

KG
11366
v.419

Observation for Inclination of
Declination Mtl.
Spiral Readings
of Ursa Minor
of "Capitulum"
Jan 5 1878 to Jan 7 1879

ndol
+LE

Jan 5 1878 Polaris $1^h 12^m +88^\circ 40'$

45 4 5.1+23 20.7+52 23.5+54 24.7+54 26.1+54 26.1+54

~~Let the time~~

Wires A 123, 5, 6, 7

A-1, 14, 2, 3

13.9+18 30.1+02 32.3+02 33.1+01 35.1+01 35.6+02

56.4-05 11.9-11 15.7-26 15.9-27 17.6-30 18.1-30

3.9+16 19.1+21 22.6+21 22.2+20 23.9+21 24.9+22
+52 +64 +51 +48 +46 +48

4.82 20.45 23.52 23.98 25.68 26.18

J. F. M.

Jan 7 1878
α Urs Min $1^h 12^m +88^\circ 40'$

A 123, 4, 5

45 4 4.9+23 8.5+29 9.5+31 11.3+35 13.3+39 16.6+45

11.1+19 14.2+18 14.7+17 17.1+16 20.5+12 22.2+10

53.6-32 57.3+03 57.7+07 59.9+16 11.7+18 36.1+17

12.1+23 16.4+21 16.9+21 20.1+21 22.6+21 26.9+22
+33 +71 +76 +88 +90 +94

5.42 9.10 9.70 12.10 14.52 17.32

J. F. M.

Jan 9 1878
α Urs Min $1^h 12^m +88^\circ 40'$

45 4 15.0 17.9 20.2 20.1 27.1

26.0 27.1 29.0 29.0 35.4

9.4 10.4 12.0 12.1 18.6

26.4 26.1 28.1 27.6 34.4

A 8+9

1878, Jan. 12

$\begin{matrix} \text{Lib. } h \\ \text{Was. mm. } 18 \end{matrix}$
 $\begin{matrix} m \\ 11 \end{matrix}$
 $+9323$
 $50 \quad 51.6 +15 \quad 48.1 +21 \quad 39.0 +36$
 $1.3 +17 \quad 58.1 +21 \quad 49.1 +30$
 $50.4 -64 \quad 47.1 -68 \quad 37.9 -38$
 $6.8 +72 \quad 3.8 +67 \quad 54.7 +52$
 $\quad \quad \quad +40 \quad \quad \quad +41 \quad \quad \quad +80$
 $57.52 \quad 54.28 \quad 45.18$

Rij $\frac{1}{2}$ - before rattle
 L. Agay

~~5052~~

$50 \quad 5.2 +06 \quad 2.2 +01$
 $15.7 +09 \quad 12.0 +10$
 $4.5 +02 \quad 0.5 +01$
 $16.4 +33 \quad 13.9 +33$
 $\quad \quad \quad +50 \quad \quad \quad +45$
 $10.45 \quad 7.15$

51 Cephei 6 42 +87 14 1878, Jan. 12

$15 \quad 0 \quad \text{Lib. } h$
 $10 \quad 4 \quad 9.8 +32 \quad 15.8 +44 \quad 21.0 +52 \quad 38.1 +35 \quad 42.8 +24 \quad 2.1 +01 \quad A$
 $20.5 +12 \quad 26.9 +05 \quad 31.1 +02 \quad 49.1 +19 \quad 53.2 +15 \quad 13.0 +10 \quad A \quad 6, 7, 8, 9$
 $6.9 +12 \quad 14.4 -22 \quad 18.6 -29 \quad 34.9 -12 \quad 40.9 -44 \quad 59.5 -02 \quad A$
 $26.8 +22 \quad 31.4 +23 \quad 36.1 +20 \quad 55.0 -01 \quad 59.1 -01 \quad 16.9 +34$
 $\quad \quad \quad +78 \quad \quad \quad +50 \quad \quad \quad +45 \quad \quad \quad +41 \quad \quad \quad -06 \quad \quad \quad +43$
 $15.95 \quad 22.12 \quad 26.70 \quad 44.28 \quad 49.00 \quad 7.88$

1878 Jan 16

5

 α Urs Min $1^h 12^m +88^\circ 40'$

Rec. J. & M.

45 3 52.7 +.22 54.9 +.21 56.9 +.20 4' 0.9 +.20 14.3 +.42 29.1 +.52
 2.8 +.16 4.9 +.19 6.3 +.20 10.1 +.19 24.1 +.08 38.3 +.05
 47.4 -.50 49.8 -.47 51.0 -.43 54.6 -.23 7.9 +.09 21.9 -.22
 5.6 +.20 6.1 +.21 7.7 +.21 11.9 +.23 25.7 +.22 40.1 +.15
 +.08 +.14 +.18 +.39 +.81 +.50
 57.12 58.92 0.48 4.38 18.00 32.35

A-1
A-56 α Urs Min $1^h 12^m +88^\circ 40'$ Jan 17 1878

Rec. J. & M.

45 4 12.0 +.36 20.5 +.52 27.2 +.54 27.1 +.54 28.1 +.53 26.9 +.54
 13.1 +.19 22.8 +.09 29.1 +.03 29.1 +.03 29.9 +.02 29.9 +.02
 21.9 -.22 28.9 +.01 36.2 -.19 36.8 -.23 37.1 -.25 37.3 -.26
 19.4 +.21 28.1 +.22 34.7 +.21 35.8 +.20 35.7 +.20 35.1 +.21
 +.54 +.64 +.59 +.54 +.50 +.51
 16.60 25.08 31.80 32.20 32.70 32.30

A-456
A-143 α Urs Min $1^h 12^m +88^\circ 40'$

Jan 19 1878

45- 3 55.1 +.21 57.1 +.20 58.2 +.20 4' 0.6 +.20 3.1 +.21 3.6 +.22
 57.1 +.23 58.9 +.18 0.1 +.16 1.4 +.14 4.0 +.18 4.9 +.19
 4.1 +.17 6.9 +.12 8.4 +.07 10.2 -.03 2.1 -.11 3.2 -.17
 4.1 +.16 5.9 +.21 6.7 +.22 10.3 +.23 10.9 +.23 11.1 +.23
 +.77 +.71 +.65 +.54 +.51 +.47
 0.10 2.20 3.35 5.62 7.52 8.20

A+, 3
A1, 23
A-1

Jan 22, 1898

 α Urs. Min $1^h 12^m +88^\circ 40'$

J.F.M.

A, H2

45' 4" 14.2 +41 16.2 +44 16.2 +44 9.1 +49 21.2 +52 21.1 +52

16.2 +17 18.1 +15 17.9 +15 20.6 +12 22.8 +09 23.1 +09

25.5 -08 26.9 -02 27.3 -01 30.4 +02 31.5 +01 32.2 +00

24.1 +.21 25.8 +.22 26.1 +.22 28.9 +.23 30.3 +.23 31.4 +.23
+.71 +.79 +.80 +.86 +.85 +.84

20.00 21.75 21.88 24.75 26.45 26.95

1878, Jan 24

 δ Urs. Min $2^h 11^m +93^\circ 23'$

J.F.M.

5' 1" 5.0 +21 5.8 +19 1.5 +14 0" 56.9 +13 54.0 +13 51.1 +16

5.4 +22 2.1 +18 58.5 +20 54.2 +27 50.4 +30 49.2 +30

7.4 -07 5.9 -04 2.2 -01 57.9 -14 54.1 -48 51.9 -59

4.8 +.69 2.1 +.62 58.2 +.53 54.1 +.51 50.2 +.51 47.8 +.51
+.105 +.95 +.86 +.77 +.46 +.386.15 3.98 0.10 55.78 52.18 ~~50.00~~

1878, Jan 28

 α Urs. Min $1^h 12^m +88^\circ 46'$

J.F.M.

45 3 29.9 +44 43.6 +37 40.9 +33 48.0 +29 49.2 +27 61.6 +23

40.8 +23 44.9 +32 46.9 +34 47.9 +34 49.9 +34 52.4 +31

40.9 -50 57.8 -41 53.4 -33 55.1 -19 56.6 -04 58.9 +13

47.3 +14 51.7 +08 53.9 +05 55.3 +04 57.9 +02 0.1 +04
+.31 +.36 +.39 +.48 +.59 +.71

43.98 48.00 50.02 51.58 53.40 55.75

A
+1

Jan 30 1878

7

S Urs Min L.C. $18^{\circ} 11' + 93^{\circ} 23'$

J.F.M.

$5' 1' 49'' +18 22 +140' 58.1 +13 55.0 +13 52.5 -14 46.4 +23$ double strike for
 $28 +19 59.9 +17 55.3 +25 51.2 +30 48.7 +30 44.1 +25$ 1st wine
 $61 -04 41 -01 598 -06 55.9 -28 53.3 -52 49.0 -67$
 $815 +66 59.6 +56 55.8 +52 51.9 +51 50.0 +51 45.2 +51$
 $+99 +86 +84 +66 +43 +32$
 $4.32 1.45 57.25 53.50 51.12 46.18$

Feb 2 1878

S Urs. Min. L.C. $18^{\circ} 11' + 93^{\circ} 23'$

J.F.M.

$5' 1' 6.9 +21 22 +140' 58.6 +13 56.1 +13 51.9 +15 44.0 +27$
 $4.1 +20 59.8 +17 55.4 +25 53.1 +28 48.4 +30 41.2 +17$
 $7.9 -09 3.3 -01 597 -06 57.1 -19 53.5 -51 45.9 -66$
 $4.4 +68 0.0 +57 55.8 +52 54.1 +51 49.6 +51 41.8 +51$
 $+1.00 +87 +84 +73 +45 +29$
 $5.82 1.32 57.38 55.10 50.85 43.22$

Feb-3 1878

S Urs. Min L.C. $18^{\circ} 11' + 93^{\circ} 23'$

J.F.M.

$5' 1' 2.9 +15 59.3 +13 56.1 +13 51.9 +15 46.9 +22 44.1 +27$
 $0.6 +17 57.0 +22 53.0 +28 50.2 +30 45.1 +27 42.3 +20$
 $5.9 -04 2.7 -01 59.1 -09 55.9 -28 50.9 -63 48.7 -67$
 $3.1 +65 59.5 +86 56.0 +52 52.3 +51 48.2 +51 45.1 +51$
 $+93 +90 +84 +68 +37 +31$
 $3.12 59.62 56.05 52.58 47.78 45.05$

Feb. 4 1878

S Urs. Min L. C. 18^h 11^m +93° 23'

J.F.M.

5^h 1' 21.140 58.1+13 54.3+13 49.9+17 46.4+23 42.9+28
 1.5+17 57.1+22 53.0+28 49.3+30 45.4+27 41.5+18
 7.4-07 3.0-01 58.9-05 55.5-33 52.1-59 49.9-65
 4.3 +68 1.1+59 57.5+53 52.8+51 49.3+51 45.9+51
 +92 +93 +89 +65 +42 +32
 3.82 59.82 56.18 51.88 48.30 45.05

Feb 5 1878

S Urs Min L. C. 18^h 11^m +93° 23'

J.F.M.

5^h 0' 38.5+36 33.7+45 28.8+48 26.1+49 23.4+46 21.9+45
 37.9+09 33.2+04 28.9+03 26.3+04 23.0+06 20.9+07
 45.6-65 40.8-51 36.3-29 32.8-13 30.1-07 28.6-10
 42.9+51 38.1+52 33.8+51 29.4+49 26.8+46 25.9+45
 +31 +48 +73 +89 +91 +87
 41.22 36.45 31.70 28.40 25.82 24.32

S Urs Min L. C. 18^h 11^m +93° 23'

1878, Feb. 6

J.F.M.

5^h 0' 51.4+16 44.9+25 41.0+32 37.1+38 31.2+47 25.4+48
 51.9+29 45.1+27 40.6+15 38.1+09 31.9+03 26.3+04
 18-01 55.3-35 51.1-63 48.1-68 42.8-58 36.3-29
 58.9+55 51.1+51 46.9+51 43.4+51 38.1+52 32.8+51
 +99 +68 +35 +30 +44 +74
 56.00 49.10 44.90 41.68 36.00 30.20

1878, Feb. 7

9

S Ursa Min L.C. 18^h 11^m +93° 23'

J.F.M.

C 24 foll.
+ B

0'	4'	9.1 ⁺ 30	13.1 ⁺ 38	18.9 ⁺ 49	24.0 ⁺ 54	32.1 ⁺ 48	35.5 ⁺ 41
		10.1 ⁺ 19	14.1 ⁺ 18	20.4 ⁺ 12	25.1 ⁺ 07	33.2 ⁺ 01	36.8 ⁺ 03
		22.2 ⁻ 21	26.4 ⁻ 05	32.2 ⁻ 00	36.7 ⁻ 22	45.5 ⁻ 57	49.0 ⁻ 60
		18.9 ⁺ 21	23.4 ⁺ 21	29.4 ⁺ 23	33.0 ⁺ 22	40.9 ⁺ 14	45.2 ⁺ 10
		15.08 ⁺ 49	19.25 ⁺ 72	25.22 ⁺ 84	29.70 ⁺ 61	37.92 ⁺ 06	41.62 ⁻ 06

1878, Feb. 7

51 Cephei 6 42 +87 14

J.F.M.

B 34 foll.
6-10 9
D

10	3	51.3 ⁺ 23	48.1 ⁺ 29	35.9 ⁺ 50	30.9 ⁺ 58	25.9 ⁺ 61	21.3 ⁺ 57
		53.1 ⁺ 30	49.1 ⁺ 34	37.1 ⁺ 16	32.3 ⁺ 15	27.1 ⁺ 17	22.8 ⁺ 21
		3.9 ⁺ 17	59.9 ⁺ 16	49.6 ⁻ 48	44.7 ⁻ 46	38.5 ⁻ 26	34.1 ⁻ 01
		3.6 ⁺ 15	59.7 ⁺ 03	48.4 ⁺ 13	42.4 ⁺ 20	37.9 ⁺ 27	33.0 ⁺ 33
		57.98 ⁺ 85	54.20 ⁺ 82	42.75 ⁺ 31	37.58 ⁺ 47	32.35 ⁺ 79	27.80 ⁺ 10

1878, Feb. 11

S Ursa Min L.C. 18^h 11^m +93° 23'

J.F.M.

A₁

0	3	50.1 ⁺ 25	51.3 ⁺ 25	54.9 ⁺ 21	58.4 ⁺ 20	4'	1.0 ⁺ 20	6.8 ⁺ 26
		48.1 ⁺ 34	49.9 ⁺ 34	53.8 ⁺ 28	57.2 ⁺ 23		59.3 ⁺ 18	5.3 ⁺ 19
		53.8 ⁻ 30	54.9 ⁻ 19	57.7 ⁺ 08	0.9 ⁺ 17		3.1 ⁺ 18	9.5 ⁺ 00
		50.5 ⁺ 09	51.6 ⁺ 08	55.9 ⁺ 03	59.1 ⁺ 03		2.3 ⁺ 10	7.6 ⁺ 21
		50.62 ⁺ 38	51.92 ⁺ 46	55.58 ⁺ 60	58.90 ⁺ 63		1.42 ⁺ 66	7.30 ⁺ 66

1878, Feb. 11

51 β . Cephei 6^h 42^m + 87° 14'

10 3 43.9 +36 39.8 +44 32.0 +57 24.4 +60 21.4 +56 15.0 +45
 41.9 +26 37.8 +18 31.1 +15 23.8 +19 20.9 +24 13.9 +29
 47.2 -50 42.4 -40 35.3 -09 27.8 +02 24.7 -10 17.7 -31
 47.7 +13 41.9 +21 35.3 +31 26.9 +34 24.1 +34 18.8 +35
 45.18 +25 40.48 +43 33.42 +94 25.78 +115 22.78 +104 16.60 +78

J.S.M.

51 β . Cephei 6^h 42^m + 87° 14'

1878, Feb. 13

A +2,3,4,5
 A +1
 A 4,5,6,7,8,9
 +A
 -1

10 4 0.8 +20 57.9 +20 54.8 +21 51.5 +23 3 40.9 +42 35.8 +50
 1.5 +13 58.2 +21 55.9 +25 52.1 +31 41.0 +23 37.1 +16
 6.4 +13 3.8 +17 1.2 +17 58.2 +10 47.1 -50 42.9 -42
 6.1 +21 3.3 +14 3.2 +14 56.2 +03 46.1 +16 41.9 +21
 3.70 +67 0.80 +72 58.78 +77 54.50 +67 43.78 +31 39.42 +45

J.S.M.

2000 μ Lib. 19^h 46^m + 91° 4'

1878, Feb. 13

2000 4 6.0 +25 6.9 +26 9.1 +30 10.1 +32 12.3 +37 13.9 +41
 5.4 +19 7.1 +19 8.6 +19 9.1 +19 12.0 +19 13.7 +18
 10.1 -02 11.6 -09 13.9 -20 14.7 -23 16.8 -29 18.4 -30
 8.8 +22 10.7 +23 11.7 +23 12.9 +23 15.4 +22 17.1 +21
 7.58 +64 9.08 +59 10.82 +52 11.70 +51 14.12 +49 15.78 +50

J.F.M.

1878, Feb. 14

11

S Ues. Min. L.C. 18^{L m} 11 + 93° 23'

f.f.m

A₋₁

0 3 47.8 +.29 49.7 +.26 54.1 +.21 57.6 +.20 0.9 +.20 4.2 +.22
 47.1 +.34 49.0 +.34 53.7 +.29 57.1 +.23 59.9 +.16 4.0 +.18
 53.5 -.32 55.1 -.18 59.4 +.14 1.2 +.17 48 +.16 9.1 +.04
 48.6 +.12 52.1 +.07 56.9 +.02 58.6 +.03 1.7 +.08 6.9 +.22
 +.43 +.49 +.66 +.63 +.60 +.66
 49.25 51.48 56.02 58.62 1.82 6.05

1878, Feb. 14

51 H. Cephia 6 42 + 87° 14'

f.f.m

10 3 49.1 +.27 44.8 +.34 39.1 +.46 36.6 +.49 29.8 +.58 24.9 +.61
 48.6 +.34 43.9 +.31 39.1 +.20 36.9 +.16 29.7 +.15 25.2 +.18
 53.1 -.35 49.1 -.49 44.9 -.47 41.4 -.37 33.7 -.01 29.6 +.05
 52.3 +.07 47.2 +.14 43.0 +.19 39.7 +.25 33.0 +.33 29.1 +.34
 +.33 +.30 +.38 +.53 +.105 +.118
 40.78 46.25 41.52 38.65 31.55 27.20

1878, Feb. 16

S Ues. Min. L.C. 18^{L m} 11 + 93° 23'

f.f.m

A₋₁, 1, 2, 3, 4 + 9

0 3 45.8 +.33 48.0 +.29 50.5 +.24 52.4 +.21 57.1 +.20 8.9 +.30
 48.9 +.33 48.2 +.34 57.1 +.33 57.9 +.26 57.1 +.23 8.9 +.19
 53.1 -.35 55.2 -.17 57.9 +.09 1.4 +.17 4.0 +.17 15.9 -.27
 49.2 +.12 52.5 +.06 54.5 +.04 58.2 +.02 1.1 +.06 12.1 +.23
 +.43 +.52 +.70 +.66 +.66 +.45
 48.50 51.05 53.50 57.22 59.82 11.45

New zero for
sheet before 9

Hazy

1878, Feb. 18

S Ursa Min L.C. 18 11 +93 23

J. F. M.

A₋₁

0	3	44.1	+36	46.2	+33	51.3	+24	52.3	+22	55.2	+21	59.7	+20
		43.2	+29	45.9	+33	50.1	+34	51.1	+33	54.4	+27	57.9	+21
		48.4	-50	50.8	-44	55.1	-18	55.8	-09	58.6	+11	2.1	+18
		44.9	+17	48.1	+13	53.0	+06	53.9	+05	56.7	+02	0.1	+04
		45.15	+32	47.75	+35	52.38	+46	53.28	+51	56.22	+61	59.95	+63

1878, Feb. 18

51 H. Cephei 6 42 +87°15'

J. F. M.

A₁ 1,2,3,4,5,6,7
+1 A+A₁

10	3	0.7	+20	3	56.2	+20	48.7	+28	42.1	+40	36.2	+50	32.9	+56
		59.8	+16		55.1	+26	48.2	+34	42.1	+26	36.9	+16	33.1	+15
		3.7	+03		59.1	-04	52.4	-51	46.9	-60	41.1	-44	37.1	-24
		3.1	+13		59.7	+04	52.0	+07	44.9	+17	39.6	+25	36.1	+30
		1.82	+52		57.52	+46	50.32	+18	44.00	+23	38.45	+47	34.80	+77

Feb. 18, 1878

λ Ursa Min L.C. 19 49 +91 4

J. F. M.

A, lost 1st wire

20	4	8.2	+28	9.7	+31	11.9	+36	11.8	+36	13.2	+39	14.9	+43
		6.9	+19	7.9	+19	9.6	+19	10.6	+19	12.2	+19	13.1	+19
		10.2	-02	11.9	-11	14.1	-20	14.6	-22	16.5	-28	17.6	-30
		8.3	+21	10.2	+23	12.9	+23	12.2	+23	15.2	+23	16.4	+21
		8.40	+66	9.92	+62	12.12	+58	12.30	+56	14.28	+53	15.50	+53

1878, Feb. 19

13

S. W. m. min. L.C. 18 11 +93° 23'

f. 7. m

A₋₁

0	3	44.7	+35	48.5	+28	52.2	+22	53.9	+21	58.8	+20	4	1.9	+20
		43.1	+29	47.8	+34	50.7	+33	53.3	+29	57.2	+23		0.9	+16
		49.8	-47	53.3	-34	55.4	-14	58.1	+09	09	+17		5.6	+15
		45.1	+17	50.1	+10	51.9	+07	55.2	+04	59.6	+04		2.9	+13
			+34		+38		+48		+63		+64			+64
		45.68		49.92		52.55		55.12		59.12			2.82	

1878, Feb. 19

51 W. Cephei 6 42 +87 15

f. 7. m

10	4	0.5	+20	3	5.5	+21	45.3	+34	41.2	+42	35.1	+52	26.0	+61
A 1, 2, 3, 4, 5,		59.8	+16		54.1	+28	45.2	+32	41.7	+25	35.1	+14	25.9	+18
+1														
6, 7, three strokes for 7.		2.2	+03		59.8	+00	48.9	-60	46.4	-59	40.1	-40	30.1	+02
A + A		3.1	+13		58.7	+03	48.9	+12	44.5	+17	39.5	+25	28.9	+34
-1			+52			+52	+18			+25		+51		+1.15
Lost 1st wire of A.		1.40			56.95		47.08		43.45		37.45		27.72	

Perhaps false 8
for the last 8 which
has two eights

1878, Feb. 19

N. W. m. min. L.C. 19 49 +91 4

A

20	4	8.7	+29	9.6	+31	10.9	+34	12.4	+37	13.6	+40	13.9	+41
		7.2	+19	8.8	+19	9.8	+19	10.2	+19	12.1	+19	12.8	+19
		9.7	-02	12.3	-13	13.7	-19	14.2	-21	15.8	-26	16.4	-28
		8.3	+21	9.9	+23	11.7	+23	12.2	+23	14.1	+23	14.9	+23
			+67		+60		+57		+58		+56		+55
		8.48		10.15		11.52		12.25		13.90		14.50	

1878, Feb. 24

S. W. Min. L.B. 18 11 +93 23

J. J. M.

A₋₁

0	3	38.2	+41	40.5	+43	43.1	+38	43.9	+36	46.1	+33	49.1	+27
		39.8	+21	41.9	+26	44.2	+31	44.9	+32	46.2	+33	50.0	+34
		49.5	-48	51.8	-41	53.3	-34	53.9	-29	55.9	-07	59.1	+13
		45.8	+16	48.6	+12	50.2	+10	50.9	+09	53.6	+05	55.9	+03
			+36		+40		+45		+48		+64		+77
		43.32		45.70		47.70		48.40		50.45		53.52	

1878 Feb. 24

5176. Cephei 6 42 +87 15

J. J. M.

A₊ 3, 4, 5, 6, 7, 8, 9
A₋₁ 4, 5, 6, 7, 8, 9

10	3	48.9	+27	45.9	+33	35.9	+50	29.6	+59	24.4	+00	16.9	+49
		50.2	+34	47.1	+34	37.8	+18	31.1	+15	25.9	+18	18.4	+27
		59.0	+13	55.9	-07	45.9	-48	39.8	-31	33.9	-01	26.9	-01
		57.9	+02	54.9	+04	44.9	+17	38.9	+26	33.1	+33	25.7	+34
			+76		+64		+37		+69		+50		+109
		54.00		50.95		41.12		34.85		29.32		21.98	

1878, Feb. 24

S. W. Min. L.B. 19 46 +91 4

J. J. M.

A₂ 3, 4, 5, 6, 7, 8, 9
3 strokes
2 times

20	3	59.9	+20	4	1.1	+20	2.9	+21	3.9	+22	5.1	+23	6.2	+25
		59.8	+16		1.5	+13	3.8	+18	4.7	+19	6.0	+20	6.9	+19
		7.0	+12		9.7	-00	11.7	-10	12.9	-16	14.2	-20	15.2	-25
		5.9	+21		8.3	+22	9.9	+23	10.9	+23	12.2	+23	12.9	+23
			+64			+55		+52		+48		+46		+42
		3.15			4.90		7.08		8.10		9.38		10.30	

lost

1878, Feb. 26

15

S Ursa. Min. L.C. $18^h 11^m +93 23$

J.F.M.

A₋₁

$0^{\circ} 3' 38.3 +47 41.5 +41 42.7 +39 46.4 +33 48.9 +27 51.6 +23$
 $38.9 +20 42.1 +26 43.1 +29 46.9 +34 49.6 +34 52.1 +31$
 $46.4 -44 48.1 -50 50.8 -44 53.6 -32 56.0 -07 59.1 +13$
 $43.9 +18 45.8 +16 46.8 +14 50.1 +10 52.9 +06 55.9 +03$
 $+36 +33 +38 +45 +60 +70$
 $41.88 44.38 45.85 49.25 51.85 54.68$

1878, Feb. 26

51 H. Lephei 6 $42 +87 15$

J.F.M.

A. 5, 6, 7, 8, 9

A₋₁

$10^{\circ} 3' 36.8 +48 30.1 +58 25.1 +61 18.7 +52 13.1 +40 8.2 +29$
 $36.6 +16 30.6 +15 25.8 +18 19.8 +25 13.7 +29 8.1 +30$
 $43.8 -44 37.4 -20 32.3 +02 26.4 -03 21.1 -26 15.2 -28$
 $42.9 +19 37.4 +28 32.1 +33 26.0 +34 20.0 +35 14.9 +38$
 $+39 +51 +114 +108 +78 +69$
 $40.02 33.88 28.82 22.72 16.98 11.60$

$1878, Feb. 26$
 π Ursa. Min. L.C. $19^h 46^m +91 4$

A

$20^{\circ} 3' 59.7 +200.9 +203.4 +213.9 +225.2 +237.2 +26$
 $59.2 +18 0.4 +16 2.5 +13 3.2 +17 4.4 +18 6.6 +19$
 $5.4 +15 6.9 +12 9.1 +04 9.0 +04 11.1 -06 13.3 -17$
 $4.4 +17 5.8 +21 8.2 +21 8.9 +22 9.4 +22 11.9 +23$
 $+70 +69 +59 +65 +57 +51$
 $2.18 3.50 5.80 6.25 7.52 9.75$

1878, Feb. 27

S Ursa Min. L.C. 18 11 +93 23

f.7.2

0' 3' 34.7⁺⁵³ 37.9⁺⁴⁷ 40.0⁺⁴⁴ 42.2⁺⁴⁰ 43.9⁺³⁶ 47.1⁺³¹
 36.4⁺¹⁵ 39.9⁺²¹ 41.4⁺²⁴ 43.6⁺³⁰ 45.4⁺³² 47.2⁺³⁴
 48.1⁻⁵⁰ 50.2⁻⁴⁶ 51.8⁻⁴¹ 54.1⁻²⁸ 55.9⁻⁰⁸ 58.6⁻¹¹
 44.2⁺¹⁸ 46.9⁺¹⁴ 49.2⁺¹² 51.1⁺⁰⁹ 53.6⁺⁰⁵ 55.6⁺⁰³
 40.85⁺³⁶ 43.72⁺³⁶ 45.60⁺³⁹ 47.75⁺⁵¹ 49.70⁺⁶⁵ 52.38⁺⁵⁷

A₋₁

1878, Feb. 27

51 P. Cephei 6 42 +87 15

f.7.2

10' 3' 48.6⁺²⁸ 42.0⁺⁴⁰ 38.1⁺⁴⁷ 36.0⁺⁵⁰ 30.5⁺⁵⁸ 25.8⁺⁶¹
 50.6⁺³³ 43.1⁺²⁹ 39.6⁺²¹ 36.4⁺¹⁵ 31.8⁺¹⁵ 27.2⁺¹⁷
 59.5⁺¹⁵ 53.1⁻³⁵ 49.8⁻⁴⁷ 46.8⁻⁵⁰ 41.9⁻³⁹ 37.2⁻¹⁹
 59.2⁺⁰³ 52.1⁺⁰⁷ 48.9⁺¹² 46.2⁺¹⁶ 40.6⁺²³ 35.9⁺³⁰
 54.48⁺⁷⁹ 47.58⁺⁴¹ 44.10⁺³³ 41.35⁺³¹ 36.20⁺⁵⁷ 31.52⁺⁸⁹

A₁ A₂ A₃
 +1 -1

1878, Feb. 27

A Ursa Min. L.C. 19 46 +91 4

f.7.2

A, Lost 1st wire 20' 3' 57.9⁺²⁰ 58.9⁺²⁰ 4' 1.9⁺²⁰ 3.2⁺²¹ 5.7⁺²⁴ 7.0⁺²⁶
 58.5⁺²⁰ 59.6⁺¹⁷ 2.1⁺¹¹ 4.3⁺¹⁸ 5.9⁺²⁰ 7.3⁺¹⁹
 6.8⁺¹² 8.7⁺⁰⁶ 11.3⁻⁰⁸ 13.3⁻¹⁷ 15.5⁻²⁶ 16.9⁻²⁹
 5.7⁺²⁰ 7.1⁺²² 9.8⁺²³ 12.5⁺²³ 13.9⁺²³ 14.9⁺²³
 2.22⁺⁷² 3.58⁺⁶⁵ 6.28⁺⁴⁶ 8.32⁺⁴⁵ 10.25⁺⁴¹ 11.52⁺³⁹

1878, Feb. 28

17

S Ues. Min. L.C. $18^h 11^m +93^s 23$

J. F. M.

A₋₁

0' 3' 33.7	+55	36.2	+50	38.9	+46	41.1	+42	42.0	+39	45.3	+34
35.3	+14	38.1	+18	40.1	+21	41.4	+24	43.1	+29	46.4	+33
46.8	-50	50.1	-47	51.9	-40	53.2	-35	54.9	-19	58.1	+09
44.2	+18	46.1	+16	48.8	+12	50.1	+10	52.8	+06	55.9	+03
	+37		+37		+39		+41		+55		+79
40.00		42.62		44.92		46.45		48.35		51.42	

1878, Feb. 28

57 Pl. Cephei 6 42 +87 15

J. F. M.

10' 3' 50.5	+24	46.8	+31	42.8	+38	37.1	+48	32.9	+56	26.5	+61
51.2	+33	47.5	+34	43.4	+30	38.1	+18	33.7	+14	27.4	+17
1.2	+17	58.4	+11	54.4	-25	49.0	-49	44.9	-47	38.2	-25
1.2	+07	57.9	+02	55.3	+04	48.1	+13	45.1	+17	38.1	+27
	+81		+78		+47		+30		+40		+80
56.02		52.65		48.98		43.08		39.15		32.55	

Ref. S near A₋₁, 2

1878, Feb. 28

λ Ues. Min. L.C. 19 46 +91. 4

J. F. M.

20' 3' 56.8	+20	58.6	+20	4' 0.9	+20	2.1	+20	4.9	+23	6.7	+26	
A. Lost 1 st wire	56.5	+24	59.1	+18	1.1	+16	2.1	+11	5.1	+19	6.3	+20
	6.2	+14	8.9	+04	10.9	-06	11.9	-11	15.8	-26	17.8	-30
	5.4	+20	7.9	+21	9.8	+23	10.7	+23	13.7	+25	[15.7]	+22
		+78		+63		+53		+43		+39		+38
	1.22		3.62		5.68		6.70		9.88		11.62	

18

1878, March 4

S Ursa Min. L.C. 18 11 +93 23

f.J.m

0'	3'	35.1 ¹¹ ₊₅₂	38.8 ¹¹ ₊₄₆	40.9 ¹¹ ₊₄₂	43.6 ¹¹ ₊₃₇	45.8 ¹¹ ₊₃₃	48.9 ¹¹ ₊₂₇
		36.1 ₊₁₅	39.1 ₊₂₀	40.9 ₊₂₃	43.8 ₊₃₁	46.2 ₊₃₃	49.8 ₊₃₄
		45.0 ₋₄₇	48.7 ₋₄₉	50.1 ₋₄₇	52.5 ₋₃₃	54.3 ₋₂₆	56.9 ₊₀₁
		42.8 ₊₁₉	45.2 ₊₁₇	47.9 ₊₁₃	50.1 ₊₁₀	53.1 ₊₀₆	54.8 ₊₀₄
		39.75 ₊₃₉	42.95 ₊₃₄	44.95 ₊₃₁	47.50 ₊₄₅	49.85 ₊₄₆	52.60 ₊₆₆

A + A
-2 -12 strokes for 4th
wire of A₋₁

1878, March 4

51th Cephei 6 42 +87 15

f.J.m

10'	3'	39.9 ¹¹ ₊₄₄	33.8 ¹¹ ₊₅₄	27.7 ¹¹ ₊₆₁
		40.0 ₊₂₁	34.8 ₊₁₄	29.0 ₊₁₆
		48.1 ₋₅₀	42.6 ₋₄₁	37.1 ₋₁₈
		48.2 ₊₁₃	42.1 ₊₂₁	36.9 ₊₂₈
		44.05 ₊₂₈	38.32 ₊₄₈	32.68 ₊₈₇

A 3 ~~4~~ 4, 5, 6
7, 8, 9

1878, March 5

S Ursa Min. L.C. 18 11 +93 23

f.J.m

0'	3'	37.5 ¹¹ ₊₄₇	40.0 ¹¹ ₊₄₄	42.0 ¹¹ ₊₄₀	46.2 ¹¹ ₊₃₃	48.9 ¹¹ ₊₂₇	53.6 ¹¹ ₊₂₁
		38.5 ₊₁₉	41.9 ₊₂₆	43.1 ₊₂₉	47.1 ₊₃₄	50.1 ₊₃₄	53.3 ₊₃₀
		47.2 ₋₅₀	49.9 ₋₄₇	52.1 ₋₄₀	55.2 ₋₁₅	57.9 ₊₀₉	1.9 ₊₁₈
		45.1 ₊₁₇	47.7 ₊₁₃	49.2 ₊₁₂	52.2 ₊₀₇	55.8 ₊₀₃	1.1 ₊₀₆
		42.08 ₊₃₃	44.95 ₊₃₆	46.60 ₊₄₁	50.18 ₊₅₉	53.18 ₊₇₃	57.48 ₊₇₅

A + A
-2 -1

1878, March 5

19

51 H. Cephei 6^L 42^m +87° 15'

f. J. M.

A + A₋₁

10 3 40".4 +43 35".3 +52 31".1 +58 25".2 +61 20".9 +56 14".9 +45
 42.4 +27 37.6 +17 32.1 +15 27.1 +17 22.1 +22 16.1 +28
 50.3 -46 46.1 -48 40.1 -32 34.5 -04 30.8 +06 24.8 -10
 50.3 +10 45.1 +17 39.4 +25 34.4 +32 29.8 +34 24.1 +34
 +34 +38 +66 +106 +118 +97
 45.85 41.02 35.68 30.30 25.90 19.98

1878, March 5

λ Ursa. Min L.C. 19 46 +91 4

f. J. M.

20 3 58.7 +20 4 0.3 +20 2.3 +20 3.8 +22 4.9 +23 6.1 +25
 0.1 +16 09 +16 2.9 +17 4.9 +19 6.2 +20 7.1 +19
 A1, 2, 3, 4, 5, 6, 7 6.8 +12 8.0 +09 9.1 +04 11.1 -06 13.0 -16 14.8 -23
 5.0 +19 6.8 +22 8.2 +21 10.3 +23 11.8 +23 12.1 +23
 +67 +67 +62 +58 +50 +44
 2.65 4.00 5.62 7.52 8.98 10.02

1878, March 6

8^{8?} Ursa. Min L.C. 18 11 +93 23

f. J. M.

A₋₁

20 3 52.3 +22 56.1 +20 58.1 +20
 52.9 +30 57.3 +23 59.8 +16
 2.2 +18 5.9 +14 8.2 +08
 59.8 +04 3.5 +15 3.4 +14
 +74 +72 +58
 56.80 0.70 2.38

1878, March 6

A
 Lost last wire
 8 Ues. Min. L.C. ^L 19 ^m 46 +91° 4' f.T.M.
 2' 0" 3" 55.6 +20 58.1 +20 59.0 +20 59.9 +20 2.2 +20 3.4 +21
 55.9 +25 58.8 +19 59.3 +17 0.2 +16 2.9 +17 3.9 +18
 3.8 +17 7.0 +12 7.8 +10 8.9 +04 11.1 -06 12.3 -13
 3.2 +13 5.3 +19 7.2 +22 7.8 +21 10.3 +23 11.3 +23
 +7.5 +7.0 +6.9 +6.1 +5.4 +4.9
 59.62 2.30 3.32 4.20 6.62 7.72

1878, March 16
 8 Ues. Min. L.C. ^L 18 ^m 11 +93° 23' f.T.M.

A
 -1
 0' 3' 38.8 +46 45.1 +34 48.0 +29 49.7 +26 55.1 +21 59.9 +20
 39.9 +21 47.1 +34 50.5 +33 51.8 +31 56.9 +23 1.4 +14
 52.9 -36 0.1 +16 3.1 +18 4.9 +16 10.1 -02 14.8 -23
 50.1 +10 57.1 +02 0.8 +06 1.9 +09 7.4 +22 11.9 +23
 +4.1 +8.6 +8.6 +8.2 +6.4 +3.4
 45.42 52.35 55.60 57.08 2.38 7.00

1878, March 16
 51 Hb Cephei 16 42 +87 15

A
 10 3 42.9 +38 39.2 +46 35.9 +50 33.5 +54 31.5 +57 28.2 +61
 45.1 +32 41.6 +25 38.1 +18 36.1 +15 33.8 +14 30.9 +15
 57.7 +07 54.7 -22 51.3 -42 49.1 -49 46.9 -50 44.4 -46
 57.4 +02 54.0 +05 50.9 +09 48.7 +12 45.9 +16 43.6 +18
 +7.9 +5.4 +3.5 +3.2 +3.7 +4.8
 50.78 47.38 44.05 41.92 39.60 36.78

1878, March 16

21

π Uas. Min. L.C. ^h 19 ^m 46 +91 4

J.F.M.

20 3 52.8+22 56.9+20 58.9+20 58.2+20 4' 0.8+20 3.1+21

A

54.2+28 57.9+21 0.1+16 59.2+18 2.1+11 4.2+18

3 strokes for 4th wire

5.8+14 9.5+00 12.0-11 12.0-11 13.9-20 16.5-28

5.2+19 8.4+21 9.9+23 9.9+23 12.2+23 14.9+23

~~5.50~~ ⁺⁸³ 3.18 ⁺⁶² 5.22 ⁺⁴⁸ 4.82 ⁺⁵⁰ 7.25 ⁺³⁴ 9.68 ⁺³⁴

1878, March 19

S Uas. Min. L.C. 18 11 +93' 23'

U 3 41.2+42 46.0+33 49.9+25 54.7+21 58.1+20

A ₋₂ 43.2, 1
+ A ₋₁

43.9+31 48.1+34 51.4+32 56.5+24 59.9+16

54.5-24 59.1+13 1.9+18 6.8+12 10.6-04

51.9+07 55.9+03 59.1+03 4.8+18 7.9+21

⁺⁵⁶ 47.88 ⁺⁸³ 52.28 ⁺⁷⁸ 55.58 ⁺⁸⁵ 0.70 ⁺⁵³ 4.12

1878, March 19

51 Hb. Cephei ^h 6 ^m 42 +87' 15'

10 3 43.3+38 33.9+54 31.1+58 29.8+58 28.8+60

45.4+32 36.0+15 33.1+15 31.1+15 30.2+15

55.2-17 47.1-50 44.6-46 42.1-39 40.6-34

55.1+04 45.5+16 43.2+19 41.9+21 40.9+23

lost wires 1 & 2 and perhaps 5

⁺⁵⁷ ~~49.75~~ ⁺³⁵ 40.62 ⁺⁴⁶ 38.00 ⁺⁵⁵ 36.22 ⁺⁶⁴ 35.12

1878, March 19

Wes. Min. L.C. 19^h 46^m + 91° 4'

J.F.M.

A

20	3	53.9 ⁺²¹	54.9 ⁺²¹	56.6 ⁺²⁰	57.9 ⁺²⁰	59.9 ⁺²⁰	4	2.9 ⁺²¹
		54.6 ⁺²⁷	55.1 ⁺²⁶	56.8 ⁺²³	58.1 ⁺²¹	0.1 ⁺¹⁶		2.9 ⁺¹⁷
		3.8 ⁺¹⁷	5.1 ⁺¹⁶	6.7 ⁺¹³	7.7 ⁺¹⁰	10.0 ⁻⁰²		12.0 ⁻¹¹
		3.1 ⁺¹³	4.8 ⁺¹⁸	6.1 ⁺²¹	7.1 ⁺²²	9.2 ⁺²²		11.7 ⁺²³
		⁺⁷⁸	⁺⁸¹	⁺⁷⁷	⁺⁷³	⁺⁵⁶		⁺⁵⁰
		58.85	59.98	1.55	2.70	4.80		7.38

1878, March 20
S. Wes. Min. L.C. 18 11 + 93 23

J.F.M.

A 4321⁺²

0	4	42.4	51.1	56.4	3.1	8.7	12.1
		42.5	52.4	57.3	4.9	5.4	11.9
		53.9	3.1	8.1	16.0	19.9	22.6
		48.9	59.8	4.9	12.1	16.1	19.2

1878, March 20
51 No. Cephei 6 46 + 87 15

J.F.M.

Lost A⁺¹

10	3	52.5 ⁺²²	47.8 ⁺²⁹	45.1 ⁺³⁴	42.4 ⁺³⁹	38.8 ⁺⁴⁶	33.5 ⁺⁵⁵
		54.1 ⁺²⁸	49.7 ⁺³⁴	46.7 ⁺³⁴	43.9 ⁺³¹	40.4 ⁺²²	36.0 ⁺¹⁵
		3.4 ⁺¹⁸	58.9 ⁺¹³	56.0 ⁻⁰⁷	53.7 ⁻³¹	49.5 ⁻⁴⁸	45.1 ⁻⁴⁷
		3.1 ⁺¹³	58.3 ⁺⁰²	55.4 ⁺⁰⁴	51.9 ⁺⁰⁷	48.5 ⁺¹²	44.1 ⁺¹⁸
		⁺⁸¹	⁺⁷⁸	⁺⁶⁵	⁺⁴⁶	⁺³²	⁺⁴¹
		58.28	53.68	50.80	47.98	44.30	39.68

1878, March 20

23

N. Ursa. Min. L.C. 19 46 +91 4

A
Lost A9

20'	3'	57.3 +20	59.4 +20	4'	0.9 +20	1.4 +20	2.4 +20	4.0 +22
		58.3 +21	59.9 +16		1.1 +16	2.1 +11	3.1 +17	4.4 +18
		4.7 +16	7.9 +09		9.1 +04	10.5 -04	11.2 -07	12.9 -16
		4.6 +18	6.9 +22		7.8 +21	8.9 +22	10.2 +23	11.0 +23
		1.22 +75	3.52 +67		4.72 +61	5.72 +49	6.72 +53	8.08 +47

S. Ursa. Min. L.C. 18 11 +93 23

1878, March 21

J.F.M.

0	3	58.0						
0'	3'	58.0 +20	4'	3.4 +21	8.8 +30	11.1 +34	33.2 +47	37.8 +35
A	3, 4, 5, 6, 7, 8 +9	59.1 +18		4.1 +18	9.1 +19	12.0 +19	34.0 +01	37.9 +04
A	1, 2, 3, 4 +5	5.8 +14		13.1 -16	16.8 -29	20.1 -27	40.9 -44	45.9 -58
A	7, 8 +9	34 +14		8.9 +22	14.5 +23	17.3 +21	38.7 +17	42.1 +13
+1		1.58 +66		7.38 +45	12.30 +43	15.12 +47	36.70 +21	40.92 -06

51 H. Cephei 6 42

1878, March 21

10	3	52.4 +22	51.2 +24	48.1 +29	43.0 +38	40.3 +43	38.9 +46
		53.0 +30	51.3 +33	48.2 +34	44.1 +31	41.1 +23	39.5 +21
		0.2 +16	58.2 +10	56.3 -05	51.7 -41	47.8 -50	47.0 -50
		0.9 +06	58.6 +02	55.1 +04	51.1 +09	47.7 +13	46.9 +14
		56.62 +74	54.82 +69	51.92 +62	47.48 +37	44.22 +29	43.08 +31

A₁ and A₂ lost 1st wire

24

1878, March 21

λ Uss. Min. L. b. $19^h 46^m + 91^\circ 4'$

	20	3	59.9 +20	4	2.1 +20	3.4 +21	4.1 +22	6.9 +26	7.1 +26
			59.0 +18		2.5 +14	3.2 +17	3.8 +18	6.1 +20	6.4 +20
A, lost last wire			5.1 +16		8.9 +04	9.2 +03	9.9 -02	12.0 -11	13.8 -19
			5.7 +20		8.9 +22	8.3 +21	9.3 +22	11.5 +23	12.1 +23
obs. ? on account			2.42		5.60	6.02	6.78	9.12	9.85
of clouds									

1878, March 26

λ Uss. Min. L. b. $19^h 46^m + 91^\circ 4'$

	20	3	53.1 +22	56.9 +20	57.7 +20	59.1 +20	4	2.6 +21	3.2 +21
A			55.3 +26	58.3 +20	59.1 +18	59.5 +17		4.1 +18	4.3 +18
lost last wire			3.6 +17	5.9 +14	7.8 +10	8.3 +07		12.1 -11	12.8 -15
			2.1 +09	4.9 +19	6.4 +21	7.7 +21		11.7 +23	11.2 +23
			58.52	1.50	2.75	3.65		7.62	7.88

1878, March 30

λ Uss. Min. L. b. $19^h 46^m + 91^\circ 4'$

	20	3	51.0 +24	54.9 +21	54.9 +21	57.7 +20	58.8 +20	4	1.7 +20
			53.2 +30	56.8 +23	57.4 +22	59.4 +17	0.9 +16		3.0 +17
A.			5.3 +16	7.8 +10	8.1 +09	10.2 +03	11.9 -11		14.2 -21
			3.2 +14	6.1 +21	6.1 +21	8.6 +22	9.9 +23		12.1 +23
			58.18	1.40	1.62	3.98	5.38		7.75

1878, March 31

25

Λ Ues. Min. L.C. 19^L 46^{mm} +91 4

20 3 54.4 +.21 55.0 +.21 56.6 +.20 57.9 +.20 58.2 +.20 59.3 +.20
 55.8 +.25 56.7 +.24 57.8 +.21 59.9 +.16 59.4 +.17 0.2 +.16
 6.8 +.12 7.5 +.10 8.9 +.04 11.3 -.08 11.1 -.06 12.1 -.11
 5.1 +.19 6.1 +.21 7.8 +.21 9.0 +.22 9.2 +.22 10.1 +.23
 +.77 +.76 +.66 +.50 +.53 +.48
 0.52 1.32 2.78 4.52 4.48 5.42

A

1878, Apr. 3

Λ Ues. Min. L.C. 19 46 +91 4

20 4 32.3 +.48 36.2 +.40 41.3 +.28 43.1 +.24 ~~53.9~~ 48.6 +.12 51.8 +.05
 32.1 +.02 37.2 +.03 42.1 +.12 44.0 +.17 ~~43.6~~ 48.9 +.19 51.4 +.17
 46.5 -.59 50.1 -.58 52.9 -.33 56.6 -.16 0.8 +.02 4.0 +.03
 44.9 +.10 49.7 +.04 53.5 -.01 ~~55.9~~ 0.7 +.02 4.1 +.12
 +.01 -.11 +.06 ~~55.9~~ 54.75 +.35 57.82 +.37
 38.95 43.30 47.95 55.9 -.02
 49.90 +.23

A 4,2,341
 +2

5 2 17.5 18.8
 17.7 18.8
 33.9
 31.1

26

1878, May 1

α Ues. Min. ^{L.B.} 13 ^m 12 +91° 20'

J.F.M.

	5	2	35.0 +46	37.0 +43	39.7 +38	45.5 +28	56.2 +16	91 +16
A ₅ , 4, 3, 2, 1			34.9 +21	36.1 +22	38.8 +27	44.7 +40	56.0 +34	58.8 +28
A ₋₁ , 9, 3, 2, 1			50.4 -53	52.0 -48	55.1 -28	0.1 +06	11.1 -11	14.8 -27
			48.1 +30	49.2 +28	52.2 +25	57.9 +21	8.7 +11	116 +40
			+44	+45	+62	+95	+80	+57
			42.10	43.58	46.45	52.05	3.00	5.93
								6.08

1878, May 2

α Ues. Min. L.B. 13 12 +91° 20'

	5	2	22.0 +50	23.5 +54	25.9 +54	58.1 +16	3	2.7 +18	6.0 +23
A ₋₁ , 3, 2, 1			21.2 +29	22.2 +28	25.1 +25	56.7 +33		1.4 +26	4.5 +29
A ₋₂ , 5, 4, 3, 2			37.8 -27	39.5 -35	42.7 -45	14.0 -25		18.0 -32	20.7 -27
			34.5 +45	36.4 +44	38.6 +41	10.8 +40		15.1 +38	18.9 +35
			+97	+89	+75	+64		+50	+60
			28.87	30.40	32.95	7.40		9.30	12.53
						4.90			

1878, May 5

α Ues. Min. L.B. 13 12 +91° 20'

	5	2	47.5 +25	52.7 +17	56.4 +16	57.9 +16	59.9 +16	3	1.9 +17
A ₁ , (5), 4, 3, 2, 1			48.1 +43	52.8 +39	56.1 +34	57.8 +30	60.4 +26		2.0 +27
A ₋₂ , 5, 4, 3, 2			5.0 +08	9.5 -05	13.3 -22	15.1 -28	17.2 -31		18.1 -32
			1.9 +28	6.9 +40	10.4 +40	12.2 +40	13.1 +39		15.8 +37
			+104	+91	+68	+58	+50		+44
Ref. after A ₋₂ , 2			55.62	0.48	4.05	5.75	7.65		9.45

1878, May 6

27

L Ursa Min. L.C. 13 12 +91 20

J.F.M.

5 2 23.8 +.53 26.1 +.54 25.8 +.54 32.9 +.50 36.9 +.43
 23.6 +.26 25.4 +.25 25.1 +.25 33.1 +.21 36.9 +.23
 A 3, 2, 1 40.0 -.37 41.7 -.43 41.2 -.42 48.2 -.57 52.2 -.47
 A₋₁ 9, 5, 4, 3, 2, 1 35.9 +.44 38.9 +.41 37.1 +.43 37.1 +.43 48.7 +.29
 30.83 +.86 33.02 +.77 32.30 +.80 37.82 +.57 43.68 +.48

1878, May 7

L Ursa Min. L.C. 13 12 +91° 20

5 2 19.2 +.46 22.1 +.50 22.9 +.51 24.1 +.53 25.8 +.54 27.2 +.54
 A (9, 8, 7, 6 18.0 +.32 21.1 +.27 22.1 +.28 24.0 +.26 24.8 +.25 26.2 +.25
 -1 5, 4, 3) 33.4 -.04 37.0 -.22 37.9 -.28 39.1 -.32 40.2 -.38 42.4 -.46
 A₊₁ 6, 5, 4, 3, 2, 1 31.3 +.48 34.5 +.45 35.2 +.45 37.1 +.43 37.8 +.42 39.2 +.41
 25.48 +.12 28.67 +.10 29.53 +.96 31.07 +.90 32.15 +.83 33.75 +.74

1878, May 8

L Ursa Min. L.C. 13 12 +91 20

5 2 20.0 +.48 21.7 +.50 22.5 +.51 23.8 +.53 24.9 +.54 26.8 +.54
 A 7, 6, 5, 4 20.1 +.30 21.9 +.28 22.1 +.28 23.4 +.27 24.3 +.26 27.1 +.24
 -1 3, 2, 1 34.6 -.09 37.1 -.22 37.2 -.23 39.0 -.32 40.0 -.37 42.5 -.46
 A₊₁ 8, 7, 6, 5 32.5 +.47 34.1 +.46 35.6 +.44 36.8 +.43 37.4 +.43 40.0 +.39
 4, 3, 26.80 +.56 28.70 +.10 29.35 +.10 30.75 +.91 31.65 +.86 34.10 +.71

28

1878, June 3

2 Ues. Min. L.C. 13 ^m 12 + 91 20

J.F.M.

	5	2	15.1 + .37	17.1 + .41	17.3 + .42	19.1 + .46	20.9 + .49	48.3 + .24
A ₋ , 3, 4, 5, 6, 7, 8, 9.			15.4 + .33	16.9 + .32	18.3 + .32	19.9 + .30	21.4 + .29	48.6 + .43
			30.9 + .03	32.5 - .01	33.2 - .03	34.5 - .09	36.9 - .22	3.5 + .10
A ₊ , 7, 8, 9			29.1 + .48	31.2 + .48	32.1 + .47	33.2 + .47	36.0 + .44	2.1 + .28
			22.63 + 1.21	24.42 + 1.20	25.23 + 1.18	26.67 + 1.14	28.80 + 1.00	55.62 + 1.05

1878, June 5

2 Ues. Min. L.C. 13 12 + 91 20

J.F.M.

2nd S comes before the 6th wire.

	5	2	15.0 + .37	16.6 + .40	18.2 + .44	19.7 + .47	21.0 + .49	23.0 + .51
			14.2 + .33	16.2 + .33	17.9 + .32	19.2 + .31	20.1 + .30	22.9 + .27
			29.7 + .03	30.8 + .03	32.5 - .01	34.1 - .06	34.9 - .11	37.1 - .22
A ₋			27.2 + .47	29.0 + .48	31.1 + .48	32.2 + .47	33.9 + .46	35.7 + .44
Lost 1 st wire			21.53 + 1.20	23.15 + 1.24	24.93 + 1.23	26.32 + 1.19	27.48 + 1.14	29.67 + 1.00

1878, June 6

2 Ues. Min. L.C. 13 12 + 91 20

J.F.M.

Lost 1st wire

	5	2	11.6 + .29	14.5 + .37	13.7 + .34	16.0 + .39	17.6 + .43	19.0 + .46
			12.9 + .34	15.2 + .33	15.2 + .33	16.9 + .32	19.1 + .31	19.9 + .30
A ₋ , 2, 3, 4, 5, 6, 7, 8, 9			26.1 - .05	28.8 + .02	28.9 + .02	30.2 + .04	32.1 + .00	33.6 - .04
			26.9 + .47	28.3 + .47	28.6 + .48	30.0 + .48	32.2 + .47	32.9 + .47
			19.37 + 1.05	21.70 + 1.19	21.60 + 1.17	23.28 + 1.23	25.25 + 1.21	26.35 + 1.19

1878, June 9

29

2 Uers. Min L.C. 13 12 +91 20

J.F.M.

$\begin{array}{cccccccc}
5 & 2 & 9'' & 4 & 11'' & 12'' & 13'' & 14'' & 16'' \\
& & +.23 & & +.28 & +.31 & +.35 & +.36 & +.41 \\
10.2 & +.34 & 11.9 & +.34 & 13.1 & +.34 & 14.1 & +.33 & 15.2 & +.33 & 17.9 & +.32 \\
24.4 & -.13 & 26.1 & -.05 & 26.8 & -.03 & 28.9 & +.02 & 29.5 & +.03 & 31.8 & +.00 \\
28.1 & +.47 & 25.4 & +.48 & 26.7 & +.47 & 28.8 & +.48 & 28.9 & +.48 & 31.6 & +.47 \\
& & +.91 & & +.105 & & +.109 & & +.118 & & +.120 & & +.120 \\
14.28 & & 18.65 & & 19.33 & & 21.42 & & 22.03 & & 24.55 & & \\
16.78 & & & & .82 & & & & & & & &
\end{array}$

1878 June 13
2 Uers Min L.C. 13 12 +91 20

J.F.M.

$\begin{array}{cccccccc}
5 & 2 & 28.1 & +.54 & 31.1 & +.52 & 32.2 & +.51 & 41.9 & +.34 & 45.2 & +.29 & 48.0 & +.24 \\
30.1 & +.22 & 31.9 & +.21 & 33.6 & +.21 & 41.3 & +.32 & 45.2 & +.41 & 48.1 & +.43 \\
45.4 & -.54 & 46.8 & -.57 & 49.0 & -.56 & 57.2 & -.07 & 0.1 & +.06 & 3.1 & +.09 \\
42.9 & +.35 & 46.1 & +.32 & 47.8 & +.30 & 55.4 & +.23 & 59.6 & +.23 & 2.2 & +.28 \\
& +.57 & & +.48 & & +.46 & & +.82 & & +.97 & & +.104 \\
36.62 & & 38.98 & & 40.65 & & 48.95 & & 52.53 & & 55.35 & &
\end{array}$

1878, June 19
2 Uers Min L.C. 13 12 +91 20

J.F.M.

$\begin{array}{cccccccc}
5 & 2 & 23.1 & +.51 & 27.3 & +.54 & 28.2 & +.54 & 34.1 & +.48 & 36.6 & +.43 & 39.2 & +.40 \\
22.6 & +.27 & 27.2 & +.24 & 28.2 & +.23 & 33.9 & +.21 & 36.0 & +.22 & 38.9 & +.27 \\
38.8 & -.31 & 43.8 & -.50 & 44.4 & -.52 & 49.9 & -.54 & 51.8 & -.49 & 54.9 & -.28 \\
36.9 & +.43 & 40.6 & +.38 & 42.1 & +.36 & 48.0 & +.30 & 49.5 & +.27 & 52.9 & +.24 \\
& +.90 & & +.66 & & +.61 & & +.45 & & +.43 & & +.63 \\
30.35 & & 34.72 & & 35.73 & & 41.48 & & 43.47 & & 46.48 & &
\end{array}$

1878, June 20

8 Ues. Min. L.C. ^L 13 ^m 12 +91° 20

f.f.m.

5' 2' 17.5+43 18.8+46 21.9+50 23.2+51 26.8+54 28.8+53
 A, A, 9, 4, 3, 2, 1. 17.7+32 18.8+31 22.0+28 23.7+26 27.0+24 28.8+23
 33.9-06 34.9-11 37.9-28 38.4-30 42.9-48 44.9-53
 31.1+48 32.4+47 35.9+44 37.0+43 40.4+38 42.7+35
 +1.17 +1.13 +.94 +.90 +.68 +.58
 25.05 26.22 29.43 30.57 34.28 36.30

1878, July 23

8 Ues. Min 18 11 +86 36

f.f.m.

50' 1' 17.5 23.9+53 18.1+45 14.1+38 9.8+28 3.1+15 0.1+13
 18.9 25.0+19 19.6+23 14.4+25 11.1+25 4.1+20 1.1+17
 35.6 42.7-48 36.7-24 31.7-04 27.9-07 21.6-33 18.6-40
 34.8 41.1+51 35.9+59 30.2+65 26.8+65 20.1+66 17.2+68
 +.75 +.103 +.124 +.111 +.68 +.58
 33.17 27.58 22.60 18.90 12.23 9.25

8 Ues. Min 1

1878, July 24

8 Ues. Min 18 11 +86 36

f.f.m.

Lost 12th win 50' 1' 24.8+53 20.6+50 17.1+43 12.4+34 7.7+22 1' 2.2+14
 25.8+19 21.3+22 17.1+25 12.4+26 7.8+24 1.9+18
 43.0-49 38.5-33 34.7-13 29.7-04 25.1-17 19.4-39
 40.5+52 36.4+58 33.4+62 28.4+65 23.4+66 17.5+67
 13.4+75 11.6+87 10.2+117 8.2+121 6.4+95 4.0+60
 33.53 29.20 25.58 20.73 16.00 10.25

1878, July 28

31

S W. min. 18 11 +86 36

J.F.M.

50 1 32.9 +48 23.8 +53 20.9 +50 15.2 +40 11.5 +32 5.2 +18
 A 2,5,6,7,8,9 4A 32.9 +18 23.9 +20 20.1 +23 15.2 +25 10.9 +25 4.8 +22
 +1 51.1 -51 42.7 -48 38.6 -33 33.5 -09 29.3 -04 23.7 -24
 49.8 +38 39.8 +53 36.4 +58 31.6 +63 27.5 +65 21.8 +65
 16.67 +53 13.02 +78 11.60 +98 9.55 +119 7.92 +118 5.55 +81
 41.68 +53 32.55 +78 29.00 +98 23.88 +119 19.80 +118 13.88 +81

a. W. min

Aug 12 1878 50 1 27.0 +53 08.8 +13 4.50 +25
 26.4 +19 58.3 +26 4.2 +25
 47.0 -68 18.7 -40 3.7 -01
 44.6 +51 15.5 +69 1.5 +61
 14.50 +55 31.3 +62 21.44 +110
 36.25 +55 7.83 +62 53.60

Front A, 1, 2, 3
 +1 -1

Aug 13 50 1 18.2 +45 83 +24 45.3 +25
 19.2 +24 77 +24 45.2 +27
 38.7 -34 26.4 -11 3.7 +14
 37.0 +57 26.3 +66 3.4 +40
 11.31 +92 68.7 +103 21.76 +106
 28.28 +92 17.18 54.40 +106

A 2, 3, 4
 +1 2, 3, 4

1878
Aug 14

Susan Min

50 1 1.5+14 0 533+14
 1.5+18 52.8+28
 20.1-38 11.8-25
 18.3+67 10.1+73
 414 +61 80 +90
 10.35 2.00

A 7+9
 A- 234

1878 Aug. 19

J. Mrs. Min 18. 11 +86. 36

50 1 22.3+51 — 0.7+14 53.6+13
 22.1+22 59.9+17 53.0+28
 42.2-46 20.2-38 12.9-30
 39.0+55 17.7+67 9.7+73
 125.6+82 38.5+60 92 +84
 31.40 9.63 2.30

2nd Son A
 Perhaps false I believe
 A+1

1878 Aug. 20

J. Mrs. Min

50 1 57.1+07 57.7+34 16.1-29 14.4+49 A 89 +61 A-
 31.7+51 31.7+21 51.1-51 49.4+39 +60
 288 294 672 638
 7.20 7.35 6.53 15.75
 253 1639
 6.33 40.98

51 Cephei

Aug 20 1878

40 1 57.7+07 8.9+22

A₊ 54321

57.2+35 8.7+35

16.1-29 27.2-02

12.0+49 23.2+47

230 680 +1.02

5.75+62 17.00

Aug 20 1878 1 hr. min.

~~A 789~~

30 1 15.9+41 11.6+32

A 789

16.3+25 11.8+26

33.4-08 29.3-05

32.8+62 28.0+65

984 807

24.60 +1.20 20.18 +1.18

Aug 22 5 hr. min.

A 4 5 6 7 8 9

50 1 3.1+15 51.9+15

3.8+20 52.2+29

22.3-31 10.0-17

19.8+66 9.3+73

490 34

12.25 +.70 0.85 +1.00

1878
Aug 22

1 Urs. Min

30 1

13.6⁺³⁷ 12.2⁺³³30.0 52.7⁺¹⁴15.1⁺²⁵ 13.3⁺²⁶53.7⁺²⁷32.3⁺⁰⁵ 29.8⁻⁰³10.9⁻²¹30.8⁺⁶⁴ 8.8⁺⁶⁵9.3⁺⁷³9.8⁺¹²¹ 8.4⁺¹²¹6.6⁺⁹³22.95⁺¹²¹ 21.031.65⁺⁹³(this age fine before
min 4reject. 3rd June 4thAug 25 1878
S Urs. Min 18 11 41 +86° 36' 31"

50 1

19.1⁺⁴⁷ 4.4⁺¹⁷21.1⁺²² 6.1⁺²³38.1⁻³⁰ 24.0⁻²³36.8⁺⁵⁷ 22.2⁺⁶⁵115.1⁺⁹⁶ 56.7⁺⁸²28.78⁺⁹⁶ 14.18⁺⁸²A₁ 2,3,4,5,6,7,8,9.A₁ 2,3,4,5,6.

Ref. 300 S

Aug 25 78 1 Urs Min

30 0

50.4⁺¹⁷ 45.4⁺²⁵ 38.8⁺³⁶ 32.7⁺¹⁰52.6⁺²⁸ 47.4⁺²⁹ 40.9⁺¹⁶ 35.2⁺⁰⁴ 26.8⁺⁴⁹ 20.1⁺⁴²7.9⁻⁰⁹ 3.0⁻⁰¹ 56.4⁻²⁴ 50.9⁻⁶³ 28.9⁺⁰³ 21.6⁺⁰⁶8.3⁺⁷³ 2.7⁺⁶⁴ 56.1⁺⁵² 50.2⁺⁵¹ 45.6⁻⁶⁵ 38.1⁻³⁹239.2⁺¹⁰⁹ 218.7⁺¹¹⁷ 192.2⁺⁸⁰ 169.0⁺³⁸ 43.9⁺⁵¹ 36.8⁺⁵²

59.80 54.68 48.05 42.25 36.30 29.13

145.2⁺³⁸ 116.5⁺⁶¹

J Urs. Min.

Aug 26 th 1878

50 1 1.3 51.1
 2.6 50.3
 21.2 9.6
 17.7 7.4

A 4 56789
 A -1

51 Cephei

Aug 26 1878

40 1 18.9 +47 22.2 +51 23.0 +52 35.8 +41 A -1
 19.8 +23 22.4 +22 23.1 +21 36.2 +19
 38.0 -30 42.3 -47 41.2 -43 54.1 -35
 3.29 +62 36.0 +59 36.9 +57 48.9 +39
 109.6 +1.02 122.9 +.85 124.2 +.87 175.0 +.64
 27.40 30.73 31.05 43.75

J Urs Min

Aug 26 1878

~~30 4 30.1~~

A -1 3456789

30 1 2.3 +14 59.0 +13 56.7 +13 53.1 +14 51.2 +16
 1.7 +17 58.4 +20 57.2 +22 53.3 +28 51.2 +30
 19.9 -38 16.3 -40 14.0 -34 10.1 -17 8.8 -13
 17.8 +67 14.2 +71 13.3 +72 9.3 +73 8.1 +73
 41.7 +60 27.9 +64 21.2 +73 5.8 +98 23.9 +1.06
 10.43 6.98 5.30 1.45 59.83

Aug 27 1878 *J Mrs Min*

50 1 23.0 +52 9.4 +27

23.6 +20 9.8 +25

43.0 -49 28.0 -07

40.3 +53 26.2 +66

1299 734 +111

32.48 +76 18.35

A₊₁

A

2nd J may, bearing

Aug 27, 1878,

51 Cephei

40 1 21.8 +51 35.9 +41 41.8 +29

21.9 +22 36.2 +19 41.1 +30

40.4 -41 54.8 -27 58.9 +08

35.6 +59 49.2 +39 54.5 +31

1197 1761 1963

29.93 +91 44.03 +72 49.08 +98

A₋₁

57 Cephei

Aug 28 1878

40 1 17.0 25.2

17.7 25.3

30.8 44.1

31.6 39.9

1234
-1

Aug 29 1878 J. W. Min

A 3 4 5 6 7 8 9

50 1 5.3+18 53.3+14 14.7+39 3.9+17
 5.3+22 53.5+27 15.0+25 4.0+20
 24.3-21 12.5-28 33.0-07 3.0-28
 21.9+65 10.3+73 31.2+64 20.0+66
 568+84 96+86 939+121 509+75
 14.20 2.40 23.48 12.73

Aug 29th 1878

51 Cephei

40 1 20.8+50 ~~22.7~~ +52
 20.3+23 22.3+22
 38.8-34 41.1-43
 34.5+60 36.2+59
 1144+99 1223+90
 28.60 30.58

A₁Aug 29 1878. J. W. Min. A₁ 4 5 6 7 8 9

30 1 0.3+13 56.3+13 54.0+13 52.7+14
 0.3+17 56.5+23 53.4+28 52.2+29
 17.8-41 13.0-30 11.0-21 9.2-14
 16.0+69 12.8+72 9.6+73 8.9+73
 344+58 186+78 80+93 30+1.02
 8.60 4.65 2.00 0.75

Aug 31st 1878 1 run min

30	1	27.2 +.53	23.8 +.53	0.9 +.14
		28.1 +.18	24.1 +.20	1.1 +.17
		46.2 -.55	42.2 -.46	19.9 -.38
		44.9 +.45	41.2 +.51	18.6 +.67
		146.4 +.61	133.3 +.75	40.5 +.60
		36.60	33.33	10.13
			32.82	

A 67
+1

A 1

A 345
-1

Sept 1 1878 1 run min

50	1	59 +.19	51.2 +.07
		89 +.23	50.0 +.19
		263 -.11	98 -.16
		24.3 +.66	94 +.73
		62.4 +.97	0.4 +.83
		15.60	0.10

A 2
+1

Sim 1

218
213
425
464
1320
33.00

A 987
-1

Reject.

1878, Sept. 2

51. Cephei L.C. 6 42 45 +92 46

J. F. M.

A₋₁

40	1	13.7 ⁺³⁷	16.9 ⁺⁴³	20.9 ⁺⁵⁰	24.6 ⁺⁵³	25.9 ⁺⁵³	32.0 ⁺⁴⁹
		12.9 ⁺²⁶	16.1 ⁺²⁵	19.4 ⁺²⁴	23.1 ⁺²¹	25.1 ⁺¹⁹	31.0 ⁺¹⁷
		33.8 ⁻⁰⁹	37.1 ⁻²⁶	41.4 ⁻⁴⁴	45.1 ⁻⁵⁴	46.9 ⁻⁵⁶	52.7 ⁻⁴⁴
		28.2 ⁺⁶⁵	31.1 ⁺⁶⁴	34.7 ⁺⁶⁰	38.1 ⁺⁵⁶	39.3 ⁺⁵⁴	45.7 ⁺⁴⁴
		⁺¹¹⁹	⁺¹⁰⁶	⁺⁹⁰	⁺⁷⁶	⁺⁷⁰	⁺⁶⁶
		22.15	25.30	29.10	32.72	34.30	40.35

1878, Sept. 6

8 Ues. Min. 18 11 +86 36

Ref. 1 st S	50	1	14.1 ⁺³⁸	3.1 ⁺¹⁵	0	43.2 ⁺²⁸	J. F. M. Lk. & rec.
Lost 1 st wire of A			15.0 ⁺²⁵	3.6 ⁺²⁰		43.1 ⁺²²	
lost 1 st wire of A ₋₁			35.2 ⁻¹⁶	23.8 ⁻²⁴		2.4 ⁻⁰¹	
			30.9 ⁺⁶⁴	18.4 ⁺⁶⁷		58.9 ⁺⁵⁵	
			95.2 ^{+1.11}	48.9 ⁺⁷⁸		207.6 ^{+1.04}	
			23.80	12.23		51.90	

1878, Sept. 7

8 Ues. Min. 18 11 +86 36

Ref. 1st S

50	1	15.4 ⁺⁴⁰	5.8 ⁺¹⁹	0	51.1 ⁺¹⁶	J. F. M. Lk. & rec.
		17.8 ⁺²⁵	7.4 ⁺²⁴		53.6 ⁺²⁷	
		35.6 ⁻¹⁸	25.2 ⁻¹⁶		10.8 ⁻²⁰	
		32.1 ⁺⁶³	21.7 ⁺⁶⁵		7.7 ⁺⁷³	
		100.9 ^{+1.10}	60.1 ⁺⁹²		32 ⁺⁹⁶	
		25.23	15.03		0.80	

1878, Sept. 8

8 Wras. Min. 18 11 +86 36

50 1 22.4 +.51 7.9 +.23 0' 53.4 +.14
 24.4 +.20 9.1 +.25 54.1 +.27
 43.5 -.51 27.1 -.09 13.1 -.30
 39.2 +.55 23.9 +.66 9.2 +.73
 12.9 5 68.0 +.05 9.8 +.84
 32.38 +.75 17.00 2.45

J. F. M. Rec.

1878, Sept. 9

7 Wras. Min. 19 46 +88 56

J. F. M. Rec.

30 0 41.9 +.30 37.8 +.37 34.9 +.43 32.4 +.46 28.8 +.48 22.1 +.45
 42.9 +.22 39.2 +.12 36.4 +.06 33.4 +.04 30.3 +.03 23.2 +.06
 59.8 -.06 56.4 -.24 53.1 -.53 51.1 -.63 47.7 -.68 40.4 -.50
 57.5 +.52 53.8 +.51 50.2 +.51 46.3 +.51 44.9 +.52 37.7 +.52
 50.2 +.98 46.8 +.76 43.65 +.47 41.30 +.38 37.92 +.34 30.85 +.53

A
-2

1878, Sept. 10

8 Wras. Min. 18 11 +86 36

50 1 12.9 +.35 7.9 +.23 5.1 +.18 0 59.6 +.13 53.1 +.14
 14.8 +.25 9.1 +.25 6.2 +.23 0.4 +.17 54.2 +.27
 33.5 -.08 27.6 -.08 24.4 -.21 19.4 -.39 13.4 -.32
 29.0 +.65 23.6 +.66 20.6 +.66 15.5 +.69 9.0 +.73
 9.0 2 68.2 +.06 56.3 +.86 34.9 +.60 9.7 +.82
 22.55 +.117 17.05 14.08 8.73 2.43

A 5, 6, 7, 8, 9
 +1
 rej. previous wires
 A

1878, Sept. 10

41

51 Cephei L.B. 6 42 +92 46

p. f. m.

Clouds 40 1 15.1 +.40 18.1 +.45 21.8 +.51
 A, 9.8765 16.9 +.25 19.3 +.24 23.4 +.21
 35.1 -.15 37.9 -.30 42.5 -.48
 30.2 +.65 32.4 +.63 36.2 +.59
 97.3 +.115 107.4 +.102 123.9 +.83
 24.33 26.93 30.98

1878, Sept. 12
 δ Ues. min. 18 11 +86° 36

A + A
 +1

50	1	18.2 +.45	14.2 +.38	9.8 +.28	7.6 +.22	3.6 +.16	0	58.8 +.13
		19.5 +.23	15.1 +.25	10.2 +.25	8.1 +.24	4.0 +.20		59.2 +.19
		38.9 -.35	34.6 -.13	29.2 -.05	27.3 -.08	22.5 -.30		18.2 -.41
		34.7 +.60	38.7 +.64	25.3 +.66	23.2 +.66	19.6 +.66		14.7 +.70
		11.3 +.93	9.46 +.114	7.45 +.114	6.62 +.104	4.97 +.72		30.9 +.61
		27.83	23.65	18.63	16.55	12.43		7.73

1878, Sept. 13 12
 51 lb. Cephei 6 42 +92 46

40	1	16.3 +.41	29.1 +.52	49.4 +.15	2	5.1 +.13	
		17.1 +.25	30.5 +.17	49.3 +.43		5.7 +.34	p. f. m. obs
		36.4 -.22	51.3 -.50	7.9 +.05		24.6 -.12	
		30.7 +.64	44.1 +.47	2.6 +.38		18.9 +.46	
		100.5 +.108	155.0 +.66	229.2 +.101		54.3 +.81	
		25.13	38.75	57.30		13.58	

1878, Sept. 14

δ Ues. Min. ^h 18 ^m 11 ^s +86° 36'

p. 7. m

50	1	18.9 ⁺⁴⁷	14.9 ⁺⁴⁰	9.5 ⁺²⁷	4.7 ⁺¹⁸	0.2 ⁺¹³	0	55.3 ⁺¹³
3 strokes for A ₊ 2		18.9 ⁺²⁴	15.1 ⁺²⁵	9.8 ⁺²⁵	4.8 ⁺²²	0.1 ⁺¹⁷		55.1 ⁺²⁵
		39.9 ⁻⁴⁰	35.4 ⁻¹⁷	30.2 ⁻⁰³	25.4 ⁻¹⁵	21.4 ⁻³⁴		16.4 ⁻⁴¹
A ₊ + A ₊		32.9 ⁺⁶²	29.3 ⁺⁶⁵	23.9 ⁺⁶⁶	18.2 ⁺⁶⁷	14.1 ⁺⁷¹		10.4 ⁺⁷³
+1		27.65 ⁺⁹³	23.68 ⁺¹¹³	18.35 ⁺¹¹⁵	13.28 ⁺⁹²	8.95 ⁺⁶⁷		4.30 ⁺⁷⁰
						~~9.45~~		

1878, Sept. 14

51 H. Cephei L.C. 6 42 +92 46

40	1	16.3 ⁺⁴²	18.8 ⁺⁴⁷	24.3 ⁺⁵³	25.0 ⁺⁵³
A ₋		16.0 ⁺²⁵	19.2 ⁺²⁴	24.6 ⁺¹⁹	25.2 ⁺¹⁹
		36.3 ⁻²²	40.1 ⁻⁴⁰	45.8 ⁻⁵⁵	46.1 ⁻⁵⁵
		27.7 ⁺⁶⁵	30.9 ⁺⁶⁴	36.0 ⁺⁵⁹	36.9 ⁺⁵⁷
		24.08 ⁺¹¹⁰	27.25 ⁺⁹⁵	32.68 ⁺⁷⁶	33.30 ⁺⁷⁴

1878, Sept. 15

δ Ues. Min. 18 11 +86 36

50	1	21.9 ⁺⁵¹	16.9 ⁺⁴³	12.2 ⁺³³	9.1 ⁺²⁶	3.2 ⁺¹⁵	0	56.5 ⁺¹³
		23.8 ⁺²⁰	18.5 ⁺²⁴	14.2 ⁺²⁵	10.7 ⁺²⁵	5.2 ⁺²²		58.2 ⁺²¹
		42.1 ⁻⁴⁶	37.4 ⁻²⁷	33.2 ⁻⁰⁸	29.1 ⁻⁰⁵	23.9 ⁻²⁴		17.8 ⁻⁴¹
		36.9 ⁺⁵⁷	32.1 ⁺⁶³	28.1 ⁺⁶⁵	24.8 ⁺⁶⁶	18.2 ⁺⁶⁷		[12.1] ⁺⁷²
		31.18 ⁺⁸²	26.22 ⁺¹⁰³	21.92 ⁺¹¹⁵	18.42 ⁺¹¹²	12.62 ⁺⁸⁰		6.15 ⁺⁶⁵

1878, Sept. 15

43

51 H. Ceph. L.C. 6 42

+9 2 46

J.F.M.

A₋₁

40 1 16.6⁺⁴² 18.3⁺⁴⁶ 22.0⁺⁵¹ 28.1⁺⁵³ 27.8⁺⁵³ 29.7⁺⁵¹
 18.9⁺²⁴ 20.8⁺²² 23.8⁺²⁰ 26.6⁺¹⁹ 29.3⁺¹⁸ 31.6⁺¹⁸
 36.7⁻²⁴ 38.6⁻³³ 42.1⁻⁴⁶ 44.2⁻⁵² 47.8⁻⁵⁷ 49.8⁻⁵³
 30.1⁺⁶⁵ 30.8⁺⁶⁴ 34.7⁺⁶⁰ 37.4⁺⁵⁷ 39.9⁺⁵³ 43.0⁺⁴⁸
^{+1.07} ^{+1.09} ^{+1.05} ^{+1.07} ^{+1.07} ^{+1.04}
 25.58 27.12 30.65 34.08 36.20 38.52

1878, Sept. 16

8 V. Min. 18^h 11^m +86 36A₊₁

50 1 19.8⁺⁴⁹ 16.4⁺⁴² 11.2⁺³¹ 6.8⁺²¹ 1.8⁺¹⁴ 0' 54.5⁺¹³
 22.1⁺²² 17.7⁺²⁵ 12.9⁺²⁶ 8.3⁺²⁴ 2.6⁺¹⁹ 55.4⁺²⁵
 39.9⁻⁴⁰ 35.0⁻¹⁵ 30.4⁻²⁸ 26.2⁻¹¹ 20.4⁻³⁷ 13.7⁻³³
 35.6⁺⁵⁹ 31.2⁺⁶⁴ 26.8⁺⁶⁵ 22.5⁺⁶⁶ 16.4⁺⁶⁹ 10.4⁺⁷³
^{+1.00} ^{+1.16} ^{+1.19} ^{+1.00} ^{+1.05} ^{+1.08}
 29.35 25.08 20.32 15.95 10.30 3.50

1878, Sept. 16

51 H. Ceph. L.C. 6^h 42^m +9 2° 46'A₋₁

40 1 15.7⁺⁴¹ 16.8⁺⁴³ 19.0⁺⁴⁷ 21.2⁺⁵⁰ 25.0⁺⁵³ 28.1⁺⁵³
 17.2⁺²⁵ 18.7⁺²⁴ 20.5⁺²² 22.4⁺²² 26.9⁺¹⁹ 29.7⁺¹⁷
 34.4⁻¹² 36.4⁻²² 38.2⁻³¹ 40.8⁻⁴² 44.9⁻⁵⁴ 47.9⁻⁵⁷
 27.7⁺⁶⁵ 28.5⁺⁶⁵ 31.0⁺⁶⁴ 33.1⁺⁶² 36.9⁺⁵⁷ 40.6⁺⁵²
^{+1.19} ^{+1.10} ^{+1.02} ^{+1.02} ^{+1.05} ^{+1.05}
 23.75 25.10 27.18 29.38 33.42 36.58

1878, Sept. 17

8 Ues. Min. 18 ^{L m} 11 +86 36

p. F. m.

50 1 19.2 +.47 4.4 +.17 46.7 +.23
 Lost 1st wire of A₋₁ 21.2 +.22 5.7 +.23 47.4 +.29
 38.5 -.32 23.5 -.26 5.4 -.03
 34.5 +.60 19.8 +.66 2.3 +.63
 28.35 +.97 13.35 +.80 55.45 +.12

p. F. m. obs'd

1878, Sept. 17

51 H. Cephei. L.B. 6 42 +92 46

p. F. m.

40 1 14.9 +.40 18.6 +.46 20.1 +.49 23.9 +.53 26.0 +.53 32.9 +.48
 16.4 +.25 19.7 +.23 21.2 +.22 25.1 +.19 27.2 +.19 34.1 +.18
 34.5 -.12 38.2 -.31 39.4 -.37 43.6 -.51 46.1 -.55 51.9 -.47
 27.9 +.65 31.8 +.63 32.7 +.62 36.4 +.58 39.3 +.54 44.8 +.45
 23.42 +.118 27.08 +.101 28.85 +.96 32.25 +.79 34.65 +.71 40.92 +.64

A₋₁

1878, Sept. 18

8 Ues. Min. 18 11 +86 36

A₊₁, A.

50 1 22.9 +.52 21.1 +.50 16.9 +.43 11.6 +.32 8.9 +.26 2.9 +.15
 26.2 +.19 23.4 +.21 19.1 +.24 13.3 +.26 9.9 +.25 4.7 +.21
 45.9 -.55 43.8 -.51 38.6 -.33 32.4 -.06 29.3 -.05 23.7 -.24
 40.2 +.53 37.4 +.57 33.4 +.62 27.9 +.65 24.1 +.66 18.7 +.67
 13.52 +.73 12.57 +.77 10.80 +.76 8.52 +.77 7.22 +.12 5.00 +.79
 33.80 31.43 27.00 21.30 18.05 12.50

1878, Sept. 18

45

51 H. Cephei L.C. 6^h 42^m +92° 46'

p. t. m.

A₋₁

40 1 10.2 +28 13.8 +37 15.9 +41 20.0 +49 24.1 +53 27.7 +53
 13.1 +26 16.4 +25 18.3 +25 21.7 +22 25.4 +19 29.6 +17
 32.3 -06 35.5 -18 37.5 -28 41.4 -44 44.8 -54 48.9 -55
 23.9 +66 27.9 +65 30.0 +65 33.5 +61 37.1 +57 41.6 +50
 79.5 93.6 +109 101.7 +103 116.6 +88 131.4 +75 147.8 +65
 19.88 +1.14 23.40 25.43 29.15 32.85 36.95

1878, Sept. 19

51 H. Cephei L.C. 6 42 +92 46

reject

directly after 3rd wave

40 1 16.9 +43 19.9 +49 22.1 +51 29.1 +52 34.2 +46 41.1 +31 46.5 +21
 17.3 +25 21.5 +22 23.1 +21 29.6 +17 34.5 +18 41.7 +32 46.1 +41
 36.7 -24 40.7 -43 43.1 -49 49.7 -54 53.4 -45 0.4 +12 5.1 +12
 29.5 +65 33.1 +62 34.9 +60 41.8 +49 46.8 +42 53.9 +32 58.9 +30
 100.4 +1.09 123.2 +83 150.2 +64 168.9 +61 197.1 +107 216.6 +104
 25.10 30.80 37.55 42.23 49.28 54.15

1878 Sept. 22

λ Ucas. Min. 19^h 46^m +88° 56'

30 1 9.9

A 8.9

A₋₁, 1, 2, 3, 4, 5

9.9 +28 7.9 +23 5.0 +18 2.1 +14 1.1 +14 0 57.7 +13
 11.6 +26 9.2 +25 6.9 +24 5.2 +22 2.6 +19 58.9 +19
 29.3 -05 26.8 -10 24.0 -23 22.5 -30 19.9 -38 16.6 -41
 24.5 +66 22.5 +66 19.5 +66 18.0 +67 14.9 +70 12.1 +72
 75.3 +1.15 66.4 +1.04 55.4 +85 47.8 +73 38.5 +65 25.3 +63
 18.83 16.60 13.85 11.95 9.63 6.33

1878, Sept. 23

51 Cephei L.C. 18^h 42^m + 9^o 24'

p.F.M.

A₋₁Reg. 1st ♂

40 1 53.7⁺0.09 57.4⁺0.07 5.9⁺1.15 8.9⁺2.22 14.6⁺3.62 1.6⁺5.50
 56.1⁺3.36 59.3⁺3.30 7.7⁺3.41 11.4⁺3.41 16.7⁺3.32 24.0⁺2.26
 14.4⁻2.41 17.4⁻3.30 24.7⁻1.11 28.6⁺0.01 33.8⁻0.05 40.8⁻4.0
 8.2⁺4.49 10.4⁺5.50 18.9⁺4.46 22.1⁺4.46 28.0⁺4.47 35.8⁺4.44
 12.4⁺7.70 24.5⁺5.57 57.2⁺8.84 71.0⁺1.03 93.1⁺1.10 122.2⁺8.80
 3.10 6.13 14.30 17.75 23.28 30.55

1878, Sept. 23

T. Wess. Min. 19 46 +88 56

30 1 27.7⁺5.32 3.4⁺5.22 2.0⁺5.12 0.4⁺4.49
 29.6⁺1.17 25.4⁺1.19 23.2⁺2.21 22.2⁺2.22
 45.8⁻5.55 41.6⁻4.45 39.2⁻3.36 37.9⁻3.30
 42.7⁺4.48 38.9⁺5.55 36.4⁺5.58 35.4⁺6.60
 14.5⁺8.80 12.9⁺3.31 12.0⁺8.80 11.5⁺9.90 +1.01
 36.45⁺6.63 32.33 30.20 28.98

A₊₁Reg. 3rd stroke
for ♂

1878, Sept. 25

T. Wess. Min. 19 46 +88 56

Reg. 1st stroke for ♂ 30 1 27.5⁺5.32 25.0⁺5.32 4.8⁺5.32 3.2⁺5.22 2.6⁺5.2 21.0⁺5.50
 28.9⁺1.18 25.2⁺1.19 24.9⁺1.24 24.3⁺2.02 23.0⁺2.21 20.9⁺2.22
 46.9⁻5.56 43.9⁻5.54 41.1⁻5.54 41.4⁻4.45 40.8⁻4.42 39.0⁻3.35
 42.9⁺4.48 38.9⁺5.55 39.9⁺5.53 37.1⁺5.57 37.7⁺5.56 34.9⁺6.60
 14.6⁺2.63 13.3⁺0.75 13.3⁺7.73 12.6⁺0.74 12.5⁺1.11 11.5⁺8.80 +9.97
 36.55 33.25 33.43 31.50 31.28 28.95

A₊₁

perhaps not for ♂
 his ♂ between wires 6 & 7

1878, Sept. 28

47

 λ Ues. Min. $19^h 46^m +88^\circ 56'$

p. f. m.

2 strokes for
 $A_{+1} 5$
 $A_{+1} 1, 2, 3, 4, 5 + 7$
 $A_{+1} 1, 2, 3, 4$

30	1	28.1	+53	28.9	+52	28.2	+53	27.7	+53	26.7	+53	26.2	+53
		30.2	+17	30.8	+17	30.4	+17	30.2	+17	28.5	+18	30.2	+17
		46.1	-55	46.9	-56	46.0	-55	45.7	-55	44.1	-52	46.2	-55
		42.9	+48	44.7	+46	42.9	+48	42.3	+49	41.1	+51	43.9	+47
		147.3	+63	151.3	+59	147.5	+63	145.9	+64	140.4	+70	148.5	+62
		36.83		37.83		36.88		36.48		35.10		37.13	

1878, Sept. 30

 λ Ues. Min. $19^h 46^m +88^\circ 56'$

$A_{+1} 4, 6, 7, 8, 9$
 $A_{+1} 1, 2, 3, 4$

30	1	24.0	+53	21.9	+51	21.4	+50	19.1	+47	19.8	+49	17.7	+44
		25.8	+19	24.2	+20	22.9	+21	21.7	+22	21.0	+22	19.4	+24
		42.9	-49	41.1	-43	39.9	-40	38.1	-30	37.5	-28	35.7	-18
		39.7	+54	38.1	+56	36.8	+57	35.2	+60	34.9	+60	33.5	+61
		132.4	+77	125.3	+84	121.0	+85	114.1	+99	113.2	+103	106.3	+111
		33.10		31.33		30.25		28.53		28.30		26.58	

1878, Oct. 2

 λ Ues. Min. $19^h 46^m +88^\circ 56'$

$A_{-1} 1, 2, 3, 4, 5$

30	1	1.9	+14	0	59.0	+13	57.9	+13	55.6	+13	51.8	+15	51.9	+15
		2.9	+19		0.4	+17	58.2	+21	56.4	+24	52.7	+28	52.2	+29
		20.7	-36		18.8	-40	16.9	-42	14.8	-36	10.4	-19	10.4	-19
		17.1	+68		14.7	+70	13.6	+71	10.6	+72	7.9	+73	7.2	+72
		42.6	+65		32.9	+60	26.6	+63	17.4	+73	2.8	+97	1.7	+97
		10.65			8.23		6.65		4.35		0.70		0.43	

48

1878, Oct. 3

 π Ues Min. 19 46 +88° 56'

J. F. M.

3 strokes for
1st wire.A
+1

30' 1' 24.0 +53 23.8 +53 23.1 +52 23.2 +52 22.2 +51 22.4 +51
26.5 +19 25.0 +19 24.1 +20 24.3 +20 23.0 +21 22.2 +22
45.2 -54 43.7 -51 43.0 -49 43.5 -50 42.0 -46 41.5 -45
39.6 +54 39.7 +54 38.4 +56 38.9 +55 37.4 +57 36.7 +58
13.5 3 +72 13.2 2 +75 12.8 6 +79 12.9 9 +77 12.4 6 +84 12.2 8 +86
33.83 +72 33.05 +75 32.15 +79 32.48 +77 31.15 +84 30.70 +86

1878 Oct. 8

 π Ues Min 19 46 +88° 56'

30 1 20.7 +50 18.8 +47 16.6 +42 15.4 +40

Lost 1, 2, 3, 4, 5

24.1 +20 22.5 +21 18.7 +24 17.2 +25

of A
+1

40.1 -40 38.6 -33 36.2 -11 33.1 -07

37.3 +57 35.3 +60 32.6 +62 31.0 +64
12.2 2 +87 11.5 2 +95 10.2 1 +1.17 9.6 7 +1.22
30.55 +87 28.80 +95 25.53 +1.17 24.18

A A 1, 2, 3, 4, 5
+1

1878, Oct. 14

 π Ues Min 19 46 +88° 56'

30 1 2.2 +14 0 59.1 +13 53.6 +13 50.7 +16 46.8 +22 44.0 +27
5.2 +22. 2.1 +18 56.2 +24 53.2 +28 49.8 +30 45.6 +28
22.1 -32 19.2 -40 13.7 -33 10.2 -18 5.9 -04 2.4 -01
19.2 +67 15.9 +69 9.9 +73 7.5 +73 2.9 +65 59.3 +56
48.7 +71 36.3 +60 13.4 +77 1.6 +99 22.5 4 +113 21.1 3 +1.10
12.18 9.08 +60 3.35 +77 0.40 +99 56.35 +113 52.83

A
-1

1878, Oct. 16

49

λ Ursa Min. 19 46 +88 56

p 7. m.

A₋₁

30 0 56.1+13 51.5+15 49.9+17 47.7+21 42.6+29 38.6+36
 58.3+20 54.0+27 52.1+29 49.7+30 44.9+27 40.4+15
 17.0-42 12.8-29 11.2-22 8.2-10 3.1-01 56.2-12
 12.8+72 8.4+73 7.7+73 5.9+71 0.1+57 56.6+52
 24.2+63 6.7+86 0.9+97 23.15+112 210.5+1.12 193.8
 6.05+63 1.68+86 0.23+97 57.88+112 52.68+1.12 48.45+91

1878, Oct. 21

λ Ursa Min. 19 46 +88 56

A₊ 4A₊ 1, 2, 3, 4, 5, 6, 7

30 1 22.9+52 18.4+46 15.7+41 12.6+34 7.4+22 5.9+19
 25.5+19 21.1+22 17.6+25 14.2+25 9.8+25 7.5+24
 42.8-48 38.1-30 33.6-09 30.2-03 26.4-11 24.1-23
 39.1+55 33.9+61 30.4+65 27.4+65 23.0+66 21.1+66
 13.03+78 11.15+99 9.73+122 8.44+121 6.66+102 5.86+86
 32.58+78 27.88+99 24.33+122 21.10+121 16.65+102 14.65+86

1878 Oct. 22

λ Ursa Min. 19 46 +88 56

Lost A₊ 12/30

+1

30 1 23.1+52 22.9+52 21.4+50 15.9+41 16.3+42 11.1+30
 25.4+19 24.8+19 22.7+21 17.6+25 16.9+25 13.1+26
 41.9-46 42.5-48 39.8-39 34.8-14 33.5-09 30.1-03
 38.8+55 37.8+56 35.8+59 31.4+64 30.5+64 26.2+66
 12.92+80 12.80+79 11.97+91 9.97+116 9.72+122 8.05+1.19
 32.30+80 32.00+79 29.93+91 24.93+116 24.30+122 20.13+1.19

A₊ +A₊ 1, 2, 3, 4, 5, 6

1878, Nov. 2

A Uers Min. 19 46 +88 56

J.F.M.

30 0 51.5 +16 48.3 +20 45.6 +24 44.4 +26 39.2 +36 37.6 +37
 A, 2,3,4,5,6,7,8+9. 54.8 +25 50.6 +30 48.8 +30 46.5 +28 42.5 +20 40.2 +14
 -1 7.6 -08 3.8 -01 1.7 -02 59.3 -08 55.6 -31 52.9 -54
7.4 +72 3.1 +65 1.0 +59 58.6 +54 55.5 +52 52.4 +51
 0.32 105 56.45 114 54.28 111 52.20 100 48.20 77 45.78 48

1878, Nov. 3

A Uers Min. 19 46 +88 56

A, 30 1 3.9 +17 0 59.3 +13 58.7 +13 55.2 +13 54.6 +13 51.6 +15
 -1 6.9 +24 2.1 +18 1.1 +17 57.2 +22 55.6 +24 54.3 +26
 19.8 -38 15.5 -38 14.4 -35 10.4 -19 8.7 -12 6.5 -05
 19.3 +67 15.0 +70 14.2 +71 9.7 +73 8.2 +73 6.5 +72
 12.48 70 7.98 63 7.10 66 3.12 89 1.78 98 59.72 108

1878, Nov. 4

A Uers Min. 18 46 +88 56

A, 5,6,7,8+9 30 0 53.8 +13 48.9 +19 45.4 +25 43.1 +28 41.9 +30 36.1 +40
 55.3 +25 50.1 +30 45.9 +28 43.6 +24 42.3 +20 37.4 +08
 5.1 -03 0.3 -04 56.8 -21 54.1 -47 53.8 -49 48.1 -68
 6.0 +71 1.7 +61 56.7 +52 55.4 +52 53.2 +51 48.3 +51
 0.05 106 55.25 106 51.20 84 49.05 57 47.80 52 42.48 31

1878, Nov. 5

51

New. Min. 19 46 +88 56

A₁

30	1	6.0 +19	4.5 +18	2.1 +14	1.1 +14	0	56.4 +13	53.8 +13
		7.4 +24	5.2 +22	2.1 +18	1.1 +17		56.4 +23	53.7 +27
		16.1 -40	13.7 -33	11.1 -21	9.7 -16		4.6 -02	2.2 -01
		16.6 +69	13.8 +71	11.3 +72	10.7 +72		5.3 +70	2.8 +64
		11.38 ⁷²	9.30 ⁷⁸	6.65 ⁸³	5.65 ⁸⁷		0.68 ¹⁰⁴	58.12 ¹⁰³

Polaris

E

Nov 13 1878

H

2222

45-2	414.3 +30	45.2 +41	58.4 -41	56.8 +20	+50	
	40.2 +38	39.9 +29	49.1 +56	51.4 +26	+39	47 49.92
	36.8 +43	37.4 +24	45.5 -54	48.3 +29	+42	45.15
	40.43	40.83	49.33	52.17		42.00
	38.73	39.13	47.63	50.47		

Polaris

Nov 23 1878

Mar. R.

45-2	38.2 +41	39.1 +27	47.6 +57	50.4 +27	+38	47 43.82
	34.7 +47	36.0 +22	43.1 +48	45.7 +32	+53	39.88
	32.10 +51	33.0 +21	40.8 -40	43.2 +35	+67	37.25
	27.9 +54	29.3 +23	36.8 +20	40.0 +39	+95	33.50
	33.20	34.35	42.08	44.82		

1878, Nov. 24

2 Ues. Min. 1 14 +88 39

45 2 59.6 +16 52.5 +18 59.1 +16 54.6 +16 51.6 +19 49.8 +21
 A, 4, 5, 6, 7, 8, 9. 0.9 +26 58.3 +29 0.7 +26 55.5 +35 52.2 +40 51.1 +41
 +1 9.7 -06 6.4 +06 9.8 -06 3.7 +10 0.1 +06 59.5 +04
 A 1, 2, 3, 4, 5 11.2 +40 8.2 +40 10.9 +40 5.4 +38 2.8 +30 0.9 +25
 5.35 ⁷⁶ 1.35 ⁸¹ 5.12 ⁷⁶ 59.80 ⁹⁹ 56.68 ⁹⁵ 55.32 ⁹¹

1878, Nov. 26

2 Ues. Min. 1 14 +88 39

45 3 2.9 +18 0.9 +17 59.5 +16 59.1 +16 57.3 +16 55.3 +16
 A 4, 5, 6, 7, 8, 9 4.2 +28 1.4 +26 59.9 +26 59.4 +27 57.8 +30 55.8 +34
 +1 A 1, 2, 3, 4, 5 11.1 +09 7.8 +02 6.4 +06 5.8 +07 3.5 +09 2.1 +09
 12.9 +39 10.1 +40 8.6 +40 8.0 +40 5.9 +39 4.3 +35
 7.78 ⁹⁴ 5.05 ⁸⁵ 3.60 ⁸⁹ 3.08 ⁹⁰ 1.12 ⁹⁴ 59.38 ⁹⁴

1878, Nov. 30

2 Ues. Min. 1 14 +88 39

45 3 3.2 +18 2.2 +17 0.2 +16 2 59.6 +16 58.3 +16 55.6 +16
 A, A 1, 2, 3, 4, 5 4.1 +28 3.4 +27 1.3 +26 0.1 +26 58.9 +30 56.9 +32
 11.9 -16 10.3 -08 7.9 +01 6.9 +05 5.7 +07 4.0 +10
 14.1 +39 13.1 +39 11.6 +40 10.3 +40 9.4 +41 7.1 +40
 8.32 ⁶⁹ 7.25 ⁷⁵ 5.25 ⁸³ 4.23 ⁸⁷ 3.08 ⁹⁴ 0.90 ⁹⁸

1878, Dec. 1

53

2 Ues. Min. $14^m + 88^\circ 39'$

45	3	3.9 ⁺ 20	1.6 ⁺ 17	1.7 ⁺ 17	2	59.0 ⁺ 16	57.0 ⁺ 16	55.0 ⁺ 16
		3.8 ⁺ 28	2.1 ⁺ 27	1.6 ⁺ 27		59.0 ⁺ 28	57.6 ⁺ 31	54.4 ⁺ 36
A 3,4,5,6,7,8,9		10.6 ⁻ 09	8.9 ⁻ 03	8.9 ⁻ 03		5.5 ⁺ 08	3.8 ⁺ 10	0.7 ⁺ 07
+1 A 1,2,3,4,5		12.9 ⁺ 39	11.4 ⁺ 40	11.9 ⁺ 40		8.3 ⁺ 40	6.9 ⁺ 40	4.1 ⁺ 34
		7.80 ⁷⁸	6.00 ⁸¹	6.02 ⁸¹		2.95 ⁹²	1.32 ⁹⁷	58.55 ⁹³

1878, Dec. 7

2 Ues. Min. $14^m + 88^\circ 39'$

45	3	4.1 ⁺ 20	2.7 ⁺ 18	0.3 ⁺ 16	2	58.9 ⁺ 16	58.9 ⁺ 16	55.9 ⁺ 16	Perhaps lost
A 4,5,6,7,8,9		2.9 ⁺ 27	1.4 ⁺ 26	59.1 ⁺ 28		58.4 ⁺ 29	56.9 ⁺ 32	55.0 ⁺ 35	stroke for 8
+1		6.6 ⁺ 05	5.3 ⁺ 08	2.5 ⁺ 09		2.5 ⁺ 09	1.9 ⁺ 09	58.6 ⁺ 01	
A 1,2,3,4		(11.4) ⁺ 40	5.1 ⁺ 37	4.0 ⁺ 34		3.9 ⁺ 34	1.9 ⁺ 28	59.5 ⁺ 22	
		6.25 ⁹²	3.62 ⁸⁹	1.48 ⁸⁷		0.92 ⁸⁸	59.90 ⁸⁵	57.25 ⁷⁴	

1878, Dec. 8

2 Ues. Min. $14^m + 88^\circ 29'$

45	3	3.7 ⁺ 19	1.3 ⁺ 17	1.7 ⁺ 17	2	58.6 ⁺ 16	58.4 ⁺ 16	54.6 ⁺ 16
A 3,4,5,6,7,8,9		3.2 ⁺ 27	0.8 ⁺ 26	1.4 ⁺ 26		57.3 ⁺ 31	57.9 ⁺ 32	53.1 ⁺ 39
+1		6.8 ⁺ 05	4.1 ⁺ 10	3.8 ⁺ 10		1.2 ⁺ 08	0.9 ⁺ 08	58.0 ⁻ 01
A 1,2,3		8.1 ⁺ 40	5.6 ⁺ 38	5.7 ⁺ 38		2.9 ⁺ 31	1.6 ⁺ 27	58.6 ⁺ 22
		5.45 ⁹¹	2.95 ⁹¹	2.90 ⁹¹		0.00 ⁸⁶	59.70 ⁸³	56.08 ⁷⁶

1878, Dec. 11

2 Wires Min 1 14 +88 40

45 2 55.1 +16 52.1 +18 51.6 +19 49.9 +21 49.1 +23 47.2 +26
 56.9 +32 53.7 +38 53.1 +39 51.4 +41 49.9 +42 49.2 +43
 3.6 +10 0.5 +07 59.9 +06 58.1 -01 57.2 -07 56.0 -16
 5.7 +38 1.8 +27 2.9 +31 0.1 +23 59.6 +23 57.9 +21
 0.32⁹⁶ 57.02⁹⁰ 56.88⁹⁵ 54.88⁸⁴ 53.95⁸¹ 52.58⁷⁴

Lost 1st 2 wires

A 1, 2, 3, 4, 5.

1st S occurred
 just after 4th wire
 Perhaps false S for A

1878, Dec. 12

2 Wires Min 1 14 +88 40

45 2 57.1 +16 55.4 +16 55.5 +16 52.6 +18 49.8 +21 48.6 +23
 57.7 +31 56.2 +34 55.6 +34 53.4 +38 50.1 +42 48.6 +43
 3.4 +09 2.4 +09 1.9 +09 59.4 +04 55.8 -18 54.7 -31
 5.8 +39 4.3 +35 3.1 +32 0.8 +25 59.1 +22 55.0 +22
 1.00⁹⁵ 59.58⁹⁴ 59.02⁹¹ 56.55⁸⁵ 53.70⁶⁷ 51.95⁵⁷

A 3, 4, 5, 6, 7, 8 +9

+1 A 1, 2, 3, 4, 5, 7, 8 +9

1878, Dec. 14

2 Wires Min 1 14 +88 40

45 2 59.3 +16 57.1 +16 57.1 +16 55.7 +16 52.6 +17 51.8 +18
 0.1 +26 57.9 +30 57.6 +31 55.5 +34 52.2 +40 51.2 +41
 5.2 +08 2.7 +09 2.4 +09 1.1 +08 58.1 -01 57.4 -05
 7.6 +40 4.9 +37 4.9 +37 2.9 +31 0.5 +24 59.0 +22
 3.05⁹⁰ 0.65⁹² 0.50⁹³ 58.80⁸⁹ 55.85⁸⁰ 54.85⁷⁶

A A 1, 2, 3, 4, 5

1st wire acc. too lateA
+1
A

1878, Dec. 16

55

2 No. Min. 1 14 +88 40

45 2 59.8 +16 57.2 +16 57.2 +16 54.9 +16 52.4 +18 50.6 +20
 A 3, 4, 5, 6, 7, 8, 9
 +1
 A 1, 2, 3, 4, 5
 59.5 +27 57.1 +31 56.4 +33 54.1 +37 51.5 +41 49.9 +42
 3.9 +10 1.6 +09 0.9 +08 58.9 +02 56.6 -11 55.2 -26
 6.2 +39 3.8 +33 4.6 +36 1.4 +26 58.1 +21 57.1 +20
 92 89 93 81 69 56
 2.35 59.92 59.78 57.32 54.65 53.20

1878 Dec. 18

2 No. Min. 1 14 +88 40

45 2 57.7 +16 56.4 +16 54.0 +16 50.1 +21 48.6 +23 47.9 +24
 A 4, 5, 6, 7, 9
 +1
 A 1, 2, 3, 4, 5
 57.6 +31 55.8 +34 53.6 +38 49.5 +42 47.7 +43 47.1 +43
 1.4 +08 59.8 +05 57.6 -04 54.4 -33 53.1 -43 52.4 -46
 4.4 +35 3.0 +31 0.4 +24 56.3 +21 54.8 +23 54.1 +23
 +90 +86 +74 +51 +46 +44
 0.28 58.75 56.40 52.58 51.05 50.38

1878, Dec. 19

2 No. Min. 1 14 +88 40

45 3 0.0 +162 56.8 +16 57.5 +16 55.1 +16 53.0 +17 51.2 +20 Perhaps 2 strokes
 A 3, 4, 5, 6, 7, 8, 9
 +1
 A 1, 2, 3, 4
 59.4 +27 56.4 +33 56.6 +33 54.3 +37 52.6 +39 50.3 +42 for 1st 8
 2.5 +09 59.9 +06 1.1 +08 58.3 -00 56.7 -10 55.5 -22 5th 8 near A, 5
 5.1 +37 2.1 +28 4.1 +34 1.2 +26 59.1 +22 57.7 +21
 7.0 +89 23.52 +83 23.93 22.89 22.14 +68 21.47 +61
 1.75 58.80 59.83 +91 57.23 +79 55.35 +68 53.68

1878 Dec. 23

L W. Min. 1 14 +88 40

45 2 59.8+16 57.9+16 56.7+16 54.9+16 54.1+16 51.0 +.20
 59.5+.27 57.7+.31 56.9+.32 55.1+.35 53.4+.38 51.5+.40
 2.9+.09 0.9+.08 59.5+.04 58.5+.00 57.4-.05 54.9-.29
 5.4+.38 3.2+.31 1.7+.27 59.9+.23 59.4+.22 56.3+.22
 7.6+.91 23.97+.86 23.48+.79 22.84+.74 22.43+.71 21.37+.53
 1.90+.91 59.93+.86 58.70+.79 57.10+.74 56.08+.71 53.43+.53

A 3,4,5,6,7,8,9
 +1
 A 1,2,3,4

1878 Dec. 24

L W. Min. 1 14 +88 40

45 2 58.4+.16 57.0+.16 56.1+.16 54.7+.16 52.7+.17 51.8+.18
 58.1+.30 56.2+.34 55.6+.34 53.6+.38 51.9+.40 50.3+.42
 1.1+.08 59.4+.04 58.6+.00 56.9-.09 55.4-.23 54.2-.35
 3.9+.34 2.1+.28 1.1+.25 59.6+.23 57.9+.21 55.9+.22
 1.5+.88 23.47+.82 23.14+.75 22.48+.68 21.79+.55 21.27+.47
 0.38+.88 58.68+.82 57.85+.75 56.20+.68 54.48+.55 53.05+.47

A 2,3,4,5,6,7,8,9
 +1
 A 1,2,3,4

1878 Dec. 25

L W. Min. 1 14 +88 40

45 2 57.5+.16 55.8+.16 56.1+.16 53.4+.17 51.3+.20 48.8+.23 3rd S between
 56.1+.34 54.8+.35 54.1+.37 52.2+.40 48.8+.43 47.1+.43 A, 5+6
 58.9+.02 57.7-.03 56.9-.09 55.5-.22 53.1-.44 51.0-.52
 1.1+.25 1.1+.25 59.7+.23 56.2+.22 53.9+.23 52.1+.25
 23.36+.77 22.94+.73 22.68+.67 21.73+.57 20.71+.42 19.90+.39
 58.40+.77 57.35+.73 56.70+.67 54.33+.57 51.78+.42 49.75+.39

A 3,4,5,6,7,8,9
 +1
 A 1,2,3,4

1878, Dec. 26

57

L W. Min. 1 14 +88 40

2nd
near 46

Perhaps
lost stroke

45 2 54.9 +16 54.2 +16 50.0 +21 47.9 +24 46.7 +27 43.6 +31
 A 3 4 5 6 7 8 9 : 54.1 +37 53.1 +39 49.3 +43 47.9 +43 46.3 +42 42.9 +37
 +1 A 58.3 -00 57.2 -07 53.6 -40 51.7 -49 50.2 -54 47.2 -57
 0.4 +24 59.8 +23 56.0 +22 54.3 +23 51.9 +25 48.7 +29
 227.7 +77 224.3 +71 208.9 +46 201.8 +41 195.1 +38 182.4
 56.93 56.08 52.23 50.45 48.78 +40 45.60 +40

Dec 30

40-2 376 +42 165 +40
 364 +22 154 +33
 40.5 -39 19.8 -29
 442 +34 221 +46
 158.7 +59 73.8
 39.68 18.45 +90

W R

A 4 6 7 8 9

A,
-1

Dec 31

L W. Min.

40-2 523 +18 490 +22 270 +54 279 +54 242 +53 218 +50
 503 +42 481 +43 258 +25 278 +23 232 +27 207 +29
 539 -17 539 -37 307 +03 320 +00 282 +00 260 -05
 592 +22 568 +20 340 +46 351 +45 309 +48 275 +47
 21.8 +65 20.9 +48 26.0 +128 27.8 +122 27.5 +128 27.5 +121
 21.77 208.3 117.5 122.8 106.5 96.0 +1
 54.43 52.08 29.38 30.70 26.63 24.00

61679

A

Polaris

45-2 510+20 363+44 192+46 109+39

500+42 350+21 189+31 157+33

538-38 381-28 207-27 118-31

539+22 422+36 262+47 231+47

2107+46

1516+73

850+97

735+88

52.68

37.90

21.25

18.38

+1

456789

Jan 5 1879

Jan 6 1879 Polaris

45-2 544+16 410+35 338+48 802+52

522+40 392+27 322+21 292+23

550-28 431-48 352-72 326-01

00+23 471+31 393+40 357+44

2216+51 1789+45 1405+97 1277+118

55.40

42.73

35.13

31.93

456789

Jan 7

45-2 396+39 342+48 287+53 265+54

385+26 322+21 278+23 250+25

409-40 342-07 300+04 270-02

451+33 387+41 337+46 314+48

1641+58 13913+103 12102+126 1099+125

41.03

34.83

30.05

27.48

456789

5 wires of A_{-1} of 4^h 48^m
but no δ .

3 wires of A_{+2} of δ 16.2 min

50
1 19.2
21.2
34.5
34.5

4.4
5.7
23.5
19.8

46.7
47.4
3.4
2.3

Form No. 3.

Observatory,

18

No.

At coincidence,

"

Difference,

of

of

Reduction to 0^h Greenwich,

of at 0^h Gwih.

h. m. s.

" " "

" " "

" " "

" " "

" " "

" " "

" " "

No.

At coincidence,

"

Difference,

of

of

Reduction to 0^h Greenwich,

of at 0^h Gwih.

h. m. s.

" " "

" " "

" " "

" " "

" " "

" " "

" " "

Observatory,

18

No.

h. m. s.

No.

h. m. s.

Observatory,

18

1, 02 25 2 -

1879phae, proj. 1423M