

KG
11366
v. 976



Miss Fowler.

| δ | α | α |
|----------|----------------|----------|
| 346 | 19802 | 18729 |
| 152 | 1619099 | 1230815 |
| | 90 | 00 |
| | 97 | 04 |
| | <u>34.6393</u> | 6409 |

| δ | α | α |
|----------|---------------|--------------|
| 132 | 5541 | 15668 |
| | 4241 | 1792021 |
| | 12500 | 30 |
| | <u>180746</u> | <u>.0744</u> |

8346 Butars - measures

1916 May 22.

| α | δ | α | δ |
|------------------------|--------------|----------------|--------------|
| $\frac{1}{2}$ 20630 | 18419 | 19227 | 19050 |
| 141 19820 | 9225 | 18440 | 982119 |
| 13.2 1921 | 2026 | 4133 | 2219 |
| 14 | 11 | 19 | 56 |
| <u>14.0809</u> | <u>.0812</u> | <u>13.0788</u> | <u>.0765</u> |
| $\frac{2}{24.6}$ 19242 | 17540 | 19435 | 17331 |
| 7.4 1233128 | 14420 | 15432 | 1130200 |
| 30 | 2229 | 3533 | 0900 |
| 26 | 29 | 29 | 39 |
| <u>24.6501</u> | <u>.6887</u> | <u>7.3998</u> | <u>.3968</u> |
| $\frac{3}{283}$ 18626 | 16144 | 18410 | 16388 |
| 222 15875 | 8889 | 1720710 | 758586 |
| 7669 | 8279 | 01 | 80 |
| 10 | 30 | 10 | 81 |
| <u>28.2747</u> | <u>.2749</u> | <u>22.1204</u> | <u>.1205</u> |

above measures.

| | | |
|------------------------|----------------|--------------|
| $\frac{1}{2}$ 244 | 17066 | 9304 |
| 73.2 | 1636172 | 0815 |
| min | 7072 | 8600 |
| 8 | 66 | 0709 |
| $\frac{2}{25.0}$ | <u>13.0698</u> | <u>19613</u> |
| 13.3 | 17057 | 1147265 |
| | 15210 | 69 |
| | 1809 | 20 |
| | 54 | <u>.1850</u> |
| | <u>13.1844</u> | |
| $\frac{2}{26.1}$ 13019 | 14918 | |
| 146 1258073 | 1915 | |
| 7073 | 14471 | |
| <u>26.0445</u> | <u>.0446</u> | |

$\frac{4}{18.2}$ $\frac{2}{19802}$
 $\frac{18.2}{1619099}$
 $\frac{90}{97}$
34.6393

$\frac{2}{18729}$
 $\frac{18729}{1230815}$
 $\frac{00}{04}$
.6409

$\frac{4}{13255}$ $\frac{2}{4241}$
 $\frac{13255}{12500}$
18.0746

$\frac{2}{15668}$
 $\frac{15668}{1497021}$
 $\frac{30}{0744}$
.0744

8346

Factors

measures

1916 May 22

a

v

a

v

$$\begin{array}{r} 120630 \\ 141 \ 19820 \\ 132 \quad 1921 \\ \quad 14 \\ \hline 14.0809 \end{array}$$

$$\begin{array}{r} 18419 \\ 9225 \\ 2026 \\ \quad 11 \\ \hline 0812 \end{array}$$

$$\begin{array}{r} 19227 \\ 18440 \\ 4133 \\ \quad 19 \\ \hline 13.0788 \end{array}$$

$$\begin{array}{r} 19050 \\ 982119 \\ \quad 22 \\ \quad 56 \\ \hline 0765 \end{array}$$

$$\begin{array}{r} 19242 \\ 246 \ 1233128 \\ 7.4 \quad 30 \\ \quad 26 \\ \hline 27.6901 \end{array}$$

$$\begin{array}{r} 17540 \\ 14420 \\ 2229 \\ \quad 29 \\ \hline 6887 \end{array}$$

$$\begin{array}{r} 19435 \\ 15432 \\ 3533 \\ \quad 29 \\ \hline 7.3998 \end{array}$$

$$\begin{array}{r} 17331 \\ 1130200 \\ \quad 09 \\ \quad 39 \\ \hline 3968 \end{array}$$

$$\begin{array}{r} 18626 \\ 283 \ 15879 \\ 122 \quad 7669 \\ \quad 10 \\ \hline 28.2747 \end{array}$$

$$\begin{array}{r} 16144 \\ 8889 \\ 8279 \\ \quad 30 \\ \hline 2749 \end{array}$$

$$\begin{array}{r} 18410 \\ 1720710 \\ \quad 01 \\ \quad 10 \\ \hline 22.1204 \end{array}$$

$$\begin{array}{r} 16388 \\ 758586 \\ \quad 80 \\ \quad 81 \\ \hline 1201 \end{array}$$

new measures

$$\begin{array}{r} 1 \\ 244 \\ 132 \\ \quad 8 \\ \hline 50 \\ 138 \end{array}$$

$$\begin{array}{r} 17066 \\ 1636172 \\ \quad 70 \\ \quad 66 \\ \hline 13.0698 \end{array}$$

$$\begin{array}{r} 930415 \\ \quad 08 \\ 8600 \\ \hline 0709 \end{array}$$

$$\begin{array}{r} 13019 \\ 140 \ 1258073 \\ \quad 7073 \\ \hline 26.0445 \end{array}$$

$$\begin{array}{r} 1491815 \\ \quad 1915 \\ 14471 \\ \hline 0446 \end{array}$$

$$\begin{array}{r} 17057 \\ 1521009 \\ \quad 18 \\ \quad 54 \\ \hline 13.1844 \end{array}$$

$$\begin{array}{r} 19613 \\ 1147265 \\ \quad 69 \\ \quad 20 \\ \hline 1850 \end{array}$$

8346 Moon Measures 1916 May 22

$$\begin{array}{r}
 4 \\
 26.4 \\
 15.1 \\
 \times \\
 \hline
 16370 \\
 1261817 \\
 30 \\
 55 \\
 \hline
 26.3742
 \end{array}
 \qquad
 \begin{array}{r}
 19448 \\
 131925 \\
 8385 \\
 32 \\
 \hline
 .3749
 \end{array}$$

$$\begin{array}{r}
 5 \\
 26.3 \\
 16.0 \\
 \hline
 19981 \\
 18347 \\
 3942 \\
 67 \\
 \hline
 26.1636
 \end{array}
 \qquad
 \begin{array}{r}
 20353 \\
 11970 \\
 6975 \\
 45 \\
 \hline
 .1624
 \end{array}$$

$$\begin{array}{r}
 6 \\
 23.0 \\
 16.6 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19764 \\
 13384 \\
 8286 \\
 58 \\
 \hline
 16.6376
 \end{array}$$

$$\begin{array}{r}
 19921 \\
 1631918 \\
 10 \\
 10 \\
 \hline
 .6399
 \end{array}$$

$$\begin{array}{r}
 7 \\
 22.5 \\
 16.0 \\
 \hline
 19100 \\
 1394948 \\
 50 \\
 91 \\
 \hline
 22.5146
 \end{array}$$

$$\begin{array}{r}
 20515 \\
 1564947 \\
 50 \\
 07 \\
 \hline
 .5137
 \end{array}$$

$$\begin{array}{r}
 8 \\
 22.4 \\
 15.1 \\
 \text{min} \\
 \times \\
 \hline
 19100 \\
 1603838 \\
 30 \\
 86 \\
 \hline
 22.3059
 \end{array}$$

$$\begin{array}{r}
 16168 \\
 923028 \\
 30 \\
 62 \\
 \hline
 .3065
 \end{array}$$

$$\begin{array}{r}
 9 \\
 22.6 \\
 14.0 \\
 \hline
 20312 \\
 1394829 \\
 38 \\
 03 \\
 \hline
 22.6369
 \end{array}$$

$$\begin{array}{r}
 16180 \\
 1255959 \\
 60 \\
 70 \\
 \hline
 .6383
 \end{array}$$

$$\begin{array}{r}
 10 \\
 23.0 \\
 13.6 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19698 \\
 1392520 \\
 29 \\
 90 \\
 \hline
 13.5768
 \end{array}$$

$$\begin{array}{r}
 18103 \\
 1388363 \\
 85 \\
 02 \\
 \hline
 .5774
 \end{array}$$

8346 Moon measures 1916 May 22

$$\begin{array}{r}
 4 \\
 264 \\
 11.2 \\
 \times \\
 \hline
 16370 \\
 12618.7 \\
 30 \\
 55 \\
 \hline
 26.3742
 \end{array}$$

$$\begin{array}{r}
 19448 \\
 13192.5 \\
 8385 \\
 32 \\
 \hline
 3749
 \end{array}$$

$$\begin{array}{r}
 3.5 \\
 263 \\
 160 \\
 \hline
 19981 \\
 18347 \\
 3942 \\
 67 \\
 \hline
 26.1636
 \end{array}$$

$$\begin{array}{r}
 20358 \\
 11970 \\
 6975 \\
 45 \\
 \hline
 1624
 \end{array}$$

$$\begin{array}{r}
 6 \\
 230 \\
 160 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19764 \\
 13384.86 \\
 82 \\
 58 \\
 \hline
 166376
 \end{array}$$

$$\begin{array}{r}
 19921 \\
 16319.18 \\
 10 \\
 10 \\
 \hline
 6399
 \end{array}$$

$$\begin{array}{r}
 2 \\
 225 \\
 160 \\
 \hline
 19100 \\
 13949.48 \\
 50 \\
 91 \\
 \hline
 225146
 \end{array}$$

$$\begin{array}{r}
 20515 \\
 15649.47 \\
 50 \\
 07 \\
 \hline
 5137
 \end{array}$$

$$\begin{array}{r}
 8 \\
 224 \\
 151 \\
 11.2 \\
 \times \\
 \hline
 19100 \\
 16038.38 \\
 30 \\
 86 \\
 \hline
 223059
 \end{array}$$

$$\begin{array}{r}
 16168 \\
 9230.28 \\
 30 \\
 62 \\
 \hline
 3065
 \end{array}$$

$$\begin{array}{r}
 9 \\
 226 \\
 140 \\
 \hline
 20312 \\
 13948.29 \\
 38 \\
 0.3 \\
 \hline
 226369
 \end{array}$$

$$\begin{array}{r}
 16180 \\
 12559.59 \\
 60 \\
 70 \\
 \hline
 6383
 \end{array}$$

$$\begin{array}{r}
 10 \\
 230 \\
 136 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19698 \\
 13925.20 \\
 29 \\
 90 \\
 \hline
 135768
 \end{array}$$

$$\begin{array}{r}
 18103 \\
 13823.63 \\
 85 \\
 02 \\
 \hline
 5774
 \end{array}$$

8346

a

Moon measures

1916 May 22

d 4

N

$$\begin{array}{r} 11 \\ 240 \\ 13.2 \end{array}$$

19669

18140

1862939

915550

2339

51

67

18

13.10361032

Density 1

Times etc

Exp to stars

1915 May 20

13

54"

-14" 06"

... Moon

13

59

48.3

-13

59

48.5"

Clock fast

0 03.0

H. Sid T.

13

59

45.4

⊙ - α = +1^h 29^m~~H. Sid T.~~

4

44

31.05"

G. Sid T.

18

44

16.45"

Sid T. h. Moon

0

27

10.12"

Tulimare

18

17

06.33"

Red

2

59.73"

G. h. T.

18

14

06.60"

From hant Alm

R. A

Decl.

Moon 18"

12^m 29^m

51.85

-7

06

34.5

Motion in 2.2070

16.725

" 14.11

+

31.14

-

3

56.0

Tabular place

12

30

2.299

-7

10

30.5

Moon's age 15 days

36^m after full

parallel

60'

17.04

secundian

16

27.0

R

987.0

Augmentation

+

10.5

+ radiation (1)

+

0.2

R

997.7

R

2.1387

aR

-

1020

(1+a) R

-

2.0367

R²

-

4.1482

a = -501.0

$$\begin{array}{r} 24 \\ 477.0 \end{array}$$

8346

a

x lunon measures

1916

May 22

d 8

N

$$\begin{array}{r} 11 \\ 24 \\ 132 \end{array}$$

| | |
|---------------|-------------|
| 19669 | 18140 |
| 1862939 | 915550 |
| 2339 | 51 |
| 67 | 18 |
| <u>131036</u> | <u>1032</u> |

Density 1

Times etc

| | | | |
|-------------|-------------|---------|---------------------|
| Ext station | 1915 May 30 | 13° 54" | -14° 06" |
| Moon | | 13 59 | 48.3' - 13 59 48.5" |
| Clock fast | | 0 03.0 | |

| | | | |
|---------------------|-------|--------|-----------------|
| H. Sid T | 13 59 | 454" | G - x + 1 h 29" |
| H. Sid T | 4 44 | 31.01" | |
| G. Sid T | 18 44 | 1645" | |
| Sid T. h. Moon | 0 27 | 10.12" | |
| Inclination | 18 17 | 0633" | |
| Red | 2 | 5973" | |
| G. in T | 18 14 | 0660" | |

| | | |
|------------------|----------------|--------------|
| From hand Alm | R. A | Decl. |
| Moon 18" | 12° 29' 51.85" | -7 06' 34.5" |
| Motion 1" 2.2070 | | 16.721" |
| 14.11 | + 31.14 | - 3 56.0 |
| Tabular place | 12 30 2299 | -7 10 30.5 |

lunon's age 15 days. 36" after full.

parallel 60' 17" 04

semidiam 16 270

93429.4

987310.5

| | |
|------------------|--------|
| R | 9870 |
| Augmentation | + 105 |
| Irradiation (11) | + 0.2 |
| R | 9977 |
| R | 21387 |
| AR | - 1020 |
| (1+2) R | 20367 |
| R = | 41482 |

a - 501.0

$$\begin{array}{r} 24 \\ 477.0 \end{array}$$

34.6401 18.0745

8346

x

14.0810

24.6894

28.2748

3167.05

22.35

-22.

035

31

112

Plate Center + Constants

y

13.0776

7.3983

22.120242.60

14.20

-18.00

3.80

466

29' 32"

C. +

12 23 34

29 23

31 22

83 79

12 28 06

- 11

Recd.

12 24

59 00

58 45

122 129 69

03 23

+29 32

Center } $A = 12^h 28^m 00^s$
 } $D = -7^{\circ} 33' 50''$ $x - \bar{x} + 500x$

+19.34

+x

-12918

+5608 + 7040 = +12648 + 252 = +12900 + 14 = +12914

= -4

+411 + 12345 = +12756 + 142 = +12898 + 25 = +12923

= +5

-1669 + 14137 = +12468 + 427 = +12895 + 24 = +12923

= +5

-4789 + 17320 = +12531 + 349 = +12880 + 34 = +12914

= -4

243403 + 12170

+292

+24

= 24.2971

 $y - \bar{y} + 500y$

-12.6x

+7.5y

-2x + 29

-6978

+501 + 6539 = +7040 - 177 = +6863 + 98 = +6961 + 3 + 3 = +6961 = -17

+3556 + 3699 = +7255 - 311 = +6944 + 56 = +7000 - 5 + 1 = +6996 = +18

-3874 + 11060 = +7186 - 356 = +6830 + 166 = +6996 - 6 + 4 = +6994 = +16

-1772 + 9037 = +7265 - 436 = +6829 + 136 = +6965 - 7 + 4 = +6962 = -16

15.1090 + 7554

-307

+113

-5 + 3 = 15.1470

 $x - \bar{x} + 500x + 20.5y + 0.8x =$

+5608

+12928

+411

12928

-4789

12929

 $y - \bar{y} + 500y - 13.8x + 8.2y =$

+501

+6902

+3556

+6903

-1772

+6903

Using only 3
P.M. StarsTables a - = 0.5 $a = -4.8$ $a - c = +4.3$ $b + d = -3.8$ O. & (4) a - = 501.0 $a = -507.7$ $a - c = +6.7$ $b + a = -6.5$

O - C = 500.5 - 502.9

2.4

-2.9

Stars (3) -500.8 -508.2 $a - c = +7.6$ $b + d = -6.7$

8346

~~Plate~~ Center + Constants

| x | y | C + | Recd |
|--------|---------|----------|-----------|
| 140810 | 130776 | 12 23 34 | -8 12 24 |
| 246894 | 73983 | 29 23 | -8 59 00 |
| 282748 | 221202 | 31 22 | -6 58 45 |
| 36705 | 4260 | 83 79 | 12 129 69 |
| 2235 | 1470 | 12 28 06 | -8 03 23 |
| -22 | -1800 | | |
| 035 | 380 | | |
| 31 | 466 | | |
| 11 | 29' 32" | | |

Center } A = 12° 28' 00"
 (1) -7° 33' 50"

| | | | |
|------------------------|---------------|--------------|----------|
| 2.8 + 1200 | +19.34 | +X | -12918 |
| +5608 + 7040 = +12648 | +252 = +12900 | +12 = +12912 | = -4 |
| +411 + 12345 = +12756 | +142 = +12898 | +25 = +12923 | = +1 |
| +1669 + 14137 = +12468 | +427 = +12895 | +28 = +12923 | = +1 |
| +4789 + 17320 = +12531 | +349 = +12880 | +34 = +12914 | = -4 |
| 240403 + 12170 | +292 | +24 | = 242971 |

| | | | | |
|-----------------------|--------------|--------------|-----------------|-------|
| $\eta - \eta + 12004$ | -12.54 | +7.54 | -26224 | -6978 |
| +501 + 6539 = +7040 | -177 = +6863 | +98 = +6961 | +3 = +6961 | = -17 |
| +3556 + 3699 = +7255 | -311 = +6944 | +56 = +7000 | -5 + 1 = +6996 | = +18 |
| -3874 + 11060 = +7186 | -356 = +6830 | +146 = +6946 | -4 + 1 = +6994 | = +16 |
| -1772 + 9037 = +7265 | -436 = +6829 | +136 = +6965 | -7 + 4 = +6962 | = -16 |
| 15190 + 7554 | -307 | +113 | -5 - 3 = 151470 | |

Using only 3
 P.m. stars

| | |
|--|--------|
| $\eta - \eta + 12004 = 13.84 + 8.24 =$ | +12928 |
| +5608 | 12928 |
| -411 | 12929 |
| -4789 | |
| $\eta - \eta + 12004 = 13.84 + 8.24 =$ | +6902 |
| +501 | +6903 |
| -3556 | +6903 |
| -1772 | |

Table a = -0.5 c = -4.8 a - c = +4.3 b + d = -3.8
 O - C (4) = +501.0 c = -507.7 a - c = +6.7 b + d = -6.9
 2.4 2.7

p.m.

Cable No. 1715 my 4 8

12 34 0504

04

03

12 34 0504

+ 4640

12 34 51.44

12 28 00

+ 6 51.44

+ 411.38

2.61424

999624

1.11772

+ 13.1136

+ 54

35.1190

34.6401

~~45211~~

- 4789

- 7 26 427

427

43.1

- 7 26 42.8

- 4 57.8

- 7 31 40.6

- 7 33 50

+ 2 09.4

+ 129.4

2.11193

944308

91210

22354

84098

+ 0.2774

- 257

18.2517

18.0745

- 1772

1 -8.48 -9.96 -20 + 30 +10 -9 +6

2 +2.65 -10.96 +8 -9 -1 -8 -9

3 +6.47 +7.51 +10 -22 -12 +7 -8

4 +13.11 +0.28 +57 -76 +8 +0 +8

M +2.30 -2.85 0 -8 +2 -5

-33 +2

ΔH 1.74

- 13 +9 -6 +3 -3

- 15 +15 -10 -1 -1

+ 7 -6 +1 -2 -1

+ 1 -0 +1 -7 -3

0 +9 -7

-1

| 8346 Standard Coordinates | | | | | | | | | |
|----------------------------|--------|--------|----------|---------|----------------------------|----------|--------|--------|----------|
| P.M. Capelus. 1687 mag 6.7 | | | | | P.M. Capelus. 1703 mag 6.3 | | | | |
| C | 12 | 22 | 47.42 | 12 | 28 | 37.02 | 12 | 30 | 35.41 |
| L | | | .52 | | | .96 | | | .42 |
| E | | | .50 | | | .03 | | | .38 |
| Mean | 12 | 22 | 47.48 | 12 | 28 | 37.00 | 12 | 30 | 35.40 |
| Proc | | + | 46.11 | | + | 46.36 | | + | 46.41 |
| a | 12 | 23 | 33.59 | 12 | 29 | 23.36 | 12 | 31 | 21.81 |
| A | 12 | 28 | 00 | 12 | 28 | 00 | 12 | 28 | 00 |
| A-A | | - 4 | 26.41 | | + | 1 23.36 | | + | 3 21.81 |
| tan(A) | | | - 266.39 | | | + 83.36 | | | + 201.80 |
| log | | 24 | 25.51 | | 19 | 20.96 | | 23 | 30.49 |
| sec | | 9.99 | 55.3 | | 9.99 | 46.4 | | 9.99 | 67.7 |
| 30 | | 0.92 | 82.8 | | 0.42 | 28.4 | | 0.80 | 89.3 |
| 30 | | - 8.47 | 77.8 | | + 2.64 | 75 | | + 6.44 | 07 |
| 30 | | - | 20 | | + | 8 | | + | 10 |
| 30 | | 13.52 | 02 | | 24.64 | 83 | | 28.44 | 17 |
| x | | 14.08 | 10 | | 24.68 | 94 | | 28.27 | 48 |
| 2-3 | | + 56 | 08 | | + | 41 | | - 16 | 69 |
| C | - 8 | 07 | 24.9 | - 8 | 54 | 01.6 | - 6 | 53 | 46.7 |
| L | | | 24.9 | | | 01.2 | | | 46.8 |
| E | | | 24.8 | | | 02.1 | | | 46.3 |
| Mean | - 8 | 07 | 24.9 | - 8 | 54 | 01.6 | - 6 | 53 | 46.6 |
| Proc | - | 4 | 59.2 | - | 4 | 58.2 | - | 4 | 58.0 |
| S | - 8 | 12 | 24.1 | - 8 | 58 | 59.8 | - 6 | 58 | 44.6 |
| D | - 7 | 33 | 50 | - 7 | 33 | 50 | - 7 | 33 | 50 |
| S-D | - | 38 | 34.1 | - 1 | 25 | 09.8 | + | 35 | 05.4 |
| tan(D) | | | - 2814.2 | | | - 5100.9 | | | + 2105.5 |
| log | | 3,36 | 44.0 | | 3.70 | 85.0 | | 3.32 | 33.5 |
| no | | 0.69 | 55.5 | | 1.03 | 96.5 | | 0.65 | 45.0 |
| tan | | 9.15 | 90 | | 9.19 | 89 | | 9.08 | 78 |
| 32 | | 1.85 | 66 | | 0.84 | 59 | | 1.61 | 79 |
| 31 | | 8.06 | 90 | | 7.09 | 80 | | 7.75 | 91 |
| no | - 4.96 | 08 | | - 10.95 | 60 | | + 4.51 | 33 | |
| 31 | - | 11 | 7 | - | 13 | | - | 57 | |
| 31 | 13.02 | 75 | | 7.04 | 27 | | 22.50 | 76 | |
| 31 | 13.07 | 76 | | 7.39 | 83 | | 22.12 | 02 | |
| 31 | + 50 | 1 | | + 35 | 56 | | - 38 | 74 | |

Calc. no. 1715 my 4.8

12 34 05.04

.04

.03

12 34 05.04

+ 46.40

12 34 51.44

12 28 00

+ 6 51.44

+ 411.38

2.61424

999624

1.11772

+ 13.1136

+ 54

35.1190

34.6401

~~+ 52.11~~

- 4789

- 7 26 42.7

42.7

43.1

- 7 26 42.8

- 4 57.8

- 7 31 40.6

- 7 33 50

+ 2 09.4

+ 129.4

2.11193

944308

9.1210m

22354

8.4098m

+ 0.2774

- 257

18.2517

15.0745

- 1772

| 8346 Standard Coordinates | | | | | | | | | |
|---------------------------|----|----|---------|------|--------------------|----|--------|------|--------------|
| Capella 1687 my 67 | | | | | Capella 1703 my 53 | | | | |
| C | 12 | 22 | 47 | 42 | 12 | 28 | 37 | 02 | 12 30 35.41 |
| L | | | 52 | | | | 96 | | +2 |
| E | | | 50 | | | | 03 | | 38 |
| Mean | 12 | 22 | 47 | 48 | 12 | 28 | 37 | 00 | 12 30 35.40 |
| Proc | | + | 46.11 | | | + | 46.36 | | + 46.41 |
| A | 12 | 23 | 33 | 59 | 12 | 29 | 23 | 36 | 12 31 21.81 |
| A | 12 | 28 | 00 | | 12 | 28 | 00 | | 12 28 00 |
| A-A | | -4 | 26 | 41 | | + | 1 | 23 | 36 + 3 21.81 |
| A(A-A) | | | -266.39 | | | | +8336 | | + 201.80 |
| log | | 2 | 72551 | | | 1 | 92096 | | 2.30492 |
| log | | 9 | 99553 | | | 9 | 99464 | | 9 99677 |
| 3 | | 0 | 92828 | | | 0 | 42284 | | 0.80893 |
| S ₀ | | -5 | 4778 | | | +2 | 6475 | | +6.4407 |
| S ₁ | | - | 20 | | | + | 8 | | + 10 |
| S | | 13 | 5202 | | | 2 | 46483 | | 28.4417 |
| X | | 14 | 0810 | | | 2 | 46894 | | 28.2748 |
| 2-3 | | | +5608 | | | + | 411 | | -1669 |
| | | | | | | | | | |
| C | -8 | 07 | 24.9 | | -8 | 54 | 01.6 | | -6 53 46.7 |
| L | | | 24.9 | | | | 01.2 | | 46.8 |
| E | | | 24.8 | | | | 02.1 | | 46.3 |
| Mean | -8 | 07 | 24.9 | | -8 | 54 | 01.6 | | -6 53 46.6 |
| Proc | | - | 4 | 59.2 | | - | 4 | 58.2 | - 4 58.0 |
| S | -8 | 12 | 24.1 | | -8 | 58 | 59.8 | | -6 58 44.6 |
| D | -7 | 33 | 50 | | -7 | 33 | 50 | | -7 33 50 |
| S-D | | - | 38 | 34.1 | | -1 | 25 | 09.8 | + 35 05.4 |
| tan(60) | | | -23142 | | | | -51009 | | + 21055 |
| log | | 3 | 36440 | | | 3 | 70850 | | 3.32335 |
| log | | 0 | 69555 | | | 1 | 03965 | | 0.65450 |
| log | | 9 | 1590 | | | 9 | 1989 | | 9.0878 |
| S ² | | 18 | 566 | | | 08 | 457 | | 1.6179 |
| η ₁ | | 8 | 0690 | | | 7 | 0980 | | 7.7591 |
| η ₀ | | -4 | 9608 | | | -1 | 09560 | | +4.5133 |
| η ₁ | | - | 11.7 | | | - | 13 | | - 57 |
| η | | 13 | 0275 | | | 7 | 0427 | | 22.5076 |
| η | | 13 | 0776 | | | 7 | 3983 | | 22.1202 |
| η-m | | | +501 | | | + | 3556 | | -3874 |

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8346

| | x | $x - x_0$ | Δx | $(x - x_0)^2$ | $(x - x_0)^2 (y - y_0)^2$ | $0 - c$ |
|----|----------|-----------|------------|---------------|---------------------------|---------|
| 1 | 24.3390 | 0.0000 | -7 | 0.0000 | 4.1550 | + 68 |
| 2 | 25.0000 | +0.6610 | -6 | 0.4361 | 4.1383 | - 99 |
| 3 | 26.0446 | +1.7056 | -4 | 2.9077 | 4.1363 | -119 |
| 4 | +26.3746 | +2.0356 | +0 | 4.1432 | 4.1432 | - 50 |
| 5 | 26.1630 | +1.8240 | +3 | 3.3281 | 4.1245 | -237 |
| 6 | 23.0000 | -1.3390 | +5 | 1.7916 | 4.1368 | -114 |
| 7 | 22.5142 | -1.8248 | +3 | 3.3288 | 4.1252 | -230 |
| 8 | -22.3062 | -2.0328 | +0 | 4.1323 | 4.1323 | -159 |
| 9 | 22.6376 | -1.7014 | -4 | 2.8961 | 4.1247 | -235 |
| 10 | 23.0000 | -1.3390 | -5 | 1.7942 | 4.1397 | - 85 |
| 11 | 24.0000 | -0.3390 | -7 | 0.1154 | 4.1370 | -112 |

4.1482 + c

| | y | $y - y_0$ | Δy | $(y - y_0)^2$ | c |
|----|----------|-----------|------------|---------------|---------|
| 1 | -13.0704 | -2.0376 | -8 | 4.1550 | 180 |
| 2 | 13.1847 | -1.9233 | -8 | 3.7022 | 161 |
| 3 | 14.0000 | -1.1080 | -4 | 1.2288 | 123 |
| 4 | 15.1080 | 0.0000 | 0 | 0.0000 | 90 |
| 5 | 16.0000 | +0.8920 | +4 | 0.7964 | 69 |
| 6 | 16.6388 | +1.5308 | +6 | 2.3452 | 320 319 |
| 7 | 16.0000 | +0.8920 | +4 | 0.7964 | 296 |
| 8 | 15.1080 | 0.0000 | +0 | 0.0000 | 270 |
| 9 | 14.0000 | -1.1080 | -4 | 1.2288 | 237 |
| 10 | 13.5771 | -1.5309 | -6 | 2.3455 | 221 |
| 11 | 13.1034 | -2.0046 | -8 | 4.0216 | 290 |

190 full

$$x = 23 \quad y = 16.6388$$

$$13.5771$$

$$302159$$

$$y = 15.1080$$

$$y - \text{min} = 13.0704$$

$$20376$$

$$20376$$

$$x - \text{max} = 26.3746 \quad x = 22.3062$$

$$x_0 = 24.3370 \quad x_0 = 24.3438$$

$$y = 16. \quad x = 26.1630$$

$$22.5142$$

$$48.6772$$

$$x_0 = 24.3386$$

$$\text{Center} \begin{cases} x_0 = 24.3390 \\ y_0 = 15.1080 \end{cases}$$

8346

| | x | $x - \bar{x}$ | Δ | $(x - \bar{x})^2$ | $(x - \bar{x})(y - \bar{y})$ | $y - \bar{y}$ |
|----|---------|---------------|----------|-------------------|------------------------------|---------------|
| 1 | 24.3390 | 0.0000 | -7 | 0.0000 | 4.1550 | +6.8 |
| 2 | 25.0000 | +0.6610 | -6 | 0.4361 | 4.1383 | -9.9 |
| 3 | 26.0446 | -1.7056 | -4 | 2.9077 | 4.1363 | -11.9 |
| 4 | 26.3746 | -2.0356 | +0 | 4.1432 | 4.1432 | -5.0 |
| 5 | 26.1630 | +1.8240 | +3 | 3.3281 | 4.1245 | -2.37 |
| 6 | 23.0000 | -1.3390 | -5 | 1.7916 | 4.1368 | -1.14 |
| 7 | 22.5142 | -1.8248 | +3 | 3.3288 | 4.1252 | -2.30 |
| 8 | 22.3062 | -2.0328 | +0 | 4.1323 | 4.1323 | -1.59 |
| 9 | 22.6376 | -1.7014 | -4 | 2.8961 | 4.1247 | -2.35 |
| 10 | 23.0000 | -1.3390 | -5 | 1.7942 | 4.1397 | -8.5 |
| 11 | 24.0000 | -0.3390 | -7 | 0.1154 | 4.1370 | -1.12 |

4.1482

| | y | $y - \bar{y}$ | Δ | $(y - \bar{y})^2$ | \bar{y} |
|----|---------|---------------|----------|-------------------|-----------|
| 1 | 13.0704 | -2.0376 | -8 | 4.1550 | 18.0 |
| 2 | 13.1847 | -1.9233 | -8 | 3.7022 | 16.1 |
| 3 | 14.0000 | -1.1080 | -4 | 1.2288 | 12.3 |
| 4 | 15.1080 | 0.0000 | 0 | 0.0000 | 9.0 |
| 5 | 16.0000 | +0.8920 | +4 | 0.7964 | 6.9 |
| 6 | 16.6388 | +1.5308 | -6 | 2.3452 | 3.20 |
| 7 | 16.0000 | +0.8920 | +4 | 0.7964 | 2.96 |
| 8 | 15.1080 | 0.0000 | +0 | 0.0000 | 2.70 |
| 9 | 14.0000 | -1.1080 | -4 | 1.2288 | 2.37 |
| 10 | 13.5771 | -1.5309 | -6 | 2.3455 | 2.21 |
| 11 | 13.1034 | -2.0046 | -8 | 4.0216 | 2.90 |

$$\bar{x} = 23 \quad \bar{y} = 16.6388$$

$$13.5771$$

$$3.02159$$

$$\bar{y} = 15.1080$$

$$\bar{x} = 23.0704$$

$$2.0376$$

$$x = 26.3746 \quad y = 22.3062$$

$$x_0 = 24.3370 \quad x_1 = 24.3438$$

$$\bar{y} = 16 \quad x = 26.1630$$

$$22.5142$$

$$4.86772$$

$$x_0 = 24.3386$$

$$\text{Center } \left\{ \begin{array}{l} \bar{x} = 24.3390 \\ \bar{y} = 15.1080 \end{array} \right.$$

| | | | |
|----|---------------|----------------|----------------|
| 1 | - 0.00 | + 0.0 | - 139.2 |
| 2 | - 1.27 | - 65.3 | + 190.0 |
| 3 | - 1.90 | - 203.5 | + 132.0 |
| 4 | + 0.00 | - 102.0 | - 0.0 |
| 5 | + 1.62 | - 431.0 | - 245.0 |
| 6 | - 2.05 | + 152.8 | - 174.5 |
| 7 | - 1.62 | + 419.0 | - 204.8 |
| 8 | - 0.00 | + 322.8 | - 0.0 |
| 9 | + 1.89 | + 399.0 | + 261.5 |
| 10 | + 2.05 | + 113.9 | + 130.0 |
| 11 | + 0.68 | + 38.0 | + 224.0 |
| | <u>- 0.60</u> | <u>+ 643.7</u> | <u>+ 204.0</u> |

| | | |
|------|------|--------------------|
| - 2 | - 6 | + 0.0 |
| + 0 | - 50 | + 32 [✓] |
| + 5 | - 48 | + 39 [✓] |
| + 14 | - 28 | + 68 [✓] |
| + 16 | + 0 | + 98 [✓] |
| + 14 | + 22 | + 118 [✓] |
| - 10 | + 38 | + 110 [✓] |
| - 14 | + 22 | + 90 [✓] |
| - 16 | + 0 | + 66 [✓] |
| - 14 | - 27 | + 41 [✓] |
| - 10 | - 38 | + 34 [✓] |
| - 2 | - 50 | + 30 [✓] |

Inv. 1. (12)

Inv. - 1.0

8346

Moon's Center

O₊

c

o-c Corr

| | | | | |
|----|-----------------------|------------------|-------|-------|
| 1 | + 0.00 - 2.04 = + 68 | + 0 - 22 = - 22 | + 90 | + 122 |
| 2 | + 0.66 - 1.92 = - 99 | + 17 - 20 = - 3 | - 87 | - 48 |
| 3 | + 1.71 - 1.11 = - 119 | + 45 - 12 = + 33 | - 152 | - 84 |
| 4 | + 2.04 + 0.00 = - 50 | + 53 + 0 = + 53 | - 103 | - 5 |
| 5 | + 1.82 + 0.89 = - 237 | + 48 + 9 = + 57 | - 294 | - 176 |
| 6 | + 1.34 + 1.53 = - 114 | - 35 + 16 = - 19 | - 95 | + 15 |
| 7 | + 1.82 + 0.89 = - 230 | - 48 + 9 = - 39 | - 191 | - 101 |
| 8 | - 2.03 + 0.00 = - 159 | - 53 + 0 = - 53 | - 106 | - 40 |
| 9 | - 1.70 - 1.11 = - 235 | - 44 - 12 = - 56 | - 179 | - 138 |
| 10 | - 1.34 - 1.53 = - 85 | - 35 - 16 = - 51 | - 34 | 0 |
| 11 | - 0.34 - 2.00 = - 112 | - 9 - 21 = - 30 | - 82 | - 52 |
| | | + 90 | - 132 | 3 |

Normal Equations

$$+ 24.87 - 0.60 + 644 + 224 \Delta$$

$$- 0.60 + 20.62 = + 204 - 6.42 \Delta$$

$$+ 0.60 - 0.01 = + 16 - 0.05 \Delta$$

$$+ 20.61 = + 220 - 6.47 \Delta$$

$$b = + 10.65 - 0.31 \Delta$$

$$+ 24.87 = + 644 + b - + 650$$

$$a = + 2.61 - 0.09 \Delta$$

Arc 319'

 $\frac{f}{n}$

$$\frac{f}{n} = .99 \quad - 112 \quad - \frac{112}{.99} = - 113 \quad \Delta R = - 1.4$$

Correction

$$- 1.0 \text{ double}$$

True ΔR

$$- 0.4$$

$$- 2R = - 4.07 \quad \Delta = - 2R \times \text{corr} = + 4.1$$

$$\Delta b = - 1''.27 - 25 \quad \Delta \delta = - 0''.6$$

$$\Delta a = - 0''.4 - 8 \quad \Delta \alpha = - 0''.01$$

8346

Mars Center

O

C

O-C

| | | | | | |
|----|-----------------|-------|-------------|------|--------|
| 1 | + 0.00 - 2.04 = | + 68 | + 0 - 22 = | - 22 | + 90 |
| 2 | + 0.66 - 1.92 = | - 99 | + 17 - 20 = | - 3 | - 87 |
| 3 | + 1.71 - 1.11 = | - 119 | + 45 - 12 = | + 33 | - 152 |
| 4 | + 2.04 + 0.00 = | - 50 | + 53 + 0 = | + 53 | - 103 |
| 5 | + 1.82 + 0.89 = | - 237 | + 48 + 9 = | + 57 | - 294 |
| 6 | + 1.34 + 1.53 = | - 114 | + 35 + 16 = | + 51 | - 45 |
| 7 | + 1.82 + 0.89 = | - 230 | + 48 + 9 = | - 39 | - 191 |
| 8 | + 2.03 + 0.00 = | - 119 | + 53 + 0 = | - 53 | - 106 |
| 9 | + 1.70 - 1.11 = | - 235 | + 44 - 12 = | - 56 | - 179 |
| 10 | + 1.34 - 1.53 = | - 85 | + 35 - 16 = | - 51 | - 34 |
| 11 | + 0.34 - 2.00 = | - 112 | + 9 - 21 = | - 30 | - 82 |
| | | | | + 90 | - 1323 |

Normal Equations

$$+ 24.87 - 0.60 = + 644$$

$$- 0.60 + 20.62 = + 204$$

$$+ 0.60 - 0.01 = + 16$$

$$+ 20.61 = + 220$$

$$b = + 10.65$$

$$+ 24.87 = + 644 + b = + 654$$

$$a = + 261$$

arc 319°

 $\frac{E}{m}$

$$\frac{p}{m} = 99$$

$$- 112$$

$$- \frac{112}{99} = -113$$

$$\Delta R = - 1.4$$

8346

Woods Mean Positions (1915)

$$X_0 = 24.3390$$

$$Y_0 = 15.1080$$

$$\begin{array}{r} \bar{x} = \quad + \quad 13 \\ \hline 24.3403 \end{array}$$

$$\begin{array}{r} \bar{y} = \quad + \quad 10 \\ \hline 15.1090 \end{array}$$

From plate constants $X = 24.2971$ $Y = 15.1470$

$$\bar{x} = +2.2971$$

$$\log \bar{x} = 0.36118$$

$$\begin{array}{r} \log \bar{x} = 9.99552 \\ 8.50724 \end{array}$$

$$((\bar{x} - A)) = 1.85812$$

$$\bar{x} - A = +1 \quad 12.13$$

$$A = 12 \quad 28 \quad 00$$

$$\bar{x} = 12 \quad 29 \quad 12.13$$

$$Red = +2.54$$

$$\bar{x} = 12 \quad 29 \quad 14.67$$

$$\eta = -2.8530$$

$$\log \tan \delta = 9.1480m$$

$$07224$$

$$7.0534$$

$$6.9238$$

$$\eta_1 = -8$$

$$\eta_0 = -2.8522$$

$$\log \eta_0 = 0.45518m$$

$$7.33115$$

$$((\bar{\delta} - D)) = 3.12403m$$

$$\bar{\delta} - D = -22 \quad 10.6$$

$$D = -7 \quad 33 \quad 50$$

$$\delta = -7 \quad 56 \quad 00.6$$

$$Red = -17.7$$

$$\delta = -7 \quad 56 \quad 18.3$$

Moore Mean Positions (1915.)

$$\begin{array}{r} X: 24339.0 \\ + 13 \\ \hline 24340.3 \end{array} \quad \begin{array}{r} Y: 15.1080 \\ + 10 \\ \hline 15.1090 \end{array}$$

From plate constants $X = 24.2971$ $Y = 15.1470$

$$\begin{array}{r} \bar{x} = +229.71 \\ \log \bar{x} = 0.36118 \\ \log \bar{y} = 9995.82 \\ 850724 \end{array}$$

$$A-A = 1.85812$$

$$x-A = +1 \quad 12.13$$

$$A \quad 12 \quad 28 \quad 00$$

$$\alpha = 12 \quad 29 \quad 12.13$$

$$\text{Red} \quad + \quad 254$$

$$\delta = 12 \quad 29 \quad 14.67$$

$$\eta = -28530$$

$$\begin{array}{r} \log \eta = 9.1480 \\ 07224 \\ 70534 \\ \hline 69238 \end{array}$$

$$\eta_1 = -8$$

$$\eta_2 = -28522$$

$$\begin{array}{r} \log \eta_2 = 0.45518 \\ 733115 \end{array}$$

$$(S-D) = 3.12403m$$

$$S-D = -22 \quad 10.6$$

$$D = -7 \quad 33 \quad 5.0$$

$$S = -7 \quad 56 \quad 00.6$$

$$\text{Red} \quad - \quad 17.7$$

$$\delta = -7 \quad 56 \quad 18.3$$

$$\begin{array}{r}
 12 \quad 25 \quad 3036 \\
 \underline{2786} \\
 + 250 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -16 \quad 02 \quad 50.0 \\
 \underline{32.3} \\
 -17.7 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 12 \quad 34 \quad 53.99 \\
 \underline{51.45} \\
 + 2.54 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -7 \quad 31 \quad 58.5 \\
 \underline{40.6} \\
 -17.9 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 12 \quad 15 \quad 36.00 \\
 \underline{33.43} \\
 + 2.57 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -0 \quad 11 \quad 57.5 \\
 \underline{40.2} \\
 -17.3 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1.15 \quad 20 \quad 2.5 \quad 30 \quad 35 \\
 \hline
 -20
 \end{array}$$

$$\begin{array}{r}
 1. \\
 \hline
 -15
 \end{array}$$

$$\begin{array}{r}
 \odot \quad .2 \\
 \hline
 -10
 \end{array}$$

$$\begin{array}{r}
 \hline
 -5
 \end{array}$$

$$\begin{array}{r}
 \hline
 0
 \end{array}$$

8346

Red. ad locum apt.

$$\delta = -7^{\circ} 56'$$

$$H + \chi \quad 5^h \quad 47^m.8 = 86^{\circ} 57'$$

$$H \quad 17 \quad 18.6$$

$$\chi \quad 12 \quad 29.2$$

$$G \quad 21 \quad 07.8$$

$$G + \alpha \quad 9 \quad 37.0 = 144^{\circ} 15'$$

$$l \cos(\delta + \alpha) \quad 9.9093m$$

$$g \quad 1.0726$$

$$\sin \quad 9.7666$$

$$\tan \delta \quad 9.1441m$$

$$8.8239$$

$$" \quad 8' \quad 09819m$$

$$8 \quad 8.8072m$$

$$l + 1.334$$

$$8 - 0.064$$

$$h + 1.266$$

$$+ 2.536 \checkmark$$

$$l \cos \delta \quad 9.9958$$

$$i \quad 0.9049m$$

$$(i) \quad 0.9007m$$

$$l \sin \delta \quad 9.1399m$$

$$\cos(H + \chi) \quad 8.7260$$

$$h \quad 1.2748$$

$$\sin \quad 9.9994$$

$$\sec \delta \quad 0.0042$$

$$8.8239$$

$$h' \quad 9.1407m$$

$$h \quad 0.1023$$

$$g \quad -9.59$$

$$h' \quad -0.14$$

$$i \quad -7.96$$

$$-17.69 \checkmark$$

8346

Red. ad. locum apt.

 $\delta = -7^{\circ} 56'$

$$H + \lambda \quad 5^{\circ} \quad 47^{\circ} 8' = 86^{\circ} 57'$$

$$H \quad 17 \quad 18.6$$

$$\lambda \quad 12 \quad 29.2$$

$$G \quad 21 \quad 07.8$$

$$G + \lambda \quad 9 \quad 37.0 = 144^{\circ} 15'$$

$$L \cos(\theta + \alpha) \quad 99093 \sim$$

$$g \quad 10726$$

$$L \sin \quad 97666$$

$$L \cos \delta \quad 91441 \sim$$

$$88239$$

$$8' \quad 09819 \sim$$

$$8 \quad 88072 \sim$$

$$f = 1.334$$

$$g = 0.064$$

$$h = 1.266$$

$$+ 2.536$$

$$L \cos \delta \quad 99958$$

$$L \quad 09049 \sim$$

$$(i) \quad 09007 \sim$$

$$L \sin \delta \quad 9.1399 \sim$$

$$\cos(H + \lambda) \quad 87260$$

$$L \quad 12748$$

$$L \sin \quad 99994$$

$$L \cos \delta \quad 0.0042$$

$$88239$$

$$L' \quad 9.1407 \sim$$

$$L \quad 0.1023$$

$$8' \quad -9.59$$

$$L' \quad -0.14$$

$$i \quad -7.96$$

$$-17.69$$

8346

Lunar parallax.

$$\alpha = 12^h 29^m 14^s.67$$

$$S = -7^\circ 56' 18.3''$$

$$\odot \quad 13 \quad 59 \quad 45.4$$

$$\odot - \alpha = 1 \quad 30 \quad 30.73$$

$$\pi \quad 60' \quad 17''.04$$

$$= + 22^\circ 37' 40''$$

$$+ \quad \quad \quad 8 \quad 40$$

$$22 \quad 29 \quad 00$$

$$9.95727$$

$$0.00000$$

$$0.03433$$

$$9.99160$$

$$\delta = 44 \quad 26 \quad 50$$

$$- 7 \quad 56 \quad 18$$

$$52 \quad 23 \quad 08$$

$$9.82640$$

$$8.24390$$

$$9.89880$$

$$0.15474$$

$$8.12384$$

$$S-S' \quad + 45 \quad 43.3$$

$$S \quad - 7 \quad 10 \quad 35.0$$

$$Ann Eph. S = - 7 \quad 10 \quad 30.5$$

$$O-C \quad - 4.5$$

$$Curv. of Plate \quad - 0.0$$

$$2nd Ord. Ref. \quad + 0.1$$

$$Corrected Irradiation \quad - 0.6$$

$$Final S \quad - 7 \quad 10 \quad 35.5$$

$$O-C \quad - 5.0$$

$$9.86913$$

$$8.24390$$

$$9.58517$$

$$0.00342$$

$$7.70162$$

$$\alpha - \alpha' = + 17' \quad 17''.64$$

$$= + 1^m \quad 09^s.18$$

$$\alpha \quad 12 \quad 30 \quad 23.85$$

$$\alpha = 12 \quad 30 \quad 22.99$$

$$+ 0.86$$

$$- 0.02$$

$$- 0.01$$

$$12^h \quad 30^m \quad 23^s.85$$

$$+ 0.85$$

case 1038

07 14

09.10

09.09

09.11

8346

Lunar parallax.

$$\alpha = 12^h 29^m 14^s.67$$

$$S = -7^\circ 56' 18.3''$$

$$\odot \quad 13 \quad 59 \quad 45.4$$

$$\odot - \alpha = 1 \quad 30 \quad 30.73$$

$$\pi \quad 60' \quad 17.04''$$

$$= + 22^\circ 37' 40''$$

$$+ \quad \quad \quad 8 \quad 40$$

$$22 \quad 29 \quad 00$$

$$9.95727$$

$$0.00000$$

$$0.03433$$

$$9.99160$$

$$\delta = 44 \quad 26 \quad 50$$

$$- 7 \quad 56 \quad 18$$

$$52 \quad 23 \quad 08$$

$$9.82640$$

$$8.24390$$

$$9.89580$$

$$0.15474$$

$$8.12384$$

$$S - S' \quad + 45 \quad 43.3$$

$$S \quad - 7 \quad 10 \quad 35.0$$

$$\alpha \quad 12 \quad 30 \quad 23.85$$

$$\text{Ann Eph. } S = - 7 \quad 10 \quad 30.5$$

$$\alpha = 12 \quad 30 \quad 22.99$$

$$O - C \quad - 4.5$$

$$+ 0.86$$

$$\text{Corr. of Plate} \quad - 0.0$$

$$- 0.02$$

$$\text{2nd Ord. Ref.} \quad + 0.1$$

$$\text{Corrected Irradiation} \quad - 0.6$$

$$- 0.01$$

$$\text{Final } S \quad - 7 \quad 10 \quad 35.5$$

$$12^h \quad 30^m \quad 23^s.85$$

$$O - C \quad - 5.0$$

$$+ 0.85$$

8346

Lunar parallel

 $\alpha = 12^h 29^m 14.67$ $\delta = -7^\circ 56' 18.3$ $\odot = 13 \quad 59 \quad 41.4$ $\Theta \alpha = 1 \quad 30 \quad 30.73$ $\Pi = 60' 17.04$ $+ 22^\circ 37' 40''$ $+ \quad \quad \quad + 0$ $22 \quad 29 \quad 00$

995727

000000

003433

999160 $\alpha = 44 \quad 26 \quad 50$ $- 7 \quad 56 \quad 18$ $52 \quad 23 \quad 08$

982640

824390

989480

0.15474

812384

 $\delta - S \quad + 45 \quad 43.3$ $S \quad - 7 \quad 10 \quad 35.0$

Ann Eph S = -7 10 30.5

 $O - C \quad - 4.5$

Curv. of Plate = 0.0

2nd Ord. Res. + 0.1

9.86913

824390

958517

0.00342

7.70762

 $\alpha - \alpha = + 17 \quad 17.64$ $+ 1^m \quad 09.18$ $\alpha \quad 12 \quad 30 \quad 23.85$ $\alpha \quad 12 \quad 30 \quad 22.99$ $+ 0.86$ $- 0.02$

1
13
13

2
23
8

2
23
8

4
33
18

1
21
13

2
23
1

3
22
14

8347 x Stars Measures

1916 May 24.

| α | δ | α | δ | α | δ | α | δ |
|-----------------|---------------|----------------|--------------|----------|----------|----------|----------|
| 1 1 49 85 | 92 28 18 | 1 6 8 20 | 155 43 | | | | |
| 13.1 1 11 60 55 | 21 | 94 98 99 | 128 61 68 | | | | |
| 13.7 51 | 84 02 | 90 | 68 68 | | | | |
| | | 34 | 56 | | | | |
| <u>13.0830</u> | <u>.0870</u> | <u>13.7335</u> | <u>.7320</u> | | | | |
| 2 23.7 19 790 | 20 195 | 13 217 | 132 34 | | | | |
| 82 126 45 | 17 320 20 | 12 225 | 24 30 | | | | |
| 42 46 | 21 | 23 29 | 122 70 | | | | |
| 75 | 06 | | | | | | |
| <u>23.7135</u> | <u>.7122</u> | <u>8.0991</u> | <u>.0959</u> | | | | |
| 3 27.3 17 770 | 18 689 | 18 619 | 183 40 | | | | |
| 22.8 15 388 90 | 14 080 82 | 10 304 97 | 166 58 55 | | | | |
| 90 | 84 | 60 | 61 | | | | |
| 63 | 00 | 22 | 50 | | | | |
| <u>27.2375</u> | <u>.12385</u> | <u>22.8321</u> | <u>.8316</u> | | | | |
| 4 33.6 16 821 | 17 639 | 17 690 | 158 23 | | | | |
| 18.8 10 601 99 | 13 831 83 | 9 560 66 | 139 40 | | | | |
| 96 | 38 | 59 | 41 40 | | | | |
| 00 | 45 | 93 | 20 | | | | |
| <u>33.6209</u> | <u>.6151</u> | <u>18.8130</u> | <u>.8118</u> | | | | |

Moon - measures.

| | | |
|--------------|----------------|--------------|
| 1 24.0 | 170 20 | 157 71 |
| 13.4 | 144 10 28 | 83 56 60 |
| min | 12 | 57 |
| ny | 14 | 70 |
| 2 23.0 | <u>13.2601</u> | <u>.2588</u> |
| 13.6 | 170 69 | 168 78 |
| | 11 600 95 | 122 80 82 |
| | 90 | 76 |
| | 78 | 80 |
| 3 15 950 | <u>13.5478</u> | <u>.5500</u> |
| 22.5 11 226 | | |
| 140 21 26 | | |
| 45 | | |
| <u>.4724</u> | <u>.4715</u> | |

8347 x Stars measures

1916 May 21

| d | n | d | n |
|----------------|--------------|----------------|-------------|
| 1 14985 | 9228.8 | 1 6820 | 15543 |
| 131 11160.55 | 21 | 949899 | 12861.68 |
| 137 51 | 8402 | 90 | 68.68 |
| | | 34 | 56 |
| <u>13.0830</u> | <u>0820</u> | <u>137335</u> | <u>7320</u> |
| 2 | | | |
| 237 19790 | 20195 | 13217 | 13234 |
| 82 12645 | 17320.20 | 12225 | 2430 |
| 4246 | 21 | 2329 | 12270 |
| 75 | 06 | | |
| <u>237135</u> | <u>7122</u> | <u>8.0991</u> | <u>0959</u> |
| 3 | | | |
| 273 17770 | 18689 | 18619 | 18340 |
| 228 15388.90 | 14080.82 | 1030497 | 16658.55 |
| 90 | 84 | 00 | 61 |
| 63 | 00 | 22 | 50 |
| <u>27.2375</u> | <u>12885</u> | <u>22.8321</u> | <u>8316</u> |
| 4 | | | |
| 336 16821 | 17639 | 17690 | 15823 |
| 188 10601.99 | 13831.83 | 9560 | 13840 |
| 9679 | 3883 | 5966 | 4140 |
| 00 | 45 | 93 | 20 |
| <u>33.6209</u> | <u>6191</u> | <u>18.8130</u> | <u>8118</u> |

Moon measures

| | | | |
|------|--------------|----------------|-------------|
| 1 | | | |
| 240 | | 17020 | 15771 |
| 134 | | 14410.28 | 8356.60 |
| mm | | 12 | 57 |
| -8 | | 14 | 70 |
| 2 | | <u>13.2601</u> | <u>2588</u> |
| 23.0 | | 17069 | 16778 |
| 136 | | 11600.95 | 12280 |
| | | 90 | 7682 |
| | | 78 | 80 |
| 3 | | <u>13.5478</u> | <u>5500</u> |
| 225 | 15950 | | |
| 140 | 11226 | 16270 | |
| | 2126 | 10983.80 | |
| | 45 | 88 | |
| | | 68 | |
| | <u>4.724</u> | <u>4.715</u> | |

8347 \times known measures 1916 May 24.

10797 1026052
22.0+ 10720 52
15.2 15.2 10178

min
x

22.0081

.0077

12.2 19951
16.0 18540
5341

17455
88566-
60

50

60

22.1406

.1400

23.0
17.1

reversed
1237060
6060

16392 set

13755

16039

6070

12995-

3732

13000

.0368 17.0356

25.8 1389074
16.0 80
13320

14385-
1384033
44

25.9439

.9454

8 17496
26.1 1675560
15.3 50

1414939
4239
13391

known

\times 26.0741

.0752

25.5 19526
14.0 1345848
4848
2

18509
1458981
29
10

25.6067

.6074

10
25.0
13.5

20162
1516040
52
45

18646
13640
3235-
45

13.5003

.4991

8347 \times known measures 1916 May 21

$$\begin{array}{r} 10797 \\ 220+ 10720 \\ 150 \\ \hline 112 \end{array} \quad \begin{array}{r} 1026852 \\ 52 \\ \hline 10178 \end{array}$$

$$\begin{array}{r} 22.0081 \\ \hline \end{array} \quad \begin{array}{r} 0077 \\ \hline \end{array}$$

$$\begin{array}{r} 19951 \\ 160 18540 \\ 5341 \\ 50 \\ \hline 22.1406 \end{array} \quad \begin{array}{r} 17459 \\ 88566- \\ 60 \\ 60 \\ \hline 1400 \end{array}$$

$$\begin{array}{r} 1237060 \\ 60 \\ \hline 12995- \end{array} \quad \begin{array}{r} 16392 \text{ star} \\ 16039 \\ 3732 \\ \hline 17.0356 \end{array} \quad \begin{array}{r} 13755- \\ 6070 \\ \hline 13000 \end{array}$$

$$\begin{array}{r} 1389074 \\ 140 80 \\ \hline 13320 \end{array} \quad \begin{array}{r} 14385- \\ 1384033 \\ 44 \\ \hline 0368 \end{array}$$

$$\begin{array}{r} 25.9439 \\ \hline \end{array} \quad \begin{array}{r} 9454 \\ \hline \end{array}$$

$$\begin{array}{r} 17496 \\ 261 1675520 \\ 153 50 \\ \hline 13391 \end{array} \quad \begin{array}{r} 1414939 \\ 4239 \\ \hline 13391 \end{array}$$

$$\begin{array}{r} 26.0741 \\ \hline \end{array} \quad \begin{array}{r} 0752 \\ \hline \end{array}$$

$$\begin{array}{r} 15515526 \\ 14.0 1345848 \\ 48 \\ 2 \\ \hline 25.6067 \end{array} \quad \begin{array}{r} 18509 \\ 1458981 \\ 79 \\ 10 \\ \hline 6074 \end{array}$$

$$\begin{array}{r} 25.6067 \\ \hline \end{array} \quad \begin{array}{r} 6074 \\ \hline \end{array}$$

$$\begin{array}{r} 20162 \\ 151 6040 \\ 52 \\ 45 \\ \hline 135003 \end{array} \quad \begin{array}{r} 18646 \\ 13640 \\ 3235- \\ 45- \\ \hline 4991 \end{array}$$

| | | | | | | | |
|-----------------|--------------|----|-----------------|-------|------|-------------------------|-----------------|
| 8347 | Times etc. | | | | | | |
| Exh to stars | 1915 Mar. 30 | 14 | 09 ^m | | - 14 | 21 ^m | |
| " " Moon | | 14 | 15 | 20.3 | - 14 | 15 | 20.5 |
| check fact | | | 0 | 03.0 | | | |
| H Sid T. | | 14 | 15 | 17.4 | | 0 - X = +1 ^m | 44 ^m |
| H long | | 4 | 44 | 31.05 | | | |
| G Sid T. | | 18 | 59 | 48.45 | | | |
| Sid T. in hours | | 0 | 27 | 10.12 | | | |
| Interv. | | 18 | 32 | 38.33 | | | |
| Red. | | | 3 | 02.28 | | | |
| G.M.T. | | 18 | 29 | 36.05 | | | |

| | | | | | | | |
|-----------------------------|----|----|-------|-----|------|--------|-------|
| From East Alen. | | | | R A | | Decl. | |
| Moon 18 ^m | 12 | 29 | 51.85 | | - 7° | 06' | 34".5 |
| Moon 18 ^m 2.2075 | | | | | | 16.722 | |
| " " 29.601 | 1 | | 05.34 | | - 8 | 15.0 | |
| Tubular place | 12 | 30 | 57.19 | | - 7 | 14 | 49.5 |

Moon's age 15 days. 15^m min. after (full)

parallax 60' 17".30

semidiameter 16' 27".05

R 9.87.05

Augmentation + 10.8

Irradiation (+) + .2

R 997.35

R 2.1350

ak - 10.21

2.0359

41449

$$934 = 9.05$$

$$987 = 10.8$$

$$a = -501.4$$

$$\frac{24}{977.4}$$

$$977.4$$

$$(1+a)R$$

$$R2$$

8347 *Truncus etc*
 Exh. 5 stars 1915 Mar 30 14 09" - 14 21"
 Moon 14 15 28.3 - 14 15 20.5
 Clock fast 0 030

H Sid 1 14 15 17.4 9-2-+1" 44"
 H long 4 44 31.05
 G Sid 1 18 59 48.45
 Sid 1. H long 0 27 10.12
 Inten 18 32 38.33
 Red 3 02.28
 G. H T. 18 29 36.05

From Hart Alm R A Head
 Moon 16 12 29 51.85 - 7 06 34.5
 Inten 15 22071 16.722
 29.601 1 05.34 - 8 15.0
 Tabular place 12 30 57.19 - 7 14 49.5

Moon's age 15 days 152 min. after full
parallax 60' 17' 30"

semidiam 16' 27.05"

933-905

947-105

R 987.05"

Augmentation +10.8

Transit (+1) +.2

R 997.35

R 21380

AK - 1021

11221 R 20359

R2 41449

2-501.4

24

477.4

8347

Plate Constant

| | | | | |
|---------------|---------|---------|---------|---------|
| x | 13.0825 | 23.7128 | 27.2380 | 33.6200 |
| y | 13.5202 | 24.6483 | 28.4417 | 35.1190 |
| $x - \bar{x}$ | -4377 | -9355 | -12037 | -14990 |
| $y - \bar{y}$ | 13.7328 | 8.0975 | 22.8318 | 18.8124 |
| $y - \bar{y}$ | 13.0275 | 7.0427 | 22.5076 | 18.2517 |
| $y - \bar{y}$ | +7053 | +10548 | +3242 | +5607 |

$$\begin{array}{rclcl}
 x - \bar{x} & +500x & +62y & +1.4x & -3034 \\
 -4377 & +6541 & +2164 & +851 & = +3015 + 18 = +3033 = -1 \\
 -9355 & +11856 & +2501 & +502 & = +3003 + 33 = +3036 = +2 \\
 -12037 & +13619 & +1582 & +1415 & = +2997 + 38 = +3035 = +1 \\
 -14990 & +16810 & +1820 & +1166 & +2986 + 47 = +3033 = -1 \\
 21.0418 & +12021 & +945 & +34 & = 25.0387
 \end{array}$$

$$\begin{array}{rclcl}
 y - \bar{y} & +500y & -54.7x & +9.7y & -x - .2y & -1338 \\
 +7053 & +6866 & +13919 & -716 & = +13203 + 133 = +13336 - 13 - 3 = +13320 = -18 \\
 +10548 & +4049 & = +14597 - 1303 & = +13294 + 88 = +13382 - 24 - 2 = +13356 = +18 \\
 +3242 & +11416 & = +14658 - 1490 & = +13168 + 221 = +13389 - 27 - 5 = +13357 = +19 \\
 +5607 & +9406 & = +15013 - 1835 & = +13174 + 182 = +13356 - 34 - 4 = +13318 = -20 \\
 15.2933 & +7647 & = 13.15 & +145 & -24 - 3 = 14.6048
 \end{array}$$

Tables a = -1.0 e = -5.0 a - e = +4.0 b + a = -4.8
 Abs a = -501.4 e = -509.5 a - e = +8.1 b + a = -6.3
 -500.4 -504.5 -1.5

8347

Plate Constant

| | | | | |
|---|--------|--------|--------|--------|
| x | 130825 | 237128 | 272380 | 336200 |
| y | 135202 | 246483 | 284417 | 351150 |
| z | -4377 | -9355 | -12037 | -14990 |
| u | 137328 | 80975 | 228318 | 188124 |
| v | 130275 | 70427 | 225076 | 182517 |
| w | +7053 | +10548 | +3242 | +5607 |

$$\begin{array}{rclcl}
 2-3 & +500\mu & +62\mu & +1.4\mu & -3034 \\
 -4377 - 6541 & +2164 + 857 & = +3015 + 18 & = +3033 & = -1 \\
 -9355 + 11856 & = +2501 + 502 & = +3003 + 33 & = +3036 & = +2 \\
 -12037 + 13619 & + 1582 + 1415 & = +2997 + 38 & = +3035 & = +1 \\
 -14990 + 16810 & + 1820 + 1166 & + 2986 + 47 & = +3033 & = -1 \\
 24.0718 + 12021 & + 945 & + 34 & = 250387
 \end{array}$$

$$\begin{array}{rclcl}
 4-7 & +120\mu & -54.7\mu & +9.7\mu & -2-24 & -15352 \\
 +7053 + 68662 & + 12919 - 716 & = +13203 + 133 & + 13336 - 13 - 3 & = +13320 & = 48 \\
 +10548 + 4049 & = +14597 - 1303 & = +13294 + 88 & = +13382 - 24 - 2 & = +13356 & = 112 \\
 +3242 + 11416 & = +14658 - 1495 & = +13163 + 221 & = +13384 - 27 - 2 & = +13357 & = 119 \\
 +5607 + 9406 & + 15013 - 1839 & = +13174 - 182 & + 13256 - 34 - 4 & = +13318 & = 20 \\
 152438 + 7647 & = 13.5 & + 148 & - 24 - 3 & = 14604
 \end{array}$$

Tables 2: - 1.0 2: - 5.0 2: - 6.0 2: + 4.0 2: + 9.0 2: - 4.8
 Abs 2: - 501.4 2: - 509.5 2: - 4.0 2: + 8.1 2: - 6.3



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Moon's Center

| | X | X - X ₀ | Δx | (x - X ₀) ² | (x - X ₀) ² (y - Y ₀) ² | O - C |
|----|---------|--------------------|----|------------------------------------|---|-------|
| 1 | 24.0000 | 0 - 0.0420 | -8 | 0.0018 | 4.1406 | -43 |
| 2 | 23.0000 | -1.0420 | -7 | 1.0872 | 4.1350 | -99 |
| 3 | 22.4720 | -1.5700 | +5 | 2.4664 | 4.1395 | -54 |
| 4 | 22.0079 | -2.0341 | +0 | 4.1376 | 4.1376 | -73 |
| 5 | 22.1403 | -1.9017 | +3 | 3.6153 | 4.1155 | -294 |
| 6 | 23.0000 | -1.0420 | +7 | 1.0843 | 4.1254 | -195 |
| 7 | 25.9446 | +1.9026 | +3 | 3.6210 | 4.1212 | -237 |
| 8 | 26.0746 | +2.0326 | +0 | 4.1315 | 4.1315 | -134 |
| 9 | 25.6070 | +1.5650 | +5 | 2.4476 | 4.1207 | -242 |
| 10 | 25.0000 | +0.9580 | +7 | 0.9164 | 4.1348 | -101 |

4.1449

| | y | y - Y ₀ | Δy | (y - Y ₀) ² | Σ |
|----|---------|--------------------|----|------------------------------------|-----------------------|
| 1 | 13.2594 | -2.0336 | -8 | 4.1388 | +180 |
| 2 | 13.5489 | -1.7451 | -7 | 3.0474 | 211 ^v |
| 3 | 14.0000 | -1.2930 | -5 | 1.6731 | 231 ^v |
| 4 | 15.2930 | -0.0000 | 0 | 0.0000 | 270 ^v |
| 5 | 16.0000 | +0.7070 | +3 | 0.5002 | 290 ^v |
| 6 | 17.0362 | +1.7432 | +7 | 3.0411 | 329 ^v |
| 7 | 16.0000 | +0.7070 | +3 | 0.5002 | 70 ^v |
| 8 | 15.2930 | +0.0000 | 0 | 0.0000 | 90 ^v |
| 9 | 14.0000 | -1.2930 | -5 | 1.6731 | 130 ^v |
| 10 | 13.4997 | -1.7933 | -7 | 3.2184 | 152 ^v full |

$$x = 23.0 \quad y = 13.5489$$

$$\begin{array}{r} 17.0362 \\ 30.5851 \end{array}$$

$$Y_0 = 15.2926$$

$$y_{\text{min}} = 13.2594$$

$$R = 20332$$

$$x_{\text{min}} = 22.0079$$

$$X_0 = 24.0411$$

$$20332$$

$$26.0746$$

$$24.0414$$

$$\text{Center } \left\{ \begin{array}{l} X_0 = 24.0420 \\ Y_0 = 15.2930 \end{array} \right.$$

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moving center

| | X | X - X ₀ | Δ | $(x - X_0)^2$ | $(x - X_0)(y - Y_0)$ | O - C |
|----|---------|--------------------|----------|---------------|----------------------|-------|
| 1 | 24.0000 | -0.0420 | +8 | 0.0018 | 4.1406 | -43 |
| 2 | 23.0000 | -1.0420 | +7 | 1.0872 | 4.1350 | +99 |
| 3 | 22.4720 | -1.5700 | +5 | 2.4664 | 4.1395 | -54 |
| 4 | 22.0079 | -2.0341 | +0 | 4.1376 | 4.1376 | -73 |
| 5 | 22.1403 | -1.9017 | +3 | 3.6153 | 4.1155 | -294 |
| 6 | 23.0000 | -1.0420 | +7 | 1.0843 | 4.1254 | -195 |
| 7 | 25.9446 | +1.9026 | +3 | 3.6210 | 4.1212 | -237 |
| 8 | 26.0746 | +2.0326 | +0 | 4.1315 | 4.1315 | -134 |
| 9 | 25.6070 | +1.5650 | +5 | 2.4476 | 4.1207 | -242 |
| 10 | 25.0000 | +0.9580 | +7 | 0.9164 | 4.1348 | -101 |

4.1449

| | y - Y ₀ | Δ | $(y - Y_0)^2$ | Σ |
|----|--------------------|----------|---------------|----------|
| 1 | -13.2594 | -8 | 4.1388 | +180 |
| 2 | 13.5489 | -7 | 3.0478 | 211 |
| 3 | 14.0000 | -5 | 1.6731 | 231 |
| 4 | 15.2930 | 0 | 0.0000 | 270 |
| 5 | 16.0000 | +3 | 0.5002 | 290 |
| 6 | 17.0362 | +7 | 3.0411 | 329 |
| 7 | 16.0000 | +3 | 0.5002 | 70 |
| 8 | 15.2930 | 0 | 0.0000 | 90 |
| 9 | 14.0000 | -5 | 1.6731 | 130 |
| 10 | 13.4997 | -7 | 3.2184 | 152 |

full

$$x = 23.59 = 13.5489$$

$$\underline{17.0362}$$

$$30.5851$$

$$y = 15.2926$$

$$y - \text{mean} = 13.2594$$

$$R = 20.332$$

$$x - \text{mean} = 22.0079$$

$$X_0 = 24.0411$$

$$20.332$$

$$26.0746$$

$$24.0414$$

$$\text{Center } \begin{cases} X_0 = 24.0420 \\ Y_0 = 15.2930 \end{cases}$$

Formation of Normals.

| | | | |
|----|---------------|---------------|----------------|
| 1 | + 0.08 | + 1.7 | + 87.3 |
| 2 | + 1.82 | + 103.0 | + 173.3 |
| 3 | + 2.02 | + 84.9 | + 69.7 |
| 4 | - 0.00 | + 148.2 | - 0.0 |
| 5 | - 1.35 | + 559.0 | - 209.0 |
| 6 | - 1.81 | + 202.8 | - 339.5 |
| 7 | + 1.35 | - 450.0 | - 168.3 |
| 8 | + 0.00 | - 272.0 | - 0.0 |
| 9 | - 2.02 | - 380.0 | + 31.20 |
| 10 | - 1.72 | - 97.0 | + 180.8 |
| | <u>- 1.63</u> | <u>- 99.4</u> | <u>+ 106.3</u> |

| -a | -b | +51 ΔC |
|------|------|--------------------|
| - 2 | - 18 | + 61 [✓] |
| - 47 | - 15 | + 19 [✓] |
| - 71 | - 11 | - 1 [✓] |
| - 91 | + 0 | - 10 [✓] |
| - 85 | + 6 | + 2 [✓] |
| - 47 | + 15 | + 49 [✓] |
| + 85 | + 6 | + 172 [✓] |
| + 91 | + 0 | + 172 [✓] |
| + 71 | - 12 | + 140 [✓] |
| + 43 | - 15 | + 109 [✓] |

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| | O | C | O-C | Corr |
|----|---------------------|---------------|---------|------|
| 1 | -0.04 - 2.032 = -43 | T0 - 11 = -11 | -32 | +29 |
| 2 | -1.04 - 1.75 = -99 | +3 - 10 = -7 | -92 | -73 |
| 3 | -1.57 - 1.29 = -54 | +6 - 7 = -3 | -51 | -52 |
| 4 | -2.03 + 0.00 = -73 | +8 + 0 = +8 | -81 | -91 |
| 5 | -1.90 + 0.71 = -294 | +7 + 4 = +11 | -305 | -303 |
| 6 | -1.04 + 1.74 = -195 | +3 + 10 = +13 | -208 | -159 |
| 7 | +1.90 + 0.71 = -237 | -7 + 4 = -3 | -234 | -62 |
| 8 | +2.03 + 0.00 = -134 | -8 + 0 = -8 | -126 | +46 |
| 9 | +1.57 - 1.29 = -242 | -6 - 7 = -13 | -229 | -89 |
| 10 | +0.96 - 1.79 = -101 | -4 - 10 = -14 | -87 | +22 |
| | -1.16 - 1.99 | | -1445.0 | |

Normal Equations

$$+23.51 - 1.63 = -99 - 1.16$$

$$- 1.63 + 17.79 = +106 - 1.99$$

$$+ 1.63 - 0.11 = -7 - 0.08$$

$$+17.68 = +99 - 2.09 \quad \Delta = +5.6 - 0.11$$

$$+23.51 = -99 + 9 = -90$$

$$a = -3.8 - 0.56$$

Arc 339°

 $\frac{\Sigma V}{n}$

$$\frac{p}{n} = 1.0$$

$$-144.5 - \frac{-144.5}{1} = -144.5 \quad \Delta R = -1.8$$

$$\text{corr.} = -1.0$$

$$\text{True } \Delta R = 0.8$$

$$-2R = -4.07 \quad -2RC = +4.07 \quad +8.1$$

$$\Delta b = -0.45 - 9 \quad \Delta \delta = -0.2$$

$$\Delta a = -2.27 - 45 \quad \Delta \alpha = -0.8$$

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| | | D | C | O-C |
|----|---------------|-----------|-------|-----|
| 1 | -004-2033-43 | TO-11:-11 | -32 | |
| 2 | -104-175=-99 | +3-10:-7 | -92 | |
| 3 | -157-129=-54 | +6-7:-3 | -51 | |
| 4 | -203+000:-73 | -8+0:-8 | -81 | |
| 5 | -190+071:-294 | +7+4:+11 | -305 | |
| 6 | -104+174:-195 | +3+10:+13 | -208 | |
| 7 | +190+071:-237 | -7+4:-3 | -234 | |
| 8 | +203+000:-134 | -8+0:-8 | -126 | |
| 9 | +157-129:-242 | -6-7:-13 | -229 | |
| 10 | +096-179:-121 | -4-10:-14 | -87 | |
| | | | -1445 | |

Normal Equations

$$+2351 - 163 = -99$$

$$-163 + 1779 = +106$$

$$+163 - 0.11 = -7$$

$$+17.68 = +99$$

$$A = +5.6$$

$$+2351 = -99 + 9 = -90$$

$$a = -3.8$$

Arc 339

$$\frac{P}{m} = 1.0$$

$$-144.5 - \frac{-144.5}{1} = 144.5 \quad \Delta R = -1.8$$

8347

Moon's lunar position (1915.0)

$$\begin{array}{r} X_0 = 24.0420 \\ \frac{1}{2}a = \underline{\quad -2 \quad} \\ 24.0418 \end{array} \quad \begin{array}{r} Y_0 = 15.2930 \\ \frac{1}{2}b = \underline{\quad +3 \quad} \\ 15.2933 \end{array}$$

From plate constants $x = 25.0387$ $y = 14.6048$

$$\bar{x} = +3.0387$$

$$\eta = -3.3952$$

$$\begin{array}{r} \log \bar{x} = 0.48269 \\ \log \cos = 9.99575 \\ 8.50724 \end{array}$$

$$\begin{array}{r} \log \tan S = 9.1478 \\ 09654 \\ \underline{70534} \\ 7.1666 \end{array}$$

$$\therefore (x-A) = 1.97970$$

$$\eta_1 = -15$$

$$\alpha - A = +1 \quad 35.43$$

$$\eta_0 = -3.3937$$

$$A = 12 \quad 28 \quad 00$$

$$\begin{array}{r} \log \eta_0 = 0.53067 \\ \underline{7.33115} \end{array}$$

$$\alpha = 12 \quad 29 \quad 35.43$$

$$\text{Red:} \quad +02.54$$

$$\therefore (x-D) = 3.19952$$

$$\alpha = 12 \quad 29 \quad 37.97$$

$$S-D = -26 \quad 23.1$$

$$D = -7 \quad 33 \quad 50$$

$$S = -8 \quad 00 \quad 13.1$$

$$\text{Red:} \quad -17.7$$

$$S = -8 \quad 00 \quad 30.8$$

8347

Moons linear position (1915.0)

$$\begin{array}{r}
 X_0 = 24.0420 \quad Y_0 = 15.2930 \\
 \frac{1}{2}a = \quad \quad -2 \quad \frac{1}{2}b = \quad \quad +3 \\
 \hline
 24.0418 \quad \quad 15.2933
 \end{array}$$

From plate Constants $X = 25.0327$ $Y = 14.6048$

$$\bar{z} = +3.0387$$

$$m = -3.3952$$

$$\begin{array}{r}
 \log \bar{z} = 0.48269 \\
 \log 5 = 9.99575 \\
 \hline
 8.50724
 \end{array}$$

$$\begin{array}{r}
 \log T_m = 9.1778 \\
 0.9654 \\
 \hline
 7.0534 \\
 7.1666
 \end{array}$$

$$(K-A) = 1.97970$$

$$m_1 = -1.5$$

$$a = 11 \quad + \quad 1 \quad 35.43$$

$$m_0 = -3.3937$$

$$A = 12 \quad 28 \quad 00$$

$$\begin{array}{r}
 \log m_0 = 0.53067 \\
 7.33115 \\
 \hline
 7.86182
 \end{array}$$

$$\alpha = 12 \quad 29 \quad 35.43$$

$$\text{Rea.} = 02.54$$

$$(C-D) = 31.9952$$

$$\alpha = 12 \quad 29 \quad 37.97$$

$$S-D = 26 \quad 23.1$$

$$D = -7 \quad 33 \quad 50.$$

$$S = -8 \quad 00 \quad 13.1$$

$$\text{Rea.} = 1.77$$

$$S = -8 \quad 00 \quad 30.8$$

8347

Lunar parallax

$$\begin{aligned}
 \alpha &= 12^{\circ} 29' 37.57 \\
 \Delta &= 14 \quad 15 \quad 17.4 \\
 \delta - \alpha &= +1 \quad 45 \quad 39.43 \\
 &+ \quad 26' \quad 24' \quad 51'' \\
 &+ \quad \quad \quad 10.00 \\
 &\quad \quad 26 \quad 14 \quad 51
 \end{aligned}$$

$$\begin{aligned}
 9.95727 \\
 0.00000 \\
 \hline
 0.04726 \\
 0.00453
 \end{aligned}$$

$$\begin{aligned}
 \delta &= 45 \quad 17 \quad 55 \\
 &- 8 \quad 00 \quad 30 \\
 &\quad 53 \quad 18 \quad 25
 \end{aligned}$$

$$\begin{aligned}
 9.82640 \\
 8.24392 \\
 9.90409 \\
 0.14827 \\
 \hline
 8.12268
 \end{aligned}$$

$$\delta - \delta' = +45 \quad 36.0$$

$$\delta = 7 \quad 14 \quad 54.8$$

$$\text{Am Eph } \delta = 7 \quad 14 \quad 49.5$$

$$O-C = \quad \quad \quad 5.3$$

$$\text{Error of Plate} = 0.0$$

$$\text{2nd Aird. Ref} \quad +0.1$$

$$-0.2$$

$$\delta = 7 \quad 14 \quad 54.9$$

$$O-C = \quad \quad \quad -5.4$$

$$\delta = -8^{\circ} 00' 30.8$$

$$\pi \quad 60' \quad 17.30$$

$$9.86913$$

$$8.24392$$

$$9.64822$$

$$0.00349$$

$$7.76476$$

$$\alpha - \alpha' = +20' \quad 00.03$$

$$= + \quad 1'' \quad 20.00$$

$$\alpha \quad 12 \quad 30 \quad 57.97$$

$$\alpha \quad 12 \quad 30 \quad 57.19$$

$$O-C = \quad \quad \quad +0.78$$

$$\text{Curr} \quad -0.02$$

$$\text{Surv. Corr} \quad -0.8$$

$$\alpha = 12 \quad 30 \quad 57.89$$

$$O-C = \quad \quad \quad +0.70$$

8347

Lunar parallax

$$\begin{array}{r}
 \alpha = 12^{\circ} 29' 37.57 \\
 \delta = 14^{\circ} 15' 17.4 \\
 \alpha - \delta = +1^{\circ} 45' 39.43 \\
 + 26^{\circ} 24' 51'' \\
 + 10^{\circ} 00'' \\
 = 6^{\circ} 14' 51''
 \end{array}$$

$$\begin{array}{r}
 995727 \\
 000000 \\
 \hline
 004726 \\
 000453
 \end{array}$$

$$\begin{array}{r}
 \alpha = 45^{\circ} 17' 55'' \\
 - 8^{\circ} 00' 30'' \\
 = 53^{\circ} 18' 25''
 \end{array}$$

$$\begin{array}{r}
 982640 \\
 824372 \\
 990409 \\
 \hline
 014827 \\
 812268
 \end{array}$$

$$S - S' = +45' 56.0$$

$$S = -7^{\circ} 14' 54.8$$

$$\text{Am Sph S} = -7^{\circ} 14' 49.5$$

$$O - C = -5.3$$

$$\text{Curv of Plate} = -0.0$$

$$\begin{array}{r}
 2^{\text{nd}} \text{ Ord Ref} \\
 + 0.1 \\
 - 0.2
 \end{array}$$

$$\begin{array}{r}
 S = -7^{\circ} 14' 54.9 \\
 O - C = -5.4
 \end{array}$$

$$S = -8^{\circ} 00' 30.8$$

$$\pi = 60' 17.30$$

$$\begin{array}{r}
 986913 \\
 824372 \\
 964822 \\
 \hline
 000349 \\
 776476
 \end{array}$$

$$\alpha - \delta = +20' 00.03$$

$$+ 1' 20.00$$

$$\alpha = 12^{\circ} 30' 57.97$$

$$\alpha = 12^{\circ} 30' 57.19$$

$$O - C = +0.78$$

$$\text{Curv} = -0.02$$

$$\text{Dir. Corr} = -0.8$$

$$\alpha = 12^{\circ} 30' 57.89$$

$$O - C = +0.70$$

9.
18.

3
10
10

3
20
2

4
30
1

1
21
13

3
2
1

A

8362

x Star-measures -

1916 May. 27

d

✓

L_r

✓

1 20522
9.6 1372530
18.4 28

20191
1697786
80

20030
17595
8682

18614
1106255
6055

20

80

30

10

9.6793

.6754

18.2443

.2448

2 10.4 18910
10.1 1578475-
8175-

20382
13510
1002

17265
1684034
4034

13165
8567
12757

17

80

10.3132

.3126

10.0427

.0409

3 285 19770
226 14816
1919

18150
13100
9800

19484
1363030
3830

19818
1564941
4241

60

69

74

16

23.4947

.4939

22.5845

.5827

4 305 17730
167 1326564
70

17809
1227975-
7475-

18970
1166066
5966

19289
1659500
9400

25

09

60

90

30.4462

.4467

16.7315

7307

Moon-measures.

1

21.0

13.8

19118
1050665-
0565-

18211
1688075-
8075-

18

25

13.8613

.8655

2 21.3 16555
140 1424487
5887

18409
1066550
5050

67

08

21.2294

.2247

four contact.

8362

Star measures

1916 May. 27

| δ | α | δ | α |
|----------------|-------------|----------------|-------------|
| 20522 | 20191 | 20030 | 18614 |
| 1372530 | 1697786 | 1755580 | 1106255 |
| 28 | 80 | 8682 | 6055 |
| 20 | 80 | 30 | 10 |
| <u>9.6793</u> | <u>6754</u> | <u>18.2443</u> | <u>2448</u> |
| 18910 | 20382 | 17265 | 13165 |
| 1578475 | 1351002 | 1684034 | 6567 |
| 86 | 1002 | 4034 | 12757 |
| 17.1 | 80 | | |
| <u>70.3132</u> | <u>3126</u> | <u>10.0427</u> | <u>0409</u> |
| 19770 | 18150 | 19484 | 19818 |
| 14816 | 13100 | 1363030 | 1564541 |
| 1919 | 9000 | 3830 | 4241 |
| 60 | 69 | 74 | 16 |
| <u>23.4947</u> | <u>4939</u> | <u>22.5845</u> | <u>5827</u> |
| 17730 | 17809 | 18970 | 19289 |
| 1326564 | 1227975 | 1166066 | 1659500 |
| 70 | 74 | 5966 | 9500 |
| 25 | 09 | 80 | 90 |
| <u>30.4462</u> | <u>4461</u> | <u>16.7315</u> | <u>7307</u> |

Moon measures

| δ | α | δ | α |
|----------------|-------------|----------|----------|
| 19118 | 18211 | | |
| 1050605 | 1688075 | | |
| 05 | 80 | | |
| 18 | 25 | | |
| <u>13.8613</u> | <u>8655</u> | | |
| 16555 | 18409 | | |
| 1424487 | 1066550 | | |
| 5887 | 5050 | | |
| 67 | 08 | | |
| <u>21.2294</u> | <u>2247</u> | | |

four contacts

8
3
2
1

4
2
12
24

5
2
16

6
21
17

7
21
17

8362 $\alpha \times$ Moon measures 1916 May 26.
 \checkmark \checkmark \checkmark

$$\begin{array}{r} 3- \\ 21.9 \\ 15.0 \end{array} \begin{array}{r} 10620 \\ 20 \\ 10489 \end{array} \begin{array}{r} 13 \\ \\ \end{array} \begin{array}{r} 12986 \\ 12879 \\ 7160 \end{array}$$

$$\underline{21.9871}$$

$$\underline{.9844}$$

$$\begin{array}{r} 4- \\ 22.1 \\ 15.5 \\ \text{max} \\ 14 \end{array} \begin{array}{r} 10470 \\ 9574 \\ 00 \end{array} \begin{array}{r} 12 \\ \\ \end{array} \begin{array}{r} 13980 \\ 75-80 \\ 12998 \end{array}$$

$$\underline{22.0961}$$

$$\underline{.0980}$$

$$\begin{array}{r} 5- \\ 22.1 \\ 16.0 \end{array} \begin{array}{r} 9469 \\ 881102 \\ 10 \end{array} \begin{array}{r} 14669 \\ 65-60 \\ 14011 \end{array}$$

$$\underline{22.0661}$$

$$\underline{.0654}$$

$$\begin{array}{r} 6- \\ 21.5 \\ 17.0 \end{array} \begin{array}{r} 20118 \\ 14416 \\ 28 \\ 21. \end{array} \begin{array}{r} 35- \\ \\ \end{array} \begin{array}{r} 18678 \\ 14400 \\ 09 \\ 68 \end{array} \begin{array}{r} 20 \\ \\ \end{array}$$

$$\underline{21.5694}$$

$$\underline{.5736}$$

$$\begin{array}{r} 7- \\ 21.0 \\ 17.5 \end{array}$$

$$\begin{array}{r} 20049 \\ 15750 \\ 57 \\ 51 \end{array} \begin{array}{r} 55 \\ \\ \end{array}$$

$$\begin{array}{r} 20817 \\ 15105 \\ 04 \\ 10 \end{array} \begin{array}{r} 00 \\ \\ \end{array}$$

$$\underline{17.4296}$$

$$\underline{.4290}$$

Very poor image of moon - especially
 on both ends.

Density 4

8362 x Moon measures 1916 May 26

$$\begin{array}{r}
 3 \quad 10620 \\
 219 \quad 20 \\
 110 \quad 10489 \\
 \hline
 219871
 \end{array}
 \quad
 \begin{array}{r}
 12986 \\
 12879 \\
 7160 \\
 \hline
 9854
 \end{array}$$

$$\begin{array}{r}
 4 \quad 10470 \\
 221 \quad 951412 \\
 115 \quad 00 \\
 \hline
 220961
 \end{array}
 \quad
 \begin{array}{r}
 13980 \\
 7580 \\
 12998 \\
 \hline
 0980
 \end{array}$$

$$\begin{array}{r}
 5 \quad 9469 \\
 221 \quad 881122 \\
 100 \quad 10 \\
 \hline
 220661
 \end{array}
 \quad
 \begin{array}{r}
 14669 \\
 6560 \\
 14011 \\
 \hline
 0654
 \end{array}$$

$$\begin{array}{r}
 6 \quad 20118 \\
 115 \quad 1441635 \\
 170 \quad 28 \\
 \quad 21 \\
 \hline
 215694
 \end{array}
 \quad
 \begin{array}{r}
 18678 \\
 1440020 \\
 09 \\
 68 \\
 \hline
 5736
 \end{array}$$

$$\begin{array}{r}
 7 \quad 20049 \\
 210 \quad 1575055 \\
 175 \quad 57 \\
 \quad 51 \\
 \hline
 174296
 \end{array}
 \quad
 \begin{array}{r}
 20817 \\
 1510500 \\
 04 \\
 10 \\
 \hline
 4290
 \end{array}$$

Very poor image of moon - especially
on fifth end.

Clarity 4

2367 Times etc.

Expt to star 1915 Apr. 4 $17^h 13^m$ - - $17^h 21^m$
 .. moon $17 18 34.3 - 17 18 34.5$ ✓
 Clock first $0 07.2$

H. Sid T. $17 18 27.2$ ✓ $\theta - \alpha = -0^h 21^m$
 H. Long $4 44 31.05$
 G. Sid T. $22 02 58.25$
 Sid T. h. moon $0 46 52.88$ ✓
 Interval $21 16 05.37$ ✓
 Red $3 29.06$ ✓
 G. h. T. $21 12 36.31$ ✓

From Mount Allen R-A Deal
 moon 21 $17^h 39^m 13.53$ - $27^{\circ} 48' 40.0$
 motion h. 2.6825 + 0.329
 .. 12.605 + 33.81 - + 4.1
 Tabular place $17 39 47.34$ - $27 48 35.9$ ✓

moon's age 20 days

.. parallel $59' 25.43$.. semidiameter $16 15.7 13.1$ $934 = +5.3$ $976 = +5.8$

Augmentalin

+ radiation (+)

R

R

aR

 $(1+a)R$

R2

 $975.7 973.1$ $+ 5.8$ $- 0.6$ $980.9 978.3$ $3.1027 2.0971$ ✓ $- 1001 - 999$ $2.0026 1.9972$ $4.0104 3.9888$ $a = -500.2$ $+ 24.$ 476.2

8362 Times etc.
 Ephemeris 1915 Apr 4 $17^h 13^m - 17^h 21^m$
 Moon $17 18 34.3 - 17 18 34.1$
 Clock fast 0 07.2

H. Sid T. $17 18 27.2 \quad \theta - \alpha = -0^h 21^m$
 H. Hour $4 44 31.05$
 G. Sid T. $22 02 58.25$
 Station hour $0 46 52.88$
 Interval $21 16 05.57$
 Red $3 29.06$
 G. Sid T. $21 12 36.31$

From Mount Allen R. A. Decl.
 Moon 21 $17^h 39^m 15.53 - 27^h 48' 40.0$
 Station 1.2 $2.6825 + 0.329$
 " 12.605 $+ 33.81 + 4.1$
 Tabular place $17 39 47.34 - 27 48 35.9$

moon's age 20 days.

parallel $59' 25'' 43$
 semi-diameter $16 15.7$

957 = +5.3

976 = -5.8

R 975.7
 Argemintalin - 5.8
 Paradiatin (+) - 0.6

R 980.9

R 3102.7

AK - 100.1

(1+R)K 2002.6

R2 4010.4

a = -520.2

+ 1.5

476.2

Mum

$$20.1013 + 10.051$$

$$+ 97.48$$

$$+ 1523$$

$$+ 12 \times$$

$$+ 4$$

$$- 5429$$

$$= 20.7163$$

$$15.6490 + 7823$$

$$- 100.9 \times$$

$$- 2028$$

$$+ 284$$

$$+ 498$$

$$- 7567$$

$$15.5136$$

8362 Plate Centre & Constants

| X | Y | R | A | Decl. |
|--------------------------------|---------|---|-----|-------|
| 9.6794 | 18.2446 | 17 | 33 | 35 |
| 10.3129 | 10.0418 | 33 | 55 | -28 |
| 23.4943 | 22.5836 | 42 | 12 | -27 |
| 30.4464 | 16.7311 | 46 | 30 | -28 |
| 73.93 | 67.60 | 154 | 136 | 32 |
| 18.48 | 16.98 | 17 | 39 | 04 |
| -22 | -18 | 17 | 40 | 55 |
| 3.52 | 1.10 | Center } $\Delta = 17^{\circ} 40' 50''$ $D = -28^{\circ} 01' 10''$ | | |
| 31 | 46.6 | | | |
| 1 ^m 49 ^s | 8' 33" | | | |

$$\begin{array}{rclcl}
 x - 5 + 500x & + 97.4y & + .2x & - 5429 & \\
 -1184 + 4840 & + 3656 + 1777 & = +5433 & + 2 & = +5435 = +6 \\
 -714 + 5156 & = +4442 + 978 & = +5420 & + 2 & = +5422 = -7 \\
 -8529 + 11747 & = +3218 + 2200 & = +5418 & + 5 & = +5423 = -6 \\
 -11424 + 15223 & = +3799 + 1630 & = +5429 & + 6 & = +5435 = +6 \\
 20.0947 + 10047 & + 1524 & + 4 & & = 20.7093
 \end{array}$$

$$\begin{array}{rclcl}
 y - 7 + 100y & - 100.9x & + 28y & - 7567 & \\
 -1098 + 9122 & - 8024 - 977 & = +7047 & + 511 & = +7558 = -9 \\
 +3313 + 5021 & - 8334 - 7040 & = +7294 & + 281 & = +7575 = +8 \\
 -1979 + 11292 & - 9313 - 7370 & = +6943 & + 632 & = +7575 = +8 \\
 +1796 + 8366 & = +10162 - 3072 & = +7090 & + 468 & = +7558 = -9 \\
 15.6473 + 7824 & - 2028 & + 438 & & = 15.5140
 \end{array}$$

$$\begin{array}{rclcl}
 \text{Tables } a = -0.9 & b = -24.9 & a - c = +25.0 & b + a = +2.0 \\
 \text{Also } a = -500.2 & c = -528.0 & a - c = +27.8 & b + a = +3.5
 \end{array}$$

$$\begin{array}{rcl}
 -499.3 & -503.1 & +1.5
 \end{array}$$

Stand Coordinates

with star

W. 2432 ng 87

17 45 32.55
65

17 45 32.60

17.00

17 46 29.60

17 40 50

+ 5 39.60

+ 339.57

2.33093

994349

098166

+ 9.5865

+ 23

31.5888

30.4464

- 1.1424

- 28 35 41.3

40.6

- 28 35 41.0

- 18.3

- 28 35 59.3

- 28 25 10

- 10 49.3

- 649.3

281245m

0.14360m

9.7366m

19633

8.7533m

- 1.3918

- 567

165515

167311

+ 1796

8362 Plate Center + Constant

| x | y | z | R | A | W | W.C. |
|----------|----------|----------|---|-----|-----|------|
| 9 67 58 | 18 24 46 | 17 33 35 | -28 | 27 | 49 | |
| 10 31 69 | 10 04 18 | 33 55 | -29 | 28 | 56 | |
| 23 49 43 | 22 58 36 | 42 12 | -27 | 27 | 58 | |
| 30 44 64 | 16 73 11 | 46 30 | -28 | 31 | 59 | |
| 47 39 3 | 67 60 | 154 136 | 32 | 131 | 222 | |
| 18 88 | 16 50 | 17 39 | 04 | -28 | 33 | 40 |
| -22 | -18 | | | | | |
| 3.52 | 7.10 | Center | } $\Delta = 17^{\circ} 40' 50''$ $0 - 28^{\circ} 27' 10''$ | | | |
| 31 | 4460 | | | | | |
| 1.593 | 831336 | | | | | |

| | | | |
|---------------------------------------|------------|------|--------|
| 2-3 7500 | +57.4y | +2x | -1429 |
| -1184 + 48 + 0 = 22656 + 1777 = 15433 | -2 = +5735 | = +6 | |
| -214 + 5156 = 14442 + 978 = 15420 | -2 = +5422 | = -7 | |
| -8129 + 11747 = 3218 + 2200 = 5418 | -5 = +5423 | = -6 | |
| -11427 + 11223 = 3799 + 1630 = 5429 | -6 = +5431 | = +6 | |
| 2109 + 7 + 10047 | -1524 | +4 | 207093 |

| | | | |
|------------------------------------|-------------------|------|---------|
| y - 7 + 100y | -1009x | +28y | -2567 |
| -1098 + 9122 + 8024 = 977 = +7047 | +5713 + 7558 = -9 | | |
| +3313 + 1021 = 8337 - 1040 = 7294 | +2815 + 7575 = +8 | | |
| -1979 + 11292 = 9313 - 2370 = 6943 | +6325 + 7575 = -8 | | |
| +1796 = 8366 + 10162 = 3072 = 7090 | +4685 + 7558 = -9 | | |
| 156473 + 7824 | -2028 | +438 | -155140 |

Tables a = -0.9 1 = -24.9 2 = -25.0 3 = -20
 also a = 500.2 4 = -528.0 5 = -27.8 6 = -3.5

Stand Coordinates 4th star.
Cape No. 2432 ng. 87
17. 45 32.55
65

17 45 32.60
+ 57.00

17 46 29.60

17 40 50

- + 5 39.60

+ 339.57

2.53093

9.94349

0.98166

3

4

$\Delta 7$ -3.27

-14

+9

+9.5865

+ 28

31.5888

30.4464

-1.1424

1 +9.59 +1.39 +23 -31 -8 +1 -7

2 -12.20 +0.75 -77 +39 -3 0 2 -3

3 -11.61 +8.20 -57 +37 -20 +8 -12

4 +2.35 +9.78 +2 -8 -6 -5 -11

M -1.29 -2.49 0 +4 +2 +15

-28 35 41.3

40.6

$\Delta 11$ -3.64

+1.73

+5

-3 +5 = +2 +1 = +3 +8

+2 -2 = 0 -1 = -1 +9

-40 +30 = -10 = -1 = -11 -6

+4 -17 = -13 +0 = -13 -8

-28 35 41.0

- 18.2

-28 35 59.3

-28 25 10

- 10 49.3

-649.3

0 +9

0

+17

2.81245m

0.14360m

9.7366m

1.9633

8.7533m

-1.3918

- 567

16.5515

16.7311

+1796

8362

Standard Coordinates

Capulin 2402 mag 7.4 Capulin 2405 mag 6.8 Capulin 2421 mag. var.

| | | | | | | | | | |
|---|----|----|-------|----|----|-------|----|----|-------|
| C | 17 | 32 | 41.99 | 17 | 32 | 57.82 | 17 | 41 | 15.91 |
| | | | 42.00 | | | 83 | | | 92 |

| | | | | | | | | | |
|------|----|----|-------|----|----|-------|----|----|-------|
| Mean | 17 | 32 | 42.00 | 17 | 32 | 57.82 | 17 | 41 | 15.92 |
|------|----|----|-------|----|----|-------|----|----|-------|

| | | | | | | | | | |
|-------|--|---|-------|--|---|-------|--|---|-------|
| Prece | | + | 56.83 | | + | 57.34 | | + | 56.55 |
|-------|--|---|-------|--|---|-------|--|---|-------|

| | | | | | | | | | |
|---|----|----|-------|----|----|-------|----|----|-------|
| X | 17 | 33 | 38.83 | 17 | 33 | 55.16 | 17 | 42 | 12.51 |
|---|----|----|-------|----|----|-------|----|----|-------|

| | | | | | | | | | |
|---|----|----|----|----|----|----|----|----|----|
| H | 17 | 40 | 50 | 17 | 40 | 50 | 17 | 40 | 50 |
|---|----|----|----|----|----|----|----|----|----|

| | | | | | | | | | |
|-----|---|---|-------|---|---|-------|---|---|-------|
| A-A | - | 7 | 11.17 | - | 6 | 54.84 | + | 1 | 22.51 |
|-----|---|---|-------|---|---|-------|---|---|-------|

| | | | | | | | | | |
|--------|--|---|--------|--|---|--------|--|---|-------|
| Mag-H) | | - | 431.10 | | - | 414.78 | | + | 82.51 |
|--------|--|---|--------|--|---|--------|--|---|-------|

| | | | | | | | | |
|-----|--|---------|--|--|---------|--|--|---------|
| log | | 2.63458 | | | 2.61782 | | | 2.91651 |
|-----|--|---------|--|--|---------|--|--|---------|

| | | | | | | | | |
|-----|--|---------|--|--|---------|--|--|---------|
| mag | | 9.94446 | | | 9.93977 | | | 9.94674 |
|-----|--|---------|--|--|---------|--|--|---------|

| | | | | | | | | |
|----|--|---------|--|--|---------|--|--|---------|
| 30 | | 1.08628 | | | 2.06483 | | | 0.37049 |
|----|--|---------|--|--|---------|--|--|---------|

| | | | | | | | | |
|----|---|---------|--|---|---------|--|--|---------|
| 30 | - | 12.1978 | | - | 11.6100 | | | +7.3469 |
|----|---|---------|--|---|---------|--|--|---------|

| | | | | | | | | |
|----|---|----|--|---|----|--|--|---|
| 31 | - | 44 | | - | 57 | | | + |
|----|---|----|--|---|----|--|--|---|

| | | | | | | | | |
|----|--|--------|--|--|---------|--|--|---------|
| 32 | | 9.7978 | | | 10.3843 | | | 24.3471 |
|----|--|--------|--|--|---------|--|--|---------|

| | | | | | | | | |
|---|--|--------|--|--|---------|--|--|---------|
| 2 | | 9.6794 | | | 10.3129 | | | 23.4942 |
|---|--|--------|--|--|---------|--|--|---------|

| | | | | | | | | |
|-----|--|-------|--|--|------|--|--|---------|
| 2-3 | | -2184 | | | -714 | | | -0.8529 |
|-----|--|-------|--|--|------|--|--|---------|

| | | | | | | | | | |
|---|-----|----|------|-----|----|------|-----|----|------|
| C | -28 | 21 | 07.3 | -29 | 28 | 21.9 | -27 | 47 | 33.9 |
|---|-----|----|------|-----|----|------|-----|----|------|

| | | | | | | | | | |
|--|--|--|------|--|--|------|--|--|------|
| | | | 07.0 | | | 21.2 | | | 33.8 |
|--|--|--|------|--|--|------|--|--|------|

| | | | | | | | | | |
|------|-----|----|------|-----|----|------|-----|----|------|
| Mean | -28 | 21 | 07.2 | -29 | 28 | 21.6 | -27 | 47 | 33.8 |
|------|-----|----|------|-----|----|------|-----|----|------|

| | | | | | | | | | |
|-------|---|--|------|---|--|------|---|--|------|
| Prece | - | | 35.1 | - | | 34.8 | - | | 24.2 |
|-------|---|--|------|---|--|------|---|--|------|

| | | | | | | | | | |
|---|-----|----|------|-----|----|------|-----|----|------|
| S | -28 | 21 | 42.3 | -29 | 28 | 56.4 | -27 | 47 | 58.0 |
|---|-----|----|------|-----|----|------|-----|----|------|

| | | | | | | | | | |
|---|-----|----|----|-----|----|----|-----|----|----|
| D | -28 | 25 | 10 | -28 | 25 | 10 | -28 | 25 | 10 |
|---|-----|----|----|-----|----|----|-----|----|----|

| | | | | | | | | | |
|-----|---|---|------|----|----|------|---|----|------|
| S-D | + | 3 | 27.7 | -1 | 03 | 46.4 | + | 37 | 12.0 |
|-----|---|---|------|----|----|------|---|----|------|

| | | | | | | | | | |
|--------|--|---|-------|--|---|--------|--|---|--------|
| Mag(D) | | + | 207.7 | | - | 3826.8 | | + | 2232.1 |
|--------|--|---|-------|--|---|--------|--|---|--------|

| | | | | | | | | |
|-----|--|---------|--|--|---------|--|--|---------|
| log | | 2.31744 | | | 3.58284 | | | 3.34871 |
|-----|--|---------|--|--|---------|--|--|---------|

| | | | | | | | | |
|----|--|---------|--|--|---------|--|--|---------|
| 70 | | 9.64859 | | | 0.91399 | | | 0.67986 |
|----|--|---------|--|--|---------|--|--|---------|

| | | | | | | | | |
|-----|--|--------|--|--|--------|--|--|--------|
| mag | | 9.7323 | | | 9.7523 | | | 9.7220 |
|-----|--|--------|--|--|--------|--|--|--------|

| | | | | | | | | |
|----|--|-------|--|--|------|--|--|--------|
| 32 | | 21726 | | | 1297 | | | 0.7410 |
|----|--|-------|--|--|------|--|--|--------|

| | | | | | | | | |
|----|--|--------|--|--|--------|--|--|--------|
| 31 | | 8.9583 | | | 8.9354 | | | 7.5164 |
|----|--|--------|--|--|--------|--|--|--------|

| | | | | | | | | |
|----|---|--------|--|---|--------|--|--|---------|
| 70 | + | 0.4452 | | - | 8.2033 | | | +4.7848 |
|----|---|--------|--|---|--------|--|--|---------|

| | | | | | | | | |
|----|---|--------|--|---|-----|--|--|----|
| 71 | - | 0.0908 | | - | 862 | | | 33 |
|----|---|--------|--|---|-----|--|--|----|

| | | | | | | | | |
|----|--|--------|--|--|--------|--|--|--------|
| 72 | | 183544 | | | 9.7105 | | | 227815 |
|----|--|--------|--|--|--------|--|--|--------|

| | | | | | | | | |
|----|--|---------|--|--|---------|--|--|--------|
| 73 | | 18.2446 | | | 10.0418 | | | 225836 |
|----|--|---------|--|--|---------|--|--|--------|

| | | | | | | | | |
|----|---|------|--|--|-------|--|--|-------|
| 74 | - | 1098 | | | +3313 | | | -1979 |
|----|---|------|--|--|-------|--|--|-------|

8362

Standard Coordinates

Cepheus 2402m 774 Cepheus 2405m 968 Cepheus 2421m 948

| | | | | | | | | | |
|---|----|----|-------|----|----|-------|----|----|-------|
| C | 17 | 32 | 41.99 | 17 | 32 | 57.82 | 17 | 41 | 15.91 |
| L | | | 42.00 | | | 83 | | | 92 |

| | | | | | | | | | |
|------|----|----|-------|----|----|-------|----|----|-------|
| Mean | 17 | 32 | 42.00 | 17 | 32 | 57.82 | 17 | 41 | 15.92 |
| Prob | | | 56.83 | | | 57.34 | | | 56.59 |

| | | | | | | | | | |
|---|----|----|-------|----|----|-------|----|----|-------|
| X | 17 | 33 | 38.83 | 17 | 33 | 55.16 | 17 | 42 | 12.51 |
| A | 17 | 40 | 50 | 17 | 40 | 50 | 17 | 40 | 50 |

| | | | | | | | | | |
|-------|---|---|--------|---|---|--------|---|---|-------|
| X-A | - | 7 | 11.17 | - | 6 | 54.84 | - | 1 | 24.51 |
| (B-A) | | | 431.10 | | | 414.78 | | | 87.51 |

| | | | | | | | | | |
|-----|--|--|---------|--|--|---------|--|--|---------|
| log | | | 2.63458 | | | 2.61782 | | | 2.91651 |
| WIS | | | 994446 | | | 993977 | | | 994679 |

| | | | | | | | | | |
|---|--|--|--------|--|--|--------|--|--|---------|
| S | | | 108628 | | | 106483 | | | 0.57049 |
|---|--|--|--------|--|--|--------|--|--|---------|

| | | | | | | | | | |
|----------------|---|--|---------|---|--|---------|---|--|--------|
| S ₁ | - | | 12.1978 | - | | 11.6100 | - | | 2.3469 |
| S ₂ | - | | 54 | - | | 57 | - | | 2 |

| | | | | | | | | | |
|----------------|--|--|--------|--|--|---------|--|--|---------|
| S ₃ | | | 9.7978 | | | 10.3843 | | | 24.3424 |
| 2 | | | 9.6794 | | | 10.3129 | | | 23.4942 |

| | | | | | | | | | |
|-----|--|--|--------|--|--|-------|--|--|---------|
| 2-3 | | | -2.184 | | | -7.14 | | | -0.8529 |
|-----|--|--|--------|--|--|-------|--|--|---------|

| | | | | | | | | | |
|---|-----|----|------|-----|----|------|-----|----|------|
| C | -28 | 21 | 07.3 | -29 | 28 | 21.9 | -27 | 47 | 33.9 |
| L | | | 07.0 | | | 21.2 | | | 33.8 |

| | | | | | | | | | |
|------|-----|----|------|-----|----|------|-----|----|------|
| Mean | -28 | 21 | 07.2 | -29 | 28 | 21.6 | -27 | 47 | 33.8 |
| Prob | - | | 35.4 | - | | 34.8 | - | | 24.2 |

| | | | | | | | | | |
|---|-----|----|------|-----|----|------|-----|----|------|
| S | -28 | 21 | 42.3 | -29 | 28 | 56.4 | -27 | 47 | 58.0 |
| D | -28 | 25 | 10 | -28 | 25 | 10 | -28 | 25 | 10 |

| | | | | | | | | | |
|----------|---|---|-------|----|----|--------|---|----|--------|
| S-D | + | 3 | 27.7 | -1 | 03 | 46.4 | + | 37 | 12.0 |
| log(B-A) | | | 2.002 | | | 3826.8 | | | 2232.1 |

| | | | | | | | | | |
|-----|--|--|---------|--|--|---------|--|--|---------|
| log | | | 2.34744 | | | 3.58284 | | | 3.34871 |
| WIS | | | 964859 | | | 091399 | | | 067986 |

| | | | | | | | | | |
|----------------|--|--|--------|--|--|--------|--|--|--------|
| S ₁ | | | 9.7323 | | | 9.7123 | | | 9.7220 |
| S ₂ | | | 21.726 | | | 21.297 | | | 0.7410 |

| | | | | | | | | | |
|----------------|--|--|-------|--|--|-------|--|--|-------|
| S ₃ | | | 89583 | | | 89354 | | | 75164 |
|----------------|--|--|-------|--|--|-------|--|--|-------|

| | | | | | | | | | |
|----------------|--|--|---------|--|--|--------|--|--|-------|
| S ₄ | | | 404452 | | | 8.2033 | | | 47842 |
| S ₅ | | | -0.0908 | | | 862 | | | 33 |

| | | | | | | | | | |
|----------------|--|--|---------|--|--|---------|--|--|--------|
| S ₆ | | | 183544 | | | 9.9108 | | | 227815 |
| S ₇ | | | 18.2446 | | | 10.0418 | | | 225836 |

| | | | | | | | | | |
|----------------|--|--|-------|--|--|------|--|--|-------|
| S ₈ | | | -1998 | | | 3313 | | | -1979 |
|----------------|--|--|-------|--|--|------|--|--|-------|

| | | | | | | | | | |
|----------------|--|--|--|--|--|--|--|--|--|
| S ₉ | | | | | | | | | |
|----------------|--|--|--|--|--|--|--|--|--|

8362

Moon's Center.

| | x | $x - X_0$ | Σx | $(x - X_0)^2$ | $(x - X_0)^2 + (y - Y_0)^2$ | $0 - c$ |
|---|---------|-----------|------------|---------------|-----------------------------|---------|
| 1 | 21.0000 | +0.9060 | +5 | 0.8217 | 4.0133 | +29 |
| 2 | 21.2270 | +1.1330 | +5 | 1.2848 | 4.0060 | -44 |
| 3 | 21.9878 | +1.8938 | +2 | 3.5872 | 4.0063 | -41 |
| 4 | 22.0970 | +2.0030 | 0 | 4.0120 | 4.0120 | +16 |
| 5 | 22.0658 | +1.9718 | -1 | 3.8876 | 4.0135 | +31 |
| 6 | 21.5715 | +1.4775 | -4 | 2.1815 | 4.0229 | +125 |
| 7 | 21.0000 | +0.9060 | -5 | 0.8159 | 4.0140 | +36 |
| | | | | | 3.9888 | |
| | | | | | 4.0104 | |

216 hrs
added

| | y | $y - Y_0$ | Δy | $(y - Y_0)^2$ | L | |
|---|---------|-----------|------------|---------------|-----|-----|
| 1 | 13.8634 | -1.7826 | -39 | 3.1916 | 207 | 153 |
| 2 | 14.0000 | -1.6460 | -36 | 2.7212 | 215 | 146 |
| 3 | 15.0000 | -0.6460 | -14 | 0.4191 | 251 | 109 |
| 4 | 15.6460 | 0.0000 | 0 | 0.0000 | 270 | 90 |
| 5 | 16.0000 | +0.3540 | +8 | 0.1259 | 280 | 80 |
| 6 | 17.0000 | +1.3540 | +30 | 1.8414 | 313 | 47 |
| 7 | 17.4293 | +1.7833 | +39 | 3.1941 | 333 | 27 |
| | | | | | 126 | |

Approx. Center.

$$x = 21.0 \quad y = 13.8634$$

$$17.4293$$

$$31.2927$$

$$Y_0 = 15.6464$$

comp. R. 20026

$$x = 22.0970$$

$$X_0 = 20.0944$$

$$\text{Center } \left\{ \begin{array}{l} X_0 = 20.0940 \\ Y_0 = 15.6460 \end{array} \right.$$

8362 *lucoris Center*

| | x | $x - Y_0$ | Δx | $(x - Y_0)^2$ | $(x - Y_0)(y - Y_0)$ | $y - c$ |
|----------|---------|-----------|------------|---------------|----------------------|---------|
| 1 | 21.0000 | +0.9060 | +5 | 0.8217 | 4.0133 | +29 |
| 2 | 21.2270 | +1.1330 | +5 | 1.2848 | 4.0060 | +44 |
| 3 | 21.9878 | +1.8938 | +2 | 3.5872 | 4.0063 | +41 |
| 4 | 22.0970 | +2.0030 | 0 | 4.0120 | 4.0120 | +16 |
| 5 | 22.0658 | +1.9718 | -1 | 3.8876 | 4.0135 | +31 |
| 6 | 21.5715 | +1.4775 | -4 | 2.1813 | 4.0229 | +121 |
| 7 | 21.0000 | +0.9060 | -5 | 0.8199 | 4.0140 | +36 |
| Σ | | | | | 4.0104 | |

| | y | $y - Y_0$ | Δy | $(y - Y_0)^2$ | c |
|---|--------|-----------|------------|---------------|-----|
| 1 | 138634 | -1.7826 | -39 | 3.1916 | 207 |
| 2 | 140000 | -1.6460 | -36 | 2.7212 | 215 |
| 3 | 150000 | -0.6460 | -14 | 0.4191 | 251 |
| 4 | 156460 | 0.0000 | 0 | 0.0000 | 270 |
| 5 | 160000 | +0.3540 | +8 | 0.1259 | 280 |
| 6 | 170000 | +1.3540 | +30 | 1.8414 | 313 |
| 7 | 174293 | +1.7833 | +39 | 3.1941 | 333 |
| | | | | | 126 |

Approx. Center

$$\begin{array}{r}
 x = 21.0 \quad y = 138634 \\
 \quad \quad \quad 174293 \\
 \hline
 \quad \quad \quad 312927 \\
 Y_0 = 156460
 \end{array}$$

*Comp. R = 20026**x - new 22.0970* *$X_0 = 20.0944$*

Center $\left\{ \begin{array}{l} X_0 = 20.0944 \\ Y_0 = 15.6460 \end{array} \right.$

Formation of Normals

| | | | | | |
|---|--------|---|----------|---|---------|
| 1 | - 1.62 | + | 26.4 | - | 51.6 |
| 2 | - 1.86 | - | 49.7 | + | 72.6 |
| 3 | - 1.23 | - | 27.5 | + | 26.6 |
| 4 | + 0.00 | + | 32.0 | + | 0.0 |
| 5 | + 0.69 | + | 61.0 | + | 10.9 |
| 6 | + 2.00 | + | 185.0 | + | 168.5 |
| 7 | + 1.62 | + | 32.8 | + | 64.2 |
| | - 0.40 | + | 210.0 | + | 291.6 |
| | | | + 2222 | | - 129.6 |
| | | | + 2432.0 | | + 162.0 |

34.9
190.0

| - a | - e | - 16 + ΔC |
|------|-----|--------------|
| + 9 | + 1 | - 6 " |
| + 11 | + 1 | - 4 " |
| + 19 | + 0 | + 3 " |
| + 20 | - 0 | + 4 " |
| + 20 | - 0 | + 4 " |
| + 15 | - 1 | - 2 " |
| + 9 | - 1 | - 8 " |

8362

Moon's Center

| | | | C | O - C | Corr |
|---|---------------------|----------------|---|--------------|------|
| 1 | +0.91 - 1.78 = +29 | +12 - 46 = -34 | | +63 | +57 |
| 2 | +1.13 - 1.65 = -44 | +15 - 43 = -28 | | -16 | -20 |
| 3 | +1.85 - 0.65 = -41 | +25 - 17 = +8 | | -49 | -46 |
| 4 | +2.00 + 0.00 = +16 | +26 + 0 = +26 | | -10 | -6 |
| 5 | +1.97 + 0.35 = +31 | +26 + 9 = +35 | | -4 | 0 |
| 6 | +1.48 + 1.35 = +125 | +20 + 35 = +55 | | +70 | +68 |
| 7 | +0.91 + 1.78 = +36 | +12 + 46 = +58 | | -22 | -14 |
| 8 | 10.29 - 0.60 | | | +133 = 101 | |
| | | | | Average = 33 | |

Normal Equations.

$$\begin{aligned}
 +16.59 - 0.40 &= +210 & +10.29 \\
 -0.40 + 11.49 &= +292 & -0.60 \\
 +0.40 - 0.01 &= +5 & +0.25 \\
 +11.48 &= +297 & -0.35 = +25.9 \\
 +16.59 &= +210 + 10 = +220 & a = +13.3
 \end{aligned}$$

$$\begin{aligned}
 +16.59 - 0.40 &= +2432 & +10.29 \\
 -0.40 + 11.49 &= +162. & -0.60 \\
 +0.40 - 0.01 &= +58.61 & +0.25 - 0.35 \\
 +11.48 &= +290.61 & b = +19.2 - 0.03 \\
 +16.59 &= +2432 + 7 = +2439 & a = +147 + 0.62
 \end{aligned}$$

Arc Meas 126 $\frac{\Sigma r}{n}$

$$\frac{\phi}{n} = .07 \quad +4.6 \quad \frac{+4.6}{.07} = +66 \quad \Delta R = +0.8$$

$$-2R = -4.00 \quad -2RC = -0.80 \quad -16 \quad \text{Corr} \quad +0.2 \quad \Delta R \quad +0.6$$

$$\Delta b = +0.02 \quad \Delta d = +0.0$$

$$\Delta a = -0.49 \quad \Delta \alpha = -0.02$$

8362

Luvon's Center

| | 0 | C | 0 - C |
|---|-------------------|----------------|--------------|
| 1 | +091 - 178 = +29 | +12 - 46 = -34 | +63 |
| 2 | +113 - 165 = -44 | +15 - 43 = -28 | -16 |
| 3 | +188 - 065 = +123 | +25 - 17 = +8 | -49 |
| 4 | +200 + 000 = +200 | +26 - 0 = +26 | -10 |
| 5 | +197 + 035 = +232 | +26 + 9 = +35 | -4 |
| 6 | +148 + 135 = +283 | +20 - 32 = -12 | +70 |
| 7 | +091 + 178 = +269 | +12 + 46 = +58 | -22 |
| 8 | | | +133 = 101 |
| 9 | | | Average = 33 |

Normal Equations:

$$+16.59 = 0.40 = +21.0$$

$$= 046 + 1149 = +292$$

$$+ 0.40 = 0.01 = 1 \quad 5^{-}$$

$$+ 1148 + 257$$

4-2-259

$$+ 1655 + 210 + 10 + 220$$

2 + 130

Arc 114 as 126

$$\frac{\Sigma v}{2}$$

$$\frac{p}{2} = .07$$

4 4 6

$$+ \frac{46}{47} = +66$$

$$PR = +0.8$$

$$\begin{array}{r} \gamma_0 = 20.0940 \\ + 73 \\ \hline 20.1013 \end{array}$$

$$\begin{array}{r} \gamma_0 = 15.6460 \\ + 10 \\ \hline 15.6470 \end{array}$$

From Plate Constants.

$$\begin{array}{r} \gamma = 20.7163 \\ - 22 \\ \hline - 1.2837 \end{array}$$

$$\begin{array}{r} \gamma = 15.5136 \\ - 18 \\ \hline - 2.4864 \end{array}$$

$$\begin{array}{r} \log \delta \quad 0.10847m \\ 9.94290 \\ \hline 8.50724 \end{array}$$

$$\begin{array}{r} 9.7393m \\ 0.2169 \\ \hline 7.0534 \\ 7.0096m \end{array}$$

$$(\alpha - A) = -1.65833$$

$$\gamma_1 = -10.$$

$$(\alpha - A) = -45.553$$

$$\gamma_0 = -2.4854$$

$$A \quad 17 \quad 40 \quad 50$$

$$\begin{array}{r} \log \gamma_0 = 0.3548m \\ 7.33115 \\ \hline 3.06425m \end{array}$$

$$\alpha = 17 \quad 40 \quad 04.47$$

$$+ 2.18$$

$$\delta - \delta = -19' 19.4$$

$$\alpha' \quad 17 \quad 40 \quad 06.65$$

$$\delta = -28' 25.10$$

$$\delta = -28^\circ 44' 29.4$$

$$- 7.0$$

$$\delta = -28 \quad 44 \quad 36.4$$

8362 Moon's Mean Position (1915.0)

$$\begin{array}{r}
 X_0 = 20.0940 \\
 + 7 \\
 \hline
 20.0947
 \end{array}
 \qquad
 \begin{array}{r}
 Y_0 = 15.6460 \\
 + 13 \\
 \hline
 15.6473
 \end{array}$$

From plate constants $X = 20.7093$ $Y = 15.5140$

$$Z = -1.2907$$

$$\eta = -2.4860$$

$$\log Z = 0.11083m$$

$$\log S = 9.94290$$

$$8.50724$$

$$\log \tan S = 9.7438m$$

$$02217$$

$$7.0534$$

$$7.0189m$$

$$(a-A) = 1.66069m$$

$$\eta_1 = -10$$

$$\alpha - A = 45.78$$

$$\eta_0 = -2.4850$$

$$A = 17 \quad 40 \quad 50$$

$$\log \eta_0 = 0.39533m$$

$$7.33115$$

$$\alpha = 17 \quad 40 \quad 04.22$$

$$(d-D) = 3.06418m$$

$$\text{Red} \quad + \quad 2.18$$

$$S-D = 19 \quad 193$$

$$\alpha' = 17 \quad 40 \quad 06.40$$

$$D = -28 \quad 25 \quad 10$$

$$S = -28 \quad 44 \quad 29.3$$

$$\text{Red.} \quad - \quad 7.0$$

$$S = -28 \quad 44 \quad 36.3$$

8.362 Motion Mean Position (1915.0)

$$\begin{array}{r}
 X = 20.0940 \\
 + 7 \\
 \hline
 20.0947
 \end{array}$$

$$\begin{array}{r}
 Y_0 = 15.6460 \\
 + 13 \\
 \hline
 15.6473
 \end{array}$$

Template Constants $X = 20.7093$ $Y = 15.5140$

$$B = -1.2907$$

$$\eta = -2.4860$$

$$\begin{array}{r}
 \log B = 0.11083 \\
 \log 5 = 9.74290 \\
 \hline
 8.50724
 \end{array}$$

$$\begin{array}{r}
 \log 10.5 = 9.7438 \\
 0.2217 \\
 \hline
 7.0534 \\
 7.0189
 \end{array}$$

$$(a - A) = 1.66069$$

$$\eta_1 = -1.0$$

$$X - A = 45.78$$

$$\eta_0 = -2.4850$$

$$A = 17.4050$$

$$\begin{array}{r}
 \log \eta_0 = 0.39533 \\
 7.33115
 \end{array}$$

$$X = 17.400422$$

$$(d - D) = 3.06418$$

$$Red = 2.18$$

$$S - D = 19.193$$

$$Q = 17.400640$$

$$D = -28.2510$$

$$S = -28.44293$$

$$Red = 7.0$$

$$S = -28.44363$$

$$\begin{array}{r}
 17 \quad 32 \quad 45.09 \\
 \underline{43.08} \\
 + 2.01 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -15 \quad 20 \quad 57.1 \\
 \underline{45.1} \\
 - 12.0 \\
 \hline
 \end{array}$$

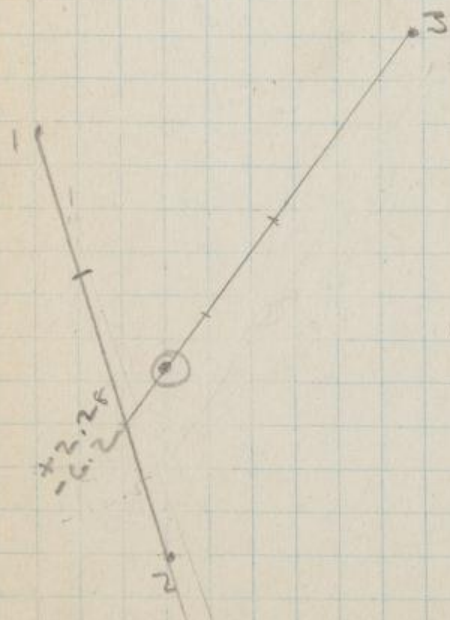
$$\begin{array}{r}
 17 \quad 41 \quad 40.77 \\
 \underline{38.36} \\
 + 2.41 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -40 \quad 05 \quad 45.8 \\
 \underline{42.5} \\
 - 3.3 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 17 \quad 54 \quad 22.64 \\
 \underline{20.79} \\
 + 1.85 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 -9 \quad 45 \quad 63.6 \\
 \underline{50.7} \\
 - 12.9 \\
 \hline
 \end{array}$$

30 35 40 45 50 55 -5 -10



$$\begin{array}{r}
 2.28 \\
 \underline{1.85} \\
 .43
 \end{array}$$

$$\begin{array}{r}
 2.28 \\
 \underline{2.05} \\
 .23
 \end{array}$$

$$\begin{array}{r}
 7.0 \\
 \underline{2.0} \\
 5.0
 \end{array}$$

$$\begin{array}{r}
 12.9 \\
 \underline{6.2} \\
 6.7
 \end{array}$$

8362

Red. ad locum aff.

$$S = -28^{\circ} 44' 29''$$

$$H+X \quad 10^{\circ} \quad 37^{\circ} 0' = 159^{\circ} 15'$$

$$H \quad 16 \quad 56.9'$$

$$X \quad 17 \quad 40.1'$$

$$G \quad 21 \quad 15.3$$

$$G+X \quad 14 \quad 55.4 = 123^{\circ} 51'$$

$$\log S \quad 9.9429''$$

$$i \quad 0.8968''$$

$$(i) \quad 0.8397''$$

$$\log(H+X) \quad 9.8580''$$

$$g \quad 1.0738''$$

$$\sin \quad 9.8406''$$

$$\tan S \quad 9.7391''$$

$$8.8239''$$

$$\log \sin S \quad 9.6820''$$

$$\cos(H+X) \quad 9.9709''$$

$$h \quad 1.2762''$$

$$\sin \quad 9.5494''$$

$$\sec S \quad 0.0571''$$

$$8.8239''$$

$$2g' \quad 0.9318''$$

$$g \quad 9.4774''$$

$$h' \quad 0.9291''$$

$$h \quad 9.7066''$$

$$+ 1.368''$$

$$+ 0.302''$$

$$+ 0.509''$$

$$+ 2.179''$$

$$g' \quad -8.55''$$

$$h' \quad +8.45''$$

$$(i) \quad -6.91''$$

$$-6.97''$$

8362

Red and brown aff

S - 28° 44' 29"

H + X 10 37.0 159° 15'

H 16 56.9

X 17 40.1

G 21 15.3

G + X 14 55.4 = 223° 51'

Lcos S 99.429

i 0.8968

h 0.8397

Lcos(H+X) 9.5580

S 1.0738

Ain 9.8406

Lcos 9.7391

8.8239

S 0.9318

S 9.4774

+ 1.368

+ 0.300

+ 0.509

+ 2.177

Lcos S 9.6820

Lcos(H+X) 9.9709

h 1.2762

Lcos 9.5494

S 0.0571

8.8239

h 0.9291

h 9.7066

S' - 8.55

h' + 8.49

L - 6.51

- 6.97

$$\alpha - 17 \quad 40 \quad 06.65$$

$$\theta - 17 \quad 18 \quad 27.2$$

$$\theta - \alpha = 21^m 39^s.45$$

$$- 5^0 \quad 24' \quad 51.75$$

$$- 2 \quad 20.67$$

$$- 5^0 \quad 22' \quad 31.08$$

$$9.95727$$

$$0.00000$$

$$0.00190$$

$$9.95917$$

$$V = +42 \quad 18 \quad 40$$

$$- 28 \quad 44 \quad 36$$

$$+ 7.1 \quad 03 \quad 16$$

$$9.82640$$

$$8.23766$$

$$9.97581$$

$$0.17189$$

$$8.21176$$

$$\delta - \delta' = +55' \quad 58.9$$

$$\delta = -27 \quad 48 \quad 37.5$$

$$\text{eph } \delta = -27 \quad 48 \quad 35.9$$

$$O-C = -1.6$$

$$\text{2nd ord. rep.} + 0.4$$

$$\text{Curv. plate} + 0.7$$

$$\text{2nd.} + 0.0$$

$$\delta = -27 \quad 48 \quad 37.1$$

$$O-C = -1.2$$

$$\delta' = -28^0 \quad 44' \quad 36.4$$

$$\Pi = 59 \quad 25.43$$

$$986913$$

$$\text{eph } \Pi = 8.23766$$

$$897512$$

$$005330$$

$$7.13521$$

$$\alpha - \alpha' = -4' \quad 41.33$$

$$= -18^s.76$$

$$\alpha \quad 17 \quad 39 \quad 47.89$$

$$\text{eph } \alpha \quad 17 \quad 39 \quad 47.34$$

$$O-C = +0.55$$

$$\text{Curv.} + 0.05$$

$$\text{2nd. Cor.} = -0.02$$

$$\alpha = 17 \quad 39 \quad 47.87$$

$$O-C = +0.53$$

8362

Lunar parallax

$$\alpha = 17^{\circ} 40' 06.40''$$

$$\delta = 17^{\circ} 18' 27.2''$$

$$G-\alpha = -21' 39.2''$$

$$-50' 24' 48''$$

$$-2' 20''$$

$$-5' 22' 28''$$

$$9.95727$$

$$0.00000$$

$$0.00191$$

$$995918$$

$$\gamma = +42' 18' 40''$$

$$-28' 44' 36''$$

$$-71' 03' 16''$$

$$9.82640$$

$$8.23766$$

$$9.97581$$

$$0.17189$$

$$821176$$

$$S-S = +55' 58.9''$$

$$S - 27' 48' 37.4''$$

$$\text{Cum Eph } S = -27' 48' 35.9''$$

$$O-C = -1.5''$$

$$240 \text{ Ord. Res.} + 0.4''$$

$$\text{Curv. of Plate} + 0.7''$$

very poor image - only seven pts. in
limit covering only about 120° .

$$S' = -28^{\circ} 44' 36.3''$$

$$H = 59' 25.43''$$

$$9.86913$$

$$8.23766$$

$$8.97470$$

$$0.05330$$

$$7.13479$$

$$Q-X = -4' 41.33''$$

$$-18.76''$$

$$\alpha = 17^{\circ} 39' 47.64''$$

$$\alpha = 17^{\circ} 39' 47.34''$$

$$+0.30''$$

$$\text{Cumr.} + 0.03''$$

8362

Lunar parallax

$$\alpha = 17^{\circ} 40' 06.40''$$

$$\delta = 17^{\circ} 14' 27.2''$$

$$Q-X = -21^{\circ} 39.2''$$

$$-5^{\circ} 24' 48''$$

$$-2^{\circ} 20'$$

$$-5^{\circ} 22' 28''$$

$$995727$$

$$000000$$

$$000191$$

$$\hline 995918$$

$$y = +42^{\circ} 18' 40''$$

$$-28^{\circ} 44' 36''$$

$$71^{\circ} 03' 16''$$

$$982640$$

$$823766$$

$$997581$$

$$017189$$

$$\hline 821176$$

$$S-S: +55^{\circ} 58.9''$$

$$S - 27^{\circ} 48' 37.4''$$

$$\text{Am Eph } S - 27^{\circ} 48' 35.9''$$

$$O-C - 1.5''$$

$$240 \text{ Arcd. Res.} + 0.4''$$

$$\text{err of plate} + 0.7''$$

$$+ 0.30''$$

$$\text{Curv} + 0.05''$$

very poor image - only seven pts in
limit - exposure only about 120"

$$S = -28^{\circ} 44' 36.3''$$

$$TT = 59' 25.43''$$

$$986913$$

$$823766$$

$$897470$$

$$005330$$

$$\hline 713479$$

$$Q-X = -4^{\circ} 41.33''$$

$$-18.76''$$

