KG
11366
v.674

Clock Errors
Instrumental Constants.
General Catalogue
1871-2

Charles W. Sever, University Bookstore, Cambridge.

Apr. 26 1871

n = -.032

T h	m	Star		o =	T-RA	tang δ	n tang δ	(-ΔT+m)	
12	13	η Virginis	√	o =	-3.23	-1.01	-.00	-3.23	- +00
×× 12	28	β Corvi			32	-00	-00	32	+00
12	35	γ Virginis	√		31	-.42	-01	32	+01

o = -3.283 - .14
-16

-3.29 0 +
+

o = -3.30 - .14 -00 -3.30
12 6 4H Draco √ o = -3.10 + 4.85 - 15 -3.31
o = -.20 - 4.99
n = -.04

n x y
o = -.01 - .14 + 1
o = +.13 + 4.85 + 1

x y
o = -00 - .14 + 1
o = -01 + 4.85 + 1

mm	nx	ny	xx	xy	yy
00	-00	+01	+02	-14	1
+02	+13	+13	23.54	+4.85	1
+.12	+.63	+.12	+23.56	+4.71	+2

~~o = +.02 - .63 - .12~~
~~o = -.63 + 23.54 + 4.85~~
o = +.63 + 23.56 + 4.71
o = +.12 + 4.71 + 2.00
o = -.24 + 9.70 +
o = +.13 + .513 + 1.00
o = +.06 + 2.35 + 1.00
o = -.07 + 2.78
n = +.025

o = 00 + .02 + .14 o = 00 - 14 + 1
o = -.05 + 23.56 + 4.85 o = -01 + 4.85 + 1
o = -.05 + 23.58 + 4.71 o = -01 + 4.71 + 2
o = -01 + 4.71 + 2.00
o = -01 + 5.13 + 1
o = -005 + 2.35 + 1
o = -006 + 2.78
4n = -.002

n = ~~-.032~~ -.040

dΓ + m = +2.900 3.290
+.017 17
+2.92 +3.37

Apr. 29

12 13 √ η Virginis o = -3.40 +.00 00 -3.40 ×

dΓ + m = +3.42

12 06 √ 4H Draco o = -2.98 +4.85
o = -.42 - 4.85
n = -.089

Apr. 30 1871 $n = -.09$

12	13	η Virginis ✓	$0 = -3.22$	$+.00$	00	-3.22
12	35	ζ Virginis ✓	$0 = .32$	$-.01$	00	.32
						-3.27 x

$dT + m = +3.29$

May 1 1871

✓ 12	35	ζ Virginis	$0 = 3.17$	$-.01$	$-.00$	3.17	12 48	
✓ 12	55	ε Virginis	3.24	$+.21$	$-.02$	26	12 50	
✓ 12	13	η " "	-3.19	$+.00$	00	19		
xx 12	28	β Corvi	.23	$-.42$	$+.04$	19		
						3.20		

✓ ε Ursæ Maj. $0 = -2.96 + 1.52 + 17$ 3.13

✓ 12 Can. Ven. $-3.14 + .81 - 8$ .22

$n_0 = -.10$ $-(dT+m)_0 = +3.21$ $n = -.105$

1 13 Polaris $0 = -7.56 - 41.41 + 4.14$ 3.42 $+4.35 - 3.21$ .18

$-3.05 + 1.66 + .12$ 3.22 -17 3.14

$3.21 - .05$ 0 3.21 0 3.21

3.195 x

+017

$dT + m = +3.21$

n x y

$0 = -.21 - 41.41 + 1$

$-.01 + 1.66 + 1$

$-00 - 05 + 1$

$0 = +8.69 + 171.479 - 41.41$ $0 = -.21 - 41.41 + 1$

$-.02 + 2.75 + 1.66$ $-.01 + 1.66 + 1$

$00 + .00 - .05$ $-.00 - 05 + 1$

$0 = +8.67 + 1717.54 - 39.80$

$-.22 - 39.80 + 3.00$

$0 = +.22 + 42.9 - 1.00$

$0 = -.07 + 13.3 + 1.00$

$0 = +.15 + 29.6$

$\Delta n = -.005$

$n = -.105$

May 2

12 35 γ Virginis 0 = −3.02 −.01 0 −3.02 12 48 ε Urs Maj 0 = −2.88 +1.52 −23 − 3.11
12 55 ε " 3.02 +.21 −3 3.05 12 54 12 Can Ven 2.89 + .81 − 12 − 3.01
12 13 η " −2.95 +.00 0 2.95 −6.12
12 28 β Corvi 3.13 − 42 +6 3.07 −2.89 +1.36 3.06
3.03 − 05 .09

$n_0 = -15$ $-(dT+m)_0 = -3.03$

n = −149

12 6 4 76 Draconis 0 = −2.36 +4.85 +1 −.73 − 8.09 −72 3.08
1 13 Polaris − 9.43 −41.41 +1 +6.21 8.22 +5.83 3.60
− 2.89 +1.16 +1 −.17 3.06 −17 3.06 × 4 24
− 3.03 + .05 +1 −.00 3.03 +1 3.02 × 2 4
28
3.04 / 1.7 ×

dT+m = +3.06

n x y
0 = −.06 + 4.85 + 1
−.19 − 41.41 + 1
−.03 + 1.16 + 1
−.00 − .05 + 1

0 = −.29 + 23.52 + 4.85
+.79 + 1714.79 + 41.41
−.03 + 1.35 + 1.16
−.00 + .00 − .05

0 = +.47 + 1739.7 − 35.45
0 = −.28 − 35.45 + 4.00

0 = +.014 + 49.2 − 1.00
0 = −.070 − 8.8 + 1.00
0 = −.056 + 40.4
Δn = +.001
$n_0 = -15$
n = −.149

May 9

12 55 ε Virginis 0 = −2.97 +21 −02 2.99 12 48 ε Urs Maj 0 = −2.90 +1.52 −16 −3.06
13 03 θ " 2.98 +.08 +01 2.97 12 54 12 Can. Ven −2.89 +.81 −08 2.97
13 06 43 Comae 2.94 +.54 −6 3.00 13 43 η Urs Maj 2.88 +1.19 −13 3.01 .63 × 3 = 2
13 18 α Virginis 3.01 −.19 +2 2.99 2.89 +1.17 −3.01
13 28 ζ " 2.96 .00 0 2.96 1 13 Polaris
2.97 +.10 2.98

$n_0 = -18$ n = −.106

0 = −7.43 −41.41 +4.56 −2.87 + 4.39 3.04
0 = −2.89 + 1.17 − 12 −3.01 − 12 3.01 × 5 +05
0 = −2.97 + .10 − 01 −2.98 − 01 2.98 × 2 − 4
+01

$-(dT+m)_0 = -2.87$
0 = 00 − 41.41 + 1
−14 + 1.17 + 1
−11 + .10 + 1

× dT+m = +3.00 (± .022)
+ .017

0 = −00 + 1714.8 − 41.41
−16 + 1.4 + 1.17
−01 + .0 + 10

The weights are reckoned as the cosines of the declination.

dT+m = +3.02

0 = −17 + 1716.2 − 40.4
0 = −25 − 40.1 + 3.0
0 = −.04 + 42.9 − 1.00
0 = −08 − 13.4 + 1.00
0 = −12 + 29.5
Δn = +.004

n = −.106

May 10

12 35 ζ Virginis 0 = −2.90 − 01 − 00 −2.90
12 55 ε " .84 + 21 − 2 .86
13 03 θ .88 − 08 + 1 .87
13 06 43 Comae .86 + .54 − 6 .92
13 28 ζ Virginis .92 .00 − 0 .92

2.88 + .13

− 2.89

0 = − 05 41.41 + 1.00
0 = − 07 + 1.30 + 1
0 = − 00 + .13 + 1

0 = + 21 + 1714.8 − 41.4
0 = − 9 + 1.7 + 1.3
0 = 0 + 2 + 0.1
0 = + .12 + 1716.5 ~~+~~ 40.0
0 = − 12 ~~+~~ 40.0 + 3.0

0 = + 0.03 + 42.9 − 1.00
0 = − 0.40 − 13.3 + 1.00
0 = − 0.37 + 29.6
40c + .001
n = − .109

12 48 ε Urs Maj 0 = − 2.73 + 1.52 − 19 2.90
12 50 12 Can Ven 2.82 + .81 − 9 2.91
13 18 ζ Urs Maj (2.92) + 1.46 − 16 (3.08)
2.82 + 1.30 −2.91

n_0 = −.11 n = −.109

1 13 Polaris 0 = −7.49 − 41.41 + 4.55 2.94 + 4.51 2.98
0 = −2.78 + ~~1.87~~ 1.17 − 14 2.96 − 13 2.91 × 5 455
0 = −2.88 + .13 − 1 2.89 − 1 2.89 × 2 178
0 = −1.95 + 2.82 − 31 633

May 16

~~4 H Draco 0 = + 4.55~~
κ Draco − 1.95 + 2.82

dT + m = + 2.90 ×

2.904
+ 17

dT + m = + 2.92

May 11

12 58 ε Virginis 0 = − 2.95 + .21 − 3 − 2.98
13 03 θ " 2.95 − 08 + 1 2.94
13 06 43 Comae 2.90 + .54 − 7 2.97
13 18 α Virginis 3.05 − .19 + 3 3.02
− 2.96 + .12 2.98

− (dT + m_0) = − 2.97
0 = − 13 + 2.82 + 1
0 = − .55 − 41.41 + 1
0 = − 2 + 1.17 + 1
0 = 0 + 12 + 1

0 = − 36 + 7.9 + 2.82
0 = + 20.77 + 1714.8 − 41.41
0 = − 2 + 1.3 + 1.17
0 = 0 + 0 + .12

0 = − 20.39 + 1724.0 − 37.3
0 = − .70 − 37.3 + 4.0

0 = − 0.55 + 45.2 − 1.0
0 = − .18 − 9.3 + 1.0
0 = − .73 + 39.9
4n = + 018
n = − .132

12 48 ε Urs Maj 0 = − 2.76 + 1.52 − 20 2.96
12 50 12 Can Ven 2.88 + .81 − 11 .99
2.82 + 1.17 − 15 .97
2.97

n_0 = −.15 n = −.132

12 28 κ Draco 0 = − 2.68 + 2.82 − 42 3.10 − 37 − 3.05
1 13 Polaris − 9.73 − 41.41 + 6.21 3.52 + 5.46 4.27
− 2.82 + 1.17 − .17 2.99 − 16 2.98 × 5 40
− 2.96 + 0.12 − 1 2.97 − 1 2.97 × 2 7
47

2.98 ×

May 29

4 H Draco 0 = + 1.41 + 4.55
β Comae − .67

dT + m = + 2.978
+ 17
dT + m = 2.995

June 1

13 28 ζ Virginis o = -0.18 +.00

May 14

13 03 θ Virginis o = -2.44 -.08
13 06 43 Comae 2.36 +.54
13 18 ζ Urs Maj 2.29 +1.46
13 28 ζ Virg. 2.36 +.00
13 43 η Urs Maj 2.32 +1.19
1 13 Polaris o = +6.40 -41.41

mo = -09 n = -096

o = -2.39 +15 -01 -2.40 -01 - 2.40 ×3
o = -2.30 +1.32 -12 2.42 -13 2.43 ×2
o = +6.40 -41.41 +3.73 2.67 +3.98 2.42

o = -00 +15 + 1
o = -02 +1.32 + 1
o = -27 -41.41 + 1

$\boxed{2.41}$ ×

o = 00 +.03 +.15
o = -03 +1.74 +1.32
o = +11.18 +1714.80 -41.41

dT+m = +2.413
+ 17
= +2.43

o = +11.15 +1716.6 -35.54
o = -.29 - 35.9 + 3.0
o = +28 + 429 - 1.00
o = -10 - 13.3 + 1.00
o = +18 + 29.6
4n = -006
n = -096

June 6

13 03 θ Virginis o = +.18 -.08 +.03 +21
13 06 43 Comae +.28 +.54 -21 +07
13 18 α Virg. +.11 -.19 + 4 +15
13 28 ζ ,, +.15 +.00 - 6 +09

+2.13

Polaris o = +.18 +.07
113 o = 16.06 -41.41
o = -16.24 -41.48
n = -.391

dT+m = +0.130
+ 17
= +0.15

June 12

1318 ζ Urs Maj o = +146
1342 η " " +1.94 + 1.19 − .50 + 1.44

Polaris 1 13 o = −15.92 − 41.41 + 17.39 1.47
o = + 1.94 + 1.19 − .50 + 1.44
o = −17.86 − 42.60
n = −.420

dt+m = +1.44 ×
+ 2

dt+m = +1.42

June 14

1355 δ Virginis o = + 1.82 + .04 − .02 + 1.80
1405 d Bootis 2.01 + .49 − .19 .82
1410 a " 1.88 + .36 − .14 .74

1.79

1343 η Urs. Maj o = + 2.18 + 1.19 − .47 1.71
1401 a Draco + 2.58 + 2.14 − .85 1.73

1.72

n = 40

n = −.399

Polaris o = −14.87 − 41.41 + 16.56 + 1.69 + 16.52 1.65
1 13 o + 2.38 + 1.67 + .67 1.71 − .86 .72×3
o = + 1.90 + .30 − .12 1.78 − .12 .78×1

o = 0 − 41.41 + 1
o = + .02 + 1.67 + 1
o = + .09 + 0.30 + 1

o = 0 + 17.48 − 41.41
o = + .03 + 2.8 + 1.7
o = + .03 + .1 + .3

×+1.74

o = + .06 + 17.18 − 39
o = + .11 − 39 + .3

− 1.735
+ 17

o = .00 + 44.1 − 1.0
o = + .03 − 13.0 + 1.0
o = + .03 + 31.1
4n = −.001

dt+m = +1.75

June 17

n = −.455

13 48 η Bootis 0 = +2.35 +34 −15 2.20
14 05 d " .35 +49 −23 .12
14 10 a " 29 +36 −16 .13
2.15 ×

14 01 a Draco 0 = +32.2 +2.14 −98 2.75

n_0 = −.44
1835

1 13 Polaris 0 = −16.80 −41.41 +16.30 +1.59 +1839 2.22
+3.22 + 2.14 − 44 2.28 − 45 2.21
+2.33 + .40 − 18 2.15 − 18 2.15

0 = 00 − 41.41 + 1.0
0 = +.69 + 2.14 + 1.0 − ~~.97~~
0 = +.56 + 40 + 1.0 − ~~22~~

0 = 00 + 1914.8 + 41.41
0 = +1.48 + 4.6 + 2.14
0 = .22 + .2 + 40

0 = +1.70 +1719.6 − 38.9
0 = +1.25 − 38.9 + 3.0

0 = +.04 + 44.2 − 1.0
0 = +42 − 12.9 + 1.0

0 = +.46 + 31.3

Δn = −.015
n = −.455

dT + m = ∓2.150
+ 17
= −2.13

0 = 00 − 41.41 + 1.0
0 = +.23 + 2.14 + 1.0
0 = +10 + .40 + 1.0

0 = 00 + 1714.8 − 41.4
0 = 1.49 + 4.6 + 2.1
0 = +04 + .2 + .4

0 = +.53 + 1719.6 − 38.9
0 = +33 + 38.9 + 3.0

0 = +.013 + 44.2 − 1.00
0 = +1.10 − 12.9 + 1.00
0 = +.123 + 31.3
Δn = −.004
n = −.444

2.21 × ½ 13
2.15 × 3 45

+2.15

June 19

n = .408

14 05 d Bootis 0 = +2.68 +49 −20 2.48
14 10 a " 65 +36 −15 .50
14 26 Q " .50 +60 −24 56
14 34 π " 65 +31 −12 53 +.021
14 43 a_2 Librae .44 −14 +6 .50
2.64 +.32 2.58
2.514 +

n = .408

0 = 00 − 41.41 + 1.0
0 = +.33 + .32 + 1.0
0 = +.34 + 1.72 + 1.0
0 = 00 + 1714.8 − 41.41
0 = +.11 + .1 + .32
0 = +.57 + 3.0 + 1.72

0 = +.68 + 1717.9 − 35.37
0 = +.67 + 38.4 + 3.00

0 = +.117 + 43.6 − 1.0
0 = +.229 − 13.1 + 1.0

0 = +.24 + 30.5
Δn = +.008

dT + m = ∓2.514
+ 17
= −2.50

14 05 a Draco 0 = +3.38 +2.14 −87 2.51
14 21 θ Bootis 3.04 +1.30 −58 2.51
3.21 +1.72

n = −.392

n_0 = −.40

Polaris 0 = −14.88 − 41.41 + 16.56 +2.18 +16.93
1 13 + 2.64 + .32 − 13 2.51 − .13
+ 3.21 + 1.72 − 69 2.52 − 68

0 = 00 − 41.41 + 1.00
0 = −.35 + .32 + 1.00
0 = −.34 + 1.72 + 1.00

0 = 00 + 1714.8 − 41.41
0 = −.12 + .1 + .32
0 = −.58 + 3.0 + 1.72

0 = −.70 + 1817.9 − 39.37
0 = −.69 − 39.4 + 3.00

0 = −.02 + 43.6 − 1.0
0 = −.23 − 13.1 + 1.0

0 = −.25 + 30.5
Δn = +.008
n = −.392

~~2.53~~
2.51 × 5 5
~~2.54~~ × 1 4
9

+2.51

June 21

n = −.481

1348 η Bootis 0 = +2.63 +.34 −16 2.47
1355 ν Virginis .60 +.04 − 2 58
1404 d Bootis .76 +.49 −24 52
1410 a " .68 +.36 −17 51
1426 Q " .80 +.60 −29 51
1435 π " .68 +.31 −15 53
~~1439~~ ε "
2.69 +.36
312

(±0.025)

+2.52

ι Cass o = −3.04
ι Cass −2.33

dT+m = −2.52 (1)
+ .17
−.2.50

1342 η UrsMaj o = +3.10 +1.19 −57 2.53
1421 θ Bootis 3.13 +1.30 −.62 .51
1401 α Draco 3.38 +2.14 −1.03 .35
3.20 +1.54

n_0 = −.48 −.481

1 13 Polaris 0 = −17.38 −41.41 +19.88 +2.50 +15.52 +2.54
2 19 ι Cass +1.56 −2.33 +1.12 2.68 +1.12 68
+3.20 +1.54 −74 2.46 −74 46
+2.69 +0.36 −17 2.52 −17 .52

0 = 00 −41.41 +1.0
0 = +18 −2.33 +1.0
0 = −04 +1.54 +1.0
0 = +02 + 36 +1.0

0 = 00 +17.148 −41.41
0 = −42 + 5.4 −2.33
0 = −06 + 2.4 +1.54
0 = +01 + .1 + 36

0 = −.47 +172.27 −41.84
0 = +16 − 41.8 +4.00

0 = −.01 + 41.2 −1.00
0 = +.04 − 10.4 +1.00

0 = +.03 +30.8
Δn = −.001

June 25

n = −.421

1348 η Bootis 0 = +3.06 +.34 −14 2.92
1355 ν Virg. 2.84 +.04 − 2 82
1405 d Bootis 3.07 +.49 −21 86
1410 a " 3.32 +.36 −15 87
1435 π " 2.99 +.31 −13 86
1440 109 Virg. 2.87 +.04 − 2 85
1443 ϑ? α2 Libr. 2.75 −.14 + 6 81
1421 γ Bootis 3.20 +.81 −33 87
2.98 +.28 2.86

(±.023)

1401 α Draco 0 = +3.91 +2.14 −90 3.11
1421 θ Bootis 3.40 1.30 −55 2.85
(1427 γ " 3.20 + .81)

n_0 = −.42 n = .421

1 53 50 Cass 0 = +1.39 −3.04 +1.28 2.67 +1.28 2.67
1418 ι Cass 0 = +1.28 −2.33 −.58 2.24 +.58 2.24
0 = +2.98 + 28 − 12 2.88 −12 2.86
14 51 β UrsMin 0 = +4.47 +3.66 −1.54 2.93 −1.54 2.93
1 13 Polaris 0 = −14.63 −41.41 +17.39 2.76 +17.39 2.76
0 = +3.65 +1.72 −.72 2.93 −72 2.93

0 = −09 −3.04 +1
−52 −2.33 +1
+11 + 28 +1
+17 +3.66 +1
+00 −41.41 +1
+.17 +1.72 +1

+2.86

dT+m = −2.857
+ .17
= −2.84

0 = +27 +9.24 −304
+1.21 5.43 −2.33
+.03 .09 + 28
+.58 13.39 +3.66
+00 1714.80 −41.41
+29 2.96 +1.72

0 = +2.38 +1745.9 −41.19
0 = −.16 41.2 + 6.0

0 = +058 + 424 −1.0
0 = −027 − 6.8 +1.0

0 = +.031 +35.6

Δn = 001

June 26 n = -.423

13 48 η Bootis o = 3.01 +.34 -.14 2.87

14 26 Q ,, 3.19 +.60 -.25 .94

14 35 ζ ,, 3.05 +.25 -.11 .94 ±.028

14 40 109 Virg. 2.97 +.00 .00 .97

14 44 a2 Lib. 2.84 -.14 +.06 .90

14 59 χ Bootis 3.20 +.52 -.22 .98

~~14 57 β ,, 3.37 +.87~~ 2.93

n_0 = .42 n = -.423

14 48 Gr. 2164 o = +3.81 +.172 -.72 +3.09 -.73 3.08

14 51 β Urs. Min. 4.49 +3.66 -1.54 2.95 -1.35 2.94

1 13 Polaris -14.51 -41.41 +17.39 2.88 -17.52 3.01

3.04 + .26 -.11 2.93 -.11 2.93

o = +.21 +.172 +1
+.07 + 3.66 +1
+.00 -41.41 +1
+.05 + .26 +1

+2.933 ×

o = +.36 +2.96 +.172
+.25 13.40 + 3.66
00 1714.80 -41.41
+.01 3 + .26

dΓ + m = -2.933
+.17
= -2.92

o = +.62 + 173.12 + 35.8
o = +.33 - 35.8 + 4.0

o = +.018 + .42 - 1.0
o = +.082 - 9 + 1.0

o = +.100 + 33
Δm = -.003

n = -.398

June 27 β Bootis +3.28 +.52 -.21 3.07 β Bootis o = +3.47 +.87 -.36 -3.11

13 55 ι Virg. o = +3.01 +.04 -.2 2.99

14 27 γ Bootis 3.39 +.81 -.32 3.07

14 35 π1 Bootis 3.15 +.31 -.12 3.03 ±.026

14 44 a2 Lib. 2.91 -.14 +.6 2.97

14 55 χ Bootis 3.27 +.52 -.21 3.06

(14 20 θ ,, +1.30) 3.03

~~14 27 γ ,, 3.39 +.81~~ n = .40 n = -.398

2 19 ι Cass o = 2.00 -2.38 +.93 2.93 +.93 2.93

14 48 Gr. 2164 3.71 +1.72 -.69 3.02 -.69 3.02

14 51 β Urs Min 4.73 +3.66 -1.46 3.27 -1.46 3.27

1 13 Polaris -13.40 -41.41 +16.56 3.16 +16.48 3.08

1 53 50 Cass +1.60 - 3.04 +1.22 2.82 +1.21 2.81

+3.17 + .54 -.24 3.03 -.14 3.03

o = -.23 -2.33 +1
-.14 +1.72 +1
+.11 +3.66 +1
+.08 -41.41 +1
-.34 -3.04 +1
-.13 + .52 +1

+3.03 +

dΓ + m = -3.032
+.17
= -3.02

o = +.54 +5.43 -2.33
-.24 +2.96 +1.72
+.40 +13.40 +3.66
+1.03 1714.80 -41.41
-.07 9.24 -3.04
00 3 + .52

o = +1.66 +44.59 -40.9
o = -.73 - 40.9 + 6.0

o = +.040 + 42.6 - 1.0
o = -.122 - 6.8 + 1.0

o = -.082 + 35.8
Δm = +.002

June 29

$n_0 = -.40$ $n = -.408$

1 13 48 η Bootis 0 = +3.71 +.84 −13 +3.58 −14 3.57
~~3~~ 14 18 ι Cass +2.83 −2.33 +.93 3.46 +.95 3.48
~~8~~ 5 16 54 ε UrsMin +6.50 +7.35 −2.94 3.56 −3.00 3.50

0 = +12 +.34 +1
0 −2.33 +1
+10 +7.35 +1

+3.57 ×

0 = +.04 + .1 + .3
+00 +.54 −2.3
+.73 +54.0 +7.3

0 = +.77 +59.5 +5.7
0 = +.22 +5.7 +3.0

0 = +.03 + 10.4 + 1
0 = +.07 + 1.9 + 1

0 = +.06 + 8.5
An = −.008
n = −.408

dΓ+m = −3.567
+ 17
= −3.55

June 30

n = −.354 n = .400

14 35 ε Bootis 3.83 +.87 −18 3.65 +20 3.63
14 27 δ Bootis 0 = +3.97 +.81 −.28 .69 −.32 65
3 14 35 β " 3.81 +.31 −11 70 +12 69 +.024
+ 14 45 α Libr. 3.52 −.14 + 5 57 +06 58
14 39 α² Bootis 3.83 + .52 −18 65 −20 63
(14 57 β Bootis 4.15 + .87 +.31 84 −35 (80)
$n_0 = 3$ | 3.68
G
14 48 G. 2164 0 = +4.07 +1.72 −64 3.91 −60 3.97
16 59 ε Urs Min +1.30 +7.35 −2.72 3.58 −2.60 .70
3.85 + .48 − .18 3.67 − .17 .68

0 = +.83 +1.72 +1
+ 0 +7.35 +1
+.09 + .48 +1

+3.68

3.67 ×

0 = +.57 + 2.96 +1.72
+ .07 +54.02 +7.35
+.04 + .24 + .48
0 = +.61 +57.22 9.55
0 = +.42 + 9.55 +3.02

0 = +.07 + 6.0 +1
0 = +.14 + 1.6 +1
0 = −.07 + .44

An = +.016

n = −.354

dΓ+m = −3.663
+ 17
= −3.68

July 1

14 26 θ Bootis 0 = +410 +.60 −25 3.85
3 14 35 π " 3.98 +.31 −12 .86
4 14 40 109 Virg. 3.88 +.04 − 2 .86 +.015
14 59 χ Bootis 4.07 +.52 −21 .86
14 57 β " 4.17 +.87 − 36 .81
4.04
4n=.44 −.410
14 48 Gr. 2164 0= +461 +1.72 −.76 3.85 −.70 4.91
14 51 β Urs Min. 5.47 +3.66 −1.61 3.86 −1.50 4.97
×× 14 28 (5 Urs Min) 5.47 +4.10 −1.80 3.67 −1.68 4.79
4.04 +.47 − 21 3.83 − 19 4.85

0 = +18 +296 +1
.19 +13.40 +1
.0 +16.81
.16 .23

0 = +18 +172 +1
+19 +3.66 +1
+0 +410 +1
+16 +.47 +1

0 = +32 +296 +172
+70 +13.40 +3.66
+00 +16.81 +410
+.08 +.23 +.47

0 = +1.10 +23.4 +10.0
0 = +.53 + 10.0 + 4.0

0 = +.110 + 3.3 + .1
0 = +.135 + 2.5 + 1
0 = −.025 + .8
4n = +.025

n = −.410

~~+4.85~~
+3.85 ×

dT + m = −3.848
17
= −3.83

July 3

n = −.422

2 14 26 θ Bootis 0 = +4.48 +.60 −25 4.23
3 14 35 π " 4.27 +25 −11 .16
7 14 59 χ " 4.29 +52 −22 07
6 14 57 β " 4.50 +.87 −.36 14

1 14 21 θ Bootis 0 = +4.80 +1.30 −.58 4.25
5 14 48 Gr. 2164 +4.91 +1.72 −.73 4.18

n = −.41
14 51 β Urs Min 0 = +5.78 +3.66 −1.58 4.28 −1.54 4.24
× × 5 " " 6.82 +4.10 −1.68 4.14 −1.73 4.09
4.38 + .56 −.23 4.15 −.23 4.15 × 4 = 60
4.85 +1.51 −.62 4.23 −.63 4.22 × 1 = 22
5/82
.16

+4.16 +

4.23
.16
.07
.14
.25
.18
1.03

dT + m = −4.172
+ 17
dT = −4.15

0 = +14 +3.66 +1
+0 +4.10 +1
+1 + .56 +1
+9 +1.57 +1

0 = +.51 +13.40 +3.66
0 = +.00 +16.81 +4.10
0 = +.01 + .32 + .56
0 = +14 + 2.28 +1.57

0 = +.66 +32.81 +9.83
0 = +.24 + 9.83 +4.00

0 = +.07 + 3.3 +1.0
0 = +.06 + 2.5 +1.0
0 = +.01 + 0.8
4n = −.012

n = −.422

July 7

$n = -.500$

1	14 35	β Boötis	0 = +6.52 + .25 − 12	6.40	
2	14 39	109 Virg.	6.37 + .04 − 2	35	
5	14 59	χ Boötis	6.64 + .52 − 26	38	±0.026
6	15 10	β Libr.	6.24 − 16 + 8	32	
7	15 26	μ Boötis	6.84 + .88 − 44	40	
8	15 29	a Cor. Bor.	6.69 + .51 − 25	43	
				6.38	

			$n_0 = -48$		$n = -50$	
15 21 ××	δ_2 Urs Maj Min? 5 Urs Min	9 ~~+7.80~~ ~~+3.18~~	−1.50	6.30	−1.56	6.24
		10 8.51 + 4.10	−1.97	6.54	−2.05	6.46
		6.55 + .34	−.16	6.39	−.17	6.38

0 = 0 + 3.13 + 1
+ 24 + 4.10 + 1
+ 9 + .34 + 1

0 = 00 + .95 + 3.13
0 = +.98 + 1.68 + 4.10
0 = +.03 + .1 + .34

0 = 1.01 + 2.67 + 7.57
0 = +.33 + 7.6 + 3.00

0 = +.13 + .35 + 1.0
0 = +11 + 2.5 + 14

0 = .02 + 1.0
4n = −.020
n = −.50

+6.38 α

dT + m = −6.380
+ 17
= −6.36

July 8

$n = -.50$

1	15 10	β Librae	0 = +6.90	−16	+08	6.98	
2	15 26	μ₁ Boötis	7.41	+.88	−44	6.97	
3	15 29	a Cor Bor.	7.16	+.51	−25	6.91	±0.024
4	15 27	μ₂ Boötis	7.36	+.88	−44	6.92	
						18	
						6.94	

15 21 b δ_2 Urs Maj Min? 0 = +8.33 + 3.13 − 1.56 6.77
7.21 + .53 − .27 6.94
1.12 + 2.60 ~~1.30~~

+6.94 ×

dT + m = −6.945
+ 17
dT = −6.93

July 9

1 14 27 η Bootis o = 7.83 + .81 − 45 7.38 ✗ Polaris o = ~~15.73~~ − 41.41 −
2 14 35 ζ " +7.65 + .25 − .14 .51 ✗ (β Urs Min 9.37 + 3.65)
3 15 10 υ " 7.80 + .67 − .37 .43 (14 51)
1 13
7.44

n_0 = −.56

n = .557

o = −15.73 − 41.41 + 21.53 +5.80 + 23.19 7.46
o = +7.76 + .58 − .30 7.46 − .32 7.44
+9.37 + 3.65 − 1.90 7.47 − 2.04 7.33

o = −00 − 41.41 + 1
−02 + .58 + 1
−13 + 3.65 + 1

+7.44 +

o = .00 + 1714.8 − 41.41
o = −.01 + .4 + .58
o = −.48 + 13.3 + .3.65

dt + m = −7.440
+ .17
= −7.42

o = −.49 + 1728.5 − 38.3
o = −.15 + 38.3 + 3.0

~~o = 64 + 1690.2~~
o = −.01 + 42 − 1.0
o = −.05 − 13 + 1.0

o = −.06 + 29

Δn = +.003

n = .557

July 10

n = −.50 14 51 n_0 = −.50

1 14 40 109 Virginis o = +8.29 + .04 − .02 + 8.27 ✗ β Urs Min o = −10.04 +3.65 − 1.82 8.22
2 15 10 υ Bootis 8.55 + .67 − .33 .22 ✗ δ₂ Urs Min +9.81 +3.13 − 1.57 8.24
3 15 27 μ " 8.58 + .88 − .44 .14 15 21 8.48 + .52 − .26 8.22
4 15 29 α Cor Bor 8.50 + .51 − .25 .25
8.29

o = 8.48 + .52

+8.22 +

o = .00 + 3.65 + 1
o = +.02 + 3.13 + 1
o = 0 + .52 + 1

dt + m = −8.220
+ .17
= −8.20

o = 0 + 13.3 + 3.6
o = .06 + 9.8 + 3.1
o = 0 + .2 + .5

o = +.06 + 23.3 + 7.2
o = +02 + 7.2 + 3.

o = +.008 3.3 + 1.0
o = +.007 + 2.4 + 1.0
Δn = .0

n = -.535

July 12
1 14 27 ϑ Bootis 0 = +9.59 +.81 -.43 9.16
4 15 10 β Librae +9.00 -.16 +.09 09
5 15 23 β Coronae 9.49 + .57 +.30 19
6 15 26 μ_1 Bootis 9.65 + .88 -.47 18 ±0.026
7 15 27 μ_2 " 9.65 + .88 -.47 18
8 15 29 $\overset{2}{a}$ Cor. Bor. 9.40 + .57 -.27 13
~~16 12 ε Oph. -.08~~
9.155

n_0 = -.50   -.535
15 51 β Urs Min   v = 11.24 +3.66 -1.83   9.41 -1.96   9.28
15 21 γ_2 " "   10.60 + 3.13 -1.56   9.04 -1.67   8.93
9.46 + .58 -.29   9.17 - .31   9.15

v = +.37 + 3.66 + 13.40
+.00 + 3.13 + 1
+.13 + .58 + 1

v = 1.35 + .13.40 + 3.66
.00 + 9.80 + 3.13
+.08 + .35 + .58

0 = 1.44 + 23.6 + 7.37
0 = +.50 + 7.4 + 3.

v = +.29 + 3.2 + 1.0
v = +.17 + 2.4 + 1.0

v = +.028 + .08

Δn = +.035

n = -.535

+9.15 ×

dT + m = -9.155
.17
= -9.14

n = -.612

16 11 ε Oph. 9.61 - .08 +.05 9.66
July 13
1 15 10 β Librae 0 = +9.48 -.16 +.10 58
2 15 23 β Coronae 9.85 + .57 -.35 50
3 15 26 μ_1 Bootis 10.17 + .88 -.54 63
4 15 27 μ_2 " " 10.15 + .88 -.54 61
5 6 15 40 β Serpentis 9.84 + .29 -.18 66
6 7 15 43 μ " 9.71 - .05 +.03 74
7 8 15 44 ε " 9.69 + .08 -.05 64
xx 8 15 57 β Scorpii 9.50 - .35 +.21 71
9 9 15 29 a Cor Bor 9.92 + .51 -.32 60
13 16 07 υ Oph. 9.66 - .06 +.04 70
9.64

15 55 γ_2 2.2296   0 = +10.49 + 1.43 - .89   9.60
16 a θ Draco.   0 = 10.70 + 1.66 - 1.02   9.68

n_0 = .60   n = -.612
15 21 x γ_2 Urs Min + 11.26 + 3.13 - 1.88   9.38 - 1.92   9.34
15 49 x ζ Urs min 12.56 + 4.78 - 2.87   9.64 - 2.92   9.59
1 13 x Polaris - 15.79 - 41.41 + 24.85   9.06 - 25.34   9.55
9.78 + .23 - .13   9.65 - .14   9.64
10.59 + 1.54 - .92   9.67 - .94   9.65

0 = +.32 + 3.13 + 1
+.58 + 4.78 + 1
+.00 - 41.41 + 1
+.59 + .23 + 1
+.61 + 1.54 + 1

0 = +1.03 + 13.4 + 3.1
+2.77 + 9.8 + 4.8
+.00 + 1714.8 - 41.4
+.01 + 0 + .2
+.94 + 2.3 + 1.5

0 = +4.75 + 1740.3 + 32.0
0 = +2.10 - 32.0 + 5.0

0 = +0.17 + .54
0 = +.42 - .6

0 = +.56 + .48
Δn = -.012

n = -.612

+9.64 ×

dT + m = -9.637
+ .17
= -9.62

July 20

n = -477

5	15	10	δ Bootis	0 =	1301	+.67	-32	12.69
	15	23	β Coronae		1293	+57	-27	.66
	15	28	μ_2 Bootis		13.13	+88	-42	71
	15	38	a Serpentis		1274	+.12	-06	68
	15	40	β Serpentis		1286	+29	-14	72
9	15	43	μ Serpentis		12.70	-05	+2	72
	~~15~~	~~53~~	~~δ Scorpii~~			~~41~~		
4	15	57	β "		1257	-35	+17	74
14	16	08	δ Ophiuchi		12.63	-.06	+03	66
15	16	12	ε "		12.70	-08	+.04	74
					1281	+24		12.70

8°0

X 15 55	μ. 2296	0 = +1345	+143	-68		12.77
X 16 00	θ Draco	13.67	+1.66	-80		12.87

n_0 = -48

15 49 X	4? 3 Urs Min	0 = +1498	+ 478	-229	12.69
	~~50 Draco~~	~~0 = 15.06~~	~~+3.81~~	-1.83	
		0 = +13.56	+154	-74	12.82
		0 = +12.81	+.24	-12	12.69
6 41 X	51 Cefn.	0 = +2.85	-20.72	+4.94	12.79

n = -477

0 = +1498	-228	12.70
+13.56	-.73	12.83
+1281	-.11	12.70
+2.85	+9.88	12.73

0 = +.0 + 4.78 + 1
+13 + 1.59 + 1
+.0 + 24 + 1
+.10 - 20.72 + 1

0 = +0 + 228 + 4.8
+20 + 2.4 + 1.5
+00 + 0 + .2
-2.07 + 4299 - 20.7

0 = -187 + 4545 - 14.2
0 = +23 - 20.7 + 4.0

0 = -13 + 319 - 1.0
0 = +06 - 5.2 + 1.0

0 = -.07 + 267
Δn = +.003
n = -477

+12.70

dT + m = -12.702
17
= -12.69

July 22

n = -512

√	15	57	β Scorpii	0 = +1309	-35	+18	13.27
4	16	08	δ Oph.	13.32	-.06	+3	.35
5	16	12	ε "	13.29	-.08	+4	.33
							13.32

X 15 55	μ. 2296	0 = +1402	+1.43	-73	13.29
X 16 00	θ Draco	1474	+1.66	-.80	13.29

n_0 = -51

16 X 14	19 Urs Min	0 = +1549	+408	-208	13.32
		13.23	-.16	+.08	13.31
		14.08	+1.54	-.78	13.30

0 = +.02 + 4.08 + 1
+.01 - 16 + 1
+00 + 1.54 + 1

0 = +.08 + 16.8 + 4.1
0 = 00 + .3 - .2
0 = 00 + 2.4 + 1.5

0 = +.08 + 19.5 + 5.4
0 = +03 + -5.4 + 3.00

0 = +.014 + 3.6 + 1.0
0 = .010 + 1.8 + 1.0
0 = +.004 + 1.8

Δn = -.002

+13.31

dt + m = -13.317
17
= -13.30

July 23

n = -.501

1	15 10	δ Bootis o =	+1373	+67	-84	
2	15 23	β Coronae	1364	+57	-29	
3	15 27	ν2 Bootis	1379	+88	-44	
5	15 38	α Serpentis	1344	+12	-06	
6	15 40	β " "	1352	+29	-15	
7	15 43	μ " "	1339	-.05	+03	
8	15 44	ε " "	13.49	+.08	-04	
9	15 51	γ " "	13.53	-29	+15	
x	15 53	δ Scorpii	~~1320~~	-.41	~~+21~~	
x	15 57	β " "	13.20	.35	+18	0 = +0 +4.78 +1
12	16 08	δ Oph.	13.36	-.06	+03	+17 +4.08 +1
13	16 12	ε "	13.33	-.08	+04	+12 +19 +1
			13.49	+.19		+10 +1.54 +1

n0 = -51

X 15 55 Gr. 2296 0 = +1411 +143 -72 13.39
X 16 00 θ Draco 1419 1.66 -.83 13.36

n0 = -.51 n = -.501

15 49 / 16 14

λ Urs Min o =	+1571 +4.78 -2.44	13.27 -2.39	-13.32
Pol Urs.	1552 +4.08 -2.08	.44 -2.04	.48
	13.49 + 19 -.10	.39 - 10	.38
	14.15 +1.54 - 78	.37 - 77	.38

13.39
35
36
38
37
42
45
38
~~36~~ 38
39
37

(±.019)

+13.385

0 = 0 +22.8 +4.8
0 = +69 +16.8 +4.1
0 = 02 + 0 + .2
0 = +15 +2.9 +1.5

0 = +.84 +52.0 +10.6
0 = +.39 +10.6 +4.0

0 = +.08 +4.9 +1.0
0 = +10 +2.6 +1.0

0 = -.02 +2.3
Δn = +.009
n = -.501

+13.38

dT + m = -13.385
+ 17
= -13.37

July 27

n = -.525

1	15 44	ε Serpentis o =	+1400	+.08	-114	13.96
2	16 08	θ Oph.	13.91	-.06	+113	94
3	16 12	ε "	13.92	-.08	+04	96
4	16 19	α Herculis	14.10	+26	-14	96
x	16 22	[α Scorpii]	13.61	-.49	+25	86
5	16 24	λ Oph.	13.96	+.04	-112	94
						1394
			13.92	-.114	+112	

15 49 / 16 14

n0 = -.52 n = -.525

λ Urs Min o =	+1642 +4.78 -2.49	13.93 -2.51	13.91
δ Urs Maj (min?)	16.11 +4.08 -2.12	13.99 -2.14	13.97
	13.92 -.04 + 02	13.94 + 02	13.94

+13.94

0 = +00 +48 +1
+06 +4.1 +1
+01 + 0 +1

0 = 0 +22.8 +4.8
0 = +24 +16.8 +4.1
0 = 00 + 0 + .0

0 = +.24 +39.6 +8.9
0 = +06 +8.9 +3.0

0 = +.027 + 4.4 +1.0
0 = +020 + 2.9 +1.0
0 = +007 + 1.5
Δn = -.005
n = -.525

dT + m = -13.937
+ 17
= -13.92

Aug. 2

n = -.508

1	15 37	a Serpentis	o = +15.50	+.12	-06	15.44
2	15 40	β " "	15.58	+29	-15	43
3	15 43	u " "	15.44	-05	+03	47
	15 53	δ Scorpii	15.20	-41	+21	41
	15 57	β " "	1520	-.35	+18	38
4	16 19	ω Herculis	15.54	+.26	-.13	41
5	16 24	λ Oph.	15.37	+.04	-02	35
6	16 30	ζ "	15.26	-18	+09	35
7	16 37	ζ Herc.	15.73	+.62	-32	41
8	16 39	η "	15.78	+.81	+41	37
10	16 46	49 Herc.	15.54	+27	-14	40
11	16 51	κ Oph.	15.47	+17	-09	38
13	16 55	ε Herc.	15.77	+.60	-.30	47
			15.49	+.17		15.405

(±.028)

15 54	Br. 2296	o = +16.11	+1.43	-72	15.39
16 22	η Draco	16.35	+1.85	-94	15.41
16 43	Br. 2377	16.26	+1.54	-78	15.48
					15.43

n₀ = -.50

15 49	ζ Urs. Minor	o = +17.95	+ 4.78	-2.39	15.56
16 14	19 Urs. Maj.	17.31	+ 4.08	-2.04	15.27
	~~δ Urs. Min.~~	16.24	+ 1.61	- 80	15.44
		15.49	+ .17	-08	15.41

n = -.508

o = + 17.95 + 4.78 - 2.43   15.52
17.31 + 4.08 - 2.07   15.24
16.24 + 1.61 - 81   15.43
15.49 + .17 - 08   15.40

o = +.29 + 4.78 + 1
+00 + 4.08 + 1
+17 + 1.61 + 1
+14 + .17 + 1

o = +4.39 + 22.8 + 4.8
+ 00 + 16.8 + 4.1
+ 27 + + 2.5 + 1.6
+ .28 + 0 + .2

o = +1.69 + 42.1 + 10.7
o = +.60 + 10.7 + 4.0

o = +.16 + 4.0 + 1.0
o = +.15 + 2.7 + 1.0
o = +.01 + 1.3
Δn = -.008

n = -.508

dT + m = -15.405
17
= -15.39

Aug. 3

n = -.519

1	15 37	a Serpentis	o = +15.59	+.12	-06	15.53
2	15 40	β " "	15.68	+.29	-16	52
3	15 43	u " "	15.54	-.05	+03	57
4	15 50	ζ " "	15.69	+.29	-16	53
	15 52	δ Scorpii		~~-.41~~		
6	16 16	γ Herculis	15.70	+.35	-18	52
7	16 19	ω "	15.70	+.26	-13	57
8	16 24	λ Oph.	15.57	+.04	-2	55
9	16 30	ζ "	15.41	-.18	+10	51
10	16 37	ζ Herculis	15.85	+.62	-32	53
						15.537

(±.015)

+15.54.

16 02	θ Draco	o = +16.50	+1.66	-86	64
16 22	η "	16.41	+1.85	-96	55

n₀ = -.53

16 28	A Draco	o = 16.93	+2.61	-1.38	15.55
15 48	ζ Urs. Min.	18.09	+4.78	-2.53	15.56
16 59	ε Urs. Min.	19.32	+7.35	-3.89	15.43
		16.64	+ .19	-10	15.54
		16.40	+1.75	-93	15.52

n = -.519

o = 16.93 - 1.35   15.58
18.09 - 2.48   15.61
19.32 - 3.82   15.50
15.64 - 10   15.54
16.45 - .91   15.54

o = +12 + 2.61 + 1
13 + 4.78 + 1
0 + 7.35 + 1
11 + .19 + 1
9 + 1.75 + 1

o = +.31 + 6.82 + 2.61
+.63 + 22.85 + 4.78
+ 08 + 54.02 + 7.35
+01 + 04 + 19
+ 15 + 3.06 + 1.75

o = +1.10 + 86.79 + 16.68
o = .45 + 16.68 + 5.00

o = +.069 + .52 + 1.0
o = +.090 + 3.3 + 1.0
o = -.021 + 1.9
Δn = +.011

Δn = -.519

dT + m = -15.537
+ .17
= -15.52

Aug. 5

n = -.573

1 16 30 ζ ophiuchi 0 = +16.20 -18 +10 +16.30
2 16 36 ζ Herculis 16.61 +.62 -35 .26
3 16 39 η " " 16.79 +.81 -46 33
4 16 46 49 " " 16.40 +.27 -15 25
5 16 51 κ oph. 16.32 +.17 -10 22
6 16 55 ε Herc. 16.63 +.60 -34 29 (±0.22)
7 17 9 α Herc. 16.46 +.26 -14 32
8 17 11 π " 16.72 +.75 -.43 29

0 = 16.52 + .41 16.28

X 16 43 Br. 2377 0 = +17.12 +1.54 -88 16.24
X 16 41 α Camel 14.96 -2.26 +1.28 16.24
X 16 59 ε Ursæ Min. +20.46 + 7.35 +4.19 16.27
16.52 + .41 - .24 16.28

n_0 = -.57

n = -.573

0 = +17.12 - 88 16.24
+14.96 +1.29 16.27
+20.46 -4.21 16.25
+16.52 - .24 16.28

+16.28

dT + m = -16.282
+ .17
-16.27

0 = +0 +1.54 +1
+0 -2.26 +1
+.03 +7.35 +1
+.04 + .41 +1

0 = +0 +2.37 +1.54
+0 +5.11 -2.26
+.22 +54.02 +7.35
+.02 + .16 + .41

~~0 = + +7.04~~
0 =
0 = +.26 + 61.66 + 7.04
0 = +.07 + 7.04 + 4.00

0 = +0.37 + 8.8 + 1.0
0 = +0.18 + 1.8 + 1.0

0 = +.019 + 7.0
Δn = -.003

n = -.573

Aug. 9

n = -.573

1 17 09 α Herculis 0 = +18.71 +.26 -.15 +13.56
2 17 10 π " 14.00 +.75 -.43 .57
XX 17 18 44 oph. 13.28 -.45 +.27 .55
3 17 18 α oph. 13.65 +.22 -.13 .52

13.66 + .19 13.55

⊙ X β Draco 0 = +14.27 +1.21 -.68 +13.59 -.69 13.58
X α " 15.00 + 2.58 +1.47 .53 -1.48 13.52
X ε Ursæ Min. +17.77 +7.35 +4.19 .58 -4.19 13.58
13.66 + .19 - .11 .55 - .11 13.55

n_0 = -.57 n = -.573

~~17 28~~
~~17 38~~

⊙ 17 28
17 38
16 59

+13.55

dT + m = -13.532
+ .17
= -13.53

0 = +.06 + 1.21 + 1
.00 + 2.58 + 1
.5 + 7.35 + 1
+.2 + .19 + 1

0 = +.07 + 1.46 + 1.21
+.00 + 6.66 + 2.58
+.37 + 64.02 + 7.35
+.04 + .04 + .19

0 = +.48 + 62.18 + 11.33
0 = +.13 + 11.33 + 4.00

0 = +0.43 + 5.6 + 1.0
0 = +0.32 + 2.8

0 = +.010 + 2.8

Δn = -.0113
n = -.573

Aug 6

n = -.526

1	16 24	λ Oph.	o = +12.71	+.04	-.02	+12.69
2	16 30	ζ "	12.58	+.18	+10	68
3	16 36	ζ Herc.	12.98	+.62	-38	65
4	16 39	η "	13.07	+.81	-42	65
5	16 58	κ Oph.	12.76	+17	-9	67
6	16 17 9	a Herc.	12.71	+.26	-13	58
7	17 11	π "	13.09	+.75	-40	69
		44	12.36	-.45-3	+24	60
8	16 46	49 Herc.	12.78	+.27	+.14	64
9	17 29	a Oph.	12.79	+.22	-.12	67
			12.78	+.25		12.65

(+032)

n₀ = -.54   n = .536

16 22	η Draco. o =	+13.67	+1.85	-100	+12.67	-.57	12.70
16 28	A "	+14.08	+2.61	-1.41	.67	-1.37	71
16 41	a Camel	+11.52	-2.26	+1.22	74	+1.18	70
17 02	ε Urs Min	+16.54	+7.35	-3.97	57	-3.87	67
17 37	ω Draco	+14.04	+2.58	-1.39	65	-1.36	68
		+12.78	+.25	-.16	62	.13	65

12.65

dT+m = -12.652
+ .017
-12.69⁵

o = +10 +1.85 +1
10 +2.61 +1
17 -2.26 +1
00 +7.35 +1
08 +2.58 +1
05 +.25 +1

o = +18 +3.42 +1.85
+26 +6.81 +2.61
-38 +5.11 -2.26
+00 +54.02 +7.35
+20 +6.66 +2.58
+01 + 06 +.25

o = +.27 +76.07 +12.38
o = +.50 +12.38 +6.00

o = +02 + 6.3 + 1.0
o = +.08 + 2.1 + 1.0

o = -.06 + 4.2
a_n = +.014

Aug 10

n = -.558

1	16 16	g Herculis	o = 14.04	+.35	-.19	13.85
	~~16 22~~	~~a Scorpii~~				
3	16 24	π Oph.	+13.89	+.04	-2	87
4	16 36	ζ Herc.	14.25	+.62	-34	91
5	16 39	η "	14.29	+.81	-45	84
7	16 46	49 "	14.05	+.27	-15	90
8	16 51	κ Oph.	14.01	+.17	-10	91
9	16 55	ε Herc.	14.22	+.60	-34	88
	~~16 30~~	~~ζ Oph.~~	1			
11	17 8	a Herc	13.97	+.26	-14	83
			14.09	+.39		13.874

17

13.87

n₀ = -.55   n = -.558

16 28	A Draco o =	+15.36	+2.61	-1.44	+13.92	-1.45	+13.91
16 43	Br. 2377	+14.73	+1.54	-.85	13.88	-.86	87
17 02	ε Urs Min	+17.98	7.35	-4.04	13.94	-4.09	89
17 27	β Draco	14.58	+1.21	-.66	13.92	-.67	91
		14.09	+.39	-.22	13.87	-.22	.87

dT+m = -13.86

o = +.05 +2.61 +1
1 +1.54 +1
7 +7.35 +1
5 +1.21 +1
+0 +.39 +1

o = +.13 +6.81 +2.61
+02 +2.37 +1.54
+52 +54.02 +7.35
+06 +1.46 +1.21
+00 +.16 +.39

o = +.73 +64.82 +13.1
o = +18 + 13.10 + 5.0

o = +.036 + 5.0 + 1.0
o = +.036 + 2.6 + 1.0

o = +.02 + 2.4
a_n = -.008

n = -.558

Aug 11

n = −.556

1 16 39 η Herculis o = +14.45 +.81 −45 14.00
2 16 46 49 " 14.14 +.27 −15 13.99
3 16 51 κ Oph. 13.99 +.17 −09 13.90
4 16 55 ε Herc. 14.31 +.60 −83 13.98
17 9 a " 14.11 +.26 −14 13.97
14.20 +.42 13.97

13.97

16 42 Gr. 2377 o = +14.81 +1.54 n₀ = −.56
17 4 " 2415 14.48 +.16
17 28 β Draco 14.64 1.21

n = −.556

16 59 δ Ursae min +18.07 +7.35 −4.13 +13.94 −4.09 13.98
14.64 +1.20 −.67 +13.97 −.67 13.97
+14.20 +.42 −.24 +13.96 −.23 13.97

o = 0 + 7.35 + 1
+.3 + 1.20 + 1
+.2 + 42 + 1

o = +00 + 54.02 + 7.35
+04 + 1.44 + 1.20
+01 + .17 + 42

o = +.15 + 55.6 + 9.1
o = + 05 + 9.1 + 8.0

o = +005 + 6.1 + 1.0
o = +017 + 3.0 + 1.8

o = −.012 + 3.1

Δn = +004

n = .556

dr + m = −13.968
17
dr = −13.95

Aug 13

n = ~~−.581~~
−.558

17 9 4 a Herculis o = ~~14.13~~ ~~+.26~~ −14 .69
16 56 5 ε " 14.83 +.60 −33 14.54
17 11 6 π " 14.89 +.75 −40 49
44 Oph. 14.19 −.45 +25 44
14.64 +.29 14.48

14.48

n₀ = −.55 n = −.553
16 43 Gr. 2377 o = +15.29 +1.54 −.85 14.44 −.85 14.44
4 42? a Camel 13.21 −2.26 +1.24 14.45 +1.24 .45
16 59 ε Urs min 18.52 +7.35 −4.04 14.48 −4.06 .46
∴ 14.64 +.29 −.16 14.48 −.16 .48

o = 0 + 1.54 + 1
01 − 2.26 + 1
4 + 7.35 + 1
.04 + .29 + 1

o = 0 + 237 + 1.54
+02 + 5.11 − 2.26
+30 + 54.02 + 7.35
+01 + .09 + .29

o = +32 + 61.59 + 6.92
o = +29 + 6.92 + 4.0

o = +.046 + 8.8 + 1.0
o = +022 + 1.7 + 1.0

o = +024 + 7.1

Δn = +003

dr + m = −14.477
+ 17
= −14.46

Aug 17 1871

n = .550

~~17 08 a Herculis = 15.62 + .96 − 14 15.48~~
17 10 π " 15.92 + .75 − 40 15.52
17 18 44 Oph. + 15.32 − .45 + 25 .57
17 28 β Draco 16.18 + 1.21 − 66 .52

20 4 θ Aquilae = + .02
20 9 31 Cygni + 1.05
20 17 γ " " + 83
20 33 a Delphini + 28
20 37 a Cygni + .99

− 15.52

19 49 ✕ λ Urs Minor = + 44.52 + 53.16
15.70 + 0.28
28.82 + 52.88

dT + m = − 15.537
17
= − 15.52

Aug 18

n = .528

17 19 44 Ophiuchi 0 = + 15.46 − .45 + 24 15.70
17 28 β Draco 16.45 + 1.21 + 63 82
17 29 a Oph. 15.87 + 22 + 11 76
17 41 μ Herculis + .83
19 32 θ Cygni + 1.19
19 39 15 ~~17~~ Cygni + .45
19 44 a Aquilae + .10

17 38 ✕ a Draco 0 = + 17.16 + 2.58
19 51 ✕ " + 1.83

n₀ = −.53

16 59 ✕ δ Urs Min 0 = + 19.64 + 7.35 − 3.90 15.74 − 3.88 15.76
0 = + 17.16 + 2.58 − 1.37 15.79 − 1.36 15.80
0 = 15.93 + .33 − 18 15.75 − 17 15.76

0 = + 00 + 7.35 + 1
+ 05 + 2.58 + 1
+ 01 + .33 + 1

− ~~A~~ 15.760
17

0 = 08 + 54.0 + 7.3
+ 13 + 6.6 + 2.6
+ 00 + .1 + .3

dT + m = − 15.74

0 = + 13 + 60.7 + 10.2
0 = + 06 + 10.2 + 3.0

0 = + 013 + 6.6 + 1.0
0 = + 020 + 3.4 + 1.0

0 = − 007 + 3.2

Δn = + 002

Aug 19 1871

~~α Oph. o = +16.12 + 2.2~~
1 μ Herc 16.21 + .53
3 ζ Draco 16.49 + 1.26

o = +0 + 2.58 + 1
3 + 1.53 + 1
12 + .53 + 1
3 + 1.26 + 1

o = 0 + 6.6 + 2.58
+05 + 2.34 + 1.53
+06 + .25 + .53
+ 04 + 1.59 + 1.26

o = +.15 + 10.85 5.90
o = +.18 + 5.90 + 4.00

o = +025 + 1.80 + 1.0
o = +045 + 1.57

o = −020 + .33
Δn = +.06

n₀ = −.50 n = −55

17 38 ω Draco o = 17.12 + 2.58 + 1.29 15.83
17 44 ψ " 16.62 + 1.53 + .76 .86
16.21 + .53 + .26 .95
16.49 + 1.26 + .63 .86

Assume n = −.50

dT + m = ~~−15.89~~ − 15.875
.17
= −15.86

19 49 λ Urs Min. 42.73 + 53.16
16.21 + .53
26.52 + 52.63

n = −.50

Aug 22

n = −.450

1 17 27 β Draco o = +17.26 + 1.21 −.54 16.72
2 μ Herculis +16.91 + .53 −.24 .67
3 ζ Draco +17.28 + 1.26 −.56 .72

17 44 ψ Draco o = +18.32 + 3.12 −1.56 16.76 −1.43 16.89 −1.40 16.92
17 38 ω " " +17.97 + 2.58 −1.29 .68 −1.19 16.78 −1.16 16.81
17.15 + 1.00 − .50 .47 − .46 16.69 − .45 16.70
19 49 λ Urs Min. +40.69 + 53.16 −26.58 14.11 −24.44 16.25 −23.92 16.77

n₀ = −.50 n₀ = .46 −.450

16.70

~~+~~16.703
.17

dT + m = −16.69

o = +.63 + 3.12 + 1
+.53 + 2.58 + 1
+.26 + 1.00 + 1
+ .00 + 53.16 + 1

o = +1.95 + 9.7 + 3.1
+1.37 + 6.6 + 2.6
+ .26 + 1.0 + 1.0
+ .00 + 2826.0 + 53.2

o = 2.58 + 2843 + 60.0
o = 1.42 + 60 + 4.0

o = .043 + 47 + 1.
o = +.355 + 15. + 1.

o = +.312 − 32.0
Δn = +.010

Aug 28 1871

1 17 54 γ Draco o = +18.64 + 1.26
2 20 09 θ Aquilae
3 20 17 γ Cygni
4 20 32 β Delphini
5 20 37 α Cygni

17 44 X ψ Draco o = +19.51 + 3.12
20 27 X θ Cephei ~~18.01~~ +2.01

X×

nυ = -.50 n = -.494

19 49 X λ Urs Mino = +44.17 + 53.16 - 26.58 17.59 - 26.42 17.75
18.64 + 1.26 - .63 18.01 - .62 18.02
17 44 X? ψ Draco. 19.51 + 3.12 - 1.56 17.95 - 1.55 17.96

υ = 00 + 50.26 + 1
+.42 + 1.26 + 1
+.36 + 3.12 + 1

υ = 00 + 28.43 + 58.2
+ 53 + 2 + 1.3
+1.12 + 9 + 3.1

υ = +1.64 + 28.54 + 57.6
υ = +.78 + 57.6 + 3.0

υ = +.03 + 57 + 1.0
υ = +.26 + 19

υ = -.23 + 32
Δn = +.007

dT + m = -18.02
+ .17

dT + m = -18.09

Aug 29

n 52
1 17 53 γ Draco o = +18.98 + 1.26 .5 18.38
2 18 03 o Herc. 18.56 + .55 28 39

18.31

Aug 31

n = -.613

n₀ = -.62 n = -.613

1 17 28 α Ophiuchi o = 19.22 + .22 - .14 19.08 X 17 38 ω Draco o = +20.58 + 2.58 - 1.60 18.98 - 1.58 19.00
2 17 54 γ Draco o = +18.64 + 1.26 - .77 99 X 17 44 ψ ,, ,, +20.90 + 3.12 - 1.93 18.97 - 1.92 18.98
XX 17 57 γ₂ Sagittarii 18.69 - .59 + .37 06 +19.19 + .21 - .13 19.03 - .13 19.06
3 18 03 o Herculis 19.41 + .55 - .34 07
XX 18 06 μ Sagittarii 18.86 .38 + .23 09 18 13 X δ Urs Mi +29.33 + 16.83 - 10.43 18.90 - 10.31 19.03

××

19.06

υ = +.08 + 2.58 + 1
07 + 3.12 + 1
10 + .21 + 1
00 + 16.83 + 1

υ = +.20 + 6.7 + 2.6
+.22 + 9.7 + 3.1
+.03 + 0 + .2
+.00 + 28.31 + 16.8

υ = +.38 + 22.7 + 4.0
υ = +.45 + 29.95 + 22.7
υ = +.020 + 13.2 + 1.0
υ = +.075 + 5.7 + 1.0
υ = -.025 + 7.5
Δn = +.007

dT + m = -19.054
+ .17

υ = -19.04

Sept. 1 1871

n = -622
1 17 54 γ Draco o = +2008 + 126 - 78 19.30
XX 17 57 γ₂ Sagittarii 1910 - 59 + 27 47
2 18 03 o Herculis 1975 + 55 - 34 41
118

n₀ = -62 n = -622
17 44 X γ Draco o = +2116 + 3.12 - 1.93 19.23 - 1.94 19.22
18 13 X δ Ursae Minoris 2982 + 16.83 - 11.43 19.39 - 10.47 19.35
19.64 + .40 - .25 19.39 - 25 19.39

o = +0 + 3.12 + 1
.16 + 16.83 + 1
.16 + .40 + 1

o = .00 + 9.7 + 3.1
+2.68 + 28.31 + 16.8
+ .06 + .2 + .4

o = +2.74 29.32 + 20.3
o = + .32 + 20.3 + 3.0

o = + .13 + 14.5 + 1.0
o = + .11 + 6.7 + 1
o = + .02 + 7.8

Δn = - .002

dT + m = -19.39 3
= 1 7
= -19.38

Sept. 2

n = -458
1 18 14 η Serpentis o = +1957.05 - .12 19.57
2 18 18 109 Herculis 1987.40 - 18 71
3 18 28 1 Aquilae 1966.15 + 07 73
4 18 33 α Lyrae 2014.80 - 37 74
XX 18 47 σ Sagittarii 1930.50 + 23 53
5 18 51 13 Lyrae 2027.96 - 44 83
6 18 54 ε Aquilae 1924.27 - 13 69
480
685

n₀ = -46 -469
6 6 X 22 H Camel o = +18.43 - 26.6 + 1.22 19.65 + 1.22 19.65
6 41 X 51 Cephei +10.17 - 20.69 + 9.52 19.69 + 9.50 19.67
19.80 + .26 - 12 19.88 - 12 19.68

o = +0 + 2.66 + 1
+04 - 20.69 + 1
+ 08 + 26 + 1

o = 0 + 7.08 - 2.7
+.82 + 428.17 - 20.7
+ 05 + 5 + .3

o = - .87 + 43.53 - 23.1
o = + .07 - 23.1 + 3.0
o = - .036 + 18.9 - 1.0
o = + .023 - 7.7 + 1.0

o = + .038 + 11.2
Δn = + .003

19.685
17

dT + m = -19.67

Sept 3

n = -.556

17	41	μ Herculis	0 = +20.18	.53	-30	19.88
18	3	o Herculis	0 = 20.34	+ .55	-30	20.04
18	5	ω Sagittarii.	0 19.78	-.38	+21	19.99
18	18	109 Herculis	0 = 20.14	+ .40	-22	19.92
18	33	α Lyrae	0 = 20.34	+ .80	-44	19.86

+.014

467

20.15 +.40 — 19.94

$n_0 = -.54$ — n = -.556

y	17	44	ψ Draco.	0 = +21.59	+ 3.12	-168	19.91	-1.73	19.86
x	18	22	δ Draco.	0 = 20.96	+ 1.65	-89	20.07	-.92	20.04
	6 x	41	51 Ceph.	0 = 8.63	-20.69	+11.17	19.80	+11.50	20.13
	16 x	59	ε Urs Min	0 = 24.27	+ 7.35	-3.97	20.30	-4.09	20.18
				0 = 20.15	+ .40	-.22	19.98	-.22	19.93

51 Cephei ~~0 =~~ ~~+1.01~~
0 = +8.63 - 20.69
0 = + 21.70

ε Urs Min 0 = + 7.35
0 = + .40
0 = + 6.95

0 = +.11 +3.12 +1
+27 + 1.65 +1
+00 - 20.69 +1
+50 + 7.35 +1
+63 + .40 +1

0 = +.34 + 9.7 +3.1
+.45 + 2.7 +1.6
+ .00 +428.2 -20.7
+3.67 +84.0 +7.3
+ .63 + .3 + .5

0 = +4.50 +494.9 -15.2
= +1.04 - 15.2 + 0.0

0 = +296 + 33.0 -1.0
0 = +200 - 3.0 +1.0

0 = +.496 + 30.0

Δn = -.016

n = -.556

-19.94

19.938
17

dT+m = -19.92

Sept. 6

n = -.564

2	18	03	o Herculis	0 = +21.05	+ .55	-31	20.74
6	18 xx	06	μ Sagitt.	0 = 20.55	-.38	+21	76
3	18	14	ξ Serpentis	0 = 20.70	-.05	+03	73
4	18	18	109 Herculis	0 = 20.91	+ .40	-22	69
5	18	28	1 Aquilae	0 = 20.72	-.15	+09	81
1	18	33	α Lyrae	0 = 21.18	+ .80	-45	73
7	18	45	β Lyrae	0 = 21.10	+ .65	-36	74
8	18	51	13 Lyrae	0 = 21.35	+ .96	-54	81
9	18	54	ε Aquilae	0 = 20.92	+ .27	-15	77

+.026

20.94 + .34 — 20.75

$n_0 = -.56$ — n = -.564

18	22 x	δ Draco.	0 = 21.72	+ 1.65	-92	20.80	-94	20.78
6	41 x	51 Ceph.	0 = 19.12	-20.69	+11.58	20.70	+11.67	20.79
			0 = 20.94	+ .34	-19	20.75	-19	20.75

0 = +10 + 1.65 +1
+ 0 - 20.69 +1
+ 05 + .34 +1

0 = +17 + 2.7 + 1.6
+00 +428.2 - 20.7
+.02 + .1 + .3

0 = +.19 + 431.0 - 18.8
0 = +.15 - 18.8 + 3.0

0 = +.010 + 227 - 1.0
0 = +.050 - 6.3 + 1.0

0 = +.040 + 1.64
Δn = -.004

-20.753
17

dT+m = -20.74

Sept. 7

n = -.547

2	17	41	μ Herculis	0 = +21.45	+ .53	- 29	21.16
X	17	57	ζ Sagitt.	0 = 20.78	- .59	+ 32	(21.05)
3	18	14	η Serpentis	0 = 21.17	- .05	+ 03	21.20
4	18	18	109 Herculis	0 = 21.36	+ .40	- 22	21.14
5	18	28	1 Aquilae	0 = 21.15	- .15	+ 08	21.23
6	18	33	α Lyrae	0 = 21.65	+ .80	- 44	21.21
7	18	40	110 Herculis	0 = 21.40	+ .37	- 20	21.20
8	18	45	β Lyrae	0 = 21.48	+ .65	- 36	21.18
X	18	47	ο Sagitt.	0 = 20.72	- .50	+ 27	(20.98)
9	18	51	18 Lyrae	0 = 21.71	+ .96	- 53	21.18
10	18	54	ε Aquilae	0 = 21.30	+ .27	- .15	21.15
				21.78	+ .24		21.19

18 22 X γ Draco 0 = 22.03 + 1.65 n = -.547

n_0 = -.56

			0 = 22.03 + 1.65 - .92	21.11	- 90	21.13
18	04 X	22 Camell	0 = +19.43 - 2.66 + 1.49	20.92	+ 1.45	20.58
18	13 X	δ Urs Mi	0 = 30.04 + 16.83 - 9.42	20.62	- 9.24	20.84
6	41 X	51 Ceph.	0 = 9.58 - 20.69 + 11.58	21.16	+ 11.32	20.90
			0 = 21.28 + .24 - 14	21.14	- .13	21.15

0 = +49 + 1.65 + 1
+30 - 2.66 + 1
+.00 + 16.8 + 1
+.54 - 20.69 + 1
+.52 + .24 + 1

21.17

0 = +.81 + .27 + 1.6
-.80 + 7.1 - 2.7
+ .00 + 283.1 + 16.8
-11.17 + 428.3 - 20.7
+ .13 + .1 + .2

21.189
17

dT + m = -21.17

0 = -11.03 + 721.2 - 4.8
0 = + 1.85 - 4.8 + 5.0

0 = -2.30 + 150.0 - 1.0
0 = + .37 - 1.0 + 1.0

0 = -1.93 + 149.0

Δm = +.013

Sept. 8

1 18 28 1 Aquilae 0 = -.15
2 18 33 α Lyrae 0 = +.80

6 41 X 51 Ceph. 0 = +11.10 - 20.69

Sept. 9

Sept. 10

u = -449

3	18	18	109 Herculis	0 = 21.85	+ .40	-20	21.65
4	18	28	1 Aquilae	0 = 21.57	- .15	+07	64
6	18	40	110 Herculis	0 = 21.86	+ .37	- 18	68
7	18	45	β Lyrae.	0 = 21.52	+ .65	- 32	60
	18	47	σ Sagitt.	0 = 21.39	- .50	+25	64
				21.72	+ .15		21.64

21.64_2
$\;\;\;\;17$

dT+m = -21.63

18	22	δ Draco	0 = 2244 + 1.65	
			$n_0 = -45$	
			0 = 2244 + 1.65 - 74	21.70
18	04	22 Camel	0 = 2029 - 266 + 1.24	21.49
18	13	δ Ursa Mi	0 = 2911 + 1683 - 7.57	21.54
			0 = 21.72 + .10 - 4	21.65
6	41	(51 Ceph.	0 = 1335 - 2083 + 9.37	22.72)

-449

0 = 2244 - 74 21.70
2029 + 119 21.48
2911 - 7.56 21.56
21.72 - 08 21.64

0 = 21 + .165 + 1
00 - 2.66 + 1
5 + 16.83 + 1
16 + .15 + 1

0 = +34 + 2.7 + 1.6
+ 00 + 7.1 - 2.7
+ 84 + 283.1 + 16.8
+ .02 + .0 + .1

0 = +1.20 + 292.9 + 15.8
0 = .42 + 15.8 + 4.0

0 = +.08 + 18.3 + 1.0
0 = +.10 + 3.9 + 1.0

0 = -.02 + 14.4
Δn = +.001

Sept. 18

n = −.041

1	17	8	a Herculis	0 = 23.17	+.26	−.00	23.16
2	17	28	a Ophiuchi	0 = 23.15	+.22	−.01	14
3	18	14	η Serpentis	0 = 23.23	−.05	+.00	23
	18	32	a Lyrae	0 = 23.17	~~+.80~~	−.03	14
4	18	40	110 Herculis	0 = 23.20	+.37	−.01	19
XX	18	47	θ Sagitt.	0 = 23.24	−.50	+.02	26
6	18	51	B Lyrae	0 = 23.24	+.96	−.04	20
7	18	54	ε Aquilae	0 = 23.19	+.27	−.01	18

±0.028

23.19

6 41x 51 Cε/m. 0 = +23.19 +29
+22.33 −20.83
+.86 +21.12
n = −.041

23.19

dT+m = −23.187
.17
= −23.17

Sept. 21

n = +.012

	~~18~~	~~15~~	η Serpentis	0 =	−.05		
3	18	40	110 Herculis	0 = 23.61	+.37	+.00	23.61
4	18	51	13 Lyrae	0 = 23.63	+.96	+.01	64
5	18	54	ε Aquilae	0 = 23.54	+.24	+.00	54
XX	19	10	d Sagitt.	0 = 23.60	−.35	+.00	60
				23.60	+.30		23.60

±0.026

18 22x b Draco. 0 = +23.46 +1.65

n = +.01 +.017

18 13x δ Urs. min. 0 = 23.46 + 1.65 − .02 23.44 −.02 23.44
0 = 23.46 + 16.83 + .17 23.63 +.18 64
0 = 23.60 + .30 − .00 23.60 .00 60

0 = 0 + 1.65 + 1
19 + 16.83 + 1
18 + .30 + 1

0 = +0 + 27 + 1.6
+1.83 + 283.1 + 16.8
+.05 + .0 + .3

0 = +1.88 + 285.8 + 18.7
0 = .38 + 18.7 + 3.0

0 = +.10 + 15.3 + 1.0
0 = +.17 + 6.2 + 1.0

0 = −.02 + 9.1
9n = +.002

23.60

dT+m = −23.598
.17
dT = −23.58

Sept. 22.

Sept. 23

~~18 51 13 Lyrae 0= +.96~~ n = +040
2 18 59 ζ Aquilae 0 = 23.57 +.24 +01 23.58
3 19 11 ω Aquilae 0 = 23.58 −.35 −01 57
4 19 18 δ Aquilae 0 = 23.60 0 +0 60 ±.004
6 19 25 β Cygni 0 = 23.61 .02 + 0 61

23.59 −.02 23.59

19 14 χ Cygni 0 = 23.52 +1.33

n₀ = +04
+4 79 Draco 0 = +23.46 +3.29 +13 23.59
23.52 + 1.33 +05 67
23.59 − .02 +00 69

0 = 002 + 3.29 + 1
0 + 1.33 + 1
2 − 02 + 1

0 = +07 + 1082 + 3.29
+00 + 1.77 + 1.33
+02 + 02 + 0

0 = +.070 + 1259 + 4.62
0 = +04 + 4.62 + 3.02

0 = +.015 + 2.78 + 1.0
0 + .015 + 1.64 + 1.0
4n = 00

dr + m = −23.590
+ 17
= −23,57~~9~~

Sept. 24.

n = +0.27

1	18	32	α Lyrae	o= 23.78	+.80	+02	23.75
2	18	40	110 Herculis	o= 23.71	+.37	+01	72
3	18	45	β Lyrae	o= 23.59	+.65	+02	61
	18	47	σ Sagitt.	o= 23.76	−.50	−02	74
4	18	51	13 Lyrae	o= 23.80	+.96	+03	83
5	18	54	ε Aquilae	o= 23.70	+.27	+01	71
	19	11	α Sagitt	o= 23.78	−.35	−01	77
6	19	19	δ Aquilae	o= 23.74	+.05	+00	74
7	19	25	β Cygni	o= 23.80	+.52	+02	82
8	19	30	κ Aquilae	o= 23.79	−.13	−00	79
9	19	40	γ Aquilae	o= 23.71	+.18	+01	72

±0.030

23.74 + 26

23.75

19	12	δ Draco.	o= 2368 + 2.41
19	49	ε Draco.	o= 23.77 + 2.74

n₀ = +03

16 41 51 Cephei	o= 24.34 + 20.83	−62	23.72	+.56	23.78
	o= 23.68 + 2.41	+ 7	.75	+ 7	75
	o= 23.77 + 2.74	+ 8	.85	+ 8	85
	o= 23.74 + .26	+ 1	.75	+ 1	76

n = +0.27

o = +0 + 20.83 + 1
3 + 2.41 + 1
13 + 2.74 + 1
4 + .26 + 1

o = 0 + 428.2 + 20.8
+7 + 5.8 + 2.4
+35 + 7.5 + 2.7
+1 + 1 + .3

o = +43 + 431.6 − 16.2
o = +20 − 15.4 + 4.0

o = +03 + 280 − 1.0
o = +.05 − 3.8 + 1.0

o = +.08 + 26.2

Δn = −.003

dT+m = −23.745
+017
−23.73

Sept. 25

n = +0.045

18	59	ζ Aquilae	o= 23.97	+ 24	+01	23.98
19	18	δ Aquilae	O = 24.00	+.05	+00	24.00
19	25	β Cygni	o= 23.92	+.52	+02	23.94
19	30	κ Aquilae	o= 23.95	−.13	−01	23.94
19	40	γ Aquilae	o= 23.94	+.18	+01	23.95
~~18~~	~~59~~	~~ζ Aquilae~~	~~o= 23.97~~	~~+.24~~	~~+1~~	~~23.98~~
19	42	δ Sagittae	o= 23.92	+.33	+2	23.94
~~19~~	~~46~~	~~η Aquarii~~	~~o=~~	~~+.01~~		
20	05	θ Aquilae	o= 24.01	−.02	−0	24.01

±0.019

23.96 + 18

23.97

n₀ = +0.04   n = 0.045

19	12	δ Draco.	o= 23.90	+ 2.41	+09	23.99	+11	24.01
19	14	χ Cygni	o= 23.89	+ 1.33	+05	94	+06	23.95
19	49	ε Draco.	o= 23.78	+ 2.74	+11	89	+12	23.90
			o= 23.96	+ 18	+01	97	+01	23.97
20	13	χ Cephei	o= 23.77	+ 4.44	+18	.95	+ 20	23.97

o = +10 + 2.41 + 1
05 + 1.33 + 1
00 + 2.74 + 1
8 + 18 + 1
6 + 4.44 + 1

o = +24 + 6.81 + 2.41
+07 + 1.77 + 1.33
+00 + 7.51 + 2.74
+01 + 1 + 18
+27 19.71 + 4.44

o = +59 + 34.81 + 11.10
o = +29 + 11.10 + 5.0

o = 053 + 3.2 + 1.0
o = 058 + 2.2 + 1.0

o = −005 + 1.0
Δn = +.005

−23.97

−23.967
+17
dT+m = −23.95

Sept. 27

n = +.112

19	49	β Aquilae.	O =	+5.85	+ .11	+01	6.86
20	05	θ Aquilae	O =	6.89	−.12	−00	89
20	17	γ Cygni	O =	5.83	+.83	+09	92
20	37	α Cygni	O =	6.84	+1.00	+11	95
20	41	ε Cygni	O =	6.78	+.66	+07	88
20	49	32 Vulpec.	O =	5.91	+.52	+06	97
21	07	ζ Cygni	O =	5.77	+.80	+09	86
21	10	ξ Cygni	O =	6.84	+.61	+07	91
21	25	β Aquarii	O =	6.88	−.11	−01	87
22	38	ε Pegasi	O =		~~+16~~		
				6.84	+.49		6.90

(+0.28)

dr + m = −5.898
+.17
= −5.88

20 13 χ Cephei O = ~~+5.62 +4.49 +.49 6.11~~

n = +.11

19 49 γ Urs Min. −0.07 +53: 38 +5.57 6.80
+5.84 +0.49 +05 5.89

Sept. 28

n = +.10

1	19	26	β Cygni	O =	+5.94	+.52	+.05	5.99
2	19	40	γ Aquarii ilae	O =	+6.01	+.18	+02	6.03
✓	19	42	δ Sagitt	O =	6.04	+.33	+03	6.07
4	20	49	32 Vulpec.	O =	6.08	+.52	+05	6.13
5	20	52	V_2 Cygni	O =	6.15	+.86	+09	6.24

100 29
20 06

−6.03

dr + m = −6.092
+.17
= −6.07

Sept. 29

For time only by A.U.

α Aquarii 0 = −.02
π Aquarii 0 = +.01
λ Aquarii 0 = −.15
α Pisc. Aust. 0 = −.58
α Pegasi 0 = +.26
θ Piscium 0 = +.10

Rej.

For time only

~~226 B.Cph.~~
ο Cephei 0 = +2.40

226 B.Cph. 0 = +3.89
j Cephei. 0 = +4.30

Sept. 30

n = +.082

1 20 37 ε Delphini 0 = 37.05 +.19 +.02 37.07
3 2 20 52 ν₂ Cygni 0 = 37.03 +.86 +.07 10
4 5 21 01 61 Cygni 0 = 37.12 +.78 +.06 18
3 4 20 49 32 Vulpec. 0 = 37.13 +.52 +.04 17 +.34
5 21 07 ζ Cygni 0 = 37.03 +.50 +.04 07
6 21 38 ε Pegasi 0 = 37.16 +.16 +.01 17

37.09 +.50 37.13

21 y 16 α Cephei 0 = +36.84 +1.88

$n_0 = +.07$ n = +.082

21 y 27 β Cephei 0 = 36.94 + 2.75 + 20 37.14 + 22 37.16
0 = 36.84 + 1.88 + 13 36.97 + 15 36.99
0 = 37.09 + .50 + 3 37.12 + 04 37.13

0 = +17 + 2.75 + 1
+00 + 1.88 + 1
+15 + .50 + 1

0 = +42 + 7.56 + 2.75
+00 + 3.53 + 1.88
+07 .25 + .50

0 = +49 + 11.34 + 5.13
0 = +.82 + 5.13 + 3.02

0 = +.095 + 2.20 + 1.0
0 = +.011 + 1.81

0 = −.016 + .49

Δn = +.012

−37.13

37.127
.17

dr + m = 37.11

Oct. 3

n = +.057

1	21	38	ε Pegasi	O = +612	+.16	+01	6.13
2	23	46	φ Pegasi	O = +617	+.33	+02	6.19
3	23	53	ω Piscium	O = +617	+.11	+01	6.18

6.15 + .20

6.17

–6.16⁷

$\frac{17}{}$

dT + m = –6.18

O = +5 – 7.03 + 1
+ 18 + 2.75 + 1
+ 8 + 1.70 + 1
+ 4 + 0.20 + 1

O = –357 + 4942 – 7.03
21 + 7.56 + 2.75
8 + 2.89 + 1.70
1 + .04 + 0.20

O = +09 + 5991 – 238
O = +17 – 238 + 400

O = +02 + 283 – 1.0
O = +07 – .6 + 1.0

O + .06 + 277

Δn = –.003

n₀ = +.06

21	16	α Cephei	O = +601	+1.88	+11
23	48	ρ Cass	O = +606	+1.53	+09

n₀ = +.06

21	18	1 Draco	O = +659 – 7.03	+ .42	6.17
21	27	β Cephei	O = 6.04 + 2.75	+ 16	6.20
			6.02 + 1.70	+10	6.12
			6.15 + 0.20	+01	6.16

n = +.057

O = 6.59 – 7.03 – 40 | 6.19
6.04 + 2.75 + 16 | 6.20
6.02 + 1.70 + 10 | 6.12
6.15 + 20 + 1 | 6.16

Oct. 4

n = +.059

1	18	59	ζ Aquilae	O = +637	+.24	+01	6.38
X	19	10	δ Sagitt.	O = .630	–.35	–02	28
2	19	26	β Cygni	O = 433	+.52	+03	36
3	19	44	α Aquilae	O = .635	+.15	+01	36
4	19	46	η Aquilae	O = 635	+.01	+00	35
5	19	49	β Aquilae	O = 640	+.11	+01	41
6	21	07	ζ Cygni	O = 640	+.50	+03	43
7	21	09	π Cygni	O = 637	+.61	+04	41
8	21	24	β Aquarii	O = 638	–.11	–01	37
9	21	38	ε Pegasi	O = 636	+.16	+01	37
10	21	42	π Pegasi	O = 637	+1.13	+06	48
	~~21~~	~~46~~	~~μ Capricorn~~	O =	~~–.25~~		0 =
11	21	59	α Aquarii	O = 639	–.02	–00	39
12	22	03	θ Pegasi	O = 633	+.10	+01	34
13	22	10	θ Aquarii	O = 642	–.15	–01	41
14	22	19	3 Lacertae	O = 628	+1.26	+07	35
15	22	28	η Aquarii	O = 634	–.01	–00	34
16	22	37	η Pegasi	O = 637	+.57	+03	40
17	22	40	λ Pegasi	O = 635	+.42	+03	38
18	22	44	μ Pegasi	O = 632	+.44	+03	35
19	22	46	λ Aquarii	O = 639	–.15	–01	38
X	22	50	α Pisc. Aust.	O = 633	–.58	–03	30
20	22	56	o Androm	O = 630	+.89	+05	35
21	22	58	α Pegasi	O = 635	+.26	+02	37

6.35 + 25

6.37

dT + m = –6.37⁴₁₇

dT + m = 6.36

n₀ = .05

19	12	δ Draco.	O = 613 + 2.41	+12	6.25
21	15	α Cygni	O = 639 + 1.88	+09	6.48
21	27	β Cephei	O = 637 + 2.75	+.14	6.51
22	06	ζ Cephei	O = 622 + 1.57	+08	6.30
			O = 6.35 + .26	+01	6.36
21	18	1 Draconis	O = 682 – 7.03	– .35	6.47

n = +.059

O = 613 + 14 | 6.27
6.39 + 11 | 6.50
6.37 + 16 | 6.53
6.22 + 09 | 6.31
6.35 + .02 | 6.37
6.82 – 41 | 6.41

O = +00 + 2.41 + 1
O = +23 + 1.88 + 1
+26 + 2.75 + 1
+05 + 1.57 + 1
+11 + 26 + 1
+22 – 7.03 + 1

O = 00 + 5.81 + 2.41
+44 + 3.53 + 1.88
+71 + 7.56 + 2.75
+08 + 2.46 + 1.57
+03 + 6 + 26
–1.55 + 46.42 – 7.03

19 49 λ Urs Min +2.15

O = –.29 + 68.84 + 1.84
O = +.87 + 1.84 + 6.00

O = –16 + 27.4 + 1.0
O = +15 + 0.3 + 1.00

O = –31 + 27.1
Δn = +.009

Oct. 5

$n = +.048$

1	18	59	ζ Aquilae	O=	+640	+.24	+01	6.41
2	19	12	ω Aquilae	O=	646	+.20	+01	6.47
4	19	19	δ Aquilae	O=	645	+.05	+00	6.45
5	19	26	β Cygni	O=	639	+.52	+03	6.42
	19	30	κ Aquilae	O=	647	−.13	−00	6.47
	19	44	α Aquilae	O=	648	+.15	+00	6.48
8	19	46	η Aquilae	O=	652	+.01	+00	6.52
9	20	41	ε Cygni	O=	641	+.66	+03	6.44
11	20	49	32 Vulpec.	O=	643	+.52	+02	6.45
12	20	52	ν_2 Cygni	O=	642	+.86	+04	6.46
13	21	01	61 Cygni	O=	641	+.78	+04	6.45
					6.44	+.35	+02	6.464

$n_0 = +.05$ .048

19	49	ε Draco.	O=	627	+ 2.74	+18 ✓	6.45	+ 03	6.40
21	18	1 Draconis	O=	677	− 7.03	−35	6.42	− 34	.43
			O=	6.44	+ .35	+02	6.46	+ 02	.46
20	43	ι Cephei	O=	631	+ 1.83	+09	6.40	+ 09	.40
21	15	α Cephei	O=	635	+ 1.88	+.09	6.44	+ 09	.44

−6.46

O = +05 +2.74 +1
2 −7.03 +1
6 + 35 +1
0 +1.83 +1
4 +1.88 +1

dT+m = −6.456
17

dT = −6.44

O = +14 + 7.51 +2.74
− 14 + 49.42 −7.03
+ 02 01 + 35
+ 00 3.35 +1.83
+ 08 3.53 +1.88

O = +.10 + 63.82 − 0.53
O = +.17 − .53 + 5.00

O = +.19 + 120.4 − 1.0
O = +.03 − .1 + 1.0

O = +.22 + 120.5
Δn = −.002

Oct. 8

W. A. R. Obs.

$n = +.065$

18	1	59	ζ Aquilae	O=	688 +	.24	+01	6.89	1	1
19	2	26	β Cygni	O=	684 +	.52	+04	88	0	0
19	3	40	γ Aquilae	O=	686 +	.18	+01	87	1	1
19		41	δ Sagittae	O=	688 +	.33	+02	90	2	4
19	4	46	η Sagittae	O=	688 +	.01	+00	88	0	0
20	5	05	θ Aquilae	O=	686 −	.02	+00	86	2	4
20	6	18	γ Cygni	O=	682 +	.83	+05	87	1	1
20	7	27	ε Delphini	O=	689 +	.19	+01	90	2	4
20	8	32	β Delphini	O=	687 +	.25	+01	88	0	0
20	9	33	α Delphini	O=	688 +	.28	+02	90	2	4
					6.87 +	28		6.88 ± .003		.00021

(±.010)

$n_0 = +.050$ +.065

19	12	δ Draco	O=	+6.75	+ 2.41	+12	6.87	+16	= 6.90
19	14	χ Cygni	O=	+6.80	+ 1.33	+07	6.87	+09	6.89
			O=	+6.87	+ .28	+01	6.88	+02	6.89
19	49	ε Draconis	O=	+6.76	+ 2.74	+14	6.90	+18	6.94
20	13	κ Cephei	O=	+6.59	+ 4.44	+22	6.81	+29	6.88
19	50	λ Urs. min	O=	+3.64	+ 53.38	+2.67	6.31	3.47	7.11

O = +.56 + 2.41 +1
+.56 + 1.33 +1
+.57 + .28 +1
+.59 +2.74 +1
+.50 +4.44 +1
+.00 +53.38 +1

dT+m = −6.883
+ 17
= −6.87

O = +1.33 + 5.8 +2.4
+ 85 + 1.8 + 1.3
+ 16 + .1 + .3
+ 1.60 + 7.6 + 2.7
+ 2.20 19.7 + 4.4
+ .000 2849.4 + 53.4

O = +6.14 2884.4 + 64.5
O = 2.78 + 64.5 + 6.0

O = +.09 + 44.8 + 1.0
O = +.56 + 12.9 + 1.0

O = −.47 + 31.9

Δn = +.015

Oct. 8 A. M. Obs.

n = +.065

21	1	01	61 Cygni	O=	694	+.78	+05	6.99	0
21	2	07	ζ Cygni	O=	691	+.50	+03	6.94	5
21	3	10	τ Cygni	O=	692	+.61	+04	6.96	3
21	4	38	ε Pegasi	O=	698	+.16	+01	6.99	0
21	5	47	16 Pegasi	O=	693	+.47	+03	6.96	3
21	6	59	α Aquarii	O=	704	+.02	−00	7.04	5
22	7	01	ι Pegasi	O=	700	+.46	+03	7.03	4
22	8	04	θ Pegasi	O=	701	+.10	+01	7.02	3
22	9	10	θ Aquarii	O=	705	−.15	−01	7.04	5
21	10	42	π_2 Cygni	O=	687	+1.14	+07	6.94	5
					6.96	+.40		6.991	

± 112b

−6.99 ±.008

dT+m = −6.991
+ 17
dT+m = −6.97

n = .065

X	21	15	α Cephei	O=	673	+ 1.88	+11	6.84
X	21	27	β Cephei	O=	680	+ 2.75	+18	6.98
X	21	41	11 Cephei	O=	661	+ 2.86	+19	6.80
X	22	6	ζ Cephei	O=	684	+ 1.57	+10	6.94
				O=	6.96	+ .40	+03	6.99
	21	18	1 Draconis	O=	723	− 7.03	−46	6.77
	21	23	24 Urs Maj	O=	713	+ 2.81	+ 18	6.95

Oct. 8. W. A. R. Obs.

n = +.065

22	1	15	γ Aquarii	O=	697	− .04	−00	6.97	5
22	2	18	3 Lacertae	O=	678	+ 1.26	+08	6.86	6
22	3	29	η Aquarii	O=	688	− .01	−00	6.88	4
22	4	35	ζ Pegasi	O=	689	+ .18	+01	6.90	2
22	5	37	η Pegasi	O=	685	+ .57	+04	6.89	3
22	6	38	13 Lacertae	O=	696	+ .87	+05	7.01	9
22	7	40	λ Pegasi	O=	692	+ .42	+03	6.95	3
22	8	44	μ Pegasi	O=	697	+ .44	+03	7.00	8
22		50	α Pisc. Aust.	O=	697	− .58	− 04	6.93	1
22	9	56	ο Androm	O=	683	+ .89	+06	6.89	3
22	10	58	α Pegasi	O=	684	+ .26	+02	6.86	6
					6.89	+ .39		6.92 ±.010	

±113b

dT+m = 6.922
+ 17
= − 6.91

~~22 45 ι Cephei O= + 2.20~~

X 22 23 9 Draco. O= 746 − 4.13 − 27 7.19

Oct. 9 W. A. R. Obs.

n=+.025

20	1	05	θ Aquarii	O=	679	− .02	−0	6.79	5	.0025
20	2	18	ζ Cygni	O=	685	+ .83	+02	87	3	9
20	3	27	ε Delphini	O=	686	+ .19	+00	86	2	4
20	4	32	β Delphini	O=	687	+ .25	+00	87	3	9
20	5	33	α Delphini	O=	685	+ .28	+01	86	2	4
20	6	37	α Cygni	O=	675	+ 1.00	+03	78	6	36
					6.83	+.42		6.84 ±.012		.0087 .00174

±.028

dT+m = −6.839
17
= −6.82

Oct. 9 A. M. Obs.

n=+.025

20	1	41	ε Cygni	O=	688	+ .66	+16	+02	6.90	4
20	3	49	32 Vulpec.	O=	693	+ .52	+13	+01	6.94	0
20	4	52	V_2 Cygni	O=	696	+ .86	+21	+02	6.98	4
21	5	01	61 Cygni	O=	694	+ .78	+19	+02	6.96	2
21	6	07	ξ Cygni	O=	693	+ .50	+13	+01	6.94	0
21	7	10	T Cygni	O=	691	+ .61	+15	+02	6.93	1
					693	+.65			6.94 ±.008	

(±.018)

n_0=+.02 n=+.025

20	X	42	η Cephei	O=+	678	+ 1.83	+05	6.82	+05	6.83
21	X	15	α Cephei	O=	687	+ 1.88	+05	6.92	+05	6.92
					6.93 +	65	+01	6.94	+02	6.95
21	X	18	1 Draco 28	O=	7.08	− 7.97	−.16	6.92	−20	6.88

O = +0 + 1.83 + 1.83 + 1
10 + 1.88 + 1.88 + 1
12 + 65 + 65 + 1
+10 − 7.97 − 7.9 + 1

O = 0 + 3.35 + 1.83
19 + 3.00 + 1.88
01 + .42 + 65
− 80 + 6.352 − 7.97

O = −60 + 7082 − 3.61
O = +32 − 3.61 + 4.00

O = −17 + 19.7 − 1.0
O = +08 − 9 + 1.0

O = −09 + 18.8

an = +.005

−6.942
17

dT+m = −6.93

Oct. 9 W. A. R. Obs.

n = +003

22 1 44 υ Pegasi 0= 695 +.44 +0 6.95 4
23 2 11 γ Piscium 0= 688 +.04 +0 88 3 ±.027
23 3 14 τ Pegasi 0= 687 +.42 +0 87 4
23 4 19 υ Pegasi 0= 694 +.42 +0 94 3
~~23 23~~ ~~λ Draco~~

6.91 + 33 6.91 ±.013

22 45 ι Cephei 0= 696 + 2.20 +05 6.99 (+.025)
0 = 6.91 + .33 +01 6.92
23 23 λ Draco 0= 694 − 2.77 −07 6.87

n = +003

0 = 6.96 +01 6.97
6.91 + 00 6.91
6.94 −01 6.93

0 = +12 + 2.20 +1
+05 + .33 +1
+00 − 2.77 +1

0 = +26 + 4.80 +2.20
+02 + .11 + .33
+00 + 7.67 − 2.77

0 = +28 + 12.58 − 0.24
0 = +17 − .24 + 3.00

0 = +1.17 + 5.24 − 1.0
0 = + 06 − .1 + 1.0

0 = +1.23 + 5.23

4n = −.023

dr + m = −6.910
+ 17
dr + m = −6.898

Oct. 9. A. M. Obs.

n = +.059

22 1 35 ξ Pegasi 0= 699 +.18 +01 7.00 0
22 2 37 η Pegasi 0= 698 +.57 +03 6.96 4
22 3 38 13 Lacertae 0= 695 +.87 +05 7.00 0 ±.019
22 4 40 λ Pegasi 0= 701 +.42 +02 7.03 3
22 5 43 μ Pegasi 0= 695 +.44 +03 6.98 2
~~22 45 ι Cephei 0 = 696 +2.20~~

7.00

6.97 +.50

7.00 ±.009

$n_0 = +.025$ n = +.059

22 24 9 Draco L.B. 0= 730 − 4.13 −10 7.20 −24 7.06
+ + 22 30 26 β Cephei 0= 683 + 3.88 +9 6.92 +23 7.06
22 45 ι Cephei 0 = 695 + 2.20 + 5 7.00 + 13 7.08
0 = 6.97 + .50 + 1 6.98 + 03 7.00

dr + m = −6.994
17
= −6.98

0 = +28 − 4.13 +1
+ 0 + 3.88 +1
+ 8 + 2.20 +1
+ 6 + .50 +1

0 = +1.16 + 17.06 + 4.13
+.00 + 15.05 + 3.88
+.18 + 4.84 + 2.20
+.03 + .25 + .50

0 = −.95 + 37.00 + 2.45
0 = +42 + 2.45 + 4.00

0 = −.39 + 15.7 + 1.0
0 = +.10 + .6 + 1.0

0 = −.49 + 14.5

4n = +.034

n = +.025
+.003
+.059
87

Mean = +.029

Oct. 16 W. A. R. Obs. with North Clock.

n = +079

19 1	14	K Cygni	0 = +8.10	+1.33	+10	8.21	1	
19 2	25	β Cygni	0 = 8.20	+ .52	+04	8.24	3	
19 3	40	γ Aquilae	0 = 8.23	+ .18	+01	8.24	2	±.02
19 4	42	δ Sagittae	0 = 8.18	+ .33	+02	8.20	2	
19 5	45	a Aquilae	0 = 8.17	+ .15	+01	8.18	4	

8.18 + .50 8.21 ±.010

n₀ = +.088 n = +.08

19	49	ε Draco.	0 = +8.18	+ 2.74	+.22 +8.40	+.23	8.21
			8.16	+ .60	+ .4 + 8.20	+.04	8.20
19	49	λ Urs. min	0 = +4.09	+ 53.38	+4.27 +8.36	+4.27	8.36

0 = 8.18 + .23 +8.41
8.16 + .04 8.20
4.09 + 4.22 8.31

0 = 20 + 2.74 + 1
0 + .50 + 1
.16 + 53.38 + 1

0 = + .55 + 7.5 + 2.7
+.00 + .2 + .5
+8.54 + 2849.4 + 53.4

0 = +9.09 + 2859.1 + 56.6
0 = + .36 + 56.6 + 3.0

0 = +.16 + 54.9 + 1.0
0 = + .12 + 18.9 + 1.0

0 = +.04 + 36.0

Δn = -.001

−8.22

dT+m = −8.214
17
−8.21

Oct. 16 A. M. Obs. ~~With~~ South Clock.

m = +.079

7.06	1 21	59	a Aquarii	0 = 7.82	−.02	−00	7.82	1	
7.06	3 22	01	ι Pegasi	0 = 7.81	+.46	+04	7.85	4	
7.08	4 22	03	θ Pegasi	0 = 7.76	+.10	+01	7.77	4	±.020
7.00	5 22	10	ϑ Aquarii	0 = 7.82	−.15	−01	7.81	0	
	6 22	15	γ Aquarii	0 = 7.79	−.04	−00	7.79	2	

7.80 +.07 7.81 ±.009

n = +.079

22	06	ζ Cephei	0 = +7.77	+1.57	+.12	7.89
22	26	α Lacertae	0 = 7.83	+1.18	+.9	7.92
			7.80	+ .07	+ .01	7.81
~~22~~	~~24~~	~~g Draco 3.86~~	~~0 =~~	~~−4.13~~		

dT+m = −7.808
+ 17
= 7.79

A. M.

n = +.079

23 18	14	τ Pegasi	0 = 7.83	+.42	+.03	7.86	0	
23 19	19	υ Pegasi	0 = 7.82	+.42	+.03	7.85	1	±.010
23 20	31	λ Androm	0 = 7.76	+1.01	+.08	7.84	2	
23 21	46	φ Pegasi	0 = 7.85	+.33	+.03	7.88	2	

7.81 +.57 7.86 ±.006

~~23~~	~~31~~	~~λ Androm~~	~~0 =~~	~~+1.01~~		
23	48	o Cass	0 = 7.81	+1.53	+.12	7.93
			7.81	+ .57	+.05	7.86
23	23	λ Draco 2.86	0 = +7.61	−2.77	?−.22	
23	34	γ Cephei	0 = 7.75	+4.30	+.34	8.09

dT+m = −7.858
+ 17
= 7.84

See preceding page

Oct. 16 W. A. R. Obs. with South. Clock.

n = +0.79

20	17	γ Cygni	O = +7.68	+.83	+.06	+7.74	1	
~~20~~	~~27~~	~~ε Delphini~~	~~O =~~	7.72	+.19			
~~20~~	~~33~~	~~α Delphini~~	~~O =~~	7.71	+.28	+.02	7.73	0
20	37	α Cygni	O =	7.66	+1.00	+.08	7.74	1 ±0.09
20	41	ε Cygni	O =	7.69	+.66	+.05	7.74	1
21	38	ε Pegasi	O =	7.67	+.16	+.01	7.68	5
21	42	π Cygni	O =	7.68	+1.14	+.09	7.77	4
21	47	16 Pegasi	O =	7.66	+.47	+.04	7.70	3

20 43 η Cephei O = +7.77 +1.83 +.14 +7.91

7.73 ±0.03

dT+m = -7.729
+ .017
= -7.71

Oct. 15 W. A. R. Obs.

n = +0.79

1	20	27	ε Delphini	O =	751	+.19	+01	7.52	2
2	20	32	β " "	O =	742	+.25	+02	7.44	8
3	20	34	α " "	O =	747	+.28	+02	7.49	1 ±1136
4	20	37	α Cygni	O =	746	+1.00	+08	7.54	4
								7.50 ±0.018	
5	22	19	3 Lacertae	O =	743	+1.26	+10	7.53	
6	22	56	α Pegasi	O =	751	+.26	+02	7.53	

-7.51 at 21h 15m

7.498
17
7.48

Oct. 21. W. A. R. Obs.

n = +183

20 1	31	β Delphini	0 = + 7.80	+.25	+.03	7.83	4
20 2	41	ε Cygni	0 = 7.65	+.66	+.09	7.74	5
20 3	49	32 Vulpec.	0 = 7.71	+.52	+.07	7.78	1
20 4	52	v_2 Cygni	0 = 7.70	+.86	+1[illegible]	7.81	2
21 5	01	61 " "	0 = 7.66	+.78	+.10	7.76	3
21	07	ζ " "	0 = 7.79	+.50	+.07	7.86	7
21 7	[illegible]	τ " "	0 = + 7.66	+.61	+.08	7.74	5

+.030

7.71 +.60   7.79 ±.011

7.79

0 = 14 +188 +1
0 + .60 +1
0 − 7.03 +1

0 = +.20 +3.53 +188
+.00 + .36 + .60
+.07 +49.42 −7.03

0 = +13 +5331 −4.55
0 = +.12 + 4.55 +3.00

0 = +.03 +11.7 −1.0
0 = +.04 −1.5 +1.0

0 = +.07 +10.2

Δn = −.007

dT + m = −7.789
+ .17
= −7.77

n_0 = +14   n = .133

21	16	α Cephei	0 = +7.64	+ 1.88	+.26	+7.90	+.25	7.89
			7.71	+.60	+.08	7.79	+.08	7.79
21	18	1 Draco 56.	0 = +8.78	−7.03	−.98	7.80	−.93	7.85

Oct. 22 W. A. R. Obs.

n = +.147

19 1	19	δ Aquilae	0 = 7.79	+.05	+.01	7.80	1
19 2	26	β Cygni	0 = 7.74	+.52	+.07	7.81	0
19 3	40	γ Aquilae	0 = 7.79	+.18	+.01	7.80	1
19 4	46	η "	0 = 7.77	+.01	+.00	7.77	4
20 5	17	γ Cygni	0 = 7.75	+.83	+.12	7.87	6

±.024

7.75 +.32   7.81 ±.010

0 = −.14 +2.74 +1
− 3 + .32 +1
− 0 +53.38 +1

0 = −.38 +7.5 +2.7
+.01 + .1 + .3
− .00 +2849.4 +53.4

0 = −.39 +2857.0 +56.4
0 = −.17 + 56.4 + 3.0

0 = −.01 + 56.9 + 1.0
0 = −.06 +18.8 +1.0

0 = −.07 +38.1

Δn = +.002

dT + m = −7.810
+ .17
= −7.79

n_0 = 145

19	49	ε Draco.	0 = 7.28	+ 2.84	+.40	+7.68
			7.75	+.32	+.04	+7.79
19	49	λ Urs. min.	0 = +0.05	+53.38	+7.74	+7.82

Oct. 22 A. M. Obs.

n=+1.14

20	1	27	ε Delphini	O=	+7.81	+.19	+02	7.83	0
20	2	32	β '' ''	O=	7.80	+.25	+03	83	0
20	3	33	α '' ''	O=	7.78	+.28	+03	81	2
20	4	49	32 Vulpec.	O=	7.73	+.52	+06	79	4
20	5	52	ν Cygni	O=	7.71	+.86	+09	80	3
21	6	07	ξ '' ''	O=	7.76	+.50	+07	83	0
21	7	38	ε Pegasi	O=	7.80	+.16	+02	82	1
21	8	42	π_2 Cygni	O=	7.65	+1.14	+13	78	5
21	9	59	α Aquarii	O=	7.87	−.02	−00	87	4 +029
22	10	01	ι Pegasi	O=	7.81	+.46	+05	86	3
22	11	03	θ Pegasi	O=	7.84	+.10	+01	85	2
22	12	10	θ Aquarii	O=	7.81	−.15	−01	80	3
22	13	37	η Pegasi	O=	7.81	+.57	+06	87	4
22	14	38	13 Lacertae	O=	7.71	+.87	+09	80	0
22	15	40	λ Pegasi	O=	7.91	+.42	+05	96	13
22	16	44	μ '' ''	O=	7.80	+.44	+05	85	2

7.79 +.40 7.83 ±.007

n₀=+.11 n=.114

21	16	α Cephei	O=	757	+1.88	+20	+7.77	+.21	7.78
22	45	ι Cephei	O=	756	+2.20	+24	7.80	+.25	7.81
				7.79	+.40	+04	7.83	+04	7.83
21	18	1 Draco.	O=	860	−7.03	−77	7.83	−80	7.80
21	27	β Cephei	O=	749	+2.75	+30	7.79	+31	7.80

O=+0 +1.88 +1
3+2.20 +1
6+ .40 +1
6−7.03 +1
.2+2.75 +1

dT+m = −7.830
+ 77
= −7.81

o=+0 +3.53 +188
+7+ 4.84 +2.20
+2++.16 +.40
−42+49.42 −7.03
+ 5+ 7.56 +2.75

O=−30+ 65.51 + 0.20
O=+17 + .20 + 5.00
O=−15.0+ 132.75+ 1.0
O=+ .03+ 0 + 1.0
Δn=+.004

Oct. 23

n=+.100

19	1	14	~~χ~~ Cygni	O=		+ ~~1.33~~		
19	2	19	δ Aquilae	O=	+7.92	+.05	.00	7.92
19	3	41	δ Sagittae	O=	+7.87	+.33	+03	90
19	4	45	α Aquilae	O=	7.93	+.15	+01	94
19	5	46	η '' ''	O=	7.96	+.01	+00	96
19	6	49	β '' ''	O=	7.94	+.11	+01	95
20	7	05	θ '' ''	O=	7.99	−.02	−00	99
20	~~7~~	11	α Capricorni	O=	7.77	−.23	−02	
20	8	17	γ Cygni	O=	7.89	+.83	+08	97
20	9	27	ε Delphini	O=	7.94	+.19	+02	96
20	10	32	β '' ''	O=	7.91	+.25	+02	93
20	11	33	α '' ''	O=	7.90	+.28	+03	93
20	12	37	α Cygni	O=	7.89	+1.00	+10	99
20	13	49	32 Vulpec.	O=	7.90	+.52	+05	95
20	14	52	ν Cygni	O=	7.93	+.86	+09	102
21	15	07	ξ Cygni	O=	7.96	+.50	+05	101
21	16	16	π '' ''	O=	7.87	+.61	+06	93
21	17	25	β Aquarii	O=	7.90	−.11	−01	89
21	18	47	16 Pegasi	O=	7.93	+.47	+05	98
22	19	15	3 Lacertae	O=	+7.89	+1.26	+13	102

7.92 +.39 7.96

n₀=+.10

20	43	η Cephei	O=	786	+1.83	+18	8.04
21	16	α Cephei	O=	792	+1.88	+19	8.11
				7.92	+.39	+04	7.96
21	18	1 Draco	O=	+8.48	−7.03	−70	7.78
19	49	λ Ursae Min.	O=	+2.58	+53.38	+5.34	7.92

O= .26 +1.83 +1
.33 +1.88 +1
.18 + .39 +1
.0 −7.03 +1
.14 +53.38 +1

O= +47 +3.3 +18
+63 +3.5 +19
+07 + .2 + 4
+ 00 +49.4 −40
+7.47 +2.849 +453.4

O= +8.64 +29.008 + 5.00
O= + .91 + 50.5 + 5.0

O= +17+ 57.8 +1.0
O= +18 + 10.1 +1.0

O= −.01 +47.7

Δn= .000

O= +.12 +1.83 +1
+ 9 +1.88 +1
+ 4 + .39 +1
−14 −7.03 +1
+ 0 +53.38 +1

−7.960
17

dT+m = −7.94

Oct. 29 A. M. Obs.

n=+119

19	1	45	a Aquilae	0=	936	+.15	+02	9:38	4
20		19	π Capricorn	0=		~~-.34~~			
20	2	27	ε Delphini	0=	941	+.19	+02	43	1
20	3	32	β " "	0=	941	+.25	+03	44	2
20	4	33	a " "	0=	945	+28	+03	48	6
20	5	37	a Cygni	0=	926	+1.00	+12	38	4
20	6	41	ε " "	0=	933	+.66	+07	40	2
20	7	49	32 Vulpec	0=	937	+.52	+06	43	1
20	8	52	ν Cygni	0=	929	+.86	+10	39	3
21	9	01	61 " "	0=	934	+.78	+09	43	1
21	10	07	ζ " "	0=	932	+.50	+06	38	4
21	11	10	τ Cygni	0=	931	+.61	+07	38	4
21	12	59	a Aquarii	0=	943	-.02	-00	43	1
22	13	01	ι Pegasi	0=	944	+.46	+05	49	7
22	14	04	θ Pegasi	0=	943	+.10	+01	44	2
22	15	10	θ Aquarii	0=	938	-.15	-02	36	6
22	16	28	η " "	0=	938	-.01	-00	38	4
22	17	37	η Pegasi	0=	935	+.57	+07	42	0
22	18	40	λ Pegasi	0=	937	+.42	+05	42	0
22	19	44	μ " "	0=	942	+.44	+05	47	5
22	20	56	ο Androm	0=	926	+.89	+11	37	5
22	21	58	a Pegasi	0=	937	+.26	+03	40	2
23	22	10	γ Piscium	0=	946	+.04	+00	46	4
23	23	19	ψ Pegasi	0=	938	+.42	+05	43	1
23	24	31	λ Androm	0=	932	+1.01	+12	.44	2

±0.25

9.38 +.42

9.42 ±.005

9.42

21 16 a Cephei 0= 918 + 1.88

n=12 n=+119

			0=	9.18	+ 188	+22	940	+22	9.40
				9.38	+ .42	+05	43	+05	43
19	49	ε Draco.	0=	9.20	+ 2.74	+33	53	+33	53
22	06	ζ Cephei	0=	9.26	+ 1.57	+19	45	+19	45
23	23	λ Draco.	0=	9.61	- 2.77	- 33	28	- 33	28
23	34	γ Cephei	0=	876	+ 430	+52	28	+51	27

0 = +12 +188 +1 + 3.53
15 +.42 +1 + .17
25 +2.74 +1 + 7.51
17 +1.57 +1 +2.46
0 - 2.77 +1 +7.67
0 + 4.30 +1 +18.49

0 = +23 +30.3 +1.88
+ 07 + .17 + 42
+.68 +7.51 +2.74
+.27 +2.46 +1.57
+00 +7.67 -2.77
+00 +18.49 +4.30

0 = 1.25 + 39.83 + 8.14
0 = 69 + 8.14 + 6.0

0 = +.15 + 4.91 + 1.0
0 = +11 + 1.3

0 = +.04 + ~~4~~3.6
Δn = -.001

Δt+m = -9.420
17
= -9.40

Oct. 30 W. A. R. Obs.

n=+200

19	1	49	β Aquarii	0=	934	+.11	+02	9.36
20	2	05	θ Aquilae	0=	932	-.02	-00	9.32
20		11	a Capricorn	0=	9.36	-~~.23~~	-04	9.32
20	3	17	γ Cygni	0=	922	+.83	+10	9.38
~~20~~		~~19~~	~~π Capricorn~~	0=		-.34		
20	4	32	β Delphini	0	923	+.25	+05	9.28 ±0.32
20	5	33	a Delphini	0=	919	+.28	+05	9:24
20	6	37	a Cygni	0=	910	+1.00	+20	9.30
20	7	41	ε Cygni	0=	921	+.66	+13	9.35
20	8	49	32 Vulpec	0=	915	+.52	+.10	9.25

9.22 + 45 9.31 ±.011

-9.31
17
Δt+m = -9.29

20 42 η Cephei ~~0=~~8.89 +183

n=+20

			0=	8.89	+ 1.83	+36	9.25
			0=	9.22	+ .45	+09	9.31
20	13	κ Cephei	0=	861	+ 4.44	+.89	9.50
19	49	λ Ursæ Min.	0=	-1.33	+53.38	+1.067	9.34
		~~κ Cephei~~	0=		~~+ 4.44~~		

0 = -09 +1.83 +1
-03 + .45 +1
+16 +4.44 +1
+00 +53.38 +1

0 = -16 + 3.3 +1.8
-01 + .2 + .4
+20 + 19.7 + 4.4
+00 +2849.4 + 53.4

0 = +.13 + 2867.6 + 60.0
0 = +.04 + 60.0 + 4.0

0 = +.23 + 47.8 + 1.0
0 = 01 + 15.0 + 1.0
Δn = 0

Oct. 31. W.A.R. Obs.

n = +180

21	1	42	π_2 Cygni	0 = +908 + 1.14 + 21	9.29	6
21	2	47	16 Pegasi	0 = 916 + .47 + 09	25	2
21	3	59	a Aquarii	0 = 924 − .02 − 00	24	1
22	4	01	ι Pegasi	0 = 914 + .46 + 08	22	1
22	5	04	θ Pegasi	0 = 921 + .10 + 02	23	0
22	6	10	θ Aquarii	0 = 925 − .15 − 02	23	0
22	7	15	γ Aquarii	0 = 922 − .04 − 01	21	2
22	8	18	3 Lacertae	0 = 899 + 1.26 + 22	21	2
22	9	35	ζ Pegasi	0 = 922 + .18 + 03	25	2
22	10	37	η Pegasi	0 = 9.12 + .57 + .10	22	1

+.01

9.16 + .40

9.23 ± 005

−9.23

$n_0 = 18$

	21	27	β Cephei	0 = 877 + 2.75 + 49	9.26
	21	40	" "	0 = 869 + 2.86 + 53	9.22
**	22	30	226 B Cephei	0 = 8.59 + 3.88 + 69	9.28
	22	06	ζ Cephei	0 = 9.00 + 1.57 + 28	9.26
				0 = 9.16 + .40 + 07	9.23

0 = +4 + 2.75 + 1
0 + 2.86 + 1
6 + 3.88 + 1
4 + 1.57 + 1
1 + 0.40 + 1

dt + m = −9.235
17

dt = −9.21

0 = +11 + 76 + 27
+00 + 82 + 29
+23 + 151 + 16
06 + 25 + 39
+00 + .2 + .4

0 = +40 + 33.6 + 11.5
0 = +15 + 11.5 + 5.0

0 = +03 + 2.9 + 1.0
0 = +03 + 2.3 + 1.0

0 = +.01 + .06
4_n = .007

Nov. 2 W.A.R. Obs.

n = .192

19	19	δ Aquilae	0 = +9.49 + .05 + 01	9.50	3
19	26	B Cygni	0 = 9.44 + .52 + 10	54	1
19	42	δ Sagittae	0 = 946 + .33 + 07	53	0
19	45	a Aquilae	0 = 9.54 + .15 + 03	57	4
19	46	η Aquilae	0 = 9.53 + .01 + 00	53	0
20	05	θ Aquilae	0 = 952 − .02 − 00	52	1
20	27	ε Delphini	0 = 947 + .19 + 04	51	2
20	32	B " "	0 = 952 + .25 + 05	57	4
20	33	a " "	0 = 944 + .28 + 06	48	4
20	37	a Cygni	0 = 941 + 1.00 + 19	60	7
20	41	ε " "	0 = 943 + .66 + 12	55	2
20	49	32 Vulpec.	0 = 946 + .52 + 10	56	3
20	52	V_2 Cygni	0 = 933 + .86 + 16	49	4
21	01	61 Cygni	0 = 937 + .78 + 15	52	1
21	10	τ Cygni	0 = 937 + .61 + 12	49	4

+.121

9.45 + .41

9.53 ± .005

−9.53

0 = +12 + 2.41 + 2.41
23 + 1.83 + 1.83
7 + 1.88 + 1.88
0 + .41
16 + 53.38
27 +

n_0 = +19

19	13	δ Draco.	0 = 915 + 2.41 + .46	9.61
~~19~~	~~14~~	~~κ Cygni~~	0 = ~~+1.33~~	
20	43	η Cephei	0 = 922 + 1.83 + 34	9.56
21	16	a Cephei	0 = 932 + 1.88 + 35	9.67
			0 = 9.45 + 41 + 08	9.53
19	53	λ Urs. Min.	0 = −070 + 53.38 + 10.14	9.44
21	19	1 Draco. 2B	0 = 10.39 − 7.03 − 1.33	9.60
21	27	β Cephei	0 = 9.19 + 2.75 + .52	9.71

0 = .17 + 2.41 + 1
12 + 1.83 + 1
23 + 1.88 + 1
9 + .41 + 1
0 + 53.38 + 1
16 − 7.03 + 1
27 + 2.75 + 1

0 = +.02 + 71.9 + 1.0
0 = +1.5 + 5.8 + 1.0
0 = −.13 + 66.1
4_n = +.002

0 = +75 + 2916.9 + 40.7
0 = +1.04 + 40.7 + 7.0

W.A.R. Obs.

n = +14

0	23	12 Ceti.	0 = +9.64 − .08 − .01	+9.63	+ 9.64 + .02	9.62
0	41	ξ_3 Androm.	0 = 9.57 + .44 + .07	9.64	9.59 + 07	68

n = .200

9.63 + 9.62 + 18 9.65

				n		n
0	33	a Cass.	0 = +9.39 + 1.47	= +16	9.39 + 1.47	= +18
			0 = 9.60 + .16			
0	26	χ Cass.	0 = +9.66 + 1.90	= +154	9.19 + 1.90	
12 0	28	κ Draco.	0 = +9.66 − 2.83	= (+020)	9.67 − 2.83	
0	41	η Cass.	0 = + 1.55		9.41 + 1.55	

0 = 9.60 + 41
0 =

A. M. Obs.

n = +16

n = .200

0	02	a Androm.	0 = +9.56 + .54 + .09	9.65	+ 9.55 + .11	9.66
0	22	" "	0 = +9.56 + 1.01 + .16	71	9.54 + .20	74
0	7	γ Pegasi	0 = +9.62 + .26 + 04	66	9.58 + 5	63
0	13	ι Ceti.	0 = +9.67 − .17 − 02	63	9.67 − 3	64
				9.66	+ 9.59 + .06	

9.669
17
9.65

Nov. 5 W. A. R.

				n = +25		n = 200	
~~20~~	~~10~~	~~α Capricorni O=~~	~~9.69 −.23~~				
20	17	γ Cygni O=	945 +.83	+21	9.66	+17	9.62
20	27	ε Delphini O=	952 +.19	+04	9.56	04	56
20	32	β " " O=	9.57 +.25	+05	9.62	05	62
20	52	ν_2 Cygni O=	941 +.86	+21	9.62	17	58
21	37	ε Pegasi O=	957 +.16	+04	9.61	03	60 +.038
21	42	π_2 Cygni O=	949 +1.14	+28	9.77	23	71
21	59	α^2 Aquarii O=	954 −.02	−00	9.54	0	54
22	01	ι Pegasi O=	950 +.46	+11	9.61	9	59
22	04	θ Pegasi O=	9.56 +.10	+02	9.58	+2	58
22	10	θ Aquarii O=	9.65 −.15	−04	9.61	−3	61
			9.53 +.38				9.60 ±.012

~~20~~ 06 ζ Cephei O= 9.36 +1.57

n_0 = +07

O = 9.36 + 1.57 +11 9.47

O = +9.53 + .38 + 2 9.55

19 53 λ Ursae min. O = −5.78 + 53.38 + 8.74 9.52

20 13 κ Cephei O = 8.80 + 4.44 + 31 9.11

21 27 β Cephei O = 9.11 + 2.75 + 19 9.30

~~22 06 ζ Cephei O= +1.57~~

~~Polaris O= +41.41~~

O = +8 + 1.57 + 1
0 + .38 + 1
12 + 4.44 + 1
08 + 2.75 + 1

O = +.12 + 2.46 + 1.57
+.00 + .15 + .38
+53 + 19.71 + 4.44
+22 + 7.56 + 2.75

O = +.87 + 29.88 + 9.14
O = +28 + 9.14 + 4.00

O = +10 + 3.3 + 1.0
O = 7 + 2.3 + 1.0

O = +03 + 1.0
An = .010

−9.60 ~~+~~
17

Δt + m = −9.58

	n = +25		n = 21	
O = +9.36 + 1.57 −	+39	9.75	+33	9.69
O = 9.53 + .38	+ 9	9.62	+.08	9.61
O = −5.78 + 53.38	+13.35	7.57 +		
O = 8.80 + 4.44	+1.11	9.91	+ 93	9.73
O = 9.11 + 2.75	+.69	9.80	+58	9.69

n = 20

9.36	+31	9.67
9.53	+ 7	9.60
8.80	+89	9.69
9.11	+55	9.66

Nov. 6 W. A. R. Obs. (Zone. Obs.?)

22	4	π_1 Pegasi O=	+.64
22	4	π_2 Pegasi O=	+.64
22	14	γ Aquarii O=	−.04
22	18	31 Pegasi O=	+1.26
23	27	72 " " O=	+.59
23	31	λ Androm O=	+1.07
23	34	χ Androm O=	+.95
0	56	ε Piscium O=	+.13
1	02	β Androm O=	+.70

22	6	ζ Cephei O=	+1.57
22	24	δ Cephei O=	+1.58
1	13	Polaris O=	+41.41

A. M. Obs.

23	45	~~θ~~ φ Pegasi O=	+.33
23	52	ω Piscium O=	+.11
24	06	γ Pegasi O=	+.26

23	41	41 H ~~Cass~~ Cephei? O=	+2.37
23	48	ρ Cass O=	+1.513

Nov. 7 W. A. R. Obs.

n=+240

20	31	β Delphini O=	8.97 + .25	+06	9.03	6	
20	33	α " " O=	8.92 + .28	+07	8.99	2	
20	37	α Cygni O=	8.73 + 1.00	+24	8.97	0	
20	41	ε " " O=	8.86 + .66	+17	9.07	0	
20	49	32 Vulpec O=	+ ~~.52~~		8		
21	01	61 Cygni O=	8.78 + .78	+20	8.98	1	
21	07	ζ Cygni O=	8.84 + .50	+12	8.96	1	
21	10	τ " " O=	8.73 + .61	+15	8.88	9	
21	25	β Aquarii O=	8.99 − .11	−03	8.96	1	
21	38	ε Pegasi O=	8.90 + .16	+04	8.94	3	±0.24
21	42	π Cygni O=	8.73 + 1.14	+27	9.00	8	
21	47	1ε Pegasi O=	8.85 + .47	+12	8.97	0	
21	59	α Aquarii O=	8.96 − .02	− 00	8.96	1	
22	01	ι Pegasi O=	8.83 + .46	+11	8.94	3	
22	03	θ Pegasi O=	8.98 + .10	+02	9.00	3	
22	15	γ Aquarii O=	8.94 − .04	−01	8.93	4	
23	46	φ Pegasi O=	8.84 + .33	+08	8.92	5	
23	52	ω Piscium O=	8.92 + .11	+03	8.95	2	
			8.87 + .40		8.97		

8.97 ±0.06

8.95

20	43	η Cephei O=	8.62 + 1.83			
~~21~~	~~16~~	~~α Cephei O=~~	~~+1.58~~			
22	06	ζ Cephei O=	8.61 + 1.57			
23	48	ρ Cass. O=	8.55 + 1.53			
			~~8.82 + .40~~			
				n₀=.25		
21	18	1 Draconis O=	10.63 − 7.03	−1.76	9.22	8.87
21	27	β Cephei O=	8.36 + 2.75	+.69	8.91	9.05
21	41	11 Cephei O=	8.59 + 2.86	+.71	9.11	9.30
19	49	λ Urs Min. O=	+9.61 + 53.38	+13.35		
		O=	+8.87 + .40	+.10	8.90	8.97
		Polaris O=	−1.00 + 41.43	+10.11		9.11
		O=	+8.63 + 1.64	+.41		9.04

n=.24

O=+10.63 − 1.69	8.94
+8.36 + .66	9.02
+8.59 + .69	9.28
+8.87 + .10	8.97
−1.00 + 9.94	8.94
+8.63 − .39	9.02

Nov. 7 A. M. Obs.

0	2	α Androm. O=	+.54
0	4	22 " " O=	+1.01
0	6	γ Pegasi O=	+.26
0	56	ε Piscium O=	+.13
1	2	β Androm. O=	+.70
1	24	η Piscium O=	+.26
1	29	20? ~~γ~~ Persei O=	+1.11

1	17	δ Cass. O=	+1.70
0	8	Gr. 29? ~~82~~ O=	+4.08 ?
1	13	Polaris O=	+41.41

Nov. 9 N.A.R. Obs

						n=213			
20	32	β Delphini	0=	850	+.25	+.05	8.55	7	
20	33	α " "	0=	853	+28	+06	59	3	
20	37	α Cygni	0=	838	+1.00	+21	59	3	
21	01	61 " "	0=	846	+.78	+16	62	0	
21	24	β Aquarii	0=	873	−.11	−02	71	9	2
21	42	π_2 Cygni	0=	831	+1.14	+24	55	7	
21	59	α^2 Aquarii	0=	871	−.02	−00	71	9	
22	01	ε Pegasi	0=	848	+.46	+10	58	4	±.03
22	04	θ Pegasi	0=	860	+.10	+02	62	0	
22	10	θ Aquarii	0=	863	−.15	−03	60	0	
22	18	3 Lacertae	0=	836	+1.26	+26	62	0	
23	31	λ Androm	0=	843	+1.01	+21	64	2	
23	46	φ Pegasi	0=	858	+.33	+07	65	3	
23	53	ω Piscium	0=	868	+.11	+02	70	8	
				8.53	+46		8.624±010		

dT+m=8.61

						n	n= 213	
20	42	η Cephei	0=	823	+1.83			
22	06	ζ Cephei	0=	828	+1.57			
23	48	ρ Cass	0=	833	+1.53			
21	27	β Cephei	0=	+8.04	+2.75	.21	+59	8.63
22	24	9 Draconis	0=	9.71	−4.13	.25	+88	8.59
			0=	8.28	+1.64		+85	8.63
1	13	Polaris	0=	8.53	+0.46	.18	+10	8.63
				+0.96	+41.41		8.82	9.78
		" "	S.P.	~~+20.29~~	~~41.41~~			

Nov. 9. A.M. Obs.

0	2	α Androm	0=	+8.58	+.51
0	3	22 " "	0=	8.83	+1.01
0	6	γ Pegasi	0=		+.26
0	56	ε Piscium	0=		+.13
1	2	β Androm	0=		+.70
1	24	ζ Piscium	0=		+.26
1	29	δ Persei	0=		+.90
1	35	φ " "	0=		+1.19
1	38	0? ν Piscium	0=		+.08

1	32	43 Cass	0=		+2.40
0?	8	Gr. 29	0=		+4.08?
1	13	Polaris	0=	8.96	+41.41

Nov 12 A. M. Obs.

n=+220

22	1	ι Pegasi	0=	795+.46	+10	8.05
22	29	η Aquarii	0=	799−.01	+00	7.99
? 22	38	13 Lacertae	0=	7.75+.87	+19	7.94
22	40	λ Pegasi	0=	792+.42	+09	8.01
22	43	ω Aquarii	0=	795+.44	+10	8.06
22 x	51	α Pisc. Aust.	0=	815−.58	−13	8.02
22	58	α Pegasi	0=	798+.26	+06	8.04

8.02

−~~802~~

−8.016

17

dT+m=−8.00

22 06 ζ Cephei 0= 7.64 +1.57 +31=7.99

Nov 13. W. A. R

n=+220

21	01	61 Cygni	0=	722+.78	+17	7.39	2
21	07	3 Cephei	0=	729+.50 R	+11	.40	1
21	24	β Aquarii	0=	752−.11	−02	50	9
22	19	3 Lacertae	0=	706+1.26	+28	34	7
22	29	η Aquarii	0=	737−.01	−00	27	4
22	35	ζ Pegasi	0=	740+.18	+04	44	3
22	37	μ " "	0=	729+.57	+13	42	1 ±.037
22	40	λ " "	0=	731+.42	+09	40	1
22	56	ο Androm.	0=	711+.89	+20	31	10
22	58	α Pegasi	0=	736+.26	+06	38	3
23	10	γ Piscium	0=	750+.04	+01	51 ✓	10
23	14	π Pegasi	0=	733+.42	+09	42	1
23	19	υ " "	0=	732+.42	+09	41	0

7.31+.43 7.41 ±.010

dT+m=−7.407

1

−7.39

n n=220

21	27	β Cephei	0=	+6.88+2.75	+.19	+60	7.48
23	23	λ Draco.	0=	+8.06−2.77	+.23	+61	7.45
			0=	7.31+.43		+10	7.40

Nov: 19 W.A.R.

n = +.350

21 25 β Aquarii 0 = 5.51 −.11 −.04 5.47
21 47 16 Pegasi 0 = 5.31 +.47 +17 48
21 59 α Aquarii 0 = 5.57 −.02 −.01 56
22 01 ι Pegasi 0 = 5.39 +.46 +16 56
22 04 ~~θ Aquarii~~ 0 = 5.43 +.10 +.03 46 +.034
22 10 θ Aquarii 0 = 5.52 −.15 −.05 47
22 15 γ " " 0 = 5.55 −.04 −.01 54
22 38 13 Lacertae 0 = 5.28 +.87 +30 58
0 2 α Androm 0 = +.54
0 4 7? γ Pegasi 0 = 26
~~0 33 α Cass 0 =~~ 44
0 41 β Androm 0 = 44
~~0 41 δ Cass~~
0 4 22 Androm 0 = 1.01

5.51 5

−5.51 ±.012

22 06 ζ Cephei 0 = +5.10 +1.57
0 33 α Cass 0 = 1.47
0 41 δ Cass 0 = 1.55

n = n = 350

22 24 9 Draco 26 0 = +6.94 −4.13 .35 −1.44 +6.50
22 30 226 B Cephei 0 = +4.17 +3.88 .35 +1.36 5.53
0 = +5.44 + .90 +07 5.51
0 = 5.10 +1.57 +55 5.65
1 13 Polaris 0 19.81 −41.48 .345 −14.50 5.31

dT+m = −5.65
17
−5.50

n = +.340
0 1 α Andr 0 = +5.36 +54 +18 5.64
0 4 22 " 5.30 +1.01 +.35 .65
0 7 γ Peg. 5.45 +.26 +.09 54
0 33 α Cass 5.02 +1.47 +.50 58
0 30 β Andr. 5.37 +.44 +.15 52
0 41 δ Cass 5.17 +1.55 +.53 (70)

0 21 5.28 +.58 5.556

0 37 21 Cass 0 = +4.49 +3.55 = n +.24
Polaris 0 = +19.81 −41.82 .35
0 = +5.28 + .58 = n .24 +.34
0 =

dT+m = +5.556 at 0h 21m
17
5.56

Nov. 22. W.A.R.

n = +.253

22 10 θ Aquarii 0 = +4.71 −.15 −.04 4.66
22 15 γ Aquarii 0 = +4.70 −.04 −.01 69
22 19 3 Lacertae 0 = +4.31 +1.26 +.28 59
22 29 η Aquarii 0 = +4.65 −.01 −.00 65
22 35 ζ Pegasi 0 = +4.64 +.18 +.05 69 ±.108
22 37 η Pegasi 0 = +4.50 +.57 +.14 64
22 38 13 Lacertae 0 = +4.38 +.87 +.22 60
22 40 λ Pegasi 0 = +4.53 +.42 +.11 64
0 1 α Androm 0 = +4.68 +.54 +.14 .72
0 3 22 Androm 0 = +4.43 +1.01 +.25 68

n = +.253
+4.59 +.17 +4.73
4.43 +.25 68

22 4 4.53 + .46 4.66

−4.66 ±.009

4.656
17

dT+m = −4.64

n = .258

22 06 ζ Cephei 0 = +4.27 +1.57 n +40 4.68
0 = 4.53 + .46 +12 4.65

22 23 9 Draco 0 = +5.62 −4.13 +.24 −1.04 4.58
22 30 226 B Cephei 0 = +3.53 +3.88 +.29 +0.98 4.51
0 6 4 Draco 0 = +5.77 −4.84 .25 +1.22 4.55
18
.253

0 6 4 Draco 0 = +5.69 −4.13
0 = 4.51 + .97
0 = +1.18 −4.90 = n +.241

Nov. 23 W.A.R

					n=+.180	
22	15	γ Aquarii	O=+	4.35 −.04	−.01	4.34 (Doors open Sej.)
22	29	η Aquarii	O=	4.50 −.01	−.00	50
22	35	ζ Pegasi	O=	4.47 +.18	+.03	50
22	37	η " "	O=	4.38 +.57	+.10	48
22	40	λ " "	O=	4.43 +.42	+.07	50
22 ‡	51	α Piscis	O=	4.62 −.58	−.10	52
22	56	o Androm	O=	4.28 +.89	+.16	44 ±.027
22	58	α Pegasi	O=	4.47 +.26	+.05	52
23	11	γ Piscium	O=	4.43 +.04	+.01	49
23	14	τ Pegasi	O=	4.50 +.42	+.07	57
23	19	υ " "	O=	4.39 +.42	+.07	46
23	31	λ Androm	O=	4.32 +1.01	+.18	50

4.43 +.30

4.49 4/7

−4.49 ±.009

					n=18	
22	24	9. Draco.	O=	+ 5.45 − 4.13	.22 −.94	+4.71
22	30	226 B Cephei	O=	+ 3.69 + 3.88	.21 +.90	4.39
23	23	λ Draco.	O=	+ 4.87 − 2.77	.14 −.50	4.35
		Polaris	O=	− 3.33 + 41.41	.19 + 7.45	4.12
			O=	+ 4.43 + .30	.19 +.05	4.49
22	45	ι Cephei.	O=	4.17 + 2.20	.13 +.40	4.57
					.90	
					.18	

±.029

dT+m = −4.48

Nov. 25 W.A.R.

					n=+.214	
22	26	α Lacertae	O=+	3.49 +1.18	+.26	3.75
22	29	η Aquarii	O=	3.71 −.01	−.00	71
22	35	ζ Pegasi	O=	3.63 +.18	+.04	67
22	37	η " "	O=	3.59 +.57	+.11	70
22	40	λ " "	O=	3.59 +.42	+.09	68
22	51	α Piscis	O=	3.94 −.58	−.11	83 ±.064
22 ?	56	o Androm	O=	3.47 +.89	+.19	66
22	58	α Pegasi	O=	3.66 +.26	+.06	72
23	11	γ Piscium	O=	3.76 +.04	+.01	77
23	14	π Pegasi	O=	3.57 +.42	+.09	66
23	19	υ " "	O=	3.57 +.42	+.09	66
23	31	λ Androm	O=	3.50 +1.01	+.22	72
1	24	η Piscium	O=	+.26		
1	30	ν Persei	O=	+1.11		−3.711
1	35	φ " "	O=	+1.19		+17
1	38	o Piscium	O=	+.08		

3.62 +.40 − 3.71 ±.010

dT+m = 3.69

					n	n=.214
22	45	ι Cephei.	O=	+3.24 + 2.20	+.21 +.47	3.71
1	32	43 Cass	O=	+ 2.39		
			O=	3.62 + 0.40	~~+.25~~ +.08	3.70
22	30	β Cephei.	O=	+ 2.76 + 3.88	+.25 +.83	3.59
23	23	λ Draco.	O=	+ 4.20 − 2.77	+.19 −.59	3.61
23	34	γ Cephei	O=	+ 2.89 + 4.30	+.19 +.92	3.81
1	13	Polaris	O=	− 5.96 + 41.41	+.23 +8.86	2.90
					107	
					.214	

Nov. 28 W.A.R.

				n=+200		n=280 corrd:	
22	15	γ Aquarii O=	2.73 -.04	-01	+2.72	-01	2.72
22	19	3 Lacertae O=	2.35 +1.26	+25	2.60	+35	70
22	26	α Lacertae O=	2.36 1.18	+23	2.59	+.33	69
22	28	η Aquarii O=	2.75 -.01	-00	2.75	-00	75
22	35	ζ Pegasi O=	2.67 +.18	+04	2.71	+05	72
22	38	13 Lacertae O=	2.44 +.87	+07	2.61	+24	68
22	44	μ Pegasi O=	2.56 +.44	+09	2.65	+12	68 ±0.27
22	45	λ Aquarii O=	2.82 -.15	-03	2.79	-04	78
22	51	α Pisc. Aust O=	2.94 -.58	-12	2.84	-16	78
22	56	ο Androm O=	2.41 +.89	+18	2.59	+25	67
22	59	α Pegasi O=	2.61 +.26	+05	2.66	+06	67
23	31	λ Androm O=	2.43 +1.01	+20	2.63	+.28	71

2.59 +.36

– 2.71 ±.008

-2.713
17

dt+m = -2.70

				n=200		n=280
23	48	ρ Cass.	O= +2.30 + 1.53	+31	+2.61 +.42	2.72
			O= +2.59 +.36	+07	2.66 +18	2.72
23	34	γ Cephei	O= +1.80? +4.30? + .86		2.66 + 1.18	2.98

Nov. 29 A.M.

				n=+274	n=290		
0	2	α Androm O=	+2.01 +.54 +.15	+2.16	+2.00 +.16	2.16	0
0	33	α Cass O=	1.75 +1.47 +.40	.15	+1.75 +.43	.18	0
0	40	ζ Androm O=	1.97 +.44 +.12	.09 ±0.22	+1.97 +.13	.10	
0	56	ε Piscium O=	2.06 +.13 +.04	.10	+2.05 +.04	.09	
1	3	β Androm O=	1.90 +.70 +.19	.09	+1.94 +.20	.14	
1	5	τ Piscium O=	1.95 +.56 +.15	.10	+1.94 +.16	.10	0
~~0~~	~~37~~	~~21 Cass~~	~~+3~~				1
			1.94 +.64	2.11		2.13	0

– 2.11 ±.010

2.129
17

dt+m = -2.13

				n+274
0	26	χ Cass	O= +1.78 +1.90 +.52	2.30
0	49	γ Cass	O= +1.64 +1.73 +47	2.13
			O = +1.94 + .64 + 18	2.12
0	28	χ Dracon	O= + 2.47 - 2.83 - 77	
1	13	Polaris	O= -9.23 +41.42 +1.35	2.12
0	37	21 Cass	O= + 1.18 + 3.55 + .97	2.15

Δd T = .025

0	26	O = +1.79 - 1 +1.78 +1.90 = (.14)
0	28	O = +1.66 - 1 +1.59 +1.73 +.31 31
0	37	O = +1.30 0 +1.30 - 2.83 (+.18)
0	49	O = +1.64 + 0 +1.64 +41.82 +.27
1	11	O = -9.23 + 1 -9.22 +3.55 +.27 .38

O = +1.94 +.64

Dec. 1 A. M.

					n = +365	n = +385		
1	5	τ Piscium	0 = +0.50+.56	+.24	+.74	+0.50 +.22	0.72	
1	24	η " "	0 = 0.59+.26	+.09	.68	+.59 +.14	.69	
1	30	γ Persei	0 = 0.36+1.11	+.40	76	+.39 +.43	.82	
1	38	ο Piscium	0 = 0.63+.15	+.05	68	+.61 +.16	67	
1	48	β Arietis	0 = 0.50+.37	+.13	63	+.49 +.14	63	
1	56	γ Androm.	0 = 0.34+.89	+.33	67 ±.037	+.35 +.34	69	
2	0	α Arietis	0 = 0.43+.42	+.15	58	+.46 +.16	62	
2	10	γ Trianguli	0 = 0.44+.66	+.24	.68	+.42 +.25	67	
2	13	ο Ceti	0 = 0.76−.06	−.02	74	+.75 −.02	73	2 18
2	21	ξ Ceti	0 = 0.57+.14	+.05	62	+.57 +.06	63	1 11
2	35	δ Persei	0 = 0.19+1.14	+.42	61	+.17 +.44	61	
3	11	β Persei	0 = 0.35+.85	+.31	.66	+.32 +.33	65	
1	58		+0.47 +.55		0.67	+0.47	0.686 17	

−0.67±.015

dT+m = −0.67

n =

2 18 ι Cass. 0 = −0.16+2.34 +.35 +.865+.85+69

0 = +0.47 + .55 +.20 +.67

Polaris 1 13 0 = −15.03+41.42 +.38 +15.12+.09

add = +.03

n

0 = −0.25+2.34+.01 −0.26 = .46

0 = −15.03+41.82+.02 −15.01 = .385

0 = +0.47 + 0.55 .385

Dec. 2 A. M.

					n = +376	n = +373		
1	5	τ Piscium	0 = −0.25+.56	+.21	−0.04	−0.25	+.21	−0.04
1	24	η " "	0 = −0.16+.26	+.10	−0.06	−0.16	+.10	−0.06
1	30	γ Persei	0 = −0.53+1.11	+.42	−0.11 ±.033	−0.50	+.41	−0.09
1	48	β Arietis	0 = −0.19+.37	+.14	−0.05	−0.20	+.14	−0.06
1	56	γ Androm.	0 = −0.49+.89	+.33	−0.16	−0.49	+.33	−0.16
2	0	α Arietis	0 = −0.29+.42	+.16	−0.13	−0.26	+.16	−0.10
			−0.31+.60		−0.09	−0.31		−0.09

1 13 Polaris 0 = −15.69 +41.42

0 = −0.31 + 0.60

n

0 = −15.69+41.82 = .373

0 = −0.31 + .60

+0.09±.013

dT+m = ~~+~~0.085
~~17~~

= −0.09

Dec. 5   W.A.R.

n = +.373

21	47	16 Pegasi O=	−1.87	+.47	+18	1.69	
21	59	α Aquarii O=	−1.68	−.02	−.01	67	
22	18	3 Lacertae O=	2.06	+1.26	+47	59	
22	26	α " " O=	2.04	+1.18	+44	60	
22	37	η Pegasi O=	1.84	+.57	+21	63	
22	44	η " " O=		+.44			
22	46	λ Aquarii O=	1.56	−.15	−06	62	
22	56	o Androm O=	2.10	+.89	+33	77	±.042
22	58	α Pegasi O=	1.68	+.26	+10	58	
0	23	12 Ceti. O=	1.73	−.08	−.03	56	
0	33	α Cass O=	2.17	+1.47	+.54	63	
0	41	ζ Androm O=	1.86	+.44	+.16	70	
0	56	ε Piscium O=	1.76	+.13	+05	71	
1	3	β Androm O=	1.96	+.70	+.26	70	
23	15						

1.87 +.55

1.67 ±.012

dτ+m = +1.665
17
= +1.68

n = +.373

22	06	ζ Cephei	O= −2.17 +1.57		+.58	1.59
0	26	δ Cass	O= −2.37 +1.90	+.37	+.70	1.67
			O = −1.87 + .55		+.21	1.66
+* 22	30	226 B Cephei	O= −3.14 +3.88	+.39	+1.45	1.69
1	13	Polaris	O= −16.63 +41.41	+.36	−15.45	1.18
				.373		

Dec. 6   W.A.R.

n = .450

(n = .430

21	42	π₂ Cygni O=	−3.01	+1.14	+49	2.52	+.52	2.49	
22	35	ζ Pegasi O=	2.53	+.18	+08	45	+.08	45	
22	38	13 Lacertae O=	2.79	+.87	+37	42	+39	40	
22	44	υ Pegasi O=	2.68	+.44	+19	49	+20	48	
22	45	λ Aquarii O=	2.42	−.15	+06	48	+06	48	
22 +* 51		α Pisc. Aust. O=	2.30	−.58	−.25	55	−26	56	
22	56	o Androm O=	2.87	+.89	+.38	49	+40	47	±.128
22	58	α Pegasi O=	2.56	+.26	+.11	45	+12	44	
23	11	γ Piscium O=	2.48	+.04	+.02	46	+02	46	
23	14	τ Pegasi O=	2.73	+.42	+18	55	+19	53	
23	19	υ " " O=	2.68	+.42	+.18	50	+19	49	
23	33	κ Piscium O=	2.48	+.09	+04	44	+04	44	
23	46	φ Pegasi O=	2.60	+.33	+14	46	+15	45	
23	53	ω Piscium O=	2.57	+.11	+.05	52	+.05	52	
			2.62	+.34		2.48		2.48	

+2.48 ±.008

0 1 α Androm. O= −2.73 +.54

+2.446
+ 17
dτ+m = +2.49

n = .450

23	48	ρ Cass.	O= −3.14 +1.53	+.43	+.69	2.45
			O = −2.62 +0.34		+15	2.47
21	41	11 Cephei	O= −3.93 +2.86	.50	+1.28	2.65
+* 22	30	226 B Cephei	O= −4.22 +3.58	.45	+1.75	2.47
(23	23	λ Draco	O= −1.79 −2.77) rej.		+1.24	(3.03)

463
.425
95
449

adt/n = +.03

Dec. 6. A. M.

n = .480 n = +.51

1	2	a Androm O=	−2.72+.54	+23	2.49	−2.73 +20	2.53
0	4	22 Androm O=	2.91+1.01	+43	.48	2.91 +37	.54
0	13	ι Ceti O=	2.27−.17	−07	(34)	(2.27) −07	(34)
1	5	τ Piscium O=	2.70+.56	+29	46	2.70 +21	49
1	39	o Piscium O=	2.46+.15	+06	40	2.48 +06	42
1	48	β Arietis O=	2.59+.37	+16	43	2.60 +14	46
1	56	γ Androm O=	2.83+.89	+38	45	2.82 +33	49
2	0	α Arietis O=	2.68+42	+18	50	2.65 +15	50

+.023

5

− 2.64 +.47 2.46 2.70

+2.46±.009

2.490

0 6
1 11
1 52

n = .425

6 4 Draco O= −0.51 −4.84 +.40+2.06 −2.57
O = −2.64 + .47 +.20 2.44
(? Polaris O = −15.13 + 41.42)
1 52 50 Cass O= −3.78+ 3.04 4.5+1.29 2.49

n n.
O = −0.61 −4.84 +.03 −0.64 =4.14 =.39
O = −14.54 +41.42 [illegible]
O = −3.80 + 3.04 +.13 −3.77 +3.04 −.14
O = −2.70 + .56

dT+m = +2.490 / .17

dT+m = +2.49

Dec. 9 W. A. R.

n = +.355 n = +.356

23	31	λ Androm O=	−4.93+1.01	+36	4.57			
23	45	φ Pegasi O=	4.58+.33	+12	46			
23	52	α Piscium O=	4.46+.11	+04	42			
0	1	α Androm O=	4.73+.54	+19	54		−4.84 +19 −4.65	
0	3	22 " " O=	4.86+1.01	+36	50		4.86 +36	.50
2	9	γ Trianguli O=	4.78+.66	+23	55	+.031	4.80 +23	.57
2	13	α Ceti O=	4.53−.06	−02	55		4.54 −2	.56
2	21	ξ₂ Ceti O=	4.60+.14	+05	55		4.60 +5	.55
2	31	ν Arietis O=	4.67+.39	+14	53		4.70 +14	.56
2	35	θ Persei O=	4.87+1.14	+40	47		4.87 +40	.47
2	33	δ Ceti O=	4.52−.02	−01	.53		4.52 −01	.53

4.69 +.48 4.52±.009

dT+m = +4.536
= 4.54

6
0
23
2
2

0 6
1 11
2 18
2 28
2 49

adt/n = +.03

n = +.355

n

0 6 4 Draco O= −2.91 −4.84 +.84 −1.71 4.63
23 47 ρ Cass O= −4.98 +1.53 +.54 4.44
2 18 ι Cass O= −5.38+2.34 +.38+.83 4.55

O = −4.69 +.48 ~~.23~~ +.17 4.82

2 28 5 Urs Maj O= −3.19 −4.10 +.33 −1.45 4.64
Polaris O= −19.79 +41.41 +.37+14.70 5.09

4 Draco O = −3.02 −4.84 +.. −3.0[illegible]
−19.29 +41.82 +.03 −19.32
−5.47 +2.34 +.00 −5.47
−3.12 −4.10 +.01 −3.11
−6.40 +5.10 +.02 −6.38

O = −4.79 +.67

n
O = +1.72 −5.41 = +.32 −
+14.54 −41.25 = +.35 +
+0.72 −1.77 = +.40 +
+1.68 −4.61 = +.33 −
+1.65 −4.07 = +.36 +
+.356

X.119

2	45	τ Persei O=	5.01+1.29	+.49	.52	−5.00 +49	4.51
2	55	α Ceti O=	4.56+.06	+.02	54	4.51 +02	49
2	57	ρ Persei O=	4.87+.79	+28	59	4.86 +28	58
3	0	β Persei O=	4.81+.85	+.30	51	4.84 +30	54

4.54 4.53

2 49 47 Cephei O= −6.37+5.10 +1.81 −4.56

2 10

Dec 11. W.A.R.

n = .369

0	33	α Cass	0 = − 6.49 + 1.47	+54	5.95
1	25	η Piscium	0 = 6.11 + .26	+09	6.02
1	30	υ Persei	0 = 6.40 + 1.11	+41	5.99
1	35	ν Piscium	0 = 6.09 + .08	+03	6.06
1	39	o Piscium	0 = 6.13 + .15	+.05	6.08 ±0.31
1	48	β Arietis	0 = 6.15 + .37	+14	6.01
1	56	γ Androm	0 = 6.28 + .89	+33	5.95
2	11	67 Ceti.	0 = 6.00 − .12	−04	6.04
2	21	ξ Ceti.	0 = 6.03 + .14	+.05	5.98

6.19 +.48 — 6.01 ±.010

n +.369

0	26	χ Cass	0 = 6.69 + 1.90	.35 +.70	6.99
~~0~~	~~37~~	~~21 Cass~~	~~0 =~~		
2	04	55 Cass	0 = 6.85 + 2.12 4	.37 +.81	6.04
~~2~~	~~21~~	~~ξ Ceti~~			
2	18	ψ Cass	0 = 6.91 + 2.34	.38 +.87	6.04
0	37	21 Cass	0 = 7.34 + 3.55	.37 +1.31	6.03
1	12	Polaris	0 = −21.87 + 41.41	.38 +0.78	5.58
×× 1	22	α cass	0 = 7.10 + 2.69	.40 + .99	6.11
1	52	50 Cass	0 = 7.12 + 3.04	.36 +1.12	6.00
2	28	5 Urs Min	0 = 4.70 − 4.10	.33 +1.51	6.19

0 = 6.19 + 0.48 .369

n = +.371

o = − 6.49	+147	+54	5.95
= 6.11	+ .26	+ 9	6.02
= 6.37	+1.11	+41	5.96
= 6.09	+ .08	+03	6.06
= 6.13	+ .15	+05	6.09
= [illegible]	+ .37	+14	6.02
= 6.28	+ .89	+33	5.95
= 6.05	− .12	−04	6.01
= 6.03	+ .14	+05	5.98

40

−6.14 +.48 6.00

adT = +.62
h

0 26	o = −6.69 + 1.90	= .14	−6.73
0 37	−7.23 + 3.55	= .13	−7.26
1 12	−21.28 + 41.52	− 2	−21.30
1 52	−7.14 + 3.04	+ 0	−7.14
2 4	−6.85 + 2.24	+ 1	−6.84
2 28	−4.62 − 4.09	+ 2	−4.60
1 21	−7.07 + 2.69	− 1	−7.08
2 11	−7.00 + 2.33	+ 2	−6.98

n

o = −0.30 + 1.42 = +.35
−1.09 + 3.07 = +.34
−15.09 + 41.34 = +.36
−.95 + 2.56 = +.37
−.66 + 1.76 = +.38
+.07 + 4.57 = +.34
−.45 + 2.21 = +.39
−.31 + 1.85 = +.44

+.371

±0.02

$dT + m = +6.00$ at $1^h\ 40^m$
5.994
7
= 5.99

Dec. 12. W.A.R.

n = .387

23	14	τ Pegasi	0 = − 6.86 + .42	+.16	6.56
23	19	υ " "	0 = 6.57 + .42	+16	61
23	33	ι Piscium	0 = 6.66 + .09	+03	63
23	46	φ Pegasi	0 = 6.79 + .33	+13	64
23	53	ω Piscium	0 = 6.70 + .11	+04	66
0	2	α Androm	0 = 6.81 + .54	+21	60 ±0.019 −6.62
0	4	22 " "	0 = 7.02 + 1.01	+39	63
0	6	γ Pegasi	0 = 6.76 + .26	+10	66
1	25	η Piscium	0 = 6.72 + .26	+10	62
1	30	υ Persei	0 = 7.06 + 1.11	+42	64
23	22	~~20~~ Piscium	0 = 6.66 + .10	+04	62
23	31	λ Androm	0 = .7.01 + 1.01	+.39	62

6.78 +.47 6.62

+6.62 ±.006

n

n +.387

23	48	ρ Cass	0 = −7.11 + 1.53	.37 +.57	6.52
			0 = 6.78 + 0.47	+.18	6.60
23	23	λ Draco.	0 = 5.53 − 2.77	.39 −1.07	6.60
×× 1	22	α cass	0 = 7.62 + 2.69	.38 +1.04	6.58
		Polaris	0 = 22.76 + 41.41	.39 +16.03	6.73

.387

0 2
0 4
0 6
1 25
1 30
1

6.624
17
6.64

Dec. 17 W. A. R.

n=.376

22	44	υ Pegasi	O= −10.75 +.44	+17	10.58	
22	56	ο Androm	O= 10.92 +.89	+33	.59	
22	58	α Pegasi	O= 10.74 +.26	+10	64	
23	11	γ Piscium	O= 10.59 +.04	+01	58	
23	14	π Pegasi	O= 10.74 +.42	+16	58	
23	19	υ " "	O= 10.69 +.42	+16	53	
23	31	λ Androm	O= 10.99 +1.01	+38	61	
23	46	φ Pegasi	O= 10.69 +.33	+12	57	
23	53	ω Piscium	O= 10.62 +.11	+04	58	−12
0	1	α Androm	O= 10.87 +.54	+20	67	−10.88
0	4	22 " "	O= 11.04 +1.01	+38	66	
1	5	τ Piscium	O= 10.89 +.56	+21	.68	

23 33

10.80 +.50 10.6116

17

ΔT+m=+10.62

n=+376

				n			
22	45	ι Cephei	O= −11.45 +2.20	.38	+83	−10.62	+
23	48	ρ Cass	O= 11.16 +1.53	.35	+67	−10.59	+
			O= 10.80 + .50		+19	10.61	+010
23	24	λ Draco	O− 9.53 −2.77	.39	−104	10.57	−
23	34	γ Cephei	O= 12.23 +4.30	.38	+162	10.61	+
0	6	4 Draco	O= 8.86 −4.84	.36	−1.83	10.69	−
44 1	22	A. Cass	O= 11.66 +2.69	.39	+101	10.65	+
Polaris			O= 26.73 +41.82	.38	+15.72	10.01	+

Dec. 17 A. M.

n=+40

1	30	υ Persei	O= −11.04 +1.11	+44	10.60	
1	35	ν Piscium	O= 10.68 +.08	+03	65	
1	39	ο " "	O= 10.70 +.15	+06	64	
1	48	β Arietis	O= 10.75 +.37	+15	60	
1	56	γ Androm	O= 10.98 +.89	+36	62	
2	10	67 Ceti	O= 10.58 −.12	−05	63	
2	21	ξ_2 " "	O= 10.68 +.14	+06	62	
2	31	ξ Arietis	O= 10.64 +.39	+16	58	×!! 29
2	33	δ Ceti	O= 10.50 .01	−00	50	
2	35	ο Persei	O= 11.09 +1.14	+46	63	
2	37	γ Ceti	O= 10.61 +.05	+02	59	
2	42	41 Arietis	O= 10.80 +.50	+20	60	
2	45	τ Persei	O= 11.04 +1.29	+52	52	

10.78 +.46 **10.60 ±.008**

2 17

n=.400

				n		
~~2~~	~~1~~	~~α Draco~~	~~O= 8.52 −2.14~~			
2	4	~~55 Cass~~	~~O= +2.24~~			
2	18	ι Cass	O= −11.62 +2.34	44	+93	−10.69
			O= −10.78 +0.46		+18	10.60
1	52	50 Cass	O= 11.76 +3.04	.38	+122	10.54
2	48	47 Cephei	O= 12.72 +5.10	.42	+204	10.68

n=+402

O= −11.01 +1.11	−11.01	+44	10.57	
O 10.68 + .08	10.68	+02	65	
O 10.72 + .15	10.72	+06	66	
O 10.76 + .37	10.76	+15	61	
O 10.97 + .89	10.98	+36	61	
O 10.63 − .12	10.63	−05	68	
O 10.64 + .14	10.68	+06	62	
O 10.50 + .39	10.64	+16	48	
O 11.11 − .01	10.50	−00	50	
O 10.11 +1.14	11.11	+46	65	
O 10.71 + .05	10.66	+02	64	
O 10.80 + .50	10.80	+20	61	
O 11.03 +1.29	11.03	+.52	51	

2 12

10.83 +.46 10.79 10.60

599

ΔT+m=−10.60

1	52	O	O= −11.78 +3.04	+02	−11.79
2	18		−11.71 +2.33	00	11.71
2	48		−12.74 +5.10	+02	12.72

n

O= −0.99 +2.58 = +.38

−0.42 +1.87 = .

−1.98 +4.64 = +.42

Dec. 18

n = + 350

2 42 41 Arietis O = -11.60 +.50 +17 11.43
2 45 τ Persei O = 11.91 +1.29 +49 .42
2 56 α Ceti. O = 11.53 +.06 +02 .51
3 0 β Persei O = 4.81 +.85 +30 .51
3 15 α " " O = +1.17 +.41
3 18 o Tauri O = +.15 +.06
3 20 ξ " " O = +.16 +.06

+11.47

71 / 68 n + 350 n
O = -11.~~68~~ + .~~08~~ .33 + .~~24~~ -11.~~48~~
2 48 47 Cephei O = -13.19 +5.10 .34 +1.78 11.41
3 4 48 " " O = 13.17 +4.42 .36 +1.55 11.62
2 51 β U. Min. O = 10.26 -3.65 .34 -1.27 11.53
~~Polaris~~ O =

Dec. ~~18~~ 19

13 12 Polaris O = + 41.82

n = + 350

O = -11.62 +.50 -11.62 +17 11.45
O = -11.90 +1.29 -11. +49 .41
O = 11.48 +.06 +.02 .46
O = 11.54 +.85 +.30 .54
O = -11.56 +1.17 +.41 .45
O = -11.59 +.15 +.05 .54
O = 11.54 +.16 +.06 .48

3 42

-11.69 +60

11.~~48~~
476
17

dT+m = +11.48

A dt = +.63

1 11 O =
2 48 O = -13.21 -01 -13.22 +5.10
3 51 O = -10.22 -1 10.23 -3.65
3 4 O = -13.12 +0 13.12 +4.42

n
O = -1.53 +4.50 = +.34 +
= -1.46 +4.20 = +.34 -
= -1.43 +3.82 = +.37 +
+350

Dec 20 W. A. R.

n = +.305

22 29 η Aquarii O = -12.57 -.01 -00 -12.57
22 51 α Piscis Aust. O = 12.18 -.58 -.18 .36
23 11 γ Piscium O = 12.48 +.04 +01 .47
23 14 τ Pegasi O = 12.66 +.42 +13 .53
23 33 ι Piscium O = 12.46 +.09 +03 .43
23 46 θ Pegasi O = 12.54 +.33 +10 .44
23 53 ω Piscium O = 12.41 +.11 +03 .38
0 2 α Androm O = 12.62 +.54 +16 .46 -12.63
0 22 " " O = 12.73 1.01 +31 .42
0 13 ι Ceti O = 12.34 -.17 -05 .39
0 23 12 " O = 12.39 -.08 -02 .41
0 33 α Cass O = 12.94 +1.47 +45 .49
0 56 ε Piscium O = 12.47 +.13 +04 .43
1 3 β Androm O = 12.66 +.70 +21 .45
1 5 τ Piscium O = 12.65 +.56 +17 .48

12.54 +.30 12.45

12.45
17

dT+m = +12.45

n
n +.305
22 45 ι Cephei O = -13.19 +2.20 +.34 +.67 12.52
23 48 ρ Cass O = 12.94 +1.53 +.32 +.47 .47
0 26 χ Cass O = 13.07 +1.90 +.33 +.58 .49
O = 12.54 +30 +09 .45

(22 30 226 β Cephei O = -14.08 +3.38) .31 +1.02 +0.19
23 34 γ Cephei O = -13.76 +4.30 +.31 +1.31 .45
0 6 4 Draconis O = 11.05 -4.84 -.28 -1.47 .52
Polaris O = -24.12 +41.82 +.28 +12.75 .37
Polaris S.P. O = -1.05 -41.81 -.27 -12.75 12.80

Dec. 20

[illegible]

n = +.328

22	29	η Aquarii O =	-12.51	-.01	[illegible]	12.51
22 ✗✗	51	α Pisc Aust O =	12.18	-.58	-.19	37
23	11	γ Piscium O =	12.48	+.04	+.01	47
23	14	τ Pegasi O =	12.66	+.42	+.14	52
23	33	ι Piscium O =	12.46	+.09	+.03	43
23	53	ω Piscium O =	12.54	+.11	+.04	43
0	2	α Androm O =	-12.63	+.54	+.18	45
0	4	22 " " O =	12.73	+1.01	+.34	40
23	46	φ Pegasi O =	12.54	+.33	+.11	43
0	13	ι Ceti O =	12.34	-.17	-.06	40
0	23	12 Ceti O =	12.39	-.08	-.03	42
0	33	α Cass O =	12.93	+1.47	+.48	45
0	56	ε Piscium O =	12.48	+.13	+.04	44
1	2	β Androm O =	12.69	+.70	+.23	46
1	4	τ Piscium O =	+12.65	+.56	+.18	47

0 - 3.2   12.57 +.41   12.44

22	45	ι Cephei O =		+2.20
23	48	ρ Cass O =		+1.53
0	26	χ Cass	O = -13.08	+1.90
0	28	χ [illegible]	-.67	-2.82

22	30	226 B Cephei O =		+3.88
23	34	γ Cephei O =		+4.30
~~23~~	~~46~~	~~φ Pegasi O =~~		~~+.33~~
0	6	4 Draco. O =	-11.16	-4.84
		Polaris O =		+41.81

~~22 50 6 = -12.57~~
22 45 = -13.19 - .06 -13.25 +2.20
23 34 = -13.76 - .03 -13.79 +4.30
23 48 = - .03
0 6 = -11.16 - 1 -11.17 -4.84
0 26 = -13.08 - 0 -13.08 +1.90

n
o = -.068 +2.20 + 1.81 = +.38
-1.22 + 4.30 + 3.89 = +.32
-1.40 - 4.84 + 5.25 = +.27
-0.51 1.49 = +.34
+.328

h n
23 58   dt + m = +12.44
457
+ 8
= +12.46

~~not in [illegible]~~

Dec. 24 A. M.

0	6	γ Pegasi O =	+.26
0	28	β Cass O =	+1.34
0	32	α " O =	+1.47
0	56	ε Piscium O =	+.13
1	2	β Androm O =	+.70

0	25	χ Cass	O = -17.38 +1.90
0	41	η "	O = +1.55
0	48	γ "	O = +1.73

Polaris O = -27.6 + 41.81

n = 330
0 6   o = -16.81 + 0.26 +.09 - 16.72
0 33   o = -17.23 + 1.47 +.49   .74

0 41 η Cass   o = -17.24 + 1.55 +.52   .72
0 48 γ "   17.28 1.73 +.58   .70
~~0 56 ε Piscium~~   16.77 + .13 +.04   .73
0 2 β Andr.   17.00 + .70 +.23   .77

0 25   o = -17.38 + 1.90
0 11   o = -27.68 + 41.52

0 41   17.07 + .97

+16.730
+   .7

n
o = +.31 + 0.93 = +.33
o = -10.61 + 40.85 ? =

h m
0 41   dt + m = +16.73
.73

Dec. 27

1 2 β Androm. 0 = −18.84 + .70 +.25 18.59 +360
1 4 τ Piscium. 0 = 18.82 + .56 +20 .62
1 25 η Piscium 0 = 18.74 .26 +09 65
1 30 υ Persei 0 = 19.00 1.11 +40 .60
A C

18.85 + 66 18.61

3 15 +18.61

0 = −18.85 + .66 +24 −18.61
Polaris 0 = −34.17 + 41.81 .37
1 22 A Cass. 0 = −19.56 + 2.69 35

n = +.350
1 2 0 = −18.87 + .70 + .24 − 18.60
1 4 = 18.82 + .56 + .20 .62
1 25 = 18.74 + .26 + .09 .65
1 30 = 18.97 + 1.11 + .39 .58

1 11 0 = −33.67 + 41.81
1 22 0 = −19.54 + 2.69

0 = −14.82 + 41.15 = +.36
− 0.69 + 2.03 = .34

1 15 18.85 + .66 18.626
dr + m = +18.62

3 15 0 = −18.97 + 1.17 + 41 18.56 18.56
3 18 18.70 + .15 + 5 .65 65
3 20 18.72 + .16 + 6 .66 66
18.62
3 27 18.77 − .17 − 09 (.86)
3 30 19.15 + 1.95 + .68 (.47)
3 34 18.99 + 1.09 + 38 .61
3 53 18.81 + .21 + .07 .74
3 59 19.03 + 1.09 + 38 .65
4 13 18.79 + .27 + 9 .70
4 16 18.80 + .31 + 10 .70
3 40 18.66

dT + m = +18.66 at 3h 40m
.659
17
= +18.66

Dec. 28.

n = +.458
19.60 n = +.451

23 31 λ Androm 0 = −19.97 + 1.01 + .45 + .45 19.52 19.97 .52 19.51 +1.25
0 2 α " " 0 = 19.77 + .54 + .24 .25 53 19.77 .52 57 +1.94
0 4 22 " " 0 = 19.97 + 1.01 + .46 .46 51 19.97 .51 49 −2.18
0 13 ι Ceti. 0 = 19.45 − .17 − .08 − 8 53 19.45 .53 56 −1.28
0 23 12 " 0 = 19.51 − .08 − .04 − 5 55 19.52 .57 57 −4.36
0 34 α Cass. 0 = 20.32 + 1.47 + .66 + 66 66 20.32 .65 61 +1.21
0 41 η " 0 = 20.33 + 1.55 + .70 + 71 63 20.28 .57 60 +1.01
1 3 β Androm 0 = 19.91 + .70 + .32 + 32 59 19.94 .62 49 +1.05
1 25 η Piscium 0 = 19.73 + .26 + 11 + 12 62 19.73 .61 93 +18.86
1 30 υ Persei 0 = −20.09 + 1.11 + .50 + 51 59 20.06 .55 90 −7.60
1 34 υ Piscium 0 = 19.63 + .08 + .04 + 4 59 19.63 .57 79 +9.36
1 39 ο " " 0 = 19.67 + .17 + .08 + 8 59 19.69 .61 59 −1.85
1 47 β Arietis 0 = 19.70 + .37 + 17 + 17 53 19.71 .54
1 56 γ Androm 0 = 19.98 + .89 + 40 + 41 58 19.96 .55
2 0 α Arietis 0 = 19.77 + .42 + 19 + 19 58 19.74 .55
2 1 β Trianguli 0 = 19.92 + .68 + 31 + 31 61 19.92 .61
2 31 Arietis 0 = 19.86 + .39 + 18 + 18 68 19.89 .71
~~Ceti 0 = .14~~ − .01 − .00 19.67 .67
~~2 30 Arietis 0 = 17.76 + .39~~
2 36 γ Ceti 0 = 19.62 + .05 + 02 + 02 60 19.67 .65
2 42 41 Arietis 0 = 19.87 + .50 + 23 + 23 64 19.88 .65
2 45 τ Persei 0 = 20.24 1.29 + 58 + 59 66 20.23 .64
2 33 δ Ceti 0 = 19.67 + .01 + 00 + 00 .67 .67

1 31 19.86 + .58 19.59 19.84 +18

+19.69 19.59
17

dr + m = +19.590
7
= +19.59

4 dT = +.03

0 = 19.86 + .58 n = 26

23 24 λ Draco 0 = −18.19 − 2.77 −18.26 .48
23 34 γ Cephei 0 = −21.44 + 4.30 21.51 .43
0 6 4 Draco. 0 = −17.27 − 4.84 17.31 .47
0 28 κ Draco 0 = −18.25 − 2.83 18.28 .46
0 48 32 Camel. 0 = −15.19 − 9.68 15.21 .42
1 21 A Cass. 0 = −20.83 + 2.69 20.68 .46
2 04 55 Cass. 0 = −20.63 + 2.24 20.61 .45
2 18 ι Cass.? 0 = −20.57 + 2.34 20.54
Polaris. 0 = −37.84 + 41.81 37.79 .44
δ Ursa Min. 0 = −12.49 − 16.86 −12.30 .44
51 Cephei 0 = −29.35 + 20.76 − 29.15 .46
2 28 ι Urs Min 17.78 − 4.10 17.94 .45

23 24 0 = −18.19 − 06 − 18.25 − 2.77 .48 −48
23 34 = −21.44 − 06 21.50 + 4.30 45
0 6 = −17.39 − 4 17.43 − 4.84 45
0 28 = −18.12 − 3 18.15 − 2.83 49
0 48 = −15.19 − 2 15.21 − 9.66 45
1 21 = −20.80 − 0 20.80 + 2.69 46
2 04 = −20.63 + 2 20.61 + 2.24 46
2 18 = −21.66 + 3 21.63 + 2.34 45
2 28 = −17.70 + 3 17.67 − 4.10 46
1 11 = −37.84 − 2 37.86 + 41.82 42
6 12 = −12.49 + 15 12.34 − 16.86 47
6 39 = 29.35 + .16 29.19 + 20.76 46
.450 467

n
0 = −0.65 + 3.35 − 0.59 − 1.59 + .48 −
2.60 + 2.72 2.68 1.06 + .45 +
1.45 + 3.42 1.41 2.41 + .45 −
.72 + 3.41 0.49 1.69 + .49 −
.61 + 15.24 3.63 4.63 + .45 −
1.96 2.11 1.96 0.96 + .41 +
1.79 1.66 1.77 0.77 + .46 +
2.82 1.76 2.79 0.79 + .45 +
1.14 1.17 + .46 −
18.46 4.69 18.32 2.17 + .42 +
6.35 4.24 6.50 17.47 + .46 +
10.51 10.31 7.50 −
+

±.01²

45

Dec. 29

dt/n = +.24

n = .445

0 = +20.74 + 0.47 ~~21~~ +.21 20.53

n = +445 n = +444

2	21	ξ₂ Ceti	0 = −20.55	+ .14	+06	20.49	0 = −20.55 +06	20.49
2	30	ν Arietis	0 = 20.66	+ .39	+.17	49	20.69 +17	52
2	36	γ Ceti	0 = 20.57	+ .05	+02	55	20.61 +02	59
2	42	41 Arietis	0 = 20.75	+ .50	+22	53	20.75 +22	53
2	45	τ Persei	0 = 21.17	+1.29	+57	60	21.16 +57	55
2	56	α Ceti	0 = 20.56	+ .06	+03	53	20.56 +3	47
3	0	β Persei	0 = 20.95	+ .85	+.38	57	20.98 +.8	60
2	41		20.74	+.47		20.54	20.75 +.47	−20.54

2	18	ι Cass.	0 = −21.48	+ 2.34	.40 +1.04	.44
2	51	β Urs. Min	0 = 18.86	− 3.65	.46 −1.62	.48
3	4	48 Cephei	0 = 22.47	+ 4.42	.44 +1.97	50
~~6~~	~~5~~	~~22 Camel.~~	~~0 = 28.07~~			
6	15	δ Urs. Min	0 = −12.50	−16.86	.48 −7.50	.00
6	39	51 Cephei	0 = 28.04	+20.76		

+20.541
~~+.47~~

dt + m = +20.54

2	18	0 = −21.57 −.01	−21.58 +2.34	+44
2	51	−18.81 +.00	18.81 − 3.65	−47
3	4	−22.42 +.1	22.41 + 4.42	42
6	15	−12.50 +.14	12.36 −16.86	48
6	39	−28.84 +.18	29.06 −20.76	41
				423 .475

x .021

n m
2 41 dt + m = +20.54

n
0 = −.83 +1.87 = .44
1.94 +4.12 .47
1.66 +3.95 .42
8.39 +17.33 .48
8.31 +20.29 .41

.444

Comparison of Harvard College Observatory Right Ascensions with the Pulcova Observations of 1842 &c and the places of the American Ephemeris

Star.	δ				R. A. 1860 Pulcova −.04	~~Cambridge~~ +.01	Naut. Al. Try.	Individual corrections to Pulcova in hundredths of seconds of time mean	Final corrections to Pulcova +	−
M Draconis	+78°	20′	12	06	7.66	7.57	7.75	+6+1−3	(1)	
η Virginis	+0	03		13	18.36	18.40	18.41	+6+0+5+0+10	4	
β Corvi	−22	41		27	~~36.88~~	36.88	36.88	−2+2−1+1	0	
κ Draconis	+70	30		27	57.76	57.70	57.89	−6−2		(4)
γ Virginis	−0	45		35	7.46	7.44		−5−6−0−0−1		2
ε ~~Virginis~~ Urs. maj.	+56	39		48	20.83	20.77		+0−13−4−4−7−6		(6)
12 Can. Ven.	+39	01		49	59.38	59.37	59.42	−4+6−2−1−2		1
δ Virginis	+11	39	12	55	46.28	45.85		+1+8+11+8	7	
θ Virginis	−4	51	13	03	16.34	16.37	16.38	+3+3+8−2+6	3	
43 Comae	+28	32		5	51.11	51.10		+1−1+1+1−5		1
α Virginis	−10	29		18	~~23.99~~	23.94	23.99	−4−10−15		56
ζ Urs. maj.	+55	36		18	43.67	43.58		−16−1		(9)
ζ Virginis	+0	04		28	7.25	7.30	7.28	+8+2+0+8+6	5	
η Urs. maj.	+49	57		42	27.33	27.26	27.36	−6−9−7−10−1		7
η Bootis	+19	03		48	32.53	32.56	32.59	+7−2+9−3+3	3	
50 Cass.	108	12		52	27.92	27.75		−5−12−34		(17)
ι Virginis	+2	10	13	55	4.93	5.01		+13+13+2+3	8	
α Draconis	+65	00	14	00	53.86	53.86	53.89	−4+10−2−8+15		(0)
d Bootis	+25	42		4	30.98	30.95		+5−5−7−2−4		3
α Bootis	+19	51		9	46.66	46.(66) 68	46.68	+1−1−1+0+1	0	
θ Bootis	+52	27		20	48.30	48.28	48.27	−5−6−7+4+4		(2)
ζ Bootis	+30	56		26	16.21	16.21		+2−3−2−2+4	0	
γ Bootis	+38	52		26	53.05	52.96		−9−6−11−14−6		9
5 Urs. Min.	+76	17		27	49.62	49.58	49.62	−1−6+8−17		(4)
π Bootis	+16	58		34	39.81	39.89		+9+9+7+8+8	8	
ζ Bootis	+14	17		34	59.34	59.39		+5+7+3+6	5	
ε Bootis	+27	37		39		21.19	21.22	−1−0−2−10−0		3
109 Virginis	+2	26		39	43.70	43.74		+2+5+4+1+8	4	
α Librae	−15	27		43	~~44.71~~	44.74	44.71	+7+4+5+2−1	3	
2 Gr. 2164	+59	~~50~~ 49		48	10.01	10.11		+20+2+9+7	(10)	
β Urs. Min.	+74	41		51	6.31	6.44	6.39	+10+4+27+15+10	(18)	
β Bootis	+40	54		57	5.20	5.21	5.21	+5+7+4−6−5	1	
ψ Bootis	+27	29	14	58	56.10	55.09		+4+2−1−10−2		1
β Librae	−8	54	15	10	4.04	4.00	4.05	−7+3−6−7		4
δ Bootis	+33	48		10	18.16	18.11		−5−6−7−3		5
γ Urs. Min.	+72	18		20	57.26	57.12	57.08	−16−18+2−10−27		(14)
β Coronae	+29	33		22	30.67	30.56		−4−19−12−10		11
μ Bootis	+41	16		26	17.74	17.75		+4+5−7+5+0	1	
μ Bootis	+41	20		27	9.87	9.93		+5+10+3+8+4	6	
α Cor. Bor.	+27	09		29	13.58	13.57	13.60	+4−5+1−3−4		1
α Serpentis	+6	50		37	54.89	54.91	54.89	+0+2+6+1	2	
β Serpentis	+15	50		40	14.07	14.07		+1+1−3+2−2	0	
μ Serpentis	−3	02		42	53.40	53.34		+3−5−5−9−14		6
ε Serpentis	+4	52		44	23.21	23.21	23.23	+1−1−3+3		0
ζ Urs. Min.	+78	11		48	42.71	43.03	43.06	+51+15+30+23+28+43	(32)	
γ Serpentis	+16	05		50	29.74	29.72		+2−2	2 −	2
Gr. 2296	+55	07		54	43.72	43.86		+8+7+8+12+25	(14)	
β Scorpii	−19	27		57	56.31	56.34	56.31	+9+6−3+1+1	3	
θ Draconis	+58	55	15	59	28.41	28.39		−2+10−10−9+2		(2)
δ Ophiuchi	−3	22	16	07	35.22	35.24	35.20	+6−9+4+2+1	2	
ε Ophiuchi	−4	23		11	29.81	29.87		+7+9+5+3+5	6	
19 Urs. Min.	+76	12		14	32.03	31.71		−31−21−29−47		(32)
γ ~~Draconis~~ Herculis	+19	27		16	13.79	13.78		−0−1		1
ω Herculis	+14	20		19	27.68	27.79		+13+17+5+9+12+12	11	
α Scorpii	−26	09		21	30.08	29.98 = 30.04	30.08	−9−10		10
η Draconis	+61	48		22	15.01	14.89	14.97	−9−19−6−12−2−2−8		(14)
ζ Ophiuchi	+2	16		24	24.56	24.51		−1−6−12−5−2		5
A Draconis	+69	03		28	14.61	14.73	14.81	+11+14+10	(12)	
ζ Ophiuchi	−10	18		30	~~3.48~~	3.42	3.43	+2−3−6−4+1+3		1
ζ Herculis	+31	50		36	25.45	25.39		−7−5−10−6−3		6
η Herculis	+39	10		38	28.46	28.50	28.44	+1+10+2+1+7	4	
Gr. 2377	+57	01		42	51.16	51.10		−7−5−5−8		(6)
49 Herculis	+15	12		46	12.49	12.53		+4+2+2+7+6	4	
χ Ophiuchi	+9	35		51	33.73	33.78	33.74	+3−3+5+9+7	4	
ε Herculis	+31	07		55	21.28	21.33		+10+3+2+4+4	5	
a Camelop.	113	53		41	14.30	14.44	14.36	+7+13+5 +13+19+11	(8) +14	
ε Urs. Min	+82	15	16	59	16.31	16.35	16.44	−6−1+13+8+7	(4)	
Gr. 2415	+40	41	17	3	34.11	34.33		+19+28	(22)	
α Herculis	+14	32		8	45.96	45.94	45.95	+8+3−2−5−0		2
π Herculis	+36	57		10	33.34	33.30		−4−1−4−7−5		4
ο Ophiuchi	−24	09		18	~~29.60~~ 62	29.62	29.60	+0−1−0+10+1	2	

Inner stars = +1.03 − .88.

Stars above 51° 30′ = +1.19 − 1.07

+2.29 − 1.93

R. A.

Star.	δ °	'			Pulcova	Cambridge	Naut. Al.	Individual corrections to Pulcova	Final corrections to Pulcova +	—
β Draconis	+52	24	17	27	31.11	31.15	31.07	+4+6+1+2+7	4	
α Ophiuchi	+12	39		28	56.80	56.83	56.79	+1+6+0+5	3	
ω Draconis	+68	49		37	42.47	42.45	42.54	+0−6−1+6−9		(2)
μ Herculis	+27	48		41	24.63	24.60	24.63	−3−5−1		3
ψ Draconis	+72	13		44	14.15	14.15	14.21	+25−1−5−14−8		(0)
ξ Draconis	+51	30	17	53	36.70	36.60	36.79	−6−6−6−15−18 (? ξ2=3671.5⁴, .65.65. 71.6.9=.65)		10
θ ~~Draconis~~ Herculis	+28	45	18	2	30.63	30.66		−2+3+3+10+1	3	~~(+3)~~
δ Urs. min.	+86	36		13	56.94	56.83	56.86	−6−3−33		(13)
η Serpentis	−2	56		14	38.09	38.15	38.05	+0+5+9+11	6	
109 Herculis	+21	43		18	12.05	12.05		+5+0−5−2+4	0	
b Draconis	+58	44		22	1.42	1.45		+13+6−3+8−10	(3)	
1 Aquilae	−8	20		28	~~11.17~~	11.23	11.17	+7+7+7+2	6	
α Lyrae	+38	40		32	34.25	34.16 24	34.24	−2−18−12−4		9
110 Herculis	+20	25		40	6.68	6.57		−9−7−13−11−15		11
β Lyrae	+33	13		45	19.02	19.01	19.03	+3+1+0+0	1	
o Sagittarii	−26	27		47	~~15.94~~	15.92	15.94	−7−1−4+4−1		2
13 R Lyrae	+43	44		51	24.57	24.53		−1+5−5−8−9−6		4
ε Aquilae	+14	54		53	46.07	46.07		−2+3+2−1+0−5	0	
ζ Aquilae	+13	40	18	59	28.81	28.85	28.78	+6+4+2+5+6+0	4	
d Sagittarii	−19	11	19	10	~~5.15~~	5.19	5.15	+3+8−2+6	4	
ω Aquilae	+11	22		11	45.66	45.66		−4+2+2		0
δ Draconis	+67	26		12	31.11	31.08	31.14	−8−0−11−2+3		(3)
κ Cygni	+53	08		14	7.16	7.15		−0−0−3−1−0		(1)
τ Aquilae	+2	52		18	59.62	59.66	59.58	+3+5+6+3+3	4	
β Cygni	+27	41		25	31.16	31.13		+3+1−7−9−3−4−7−4−1−3		3
κ Aquilae	−7	19		29		57.08	57.00	+13+6+8+5	8	
γ Aquilae	+10	18		40	7.60	7.61	7.59	+3−2−1+2+1+3	1	
δ Sagittae	+18	13		41	38.22	38.13		−7−12−5−6−9−15−10		9
α Aquilae	+8	32		44	29.35	29.31	29.31	−3−0−8−5−7−1		4
η Aquilae	+0	41		45	54.05	54.07		+1+8+1−2+3+1	2	
ε Draconis	+69	56		48	35.87	35.88	35.79	−13+6−7−4+6+17+3	(1)	
β Aquilae	+6	05	19	48	58.58	58.58	58.56	−4+5−1+1	0	
θ Aquilae	−1	12	20	4	38.88	38.91		+7+3+1−1+5+5 ~~+8~~	3	
κ Cephei	+77	19		13	11.12	11.28	11.22	+5+26+4+24+23	(16).	
γ Cygni	+39	51		17	35.93	35.90		+1−3−7−2−4−4−0−4		3
ε Delphini	+10	52		27	2.96	2.97	2.96	+6+3+2+2+1+3+0+2−3−4	1	
β Delphini	+14	09		31	29.94	29.99		+5+9−3+10+7+1+7+1+5+10−4	5	
α Delphini	+15	28		33	38.79	38.78		+2+3−2+1+2−4+4−6−3+1−4		1
α Cygni	+44	49		37	2.06	2.05	2.06	+5+0−8+2+0−4−6−2+7−1−5		1
ε Cygni	+33	29		40	59.53	59.47		−11−7−10−4−10−8−3−3−2		6
η Cephei	+61	20		42	39.76	39.69		−15−17+11−4−11−4+2−18		(7)
μ Aquarii	−9	28		45	~~41.61~~	41.73	41.61	+19+12+10+9+9+12+7+15+19	12	
32 Vulpeculae	+27	34		49	3.74	3.76		+7+9+3−1−0−2−1−1−0+1+2	2	
ν Cygni	+40	40	20	52	21.88	21.86	21.85	−1−6−2+2+0+1+1+2−6−6−5		2
61 Cygni	+38	07	21	1	6.92	6.94	6.98	+5+14+7+2+3−1+2−8+1+2−1	2	
ζ Cygni	+29	42		7	26.86	26.79	26.78	−7+5−15−13−1−12−1−5−3−12−8−11		7
τ Cygni	+37	30		9	38.52	38.55		~~−2+10+3+5+0+1+0−1+2−7~~	8	
α Cephei	+62	02		15	29.95	29.86	29.95	−24−9−25−15+4−13+4−11−1−8+4−10 ✓		(9)
1 Draconis	+98	06		18	29.44	29.36	29.45	−19+3+5−10−3+8−23−23		(8)
24 Urs. Maj	+109	36		23	~~1.99~~	1.94	1.82	−19+17+13+20+30−1	(12)	
β Aquarii	−6	8		24	45.99	46.06	46.00	+7+4−2+7+16+14+3	7	
β Cephei	+70	00		26	59.18	59.22	59.16	+5−8+8+4+15−12+3+19+5+5−1+6	(4)	
ε Pegasi	+9	17		37	50.99	51.02	51.03	+4+6+1+6+1+4−2+6+4+1+5	3	
11 Cephei	+70	43		40	1.45	1.37	1.45	−17+4−14		(8)
π₁ Cygni	+48	43		42	1.73	1.74		+7−6+1+0+14+11+2−9−1−5	1	
16 Pegasi	+25	19		47	11.58	11.63		+5+5+8+9+6+3+2	5	
α Aquarii	−0	54	21	59	9.46	9.48	9.44	+2+4+6+3+8+3+2−4+1+8+7+7	4	
ι Pegasi	+24	43	22	1	0.37	0.41		+5+6+4+9+9+1+1−2−2+3+5	4	
θ Pegasi	+5	34		3	41.54	41.56		+0+5−1+7+5+3+0+6+3−3	2	
ζ Cephei	+57	34		6	22.80	22.83		+7−5−6+9+4+5+8+3 [illegible] +14+1	(3)	
θ Aquarii	−8	25		10	1.59	1.53	1.51	−1−0−6−7−11−5−4−7−9−9−6		6
γ Aquarii	−2	2		14	59.66	59.58		+7+0−1−1+5+3+1	2	
3 Lacertae	+51	35		18	29.40	29.40		+8+0−6+3+5−2+2−7−4+0	0	
9 Draconis	+103	37		24	3.73	3.41	3.80	−33−39−57−20−10−51−21		(32)
7 Lacertae	+49	37		25	58.69	58.78		−2+6+12+21+12+6	9	
η Aquarii	−0	47		28	43.58	43.66	43.60	+6+5+5+7+6+9+9+9+12+8	8	
226 13 Cephei	+75	34		30	~~0.01~~	59.95	0.01	+0−4−1−3+25−9−26−20+3−33		(6)
ζ Pegasi	+10	10		35	1.68	1.75	1.66	+4+6+7+12+9+8+7+1+5+10	7	
η Pegasi	+29	33		36	57.46	57.45		+2+1−6−6+6−2−4+7−2−4−4−2		1
13 Lacertae	+41	09		38	20.49	20.47		+6−3−1−11+4−10−6+5		2
λ Pegasi	+22	53		40	19.12	19.15		+2+5+4+5+9+0+1+4−2	3	

Limestars = +1.27 − 84
Stars above 51° 30' = +.89 − 92

+1.67 — 1.78

R. A.

Star	δ		Pulcova			Camb.	Naut. Al.	Individual corrections to Pulcova	Prime corr-ections to Pulcova +	−
	°	′	h	m	s					
ψ Pegasi	+23	55	22	43	46.76	46.74		−4−5+4−5+2+1−0−6−0−3		2
ι Cephei	+65	31		45	55.55	55.51	55.52	+6+3−15+7+0−17−13		(4)
λ Aquarii	−8	16		45	52.97	53.03	52.95	+4+9+8+2	6	
α Piscis Aust.	−30	18		50		31.12	31.06	−2+6+4+8+15+12−3+8	6	
ο Androm.	+41	38		55	59.37	59.36		+9+5+3+2−3−9−8−8−3−2		1
α Pegasi	+14	31	22	58	20.18	20.18	20.16	−4−6−7+1−2+2+6+2+1−3+9+4		0
γ Piscium	+2	35	23	10	28.66	28.72		+2+10+14+0+11+7+7−1	6	
τ Pegasi	+23	02		14	15.26	15.26		−4+0+1+10−5−5+5+2		0
υ Pegasi	+22	42		18	56.59	56.59		+3+0+1+1−1−4−1−1+5		0
θ Piscium	+5	40		21	25.46	25.53	25.46	+2+3+6+12+7+9+3+13	7	
λ Draconis	+109	57		23	43.03	43.13	43.01	~~+15−34−2+18−1+3+40+14+22~~ +15−2+18−1+3+13+17+22	(10)	
λ Androm.	+45	46		31	15.44	15.34		−12−8−8−10−9−9−11−10−11	~~(10)~~	~~15~~ 10
ι Piscium	+4	56		33	18.95	18.99	18.99	+10+9−4+2+3	4	
γ Cephei	+76	55		34	4.26	4.35	4.20	+28−12+14+32+3−1+0	(9)	
φ Pegasi	+18	24		45	55.65	55.63		−0−1−8+1+1−3−6+3		2
ρ Cass.	+56	44		47	56.86	56.90		+0+9−2+6+6+8+3+10+5−2	(4)	
ω Piscium	+6	09		52	41.23	41.28	41.28	+3+1+14+1+11−2+5+9	5	
									48	19

time stars = +.34 −.15 | 2.29 | 1.95

stars above 51° 30′ = +.14 −.04 | 1.67 | 1.95

4.36 | 3.90

Sum of residuals.

Sum of plus residuals from 12^h to 0^h (a few stars as far as 3^h included = +4.36 s

Sum of minus " " " " " " = −3.90

For time stars (for the most part only stars below 61° 30′) sum of plus residuals = +2.54

For ~~stars above 61° 30′~~ time stars " minus " = −1.87

For stars above 61° 30′ the sum of plus residuals = +1.72

For stars " " " " " " minus " = −2.03

Notes on the form and order of computation.

I The preliminary computation is in pencil. The order is

mean of wires
R.A.
~~time~~ T−RA
clock error
n tan δ
Red. to 1871.0
α for 1871.0

In this computation the diurnal aberration was not applied except for dates after Dec 29. The average resulting error in n is about .016^s

Having found the mean places for 1871, they were with inexcusable carelessness, then corrected for aberration, this correction having already been taken account of in the T−RA.

In this computation where pole stars were corrected for aberration, the correction was added to the ephemeris. This does not seem to be the most convenient way of proceeding.

II In the second computation the order is as follows.

1 Mean of wires carried to thousandths of seconds. (in blue)
2 The same corrected for aberration time. The aberration correction is written on the left.
3. The tabular right ascension corrected for error of ephemeris as derived from the first computation. As the aberration was wrongly applied, the star places are all too small by about .017s, this being the correction due to aberration for the mean declination of the stars on which the clock error rests. (stars as far as 51° 30' mainly)
4 T−RA in blue.
5 T, corrected for aberration (in red)
6 Clock error (in red). The clock errors are found from the new T−RA (in this book). For several hours, the n is derived thus:
(a) A normal equation for time is formed from stars up to 51° 30'
(b) n is derived from this equation and all equations for pole stars by least squares. The final n adopted is written in red in (Books 1-2-3) above the dates.
After it became obvious from the reductions that the weight of n was nearly or quite the same for any declination between 70° and 88°, however, n was derived from each pole star and the mean taken. This course will be pursued till further notice.
7 n tan δ (in red)
8 Reduction to 1871.0 (in red)
9 Mean place for 1871.0 (in red)
10 The value above, corrected for error of aberration time (in red). included in the value of ΔT+m employed. This correction .017^s is applied in two cases as .02^s and in the third as .01^s, this order being repeated for the whole number of observations.
11 The final mean places are placed in red at the top of the page below the Pulcova place (in pencil) and the individual corrections are also placed at the top of the page. Tan δ is placed usually in pencil under the declination.

In order to correct for the error of aberration already included in ΔT+m for stars not fundamental, the correction −(Diurnal Aberration + .017^s) will be applied.

Clock errors and instrumental errors.

Date		T		n	4T+m	Daily Rate		Hourly Rate	Clock corrections at even hours.				
Apl		h	m	s	s								
Ap.	26	12	20	−.032	+3.29								
	29	12	10	.089	3.40								
	30	12	20	.090	3.27								
May	1	12	40	.105	3.19								
	2	12	20	.149	3.05								
	9	13	10	.106	3.00								
	10	12	50	.109	2.90								
	11	12	40	.182	2.98								
	14	13	20	.096	+2.41								
June	6	13	10	.391	−0.13	−	.22	−.009					
	12	14	00	.420	1.44	−	.15	6					
	14	14	00	.399	1.74	−	14	6					
	17	14	00	.455	2.15	−	18	7					
	19	14	30	.408	2.57	−	00	0					
	21	14	10	.481	2.52	−	8	3					
	25	14	20	.421	2.86	−	7	3					
	26	14	40	.423	2.93	−	10	4					
	27	14	20	.398	3.03	−	7	6					
	29	14	00	.408	3.57	−	27	11					
	30	14	40	.400	3.67	−	11	4		15h	16h	17h	
July	1	14	40	.410	3.85	−	17	7					
	3	14	40	.422	4.16	−	16	7	//	−4.16	.17		
	7	15	10	.500	6.38	−	55	23	//	6.38	40		
	8	15	20	.500	6.94	−	53	22	//	6.93	.95		
	9	15	40	.557	7.44	−	53	22	//	7.45	.47		
	10	15	10	.500	8.22	−	76	31	//	8.22	.25		
	12	15	20	.535	9.15	−	47	20	//	9.14	.16		
	13	15	30	.612	9.64	−	44	19	//	9.63	65		
	20	15	50	.477	12.70	−	31	13	//		12.70	.71	
	22	16	04	.572	13.31	−	8	3	//		13.31	.31	
	23	15	40	.501	13.38	−	13	5	//		13.38	.38	
	27	16	10	.525	13.94	−	24	10	//		13.94 1'	95	
Aug	2	16	40	.508	15.40	−	14	6			15.39	.40	
	3	16	10	.579	15.54	−	36	15			15.54	.56	
	5	16	50	.573	16.28	−	37	15			16.26	.28	
	6	16	40	.526	12.65	−	30	13			12.64	.65	
	9	16	40	.573	13.55	−	33	14			13.54	55	
	10	16	40	.558	13.87	−	10	4			13.87	87	
	11	16	50	.556	13.97	−	20	8			13.97	98	
	13	16	50	.553	14.48	−	25	10			13.48	.49	
	17	18	00	.550	15.52	−	24	10					
	18	18	30	.528	15.76	−	15	6					
	19	17	40	.500	15.89	−	27	11					
	22	17	40	.450	16.70	−	22	9					
	28	19	40	.497	18.02	−	29	13					
	29	16	(11)	.520	18.31	−	37	15					
	31	17	50	.613	19.06	−	33	14					
Sept.	1	17	50	.622	19.39	−	28	11					
	2	18	30	.459	19.68	−	27	11					
	3	18	00	.556	19.94	−	27	11					
	6	18	20	.564	20.75	−	42	18					
	7	18	20	.547	21.17	−	9	6					
	10	18	30	−.449	21.64	−	20	8					
	18	18	20	−.041	23.19	−	14	6					
	21	18	40	+.011	23.60	−	0	0					
	23	19	10	+.040	23.59	−	15	6					
	24	19	10	+.027	23.75	−	22	9					
	25	19	10	+.045	23.97	−	22	9					
	27	22	40	.112	5.50	−	22	2					
	28	20	00	.100	6.03	−	15	6					
	30	21	10	.082	8713(n.b)		0	0					
Oct.	3	22	40	.057	6.16	−	4	0					
	4	21	40	.059	6.87	−	23	9					
	5	20	10	.048	6.46	−	9	3					
R	8	19	50	.065	6.88	−	14	6					From 18h 59m to 20h 33m
M	8	21	40	.065	6.99	−	14	6					21 1 22 3
R	8	22	40	.065	6.92	−	14	6					22 15 22 58
R	9	20	30	.025	6.84	+	4	2					20 5 20 37
M	9	20	50	.025	6.94	+	0	1					20 41 21 18
R	9	23	10	.003	6.91	+	0	0					22 44 23 23
M	9	22	40	.059	−7.00	+	0	0					22 24 22 45

Date	T h m	n s	$\Delta T+m$ s	Daily Rate	Hourly Rate
Oct 15	20 30	+.079	−7.51	−.08	−.003
R 16	19 40	.079	8.22 (N.C.)	00	0
M 16	22 00	.079	7.81	18	10
M 16	23 30	.079	7.86	00	0
R 16	20 30	.079	7.73	00	0
21	21 00	.133	7.79	00	0
22	22 40	.147	7.81	− 02	0
23	20 30	100	−7.96	− 24	− 10
29	22 00	119	9.42	+11	+ 5
30	20 30	200	9.31	+ 8	+ 3
31	22 10	180	9.23	− 15	− 6
Nov. 2	20 30	192	9.53	− 2	− 1
5	21 40	200	9.60	− 2	− 1
7	21 40	240	8.97	+ 31	+ 12
9	22 00	213	8.62	+20	+ 8
12	22 40	220	8.02	+.61	+ 25
13	22 40	220	7.41	+.32	+ 13
19	22 00	350	5.57	+ 28	+ 12
22	22 30	253	4.66	+17	+ 7
23	22 50	150	4.49	+39	+ 15
25	23 00	214	3.71	+34	+ 14
28	22 00	250	2.55	+55	+ 23
28	22 40	280	2.71	+55	+ 23
29	0 40	274	2.11	+.72	+ 30
Dec 1	1 50	366	−0.67	+ 76	+ 32
2	1 40	376	+0.09	+55	+23
5	22 40	379	1.67	+67	+27
M 6	22 50	.450	2.98	+67	+ 27
R 6	1 30	.430	2.46	+65	+26
9	2 10	355	4.52	+75	+31
11	1 40	369	6.01	+.61	+26
12	0 0	387	6.62	+.80	+33
R 17	23 20	376	10.61	+.75	+30
M 17	2 30	400	10.60	+.75	+30
18	3 00	350	11.47	+.52	+22
20	0 00	305	12.45	+1.05	+43
24	0 40	360	16.71	+.64	+27
27	1 20	360	18.61	+.98	+41
28	1 30	451	19.59	+.98	+41
29	2 40	+445	20.04	+.91	+38

Clock errors at even hours

From 19h 14m to 19 49
19 14 — 19 45
21 59 — 22 26
23 14 — 23 46
20 17 — 21 48

	21h	22h	23h	0h	1h	2h	3h
	6.52	5.57	5.50				
	4.66	.64	.67				
	4.52	50	49				
	3.74	72	.71				
To 22h 15m	2.75	73	.71				
			2.16	13	10	7	
		−	73	70	67	64	
		+	5	8	10	12	
		1.65	.68	70	73		
		2.45	48	51	53		
				2. 2.41	44	.47	.50
					4.49	.52	.55
					5.59	02	05
			6.59	62	65	.68	
			10.60	63	66		
					10.56	.59	.62
						11.45	47
			12.41	45	.49		
				16.69	.72	.75	
				18.56	60	.64	
				19.58	57	61	65
					20.47	.51	.55

From 21h 42m to 23h 53m
0 2 — 2 0

For first set of values of n and $\Delta T+m$ see Instrumental Constant Book (1)

Jan 1 1872

n = +.39

n = +.398

[illegible] +.04

T h	m	θ = ΔT−RA	tan δ	n tan δ	−(ΔT+m)		
1	25	0 = −23.56	+ .26	+.01	−23.46	23.56 +.10 −23.46	
1	30	23.87	+1.11	+.42	45	.87+.44	43
1	35	23.53	+.08	+.03	50	.53+.3	50
1	39	23.48	+.15	+.06	42	.51+ 6	45
1	48	23.62	+.37	+.14	48	.62+.15	47
1	56	23.81	+.89	+.55	46	.84+.35	49
2	00	23.61	+.42	+.16	45	.68+.17	51
2	2	23.72	+.68	+.27	45	.70+.27	43
2	21	23.41	+.14	+.06	35	.45+.06	39
2	31	23.56	+.39	+.16	40	.56+.16	40
2	37	23.37	+.05	+.02	35	.40+.2	38
2	42					.68+.20	48
2	45	23.96	+1.29	+.51	45	.97+.51	48
2	56	23.54	+.06	+.02	52	.53+.06	47
2	57	23.85	+.79	+.31	.54	.84+.32	52
3	00	23.82	+.85	+.33	49	.82+.34	48
3	04						
3	15	24.01	+1.17	+.46	.55	.90+.46	44 23.46
2	35	23.67	+ .54		− 23.46	23.68	

h	m	s			
2	00	0 = −24.28	+ 2.24	+.88	23.40
2	18	−24.22	+ 2.34	+.91	23.31
2	28	−21.57	−4.10	−1.60	23.17
2	51	−22.01	− 3.65	−1.43	23.44
3	04	−25.33	+ 4.42	−1.72	23.61
					23.39

n

0 = −0.61 + 1.70 + .36
55 1.80 + .31
~~[illegible]~~ − 4.64 + .45
2.10 =
1.66 4.19 + .40
1.66 3.88 + .43
+.39

2	4	0 = −24.36 −.02	−24.38 + 2.24	+.41
2	18	24.25 − 1	24.26 + 2.34	.32
2	28	21.48 − 0	21.48 − 4.10	47
2	51	22.13 + 1	22.12 − 3.65	38
3	4	25.29 + 2	25.27 + 4.42	41

380 425

±.036

2 35

dT+m = +23.46 at 2h 35m

n
0 = −0.70 + 1.70 = +.41
58 + 1.80 +.32
2.20 + 4.64 +.47
1.56 + 4.19 +.38
1.59 + 3.88 +.41
.398

Jan 2 1873

n = +.38

n = +.380

h	m	s					
0	26	0 = −25.12	+1.90	+.72	−24.40	−25.12 +.72	24.40
0	34	24.99	+1.47	+.56	.43	24.57+.56	.41
0	56	24.34	+.13	+.05	.29	24.38+.05	.33
1	3	24.70	+.70	+.27	.43	24.67+.27	.40
0	45	0 = −24.79	+1.05		−24.39	24.79	24.39

h	m		
0	28	0 = −22.92	−2.83
1	22 44	−25.40	+2.69

n
0 = −1.87 + 4.88 = .38+
−0.61 + 1.64 .37+
.38

0 1 0 = −24.53 + 54

0	28	0 = −22.84 −.01	−22.85 −2.83
1	22	25.37 + 2	25.35 + 2.69

dT+m = +24.39 at 0h 45m

n
0 = −1.95 + 3.88 = +.40
−0.58 + 1.64 = +.36
+.380

1872 Jan 5

n = +.41

$4\,dT_h = +.94$

n = +.392

h m				
2 21	0 = -26.73 + .14 + .06	- 26.67	0 = -26.76 + .05 = 26.71	
2 31	26.89 + .39 + .16	.73	26.91 + .15	.76
2 35	27.17 + 1.14 + .46	.71	27.17 + .45	.72
2 42	26.88 + .50 + .21	.67	26.88 + .20	.68
2 45	27.18 + 1.29 + .53	.65	27.23 + .51	.72
2 56	26.84 + .06 + .03	.81	26.73 + 3	.70
3 00	27.12 + .85 + .35	.77	27.12 + .33	.79
3 15	27.40 + 1.17 + .47	.93	27.29 + .46	.83
3 18	26.80 + .125 + .06	.74	26.81 + .06	.75
3 27	26.58 - .17 - .06	.64	26.65 - 7	.72
3 34	27.18 + 1.09 + .44	.74	27.19 + .43	.76
3 40	26.95 + .44 + .18	.77	26.96 + .17	.79
3 54	26.81 + .21 + .08	.73	26.86 + .8	.78
3 59	27.08 + 1.09 + .44	.65	27.15 + .43	.72
4 12	26.85 + .27 + .11	.74	26.85 + .11	.74
3 13	26.96 + .50	26.73	26.97	26.74

h m			
2 49	0 = -28.75 + 5.10	- 27.73	
3 04	28.46 + 4.42	28.46	
~~3 18~~	~~26.10~~		
3 30	- 27.49 + 1.94	27.50	
3 49	24.35 - 4.78	24.87	

		n
0 = -.77	+ 4.52	+ .39
1.50	3.84	+ .39
.54	1.36	+ .40
2.28	5.36	+ .48
		+ .41

3 48 0 = -24.30 - 4.78

$dd_hT = +.03$

2 49	0 = -28.77 - .02	- 28.79 + 5.10	+.40
3 4	28.41 - .00	28.41 + 4.42	.37
3 30	27.45 + 1	27.44 + 1.94	.35
3 49	24.78 + 2 .77	24.57 - 4.78	

.45

.373

n

0 = -1.80 + 4.52 = +.40

-1.44 + 3.84 = +.38

~~-0.48 + 1.36 = +.35~~

-2.29 + 5.36 = +.40

+.392

3 54 26.81 + .20

3 59 27.08 + 1.09

4 12 26.85 + .27

dT + m = +26.74 at 3h 13m

Jan 6 1873

n = +.39

n = +.375

2 24	0 = -27.27 + .14 + .06	- 27.22	0 = -27.31 + .05 = 27.26	
2 31	27.43 + .39 + .16	.27	27.45 + .14	.32
2 35	27.78 + 1.14 + .45	.33	27.64 + .43	.25
2 42	27.47 + .50 + .20	.27	27.47 + .17	.28
2 45	27.46 + 1.29 + .51	.25	27.81 + .48	.33
2 56	27.31 + .06 + .02	.29	27.30 + 2	.28
3 00	27.66 + .85 + .34	.32	27.66 + .32	.34
3 18	27.34 + .15 + .06	.28	27.35 - .06	.29
3 20	27.17 + .16 + .06	(.11)	27.27 + 6	.21
3 24	27.38 + .22 + .09	.29	27.35 + 8	.27
3 27	27.19 - .17 - .07	.26	27.26 - 6	.32
3 34	27.76 + 1.09 + .44	.32	27.77 + .41	.36
3 40	27.51 + .44 + .17	.34	27.52 + .16	.36
3 46	27.59 + .61 + .24	.35	27.56 + .23	.33
3 49	27.60 + .83 + .32	.28	27.68 + .31	.37
3 17	27.48 + .48 .52	- 27.29	27.54	

		n
2 18	0 = -28.03 + 2.34 - 27.99 =	+ .37 38
2 49	0 = -29.23 + 5.10 - 29.21	
3 04	0 = -29.12 + 4.42 = -29.10	
3 30	0 = -28.11 + 1.94 - 28.12	.44

		n
0 = -.51	+ 1.86	= + .28
1.63	+ 4.62	+ .35
1.94	+ 3.94	+ .49
0.64	+ 1.46	+ .44
		+ .39

2 18	0 = - 28.10 - .03	- 28.13 + 2.34	.34
2 49	= - 29.25 - 2	- 29.27 + 5.10	.38
3 4	= - 29.08 - 0	- 29.08 + 4.42	
3 30	0 = - 28.06 + 1	- 28.05 + 1.94	

3 46 27.59 + .61

3 49 27.60 + .83

dT + m = 27.30 at 3h 17m

		n
0 = -0.63 +	1.86	= +.34
= -1.77 +	4.62	= +.38
= -1.58 +	3.94	= +.40
= -0.55 +	1.46	= +.38
		+.375

Jan 8

Assume n = +.42   n = +.420

h	m	s					
1	25	0 = −28.96 +.26 +.11	28.85	0 = −28.98 +.11 −	28.87	1 22	0 = −~~24.17~~ 30.26 +2.69
1	30	29.27 +1.11 +.45	.82	29.27 +.45	.82		
1	35	28.93 +.08 +.03	90	28.92 +.03	.89		
1	39 ~~32~~	29.01 +.15 +.06	95	29.02 +.06	.96		
		+.40		29.05	28.89		
1	32	29.04 +.40	28.88			1 22	0 = −30.22 +2.69
3	39	29.27 + .44 +.18	29.09	29.29 +.15	29.11		0 = −1.17 + 2.29
3	46	29.81 +1.78 +.75	29.06	29.77 +.75	29.02		0 =
3	49	29.27 + .83 +.37	28.99	29.35 +.37	28.98		
3	54	29.13 + .20 +.08	29.05	29.17 +.08	29.09		
4	12	29.19 + .27 +.11	29.08	29.13 +.11	29.02		
4	15	29.11 +.31 +.13	28.99	29.17 +.13	29.04		
4	21	29.71 +1.36 +.57	29.14	29.60 +.57	29.03		
3	59		29.05		29.04		

dT+m = 28.89 at 1h 32m
dT+m = 29.04 at 3 59

Jan 9

a, dT = +.03

			n = +.44	n = +.430			
1	25	0 = −29.80 +.26 +.11	29.69	0 = −29.82 +.11 −	29.71	1	11
1	30	30.18 +1.11 +.49	.69	30.18 +.48	70	1	52
1	35	29.74 +.08 +.04	70	29.73 +.08	70	2	18
1	39	29.83 +.15 +.06	77	29.83 +.06	77	1	22
1	48	29.85 +.37 +.16	69	29.85 +.16	69		
1	56	30.04 +.89 +.39	65	30.08 +.38	70		
1	59	29.91 +.42 +.18	73	29.87 +.18	69		
2	2	30.00 +.68 +.30	70	29.99 +.29	70		
2	5	30.20 +1.21 +.53	.67	30.21 +.52	69		
1	46	−29.95 +.57	29.70	29.95	29.71	1 1 2 1	11 52 18 22

−48.62   48.60
0 = ~~+0.99~~ +41.84 +.02 + ~~1.01~~
−30.78 + 3.04 +.00 −30.71
30.71 + 2.34 −.02 −30.73
−30.90 +2.69 +.01 −30.89

n
0 = −41.27 +18.65   +.45
0 = −2.47 + 1.88 = (+.34)
−1.77 + .78   +.44
−2.12 + .94   +.44

0 = −49.12 + 41.52 −.01 − 49.13
= −30.80 + 3.04 + 0   30.90
30.72 + 2.34 + 2   30.71
30.86 + 2.69 +.03   30.83

dT+m = +29.71 at 1h 46m

n
0 = −19.17 + 41.25 = +.46
−0.95 + 2.47 = +.39
−0.78 + 1.77 = +.44
−0.91 + 2.12 = +.43
(+.430)

Jan 10

n=3.94

n = +.41

2 45 0 = −31.21 + 1.29 + .53 − 30.68 − 31.26 + .50 2 48
2 56 30.66 + .06 + 02 64 30.67 + 02 2 51
2 57 31.05 + .79 + 32 73 31.04 + 31 3 04
3 00 30.90 + .85 + 35 55 30.91 + .33 68

2. 54 30.95 + .75 30.65 30.96 30.67

4 21 − 30.70 + .34 + 14 30.56 − 30.80 4 41
4 28 30.88 + 29 + 12 71 30.83
4 30 30.58 − .06 − 02 60 30.67
4 37 31.44 + 1.51 + .62 82 31.38
4 52 31.56 + 1.75 + .72 84 30.65
4 34 30.71 1.95
30.98

+61

4 58 − 30.88 + 139 + 16 30.67 4 59
5 03 30.67 − .16 − 05 72
5 5 31.02 + .79 + 31 71
5 7 31.29 + 1.03 + 42 87
5 8 30.59 − .13 − .06 .65

5 04 30.86 + .38 30.72

add = +.04

0 = −29.72 + 5.10 − 32.77 − 00 − 32.77
32.45
29.14 − 3.65 − 29.24 − 00 − 29.24
32.49 + 4.42 = 32.45 + 01 − 32.44

n

0 = −1.80 + 4.35 = +.41
−1.81 + 4.40 +.41
−1.54 + 3.67 +.42

n

0 = −1.78 + 4.35 = +.41
= −1.72 + 4.40 +.39
= −1.49 + 3.67 +.41

0 = −31.57 + 2.26 + 93 − 30.64 +.41
31.63

0 = −28.11 − 7.35 n = +.36 − 28.07

0 =

T. R.A. for
Correct 4 41 is − .20

2 45 4 21 0 = −30.80 + 34 + .13 − 30.67
2 56 4 28 30.83 + 29 + .11 72
2 4 30 30.67 + .06 − .02 69
4 37 31.38 + 1.51 + .59 79
4 32 30.68 − .06 − 2 70
4 48 30.98 + 65 + .26 72
~~4 52 30 + .75~~
4 55 30.93 + .39 + .15 78
~~4 47~~
5 03 30.67 − 16 − .06 73
5 05 31.12 + 79 + .31 81
5 07 31.20 + 1.03 + .41 79
5 08 30.60 − 15 − 6 66
4 44 30.90 + .42 30.73

4 41 0 = −31.63 + 2.26
4 59 −28.07 − 7.41

n

0 = −0.73 + 1.84 = +.40
−2.83 + 7.83 = +.36

+.41
−.39
+.41
+.40
−.36
.394

±.013

s h m
dT + m = +30.67 at 2 54
30.72 " 4 49

Jan 12

n = +.41 n = +.405

3 53 0 = − 2.66 + .21 + .09 − 2.57 − 2.73 + .08 − 2.405 4 1
3 59 3.08 + 1.09 + .45 .63 3.14 + .44 40 59
4 12 2.86 + .27 + 11 .75 2.85 + .11 .74
4 16 2.79 + .31 + 13 .66 2.84 + 13 .71
4 21 2.86 + .34 + 14 .72 2.87 + .14 .73
4 37 3.34 + 1.51 + 62 .72 3.28 + .61 .67
4 49 2.96 + .65 + 27 .69 2.95 + 26 69 n .71
4 52 3.54 + 1.75 + 72 .82 3.43 + 71 72
5 5 3.03 + .79 + 31 .72 3.02 + 32 71
5 7 3.25 + 1.03 + 42 .83 3.16 + .42 74
~~5 8~~ + .75

4 31 − 3.04 + .79 2.71 3.03

0 = −3.61 + 2.26
+ 0.27 − 7.35 + 0.28

n

0 = − .62 + 1.47 = + .49
0 = − 3.31 8.14 .41

4 41 0 = −3.63 − 00 − 3.63 + 2.26
4 59 0 = +0.28 + 1 + 0.29 − 7.41

n

0 = −0.60 + 1.47 = +.41
3.32 + 8.20 = .40
.405

s h m
dT + m = + 2.71 at 4 31

Jan 13 1872

n = +.37

h	m					
2	57	o = −3.26	+.79	+29	2.97	
3	00	3.25	+.85	+.31	2.94	
3	15	3.52	+1.17	+.43	3.09	
(3	20)	(2.81	+.16)			
3	23	3.10	+.22	+.08	3.02	
3	27	2.82	−.17	−.06	2.88	
3	31	3.77	+1.94	+.72	3.05	
3	34	3.45	+1.09	+.40	3.05	
3	40	3.11	+.44	+.16	2.95	
3	46	3.65	+1.78	+.66	2.99	
3	49	3.12	+.83	+.31	2.81	
3	59	3.27	+1.09	+.40	2.87	
3	29	3.30	+.82		2.97	

2 48 o = −4.73 + 5.10
3 04 − 4.64 + 4.42

n
o = −1.43 + 4.28 = + .34
o = 1.34 3.60 + .40
74
.87

n = +.387

2	57	o = −3.25 +.79 +.31	−2.94
3	0	−3.25 +.85 +.33	.92
3	15	−3.42 +1.17 +.45	.97
3	20	−2.91 +.16 +.06	.85
3	23	−3.07 +.22 +.09	.98
3	27	−2.89 −.17 −.07	.96
~~3~~	~~31~~		
3	34	−3.36 +1.09 +.42	.94
3	40	−3.12 +.44 +.17	.95
3	46	−3.13 +1.78 +.69	.94
3	49	−3.20 +.83 +.32	.88
3	59	−3.34 +1.09 +.42	.92
3	29	−3.22 +.77	2.93

2 48 o = −4.76 + 5.10
3 4 −4.59 + 4.42
3 30 −3.72 + 1.95

n
o = −+1.54 + 4.83 = +.36
− 1.37 + 3.65 = +.38
− 0.50 + 1.18 = +.42
116
+.387

$dT + m = +2.92^s$ at $3^h\ 29^m$

Jan 14 1872

n = +.41

2	10	o = −3.23	+.66	+.27	2.96
2	31	3.09	+.39	+.16	.93
2	35	3.42	+1.14	+.47	.95
2	42	3.16	+.50	+.20	.96
2	45	3.39	+1.29	+.53	.86
2	57	3.43	+.79	+.32	1.11
3	00	3.53	+.85	+.35	(1.18)
2	40	3.32	+.80		2.96

1 11 o = −21.70 + 41.14
2 4 − 3.71 + 2.24
2 18 3.62 + 2.34
3 04 4.69 + 4.42

n
o = −18.88 + 41.04 = +.45
{− 0.39 + 1.44 + .27}
{− .30 + 1.54 + .20} rej. hereafter.
− 1.37 + 3.62 + .38

n = +.387

2	10	o = −3.19 +.66 +.26	−2.93
2	31	−3.10 +.39 +.15	.95
2	35	−3.41 +1.14 +.45	.96
2	42	−3.16 +.50 +.19	.93
2	45	−3.44 +1.29 +.50	.94
2	57 Jan 15?	−3.42 +.79	
3	00 " "	−3.53 +.85	
2	33	−3.26 +.80	2.95

1 11 o = −18.20 + 41.82
2 4 −3.82 2.24
2 18 −3.84 + 2.34
3 4 −4.63 + 4.42

n
o = −15.94 + 41.02 = +.39
−0.56 + 1.44 = +.39
−0.58 + 1.54 = +.38
24
+.387

$dT + m = +2.95^s$ at $2^h\ 33^m$

Jan 15 1872

n = +33

~~n = +35~~

3 15	0 = −3.58 + 1.17	+41	−3.77	+39	(3.19)	2 48	0 = −4 80 + 5 10
3 18	3.15 + 15	+05	10	+05	10	3 49	1.51 − 4.78
(3 20	(2.95) + 16	+05	(2.80)	+05	(2.90)		
3 23	3.15 + 22	+08	07	+07	.08		
3 31	3.65 + 1.94	+68	97	+65	0.0		
3 34	3 39 + 1.09	+38	01	+36	03		
3 40	3.18 + 44	+15	03	+15	03		
3 46	3.62 + 1.78	+62	00	+59	03		
3 59	3.34 + 1.09	+38	96	+36	98		
4 12	3.08 + 27	+10	98	+09	99		
4 16	3.07 + 31	+11	96	+10	97		
4 21	3.15 + 34	+12	03	+17	04		
4 28	3.14 + 29	+10	04	+10	04		
3 48	−3.27 + .68		3.08		3.03		

0 = −1.53 + 4.42 = +.34
−1.76 + 5.46 = +.32

+.33

n = +.350

2 57	0 = +1.17 − 3.42 + .79	+26	3.16	2 48	0 = −4.82 + 5.10
3 0	+ .15 − 3.53 + .55	+.30	.23	3 4	−4.63 + 4.42
3 15	+ .16 − 3.47 + 1.17	+.41	3.06	3 49	−1.52 − 4.78
3 18	+ .27 − 3.14 + 15	+.06	3.08		
3 20	+ .1 − 3.05 + 16	+.06	2.99		
3 23	−3.12 + 22	+.08	3.04		
3 31	−3.60 + 1.94	+.68	2.97		
3 34	−3.40 + 1.09	+.38	3.02		
3 40	−3.19 + 44	+.16	3.03		
3 46	−3.60 + 1.78	+.62	2.98		
3 59	−3.41 + 1.09	+38	3.03		
4 12	−3.05 + 27	+09	2.99		
4 16	−3.13 + .31	+.11	3.02		
4 21	−3.15 + .34	+.12	3.02		
4 28	−3.14 + .29	+.10	3.04		
3 40	−3.30 + .72		3.02		

0 = −1.52 + 4.87 = +.35
−1.33 + 3.69 = +.37
−1.78 + 5.51 = +.33

15

+.350

$dT + m = +3^s.02$ at $3^h\ 48^m$

Jan 21 1873

n = +.37

1 56	0 = −5.58 + .89 + .33	−5.25
2 00	5.51 + .42 + .16	35
2 11	5.21 − .12 − .04	25
2 21	5.27 + .14 + .05	22
2 07	−5.39 + .33	−5.27

~~2 51 0 = −4.13 − 3.66~~

1 10 0 = ~~+17.21~~ −21.37 + 41.84
1 52 −6.35 + 3.04
2 4 −6.18 + 2.24
2 18 −6.14 + 2.34
2 28 −3.90 − 4.10

0 = −15.88 + 41.51 = +.38
−0.96 + 2.71 = +.35
−0.79 + 1.91 = +.41
−0.95 + 2.01 = +.37
−1.49 + 4.43 = +.34

.37

n = +.376

1 56	0 = −5.61 + .89 + .33	−5.28
2 00	−5.48 + .42 + .16	.32
2 11	−5.26 − .12 − .05	.31
2 21	−5.31 + .14 + .05	.26
2 7	−5.41 + .33	−5.29

1 11 0 = −20.77 + 41.42
1 52 = −6.63 + 3.42
2 4 = −6.15 + 2.24
2 18 = −6.17 + 2.34
2 28 = −3.80 − 4.10

$dT + m = +5^s.29$ at $2^h\ 4^m$

0 = −15.36 + 41.49 = +.37
= −1.02 + 2.71 = +.38
= −0.74 + 1.91 = +.39
= −0.76 + 2.01 = +.38
= −1.61 + 4.43 = +.36

+.009

+.376

Jan 23 1872

h	m		s			n = +.38
~~2~~	~~10~~	0 =	~~−3.23 + 66~~			
2	56		5.41 + .06	+ .02	−	5.39
2	57		5.67 + .79	+ .30		38
3	00		5.66 + .85	+ .32		34
3	4		5.57 + .26	+ .10		47
3	23		5.58 + .22	+ .08		45
						−5.40
3	04		−5.68 + .44			

57

h m
2 51 0 = −4.13 − 3.66
0 = −5.68 + 44
0 = −1.65 + 4.10 n = +.38

.376
.343
.360

n = +.360

2	56	0 = −5.40 + .06 + 02	−	5.38
2	57	−5.64 + .79 + 29		37
3	0	−5.66 + .85 + 30		36
3	4	−5.55 + .26 + 09		46
3	23	−5.50 + .22 + 08		42
3	4	−5.55 + .44		−5.40

2 51 0 = −4.22 − 3.66 ?
0 = −5.54 + 44
0 = −1.32 + 4.10

$d T + m = +5\overset{s}{.}40$ at $3^h\ 4^m$

Corr^d a Persei by −.12^s

Jan 24 1872

h	m		s		n = +.39	
2	33	0 =	−5.50 − .01	− .00	−	5.50
2	37		5.42 + .05	+ .02		40
2	42		5.64 + .50	+ .20		44
3	04		5.72 + .36	+ .13		(59)
3	15		6.87 + 1.17	+ .46		41
3	18		6.52 + 0.15	+ .06		46
3	23		5.57 + .22	+ .09		48
3	27		5.36 − .17	− .07		43
3	31		6.20 + 1.94	+ .76		44
3	05		−5.55 + .47			−5.45

1 52 0 = −6.68 + 3.04
−6.55 + .47
0 = −1.09 + 2.57 n = +.40

3 31 6.20 + 1.94 +.38

n = +.343

2	33	0 = −5.44	− .01	− 00	−	5.44
2	37	= −5.45	+ .05	+ 02		.43
2	42	= −5.65	+ .50	+ .17		.48
3	4	= −5.61	+ .36	+ .12		.49
3	15	= −5.88	+ 1.17	+ .40		.48
3	18	= −5.53	+ .15	+ .05		.48
3	23	= −5.55	+ .22	+ .08		.47
3	27	= −5.43	− .17	− .06		.49
~~3~~	~~31~~		~~+1.94~~			
2	56	= −5.50	+ .44	+ .26		.54
3	02	−5.51 + .34				−5.48

1 52 0 = −6.66 + 3.04
2 51 = −4.26 − 3.65
3 21 −4.55 − 3.13
3 31 −6.15 + 1.94

0 = −1.07 + 2.70 = +.39 +
−1.33 + 3.99 = +.33 −
−1.04 + 3.47 = +.30 −
−0.56 + 1.60 = +.35 +
+.343

$d T + m = +5\overset{s}{.}48$ at $3^h\ 2^m$

Jan 30 1872

h	m	s	n = + .38	
1	48	0 = − 6.53 + .37	+ .14	6.39
1	56	6.78 + .89	+ .34	44
2	10	6.66 + .66	+ .20	41
3	15	6.90 + 1.17	+ .44	46 6.43
3	18	6.46 + .15	+ .06	40
3	27	6.26 − .17	− .06	32
3	34	6.83 + 1.09	+ .42	41
3	46	~~7.28 + 1.78~~	+ .68	~~60~~
			n = + .49	
4	16	6.46 + .31	+ .15	6.31
4	22	7.10 + 1.36	+ .65	45
4	30	6.22 − .06	− .03	25
4	35	6.44 + .42	+ .21	23
4	37	7.11 + 1.51	+ .75	36
4	39	6.35 − .06	− .03	36
4	49	6.69 + .65	+ .32	37
4	52	7.28 + 1.75	+ .86	42
4	54	6.99 + .87	+ .43	(56)
4	55	6.57 + .39	+ .20	37
5	3	6.18 − .16	− .08	26
5	5	6.72 + .79	+ .40	32
5	7	6.94 + 1.02	+ .51	43
5	8	6.27 − .15	− .07	34
5	11	6.26 − .12	− .06	32
5	18	6.59 + .54	+ .26	33
			(n = + .45)	6.34
5	48	6.53 + .13	+ .06	6.47
5	50	6.89 + 1.00	+ .45	44
6	2	6.50 + .26	+ .11	39
6	7	6.56 + .38	+ .17	~~.57~~ .42
5	56	6.62 + .38		6.45

			n	n
1	12	0 = − 23.54 + 41.14	= + .41	+ .88
~~2~~	~~44~~	− 1.95 + 2.24		
3	21	− 5.32 − 3.13	= + .37	
3	49	− 3.40 − 4.78	= + .37	
4	41	− 7.48 + 2.26	= + .50	+ .49
5	2	− 2.68 − 7.35	= + .49	
5	23	− 8.19 + 3.72	= + .49	
6	4	− 7.60 + 2.66	+ .39	+ .46
6	15	+ 1.81 − 16.88	+ .46	
6	40	− 16.78 + 20.78	+ .50	

n = + .437

1	48	0 = − 6.53 + .37 + .16	− 6.35
1	56	− 6.81 + .89 + .39	.42
2	10	− 6.63 + .66 + .29	.34
3	15	− 6.91 + 1.17 + .51	.40
3	18	− 6.47 + .15 + .07	.40
3	27	− 6.33 − .17 − .07	.40
3	34	− 6.84 + 1.09 + .48	.36
3	46	− 7.26 + 1.78 − .78	.48
		− 6.72 + .74	
		n = + .47	
4	16	0 = − 6.52 + .31 + .15	− 6.37
4	22	− 6.99 + 1.36 + .65	.34
4	30	− 6.31 − .06 − .02	.33
4	35	− 6.47 + .42 + .20	.28
4	37	− 7.04 + 1.51 + .72	.32
4	39	− 6.32 − .06 − .02	.34
4	49	− 6.68 + .65 + .31	.37
4	52	− 7.17 + 1.75 + .83	.34
4	54	− 6.84 + .87 + .41	.43
4	55	− 6.57 + .39 + .19	.38
5	03	− 6.18 − .16 − .08	.26
5	05	− 6.72 + .79 + .38	.34
5	07	− 6.85 + 1.02 + .45	.40
5	08	− 6.28 − .15 − .07	.35
5	11	− 6.27 − .12 − .06	.33
5	18	− 6.58 + .54 + .26	.32
4	57	− 6.61 + .35	6.34
5	48	− 6.48 + .13 + .06	6.42
5	50	− 6.86 + 1.00 + .47	.39
6	2	− 6.50 + .26 + .12	.38
6	7	− 6.56 + .38 + .18	.38
5	56	− 6.60 + .44	6.39

1	12	0 = − 23.05 + 41.82	
2	4	− 28.25 + 2.24	
3	21	− 5.14 − 3.13	
3	49	− 3.91 − 4.78	

n

0 = − 16.33 + 41.08 = + .40
− 1.58 + 3.87 + .41
− 2.81 + 5.52 + .50
+ .437

4	41	0 = − 7.44 + 2.26
5	2	= − 2.64 − 7.41
5	23	= − 8.02 + 3.72

n

0 = − 0.83 + 1.68 = + .49
= − 3.57 + 7.99 = + .49
= − 1.41 + 3.14 = + .45
+ .477

6	4	0 = − 7.61 + 2.66
6	15	= 1.81 − 16.88
6	40	= − 16.78 + 20.83

n

0 = − 1.01 + 2.22 = + .46
0 = − 7.61 − 17.32 + .46
0 = − 10.18 + 20.39 + .50
+ .473

For Jan 31 see next page

Feb. 1 1872

			n = + .43	n = + .52	
1	48	0 = − 7.54 + .37	+ .16	7.38 + 1.87 ~~36~~	~~.04~~
2	10	7.23 − .12	− .05	28 − .06 (29)	8
3	4	7.61 + .36	+ .16	45 + .17	446
3	40	7.60 + .44	+ .19	41 + .23	376
3	46	~~8.48~~ + 1.78	+ .77	66 + .92	516
3	54	7.60 + .21	+ .09	51 + .11	49
3	~~59~~	~~6.11 + 1.09~~	+		
4	22	8.32 + 1.36	+ .58	.74 + .69	.63
4	28	7.61 + .29	+ .12	49 + .16	45
5	30	(8.18) − .02 ?	− .01	(19)	
5	50	8.15 + 1.00	+ .43	72 + .52	.63
3	51	7.45 + .57		7.52 − 7.48	

49	0 = − ~~.04~~	+ ~~2.24~~
49	0 = − 4.58	− 4.78
4	− 7.88	+ 2.26
15	+ 0.95	+ 16.88
40	− 18.64	+ 20.78

		n
0 = − 2.87	+ 5.35	+ .54
(− 0.43	+ 1.69	= + .26)
− 8.40	+ 17.45	+ .48
− 11.19	+ 20.21	+ .55
		+ .43
		+ .52

dT + m = + 7.48

a dl = + 0.02

n = + .505

1	48	0 = − 7.54 + .37 + .19	− 7.35 − .04	7.39	
2	10	= 7.28 − .12 − .06	34 − 3	37	
3	4	= 7.59 + .35 + .18	41 − 2	43	
3	40	= 7.61 + .44 + .22	39 − 0	39	
3	46	= 8.41 + 1.78 + .90	51 + 0	.51	
3	54	= 7.65 + .21 + .11	54 + 0	54	
4	22	= 8.18 + 1.36 + .69	49 + 2	47	
4	28	= 7.61 + .29 + .15	46 + 2	44	7.44
~~5~~	~~30~~	= ~~8.4~~			
5	50	= 8.12 + 1.00 + .50	.62 + 4	58	
3	40	7.78 + .63	7.46		

3	49	0 = − 4.58 − 4.78 + .00 − 4.58
6	4	− 7.89 + 2.26 + 5 − 7.94
6	15	+ 0.71 − 16.88 + 5 + 6.66
6	40	− 18.96 + 20.83 + 6 − 18.52

n

0 = − 3.20 + 5.41 ?
− 7.11 + 1.63 ?
− 8.44 + 17.51 = + .48
− 11.48 + 20.20 + .53
101
.505

n

0 = 3.20 =
− 0.06
− 8.44 + .48
10.74 + .56

dT + m = 7.44 at 3 24 (s, h m)

4 dT = +.02

Jan 31 1872   n = +.50

h m s
2 00 0 = −7.06 +.42 +.21 − 6.85
2 2 7.38 +.68 +.34 7.04
2 6 7.68 +1.21 +.60 6.98
2 11 6.74 −.12 −.06 6.80

2 07 6.92

4 22 0 = −~~8.64~~ 7.72 −~~1.72~~ +1.36 +.68 7.04
5 35 ~~7.89~~ 49 ~~7.89~~ +1.18 +.59 6.90
5 42 7.27 ~~7.27~~ +.81 +.40 6.87
5 48 7.96 ~~7.96~~ +.13 +.06 6.90
5 50 7.44 +1.00 +.50 6.94

5 27 7.66 +.90 − 6.93

6 4 0 = −8.29 + 2.66
6 15 +2.00 − 16.88
6 39 −16.79 + 20.78

n
(0 = −0.63 + 1.76 = .36)
−9.66 + 17.78 = .54
−9.13 + 19.88 = .46

n = +.513
2 0 0 = −7.03 + .42 + .22 − 6.81
2 2 7.21 + .68 + .35 .86
2 3 7.57 + 1.21 + .62 .95
2 11 6.75 − .12 − 6 .85
6.87

2 7 0 =

6 4 0 = −8.31 + .01 − 8.30 + 2.66
6 15 + 2.00 + .02 + 2.02 − 16.88
6 39 −16.77 + .02 −16.75 + 20.83
77

n
0 = −0.95 + 1.76 = +.54
= −9.37 + 17.75 = +.53
= −9.40 + 19.93 = +.47
154
+.513

4 22 0 = 7.61 + 1.36 + .70 6.91
5 35 7.52 + 1.18 + .61 .91
5 42 7.36 + .81 + .42 .94
5 48 6.55 + .13 + .7 (.78)
5 50 7.41 + 1.00 + .51 .90

5 27 0 = 7.35 + .90 6.91

dT + m = +6.87 at 2h 7m

dT + m = +6.91 at 5 27

Feb. 1

1 48 0 = −7.54 + .37
2 10 7.23 − .12
3 4 7.61 + .36

Feb. 2 1872   n = +.55

5 48 0 = −8.11 + .13 + .07 8.04
5 50 8.64 + 1.00 + .55 09
6 00 8.17 + .26 + .14 03
6 7 8.19 + ~~.71~~ .38 + ~~.06~~ .21 7.98
8.04

5 56 − 8.28 + .38

h m
5 44 0 = − 6.13 − 3.11
6 4 − 8.79 + 2.26
6 15 + 2.07 − 16.88
6 35 −17.16 + 20.78

n
0 = −2.15 + 3.49 = +.62
− 0.51 + 1.88 = +(.27)
−10.35 + 17.26 = +.60
− 8.88 − 20.40 = +.44
.55

dT + m = +8.04

n = +.522
5 48 0 = − 8.10 + .13 + .07 − 8.03
5 50 − 8.61 + 1.00 + .52 .09
6 0 − 8.17 + .26 + .13 .04
6 7 − 8.19 + .38 + .19 .00

5 56 0 = − 8.27 + .44
8.04

5 44 0 = − 6.19 − 3.12 −
6 4 − 9.28 + 2.65
6 15 + 0.98 − 16.88
6 35 − 16.78 − 20.77

n
0 = − 2.08 + 3.56 = +.58 −
− 1.10 + 2.21 +.46 +
− 9.25 + 17.32 +.53 −
− 10.51 + 20.32 +.52 +
209
+.522

dT + m = +8.04s at 5h 56m

Feb. 4 1872

n = +.44

h	m		
2	56	0 = −8.73 +.06 +.03	−8.70
3	15	9.35 +1.17 +.52	.62
3	18	8.73 + .15 +.07	66
−12 3	20	8.63 + .16 +.07	58
−.26 3	24	8.62 + .22 +.10	52
3	34	9.21 +1.09 +.48	73
3	40	8.88 + .44 +.19	69
3	46	8.98 + .61 +.27	71
3	49	9.01 + .83 +.36	65
3	54	8.67 + .21 +.09	58
3	59	9.22 +1.09 +.48	74
4	12	8.85 + .27 +.12	73
4	16	8.79 + .31 +.14	65
4	21	8.88 + .34 +.15	73
4	29	8.97 + .29 +.13	84
5	50	9.61 +1.00 +.44	(9.17)
3	52	8.95 + .57	8.70

2 48 0 = −10.90 + 5.10
3 4 10.74 + 4.42

n
0 = −1.95 + 4.59 = .43
0 = 1.76 + 3.91 = .45
.44

n = +.445

2	56	0 = −8.72 +.06 +.03	8.69
3	15	9.24 +1.17 +.51	73
3	18	8.74 + .15 + 7	67
3	20	8.73 + .16 + 7	66
3	24	8.79 + .22 +.10	69
3	34 40	8.89 +1.09 44 +.48 .20	74
3	46	8.95 + .44 61 +.27	68
3	49	9.12 + .61 83 +.37	75
3	54	8.86 + .83 21 +.09	77
3	59	9.29 + .21 1.09 +.48	81
4	12	8.85 +1.09 27 −.12	73
4	16	8.85 + .27 31 +.14	71
4	21	8.88 + .31 34 +.15	73
4	29	8.97 + .34 29 +.13	84
		+ .29	
3	45	8.94 +.47	8.73

2 48 0 = −10.92 + 5.10
3 4 −10.66 + 4.42

n
0 = −1.98 + 4.62 = +.45
1.72 + 3.94 = +.44

dT + m = +8.73 at 3h 45m

Feb. 5 1872

n = +.48

5	25	0 = −9.13 −.01 −.00	−9.13
5	29	9.12 −.02 −.01	9.13
5	32	8.97 −.05 −.02	8.99
5	36	9.68 +1.18 +.57	9.11
5	43	9.43 + .81 +.39	9.04
5	48	9.23 + .13 +.06	9.17
5	50	9.68 +1.00 +.48	9.20
6	00	9.26 + .26 +.12	9.14
6	7	9.37 + ~~.41~~ 38 + ~~0.5~~ 18	(9.19)
6	30	9.33 + .30 +.14	9.09
6	48	9.32 + .37	−9.12

5 22 0 = −11.09 + 3.72
6 15 −1.83 − 16.28
6 35 −10.82 + 20.70

n
0 = −1.77 − 3.35 = +.53
−7.99 − 17.25 +.47
−7.50 − 20.33 +.37
+.48

n = +.460

5	25	0 =	
5	29	0 = −9.12 −.02 −.01	−9.13
5	32	9.43 −.05 −.02	.15
5	36	9.71 +1.18 +.55	.17
5	43	9.52 + .87 +.39	.15
5	48	9.22 + .13 + .6	.16
5	50	9.65 +1.00 +.46	.19
6	00	9.36 + .26 +.12	.14
6	7	9.37 + .41 +.19	.18
6	30	9.38 + .30 +.14	.24
5	48	9.36 + .30 7 + .46	−9.17

5 22 0 = −10.92 + 0 −10.92 +3.72
6 15 −1.63 + 1 −1.47 −16.88
6 35 −18.44 + 1 −17.64 +20.77

n
0 = −1.56 + 3.27 = +.48 +
−7.74 + 17.33 + .45 −
−9.07 + 20.32 + .45 +

+.460

dT + m = +9.17 at 5h 48m

1873 Feb. 6   Only one star Reject.

1873 Feb. 7

h	m		δ	n = +40	
1	56		o = − 10.08 + .89	+ 36	− 9.72
2	5		10 23 + 1.21	+ 48	.75
2	10		10.10 + .66	+ 26	.84
2	33		9.86 − .01	− 00	.86
2	35		10.23 + 1.14	+ 46	.77
2	37		9.80 + .05	+ 02	.78
3	15	+ 12	10.11 + 1.17 23	+ 47	.74
2	23		10.06 + .73		− 9.78

2 28   o = − 8.44 − 4.10

o = − 10.06 + 73

o = − 1.62 + 4.83   n = + .34

			n = + .40	
4	35	o = − 10.00 + 0.39	+ .16	9.84
5	3	9.84 − .16	− 06	90
5	5	10.16 + .79	+ 32	84
5	7	10.36 + 1.03	+ 41	95
5	8	9.83 − .15	− 06	89
5	11	9.82 − .12	− 05	87
5	18	10.06 + .54	+ 22	84
5	30	9.80 − .02	− 01	81
5	32	9.81 − .00	− 02	83
5	36	10.25 + 1.18	+ 47	78
5	14	9.99 + .84		9.85

4 59   o = − 7.00 − 7.35
5 22   11.57 + 3.72

o = − 2.99 + 7.69 = + .39 (n)
o = − 1.58 + 3.38   + .47

		n = + .387	
1	56	o = − 10.12 + .80 + 34	− .78
2	5	10.23 + 1.21 + .44	.76
2	10	10.06 + .66 + 26	.80
2	33	9.79 − .01 − 00	.79
2	35	10.23 + 1.14 + 40	.79
2	37	9.83 + .05 + 02	.81
3	15		
(2)	19	10.04 + .66	− 9.79

		n = + .387	
4	55	o = − 9.98 + 0.39 + 15	− 9.83
5	3	9.84 − .16 − 6	.90
5	5	10.16 + .79 + 31	.85
5	7	10.27 + 1.03 + 40	.87
5	8	9.84 − .15 − 6	.90
5	11	9.83 − .12 − 5	.89
5	18	10.05 + .54 + 21	.84
5	30	9.82 − .02 − 1	.83
5	32	9.87 − .05 − 2	.89
5	36	10.28 + 1.18 + 45	.83
5	14	− 9.99 + .34 5	9.86

4 59   o = − 6.77 − 7.41
5 22   = − 11.20 + 3.72

o = − 2.22 + 7.75 = + .41 (m)
− 1.31 + 3.36 = + .39
.34
114
+ .387

2 28   o = − 8.34 − 4.10
o = 10.04 + .66

o = − 1.70 + 4.76   n = + .36

dT + m = + 9.79 at 2h 19m
dT + m = + 9.86 at 5 14

1873 Feb. 8

n = +.37 n-34

h m
4 55 0 = −10.33 + .89 + .14 − 10.19 +.13 −10.20 4 59 0 = −7.66 − 4.35
5 5 10.55 + .79 + .29 .26 +27 28 5 22 −11.96 + 3.72
5 7 10.67 +1.03 + .38 .29 +35 32 5 44 −9.02 −3.11
5 8 10.19 − .15 − .06 .25 −05 24 6 04 11.02 +2.66
5 18 10.45 + .54 + .20 .25 +18 27 6 15 +4.38 −16.88
5 25 10.23 − .01 − .00 .23 −00 23 6 40 −14.09 + 20.78
5 30 10.13 − .02 − .01 .14 −01 14
5 32 10.11 − .05 − .02 .13 −02 13 n
5 36 10.69 +1.18 + .44 .25 +40 29 0 = −2.69 + 7.77 = +.35
5 43 10.40 + .81 + .30 (.10) +28 12 (−1.61 + 3.30 = +.49)
5 48 10.10 + .13 + .05 (.05) +04 (06) −1.33 +3.53 = +.38
5 51 10.50 + .76 + .28 .22 +26 24 −0.67 +2.24 = +.30
6 0 10.30 + .26 + .09 .21 +09 21 −6.86 +17.30 = +.34
6 7 10.35 + .11 + .04 .31 +04 31 −6.74 +20.36 = +.33
6 30 10.27 + .30 + .11 .16 +10 17

+.374

5 34 10.35 + .42 − 10.22) 10.22

4 dT = +0.15

n = +.352

4 55 0 = −10.33 + .89 + .13 − 10.20 4 59 0 = −7.88 − 7.0 − 7.89 −7.41
5 5 10.55 + .79 + .28 .27 5 22 −11.65 − 0 − 11.68 + 3.71
5 7 10.57 +1.03 + .36 .21 5 44 −9.09 + 0 − 9.09 + 3.11
5 8 10.20 − .15 − .5 .25 6 4 −11.04 + 1 − 11.03 + 2.66
5 18 10.44 + .54 + .18 .26 6 15 −4.03 + 1 − 4.26 − 16.88
5 25 10.20 − .01 − .00 .20 6 44 −16.85 + 2 − 16.82 + 20.77
5 30 10.15 − .02 − .01 .16 17.71
5 32 10.17 − .05 − .02 .19
5 36 10.72 +1.18 + .41 .31 n
5 43 10.49 + .81 + .29 .20 0 = −2.47 + 7.83 = + .32 −
5 48 10.18 + .13 + .04 .14 −1.32 + 3.29 = + .40 +
5 51 10.50 + .76 + .27 .23 −1.27 + 3.53 = + .36 −
6 0 10.29 + .26 + .9 .20 −0.67 + 2.24 = + .30 + +0.4
6 7 10.35 + .11 + .4 .31 −6.33 + 17.32 = + .37 −
6 30 10.32 + .30 + .10 .22 −7.95 + 20.35 = + .36 +

+.352

5 34 10.36 + .42 10.22

dT + m = +10.22 at 5h 34m.

1873 Feb. 12

h m δ n = +.32
2 57 0 = −11.43 + .79 + .26 − 11.17 4 41 0 = −11.84 + 2.26
4 21 11.27 + .34 + .11 .16 6 4 12.01 + 2.66
4 29 11.22 + .29 + .10 12 6 15 5.69 − 16.88
4 30 11.08 − .06 − .02 10 6 40 18.50 + 20.78
4 35 11.27 + .42 + .14 13
4 37 11.44 +1.51 + .50 24 n
4 39 11.17 − .06 − .02 19 0 = −0.53 + 1.84 = + .29
6 0 11.30 + .26 + .09 21 − .70 + 2.24 = + .31
6 7 11.36 + .38 + .13 23 − 5.62 + 17.30 = + .32
6 30 11.25 + .30 + .10 20 − 7.24 + 20.36 = + .35

+.32

4 52 11.31 + .42 − 11.18)

4 dT = +.01

n = +.338

2 57 0 = −11.42 + .79 + .24 − 11.15 4 41 0 = −12.04 + 2.26 − 0 − 12.02
4 21 11.27 + .34 + .10 .15 6 4 −12.02 + 2.65 + 1 − 12.01
4 29 11.22 + .29 + .10 .12 6 15 − 5.61 − 16.88 + 1 5.59
4 30 11.17 − .06 − .02 .14 6 40 − 17.26 + 20.77 + 2 17.24
4 35 11.32 + .42 + .14 .18 17.20
4 37 11.68 +1.51 + .50 .18 n
4 39 11.14 − .06 − .02 .16 0 = − 0.68 + 1.84 = + .37 +
6 0 11.30 + .26 + .09 .21 − 0.69 + 2.23 = + .31 +
6 7 11.36 + .38 + .13 .23 − 5.83 + 17.30 = + .33 −
6 30 11.30 + .30 + .10 .20 − 6.88 + 20.35 = + .34 +

+.338

4 52 11.32 + .42 11.18

dT + m = +11.18 at 4h 52m.

1872 Feb. 14

n = +.28

h	m				
2	42	0 = − 11.46 + .50	+.14	− 11.32
2	55	11.39 + .06	+.02	.37
2	57	11.57 + .79	+.22	35
3	4	11.47 + .36	+.09	38
3	15	11.74 + 1.17	+.33	(41)
3	18	11.30 + .15	+.04	26
3	24	11.41 + .24	+.07	34
3	27	11.20 − .17	−.05	25
3	31	11.89 + 1.94	+.54	35
4	34	11.13 + .42	+.12	(01)
4	37	11.80 + 1.51	+.42	38
4	39	11.82 − .06	−.02	34
3	35	− 11.47 + .57		− 11.33

h	m	
2	51	0 = − 9.84 − 3.65
3	21	− 10.55 − 3.13
4	41	− 12.72 + 2.26
6	4	− 12.94 + 2.66
6	15	− 6.41 − 16.88
6	40	− 16.81 + 20.78

n

0 = − − 1.63 + 4.22 = +.36
− − .92 + 3.70 = +.25
− − .95 + 1.69 =
− − .47 + 2.09 = +.23
− − 5.06 + 17.45 = +.29
− − 5.34 + 20.21 = +.27

+.28

n = +.290

2	42	0 = − 11.46 + .50	+.14	− 11.32
2	55	11.38 + .06	+.02	.36
2	57	11.56 + .79	+.23	.35
3	4	11.45 + .36	+.10	.35
3	15	11.63 + 1.17	+.34	.29
3	18	11.31 + .15	+.04	.27
3	24	11.38 + .22	+.07	.31
3	27	11.27 − .17	−.5	.32
3	31	11.85 + 1.94	+.56	.29
4	34	11.47 + .42	+.12	.35
4	37	11.74 + 1.51	+.43	.34
4	39	11.29 − .06	−.02	.31
3	31	11.48 + .57		11.32

2	51	0 = − 9.94 − 3.65
3	21	− 10.36 − 3.13
4	41	− 11.88 + 2.26
6	4	− 11.56 + 2.65
6	15	− 6.39 − 16.88
6	40	− 17.26 + 20.78

73

n

0 = − 1.54 + 4.22 = +.36 −
− 1.12 + 3.70 = +.30 −
− 0.40 + 1.69 = +.24 +
− 0.48 + 2.08 = +.23 +
− 5.13 + 17.45 = +.30 −
− 6.25 + 20.21 = +.31 +

±0.24

+.290

$dT + m = +11.32^s$ at $3^h\ 32^m$

Feb. 15 1872

$n = +\frac{28 + 45}{2} = +.37$

n = +.28

4	30	0 = 11.18 − .06 − .02	− 11.28 − .01	− 11.(19)
4	53	11.94 + .87 + .24	(70) + .32	(62)
5	11	11.80 − .12 − .03	27 − .04	34
5	18	11.56 + .54 + .15	40 + .20	35
5	25	11.82 − .01 − .00	32 − .00	32
5	51	11.63 + .76 + .21	42 + .28	35
5	10		11.32	11.34

n = +.400

4	30	0 = − 11.27 − .06 − .02	− 11.29
4	53	11.64 + .87 + .35	.29
5	11	11.31 − .12 − .05	.36
5	18	11.54 + .54 + .22	.32
5	25	11.29 − .01 − .00	.29
5	51	11.63 + .76 + .30	.33
5	10		11.31

0 = − 11.27 − .06
11.31 − .12
11.29 − .01

0 = − 11.64 + .87
11.54 + .54
11.63 + .76

0 = − 11.29 − .06
0 = − 11.60 + .72

0 = − 11.60 + .72

0 = − 0.31 + .78
n = +.40

$dT + m = +11.31$ at $5^h\ 10^m$

Feb. 16 1872

Mar 19?
~~Feb.~~ 19 1872

~~5~~ 7 n = +.40

7	3	0 = −12.37	−49	−20	−12.57
7	9	12.47	+.87	+35	.52
7	12	12.69	+41	+16	.58
7	18	12.70	+.53	+21	.49
7	20	12.50	+10	+06	44
7	26	12.37	+63	+25	32
7	33	12.35	+10	+04	31
7	37	12.69	+54	+22	48
71.19					−12.50

1871phae.proj.1678R

1872 Feb. 18

n = +.45 n = +.417

h	m						
3	54	0 = − 12.05 + .21	+ .09	− 11.96	12.10 + 9	12.013	49
3	59	− 12.~~27~~ 30 + 1.09	+ .49	(86)	12.39 + 45	11.945	32
4	12	− 12.07 + .27	+ .12	95	12.07 + 11	11.965	44
4	16	− 12.06 + .31	+ .14	92	12.12 + 13	11.996	15
4	21	− 12.02 + 24	+ .15	87	12.02 + 14	11.88	
4	29	− 12.10 + 29	+ .13	102	12.15 + 12	12.03	
5	18	− 12.25 + .54	+ .24	1.01	12.23 + 22	12.01	
5	25	− 12.10 − .01	− 00	1.10	12.07 − 00	12.07	
5	30	− 12.07 − .02	− .01	1.04	12.05 − 01	12.06	
5	32	− 11.96 − .05	− .02	.98	12.01 − 02	12.03	
5	48	− 12.14 + .13	+ .06	1.08	12.13 − .05	12.08	
4	48	− 12.10 + .28		− 12.00	12.02	12.01	

4 48

0 = − 9.73 − 4.78
13.58 + 3.72
10.54 − 3.11
~~7.18 − 16.88~~

Mean 18

0 = − 2.37 + 5.06 = +.46
− 1.48 + 3.44 = +.43
− 1.56 + 3.39 = +.46
~~4.9 = +11.16 =~~

1.01 + .02 +.45

3 49 0 = − 9.54 − 02 − 9.56 − 4.78
5 32 13. + 02 − 13.38 + 3.72
5 44 10.60 + 02 − 10.58 − 3.11

dT − m = +12.01 at 4h 48m

0 = − 2.16 + 5.06 = +.43 −
− 1.26 + 3.44 = +.37 +
− 1.54 + 3.39 = +.45 −

n = +.417

6 35 0 = − 20.17 + 20.78

1872 Feb. 19

n = +.43

7	3	0 = − 12.37	− .49	− 21	12.58
7	11	12.87	+ .87	+ .37	50
7	12	12.69	+ .41	+ .18	51
7	18	12.70	+ .53	+ 23	47
7	20	12.50	+ .15	+ 6	44
7	32	12.52	+ .10	+ 4	48
7	37	12.69	+ .54	+ 23	46
					12.49

1872 Feb. 22

n = +.41 n = +.400

2h	56	0 = − 13.11 + .06	+ 25	12.862	13.01 + 02	12.992	2	57	0 = − 11.89 − 3.65
3	40	13.12 + .44	+ 18	94	13.13 + 18	12.953	3	21	− 11.50 − 3.03
3	46	13.42 + 1.78	+ .73	(79)	13.54 + 70	12.883	3	49	− 11.03 − 4.78
3	54	13.13 + .21	+ 09	04	13.18 + 08	13.104	4	59	− 10.04 − 7.35
4	12	13.15 + .27	+ 11	04	13.14 + 11	13.036	6	15	− 6.95 − 16.88
4	16	13.08 + .31	+ 13	95	13.13 + 12	13.016	6	40	− 20.72 + 20.78
4	21	13.15 + .34	+ 14	01	13.15 + 14	13.01			
4	29	13.14 + .29	+ 12	02	13.13 + 12	13.01			
4	53	13.23 + .95	+ 39	84	13.39 + 38	12.99			
(4	58 ?)	(13.68 + .87)	+ 35		13.34 + 35	12.99			
5	03	12.98 − .16	− 06	04	12.98 − 06	13.04			
5	08	12.98 − .12	− 05	03	12.98 − 5	13.03			
5	25	13.06 − 01	− 00	06	13.03 − 00	13.03			
5	43	13.33 + .81	+ 33	00	13.24 − 32	12.92			
5	51	13.23 + .76	+ 31	91	13.22 + 30	12.92			
4	33	− 13.16 + .48		12.99	13.17	12.99			
		.45		12.98					

0 = − 1.77 + 4.13 = +.43
− 1.66 + 3.51 = +.47
− 2.13 + 5.26 = +.41
− 3.12 + 7.83 = +.40
− 6.31 + 17.36 = +.39
− 7.56 + 20.30 = +.37

+.41

add δ = +.11

2	57	0 = − 11.49 − 3.65 − .02	− 11.51
3	21	− 11.57 − 3.03 − 01	− 11.58
3	49	− 11.24 − 4.78 − 0	− 11.25
4	59	− 10.00 − 7.35 − 0	− 10.00
6	15	− 7.07 − 16.88 +	− 7.05
6	40	− 20.37 + 20.78 −	− 20.35

dT + m = + 12.99 at 4h 33m

0 = − 1.66 + 4.10 = +.40
− 1.59 + 3.48 = +.46
− 1.92 + 5.23 = +.37
− 3.17 + 7.86 = +.40
− 6.12 + 17.33 = +.36
− 8.17 + 20.33 = +.41

.4000 ±.023

1872 Feb. 24

n = +.40 n = 42 n = +400

4 22 o = −13.92 +1.36 +.54 −13.38 +57 −13.35 = −13.80 +.54 13.26
4 30 13.24 − .06 −.02 26 − 03 27 13.33 − 2 .35
4 35 13.45 + .42 +.17 28 +18 27 13.49 +18 31
4 37 13.91 +1.51 +.60 31 +63 28 13.85 +.60 25
4 39 13.34 − .06 −.02 36 −03 35 13.31 − 2 33
4 49 13.57 + .65 +.26 31 +27 30 13.58 +26 29
4 53 13.99 +.87 +.35 (64) 13.72 +.35 .37

4 36 −13.83 13.31 13.58 13.31

4 41 o = −14.28 +2.26
o = −13.58 + 67
o = −6.70 + 1.59
n = +.44

n = +42
7 3 o = −13.73 + .83 +.35 −13.38
7 21 13.52 + .62 +.26 26
7 26 13.73 + .63 +.26 47
7 33 13.55 + .10 +.04 51
7 37 13.50 + .54 +.23 27

7 24 13.61 + .54 −13.38

7 44 o = −14.35 + 3.54
7 52 +8.81 −52.98

n
o = (−7.74 + 3.00 = +.25)
−22.42 + 53.52 = +.42

n + 400
7 3 o = −13.73 + .83 +.33 −13.40
7 21 13.37 + .62 +.25 .32
7 26 (13.34 + .63 +.25)
7 33 13.35 + .10 +.04 .31
7 37 13.50 + .54 +.22 .28

7 24 13.50 + .54 13.33

7 44 o = −14.63 + 3.54
7 52 + 9.18 − 53.07

n
o = −1.13 + 3.00 = +.38
−22.68 + 52.61 = +.42
.40

dT + m = +13.31 at 4 36
dT + m = +13.33 at 7 24

1872 Feb. 26

n = +.38 n = 35

4 22 o = −13.74 +1.36 +.57 −13.23 +48 (13.26)
4 30 13.88 − .06 − .02 12.90 −02 12.90
4 35 13.15 + .42 +.16 12.99 +15 13.00
4 37 13.66 +1.51 +.57 13.09 +52 13.14
4 39 13.08 − .06 −.02 13.10 −02 13.10
4 49 13.34 + .65 +.26 13.09 +22 13.10
4 52 13.86 +1.75 +.67 13.19 +62 (13.24)
4 53 13.70 + .87 +.33 (13.37 +30 (13.40)
4 55 13.17 + .39 +.15 13.02 +14 13.03
5 3 12.97 −.16 −.06 13.03 −06 13.03
5 5 13.47 +.79 +.30 13.17 +28 13.19
5 7 13.51 +1.03 +.39 13.12 +36 13.15
5 8 12.96 ± ~~.07~~ .15 −.06 13.02 −005 13.01
5 11 12.99 − ~~.0~~ .12 −.05 13.04 −04 13.03
5 18 13.25 + ~~.12~~ .54 +.20 13.05 +19 13.06
5 25 13.04 + ~~.54~~ .01 −.00 13.04 −00 13.04
5 26 13.00 ~~.01~~ −.02 −.01 13.01 −01 13.01
5 32 12.96 −.15 −.06 13.02 −05 13.01
5 36 13.42 +1.18 +.45 12.97 +41 13.01
~~5 42~~ 13.27 + .81 +.31 12.96 +28 12.99
6 39 13.85 − .30 −.11 12.96 −11 12.96

5 03 13.35 + .54 13.05 13.04

5 22 o = −14.79 + 3.72
4 59 −10.52 − 4.35
6 15 −7.31 − 16.88
6 40 −20.92 + 20.74

n
o = − −1.44 +3.18 = +(.45)
− 2.83 +7.89 +.36
− 6.00 +17.42 +.35
− 7.09 +20.20 +.38

.36

n = +.3702
4 22 o = 13.62 +1.36 +.50 13.12
4 30 13.37 − .06 − 2 12.98
4 35 13.20 + .42 + .16 13.04
4 37 13.59 +1.51 +.57 13.03
4 39 13.05 − .06 −.02 13.07
4 49 13.33 + .65 +.24 13.09
4 52 13.75 +1.75 +.64 13.11
~~4 53~~ 13.33 + .57 +.32 13.01
4 55 13.17 + .39 +.14 13.03
5 3 12.97 − .16 − .06 13.03
5 5 13.47 + .79 +.29 (13.18) ?
5 7 13.42 +1.03 +.38 13.04
5 8 12.97 − .15 − 6 13.03
5 11 13.00 − .12 − 4 13.04
5 18 13.24 + .54 +.20 13.04
5 25 13.01 − .01 − .00 13.01
5 29 13.02 − .02 − .01 13.03
5 32 13.02 − .05 − .02 13.04
5 36 13.45 +1.15 + .43 13.02
5 42 13.36 + .82 + .30 13.06

5 04 13.25 + .53 13.04

dT + m = +13.04 at 5 4

4 59 o = −10.49 + 3.72
5 22 −14.61 − 7.41
6 15 − 7.31 − 16.88
6 40 −21.04 + 20.78

n
o = −2.76 − 7.74 = +.35 +
−1.36 − 3.19 = +.42 −
−3.89 − 17.41 = +.34 −
−7.99 − 20.25 = +.38 +
.372

1872 Feb. 27

n = +.42

5 7 o = −13.37 +1.03 +.43 12.94
5 8 12.88 − .15 −06 94
5 11 12.78 − .11 −05 83
5 18 13.13 + .54 +.23 90
5 25 12.91 − .01 −00 91
5 26 13.00 − .02 −01 101
5 32 12.87 − .15 −06 93
5 42 13.18 + .81 +34 84
6 40 12.79 − 80 −13 92

5 54 12.99 + .18 12.91

5 22 o = −14.64 + 3.72
6 15 − 5.30 16.88
6 40 ~~16.86~~ +20.74
21.16

n
o = (−1.65 + 8.54 = +.47)
−4.69 +17.06 = +.45
−~~3.37~~ +20.56 = +.40
8.17
+~~.36~~
.42

n = +.42

6 46 o = 13.46+ 1.64 +.75 12.71
6 54 12.63 − .55 −.28 .86

6 50 13.04 + .54

6 51 o = −11.25 −3.81
7 52 +9.38 −52.98

n
o = −1.79 + 4.35 = +.41
22.42 + 58.52 = +.42

n = +.416

5 7 o = −13.28 +1.03 +43 12.85
5 8 12.47 − .15 − 6 .85
5 11 12.80 − .15 − 6 .86
5 18 13.12 + .54 +22 .90
5 25 12.91 − .01 −00 .91
5 26 13.01 − .02 −01 102
5 32 12.89 − .15 −06 95
5 42 13.27 + .81 +34 93
~~6 40~~

5 22 −13.02 + .22 12.92

dT+m = +12.42
at 5h 54m

5 22 o = −14.47 + 3.72
6 15 5.28 − 16.88
6 40 21.78 +20.78

n
o = −1.45 + 3.50 = +.41 +
−4.74 +17.00 = +.41 −
−8.76 +20.58 = +.43 +

6 40 o = −12.85 −.30 −.12 12.97
6 46 13.42 +1.64 +.69 .73
6 54 12.68 − .55 −.23 .91

12.61 + .26

6 51 o = −11.28 −3.81
7 52 o = +9.71 −53.07

n
o = −1.44 +4.07 = +.37 −
−22.40 +53.33 = +.42 −
.416

+.018

1872 Feb. 28

n = +.41

4 22 o = −13.52 +1.36 +.35 +.49 .56 −13.17 13.03 12.96 4
4 29 13.04 + .29 +.07 +.12 12.97 12.94 .92 4
4 30 13.68 − .06 −02 −.02 (12.70) 6
4 35 13.02 + .42 +.11 +.15 .17 12.91 12.87 .85
4 37 13.58 +1.51 +.39 +.54 .61 13.19 13.04 .97
4 39 12.86 − .06 −.02 −.02 .03 12.88 12.88 .89
4 49 13.17 + .42 +.11 +.15 .17 13.06 13.02 100
4 52 13.66 +1.75 +.44 +.63 .72 13.22 13.03 .94
4 55 13.02 + .39 +.10 +.14 +.16 12.92 12.88 .86
6 39 12.67 − .30

4 39 13.17 +.67 ~~12.96~~ 12.92

4 41 o = −13.67 +2.26
4 59 10.06 −~~16.88~~ 17.35
6 40 ~~18.71~~ +20.74
20.84

n
o = −.50 + 1.59 = +.32
−3.11 + 8.02 = +.39
−7.67 +20.07 = +.38
+.36

n = +.41

6 46 o = 13.63 +1.64 +.67 −12.96
6 54 12.52 − .55 −.23 .75
7 3 12.07 − .49 −.20 .97
7 11 12.95 + .30 +.12 .83

6 58 12.79 + .22 −12.88

6 51 o = −11.00 −3.81
7 12 −11.64 − 2.40
7 52 +11.44 −52.98

+.034

n
o = −1.79 + 4.03 = +.44
−1.15 + 2.62 = +.44
24.23 + 53.20 = +.46
+.45
.36
81
+.41

n = +.438

4 22 o = −13.40 +1.36 +.59 12.81
4 29 12.94 + .29 +.13 .81
4 30 12.77 − .06 −.03 .80
4 35 13.07 + .42 +.18 .89
4 37 13.51 +1.51 +.66 .85
4 39 12.83 − .06 −.03 .86
4 49 13.16 + .85 +.25 (.88)
4 52 13.60 +1.75 +.73 .87
4 55 13.04 + .39 +.17 .87 12.85
4 37 13.79 + .66
6 39 12.73 − .30 −.13 .86
6 46 13.59 +1.64 +.72 .87
6 54 12.58 − .55 −.24 .82
7 3 12.60 − .49 −.22 .82 12.84
7 11 12.95 + .30 +.13 .82
6 54 −12.59 + .14

4 41 o = −13.13 +2.26
4 59 −8.86 −7.41
6 40 −21.41 +20.78
6 51 −11.03 −3.81
7 12 −11.79 −2.40
7 52 +11.41 −53.07

n
o = −0.89 +1.60 = +.43 +
−8.28 +8.07 = +.41 −

n
o = −8.57 + 20.64 = +.42 +
1.86 + 3.45 +.47 −
1.10 + 2.54 +.43 −
29.70 +53.21 +.47 −
.438

dT+m = +12.85 at 4h 39
dT+m = +12.83 at 6h 54m

1872 Feb. 28

h	m		s	
4	22	0 =	− 13.52	+ 1.36
4	29		13.04	+ .29
4	30		13.68	− .06
4	35		13.02	+ .42
4	37		13.58	+ 1.51
(4	39)		(12.86)	− .06
4	49		13.17	+ .42
4	52		13.66	+ 1.75
4	55		13.02	+ .39
6	39		12.67	− .30
4	38		− 13.34	+ .75

4 41 0 = − 13.67 + 2.26
4 59 10.06 − 7.35
6 40 18.71 + 20.74

n

0 = − 0.38 + 1.51 = + .20
− 8.28 + 8.10 + .40
− 5.37 + 29.99 + .18

+ .26

1872 Mar. 1

n = +.45 n = +.46

6	0	0 = − 12.88 + .26 + .12	− 12.76	− 12.88	+ .12	− 12.76		
6	9	12.96 + .38 + .17	.79	12.96	+ .17	.79		
6	30	12.86 + .30 + .13	.73	12.91	+ .14	.77		
~~6~~	~~39~~							
6	09	12.90 + .33	12.76			12.77		

6 9 0 = − 13.95 + 2.66 − 13.97
6 15 − 4.96 − 16.88 − 4.96
6 40 ~~− 19.58~~ 22.06 + 20.74 − 20.68

n

0 = − 1.08 + 2.88 = + .45
− 8.94 + 17.21 + .46
− ~~6.68~~ 9.16 + 20.44 + .45

+ .45

n = +.45

6	56	0 = 12.90 + .38 + .17	− 12.73	− 12.91	+ .17	− 12.74
7	3 ++	12.63 − .49 − .22	.85	12.61	− .22	.83
7	9	13.17 + .87 + .39	.78	13.17	+ .41	.76
7	12	12.92 + .41 + .18	.74	12.93	+ .19	.74
7	20	12.80 + .15 + .07	.73	12.84	+ .07	.77
7	26	12.82 + .63 + .28	(.54)	13.03	+ .30	.48
7	30	12.77 + .10 + .04	.71	12.77	+ .04	.73
7	14	+ .29 + .13	12.76	− 12.89		12.76

n

0 = − 1.88 + 2.37 = + .46
− 7.93 + 17.07 + .46
− 9.79 + 20.45 + .48

+ .46

dT + m = 12.76 at $7^h\ 14^m$

Wire intervals from

δ Urs Min (S.P.) (ε Urs. Min.) 51 Ceph. (S.P.)

	m	s	s						
6-1	+1	31.59 +	91.59	+ +33	28.43 +2) 53.29	28.43	+	4	17.75
6-2	+1	16.09	76.09	+ +2 2	18.31 ± 1 2 9.47	53.59	+	3	33.61
6-3	+1	0.90	60.90	+ +02	34.39 + 0.23	18.31	+	2	51.31
6-4	+0	30.51	30.51	+ 3 !	35.03 9.47	9.47	+	1	25.62
6-5	+0	15.29	15.29	+ 0	19.23 52	34.29	+	0	42.56
6-6	−0	0.15	0.15	+ +0		0.23	+	0	0.26
6-7	−0	15.08	15.08	− 0		35.03	−	0	42.40
6-8	−0	30.25	30.25	− 1		9.47	−	1	25.92
6-9	−1	0.91	60.91	− 2		19.23	−	2	52.21
6-10	−1	16.44	76.44	− 2		54.16	−	3	33.42
6-11	−1	31.73	91.73	− 3		28.20	−	4	17.03

Revise this work.

See correct reduction after the summing of clock rates in this book.

log cos δ = 9.13015 log cos δ = 8.68223 log cos δ = 8.77292

Log. intervals.

log tang δ ~~= 9.1305000~~	log tang δ ~~= 8.6822200~~	log tang δ =
1.9618481	2.3189602	2.4111987
1.8818276	2.2395247	2.3296216
1.7846173	2.1408586	2.2337827
1.4844422	1.8417973	1.9325782
1.1844075	1.5951887	1.6290016
9.1760913	9.31173	9.41497
1.1784013n	1.5444401n	1.6278659n
1.4807254n	1.8402943n	1.9340943n
1.7846886n	2.1437328n	2.2360584n
1.8833207n	2.2409484n	2.3292351n
1.9625114n	2.3184807n	2.4099838n

Intervals.

s		s		s	
+ 12.360		+ 12.356		+ 12.400	
	2.092		2.065		2.123
+ 10.268		+ 10.291		+ 10.277	
	.050		.091		.035
+ 8.218		+ 8.200		+ 8.242	
	.050		.041		.061
+ 4.117		+ 4.118		+ 4.119	
	.054		.085		.071
+ 2.063		+ 2.033		+ 2.048	
	.083		.019		.036
± .029		+ .014		+ .012	
	.055		.063		.052
± 2.035		− 2.077		− 2.040	
	.047		.027		.094
− 4.082 ~~4.482~~		− 4.104		− 4.134	
	.068		.076		2.075
− 8.219		− 8.254		− 8.285	
	.096		.071		1.983
− 10.315		− 10.825		− 10.268	
	2.063		.018		2.098
− 12.378		− 12.403		− 12.366	
	2.0658		2.0545 ~~2.0776~~		2.0628

Mean = ~~2.0671~~ 2.0610 s

Mean Equatorial Intervals

	s		
6 – 1	+ 12.372		
6 – 2	+ 10.279	2.093	2.095
6 – 3	+ 8.220	.059	059
6 – 4	+ 4.118	.051	051
6 – 5	+ 2.048	.070	070
6 – 6	+ 0.002	046	046
6 – 7	– 2.051	053	051
6 – 8	– 4.107	.056	056
6 – 9	– 8.253	073	073
6 – 10	– 10.303		050
6 – 11	– 12.362	.059	059
		2.0563	2.608

By assuming the intervals to be equal and ~~comparing~~ dividing the difference between the first and last by 12 the number of intervals we have,

Ȯ Mer. Mic.	Mer. Mic	51 Ceph.
2.0615 s	2.0583	2.0638

Mean = 2.0612

Assuming the ~~mean between 2.0612 an 2.0641 or 2.0641 we have.~~ value ~~value we have~~.

		s	
6 – 1	+	12.367	
6 – 2	+	10.306	2.061
6 – 3	+	8.245	.061
6 – 4	+	4.122	.061
6 – 5	+	2.061	.061
6 – 6	±	0.000	061
6 – 7	–	2.061	061
6 – 8	–	4.122	061
6 – 9	–	8.245	061
6 – 10	–	10.306	061
6 – 11	–	12.367	.061

For the present the mean between these two sets of values will be adopted viz:

	s	s	log Reduction to mean thread
6 – 1	+ 12.369		9 1.09233
6 – 2	+ 10.293	2.076	1.01254
6 – 3	+ 8.233	.060	0.91556
6 – 4	+ 4.120	.066	0.61490
6 – 5	+ 2.055	.065	0 0.31281 31302
6 – 6	+ 0.001	.054	
6 – 7	– 2.056	.057	.61437
6 – 8	– 4.115	.059	.91640
6 – 9	– 8.249	.067	1.01301
6 – 10	– 10.304	.055	
6 – 11	– 12.364	.060	1.09216
		2.0609	

1873 Mar. 3

h	m		s			n = +.40	n = +.38
5	7	0 =	-13.18	+1.03	+41 +39	12.77	-12.79
5	18		12.96	+.54	+22 +21	.74	.75
5	25		12.82	-.01	-00 -00	82	82
5	26		12.71	-.02	-01 -01	73	72
5	32		12.62	-.15	-06 -06	68	68
5	36		13.06	+1.18	+47 +45	59	61
5	42		12.95	+.81	+32 +31	63	64
6	40		12.58	-.30	-12 -11	70	69
5	27		-12.94	+.48		12.71	12.71

5 22 0 = -14.41 + 3.72
6 40 -19.5 + 20.74

n
0 = -1.51 + 3.24 = +.47
-6.61 + 20.26 = +.33
80
+.40

					n = +.38
6	53	~~0 =~~ -12.49	-.55	-.21	-12.70
6	56	12.86	+.38	+.14	.72
7	3	13.03	+.83	+.32	71
7	9	13.16	+.87	+.33	83
7	11	12.86	+.30	+11	75
7	18	12.97	+.53	+20	77
7	20	12.93	+.62	+24	69
7	33	12.73	+.10	+04	69
7	37	12.93	+.54	+.21	72
7	13	-12.88	+.40		12.73

6 50 0 = -11.46 - 3.81
7 12 -11.82 - 2.40
7 48 -11.65 - 2.74

n
0 = -1.42 + 4.21 = +.34
1.06 + 2.80 = +.38
1.23 + 3.14 = +.39

47
33
34
38
39
24
+.36

n = +.356

5	7	0 = -	13.09 + 1.03 + 37	-12.72
5	18		12.95 + .54 + 19	.76
5	25		12.78 - .01 - 00	.78
5	26		12.72 - .02 - 01	.73
5	32		12.67 - .15 - 05	.72
5	36		13.09 + 1.18 + 42	.67
5	42		13.04 + .82 + 29	.75
5	52		13.02 + .76 + 27	.75
5	30		12.92 + .52	12.73

dT + m = +12.73 at $5^h\ 30^m$

n = +.356

6	40	0 = 12.64 - 30 - 11	-12.75
6	53	-12.54 - .55 - 20	.74
6	56	12.87 + .38 + 13	.74
7	03	13.03 + .83 + 30	.70
7	9	13.16 + .87 + 31	(85)
7	11	12.85 + .30 + 11	.74
7	18	12.95 + .53 + 19	.76
7	20	12.98 + .62 + 22	.76
7	33	12.77 + .10 + 04	.73
7	37	12.93 + .54 + 19	.74
7	10	-12.87 + .33	12.74

dT + m = +12.74 at $7^h\ 10^m$

5 22 0 = -19.23 + 3.72
6 40 -20.08 + 20.78
6 50 11.51 - 3.81
7 12 13.02 - 2.40
7 48 11.71 - 2.74

n
0 = -1.36 + 3.39 = +.40 +
1.26 + 20.95 = +.36 +
1.36 + 4.14 = +.33 -
0.85 + 2.73 = +.31 -
1.16 + 3.07 = +.38 - +.374
+.356

1873 Mar. 11

h	m		s		n = +.41	
5	05	0 =	-14.07	+.79	+32	-13.75
5	07		14.21	+1.03	+42	.79
5	08		13.68	-.15	-06	74
5	11		13.55	-.11	-04	
5	08		13.88	+.39		-13.76
5	44		(13.84	+10		13.80)

4 59 0 = -10.59 - 7.35
5 22 15.30 + 3.72
5 44 12.45 - 3.11
6 40 21.39 + 20.74

n
0 = -3.29 + 7.74 = +.42
-1.42 + 3.33 .43
-1.43 + 3.50 .41
-7.51 + 20.35 .37
.41

					n = +.41		n = +.398
7	09	0 = -14.05	+.87	+.36	13.69	-14.05 + .87 + .35	-13.70
7	11	13.83	+.30	+12	.71	13.83 + .30 + 12	.71
7	12	13.91	+.41	+17	.74	13.89 + .41 + 16	73
7	18	14.03	+.53	+23	80	14.01 + .53 + 21	80
7	26	14.12	+.63	+26	86	13.94 + .63 + 25	69
7	37 7 33	13.86	+.54	+22	.64	13.76 + .10 + 04	72
						12.86 + .54 + 21	.65
7	19				13.74	13.90 + .48	13.71

n = +.398

5	5	0 = 14.07 + .79 + 31	13.76
5	7	14.12 + .83 + 41	.71
5	8	13.69 - .15 - 6	.75
5	11	-13.74 - .12 - 5	.77
5	08	13.90 + 39	13.757

4 59 0 = -10.56 - 7.41
5 22 -15.13 + 3.72
5 44 -12.51 - 3.12
6 40 -22.01 + 20.78

0 = -13.90 + .43

n
0 = -3.34 + 7.84 = +.43 -
-1.23 + 3.29 = +.37 +
-1.39 + 3.55 = +.39 -
-8.11 + 20.35 = +.40 +
+.398

dT + m = +13.74 at $5^h\ 8^m$

dT + m = +13.71 at 7 20

1871phae.proj.1678R

1872 Mar. 14

n = +.366

n = +.36

6 0 0 = −13.05 +.26 +09 −12.96 −13.05 +10 12.96 6 04
6 7 13.15 +.38 +10 13.05 13.17 +14 12.96 6 15
6 30 13.07 +.30 +11 12.96 13.12 +11 12.96 6 40
6 39 12.79 −.30 −.11 12.90 12.84 −11 12.95

6 19 13.02 +.16 −12.97 13.04 12.95

0 = −14.44 +2.66 −13.88 0 = −.84 =
− 6.60 −16.88 − 6.60 6.44 =
−19.84 +20.74 −22.01 8.97 =

0 = −1.42 +2.50 = n
− 6.42 +17.04 = +.38 −6.44 +.38
− 6.84 +20.58 = +.33 −8.57 +.44
+.36

n −.84 → +.32

7 32 +.10 +.36 −12.94 +04 12.90
7 37 0 = −13.15 +.52 +.19 12.96 13.14 +20 .94
8 10 13.00 +.17 +06 12.94 13.01 +.06 .97 7 45
15 47 7 48
7 53 13.07 +.35 −12.95 13.03 +27 7 52
7 44 8 13

0 = −14.97 + 3.54
−12.93 − 2.74 −12.90 0 = −
+ 3.74 −52.92 + 4.11 −17.14
−12.32 − 4.44 17.40 − 0.63

0 = −0.90 +3.19 = +.37 n
14 + 3.09 =
−16.81 +53.27 = +.32
12.75 + 4.89 +.37
(+.35+)

dT + m = −12.94 at 7h 01m

0 = −13.88 + 2.66 0 = −0.84 + 2.50 = +.34+ n
− 6.60 −16.88 − 6.44 +17.04 +.38−
−22.01 +20.78 − 6.97 − .62 +.44+

0 = + 4.11 −53.07 0 = −17.14 +53.34 = +.32− n
−12.40 − 4.44 +1.63 + 4.71 +.38−
+.366

+.08²

1872 Mar. 18

n = +.42

6 39 XX 0 = −14.03 −.30 −13 −14.16 −14.08 6 15 0 = −6.94 −16.88 −6.94
6 40 22.30 +20.74 −14.05

0 = −7.56 +17.66 = +.43 n
−7.80 +19.96 = +.39
+.41

7 37 0 = −14.43 +.54 +23 −14.20 −14.43
8 10 14.26 +.17 +07 19 14.27 7 45 0 = −15.40 +3.54 −15.41
8 20 14.95 +1.81 +76 18 14.96 7 48 −12.94 −2.74 −13.00
8 25 14.36 +.38 +16 20 14.36 7 52 +6.90 −52.92 +7.27

8 08 14.50 +.78 −14.20
14.20

0 = +.90 (.25) +2.76 = +.342 n
−7.86 +3.52 = +.44
−21.40 +53.70 = +.40
+.39
+.43

n = +.424

7 37 0 = −14.43 +.54 +.23 14.20 6 15 0 = −6.94 −16.88 0 = −7.56 +17.60 = +.42−
8 10 −14.27 +.17 +.07 .20 6 40 −20.92 +20.78 −8.42 +20.06 +.42+
8 20 −14.96 +1.81 +.77 .19
8 25 −14.36 +.38 +.16 .20

8 08 −14.50 +.72 14.20 7 45 0 = −15.71 +3.54 0 = −1.21 +2.82 = +.43+ n
7 48 −13.00 −2.74 −1.50 +3.46 +.42−
7 52 +7.27 −53.07 −21.77 +53.79 +.41−
.424

dT + m = +14.20 at 8h 8m

+.007

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Mar 19 1872

h	m		s			n = +38
6	51	0 =	− 14.49	+ .76	+ 29	− 14.20
6	00		14.33	+ .26	+ .10	23
6	7		14.38	+ .38	+ .14	24
5	59		14.40	+ .47		14.22
7	3	0 =	− 14.63	+ .83	+ 26	(14.37)
7	9		14.56	+ .87	+ .27	.29
7	11		14.32	+ .30	+ .11	.21
7	12		14.35	+ .41	+ .16	19
7	18		14.46	+ .53	+ .20	26
7	20		14.21	+ 10	+ 06	15
7	26		14.65	+ .63	+ 24	(41)
7	33		14.23	+ .10	+ 04	19
7	37		14.42	+ .54	+ 21	21
8	10		14.26	+ .17	+ 06	20
8	20		14.91	+ 1.81	+ 69	.22
7	23		14.45	+ .59		14.21

6 04 0 = − 15.22 + 2.66
6 15 − 7.89 − 16.88

0 = − 0.82 + 2.19 = + 38 (n)
− 6.51 + 17.38 = + .38
+ .38

7 45 0 = − 15.30 + 3.54
7 52 + 5.10 − 52.92
8 13 − 12.49 − 4.44

0 = + 0.85 (+2.5) + 2.95 = + .37 (n)
+ 19.55 + 53.51 = + 37
1.96 + 5.08 = + .39
+ .38

						n = +382
5	51	0 =	− 14.49	+ .76	+ 29	− 14.20
6	0		14.33	+ 26	+ 10	.23
6	7		14.37	+ 38	+ 15	.22
5	59					14.22
7	3	0 =	− 14.54	+ 83	+ 32	14.22
7	9		14.56	+ 87	+ 33	.23
7	11		14.32	+ 30	+ 11	.21
7	12		14.37	+ .41	+ .16	.21
7	18		14.44	+ 53	+ 20	24
7	20		14.27	+ 10	+ .06	19
7	26		14.46	+ 63	+ 24	22
7	33		14.23	+ .10	+ 04	19
	37		14.42	+ .54	+ 21	21
	10		14.27	+ 17	+ 06	21
	20		14.92	+ 1.81	+ 69	23
	23		14.43	+ .58		14.22

6 04 0 = − 15.24 + 2.66 0 = + 0.81 + 2.08 = + .37 + (n)
6 15 7.89 − 16.88 − 6.54 + 17.46 .382 −

7 45 0 = − 15.58 + 3.54 0 = − 1.15 + 2.96 = + .37 − (n)
7 52 + 5.48 − 53.07 − 2.91 + 53.65 + .39 −
8 13 − 12.56 − 4.44 − 1.87 + 5.02 + .36 −
.382

$dT + m = +14^{s}.22$ at $6^{h}\ 41^{m}$

+0.09

1872 Mar 21

						n = +42	n = +45			
6	56	0 =	− 14.07	+ .38	+ 16	− 13.91	− 14.48 + 17	14.31	8	53
7	3		14.69	+ .83	+ .35	14.34	14.69 + 38	.31	8	59
7	9		14.71	+ .87	+ 38	33	14.71 + 40	.31		
7	11		14.49	+ .30	+ 13	36	14.49 + 13	.36		
7	12		14.45	+ .41	+ 17	28	14.46 + 18	.28		
7	21		14.15	+ .62	+ 26	29	14.60 + 29	.31		
7	26		14.62	+ .63	+ 26	36	14.64 + 29	.35		
7	11		14.54	+ .61		14.33	14.56	14.32		

0 = − 11.48 − 5.70
− 15.31 + 2.43

0 = − 8.08 (27+80) + 6.32 = + 39 (n)
− 0.75 + 1.87 = + .42

8 53 0 = − 11.75 − 5.70
8 59 − 15.42 + 2.43

					n = +42		
8	46	14.44	+ .60	+ 06	14.38	14.52 + 28	14.34
8	49	14.31	+ .11	+ 05	26	14.29 + 05	24
8	50	14.79	+ 1.13	+ 47	32	14.80 + 52	26
8	55	14.69	+ 1.10	+ .46	23	14.75 + 50	25
8	50	14.56	+ .76		14.30	14.59	14.25

0 = − 14.59 + .76
n
0 = − 2.84 + 6.46 = + 44 −
− 0.81 + 1.67 = + .45 +
46

$dT + m = +14^{s}.32$ at $7^{h}\ 11^{m}$

$dT + m = +14.25$ at $8\ 50$

1872 Mar. 24

					n = +.44	n = +.420	
7	9	0 = −15.18	+ .87	+ .38	−14.80	−15.18+37	14.81
7	18	14.97	+ .53	+ .23	74	14.97+22	.737
7	20	14.99	+ .62	+ 27	72	15.55+26	.71
7	26	15.06	+ .63	+ 28	76	15.11+26	85
7	37	15.01	+ .54	+ 23	78	15.01+23	.78
8	37	14.91	+ .34	+ 15	76		
7	22	15.04	+ .64		−14.76	15.06	14.79

7 12 0 = −13.66 − 2.40 −13.66 = $\overset{n}{+}$

7 52 + 8.40 − 52.52 + 5.77

3.07

n =

0 = −1.38 + 3.04 + .45 −1.20 + 3.04 = + .40

23.44 + 53.56 + .44 −23.83 + 53.71 + .44

+.44 .420

dT + m = + 14.79 at 7h 22m

1872 Mar. 27

					n = +.40	.30			
7	18	0 = −15.49	+ .53	+.21	−15.28	+.16	33	8	53
7	20	15.36	+ .15	+.06	30	+ 5	31	8	59
7	26	15.42	+ .63	+.25	37	+.19	.237		
8	19	15.90	+1.51	+.72	.18	+.54	36		
8	25	15.43	+ .38	+.15	28	+.11	32		
8	37	15.46	+ .34	+.13	.33	+10	36		
8	40	15.34	+ .11	+.04	27	+ 3	28		
8	46	15.42	+ .15	+.06	36	+ 5	37		
8	49	15.35	+ .11	+.04	31	+ 3	32		
8	50	15.65	+1.13	+.45	21	+34	31		
8	15	15.50	+ .53		15.29		15.32		

0 = −13.35 − 5.70

16.05 + 2.43

0 = −(2.15) + 6.23 = $\overset{n}{+.30}$

−.55 + 1.90 =

					n = +.330
7	18	0 = −15.47	+ .53	+18	15.25
7	20	15.40	+ .15	+05	.35
7	26	15.45	+ .63	+21	.24
8	19	15.91	+ 1.51	+.60	.31
8	25	15.43	+ .38	+ 13	.30
8	37	15.46	+ .34	+ 12	.35
8	40	15.32	+ .12	+ 04	.28
8	46	15.50	+ .60	+ 20	.30
8	49	15.32	+ .11	+ 04	.28
8	50	15.66	+ 1.13	+37	.25
8	15	15.49	+ .55		15.30

8 53

8 59

0 = −13.62 − 5.78

16.15 + 2.43

0 = −15.44 + .58

0 = −1.87 + 6.29 = $\overset{n}{+.30}$ −

−0.66 + 1.85 = +.36 +

.330

dT + m = +15.30s at 8h 15m

1872 Mar. 28

n = +.31

6 39 0 = -15.23 -.30 -10 -15.33
6 44 15.53 +.68 +27 32
6 46 16.04 +1.64 +51 (54)
~~6 54 14.47 - .55~~
6 56 15.44 + 38 +12 32
7 3 15.18 - 47 -.15 33
6 50 15.48 + .39 15.32

6 15 0 = - 9.23 -16.88
6 40 21.48 + 20.74
6 50 ~~17.00~~ 8.71 - 3.81

n
0 = - 6.25 + 17.27 = +.36
- 6.00 + 20.35 = +.30
+.33

n = +.31
8 55 15.47 +1.10 +34 -15.13
9 39 15.35 + 45 -14 49
9 42 16.04 +1.71 +.53 51
9 26 15.49 + .79 15.38

8 59 0 = -15.82 + 2.43
9 19 17.22 + 7.03
9 23 16.25 + 2.81
9 27 14.41 - 2.74
9 40 14.65 - 2.84

n
0 = - 0.33 + 1.64 = +.20
-1.73 + 6.24 = +.28
- .76 + 2.02 = +.38
-1.08 + 3.53 = +.31
(-0.84 + 4.63) =
+.29

36
30
20
28
38
81
183
+.31

n = +.306
6 39 0 = -15.28 -.30 -09 -15.37
6 44 15.53 +.65 -21 .32
6 46 16.01 +1.64 +.50 (.50)
6 56 15.44 +.38 +.11 .33
7 03 15.16 - .47 -.15 .31
6 50 15.48 +.38 15.33

6 15 0 = -9.25 -16.88
6 40 -22.10 +20.75
6 50 14.20 - 3.81

n
0 = -6.23 + 17.26 = +.36
-6.62 + 22.40 +.33
-1.28 + 4.19 +.31

.36 -
.33 +
.31 -

~~8 55~~
9 39 0 = -15.37 +45 +14 15.23
9 42 -15.84 +1.71 +.52 .32
9 26 -15.60 +1.08 15.28

8 59 0 = -15.91 + 2.43
9 19 17.28 + 7.02
9 23 16.20 + 2.81
9 27 14.41 - 2.05
9 40 14.57 - 2.86

n
0 = - .31 + 1.35 = +.23 +
1.68 + 5.44 +.27 +
.60 + 1.73 +.35 +
1.19 + 3.83 +.31 -
1.03 + 3.94 +.26 -
+.306

±.027

dT + m = +15.33 at 6h 48m
dT + m = +15.28 at 9 40

1872 Apr. 1

n = +.27
8 50 0 = -14.77 + 1.13 +31 -14.46 -14.78
9 8 14.46 + .05 + .01 45
9 11 14.54 + .76 +21 33
9 12 14.59 + .33 +09 50
9 13 14.60 + .70 + .19 41
9 21 14.46 - .14 -04 50
9 34 14.61 + .19 +03 55
9 39 14.53 + .45 +12 41
9 42 14.86 + 1.71 +.46 40
9 45 14.55 + .50 +.13 43
9 21 14.60 + .57 14.45

8 53 0 = -12.71 - 5.70
8 59 14.96 + 2.43
9 18 16.41 + 7.03
9 23 15.29 + 2.81
9 27 13.70 - 2.74
9 40 14.82 - 2.84
9 47 15.19 + 3.78

n
0 = - 1.89 + 6.27 = +.33
- .36 + 1.86 +.20
- 1.81 + 6.46 +.28
- .59 + 2.24 +.27
- .90 + 3.31 +.27
(- .22 + 3.41
- .59 3.21)
+.27

n = +.261
8 50 0 = -14.78 +1.13 +29 14.49
9 8 -14.46 + .05 + .01 .45
9 11 14.61 + .76 + .20 .41
9 12 14.52 + .33 + .05 .44
9 13 14.63 + .70 + .18 .45
9 21 ~~14~~
9 34 14.50 + .19 + .05 .45
9 39 14.55 + .45 + 12 .43
9 42 14.84 + 1.71 + .45 .41
9 45 14.57 + .50 + 13 .44
9 21 14.61 + .65 14.44

8 53 0 = -12.98 - 5.71
8 59 15.05 + 2.43
9 18 16.42 + 7.02
9 23 15.24 + 2.81
9 27 13.70 - 2.75
9 40 19.74 - 2.86
9 47 15.34 + 3.77

n
0 = - 1.63 + 6.36 = +.26 -
0.44 + 1.78 +.25 +
1.81 + 6.37 +.28 +
0.63 + 2.16 +.29 +
0.91 + 3.40 +.27 -
0.87 + 3.51 +.25 -
0.73 + 3.12 +.23 +
+.261

±.014

dT + m = +14.44 at 9h 21m

Apr. 2 1872

n = +.23

8 20 0 = −14.79 + 1.81 + 42 − 14.37
8 25 14.54 + .38 + 9 .45
8 37 14.49 + .34 + 8 .41
8 40 14.45 + .11 + 3 .42
8 46 14.52 + .15 + 4 .48
8 49 14.51 + .11 + 3 .48
8 50 14.67 + 1.13 + 26 .41
8 55 14.58 + .70 + 16 .42
9 8 14.40 + .05 + 1 .39
9 11 14.49 + .76 + 17 .38
9 12 14.53 + .33 + 8 .45
9 13 14.58 + .70 + 16 .42
9 39 14.51 + .45 + .10 .41
9 45 14.50 + .50 + 11 .39

8 56 14.54 + .54 − 14.42

8 1.3 0 = − ~~12.66~~ 13.09 − 4.44
8 53 − 13.06 − 5.70
8 59 − 14.59 + 2.43
9 19 − 16.00 + 7.03
9 27 − 13.77 − 2.74
9 42 − 14.80 + 1.71

n

0 = − 1.45 − 4.98 = (+.29)
− 1.48 6.31 .24
− .35 1.89 + 19
− 1.46 6.49 + 22
− .77 3.28 + 24
− .26 1.17 + 22

+.23

n = +.235

8 20 0 = − 14.40 + 1.51 + 43 14.37
8 25 14.53 + .38 + 09 .44
8 37 14.49 + .34 + 08 .41
8 40 14.46 + .12 + 03 .43
8 46 14.59 + .60 + 14 .45
8 49 14.47 + .11 + 03 .46
8 50 14.65 + 1.13 + 27 .41
8 55 14.64 + 1.10 + 26 .38
9 8 14.40 + .05 + 01 .39
9 11 14.57 + .76 + 18 .39
9 12 14.48 + .33 + 08 .40
9 13 14.61 + .70 + 16 .45
9 39 14.53 + .45 + 11 .42
9 42 14.77 + 1.71 + 40 .37
9 45 14.52 + .50 + 12 .40

9 01 14.57 + .67 14.41

8 13 0 = − 13.11 − 4.44
8 53 13.48 − 5.71
8 59 14.98 + 2.43
9 19 16.01 + 7.02
9 23 15.12 + 2.81
9 ~~27~~ 13.77 − 2.71

n

0 = − 1.46 + 5.11 = + .28 −
− 1.19 + 6.38 + .18 −
− 0.44 + 1.76 + .23 +
− 1.44 + 6.35 + .23 +
− 0.53 + 2.14 + .26 +
− 0.82 + 3.42 + .23 −

+.235

x, .23

dT + m = + 14.41 at 9h 1m

Apr. 3 1872

n = +.23

6 56 0 = − 14.63 + .38 + 09 − 14.54
7 3 XX 14.44 − .49 − 11 56
7 11 14.68 + .30 + 7 61
7 18 14.72 + .53 + 12 59
7 21 14.74 + .62 + 14 60
7 26 14.66 + .63 + 14 (53)
7 33 14.61 + .10 + 02 59
7 37 14.70 + .54 + 13 57

7 21 14.67 + .33 − 14.57

7 12 0 = − 13.78 − 2.40
7 45 − 15.08 + 3.54
7 52 − 3.91 − 52.50
8 53 − 13.11 − 5.70

n

0 = − 0.89 + 2.73 = + 33
− .41 + 3.21 + 13
− 10.76 + 52.23 + .20
− 1.56 + 6.03 + .26

+.23

n = +.23

8 37 0 = − 14.60 + .34 + .08 14.52
8 47 14.60 + .15 + .03 57
8 49 14.62 + .11 + 02 60
8 50 14.78 + 1.13 + .26 52
8 55 14.75 + 1.10 + .25 53
248

8 50 − 14.55

n = +.218

6 56 0 = − 14.63 + .38 + 08 − 14.55
7 3 14.42 − .49 − 11 53
7 11 14.65 + .30 + 06 62
7 18 14.70 + .53 + 12 58
7 21 14.79 + .62 + 14 65
7 26 14.65 + .63 + 14 54
7 33 14.61 + .10 + 02 .57
7 37 14.70 + .54 + 12 .58

7 21 14.65 + .33 14.58

n = +.218

8 37 0 = − 14.60 + .34 + 07 − 14.53
8 47 14.67 + .60 + 13 54
8 49 14.60 + .10 + 02 58
8 55 14.81 + 1.10 + 24 57
8 50 14.77 + 1.13 + 25 54

8 47 14.67 + .65 14.55

7 12 0 = − 13.98 − 2.40
7 45 − 15.35 + 3.54
7 52 − 3.52 − 52.90
7 58 13.48 − 5.71

n

0 = − 0.67 + 2.73 = + .25 −
0.70 + 3.21 + .22 +
11.13 + 53.23 + .21 −
1.17 + 6.04 + .19 −

+.218

dT + m = + 14.58 at 7h 21m
14.56 at 8 47

1872 Apr 4

(+21)

6 56	0 = −14.57 + .38 + .08	− 14.49
7 3	.39 − .49 − .10	49
7 11	.60 + .30 + .06	54
7 21	.58 + .62 + .13	45
7 33	.56 + .10 + .02	54
7 37	.70 + .54 + .11	59
7 14	−14.57 + .24	− 14.52

7 45 0 = −15.04 + 3.54
7 52 − 3.27 − 52.90

n
(0 = − 0.47 + 3.30 = +.15)
− 11.30 + 53.14 = +.21

n = +.220

6 56	0 = −14.57 + .38 + .08	− 14.49
7 3	14.37 − .49 − .11	.46
7 11	14.57 + .30 + .07	52
7 21	14.63 + .62 + .14	49
7 33	14.55 + .10 + .02	53
7 37	14.70 + .54 + .12	58
7 14	− 14.57 + .24	14.52

7 45 0 = − 15.31 + 3.54
7 52 − 2.90 − 52.90

u
0 = − 0.74 + 3.30 = + +.22
− 11.67 + 83.14 + +.22

ΔT + m = + 14.52 at 7h 14m

1872 Apr. 6

h	m		n = +.14
		s	
8	50	0 = −14.41 + 1.12 + .16	− 14.25
9	8	14.13 + .05 + .01	14
9	11	14.14 + .76 + .11	03
9	13	14.17 + .70 + .10	07
9	21	14.02 − .14 − .03	05
9	34	14.16 + .19 + .03	13
9	39	14.22 + .45 + .06	16
9	42	14.51 + 1.71 + .24	27
9	45	14.21 + .50 + .07	14
9	23	14.22 + .60	14.14

8 53 0 = − 13.54 − 5.70
8 59 14.45 + 2.43
9 19 15.47 + 7.03
9 23 14.50 + 2.81
9 27 13.85 − 2.74
9 47 14.58 + 3.78

n
0 = − 1.18 + 6.30 = +.19
− .23 + 1.50 +.13
− .85 + 6.43 +.13
− .28 + 2.21 +.13
− .37 + 3.34 +.11
− .33 + 3.18 +.14

+.14

n = +.14

8	50	0 = −14.32 + 1.13 + .16	14.16
9	8	14.14 + .05 + .01	13
9	11	14.21 + .76 + .11	10
9	13	14.20 + .70 + .10	10
9	21	14.04 − .14 − .03	07
9	34	14.15 + .27 + .03	12
9	39	14.24 + .45 + .06	18
9	42	14.50 + 1.71 + .24	26
9	45	14.22 + .50 + .07	15
9	23	14.22 + .60	14.14

8 53 0 = 0 − 13.31 − 5.7
8 59 14.84 + 5.43
9 19 15.09 + 7.02
9 23 14.45 + 2.81
9 27 13.85 − 2.75
9 47 14.68 + 3.37

n
0 = − 0.91 + 6.31 = +.14 −
.32 + 1.83 +.17 +
.87 + 6.42 +.19 +
.23 + 2.21 +.11 +
.37 + 3.35 +.11 −
.46 + 2.77 +.17 +

+.140

+.14

ΔT + m = +14.14 at 9h 23m

1872 Apr. 10

n = +.21

7	33	0 = 13.18 + 0.10 + .12	− 13.16
7	37	13.24 + .54 + .11	13
8	10	13.14 + .17 + .04	10
8	20	13.40 + 1.81 + .38	02
8	25	13.22 + .38 + .08	14
8	37	13.14 + .34 + .07	07
8	40	13.13 + .11 + .02	11
8	29	13.21 + .49	− 13.10

7	45	0 = −13.34 + 3.54
7	52	− 2.09 − 52.50
8	13	− 12.11 − 4.44

n

(0 = −0.13 + 3.05 = +.04)

−11.22 + 53.39 + .21

− 1.10 + 4.93 + .22

n = +.187

7	33	o = 13.18 + .10 + .02	13.16
7	37	13.24 + .54 + .10	14
8	10	13.15 + .17 + .03	12
8	20	13.41 + 1.81 + .34	07
8	25	13.22 + .38 + .07	15
8	37	13.14 + .34 + .06	8
8	40	13.14 + .12 + .02	.12
8	29	13.21 + .49	13.12

7	45	o = −13.12 + 3.54
7	52	− 1.73 − 52.50
8	13	12.12 − 4.44

n.

o = −0.41 + 3.05 = +.13 +

−11.48 + 53.39 + .21 −

− 1.04 + 4.93 + .22 −

.147

$dT + m = +13^{s}.12$ at $8^{h}\ 29^{m}$

1872 Apr. 11

n = +.19

8	10	o = −12.78 + .17 + .03	− 12.75
8	20	13.11 + 1.81 + .34	77
8	25	12.83 + .38 + .07	76
8	37	12.84 + .34 + .07	77
8	23	12.89 + .68	12.76

7	52	o = −2.59 − 52.90
8	13	−11.90 − 4.44

n

o = −10.30 + 53.58 = +.19

− 0.99 + 5.12 = +.19

n = +.185

8	10	o = −12.79 + .17 + .13	− 12.76
8	20	13.12 + 1.81 + .34	.78
8	25	12.83 + .38 + .07	.76
8	37	12.84 + .34 + .07	.77
8	23	12.90 + 0.68	12.77

7	52	o = −3.02 − 52.80
8	13	− 11.91 − 4.44

n

o = −9.88 + 53.58 = +.18

0.99 + 5.12 = +.19

$dT + m = +12.77$ at $8^{h}\ 23^{m}$

1872 Apr. 17

$n = +.16$

8	55	$0 = -11\overset{s}{.}75 + 1.10 + .18$	$- 11.57$
9	8	11.64 + .05 + .01	61
9	11	11.68 + .76 + .12	56
9	12	11.74 + .33 + .05	69
9	34	11.64 + .19 + .03	61
9	39	11.64 + .45 + .07	57
9	45	11.63 + .50 + .08	55
10	00	11.66 + .31 + .05	61
10	2	11.63 + .22 + .04	59
10	26	11.58 + .18 + .03	55
10	39	11.76 + .61 + .10	66
10	43	11.63 + .20 + .03	60
10	56	12.08 + 1.92 + .31	(77
10	58	11.48 + .14 + .02	46)
11	2	11.76 + 1.01 + .16	60
11	11	11.64 + .63 + .10	54
10	05	11.62 + .54	11.59

8	59	$0 = -11.91 + 2.43$
9	23	12.09 + 2.81
9	27	11.14 − 2.74
9	47	11.97 + 3.78
10	24	12.15 + 4.13
10	30	11.37 − 3.88

	n
$0 = -0.29 + 1.89$	$= +.15$
$-.47 + 2.27$	+.22
$-.48 + 3.28$	+.10
$-.35 + 3.24$	+.11
$-.53 + 3.59$	+.15
$-.25 + 4.42$	(+.06)

$n = +.150$

8	55	$0 = -11.50 + 1.10 + .16$	$- 11.62$	11.64
9	8	11.64 + .05 + .01	63	63
9	11	11.75 + .76 + .11	62	64
9	12	11.68 + .33 + .05	.62	63
9	34	11.69 + .19 + .03	60	60
9	39	11.66 + .45 + .07	.58	59
9	45	11.64 + .50 + .08	.56	56
10	00	11.66 + .31 + .05	61	61
10	2	11.63 + .22 + .03	59	60
10	26	11.64 + .18 + .03	61	61
10	39	11.72 + .61 + .09	64	63
10	43	11.63 + .20 + .03	60	60
10	56	11.84 + 1.91 + .28	57	61
~~11~~	~~58~~			
11	2	11.78 + 1.01 + .15	58	60
11	11	11.76 + .63 + .09	66	67
10	07	11.70 + .56	11.60	11.61

8	59	$0 = -12.00 + 2.43$
9	23	12.04 + 2.81
9	27	11.13 − 2.75
9	47	12.07 + 3.37
10	24	12.20 + 4.12
10	30	11.31 − 3.84
~~11~~	~~31~~	

	n		
$0 = -0.30 + 1.87$	$= +.16$	+.16	+
.34 + 2.25	+.15	+.15	+
.37 + 3.31	+.16	+.17	−
.37 + 2.81	+.15	+.13	+
.50 + 3.56	+.16	+.14	+
.39 + 4.45		(+.09)	−
	+.168		
		+.150	

$+.01^2$ /

$dT + m = +11\overset{s}{.}60$ at $10^h\,07^m$

1872 Apr. 18

$n = +.13$

h	m		
(9	21	$0 = -11\overset{s}{.}11 - .14)$	
9	34	11.53 + .19 + .02	$- 11.51$
9	39	11.59 + .45 + .06	.53
9	45	11.53 + .50 + .07	46
10	00	11.56 + .31 + .04	52
10	2	11.54 + .22 + .03	51
10	15	11.70 + .91 + .12	58
10	20	11.65 + .76 + .10	55
10	26	11.47 + .18 + .02	45
10	39	11.51 + .61 + .08	43
10	43	11.49 + .20 + .03	46
10	56	11.88 + 1.92 + .25	(63)
11	2	11.64 + 1.01 + .13	51
11	7	11.54 + .39 + .05	49
11	11	11.43 + .63 + .08	35
10	24	11.58 + .59	11.49

9	40	$0 = -10.95 - 2.84$
9	47	11.89 + 3.78
10	24	12.06 + 4.13

	n
$0 = -0.57 + 3.35$	$= +.17$
$-.31 + 3.19$	+.10
$-.48 + 3.54$	+.12
	+.13

$n = +.160$

9	34	$0 = 11.52 + .19 + .03$	$- 11.47$
9	39	11.61 + .45 + .07	54
9	45	11.54 + .50 + .08	46
10	0	11.56 + .31 + .05	51
10	2	11.54 + .22 + .03	51
10	15	11.67 + .91 + .14	53
10	20	11.61 + .76 + .12	49
10	26	11.53 + .18 + .03	50
10	39	11.47 + .61 + .10	46
10	43	11.46 + .20 + .03	45
10	56	11.79 + 1.91 + .30	49
	58	11.49 + .14 + .02	47
11	2	11.63 + 1.01 + .16	47
11	7	11.57 + .39 + .06	51
11	11	11.55 + .63 + .10	45
10	26	11.57 + .56	11.49

9	40	$0 = 10.87 + 2.84$
9	47	11.99 + 3.78
10	24	12.11 + 4.13

	n	
$0 = .70 + 3.40$	$= +.20$	−
.42 + 3.22	+.13	+
.54 + 3.57	+.15	+
	+.160	

$dT + m = +11.49$ [illegible] $10^h\,26^m$

1872 Apr. 19

^{h} ^{m}
9 50 o = −(11.52 + .91) n = +.17
10 26 11.05 + .18 + 03 −11.05
10 39 11.28 + .61 + 10 18
10 43 11.07 + .20 + 03 4
10 55 11.44 + 1.92 + 33 11
11 2 11.29 + 1.01 + 17 12
11 7 11.14 + .39 + 07 7
11 11 11.12 + .63 + 11 1

10 52 11.20 + .55 −11.08

n = +.173

10 26 o = − 11.14 + .18 + 03 11.11
10 39 11.23 + .61 + 10 13
10 43 11.01 + .20 + 03 3
10 55 11.34 + 1.41 + 33 1
11 2 11.28 + 1.01 + 17 10
11 7 11.17 + .39 + 7 10
11 11 11.24 + .63 + 11 12

10 52 11.21 + .70 11.09

9 19 o = −12.25 + 7.03
9 23 11.69 + 2.04
9 27 10.58 − 2.74
9 47 11.76 + 3.48
10 24 11.58 + 4.18
10 30 10.52 − 3.89

n
o = −1.05 + 6.47 = +.16
− .49 + 2.26 +.22
− .62 + 3.30 +.19
− .56 + 3.22 +.18
− .38 + 3.57 +.11
− .70 + 4.44 +.16

+.17

9 19 o = −12.25 + 7.02
9 23 −11.64 + 2.51
9 27 −10.58 − 2.75
9 47 −11.55 + 3.37
10 24 −11.63 + 4.12
10 30 −10.45 − 3.89

o = −1.04 + 6.32 + .16 +
− .43 + 2.11 + .10 +
− .63 + 3.45 + .18 −
− .54 + 3.08 + .21 +
− .42 + 3.42 + .12 +
− .46 + 4.54 + .17 −

+.173

+.020

dT+m = +11.09 at $10^h\ 52^m$

1872 Apr. 20

n = +.16
11 39 o = −11.06 + 1.13 + 09 −10.97 + .18 10.88 12 6 o = −11.67 + 4.81
11 43 11.02 + .27 + 02 (10.00) + 04 98
11 44 10.98 + .04 + 00 98 + 01 97 o = − 0.67 + 4.21 = +.16
11 47 11.13 + 1.40 + 11 11.00 + 22 91
11 59 11.02 + .17 + 01 11.02 + 03 99

11 46 11.00 + .60 −11.00 10.96

n = +.085
11 39 o = − 11.01 + 1.13 + 10 10.91
11 43 11.00 + .27 + .02 10.98
11 44 11.01 + .04 + 00 11.01
11 47 11.02 + 1.40 + 12 10.94
11 59 11.02 + .17 + .01 10.99

11 46 11.02 + .60 10.97

12 06 o = −11.54 + 4.84
o = 11.02 + .60

o = − .52 + 4.24
n = +.120

o = 11.00 + .27 o = 11.01 + 1.13
11.01 + .04 11.06 + 1.40
11.02 + .17

+.12
+.05
17
+.085

o = 11.02 + .16 o = 11.05 + 1.26
−11.00 + .16

o = −.05 + 1.1
n = +.05

dT+m = +10.97 at $11^h\ 46^m$

1872 Apr. 21

n = +.05

8	50	0 = −10.86 + 1.13 + .06	−10.80
9	8	10.80 + .03 + .00	80
9	11	10.79 + .76 + .04	75
9	13	10.88 + .80 + .03	85
9	21	10.78 − .14 − .01	79
9	37	10.82 + .45 + .02	80
10	10	10.85 + .55 + .05	80
10	15	10.88 + .91 + .05	83
10	39	10.92 + .61 + .03	89
10	43	10.85 + .20 + .01	84
10	56	10.95 + 1.92 + .10	85
11	2	10.84 + 1.01 + .05	79
11	7	10.79 + .39 + .02	77
11	11	10.67 + .63 + .03	64
11	30	10.73 + .00 + .00	73
10	12	10.83 + .59	10.80

8	59	0 = −10.87 + 2.43
9	19	11.44 + 7.03
9	23	10.91 + 2.81
9	27	10.67 − 2.74
9	40	10.81 − 2.84
9	47	10.88 + 3.78
10	30	10.63 − 3.88
11	24	10.98 + 2.74
11	34	10.40 − 4.32

n

0 = − 0.04 + 1.84 = +.02
− 0.61 + 6.44 = +.09
− 0.02 + 1.82 = +.06
− 0.16 + 3.39 = +.05
− 0.02 + 3.45 = +.01
± 0.05 + 3.19 = +.02
− 0.20 + 4.47 = +.05
− 0.85 + 1.75 = +.09
− 0.43 + 4.91 = +.09

+.05

n = +.058

8	50	0 = −10.87 + 1.13 + .06	−10.81
9	08	10.80 + .03 + .00	80
9	11	10.86 + .76 + .04	82
9	13	10.91 + .80 + .04	87
9	21	10.80 − .14 − 1	81
9	37	10.84 + .45 + 3	81
10	10	10.83 + .45 + 6	78
10	15	10.85 + .91 + 5	80
10	39	10.88 + .61 + 4	84
10	43	10.84 + .20 + 1	83
10	56	10.86 + 1.91 + 11	75
11	02	10.82 1.01 + 6	77
11	07	10.87 + .39 + 2	79
11	11	10.79 + .63 + 4	75
11	30	10.73 .00 + 0	73
10	12	10.83 + .58	10.80

4dT = +.01

8	59	0 = −10.36 + 2.43 + 1	−10.46
9	19	11.42 + 7.02 + 1	11.41
9	23	10.86 + 2.81 + 1	10.85
9	27	10.67 − 2.75 + 1	10.66
9	40	10.73 − 2.86 + 1	10.72
9	47	10.98 + 3.37 + 0	10.98
10	30	10.57 − 3.89 − 0	10.57
11	24	11.04 + 2.76 − 1	11.05
11	34	10.42 − 4.30 − 2	10.44

n

0 = −0.12 + 1.85 = + +.07 +
.42 6.44 +.07 +
.02 2.23 +.08 +
.17 3.33 +.05 −
.11 3.44 +.03 −
.15 2.79 +.05 +
.26 4.47 +.06 −
.22 2.18 +.10 +
.39 4.93 +.08 −

+.018

dT + m = +10.80 at $10^{h}\,12^{m}$

1872 Apr. 22

n = +.03

10	10	0 = −10.61 + .95 + .03	−10.59
10	20	10.59 + .76 + .02	57
10	26	10.37 + .18 + .01	(38)
10	39	10.96 + .61 + .02	(.94)
10	43	10.51 + .20 + .01	50
10	56	10.67 + 1.92 + .06	(61)
10	58	10.47 + .14 + .00	47
11	02	10.47 + 1.01 + .03	44
11	7	10.48 + .39 + .01	47
11	11	10.37 + .63 + .02	(35)
10	47	10.55 + .68	10.51

10	24	0 = −10.64 + 4.13
10	30	10.23 − 3.88
11	24	10.52 + 2.74
11	30	10.63 − 4.32

n

34 0 = − .09 + 3.45 = +.03
− .32 + 4.56 = +.07
+ .03 + 2.06 = −.01
− 0.08 − 5.00 = +.02

+.03

n = +.020

10	10	0 = −10.59 + .95 + .02	10.54
10	20	10.55 + .76 + .02	50
10	26	10.45 + .18 + .00	45
10	39	10.86 + .61 + .01	55
10	43	10.52 + .20 + .00	52
10	56	10.58 + 1.91 + .04	59
10	58	10.48 + .14 + .00	48
11	2	10.46 + 1.01 + .02	44
11	7	10.51 + .39 + .01	50
11	11	10.49 + .63 + .01	48
10	47	10.52 + .68	10.51

10	24	0 = −10.69 + 4.12
10	30	10.16 − 3.89
11	24	10.48 + 2.76
11	34	10.66 − 4.30

n

0 = −.17 + 3.44 = +.05 +
−.36 + 4.57 +.08 −
− 4 − 2.08 −.02 +
− 14 − 498 −.03 −

+.020

dT + m = $+10^{s}.51$ at $10^{h}\,47^{m}$

1872 Apr. 23

n = +.05

9	8	0 =	-10.18 + 05	+00	-10.18
9	11		10 20 + 76	+04	16
9	12		10 28 + 33	+02	26
9	13		10 17 + 70	+.04	13
10	0		10 20 + 31	+.02	18
10	2		10 16 + 22	+.01	15
10	10		10 27 + 91	+05	22
10	27		10 27 + 91	+.05	22
10	20		10 26 + 76	+04	22
10	26		10 15 + 18	+01	14
10	39		10 34 + 61	+.03	31
10	56		10 44 + 1.92	+.10	(34)
10	58		10 15 + 14	0.01	14
11	02		10 30 + 1.01	.05	25
11	7		10 18 + 39	.02	16
11	11		10 06 + 63	.03	(03)
11	15		10 21 + 12	+.01	20

10 24 0 = 10 48 + 4 13?
10 30 0 = - 10.12 - 388?

0 = -0.26 + 3.54 = +08 (n)
-0.10 + 4.47 +02

+.05

10	19		10.22 + .59		10.20

n = +.065

9	8	0 =	10.15 + .05	+00	-10.15
9	11		10.27 + .76	+05	.22
9	12		10.20 + 33	+02	.18
9	13		10.20 + 70	+05	.15
10	0		10.20 + .31	+.02	.18
10	2		10.16 + .22	+.01	.15
10	10		10.25 + .95	+.06	.19
10	24		10.25 + .91	+.06	.19
10	20		10.22 + .76	+.05	.17
10	26		10.21 + .18	+.01	.20
10	39		10.29 + .61	+.04	.25
10	56		10.35 + 1.91	+.12	.23
10	58		10.16 + .14	+.01	.15
11	2		10.29 + 1.01	+.07	.22
11	7		10.21 + .39	+.03	.18
11	11		10.18 + .63	+.04	.14
11	15				
	18		10.23 + .62		10.19

10 24 0 = 10.53 + 4.13
10 30 10.06 - 3.89

0 = -0.30 + 3.50 = +.09 (n)
-0.17 + 4.51 +.04

+.065

$dT + m = +10^s.19$ at $10^h\ 18^m$

Apr. 25

n = +.07

10	2	0 =	-10.00 + 22	+02	-9.98
10	10		10.10 + 95	+07	10.03
10	15		10.12 + 91	+.06	10.06
10	20		10.18 + 76	+.05	10.13
10	26		10.03 + 78	+.05	9.98
10	39		10.06 + 61	+.04	10.02
10	43		10.06 + 20	+.01	10.05
10	56		10.27 + 1.91	+.15	10.12
10	58		10.08 + 14	+.01	10.07
11	02		10.11 + 1.01	+07	10.04
11	7		10.04 + .39	+.03	10.01
11	11		9.95 + 63	+.04	(9.91)
11	15		10.09 + 12	+.01	10.08
11	30		10.02 + 00	+.00	10.02
11	39		10.19 + 1.13	+08	10.11
11	43		10.03 + .27	+.02	10.01
11	44		9.97 + .04	+.00	9.97
11	47		10.26 + 1.46	+10	(10.21)
11	58		10.03 + 17	+.01	10.02

11 01 -10.08 + .61 -10.05

10 24 0 = - 9.92 + 4.13
11 24 10 23 + 2.74
11 34 9 45 - 4.32
12 6 10 45 + 4.81

0 = +.08 + 3.52 = +.02 (n)
-.15 + 2.13 +.07
-.63 + 4.93 +.13
-.37 + 4.20 +.09

+.07

10 24 0 = 10.17 + 4.12
11 24 9.96 - 3.57
11 34 10.29 + 2.76
12 6 10.40 + 4.84

0 = -.04 + 3.52 = +.03 + (u)
= -.32 + 4.49 +.07 -
= -.21 + 2.16 +.10 +
= -.32 + 4.24 +.08 +

+.070

n = +.070.

10	2	0 =	-10.07 + .22	+01	-10.06
10	10		10.08 + .95	+.07	.01
10	15		10.09 + .91	+.06	.03
10	20		10.14 + .76	+.05	.09
10	26		10.06 + .18	+.01	.05
10	39		10.02 + .61	+.04	-.02
10	43		10.05 + .20	+.01	.04
10	56		10.18 + 1.91	+.15	.03
10	58		10.09 + .14	+.01	.08
11	2		10.10 + 1.01	+.07	.03
11	7		10.07 + .39	+.03	.04
11	11		10.07 + .63	+.04	.03
11	15		10.04 + .13	+.01	.03
11	30		10.02 + .00	+.00	.02
11	39		10.14 + 1.13	+.08	.06
11	43		10.01 + .27	+.02	-.01
11	44		10.02 + .04	+.00	.02
11	47		10.18 + 1.40	+.10	.08
11	58		10.01 + .12	+.01	.00

11 01 10.08 + .60 10.04

$dT + m = +11.04$ at $11^h\ 01^m$

1872 Apr 26

n = −.030

10	01	0 =	−9.76 + 32	+.02	−9.74	−9.75 − 01	−9.76
10	02		9.81 + 22	+01	80	9.81 − 01	.82
10	15		9.77 + 91	+.05	72	9.74 − 03	.77
10	20		9.75 + 76	+.04	71	9.71 − 02	.73
10	26		9.70 + 18	+.01	69	9.76 − 01	.77
10	39		9.63 + 61	+.03	60	9.72 − 02	.74
10	43		9.79 + 20	+.01	78	9.78 − 01	.79
10	56		9.75 + 1.92	+.10	65	9.66 − 06	.72
10	58		9.74 + 14	+.01	73	9.75 − 00	.75
11	2		9.75 + 1.01	+.05	70	9.74 − 03	.77
11	7		9.65 + 39	+.02	63	9.68 − 01	.69
11	11		9.56 + .63	+.03	(55)	9.68 − 02	.70
11	15		9.78 + 12	+.01	77	9.74 − 00	.74
11	30		9.75 + .00	+.00	75	9.75 − 00	.75
11	39		9.80 + 1.13	+.06	74	9.75 − 03	.78
11	43		9.76 + 27	+.01	75	9.74 − 01	.75
11							
10	52		9.73 + .55		9.72	9.79	−9.76

9	47	0 =	9.51 + 378
10	2		9.40 + 413
10	30		9.91 − 388
11	24		9.55 + 274
11	34		9.71 − 433
12	06		9.73 + 481

n

0 = −0.22 + 3.23 = +.07
.33 + 3.58 +09
.18 + 4.43 +04
.18 + 4.19 +09
.02 + 4.88 +00
.00 + 4.36 +00

+.05

9	47	0 =	−9.61 + 3.78
~~10~~	~~2~~		
~~10~~	~~30~~		
11	24		9.61 + 2.76
12	06		9.64 + 4.84
11	34		9.44 − 4.30

$dT + m = +9.75$ at $10^h\ 52^m$

n

0 = +.12 + 3.23 = −.04
+.12 + 3.71 −.05
+.09 + 4.21 −.02
+.01 + 4.55 −.01

12
−.030

Apr. 27

n = +.04 n = +.040

10	01	0 =	9.61 + 31	+.01	−9.60	−9.60	+.01	−9.59
10	2		9.60 + 22	+.01	59	9.60	+.01	59
10	15		9.70 + 91	+.04	66	9.66	+.04	62
10	20		9.64 + 78	+.03	61	9.60	+.03	57
10	26		9.52 + 18	+.01	51	9.58	+.01	57
10	43		9.62 + 20	+.01	61	9.61	+.01	60
10	56		9.77 + 1.92	+.08	(69)	9.68	+.08	60
10	58		9.59 + 14	+.01	58	9.60	+.01	59
11	2		9.65 + 1.01	+.04	61	9.64	+.04	60
11	7		9.52 + 39	+.01	51	9.55	+.02	53
11	11		9.49 + 63	+.05	(48)	9.61	+.03	58
10	52		9.61 + .60		9.57	9.61		9.59

n = +.04

11	15	0 =	9.62 + 12	+.00	−9.62
11	30		9.55 + 00	+.00	55
11	39		9.77 + 1.13	+.04	(73)
11	43		9.60 + 27	+.01	59
11	44		9.51 + 04	+.00	51
11	47		9.78 + 1.40	+.06	(72)
11	58		9.56 + 17	+.01	55
11	40		9.63 + .48		9.56

~~0 = .01~~
−

9	47	0 =	−9.65 + 3.78
10	24		9.50 + 4.13
10	30		9.24 3.88
11	34		9.43 − 4.82

$dT + m = +9.^s59$ at $10^h\ 52^m$

n

0 = −.04 + 3.18 = −.01
+.11 + 3.53 +.03
−.37 + 4.48 +.09
−.18 + 4.92 +.04

+.04

9	47	0 =	−9.75 + 3.78
10	24		9.54 + 4.12
10	30		9.18 − 3.89
11	34		9.46 − 4.30

n

0 = −.14 + 3.15 = +.05 +
+.07 + 3.03 −.02 +
−.43 + 4.45 +.10 −
−.15 + 4.92 +.03 −

+.040

Apr 29, 1872

n = + .045

9	8	0 = − 894 + 05 + 00	− 8.94	− 8.94 + 00	− 8.94 85
9	11	893 + 76 + .03	90	9.02 + 03	.97 9
9	21	886 − 14 − 01	87	8.88 − 00	.88 9
9	38	891 + 45 + .02	89	8.93 + 02	.91 9
9	45	892 + 50 + 02	90	8.94 + 02	.92 9
10	0	893 + 31 + 02	91	8.93 + 01	.92 11
10	2	889 + 22 + 01	88	8.89 + 01	.88 11
10	15	901 + 91 + .06	95	8.98 + 07	.89
10	20	897 + 76 + 04	93	8.93 + 3	.90
10	30	891 + 00 + 00	89		
9	49	8.93 + .38	− 8.91	8.94	− 8.91

59	0 = − 898 + 243	− 9.07 + 2.43 + 1	− 9.06
19	− 931 + 703	9.32 + 7.02 + 1	9.31
23	943 + 281	9.38 + 2.81 + 0	9.38
27	884 − 274	8.85 − 2.74 + 0	8.85
40	881 − 284	8.73 − 2.86 + 0	8.73
24	914 + 274	9.13 + 2.76 − 2	9.15
34	907 − 432	9.09 − 4.30 − 2	9.11

n

0 = − .05 + 2.05 = + .03
− .38 + 6.65 = + 06
− .50 + 2.48 =
− .09 + 3.12 = + .03
− .12 + 3.22 = + .04
− .31 + 2.36 = + .12
+ .14 + 4.70 = − .03

+ .04

n

0 = − .12 + 2.05 = + .06
.37 + 6.64 + .04
~~.44 + 2.43~~ +
.9 + 3.13 + .03
.21 + 3.24 + .07
.21 + 2.38 + .09
.17 + 4.68 + .04

+ .045

+ .032

dT + m = + 8.91 at 9^h 49^m

Apr. 30

n = + .055

10	00	0 = 876 + 31 + .01	− 8.75	− 8.76 + 02	− 8.74
10	02	876 + 22 + .01	75	8.76 + 01	75
10	10	879 + 95 + 05	74	8.77 + 05	72
10	15	875 + 91 + .05	70	8.72 + 05	67
10	20	877 + 76 + .04	73	8.73 + 04	69
10	26	865 + 18 + 01	(64)	8.71 + 01	80
10	12	8.75 + .56	− 8.73	8.74	8.71

10 24 0 = 879 + 413 8.83 8.83 + 4.13
12 06 918 + 481 9.13 + 02 9.11 + 4.84

n

0 = + .04 + 3.57 = + .01
− .43 + 4.25 + .10

+ .06

n

− .09 + 3.57 + .02
− .37 4.28 + .09

+ .055

0 =

dT + m = + 8.71 at 10^h 12^m

1872 May 20

$n = -.05$

$n = +.06$

11 30 $o = -6.22 + .00 + .00 - 6.22 - 6.22$

11 43 $6.25 + .27 + .01 \quad 6.26 \quad 24$

11 47 $6.21 + 1.40 + .08 \quad 29 \quad 13$

59

11 40 $6.23 + .56 \quad - 6.26 \quad 6.20$

11 34 $o = -5.95 - 4.82$

$o = -6.23 + .56.$

$o = -.27 + 4.88 = \overset{n}{+.06}$

$n = +.050$

11 30 $o = -6.22 + .00 + .00 - 6.22$

11 43 $6.23 + .27 + .01 \quad .24$

11 47 $6.14 + 1.40 + .07 \quad .26$

11 40 $6.20 + .16 \quad 6.24$

11 24 $o = -5.85 - 4.30$

$o = -6.24 + .52$

$o = -.23 + 4.86$

$n = +.050$

$\Delta T + m = +6.24$ at $11^h 40^m$

May 21

1872 May 22 n = -.06

n = -.060

11 39 0 = - 6.77 + 1.13 - .07 - 6.84 - 6.72 - .07 - 6.79
11 43 6.77 + .27 - .01 78 6.77 - .01 .76
11 44 6.74 + .04 - .00 74 6.77 - .00 .77
11 47 6.79 + 1.40 - .08 (84) 6.71 - .08 .79
11 58 6.78 + .17 - .01 79 6.76 - .00 .76

11 46 - 6.77 + .60 - 6.79 6.74 - 6.77

12 06 0 = - 6.54 + 4.81

0 = + .23 + 4.21 = $\overset{n}{-.06}$

12 06 0 = - 6.49 + 4.83
6.74 + .60

0 = + .23 + 4.24

dT + m = + 6.77 at 11^h 46^m n = -.060

Ap. 24 1872 n = +.08

10 26 0 = - 10.04 + .18 + .01 10.03
10 39 10.19 + .61 + .05 14
10 43 10.12 + .20 + .02 10
10 56 10.31 + 1.92 + .16 15
10 58 10.10 + .14 + .01 9
11 03 10.17 + 1.01 + .08 9
11 07 10.10 + .39 + .03 12
11 11 10.02 + .63 + .05 (9.97)
11 30 10.04 + .00 + .00 04
11 42 10.08 + .27 + .02 04
11 47 10.46 + 1.40 + .11 (30)

11 06 - 10.15 + $\overset{.61}{\cancel{.80}}$ - 10.09

10 24 0 = - 10.26 + 4.13
11 24 - 10.37 + 2.74
11 34 - 9.65 - 4.32

0 = - .11 + 3.63 = $\overset{n}{+.03}$
- .22 + 2.24 + .10
- .50 + 4.82 + .10

+ .08

n = + .077

10 26 0 = - 10.10 + .15 + .01 - 10.09
10 39 10.15 + .61 + .05 10
10 43 10.11 + .20 + .01 10
10 56 10.22 + 1.91 + .15 07
10 58 10.11 + .14 + .01 10
11 3 10.16 + 1.01 + .08 8
11 7 10.18 + .39 + .03 15
11 11 10.14 + .63 + .05 09
11 30 10.04 + .00 + .00 04
11 42 10.05 + .27 + .02 .06
11 47 10.27 + 1.40 + .11 .16

11 06 10.14 + .61 10.09

10 24 0 = - 10.31 + 4.12
11 24 10.43 + 2.76
11 34 9.71 - 4.30

0 = - .17 + 3.51 = $\overset{n}{+.05}$ +
- .19 + 2.15 + .04 +
- .43 + 4.91 + .09 -

+ .077

dT + m = + 10.09 at 11^h 06^m

Preliminary clock errors and instrumental constants from Jan 1 1872 to May 22 187

Dates	S T h	m		ΔT from	ΔT	Daily rates s		Hourly rates		n	n	
1872 Jan 1	2	35		+ 23.46	23.46	+1.03	+1.01	+.042	+.042	+.39	+.398	
2	0	45		24.39	24.39	+.74	+.79	+.031	+.032	+.38	+.380	
5	3	13		26.78	26.74	+.56	+.73	+.023	+.030	.41	.392	
6	3	17		27.29	27.30	+.71	+.70	+.030	+.029	.39	.370	
8	1	32		28.88	28.89	+.71	+.75	+.030	+.030	.42	.420	
8	3	59		29.05	29.04	+.71	+.75	+030	+.030	.42	.420	
9	1	46		29.70	29.71	+.81	+.85	+034	+.035	.44	.430	
10	2	54		30.65	30.67	+.91	+.91	+038	+.038	.41	.394	
10	4	34	4 49	30.71	30.73	+.91	+.91	+.038	+.038	.41	.394	
10	5	04	4 49	30.72	30.73	+.91	+.91	+.038	+.038	.41	.4	.41
12	4	31		2.71	2.71	+.25	+.22	+.010	+.009	.41	.405	
13	3	29		2.97	2.92	+.00	+.13	+.000	+.006	.37	.387	
14	2	40		2.96	2.95	+.07	+.10	+.003	+.004	.41	.389	
15	3	48		3.03	3.02	+.07	+.08	+.003	+.003	.33	.350	
21	2	7		5.27	5.29	+.07	+.07	+.003	+.003	.37	.376	
23	3	4		5.40	5.40	+.05	+.08	+.002	+.003	.38	.367	.38
24	3	5		5.45	5.48	+.05	+.08	+.002	+.003	.39	.343	.38
30	2	00		6.43	6.39	+.47	+.49	+020	+.021	.38	.437	
30	4	57		6.34	6.34	+.47	+.49	+.020	+.021	.49	.477	
30	5	56		6.43	6.39	+.47	+.49	+.020	+.020	.45	.470	
31	2	7		6.92	6.87	+.58	+.50	+.029	+.021	.50	.513	
31	5	27		6.93	6.91	+.52	+.50	+.029	+.021	.50	.512	
Feb. 1	0	51		7.48	7.44	+.53	+.53	+.022	+.022	.52	.504	.47
2	5	50		8.04	8.04	+.36	+.44	+.015	+.019	(+.50)	.52	
4	3	52		8.70	8.73	+.38	+.39	+.016	+.016	.44	.440	
5	5	48		9.12	9.17	+.36	+.37	+.015	+.015	.48	.464	.46
7	2	23		9.78	9.79	+.38	+.37	+.016	+.015	.40	.387	
7	5	14		9.85	9.86	+.38	+.37	+.016	+.015	.40	.387	
8	5	34		10.22	10.22	+.37	+.30	+.015	+.012	.34	.352	
12	4	52		11.18	11.18	+.22	+.16	+.009	+.007	.32	.338	
14	3	35		11.33	11.32	+.08	+.03	+.003	+.001	.28	.290	
15	5	10		11.34	11.31	+.10	+.12	+.004	+.006	.37	.400	+.34
16												
17												
18	4	48		12.00	12.01	+.22	+.33	+.009	+.014	.45	.417	
19	7	17		12.49	12.49		+.30		+.012	.43		
22	4	33		12.98	12.99	+.24	+.20	+.010	+.008	.41	.400	
24	4	36		13.31	13.34	+.17	+.01	+.007	+.001	.42	.400	+.43

	Dates	S. T.			ΔT + m	ΔT + m	Daily rates		Normal rates		n	
		h	m		s		s		s			
1872	Feb. 24	7	24		+13.88	13.33	−.18	+.01	−.008	+.001	+.42	+.400
	26	5	3		13.04	13.04	−.13	−.12	−.006	−.006	.35 ~~.42~~	.372
	27	5	51		12.91	12.92	−.00	−.10	−.000	−.004	.42	.416
	28	4	39		12.92	12.85	−.02	−.08	−.005	−.002	.41	.438
	28	6	58		12.88	12.84	−.02	−.08	−.005	−.002	.41	.438
	Mar. 1	6	9		12.76	12.77	−.03	−.04	−.005	−.002	.45	.467
	1	7	30		12.76	12.76	−.03	−.04	−.005	−.002	.45	.467
	3	5	27		12.71	12.73	−.02	−.01	−.001	−.001	.38	.356 +.41
	3	7	13		12.73	12.74	−.02	−.01	−.001	−.001	.38	.356
	11	5	44		13.76	13.74	+.07	+.07	+.003	−.003	.41	.398
	11	7	19		13.74	13.71	+.07	+.07	+.003	−.003	.41	.398
	14	6	19	7 01	12.97	12.94	+.30	+.03	−.012	+.001	.36	.366
	14	7	53	7 01	12.95	12.94	.30	+.03	+.012	−.001	.36	.366
	18	8	8		14.20	14.20	+.02	+.17	+.001	+.005	.42	.424 +.39
	19	5	59	6 41	14.22	14.22	+.12	+.03	+.005	+.001	.38	.382
	19	7	23	6 41	14.21	14.22	+.12	+.03	+.005	+.001	.38	.382
	21	7	11		14.33	14.32	+.15	+.10	+.006	+.004	.42	.460
	21	8	50		14.30	14.25	+.15	+.10	+.006	+.004	.42	.460
	24	7	22		14.76	14.79	+.17	+.16	+.007	+.006	.44	.420
	27	8	15		15.32	15.30	+.03	+.10	+.001	+.004	.30	.330 +.41
	28	6	50		15.82	15.33	.03	+.1	+.001	+.000	.31	.306
	28	9	26		15.88	15.28	.03	−.13	+.001	−.005	.81	.306
	Apr. 1	9	21		14.45	14.44	−.03	−.12	−.001	−.001	.27	.261
	2	8	58		14.42	14.41	+.15	+.07	+.006	+.003	.23	.23
	3	7	4		14.57	14.58	.04	+.06	−.002	+.002	.23	.218
	3	8	50		14.55	14.55	.04	+.06	−.002	+.002	.23	.218
	4	7	14		14.52	14.52	.21	−.10	−.008	−.004	.21	.220
	6	9	23		14.14	14.14	27	−.22	.011	−.009	.14	.140
	10	8	29		13.10	13.12	−.34	−.30	−.014	−.012	.21	.147
	11	8	23		12.76	12.77	−.19	−.30	−.008	−.012	.19	.185
	17	10	5		11.59	11.61	−.10	−.26	−.004	−.011	.16	.150
	18	10	24		11.49	11.49	−.41	−.25	−.017	−.011	.13	.160
	19	10	52		11.08	11.09	−.09	−.26	−.004	−.011	.17	.173
	20	11	46		10.95	10.97	.20	−.15	−.009	−.006	+.08	.085
	21	10	12		10.80	10.80	.21	−.29	−.009	−.012	.05	.058
	22	10	47		10.51	10.51	.29	−.30	−.012	−.012	.03	.020
	23	10	19		10.20	10.19	−.31	−.14	−.012	−.006	+.05	.045
	24	11	6		10.09	10.09		−.07		−.003	+.08	.077

Dates		~~ST~~ T h	m	4T+m	4T+m	Daily rates s		Hourly rates s		n	n
1872 Apr.	25	11	01	+10.05	10.04	− 0.33	−.19	−.014	−.008	+.07	+.070
	26	10	52	9.72	9.75	− .15	−.22	−.006	−.009	.05	−.030
	27	10	52	9.57	9.59	− 34	−.25	.014	−.010	.04	+.040
	29	9	49	8.91	8.91	− .18	−.29	−.008	−.012	.04	+.045
	30	10	12	8.73	8.71	− .18	−.29	.008	−.012	+.05	+.055
May	20	11	40	6.20	6.19	+ 29	+.29	−.012	+.012	+ .06	+.050
	21										
	22	11	46	+6.79	6.77	+.29	+.29	.012	+.012	− .06	−.060

In the first computation (in blue) the daily rates were found by comparing successive dates, but in the final computation, in general the mean from the preceding and following dates has been taken, but in some cases I have given the rate which seems to be most likely to be the true one.

Adopted Intervals	Log.
12.872	1.09244
10.278	1.01191
8.233	0.91556
4.116	0.61448
+2.044	0.31048
+ .008	
± 2.056	0.31302
4.108	0.41363
8.239	0.91587
10.294	1.01258
12.352	1.09174

1871phae.proj.1678R

Pog obone Bell.

Wire Intervals from

	ε Ursæ Min. log cos δ = 9.13015	δ Ursæ Min log cos δ = 8.77292		51 Ceph. log cos δ = 8.68223	
Mean – 1	91.58	+208.66	+	256.97	257.47
2	76.14	173.48	+	213.44	213.60
3	60.89	138.94	+	171.57	171.36
4	30.50	69.46	+	85.93	85.49
5	+15.17	34.53	+	42.50	42.36
6	+0.14	.03	+	0.16	+0.16
7	−15.08	−35.23	−	42.36	−42.50
8	30.26	69.26	−	85.49	85.93
9	60.92	139.03	−	171.36	171.57
10	76.44	173.71	−	213.60	213.44
11	91.70	207.79	−	257.47	256.97

Log Intervals

1.96180	2.31944	2.41073
1.88161	2.23925	2.32960
1.78455	2.14283	2.23391
1.48430	1.84173	1.93192
1.18099	1.53820	1.62696
9.14613n	8.54691n	9.20412
1.17840n	1.84048	1.62839n
1.48087	2.14311	1.93414
1.78476	2.28982	2.23444
1.88882		2.32928
1.96237n	2.31762n	2.40988n

Intervals

+12.358		+12.370		+12.387	
+10.275	2.083	+10.284	2.086	+10.276	2.111
+8.217	2.058	+8.237	.047	+8.244	.032
+4.116	2.060	+4.118	.059	+4.113	.065
+2.047	2.069	+2.047	.071	+2.038	.075
+.019	2.028	−.002	.049	+.008	.030
−2.035	2.054	−2.089	.067	−2.045	.055
−4.083	2.048	−4.106	.017	−4.134	.089
−8.221	2.089	−8.242	.068	−8.254	.060
−10.315	2.094	−10.298	.056	−10.269	.015
−12.374	2.059	−12.318	.020	−12.363	.094
	2.061		2.056		2.063 } mean = 2.060

12.358	10.275	8.217	4.116	2.047	+0.019	−2.035	4.083	8.221	10.315	12.374
370	284	237	118	047	−002	089	106	242	298	318
387	276	244	113	.038	+008	045	134	254	269	363
+12.372	+10.278	+8.233	+4.116	+2.044	+0.008	−2.056	−4.108	−8.239	−10.294	−12.352

2.094 2.095 2.058 2.072 2.036 2.064 2.052 2.060 20.55 2.058 = mean

s
2.094
045
055
072
036
064
052
060
055
058

2.059

Assuming the intervals to be equal and dividing the first and the last by 12, the number of intervals I have found for.

ε Urs. Min. $\frac{24.732}{12} = 2.061$

δ Urs. Min. $\frac{24.688}{12} = 2.057$

51 Ceph. $\frac{24.750}{12} = 2.063$

Mean = 2.060 s

Places of Fundamental Stars reduced to 1871.0

	Star	Pulcova h	m	s	J o	Camb.	Correction to Pulcova. 32 36 45 ~~27 30 29 38 81 35 37~~		Mean	+	Provisional corr.	No.
1	α Andromedae	0	01	43.38	+284	43.36	+01 −02 +07 −01 −08 −09 +0 −07	−.02	.15		−01	74
2	22 Andromedae	0	3	37.44	+454	37.34	+.03 −40 −6 −17 −17 −10 −13 −7 −7 −16	−.09	.02		−01	75
3	4 H. Draco	0	6	7.56	101.7	7.43	−22 +2 −31 −27 −23 −11 +20	−.13	(.10)		−4	76
4	γ Pegasi	0	6	35.69	+145	35.69	+3 +1 −6 +1	−.00	.08		+8	77
5	ι Ceti	0	12	51.29	−95	51.29	−2 +1 +2 −3		.00		+0	78
6	12 Ceti	0	23	27.35	−47	27.37	+2 −3 +8 +2		.00	.02	+3	79
7	κ Cassiopeiae	0	25	41.07	+622	41.06	−.08 +.17 +.02 −.05 −.06 −.04 −.05		(.01)		−2	80
8	κ Draconis	0	27	57.46	+1095	57.41	−.19 −.42 −.14 +.11 +.41		#(.05)		−7	81
9	α Cassiopeiae	0	33	12.01	+558	11.95	−1 −8 −1 +2 −4 −.06 −.16 −.09 −.11 −.07		.06		−6	82
10	21 Cassiopeiae (✱✱)	0	37	10.26	+743	10.59	+.35 +.38 +.25		(.33)	(.33)	+18	83
11	ζ Andromedae	0	40	30.27	+235	30.27	+4 −1 −2 +1 +0			.00	+01	84
12	η Cassiopeiae	0	41	18.43	+57.1	18.58	+22 +10 +13		~~.15~~	15	+.13	85
13	γ Cassiopeiae	0	48	56.40	+600	56.34	−6 −7 −5		6		−7	86
14	ε Piscium	0	56	14.98	+42	15.02	+1 +3 −3 +9 +10 +4 +5			4	+4	87
15	β Andromedae	1	2	30.93	+349	30.86	−8 −5 −11 −5 −6 −10 −7 −4 −7		7		−4	88
16	ζ Piscium	1	4	33.71	+294	33.60	−10 −10 −08 −11 −14 −10 −11 −10		11		−11	89
17	Polaris ✱††	1	11	37.29	+886	37.44						90
18	A Cassiopeiae	1	21	40.60	+696	39.96	+1 −11 +7 +0 −1 −4 +3 −23 −3		(4)		−3	91
19	η Piscium	1	24	34.94	+147	34.97	+2 +6 +0 +6 +0 +0 −5 +5 +2 +11			3	+3	92
20	8 Persei	1	30	6.04	+48.0	6.08	+11 +0 +3 +5 +1 +5 +4 +2 ~~+0~~ −1 +3			4	+0	93
21	ν Piscium	1	34	43.19	+4.8	43.17	−5 −8 −0 −8 −0 −1 +5		2		+0	94
22	ο Piscium	1	38	35.14	+8.5	35.00	−12 −2 −20 −19 −13 −13 −17 −17 −11		14		−.10	95
23	β Arietis	1	47	[illegible].03	+202	31.03	−6 +4 +6 −1 −3 +6 −5 +1 −3 −2 +5			0	+0	96
24	50 Cassiopeiae	1	52	[illegible]7.92	+418	27.98	+14 −10 +5 +7 +27 +7 −8			(6)	+7	97
25	γ Andromedae	1	56	59.28	+417	59.30	+4 −3 +6 +8 +1 +8 −3 +4 +5 −3 +4			2	+3	98
26	α Arietis	1	59	54.31	+229	54.28	−9 −2 −0 +3 −11 −0 −6 +2		3		−3	99
27	β Trianguli	2	1	52.39	+344	52.39	+0 +0 +2 −1 −2			0	+0	100
28	55 Cassiopeiae	2	4	23.27	+659	23.34	+6 +8 +5 +8 +6			✱(7)	+8	
29	6 Persei	2	5	6.19	+50.5	6.19	+4 −8 +4			0	+1	101
30	γ Trianguli	2	9	39.09	+33.3	39.05	−5 −8 −1 −2 −0 −5		4		−4	102
31	67 Ceti	2	10	32.99	−40	33.02	−3 −3 +4 +7 +11			3	+5	103
32	ο Ceti	2	12	49.82	−36	49.84	+7 −2			2	+1	~~104~~
33	ι Cassiopeiae	2	18	28.03	+668	28.21	+18 +9 +9 +3 +23 +20 +33 +25 +20 +22 +20			(18)	+21	104
34	ξ Ceti	2	21	18.10	+49	18.17	+10 +2 +9 +2 +9 +10 +6 +6 +8			7	+4	105
35	δ Urs. min.	2	28	49.62	+1037	49.56	−12 −22 +17 −5 +24 −14 −15 −23		(6)		−10	106
36	ν Arietis	2	31	29.72	+21.4	29.71	−2 +10 −7 −8 +1 +5 −4 −3 −0		1		−0	107
37	δ Ceti	2	32	52.33	−02	52.26	−5 −7 −11 −3 −7		7		−7	168
38	θ Persei	2	35	23.96	+48.7	23.96	−5 +6 −4 −0 −0 +2 −2 +1			0	+0	109
39	γ Ceti	2	36	37.08	+27	37.11	+0 +1 −2 +11 +8 +1			3	+3	110
40	41 Arietis	2	42	23.66	+26.7	23.66	+0 +2 −2 +1 −2 +4 +0 −2 −0 +1			0	+0	111
41	τ Persei	2	45	7.40	+522	7.45	+6 +16 +7 +5 +0 +3 +5 +0 −2 +7 +6			5	+5	112
42	47 Cephei	2	49	2.89	+789	2.91	−3 +6 +6 −13 +6 −7 +25 +1 +8			(2)	+2	113
43	B Urs. min.	2	51	6.31	+105.3	6.43	+8 +21 +1 +10 −1 +9 +32 +14			(12)	+10	114
44	α Ceti	2	55	32.25	+3.6	32.25	+6 +0 +7 −5 +1 −1 +3 +1 +1 −5 −4			0	−1	115
45	ρ Persei	2	56	55.00	+38.3	54.97	−3 −6 −7 −3 +1 −6 −1 −2		3		−2	116
46	β Persei	2	59	46.93	+40.5	46.92	+0 +2 −6 −5 −1 −6 −5 +9 +3 +0 +0 −5		1		−0	117
47	48 Cephei	3	4	2.42	+77.3	2.65	−15 +4 −12 −0 −19 −9 −1 −3		(7)		−5	118
48	δ Arietis	3	4	15.36	+19.2	15.33	−4 −3 −1 −5		3		−2	119
49	α Persei	3	15	7.45	+49.9	7.35	−8 −5 −4 −20 −16 −15 −11 −11 −10 −11 −8		10		−11	120
50	ο Tauri	3	17	52.40	+8.6	52.40	−5 −2 −1 +0 +2 −6 −1 −0 +6 +7			0	+1	121
51	ξ Tauri	3	20	10.66	+9.3	10.79	+11 +6 +10 +19 +17 +9 +16			13	+10	122
52	γ Urs. min.	3	20	57.26	+107.7	57.10	−20 −29 −25 −12 +2		(16)		−15	123
53	f Tauri	3	23	45.22	+12.5	45.18	−0 −10 −5 −5 −3 −0 −3		4		−3	124
54	ε Eridani	3	26	51.19	−9.9	51.26	+9 +5 +3 +6 +7 +7			6	+7	125
55	Gr. 716	3	30	58.88	+62.8	58.88	+15 +2 −15 +1 −6 −8 +6 +6 +0			(0)	−4	126
56	δ Persei	3	33	44.89	+47.4	44.90	+6 +0 +0 −4 −1 +1 +4 +2 +0			~~2~~	+1	127
57	η Tauri	3	39	49.14	+28.7	49.14	−3 −4 −7 −2 −1 +7 +4 +3			0	+1	128
58	ε Camel. H	3	46	9.29	+60.7	9.27	−1 −4 +2 −10 −8 +7		(2)		−2	129
59	ζ Persei	3	46	1.64	+31.5	1.63	−4 +3		~~1~~		−3	130
60	ε Urs. min.	3	48	42.71	+101.8	43.08	+60 +64 +63 +67 +28 +63			(.38)	+.4	131
61	ε Persei	3	49	12.04	+39.6	12.12	+3 +11 +12 +6			8	+8	13
62	λ Tauri	3	53	32.12	+12.1	32.12	−2 +3 +0 +11 −6 +1 +3 −7		0		+5	13
63	c Persei	3	59	18.17	+47.4	18.24	+9 +11 +4 +8 +7 +6 +3 +4 −1 +14			/	+7	13
64	γ Tauri	4	12	27.24	+15.3	27.24	−3 +3 +2 −3 +8 +3 +0 +4 −5		0		+0	13
65	δ Tauri	4	15	29.78	+17.2	29.85	+14 +6 +5 +6 +2 +9 +7 +7 +4			/	+6	136
66	✱ε Tauri	4	21	6.16	+18.9	6.16	+4 −2 −1 −0 +2 −2		0		+0	137
67	1 Camel.	4	21	49.37	+53.6	49.26	−9 −12 −11 −6 −19		11		−11	138
68	α Tauri	4	28	31.21	+16.2	31.19	−0 −2 −1 −10 +6 −12 −2 −4		2		−1	139
69	ν Eridani	4	29	52.39	−3.6	52.49	+12 +8 +8 +11 +5 +14 +14		✱	10	+9	14
70	τ Tauri	4	34	30.24	+22.7	30.28	+5 +9 +5 +2 +4 +5 +1			4	+5	14
71	4 Camel.	4	37	15.97	+56.5	15.92	−13 −2 −5 −5 −4 −0 −5 −6		5		−6	14
72	μ Eridani	4	39	3.24	−3.5	3.21	−1 −4 −1 −2 −5 −6 −4		3		−3	14
73	α Camel.	4	41	14.30	+66.1	14.47	+24 +16 +13 +11 +27 +10 +18			(.17)	+.1	

−.121 + .94
−.81 + .99

No.	Star	Pulcova h	m	s	δ	S. Camb. s	Separate corrections to Pulcova	Prov. corr.	Mean −	Mean +
74	ι Aurigae	4	48	35.70	+83.0	35.68	−0+1−4−1+1−6−4	−.01	2	
75	10 Camel	4	51	57.16	+60.2	57.03	−15−12−10−17−9	−11	(13)	
76	ε Aurigae	4	52	42.86	+43.6	42.94	+15+7+2	+10		8
77	ζ Aurigae	4	53	27.82	+40.9	27.85	−6+5+3+5+6	+3		3
78	ι Tauri	4	55	23.20	+21.4	23.19	−4−4+3+2+1−2	−0	1	
79	ε Urs. Min.	4	59	16.31	+97.8	16.28	−15−0+17+16−27+4−20−25+24	+1	(3)	
80	λ Eridani	5	2	58.46	−8.9	58.46	+0+8−4−5+3	+0		0
81	ν Aurigae	5	4	36.20	+38.3	36.19	+2+0+0+1−6−2	+0	1	
82	α Aurigae	5	7	9.76	+45.9	9.67	−15−12−11−10−9−9−2−9−6	−9	9	
83	β Orionis ~~Aurigae~~	5	8	20.35	−8.3	20.35	+9+0−3−3+2−2+0	+1		0
84	γ Orionis	5	11	20.63	−7.0	20.63	+2+0−4−3+1+8−4	+1		0
85	β Tauri	5	18	8.30	+28.5	8.29	+1+1−4−2−0−1+3−4	−1	1	
86	Gr. 966	5	22	29.50	+74.9	29.32	−8−21−17−32−0−35−6−35−8	−17	(18)	
87	δ Orionis	5	25	25.05	−0.6	25.01	−1−1−8−6−0−2−8	−3	4	
88	ε Orionis	5	29	40.11	−1.3	40.13	+4+4+8−2+3−7+2	+2		2
89	σ Orionis	5	32	16.21	−2.7	16.28	+9+3+9+5+6+7+10	+6		7
90	ο Aurigae	5	35	54.45	+49.8	54.49	+4+3+7−5+6+9	+3		4
91	δ Aurigae	5	42	32.92	+39.1	33.62	+6+12+11+18+8+8+7	+9		10
92	ψ Draconis	5	44	14.15	+72.2	14.27	+1+28+9+18+5	+6		(12)
93	α Orionis	5	48	11.30	+7.4	11.31	−4+11+0+0+7−6	−1		1
94	β Aurigae	5	50	4.05	+44.9	3.98	−3−1−16−8−5	−3	7	
95	θ Aurigae	5	50	55.50	+37.2	55.51	−1−2+8−2+2	+1		1
96	ν Orionis	6	0	12.42	+14.8	12.42	+1+0+3+0−3+1+0−1	+0	0	
97	22 Camel	6	4	37.56	+69.4	37.62	+6−1−4+16+12+9+14+5+5+1	+2		(6)
98	η Geminorum	6	7	5.45	+22.5	5.46	+2+6−1+2−3+5+0−5+1	+0		1
99	δ Urs. Min	6	14	38.09	+93.4	38.09	−32+22−35+35−6+22−20+4−60	—		
~~100~~	~~η Geminorum~~	~~6~~	~~30~~	~~15.55~~	~~+16.5~~	~~15.59~~	+58−11−53+12+5−21+67	—	.44	(0)
100	γ Geminorum	6	30	15.55	+16.5	15.59	−1+7+4+10+6−2	+5		4
101	51 Cephei	6	39	14.41	+87.2	13.76	−1.66−.57−1.76−.38−.20−.66−.48−.88+.75−.50	—		
102	15 Lyncis	6	46	5.97	+58.6	5.95	= −.77−.70−1−.70−.49−.57−.41−.42−.90	—	(65)	
103	50 Draconis	6	50	31.22	+104.7	31.50	+15−6−6−21	−3	−5	
~~104~~							= +33+42+14+24 = A. H.	+28		(28)
104	ζ Geminorum	6	50	27.41	+20.8	27.44	+5+1+2+2+4+4	+1		3
105	63 Aurigae	7	2	46.75	+39.5	46.73	−7−1−0+1	+0	2	
106	64 Aurigae	7	9	3.83	+41.1	3.83	−1+1−11+11−1+1−2	+0	0	
107	λ Geminorum	7	10	40.71	+16.8	40.71	+2+0+0+1−3−4+0	+0	0	
108	δ Geminorum	7	12	25.03	+22.2	25.05	−2+4−7+2+6	+1		2
109	δ Draconis	7	12	31.11	+112.6	31.28	+16+2+8+24	+14		(13)
110	ι Geminorum	7	17	42.46	+28.1	42.44	+2−4−11−4+4−2	−2	2	
111	β Can. Min.	7	20	9.24	+8.5	9.28	+5+2+7+1	+4		4
112	ρ Geminorum	7	20	48.64	+32.0	48.69	+6+3+6+7−2+8	+5		5
113	α Geminorum	7	26	21.78	+32.2	21.74	−1+4+3+3+1−2−5−2+5	+0		1
114	α Can. Min.	7	32	32.83	+5.6	32.84	+2+2+4+1−1+4+3−1−1−3	+1		1
115	β Geminorum	7	38	25.15	+28.3	25.16	+3+5+0+7+0+0+1+1+0−6+3	+0		1
116	Gr. 1374	7	44	41.89	+74.3	42.21	+40+27+28+28+27+45	+28		(32)
117	ε Draconis	7	48	35.87	+110.1	35.94	+11+1+10	+15		(7)
118	γ Urs Min	7	53	18.82	+91.1	18.84	+1.24+.54+1.36−1.01−.60+1.25−.57−.9+1.43−.32	—		(.32)
119	β Cancri	8	9	31.07	+9.6	31.08	+0+1+1+1+1	+1		1
120	κ Cephei	8	13	11.12	+102.7	11.26	−3+2+33+24+11	+7		(14)
121	o Urs. Maj.	8	19	31.59	+61.1	31.62	+2+0+0+4+11−1	+1		3
122	η Cancri	8	25	14.78	+20.9	14.77	+0+0−3−3+1	+0	1	
123	δ Cancri	8	37	21.09	+18.6	21.09	+4−5+0+1+4−1	+0	0	
124	ε Hydrae	8	39	56.60	+6.9	56.61	+3−1+1	+1		1
125	σ₂ Cancri	8	46	22.06	+31.1	22.14	+9+8+4+9	+8		8
126	ζ Hydrae	8	48	34.43	+6.4	34.39	[illegible]1 [illegible]1−8−5	−2	4	
127	υ Urs. Maj.	8	50	21.87	+48.5	21.87	−2+2−3−0+1−1+2	+1	0	
128	J. F. G. 1879	8	53	21.55	+100.0	21.67	+14+7+24−9+9+29	+12		(12)
129	κ Urs. Maj	8	54	48.35	+47.7	48.41	+6+9+4+4	+6		6
130	σ₂ Urs Maj	8	59	0.42	+67.6	0.50	+6+4+20+11+8+3+7+8+2	+8		8
131	θ Hydrae	9	7	39.10	+2.9	39.10	−1+2+1−1+1+2−2	+0	0	
132	38 Lyncis	9	10	48.51	+37.3	48.58	+10+9+11+5+7+5+4	+7		7
133	83 Cancri	9	11	46.75	+18.3	46.69	−6−5−7−4	−6	6	
134	α Lyncis	9	13	11.36	+34.9	11.39	+2−1+7−3+8	+3		3
135	1 H Draco	9	18	28.96	+81.9	29.32	+57+23+43+41+44+15+29	+34	~~(33)~~	(36)
136	α Hydrae	9	21	14.88	−8.1	14.90	−8+10+2+5	+2		2
137	d Urs. Maj.	9	23	1.99	+70.4	1.93	−11−12−10+3−5−11+4	−6	(6)	
138	β Cephei	9	26	59.18	+110.0	59.19	+4+3+0−9+8+5+0−6	+2		(1)
139	o Leonis	9	34	15.82	+10.5	15.82	−2+1+1−0	−1	0	
140	ε Leonis	9	38	31.49	+24.4	31.51	+7+3+1−2+5−2+2+2	+2		2
141	11 Cephei	9	40	1.45	+109.3	1.37	−24−3+9−17−3	−8	(8)	
142	b Urs. Maj	9	41	47.78	+59.6	47.76	−4+3+4−12	−0	2	
143	μ Leonis	9	45	25.32	+26.6	25.35	+2+3+0+7+6+1	+2		3

−.44+103
−113 188

No.	Star		Pulcova		δ	Camb.	Corr. to Pulcova	Prov. corr. +0	Mean −	Mean +
144	Gr. 1586	9	46	47.46	+ 73.5	47.58	+13+3+16+13−7+12+15+8	+0		(11)
145	η Leonis	10	00	17.80	+17.4	17.80	+1−1+1+2+1−1−3	+0	0	
146	α Leonis	10	1	29.98	+12.6	29.98	+2−1+4+0−5+1+3−4	+0	0	
147	λ Urs. maj	10	9	18.43	+43.6	18.41	+1−7−2+2−4	−2	2	
148	μ Urs. maj	10	14	38.12	+42.2	38.10	−6−3+2−3−1−1−5−6+1	−3	3	
149	31 Leonis	10	20	25.03	+37.4	25.00	−2−5−2−8−1−1−3−2	−4	3	
150	9 Draconis	10	24	3.73	+76.4	3.56	−23−21−7−35−33−16−8−7−4−14	−25	(17)	
151	ρ Leonis	10	26	0.97	+10.0	1.03	+5+5+5+12+5+6+2+4+8+7	+6		6
152	226 B Cephei	10	39	60.01	+104.4	59.57	−35−8−2+21−18−5+19	−6	(4)	
153	42 Leonis	10	38	41.24	+ 31.4	41.19	−7−1−6−9−8−10−5+2−3−2	−5	5	
154	l Leonis	10	42	28.50	+11.2	28.49	+0+3+6−4−0−1−1−5−2	−1	1	
155	α ~~Leonis~~ Urs. maj	10	55	44.79	+62.4	44.71	−9−10−1−4−12−13−7−10−6−10	−8	(8)	
156	χ Leonis	10	58	21.71	+8.0	21.72	+2+4+5+0−3+1+1	+1		1
157	ψ Urs. maj	11	2	24.09	+45.2	24.08	−1−0−3+1+6−4−0−0−3−2	−1	1	
158	σ Leonis	11	7	14.66	+21.2	14.69	+0+2+2+4+4−3+3+5+8	+3		3
159	ξ Urs. maj.	11	11	17.68	+32.3	17.81	+5+15+8+14+17+16+12+13+17+13	+12		13
160	ι Leonis	11	14	29.02	+6.7	28.99	−2−3−3−3	−4	3	
161	λ Draconis	11	23	43.03	+70.1	43.03	−3+5−7+0+12−5	+6	0	
162	91 Leonis	11	30	20.62	−0.1	20.64	+6+5+2−1+4−2−3	+1		2
163	2 Cephei	11	34	4.26	+103.0	4.35	+14+7+29+15−3+3+1	+9		(9)
164	χ Urs. maj	11	39	13.80	+48.5	13.73	+1−7−9−13−7	−6	7	
165	β Leonis	11	42	28.68	+15.3	28.67	−3+4+3−3−1−5−2	−2	1	
166	β Virginis	11	44	58.49	+2.5	58.52	−1+7+1+7+3	+3		3
167	γ Urs. maj.	11	47	2.12	+54.4	2.02	−5−15−12−3−14−11	−7	10	
168	8 Virginis	11	58	38.24	+ 9.5	38.22	−4+1−8+3−2	−2	2	
169	4 Draco.	12	6	7.56	+ 7.85	7.45	−20+1−9−21−5	−4	(11)	
									−38	+28
									−40	+18

~~+4.36~~ 3.90

+2.54
+ .94
+1.03
+ .28
+4.79
−3.90
270 / +.89
+0.003

−1.87
−1.21
− .44
− .38
−3.90

+1.72
+ .99
+1.83
+ .18
+4.72
−4.37
63 / +.35
+0.006

−2.03
− .81
−1.13
− .40
4.37

Additional observations (in 1872)

					Mean adopted
α Lyrae 1871.0	18	32	34.21	(26 27 17 14 23 (7) 18 21 23 21 24 24)	34.26
α Lyrae 1871.0	from 1872 obs		34.27	(27)(27)(26)(24)(30)	
α Herculis	17	08	45.93	89 91 96 96 88 94 91 96 93	(45.94)
α Scorpii	16	21	30.03	.07 .99 .10 .9 .99 .97	30.04
α Bootis	14	09	46.71	.69 .68 .77 .70	46.68
α Ophiuchi	17	28	56.81	.82 .80 .82 .80	56.84
α Virginis	13	~~18~~	~~23.90~~	~~.93 .87~~	~~23.92~~
α Aquarii	21	59	9.48	53 52 43 46 47	9.48