	15.8500	0.0000 0	0.0000	270		
6	17.0000	+1.1500 + 1	1.3227	306		
7	17.5738	+1.7238 + 1	2.9718	332		
8	17.6996	+1.8496 + 1	3.4217	341		161°

Approx. Center

x = 23.0 y = 17.1265
17.5738
31.7003
y_0 15.8501
y_{min} 13.8997
1.9504 1.9553
x_{min} 21.9636
23.9190

Center { x_0 23.9190
y_0 15.8500

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11 3 47 Moonin Center 26

	x	x - x̄	Δx	(x - x̄)²	(x - x̄)(y - ȳ)	O - C
1	23.9190	0.0000	- 6	0.00000	3.8236	+ 73
2	23.2839	- 0.6351	- 6	0.40310	3.8277	+ 74
3	23.0000	- 0.9190	- 3	0.84525	3.8163	- 30
4	22.1593	- 1.7597	- 3	3.09976	3.8263	+ 10
5	- 21.9636	- 1.9554	0	3.82336	3.8236	+ 73
6	22.3968	- 1.7222	+ 3	2.96709	3.7936	+ 357
7	23.0000	- 0.9190	+ 3	0.84436	3.8137	- 39
8	23.2936	- 0.6254	+ 6	0.39094	3.8118	- 75

$\bar{x}$ = 23.9190

	y	y - y₀	Δy	(y - y₀)²		
1	- 13.8997	- 1.9503	- 1	3.80336	180	
2	17.0000	- 1.8500	- 1	3.42225	179	
3	17.1265	- 1.7235	- 1	2.97008	208	
4	15.0000	- 0.8500	- 1	0.72225	274	
5	15.8500	0.0000	0	0.00000	270	
6	17.0000	+ 1.1500	+ 1	1.32225	306	
7	17.5738	+ 1.7238	+ 1	2.97104	332	
8	17.6976	+ 1.8476	+ 1	3.41349	341	161°

Approx. Center

x = 23.9 y = 17.1265

17.5738

31.7003

y_0 15.8501

$\bar{y}$ 13.8997

1.9504

$\bar{x}$ 21.9636

23.9190

1.9554

Center { x_0 23.9190
{ y_0 15.8500

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Formation of Normals.

1	0.0	00	- 84.5
2	+ 1.18	- 54.0	- 155.0
3	+ 1.58	+ 27.5	+ 51.5
4	+ 1.50	- 17.6	- 8.5
5	0.0	- 84.5	0.0
6	- 0.90	+ 209.6	- 74.0
7	- 1.58	+ 36.0	- 67.0
8	- 1.17	+ 47.0	- 139.0
	+ 4.26	+ 320.0	+ 51.5
	- 3.65	- 156.1	- 602.0
	+ 0.61	+ 163.9	- 550.5

a	- 33
b	- 3
c	- 39

a	b	c	new o-c
+ 0	+ 6	- 33	- 53
+ 21	+ 6	- 12	+ 25
+ 30	+ 5	- 4	- 72
+ 58	+ 2	+ 21	+ 37 + 36
+ 65	0	+ 26	+ 105
+ 52	- 3	+ 10	- 181
+ 30	- 5	- 14	+ 19
+ 21	- 6	- 24	- 28

+ 0.61 + 17.66 = - 1.66 △

+ [illegible] + 0.37 = - 0.51 △

+ 17.29 = - 1.15 △

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1153-74 · Conditional Equations.

							O-C
1	0.00	-1.96	= +43	0	+63	= +63	-20
2	-0.64	-1.85	= +84	-12	+59	= +47	+37
3	-0.92	-1.72	= -30	-17	+55	= +38	-68
4	-1.76	-0.85	= +10	-32	+27	= -5	+15
5	-1.96	0.00	= +43	-36	0	= -36	+79
6	-1.57	+1.15	= -257	-29	-37	= -66	-191
7	-0.92	+1.72	= -39	-17	-55	= -72	+33
8	-0.63	+1.85	= -75	-12	-59	= -71	-4
					+164	-283	

Average 56

$+10.02 + 00.61 = +163.9$ $\quad -8.40\ \Delta$

$+0.61 + 17.66 = -550.5$ $\quad -1.66\ \Delta$

$+[\ \ ] + 0.04 = +9.9$ $\quad -.07\ \Delta$

$+17.62 = -560.4$ $\quad b = -31.9$

$+10.02 = +163.9 + 19.5 = +183.4$ $\quad a = +18.3$

$-0.84\ \Delta$

Arc Measured 161°

$\frac{P}{n} = .205$ $\qquad \frac{\Sigma v}{n} = -15$

In 5 $\quad R\ 1.95$

$-2RC = -1.95$ $\qquad \frac{-15}{205} = -73$ $\qquad \Delta R = -0.9$

Corr $+0.5$

$\Delta b = +0''.14$ $\qquad \Delta S = +0''.1$ $\qquad \Delta R\ -1.4$

$\Delta a = +1''.64$ $\qquad \Delta \gamma = +0''.06$

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11.77 Conductional Equations

						O-C
0.00	-1.76	+ 93	0	+ 63	= +63	- 24
-0.69	-1.75	+ 84	-12	+ 59	= +97	+ 37
-0.92	-1.72	- 20	-17	+ 55	= +38	- 68
-1.76	-0.85	+ 10	-32	+ 27	= - 5	+13
-1.76	0.00	+ 93	-36	-0	= -36	+ 79
-1.27	+1.15	- 237 4/4	-29	- 37	= -66	-191
-0.92	+1.72	- 39	-17	- 55	= -72	+ 33
-0.63	+1.85	- 75	-12	- 59	= -71	- 9
				+169	-283	

Arc 56

+10.02 + 00.61 = +163.9

+20.61 + 17.66 = -350.5

+[ ] + 3.09 = +9.9

+1762 = -360.9 b = -319

110.02 = +163.9 + 19.5 = 1183.4 a = +183

Arc Measured 161°

$\frac{P}{h}$ = -.265 $\frac{\Sigma v}{h}$ = -15

$\frac{-15}{205}$ = -73 Δk = -0.9

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1915 July 9 Moon's Mean Position 28

x_0 23.9190″
+ 9″
23.9199″

y_0 15°85′00″
-16″
15.8484″

From Plate constants.

x 24.0695″

ξ + 2.0695″

y 15.8351″

η − 2.1679″
828″

log ξ 0.31586″
Cos δ 999302
8.50727″
1.81360″

log tan δ 9.18647
ξ = 0.6317″
7.0537
6.8715″

d − A 65.03″

η, + .0007″

A 0 32 38.00″

log η_0 0.33558″
7.33115
3.00493″ η − 1010.3
760

α_0 0 33 03.03″

Red +7.51″

α 0 33 47.54″

δ − D −16 50.3″

D +8 56 30.0″

δ_0 +8 39 39.7″

Red +30.6″

δ' 8 40 10.3″

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11 99 Moons Mean Position

x_0 23.9190
+ 9
23.9199

y_0 15.85.00
-16
15.8484

From Plate Constants.

x 24.0695

ξ 12.0695

y 15.83.1

η -2.1699

log ξ 0.31336
cos 99.502
8.0729
1.81340

log tan 39.1864
z 06317
7.0537
6871

1-A 65.03

η + .0009

A 0 32 38.00

log η_0 0 33 58
7.33115
3.00497 n - 1010.3

δ -D -16 03

D_0 0 33 03.03

D +8 56 30.0

δ_0 +8 39 37.7

Red +30.6

δ' 8 70 103

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1915 9 9 Lunar Parallax.

α'	0	33	47.59	π	57	48.97
ϕ	3	00	29.83			
$\phi - \alpha' + 2$	26	42.31		9.86913		
$= \gamma - \alpha'$	36	40	37.65	8.22576		
$\frac{1}{2}(\gamma - \alpha')$			51.76	9.77618		
	36	39	42.89	0.00564		
				7.87671		

9.957127
0.000000
0.095773
0.053000

$\alpha - \alpha'$ 25 52.86
$=$ +1 43.52

γ 48 29 14.4

δ +8 40 10.3

$\gamma - \delta$ 39 49 04.1

9.826700
8.22576
9.806472
0.12563
7.98424

$\delta - \delta'$ +33 09.0

δ +9 13 19.3 α 0 35 31.06

Am Eph +9 13 13.4 Eph'd 0 35 30.34

O - C +5.9 O - C +0.72
Curv Corr +0.6 -0.03
2nd Ch. Ref. 0.0

Int Corr +0.1 +0.06

δ +9 13 19.4 α 0 35 31.12

O - C +6.0 +0.78
good.

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1153 79 Lunar Parallax.

x'	0	33	97.69"	
ϕ	3	00	29.23"	
z = x' +	2	26	92.39"	
=	36	90	39.43"	
½ (i+i')			51.76"	
½	36	39	91.87"	

π	57	98.97"		
	9.769	13		
	2	23	76"	
	9.771	89		
	0.00	36	8	
	7.877	67	6"	

9.995	12	9		
0.000	00	0		
0.095	73	"		
0.053	00	"		

x - x' 23 32.86

= 1 93.52

x 98 29 19.9"

λ + x 70 10.3"

x - λ 39 19 01.1"

9.826	70			
x 22	36	76"		
9.806	97	2		
0.125	63	"		
7.931	24			

λ - λ' 33 07.0"

λ +9 13 19.3" L 0 35 31.06

Corr Eph +9 13 13.7" Eph L 0 35 20.34"

O - C		+ 5.9"	O - C	+ 0.72
Corr Corr		+ 0.6		- 003
2nd Corr. Ref		0.0		

Good.

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1915 Aug 9

Reduction to Apparent Place

δ + 8 40.2

H + α	3	25.2	= 51	18.0	log cos δ	9.9950
H	2	52.2			n	+0.7693
α	0	33.0			(n)	0.7593
G	23	22.0				
G + α	23	55.0	= −1	15.		

log cos (G + α)	9.9999	log sin δ	9.1782
δ	1.3621	cos (H + α)	9.7960
sin	8.3387 n	h	1.2929
tan δ	9.1832	sin (H + α)	9.8923
	8.8239	sec δ	0.0050
			8.8239

log g'	1.3620	h'	0.2671
g	7.7079 n	h	0.0141

f	+3.487
g	−.005
h	+1.033
	+4.515

g'	23.015
h'	+1.850
i	+5.795
	+30.610

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11.'99

Reduction to Apparent Place

δ + 8° 40' 2

H + α 2 23 2 = 51 18.0 log cos δ 9 9 9 3 0

H 2 32.2 n + 0 7 6 9 2

α 0 33 0 (n) 0 7 5 9 3

α + α 23 23 55.0 = − 1 15.

log sin δ 9 1 7 8 2

log cos (H + α) 9 7 9 6 0

t 1 27 29

log cos (H + α) 9 9 9 9 9 sin (H + α) 9 8 9 2 3

δ 1 36 21 log t 0 0 0 5 0

log cos δ 8.3387 n 8 5 2 3 9

log sin δ 9.1832

8 5 2 3 9

log z' 1.3620 t' 0.2671

z 7.7079 4 t 0.0191

f + 3.987 g' 23.015

g − .005 t + 1.350

t + 1.033 + 5.792

+ 9.515 + 30.610

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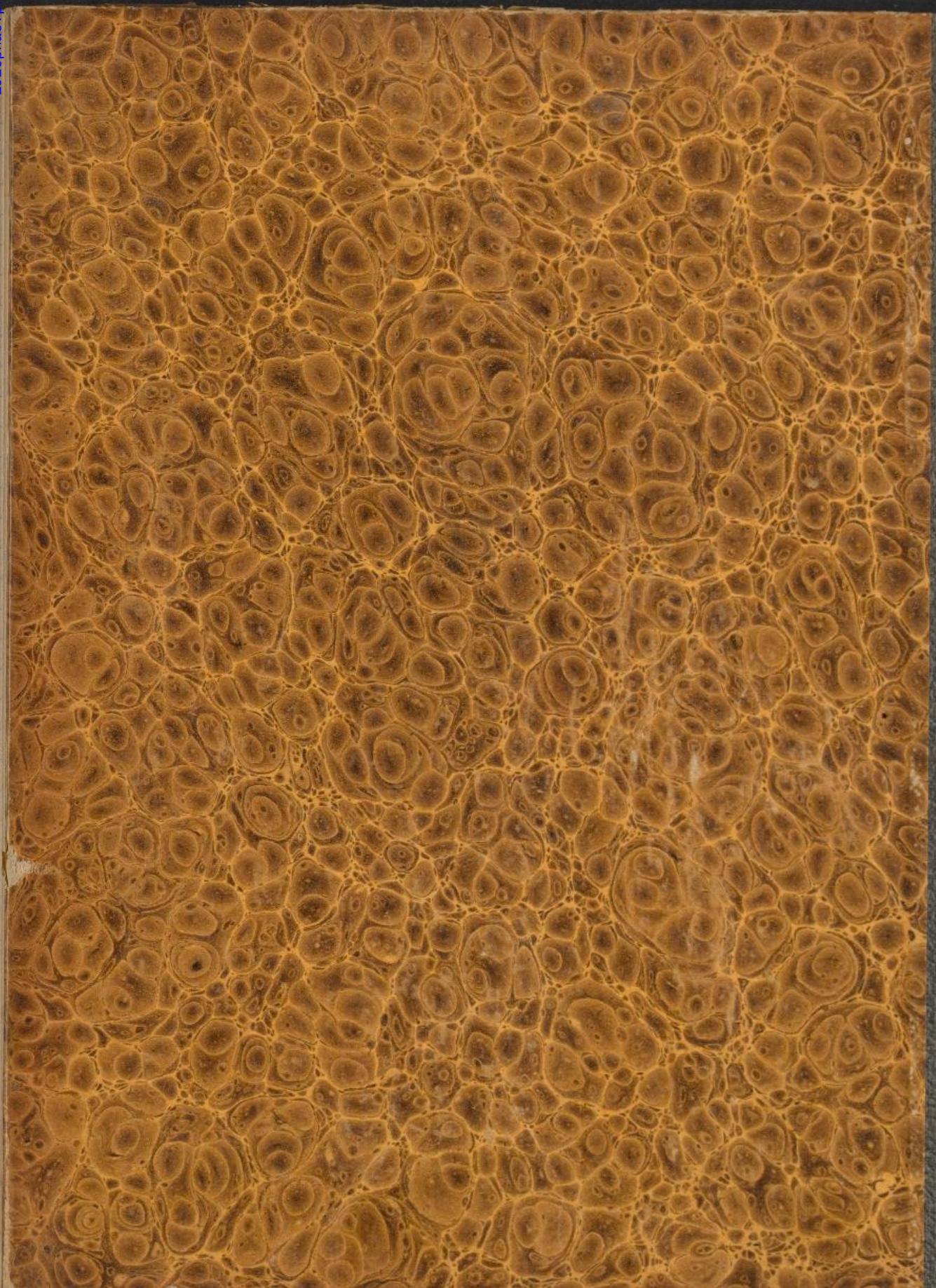
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