

KG
11365
135

F.6

No 11.

KG-11365.135

March 1900

10	10	} 10.00
10	10	
10	10	
10	10	
10	10	

After the conclusion

of the 10.00 10.00 10.00

in the 10.00 10.00 10.00

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10.00 10.00 10.00

James M. Smith

(Faint handwritten notes or bleed-through from another page)

[illegible]

Handwritten text, likely bleed-through from the reverse side of the page, is visible at the bottom of the page.

Dear Sir,
 I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above.
 I am sorry to hear that you are not well, and hope that you will soon be able to resume your usual avocations.
 I am, Sir, very respectfully,
 Yours, &c.
 J. B.

[illegible]

the end for the success of

the wine below

20820 = 20820

1850-1851

no sensible influence on the

(2) just as it is

at B. C & c in order of M E

KG 11345.135



Intervals of wires

AD	41.100	} Used in the Reduction.
BD	27.462	
CD	13.715	
ED	13.766	
FD	27.457	
GD	41.276	

Cor. of mean of wires to D

$$= 0.032$$

or mean of wires is 0.032 ~~more~~ from D
towards G.

After the computations it was found that the obs. of Polaris Aug 30th had been entered in the observing book of that month (in the list at the end of the Book) in the reverse order so that G. D was used for that day instead of E. D.

Then corrections applied give for the true intervals of the wires

AD	-41.100	} = +0.228
BD	-27.455	
CD	-13.720	
ED	+13.769	
FD	+27.455	
GD	+41.279	+82.503

The cor. for the mean of
the wires becomes

$$0.0325 = \text{cor. value}$$

$$0.0320 = \text{value used}$$

So that the error has had
no sensible influence on the reduction

$$\begin{array}{r} 2) 0.228 \\ 0.0325 \end{array}$$

Preliminary

Reduction of Stars. used on the Chronometric Expedition in 1849 = 50

I first calculated the intervals of the wires from all the transits of Polaris from Aug. to Feb. in order to find the distance of the mean of the wires from the mid-wire. For this quantity I have used 0.032 always applying it to the collimation of the mid-wire. It being equivalent to so much collimation error W. of S. Ill East. I have also applied diurnal aberration to the instrumental collimation. it being equivalent to a collimation error of 0.015 W. of S. in both positions of the instrument.

I next proceeded to find the true distances of the N & S marks from the Meridian of the Transit Circle. from passages of Circumpolar stars at times near the reversal of the Instrument. I obtained the values

N mark = 0.667 and S mark = 2.067 West of Meridian of Transit. with these I reduced the measured distances of the marks from Aug to Feb giving the az. & col. The col. was also several times found by reversal. The values of the azimuths served as a check & verification of the azimuths derived from Circumpolar stars which latter alone were used in the reductions. But when results by different stars were discordant or there was any uncertainty I was guided by the state of the instrument indicated by the marks. In general the errors seem to be known to about 0.05 . I think however that the method of getting the errors from the marks is susceptible of more accuracy. Their places should be well determined by upper & lower Culminations of the Circumpolar stars in reversed position of the axis. The azimuths used are such as would be obtained by charting all the azimuths derived from circumpolar stars & then running a mean curve through the series. Keeping usually within the probable error limit of each separate determination but inclining to as continuous a curve as practicable.

MERIDIAN TRANSITS observed at Cambridge, Mass.

Aug 1st

1849

Corrections for Collimation,

+ .47

Level, + .09

Azimuth, + .45

Illumination, East

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	α Cor. Boe. Dec. +27	α Serpenti Dec. +7	γ Vir. Min Dec. +78.15	β Scorpii Dec. -19	δ Ophi. Dec. -3
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B					
	C					
	D					
	E					
C x 4.91 47 34 38 196 4 230 78 4 36 12 2.88 45 1440 1152 129 60						
		15. 38. 05.68	15. 46. 38.30	15. 59. 20.04	16. 06. 28.44	16. 16. 14.71
	Col.	+ .53	+ .47	+ 2.31	+ .51	+ .47
	Level	+ .10	+ .07	+ 0.36	+ .05	+ .06
	Az.	+ .14	+ .27	- 1.30	+ .41	+ .32
		15. 38. 06.45	15. 46. 39.11	15. 59. 21.41	16. 06. 29.41	16. 16. 15.56
Tab. R.		15. 28. 19.03	15. 36. 51.62	15. 49. 33.82	15. 56. 41.99	16. 06. 28.12
2557 part.		9. 47.42	9. 47.49	9. 47.59	9. 47.42	9. 47.44
Aug 2 nd	WIRES.	α^2 Cap. Dec. -13	Arcturus Dec. +20	γ Aquila Dec. +10	α Aquila Dec. +8	β Aquila Dec. +6
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B					
	C					
	D					
	E					
		20. 19. 32.69	14. 18. 39.26	19. 49. 00.30	19. 53. 20.09	19. 57. 49.36
	Col.	+ .49	+ .51	+ .47	+ .47	+ .47
	Level	+ .05	+ .09	+ .08	+ .07	+ .07
	Az.	+ .38	+ .18	+ .25	+ .26	+ .28
		20. 19. 33.61	14. 18. 40.04	19. 49. 01.10	19. 53. 20.89	19. 57. 50.18
Tab. R.		20. 09. 43.05	14. 08. 47.38	19. 39. 07.41	19. 43. 27.53	19. 47. 56.34
2557 part		9. 50.56	9. 52.64	9. 53.69	9. 53.36	9. 53.84

Aug 2

Aug 3

c +.47
t +.09
u +.45

Aug 3

Aug 1st 16^h + 9.47.47
5^h 15.40 9.58.20
10.73₉
4 | 10.76
2.69

c +.47
t +.09
u +.44

Aug 5

c +.05
t +.10
u +.44

Aug 7

184.9

e² Cap -13

*e Cor. Bor. +27

Antares -26

2557

Aug 7. 16.30 + 10.03.62

5 15.40 10.58.20

5.42

11

2 | 5.31

2.65

20.19.35.73
+.48
+.05
+.38

20.19.36.64
20.09.43.06
9 53.58

15.38 16.40
+.53
+.10
+.13

15.38.17.16
15.28.18.96
9.58.20

16.30.14.81
+.05
+.04
+.46

16.30.15.36
16.20.11.74
10.03.62

MERIDIAN TRANSITS observed at Cambridge, Mass.

Aug 7th 1849

1849.

Corrections for Collimation,

+06

Level, +10

Azimuth, +44

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	β Orionis	β Tauri	γ Orionis	ϵ Orionis	Dec.
		Dec. -8	Dec. +28	Dec. 0	Dec. -1	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
+41.276	A					
+27.457	B					
+13.766	C					
+82.499	D					
-41.100	E					
-27.462						
-13.715						
-82.277						
7) 222		5.07.35.70	5.17.04.49	5.24.36.71	5.28.52.03	
+ .032	Col.	+06	+07	+06	+06	
5) 227	Level	+06	+12	+07	+07	
+0.045	Az.	+34	+12	+30	+30	
Tab. R.		5.07.36.16	5.17.04.80	5.24.39.14	5.28.52.46	
No 179		5.07.17.54	5.16.45.94	5.24.18.30	5.28.33.75	
		+18.62	18.86	18.84	18.71	
+41.2	Aug 8 th	α Polaris SP	Spica	η Ursa Maj	η Bootis	Dec.
+82.277	WIRES.	Dec.	Dec. -10	Dec. +50	Dec. +19	Dec.
-82.499		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
-1222	A					
-1032	B					
176	C					
.046	D					
-009	E					
Aug 8 th PM						
Col +06						
lev +10						
az +44						
Tab. R.		13.05.53.55	13.17.35.02	13.41.54.79	13.47.50.16	
	Col.	-2.30	+06	+10	+07	
	Level	-2.51	+06	+15	+10	
	Az.	+12.76	+35	-09	+18	
		13.06.01.50	13.17.35.49	13.41.54.95	13.47.50.51	
		13.05.35.00	13.17.15.63	13.41.34.96	13.47.30.44	
		28.50	19.86	19.99	20.07	

Had mean of
y.e. & c.d. corr.

13.05.53.06

+49

an +.02

c +.02

az by Polaris +21

az = +0.013 med SP 13.05.53.55

col +.07
l +.10
wz +.43

7/8 5^h 20^m 179 + 18.76
15/16 5.20 + 49.78
8) 31 (3.90
7
5.144
35.71
15.75

5.20 18.76
13.30 19.47
8 10 1.23
1.20
3.60

9 13.17 29.22
13 16.10 39.54
14 5 45.67

Aug 13

24.
25.
38.4

Polaris SP Spica - 10

15.78
23.22
29) 7.44 (26
58
164
194

♂ Cphi - 3 Antares - 26

38.4
45.67
26.86

13.05 56.69 13.17 38.36
-2.69 +.07
-2.51 +.06
+.34

16.07 07.19 16.20 50.43
+.11 +.11
+.07 +.04
+.30 +.44

13.17 38.83
1.05 35.71 13.17 15.61
wz by Polaris +.26 23.22

16.07 07.67 16.20 51.02
16.06 27.96 16.20 11.65
39.71 39.37

col +.12
l +.11
u +.42

♂ Eridani
-14

♂ Tauri
+16

Aug. 14

Capella
+46

♂ Tauri
+28

♂ Orionis
0

3.

3.51 45.46
+.12
+.06

4.28 02.20
+.12
+.00

5.06 19.46
+.17
+.16
14.74

5.17 31.67
+.14
+.13

5.25 03.71
+.12
+.08
03.91

3.51 00.21

4.27 16.98

5.05 33.96

5.16 46.15

5.24 18.48

45.83

45.43

Corrections for Collimation.

Level,

Azimuth,

Illumination, *East*

Clock rate,

Clock error at 0 hrs. sidereal time.

Aug 14th cont.

Aug 16th

[illegible]
$$\begin{array}{r} 21.29 \\ 50 \overline{) 5094} \\ \underline{50} \\ 94 \end{array}$$

wz By polaris + 35
~~17.5.2000~~ + 24

$$P_{2,3} \text{ Ur. Au} = 0.19$$

Polaris = 35 wt 3 = 105
 Asur 19 " 1 4) 124

My Mark + 0.40 on 22nd

5 wires

$$\begin{array}{r} 32 \\ 381 \\ 190 \\ \hline 571 \end{array}$$

2.04
3.21
3.81

Aug 16th cont.

c + 13
e + 17
u + 21

$$\begin{array}{r} 2.04 \\ 31 \overline{) 204} \\ \underline{612} \\ 632 \end{array}$$
$$\begin{array}{r} 95 \\ 63 \\ + 37 \\ \hline 195 \end{array}$$
~~WT 1.005 x 38~~

~~150~~

cor for mid-winter misfiring = $0.005 \times \text{sec}$ ^{sub. P60}
for polaris = $+0.15$

MERIDIAN TRANSITS observed at Cambridge, Mass.

Aug 17

18 49

Corrections for Collimation.

Level,

Azimuth,

Illumination, *East*

Clock rate,

Clock error at 0 hrs. sidereal time.

Clock rate,
wz by Polaris $+0^s.33$

MONTH AND DAY.	WIRES.	Polaris SP Dec. 6 ⁰⁰	Spica Dec. -10	3 Mr. May Dec. +50	@ Booth's Dec. +20	E Booth's Dec. +28
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
C + .15	A	Aug 17 th 9 ^h East				
L + .11	B	wz = +0.35 E of S By Polaris & Spica				
U + .41	C	col = +0.15 Set on 20 th				
	D	lw = +0.11 Set on 16 & 20 th				
	E					
384 1536 384 5376 251 251 2761 49 13.06.33.19			13.18.08.81	13.42.28.43	14.09.40.66	14.39.17.93
Col.		-5.76	+1.14	+1.22	+1.14	+1.16
Level		-2.76	+1.07	+1.17	+1.11	+1.13
Az.		+10.15	+1.29	+1.07	+1.14	+1.10
13.06.34.82			13.18.09.31	13.42.28.75	14.09.41.05	14.39.18.32
1.05.41.00			13.17.15.52	13.41.34.73	14.08.47.17	14.38.24.25
+53.82			+0.53.79	+54.02	+0.53.88	+0.54.07
Tab. R.			Aug 20 th 6 ^h E	a Cor. Boer		Reversed 14 th W.
179						E Mr. Minors
C + .15	WIRES.	Polaris SP Dec.	Spica Dec. -10	Dec. +27	Dec.	Dec. 82° 16'
L + .10		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
U + .39	A	Aug 20 th 9 ^h East				
Wz + 0.36	B	Col = +0.15 By Reversal 20 th (same day)		By E Mr. Min	Hew d Polaris Hc E	C = +0.18
384 192 576	C	lw = +0.10				
2 Wz + 4.78 lw	D	az = +0.36 By Polaris & E Mr. Min.				
5.70 C	E					
7.44 C						
744 322 1116 C 94 W = 0.15 1.116 233 1339						
7.44						
1488 1116 1.339						
63 46 09 49						
36.49 36.54						
Tab. R.						
45.43						
8.27						
32132						
37.16						
13.06.45.43			13.18.18.63	15.29.22.40		17.02.43.73
Col.		-5.76	+1.15	+1.17		+1.34
Level		-2.51	+1.06	+1.12		+0.57
Az.		+10.44	+1.30	+1.11		-1.72
13.06.47.60			13.18.19.14	15.29.22.80		17.02.41.24
1.05.42.88			13.17.15.49	15.28.18.68		17.01.36.54
1.04.72			+1.03.65	+1.04.12		+1.05.70

Instrument Perished
30 H. West

col - 18 9th W

In W
 C-18
 L+10
 A+.8

Aug 20th 1849. W. West

α Lyra + 39	β Lyra + 33	δ Aquila + 14	δ Aquila + 3	γ Aquila + 10	α Aquila + 8
18.32.56.24	18.45.36.99	18.59.35.20	19.19.00.17	19.40.12.00	19.44.32.07
-.23	-.22	-.19	-.18	-.18	-.18
+ 13	+ 12	+ 09	+ 08	+ 09	+ 09
+ 03	+ 07	+ 17	+ 23	+ 20	+ 21
18.32.56.17	18.45.36.96	18.59.35.27	19.19.00.30	19.40.12.11	19.44.32.19
18.31.51.67	18.44.32.51	18.58.30.52	19.17.55.53	19.39.07.35	19.43.27.47
+ 1.04.50	+ 1.04.45	+ 1.04.75	+ 1.04.77	+ 1.04.76	+ 1.04.72
α Tauri	Capella	α Orionis	γ West	$\epsilon = -18$	
+ 16	+ 46	+ 7			

Aug 21 Ill West

$$\cos A = -0.18$$
$$\text{lev} = +.10$$

$w_2 = +.38$ increase between 20th & 22nd

4. 28. 26.03	5. 06. 43.23	5. 48. 09.63
- .19	- .26	- .18
+ .09	+ .14	+ .08
+ .17	+ .04	+ .23
4. 28 26.10	5. 06. 43.07	5. 48. 09.76
4. 27. 17.19	5. 05. 34.23	5. 47. 00.85
+ 1. 08.91	+ 1. 08.84	+ 1. 08.91

1849

Corrections for Collimation.

Level,

Azimuth,

Illumination, West

Clock rate,

+ Clock error at 0 hrs. sidereal time,

over far $5 \text{ wires} = +.023 \text{ mcd} = 4.87 \text{ } \mu\text{W}$ 5 P

[illegible]

as by Air Min = 0.25

Box 2557

c - .01

l + .11

u + .32

observed at Cambridge Mass

Aug 26th 1849

W. West.

β^1	β^1	β^2	β^2	β^2	β^2
α Tauri	Capella	α Orionis	α Geminor	Sirius	ϵ Can. Min
+16	+46	+7	+23	-16	-29
col - 0.01					
lev + 0.11					
ax + 0.33	By Polaris				
4 ^h 27 ^m 15.29	5 ^h 05 ^m 32.43	5 ^h 46 ^m 59.10	6 ^h 13 ^m 48.67	6 ^h 38 ^m 28.30	6 ^h 52 ^m 39.89
- .01	- .02	- .01	- .01	- .01	- .01
+ 10	+ .16	+ .08	+ .11	+ .06	+ .04
+ .15	+ .03	+ .20	+ .12	+ .29	+ .36
4 ^h 27 ^m 15.53	5 ^h 05 ^m 32.58	5 ^h 46 ^m 59.37	6 ^h 13 ^m 48.89	6 ^h 38 ^m 28.64	6 ^h 52 ^m 40.28
4 ^h 27 ^m 17.34	5 ^h 05 ^m 34.43	5 ^h 47 ^m 01.00	6 ^h 13 ^m 50.59	6 ^h 38 ^m 30.26	6 ^h 52 ^m 41.82
2557 Slow - 1.81	- 1.85	- 1.63	- 1.70	β^2 1.62	- 1.54
β^2 α^2 Geminor	β^2 Procyon	β^2 α Geminor	β^2 α Aurigae	Polaris S.P.	Spica
+ 32	+ 6	+ 28	+ 63		- 10
				38.03 - 2.38 35.65 46.36 49.29	13.91 + 3.33 14.30 15.42 58.88 49.29 29) 9.59 (33 889
					29 33 87 87 9.54 6.93 27.6 7.17 38.03 + 0.33
7 ^h 24 ^m 56.43	7 ^h 31 ^m 22.52	7 ^h 36 ^m 02.94	10 ^h 54 ^m 18.96	13 ^h 05 ^m 38.03	13 ^h 17 ^m 13.91
- .01	- .01	- .01	- .02	+ 0.38	- .01
+ .12	+ .08	+ .13	+ .22	- 2.78	+ .07
+ .07	+ .20	+ .10	- .22	+ 9.55	+ .27
7 ^h 24 ^m 56.51	7 ^h 31 ^m 22.79	7 ^h 36 ^m 03.16	10 ^h 54 ^m 18.94	1 ^h 05 ^m 45.20	13 ^h 17 ^m 14.24
7 ^h 24 ^m 58.14	7 ^h 31 ^m 24.18	7 ^h 36 ^m 04.74	10 ^h 54 ^m 20.17	1 ^h 05 ^m 46.36	13 ^h 17 ^m 15.42
- 1.63	- 1.39	- 1.58	- 1.23	- 1.16	- 1.18

$Q = -.00$

MERIDIAN TRANSITS observed at Cambridge, Mass.

18

Corrections for Collimation,

Level,

Azimuth,

Illumination, *West*

Clock rate,

Clock error at 0 hrs. sidereal time,

*Aug 27 9h**Aug 30*

MONTH AND DAY.	WIRES.	<i>α Orionis</i>		<i>Polaris</i>	<i>α Bootis</i>	<i>ϵ Bootis</i>
		Dec. <i>+7</i>	Dec.	Dec.	Dec. <i>+20</i>	Dec. <i>+28</i>
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
<i>27th 00</i>	A	<i>c = 0.00</i>				
<i>1 + 11</i>	B	<i>c = +.11</i>				
<i>a + 34</i>	C	<i>a = +.35</i>				
<i>30th 9h W</i>	D					
<i>c = 0</i>	E					
<i>l = +.12</i>						
<i>a = +.34</i>						
<i>251</i>						
<i>251</i>						
<i>276</i>						
<i>44.04</i>						
<i>48.48</i>						
<i>55.56</i>						
<i>29/10.3 (38)</i>						
<i>87</i>						
<i>220</i>						
Tab. R.						
<i>2557</i>						
<i>452</i>						
<i>17</i>						
<i>12.00</i>						
<i>4.44</i>						
<i>7.16</i>						
<i>24/7.2 (3)</i>						
<i>72</i>						
<i>da</i>						
<i>dv = (d + da) sin(v + dv)</i>						
<i>dv = d sin(v - dv)</i>						
<i>-(d + da) sin</i>						
Col.						
Level						
Az.						
Tab. R.						

Instrument now for a week to come
is altered often in azimuth

Col
lev
az + 81

Aug 30th M. East.

5 wires Cor = +0.18

2 Ursae
+ 82.17

α Herculis
+ 15

α Cygni
+ 39

β Cygni
+ 33

δ Aquila
+ 3

7.44
0.3
2.232
47.8
47.8
38.24
2.8
57.4
114.0
57.0
68.4

Aug 30th M. East

Az by 2 Ur. Minoris.

col = -0.03

lev = +0.12

az = +0.81 Az seems to have been altered in the wrong direction.

44.92 53.75
+ 46 + 46
45.38 54.21
34.70 47.40
10.68 6.81
6.81
4.8 3.87 1.81
3.87 3.0
- 3.87
2.2
- 4.09
+ 6.8
23 3.41
44.92
41.51

17.01.44.92 17.07.53.75 18.31.58.21 18.44.39.05 19.18.01.86
-0.22 -1.03 -.04 -.04 -.03
+0.68 +1.11 +15 +14 +09
-3.87 +38 +07 +16 +51

17.01.41.51 17.07.54.21 18.31.58.39 18.44.39.31 19.18.02.43
17.01.34.70 17.07.47.40 18.31.51.47 18.44.32.34 19.17.55.43
+6.81 +6.81 +6.92 +6.97 +7.00

2557 fast.

18 49

Corrections for Collimation.

Level,

Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

4 wires

MONTH AND DAY.	WIRES.	<i>B. Draconis</i> Dec. 52° h. m. s.	<i>γ Draconis</i> Dec. 51° h. m. s.	<i>μ Sagittarii</i> Dec. -21 h. m. s.	<i>B. Lyrae</i> Dec. +33 h. m. s.	<i>δ Aquila</i> Dec. +14 h. m. s.
col	A					
lev	B	Sept 1 st	86 2.	14.44 +13 14.57	19.67 +13 19.80	58.10 +01 58.11
Az	C	col -0.04		02.44 +12.13	07.45 2.45	46.34 11.77
	D	lev +.12				
	E	Az +.37	<i>B. Draconis</i> & <i>μ Sagittarii</i>	wt=1	1/2 wt	
				12.23 11.77 .46	Az = +0.37	
		17.27 14.44	17.53 19.67	18.04 58.10	18.44 44.29	18.58 42.14
	Col.	- 06	- 06	- 04	- 05	- 04
	Level	+ 19	+ 19	+ 05	+ 14	+ 11
	Az.	- 09	- 09	+ 35	+ 08	+ 18
		17.27 14.48	17.53 19.71	18.04 58.46	18.44 44.46	18.58 42.39
		17.27 02.44	17.53 07.45	18.04 46.34	18.44 32.30	18.58 30.37
		+12.04	+12.26	+12.12	+12.16	+12.02
Tab. R.						
	WIRES.	<i>α Aquila</i> Dec. +8 h. m. s.	<i>B. Aquila</i> Dec. +6 h. m. s.	<i>γ Aquila</i> Dec. +10 h. m. s.	Dec. h. m. s.	Dec. h. m. s.
	A					
	B					
	C					
	D					
	E					
		19.43 39.24	19.48 08.26	19.39 19.00		
	Col.	- 04	- 04	- .04		
	Level	+ 10	+ 09	+ .09		
	Az.	+ 21	+ 22	+ .20		
		19.43 39.51	19.48 08.53	19.39 19.25		
		19.43 27.37	19.47 56.19	19.39 07.24		
		+12.14	+12.34	+12.01		
Tab. R.						

Sept 2nd 1849

Capella	δ Coronis	α Orionis	β Pauri	Sirius	α Geminos
+46	0	+7	+28	-16	+32

Sept end

coll = -0.04

lev = +0.13

ax = +0.37 from Sept 1st No stars on 2nd for ax.

5.05.50.71	5.24.35.10	5.47.17.07	5.17.02.84	6.38.46.17	7.25.14.64
-05	-04	-04	-04	-04	-05
+19	+10	+10	+15	+07	+15
-04	+24	+21	+11	+32	+08
5.05.50.81	5.24.35.40	5.47.17.34	5.17.03.06	6.38.46.52	7.25.14.82
5.05.34.71	5.24.19.00	5.47.01.18	5.16.46.76	6.38.30.43	7.24.58.34
+16.10	+16.40	+16.16	+16.30	+16.09	+16.48

Procyon	β Geminos
+6	+28

7.31.40.53	7.36.21.21
-04	-04
+10	+16
+22	+11
7.31.40.81	7.36.21.44
7.31.24.34	7.36.04.91
+16.47	+16.53

New az

MERIDIAN TRANSITS observed at Cambridge, Mass.

Sept 3 ⁵³₁₇₁
17.44
2976

1849

Corrections for Collimation,

Level,

Azimuth,

Illumination, East

Clock rate, +2.5

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	α Cor. Boor. Dec. +27	α Serpenti Dec. +7	δ Ophiuchi Dec. -3	ϵ Urr. Min. Dec. +82	β Draconis Dec. +52
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
Sept 3 16 ^h 17.32	A				08.21 52.73	44.61
	B	Sept 3			+26 +44	+29
	C	Col. = -0.04			08.47 53.17	44.90
	D	lev. = +0.13			17.36 34.01	27.62
	E	az. = +0.35			19.16 17.28	17.28
					17.47 1.69	1.35
					1.43 25.60	23.90
						1434
						16730
		15.28.35.44	15.37.08.21	16.06.44.61	17.01.52.73	17.27.19.53
	Col.	-0.04	-04	-04	-130	-06
	Level	+1.15	+1.10	+0.9	+1.74	+1.21
	Az.	+1.10	+22	+25	-1.67	+10
		15.28.35.65	15.37.08.49	16.06.44.91	17.01.51.50	17.27.19.58
Tab. R.		15.28.18.41	15.36.51.11	16.06.27.62	17.01.34.01	17.27.02.37
		+17.24	+17.38	+17.29	+17.49	+17.21
		α Orionis	α Sirius	Procyon	α Geminor	β Geminor
		Dec. +7	Dec. -16	Dec. +6	Dec. +32	Dec. +28
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B					
	C	col -0.05				
	D	lev +.14				
	E	az. - .14				
		5.47.20.31	6.38.49.57	7.31.43.64	7.25.17.44	7.36.23.96
	Col.	-0.04	-04	-04	-05	-04
	Level	+10	+1.07	+10	+1.17	+1.16
	Az.	-0.9	-12	-0.9	-03	-04
		5.47.20.28	6.38.49.48	7.31.43.61	7.25.17.53	7.36.24.04
Tab. R.		5.47.01.21	6.38.30.46	7.31.24.36	7.24.58.37	7.36.04.94
		+19.07	+19.02	+19.25	+19.16	+19.10

The Transits of Polaris & Spica on the 3rd are omitted because the use of the inst was changed just before & after the obs

Sept 5th

251
1255
3265

251
1004
2514
3765

384
105
1926

Sept 6th

McE

384
142
-576

= -0.57

3 wires cor to old mean of EDC = -0.015 McE

B. Dracomi a by ore
+52 +39

Polaris SP Spica
-10

+1.92

-6.12

4.20

21.60

17.40

Sept 5th

col = -0.05

lev = +0.14

az = -0.09 W of S from Sept 4th & 7th

Sept 6th

col = -0.05

lev = +0.14

az = -0.09 W of S

21.60

40.81

-1.59

00

20.01

40.81

51.86

15.33

28.15

25.48

25.48

29

21.61

0.09

By Polaris & Spica
3 wires

17.27.25.01 18.32.14.10
-1.08 -0.06
+0.23 +0.18
+0.03 -0.01

13.06.21.60 13.17.40.81
+1.92 -0.05
-3.51 +0.09
-2.61 -0.07

17.27.25.19 18.32.14.21
17.27.02.30 18.31.51.33
+22.89 +22.88

13.06.17.40 13.17.40.78
1.05.51.86 13.17.15.33
+25.54 +25.45

Polaris SP Spica
-10

Sept 8th Polaris 3 wires

Arcturus B²
+20 326
377

Rate +2.7

Sept 7th

col = -0.05

lev = +0.15

az = -0.14

26.63 43.72
-1.84 15.32
24.79 28.40
32.49
28.40
29 4.09
19 1.16

Sept 8th

col = -0.05

lev = +0.15

az = -0.17

az By Polaris.

& Arcturus.

31.23 18.63
-1.85 +0.09
29.38 18.67
52.74 46.86
36.64 31.81
31.91
31.91
17 51.17
493

13.06.26.63 13.17.43.72
+1.92 -0.05
-3.76 +0.09
-4.06 -0.11

-7.82
-07 +1.92
5.90
26.63
20.73

13.06.31.23
+1.92
-3.77
-4.93

14.09.18.63
-0.05
+0.15
-0.07

1.06.20.73 13.17.43.65
1.05.52.30 13.17.15.32
+28.43 +28.33

13.06.24.45
1.05.52.74
+31.71

14.09.18.66
14.08.46.86
+31.80

Polaris 5 wires mean + 0.87 = diam of 7 wires McE
Spica cor + 0.02

1849

Corrections for Collimation.

Level,

Azimuth,

Illumination, East

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	<i>B Pauri</i>	<i>P Orionis</i>	<i>3 Pauri</i>	<i>Sirius</i>	
		Dec. +28	Dec. 0	Dec.	Dec. -16	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	Sept 9 th				
	C	Col -0.05				
	D	lev +0.16				
	E	az -0.17	from Sept 8 = 11 ^h			
6/15.5 2.5		5. 17. 21.64	5. 24. 53.88	5. 09. 13.86	6. 39. 05.40	
	Col.	-05	-05		-05	
	Level	+18	+12		+15	
	Az.	-05	-11		-15	
Tab. R.		5. 17. 21.72	5. 24. 53.84		6. 39. 05.35	
		5. 16. 46.98	5. 24. 19.20		6. 38. 30.62	
		+34.74	+34.64		+34.73	
Sept 10 th	WIRES.	<i>α Herculis</i>	<i>α Orionis</i>	<i>μ Geminis</i>	<i>Sirius</i>	<i>α² Geminis</i>
		Dec. +15	Dec. +7	Dec. +23	Dec. -16	Dec. +32
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	Sept 10 th				
	C	Col -0.05				
	D	lev +.16				
	E	az -.18	Sept 8 ^h 21 ^h			
		17. 08. 23.33	5. 47. 39.36	6. 14. 28.97	6. 39. 08.60	7. 25. 36.39
	Col.	-05	-05	-05	-05	-05
	Level	+15	+12	+16	+09	+19
	Az.	-09	-11	-07	-16	-04
Tab. R.		17. 08. 23.34	5. 47. 39.32	6. 14. 29.01	6. 39. 08.48	7. 25. 36.49
		17. 07. 47.20	5. 47. 01.41	6. 13. 51.03	6. 38. 30.64	7. 24. 58.57
		+36.14	+37.91	+37.98	+37.84	+37.92

Sept 10th 1849 Ple 2Sept 11th ←
$$\begin{array}{r} 25 \\ 16 \\ 23 \\ 22 \\ \hline 5.2 \end{array}$$
Procyon
+ 6β Geminos
+ 28

Polaris SP

Spica
- 10
$$\begin{array}{r} 40.50 \quad 54.20 \\ -2.34 \quad -0.04 \\ \hline 38.16 \quad 54.16 \\ 54.00 \quad 15.29 \\ 44.16 \quad +38.87 \\ \hline 38.87 \\ 29 \overline{) 5.29} \quad 18 \\ \underline{29} \\ 239 \\ 23 \end{array}$$
Sept 11th

col = - 0.05

lev = + 0.17

az = - 0.18 By Polaris

384
192
$$\begin{array}{r} 9.48 \\ 1.92 \\ \hline 7.56 \end{array}$$

251

1757

221

4267

$$\begin{array}{r} 7.32.02.84 \quad 7.36.43.09 \\ - .05 \quad - .05 \\ + .12 \quad + .18 \\ - .11 \quad - .06 \end{array}$$

$$\begin{array}{r} 7.32.02.80 \quad 7.36.43.16 \\ 7.31.24.53 \quad 7.36.05.13 \\ + 38.27 \quad + 38.03 \end{array}$$

α Cor Boos.

+ 27

β Aquile

+ 6

Sept 12

α Orionis

+ 7

Sept 12th

col - 0.06

lev + 0.17

az - .15 " 12th 13th

$$\begin{array}{r} 15.28.57.39 \quad 19.48.36.03 \\ - .05 \quad - .05 \\ + .19 \quad + .13 \\ - .06 \quad - .11 \end{array}$$

$$\begin{array}{r} 15.28.57.47 \quad 19.48.36.00 \\ 15.28.18.27 \quad 19.47.56.07 \\ + 39.20 \quad + 39.93 \end{array}$$

$$\begin{array}{r} 5.47.45.26 \\ - .06 \\ + .13 \\ - .09 \end{array}$$

$$\begin{array}{r} 5.47.45.24 \\ 5.47.01.46 \\ + 43.78 \end{array}$$

MERIDIAN TRANSITS observed at Cambridge, Mass.

Corrections for Collimation.

Level,

Azimuth,

Illumination, East

Clock rate,

Clock error at 0 hrs. sidereal time.

3 wires are $+0.015 \text{ mcd}$ for $eDE = +0.11$

Sept 13

1849

ation, East
E. W. Allen

MONTH AND DAY.	WIRES.	<i>Polaris</i> Dec.	<i>Spica</i> Dec.	<i>2 Ur Min</i> Dec.	<i>a Herculis</i> Dec.	<i>a Herculis</i> Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
251 175 175 251 4 26 13 29 87 23 377	A					
	B	Sept 13	38.4 6 230.4	7.44 6 44.64	00.00 -05 55.95 15.28 44.67	45.54 -1.96 43.58 54.26 48.82 44.67 (14)
	C	col - 0.06		5.7 12 35.9 57.4		
	D	lev + 0.17		47.5 16.34 47.84 62.14	16.11 16.57 32.07 32.24 44.38	45.54 12.5 11.6 45.54 (12) 48.7
	E	az - 0.14 By <i>Polaris</i> az - 0.12 By <i>2 Ur Min.</i>			32.06 + 32.07 47.14 46.93 44.55	
8.03 2.30 5.73	Col.	13.06.45.54 + 2.30	13.18.00.00 - .06	17.02.16.11 - 0.46	17.08.32.06 - .06	17.08.34.74 - .06
	Level	- 4.26	+ .14	+ 0.97	+ .15	+ 1.5
	Az.	- 3.77	- 10	+ 0.62	- 06	- 05
		13.06.39.81	13.17.59.98	17.02.17.24	17.08.32.09	17.08.34.78
Tab. R. 2557		1.05.54.76 + 45.05	13.17.15.28 + 44.70	17.01.32.24 + 45.00	17.07.47.14 + 44.95	17.07.47.12 + 47.66
Sept 15	WIRES.	<i>a Orionis</i> Dec. +7	Sept 16	<i>2 Gemin</i> Dec. +32	<i>a Aurigae</i> Dec. +6	<i>B Gemin</i> Dec. +28
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
Sept 15	B		Sept 16 th			
col = - 0.07	C		col - 0.07 Mc East			
lev = + 0.17	D		lev + 0.17			
az = - .08	E		az - .06 13 x 19 th			
By Sept 15 x 19 th						
	Col.	5.47.01.70 - .07		7.24.58.53 - .08	7.31.24.90 - .07	7.36.05.17 - .08
	Level	+ .13		+ .21	+ .14	+ .19
	Az.	- 05		- .02	- .04	- .01
		5.47.01.71		7.24.58.64	7.31.24.93	7.36.05.27
Tab. R.		5.47.01.55 + .16		7.24.58.66 - .02	7.31.24.68 + .25	7.36.05.29 - .02

Sept 17th He West

Sirius -16 α Geminor +22 α^2 Gemin +32 α Can. Min +6 β Geminor. +28

Sept 17th

cor +.06 He West

lev +.17

az -0.04

6.38.30.24	7.11.06.67	7.24.57.89	7.31.24.03	7.36.04.40
+06	+06	+07	+06	+06
+08	+17	+27	+13	+19
-03	-01	-01	-02	-01
6.38.30.35	7.11.06.89	7.24.58.16	7.31.24.20	7.36.04.66
6.38.30.84	7.11.07.44	7.24.58.78	7.31.24.71	7.36.05.32
-.49	-.55	-.62	-.51	-.66

Sept 18 He W

 α^2 Gemin +32

Procyon +6

 β Gemin +28

2 Arct. Mag. +49

Sept 18

cor +0.05 He West

lev +0.16

az -0.00

7.24.56.54	7.31.22.73	7.36.03.08	8.48.48.97
+06	+05	+05	+07
+20	+12	+18	+24
00	00	00	00
7.24.56.80	7.31.22.90	7.36.03.31	8.48.49.28
7.24.58.81	7.31.24.73	7.36.05.35	8.48.51.04
-2.01	-1.83	-2.04	-1.76

β Gemin cor 5 wires = -0.022 He W = 0.02
 i Arct. Mag. = -0.03

MERIDIAN TRANSITS observed at Cambridge, Mass.

Sept 19th

1849

Corrections for Collimation,

Level,

Azimuth,

Illumination, East

Clock rate,

Clock error at 0 hrs. sidereal time,

5 wires are + 0.023 each 1/2.

MONTH AND DAY.	WIRES.	Polaris SP Dec.	Spiru Dec. -10	a Herminia Dec. +14	a Bootis Dec. +20	B Zosma Dec. +74
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
384 2304 256 16 2008 2516 4516 1004 351 29 118	A					
	B	Sept 19 th	-		54.50 12.92 -1.22 15.25 53.28 -2.33 56.78 -3.50 -2.33 29) 1.17	3.81 2286 3.21 18 2568 3218 5778
	C	col - 0.06				
	D	lev + 0.14				
	E	az + 0.04 By Polaris				
		13.05.54.50	13.17.12.92	17.07.44.40	14.08.44.20	14.51.04.57
	Col.	+2.30	-1.06	-1.06	-1.06	-1.23
	Level	-3.51	+0.08	+1.12	+1.14	+1.46
	Az.	+1.16	+0.03	+0.02	+0.02	-1.08
		13.05.54.45	13.17.12.97	17.07.44.48	14.08.44.30	14.51.04.72
Tab. R.		1.05.56.78	13.17.15.25	17.07.47.02	14.08.46.73	14.51.07.55
		-2.33	-2.28	-2.54	-2.43	-2.83
He East	WIRES.	a Corona Dec. +27	a Serpens Dec. +7	Sept 20	a Serpens Dec. +7	
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A			Sept 20 th		
	B			col - 0.06		
	C			lev + 0.14		
	D			az + 0.03 Interpolated.		
	E					
		15.28.15.59	15.36.48.33		15.36.46.69	
	Col.	-0.07	-0.06		-0.06	
	Level	+1.16	+1.11		+1.11	
	Az.	+0.01	+0.02		+0.02	
		15.28.15.69	15.36.48.40		15.36.46.76	
Tab. R.		15.28.18.12	15.36.50.86		15.36.50.84	
		-2.43	-2.46		-4.08	

Sept 23rd

The East

Sept 24th
cur + 0.023Sirius
-16 α^2 Gemin
+32Procyon
+7 β Gemin
+28 α Lyra

Sept 23

col -0.07

lev + 0.10

az 0.00 interpolated

Sept 24

col -0.08

lev + 0.10

az 0.00 19th 25th

6.39.31.99	7.25.59.90	7.32.25.90	7.37.06.23
-0.07	-1.09	-1.07	-1.08
+0.09	+1.20	+1.12	+1.18
00	00	00	00

18.32.51.65
-1.10
+1.20
00

6.39.32.01	7.26.00.01	7.32.25.95	7.37.06.33
6.38.31.00	7.24.58.97	7.31.24.86	7.36.05.50
Sept + 1.01.01	+ 1.01.04	+ 1.01.09	+ 1.00.83

18.32.51.75
18.31.50.85
+ 1.00.90

Sept 24

 α^2 Gemin
+32Procyon
+7 β Geminor.
+28

Sept 24

col -0.08

lev + 0.10

az 0.00 Sept 19th 25th

7.25.59.23	7.32.25.16	7.37.05.73
-1.10	-1.08	-1.09
+1.20	+1.13	+1.18
00	00	00

7.25.59.33	7.32.25.21	7.37.05.82
7.24.59.00	7.31.24.88	7.36.05.53
+ 1.00.33	+ 1.00.33	+ 1.00.29

Sept 27th 1849 K.S.Sept 27th

Boetacoris *Sur. minor*
+ 52 + 86.36

86.36
42.23
44.13

16.9
12.1
1.6
1.26
1.21
1.436

Sept 26th

col -0.08

ter +0.10

ur -0.01

Sur. Min. d

in 9.8435

cor 9.8553

ur 1.2269

1.0704

Boetacoris

1.0822

col 16.86

ter 12.08

00.87

+12

00.99

01.57

-0.58

1.35

2.06

+71

52.03

59

52.62

53.28

-0.66

ur *Boetacoris* -0.04

17.28.00.87 18.21.52.03

-13 -1.35

+25 +1.94

00 +0.12

17.28.00.99 18.21.52.74

17.27.01.57 18.20.52.86

+59.42 +59.88

ur 11.76 20.13.33.87

for the interpolation see the list on the next page

MERIDIAN TRANSITS observed at Cambridge, Mass.

Oct. 1st (2nd)

18 49

Corrections for Collimation,

Level,

Azimuth,

Illumination, East

Clock rate,

Clock error at 0 hrs. sidereal time,

Mer Page 2ndMer Page 2nd

MONTH AND DAY.	WIRES.	α^2 Gemm Dec. 32	Procyon Dec. +6	β Gemm Dec. +28	Polaris Dec. SP	Spica Dec. -10
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
38.4	A					
	B	Oct 1 st		02.57 05.25 56.1	140 1.40 350 71 2.11	1173 1172 15.22 6.50 29 11.64
	C	C - 0.10			58.03 +33 55.36	
	D	l + .04			55.79	
	E	~~ax - .07~~ (By Polaris ax - .07)			56.50 56.50 2452.09 109	
		ax - .04 By interpolation.				
		7 ^h 25 ^m 56.00	7 ^h 32 ^m 21.88	7 ^h 37 ^m 02.45	13 ^h 06 ^m 58.03	13 ^h 18 ^m 11.73
	Col.	- .12	- 10	- 11	+ 3.84	- .10
	Level	+ .16	+ 11	+ 17	- 3.51	+ .09
	Az.	- .01	- 02	- 01	- 1.16	- 03
		7 ^h 25 ^m 56.03	7 ^h 32 ^m 21.87	7 ^h 37 ^m 02.50	13 ^h 06 ^m 57.20	13 ^h 18 ^m 11.69
Tab. R.		7 ^h 24 ^m 59.23	7 ^h 31 ^m 25.07	7 ^h 36 ^m 05.75	1 ^h 05 ^m 59.79	13 ^h 17 ^m 15.22
		+ 56.80	+ 56.80	+ 56.75	+ 57.41	+ 56.47
Oct 8 th	WIRES.	α^2 Gemm Dec. +32	Procyon Dec. +6	β Gemm Dec. +28	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	Oct 8				
	C	C - 0.12				
	D	l + .10	By interpolation			
	E	ax - .05	~~Polaris + 6~~ ~~ax - .07~~			
		7 ^h 25 ^m 50.39	7 ^h 32 ^m 16.33	7 ^h 36 ^m 56.86		
	Col.	- .14	- .12	- .14		
	Level	+ .13	+ .08	+ .12		
	Az.	- .01	- 03	- .01		
		7 ^h 25 ^m 50.37	7 ^h 32 ^m 16.26	7 ^h 36 ^m 56.83		
Tab. R.		7 ^h 24 ^m 59.46	7 ^h 31 ^m 25.27	7 ^h 36 ^m 05.97		
		- 50.91	50.99	50.86		

For the interpolations see the list on Oct 26th

Oct 11th 1849

ϵ UMi. Σ Leonis α Leonis
+52 +25 +13

Oct 10

 $c -0.13$ $l +.12$ $a .00 - 0.05$ By interpolation.

9.23.34.56	9.38.07.17	10.01.10.53
-.22	-.15	-.13
+.14	+.13	+.11
+.01	-.02	-.02

9.23.34.52	9.38.07.13	10.01.10.49
9.22.44.34	9.37.17.32	10.00.20.47
+50.18	+49.81	+50.02

Oct 12 ϵ Argus Σ Hydrae ϵ UMi. α Leonis¹³²
-24 +7 +49 +13

Oct 12

 $c -0.13$ $l +0.13$ $a -.05$ By interpolation

8.01.58.36	8.39.38.26	8.49.42.20	10.01.10.81
-.14	-.13	-.20	-.14
+.05	+.12	+.20	+.12
-.05	-.03	+.01	-.03
8.01.58.22	8.39.38.28	8.49.42.21	10.01.10.76
8.01.08.25	8.38.48.05	8.48.51.90	10.00.20.49
+49.97	+50.23	+50.31	+50.27

MERIDIAN TRANSITS observed at Cambridge, Mass.

Oct 13

1849

Corrections for Collimation,

Level,

Azimuth,

Illumination, E

Clock rate,

Clock error at 0 hrs. sidereal time,

5 wires cor = +0.023 sec = +0.17

MONTH AND DAY.	WIRES.	ϵ UMi	α Herculis	β Draconis	γ Draconis	α Lyrae
		Dec. +15	Dec. +52	Dec. +51	Dec. +39	
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	Oct 13	ϵ UMi 13 ^h 17 ^m 2 ^s az +0.06 Polaris 14 ^h	ϵ UMi 17 ^h 29 ^m 17 ^s 17.50 17.10 50.40 W 50.11 50.29 +0.06	ϵ UMi 36.93 36.93 36.93 49.58 50.30 49.60 50.30 50.11	40.39 40.39 40.39 50.36 50.36
	C	C - 0.13	-0.07			
	D	C + .12				
	E	C - .05 By interpolation.				
	Col.	17.02.17.79	17.08.36.93	17.27.51.01	17.53.56.14	18.32.40.39
	Level	- .97	- .14	- .22	- .22	- .17
	Az.	+ .68	+ .11	+ .19	+ .19	+ .15
		+ .24	- .02	+ .01	+ .01	- .01
Tab. R.		17.02.17.74 17.01.27.10 +50.164	17.08.36.88 17.07.46.60 +50.28	17.27.50.99 17.27.01.00 +49.94	17.53.56.12 17.53.06.03 +50.09	18.32.40.36 18.31.50.36 +50.00
	WIRES.	β Lyrae	Oct 14 & 15	ϵ Hydra	α Leonis	Polaris
		Dec. +33	Dec. +7	Dec. +13	Dec. 3P	
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B		49.30 22 49.20	Oct 14	37.38 48.08 49.50 09.55 20.54 49.05	38.4 768 4608 130 325
	C			C - 0.12		50.50 +1.35 28
	D			C + .13		51.85 00.70 51.15 17.4
	E			C - 0.06 By interpolation		49.20 29 1.14 107 12 - 0.07
	Col.	18.45.21.57		8.39.37.40	10.01.09.59	13.06.50.50
	Level	- .16		- .12	- .12	+ 4.61
	Az.	+ .14		+ .10	+ .12	- 3.26
		- .01		- .03	- .03	- 1.74
Tab. R.		18.45.21.54 18.44.31.35 +50.19		8.39.37.35 8.38.48.08 +49.27	10.01.09.56 10.00.20.54 +49.02	13.06.50.41 1.06.00.70 +49.41

Oct 15 μ E7.44
51.857
28
85Oct 17¹⁵5 wires $\alpha = +.17$ α Lyra
+39 β Lyra
8^h 5. ϵ Urdin α Her.
+154.78
2868

Oct 15

39.53
50.22
49 $c - 0.11$ $l + 0.14$ $u - 0.06$ By interpolation.

Oct 17

16.46
26.46
50.00
49.42
49.42 $c - 0.10$ $l + .15$ $u - .06$ Interpolated
By ϵ Urdin $\alpha = +0.12!$ 18.32.39.49
-.14
+.18
-.0118.32.39.52
18.31.50.31
+49.21

Oct 19 = 20

 α Leonis
+13 α ^{20^h} Lyra
+39 β Lyra
+3317.02.16.43 17.08.35.94
-.82 -.12
+.85 +.14
+.29 +.03
17.02.16.75 17.08.35.93
17.01.26.46 17.07.46.54
+50.29 49.39

Oct 19

 $c - 0.10$ $l + .14$ $u - .07$ Interpolated.10.01.10.40 18.32.39.84 18.45.21.13
-.10 -.13 -.12
+.13 +.18 +.16
-.03 -.01 -.0210.01.10.40 18.32.39.88 18.45.21.15
10.00.20.67 18.31.50.18 18.44.31.19
+49.73 +49.70 +49.96

MERIDIAN TRANSITS observed at Cambridge, Mass.

Oct 22nd

18 49

Corrections for Collimation.

Level,

Azimuth,

Illumination, East

Clock rate,

Clock error at 0 hrs. sidereal time,

 β^2

MONTH AND DAY.	WIRES.	<i>♈ Aquari</i> Dec. -6 h. m. s.	<i>♏ Pegasi</i> Dec. +9 h. m. s.	<i>♏ Hydre</i> Dec. +7 h. m. s.	Dec. h. m. s.	<i>♌ Leonis</i> Dec. +13 h. m. s.
	A					
	B	Oct 22				10.98 20.14 50.24
	C	c -0.10				
	D	d +.12				
	E	e -.07	interpolation			
			az by Polaris -0.10			
		21. 24. 28.41	21. 37. 38.36	8. 39. 38.20		10. 01. 10.97
	Col.	-.10	-.10	-.10		-.10
	Level	+.08	+.11	+.10		+.11
	Az.	-.05	-.04	-.04		-.03
		21 24. 28.34	21. 37. 38.33	8.39. 38.16		10. 01. 10.95
Tab. R.		21. 23. 38.63	21. 36. 48.52	8. 38. 48.32		10. 00. 20.74
		+49.71	+49.81	+49.84		+50.21
Oct 22	WIRES.	<i>♏ U. M. J.</i> Dec. +63 h. m. s.	<i>♏ Polaris S.P.</i> Dec. h. m. s.	Oct 23	<i>♏ Pegasi</i> Dec. 49 h. m. s.	<i>♏ Aquari</i> Dec. -1 h. m. s.
251	A					
300	B	10.	52.41 + 53.24 105.65	Oct 23	38.77 50.26	
298	C		53.04	c -0.10		
232	D		50.15	d +.12		
	E		29) 2.8910	e -.08	By Interpolation	
			az. -0.10		az by Polaris -0.10	on 22 nd
		10. 55. 11.55	13. 06. 52.41		21. 37. 38.76	21. 58. 54.29
	Col.	-.21	+3.84		-.10	-.10
	Level	+.24	-3.01		+.11	+.08
	Az.	+.05	-2.32		-.04	-.05
		10. 55. 11.63	13. 06. 50.92		21. 37. 38.73	21. 58. 54.22
Tab. R.		10. 54. 21.43	1. 06. 00.20		21. 36. 48.51	21. 58. 03.96
		+50.20	+50.71		+50.22	+50.26

Oct 25th38) 1.78 1047
1.52
260

<i>B. Draconis</i> +52	<i>B. Draconis</i> +51	<i>S. Aquila</i> +3	<i>S. Aquila</i> +10	<i>a. Aquila</i> +8		
Oct 25						
<i>c</i> -0.10						
<i>l</i> +.10						
<i>a</i> -.08 from 26 th by Interpolation						
17.27.50.59	17.53.55.49	19.18.44.57	19.39.56.42	19.44.16.61		
-.16	-.16	-.10	-.10	-.10		
+.16	+.16	+.08	+.09	+.08		
+.02	+.02	-.04	-.04	-.04		
17.27.50.61	17.53.55.51	19.18.44.51	19.39.56.37	19.44.16.55		
17.27.00.64	17.53.05.64	19.17.54.51	19.39.06.35	19.43.26.50		
+49.97	+49.87	+50.00	+50.02	+50.05		
Oct 25 - 26	<i>B. Ursina</i>	<i>S. Ursina</i>	<i>B. Draconis</i>	<i>a. Ursina</i>		
			+52	Oct 26 th -0.08	<i>Polaris</i>	3
				-08	<i>S. Ursina</i>	1
				-08	<i>B. Ursina</i>	1/2
<i>c</i> -0.10	55.51	14.77	50.47	-07 22 - .10	<i>Polaris</i>	3
<i>l</i> +.10	55.45	14.60	50.50	-06 17 + .12	<i>S. Ursina</i>	1 1/2
<i>a</i> -.08	55.25	14.45	50.64	-05 14 - .07	<i>Polaris</i>	3
<i>Polaris</i>	49.50	49.50	49.84	-05 13 + .06	<i>S. Ursina</i>	1
<i>S. Ursina</i>	49.84	49.84	47.8	-04 1 - .07	<i>Polaris</i>	3
	2 1.19	42 - 0.09	38.24	-01 Sept 26 -04	<i>S. Ursina</i>	1 1/2
SP <i>Polaris</i> az -0.08				-01 25 -01	<i>Polaris</i>	3
2C <i>S. Ursina</i> -0.09						
<i>S. Ursina</i> -.19						
14.51.55.51	14.51.55.51	17.02.14.77	17.27.50.47			
	-.38	-.74	-.16			
	+.32	+.57	+.16			
	+.16	+.38	+.02			
14.51.55.61	17.02.14.98	17.27.50.49				
14.51.05.95	17.01.25.15	17.27.00.61				
+49.66	+49.83	+49.88				

18 49

Corrections for Collimation.

Level,

Azimuth,

Illumination.

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	<i>a Lyra</i> Dec. +39 h. m. s.	<i>B. Aquila</i> Dec. +3 h. m. s.	<i>3 Cygni</i> Dec. +30 h. m. s.	<i>Polaris</i> Dec. h. m. s.	<i>Polaris</i> Dec. h. m. s.
	A			22.50 32.71 49.79		
	B	Oct 26			50.50 +1.33 51.83 59.64 52.19 59.85 27) 400 12 - 0.08	Ref + 0.15 29 23.2
	C	1e - .10				
	D	l + .10				
	E	u - .08				
		az by Polaris - 0.08				
		18. 32. 39.64	19. 18. 44.30	21. 07. 22.49	13. 06. 50.50	
	Col.	- .13	- .10	- .11	+ 3.84	
	Level	+ .13	+ .08	+ .12	- 2.51	
	Az.	- .01	- .05	- .02	- 2.32	
		18. 32. 39.65	19. 18. 44.23	21. 07. 22.48	13. 06. 49.51	
		18. 31. 50.04	19. 17. 54.50	21. 06. 32.71	1. 05. 59.64	
		+ 49.61	+ 49.73	+ 49.77	+ 49.87	
Tab. R.						
Oct 27	WIRES.	<i>a Lyra</i> Dec. +39 h. m. s.	<i>B. Aquila</i> Dec. +3 h. m. s.	Oct 29 Dec. h. m. s.	<i>B. Aquila</i> Dec. h. m. s.	<i>B. Aquila</i> Dec. +14 h. m. s.
	A					
	B	Oct 27		Oct 29	2.04 12.24	
	C	c - 0.10		c - 0.11		
	D	l + .09		l + .08		
	E	u - .07		u - .06		
		18. 32. 39.79	19. 18. 44.46		14. 51. 55.03	18. 59. 18.73
	Col.	- .13	- .10		- .12	- .11
	Level	+ .12	+ .07		+ .26	+ .07
	Az.	- .01	- .04		+ .12	- .03
		18. 32. 39.77	19. 18. 44.39		14. 51. 54.99	18. 59. 18.66
		18. 31. 50.02	19. 17. 54.48		14. 51. 05.92	18. 58. 29.33
		+ 49.75	+ 49.91		+ 49.07	+ 49.33
Tab. R.						

Oct 31st The East

Sub Polo

5 Pegasi +10
 Romalpent - 30
 & Mully's R. + 63
 7 Pegasi +14

$2 \frac{45}{22}$
 46.96
 58.45
 48.51

Oct 31

c - .11

l + .06

u - .05

09.76
 +2.20
 09.96
 21.80
 48.16

gives us E of 8 + 20

22.34.46.96 22.50.09.00 22.55.09.76 0.06.19.56
 - .11 - .12 + .23 - .12
 + .05 + .04 - .03 + .06
 - .03 - .05 - .10 - .02

22.34.46.87 22.50.08.87 22.55.09.86 0.06.19.48
 22.33.58.45 22.49.20.33 10.54.21.80 0.05.30.96
 +48.42 +48.54 +48.06 +48.52

Nov 1st 2nd

a Leonis

+13

Polaris SP

S Aquila

+3

7 Aquila

+10

3 Aquila

+6

384
 192
 192
 192

Nov 1

c - 0.11

l + .06

u - .04

09.08
 21.02
 48.06

384
 192
 192

251
 1506

44.92
 +2.71
 47.63
 58.40
 49.23
 48.06
 11.17

29 11.17
 we - 0.04

42.56
 54.40
 48.16

54.21
 06.24
 47.97

43.29
 55.23
 48.06

10.01.09.16 13.06.44.92 19.18.42.66 19.39.54.31 19.48.43.40
 - .11 +4.23 - .11 - .11 - .11
 + .06 - 1.51 + .05 + .05 + .05
 - .02 - 1.16 - .03 - .03 - .03
 10.01.09.09 13.06.46.47 19.18.42.57 19.39.54.22 19.48.43.31
 10.00.21.02 1.05.58.40 19.17.54.40 19.39.06.22 19.47.55.23
 +48.07 +48.07 +48.17 +47.98 +48.08

MERIDIAN TRANSITS observed at Cambridge, Mass.

N.

18

Corrections for Collimation,

Level,

Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	<i>α Leonis</i> Dec. +13	<i>No 10</i> Dec.	<i>γ Aquila</i> Dec. +10	<i>α Aquila</i> Dec. +8	<i>β Aquila</i> Dec. +6
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
<i>Nov 2nd</i>	A					
	B	<i>Nov 2</i>		<i>No 10</i>		
	C	<i>c - 0.11</i>		<i>c - 0.12</i>		
	D	<i>l + .05</i>		<i>l + .08</i>		
	E	<i>a - .04</i>		<i>a - .02</i>		
	Col.	<i>10.00.09.50</i> <i>- .11</i>		<i>19.39.55.31</i> <i>- .12</i>	<i>19.44.15.40</i> <i>- .12</i>	<i>19.48.44.47</i> <i>- .12</i>
	Level	<i>+ .04</i>		<i>+ .07</i>	<i>+ .07</i>	<i>+ .07</i>
	Az.	<i>- .02</i>		<i>- .01</i>	<i>- .01</i>	<i>- .01</i>
		<i>10.00.09.41</i>		<i>19.39.55.25</i>	<i>19.44.15.34</i>	<i>19.48.44.41</i>
Tab. R.		<i>10.00.21.04</i> <i>+48.37</i>		<i>19.39.06.10</i> <i>+49.15</i>	<i>19.43.26.25</i> <i>+49.09</i>	<i>19.47.55.09</i> <i>+49.32</i>
	WIRES.	<i>61' Cygni</i> Dec. +38	<i>5 Cygni</i> Dec. +30	<i>α Cephei</i> Dec. +62	<i>Polaris</i> Dec. <i>above Pol</i>	<i>α Arcturus</i> Dec. <i>5 wires</i> +23
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A		<i>45.90</i>		<i>26.22.0</i>	<i>37.7</i>
	B		<i>-2.48</i>	<i>384</i>	<i>26.33.3</i>	<i>30</i>
	C		<i>43.42</i>	<i>768</i>	<i>11.3</i>	<i>40</i>
	D		<i>58.85</i>	<i>264</i>	<i>40</i>	<i>133</i>
	E		<i>44.25</i>	<i>460</i>	<i>266</i>	<i>132</i>
			<i>21.07.21.81</i>	<i>21.15.49.14</i>	<i>26.26.9</i>	<i>17.34.0</i>
			<i>21.07.21.81</i>	<i>21.15.49.14</i>	<i>26.31.4</i>	<i>17.36.4</i>
	Col.	<i>- .15</i>	<i>- .14</i>	<i>- .25</i>	<i>+4.61</i>	<i>- .13</i>
	Level	<i>+ .00</i>	<i>+ .09</i>	<i>+ .16</i>	<i>+2.13</i>	<i>+ .08</i>
	Az.	<i>00</i>	<i>00</i>	<i>+ .01</i>	<i>-0.58</i>	<i>- .01</i>
		<i>21.00.58.85</i>	<i>21.07.21.76</i>	<i>21.15.49.06</i>	<i>1.06.42.84</i>	<i>1.59.33.14</i>
Tab. R.		<i>21.00.09.74</i> <i>+49.11</i>	<i>21.06.32.42</i> <i>+49.34</i>	<i>21.14.59.86</i> <i>49.20</i>	<i>1.05.55.85</i> <i>+46.99</i>	<i>1.58.43.90</i> <i>+49.24</i>

Illustration

Nov 11th

Level

Corrections for Collimation

Clock error at 0 hrs sidereal time

Clock rate

MONTH AND DAY	WIRE	Dec	h	m	s	Level	Corrections for Collimation	Clock error at 0 hrs sidereal time	Clock rate
Nov 11	A	10 ^h 01 ^m 11.07	11 ^h 42 ^m 12.03	11 ^h 46 ^m 41.89					
	B	- .12	- .13	- .22					
	C	+ .07	+ .08	+ .14					
	D	- .01	- .01	+ .01					
	E								
Nov 11	A	10 ^h 01 ^m 11.01	11 ^h 42 ^m 11.97	11 ^h 46 ^m 41.62					
	B	10 ^h 01 ^m 21.31	11 ^h 41 ^m 22.30	11 ^h 45 ^m 51.88					
	C	01 49.70	+ 49.67	+ 49.74					
Nov 12	A	18 ^h 59 ^m 19.21	19 ^h 18 ^m 44.26	19 ^h 39 ^m 56.11	19 ^h 43 ^m 16.23	19 ^h 48 ^m 45.11			
	B	- .12	- .12	- .12	- .12	- .12			
	C	+ .07	+ .07	+ .07	+ .07	+ .07			
	D	- .01	- .01	- .01	- .01	- .01			
	E								
Nov 12	A	18 ^h 59 ^m 19.15	19 ^h 18 ^m 44.20	19 ^h 39 ^m 56.05	19 ^h 43 ^m 16.17	19 ^h 48 ^m 45.05			
	B	18 ^h 58 ^m 29.14	19 ^h 17 ^m 54.26	19 ^h 39 ^m 06.07	19 ^h 43 ^m 26.23	19 ^h 47 ^m 55.06			
	C	+ 50.01	+ 49.94	+ 49.98	+ 49.94	+ 49.99			
	D								
	E								

MERIDIAN TRANSITS observed at Cambridge, Mass.

Nov 13 14

18 49

Corrections for Collimation,

Level,

Azimuth,

Illumination, *Dark*

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	<i>8 Leonis</i>	<i>Polaris S.P.</i>	<i>α Bootis</i>	Dec.	Dec.
<i>Nov 13th</i>		Dec. <i>+21</i>	Dec.	Dec. <i>+20</i>	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	<i>Nov 13</i>	<i>38.48</i> <i>7.68</i> <i>46.16</i>	<i>43.84</i> <i>+2.60</i> <i>46.44</i>	<i>50.12</i> <i>49.92</i>	
	C	<i>c - 0.12</i>	<i>25/</i> <i>8</i>	<i>54.53</i> <i>51.91</i>		
	D	<i>l + .08</i>	<i>20.08</i>	<i>50.02</i> <i>29 11.89</i>	<i>06</i>	
	E	<i>a - .02</i>		<i>22 - 0.06</i> <i>Polaris S.P.</i>		
		<i>11.06.55.56</i>	<i>13.06.43.84</i>	<i>14.09.36.96</i>		
	Col.	<i>- .12</i>	<i>+4.61</i>	<i>- .12</i>		
	Level	<i>+ .08</i>	<i>- 2.01</i>	<i>+ .08</i>		
	Az.	<i>- .01</i>	<i>- 0.58</i>	<i>- .01</i>		
		<i>11.06.55.51</i>	<i>13.06.45.86</i>	<i>14.09.36.91</i>		
Tab. R.		<i>11.06.05.60</i>	<i>1.05.54.53</i>	<i>14.08.46.80</i>		<i>14/15</i>
		<i>+49.91</i>	<i>+51.33</i>	<i>+50.11</i>		
<i>Nov 14</i>	WIRES.	<i>Polaris above</i>	<i>α Arctis</i>	<i>8 Leonis</i>	<i>Polaris S.P.</i>	<i>DEF 2 α Bootis</i>
		Dec.	Dec. <i>+23</i>	Dec. <i>+21</i>	Dec.	Dec. <i>+20</i>
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	<i>Nov 14</i>	<i>49.62</i> <i>-2.75</i> <i>46.87</i>	<i>34.58</i> <i>43.93</i> <i>50.65</i>	<i>253</i> <i>1755</i>	
	C	<i>c - 0.12</i>	<i>54.33</i> <i>52.54</i>	<i>51.05</i> <i>50.43</i>	<i>44.19</i> <i>+2.85</i> <i>47.04</i>	
	D	<i>l + .07</i>	<i>50.65</i> <i>29 1.49 06</i>		<i>54.13</i> <i>52.91</i>	
	E	<i>a - .02</i>	<i>22 + 0.06</i> <i>Polaris above</i>		<i>50.94</i> <i>29 1.47 07</i>	
					<i>22 - 0.06</i> <i>Pol. below.</i>	
		<i>1.06.49.62</i>	<i>1.59.34.64</i>	<i>11.06.56.74</i>	<i>13.06.44.19</i>	<i>14.09.37.71</i>
	Col.	<i>-4.61</i>	<i>- 13</i>	<i>- .13</i>	<i>+4.61</i>	<i>- .13</i>
	Level	<i>+1.86</i>	<i>+ 07</i>	<i>+ .07</i>	<i>- 1.76</i>	<i>+ .07</i>
	Az.	<i>+0.55</i>	<i>- .02</i>	<i>- .02</i>	<i>- 0.58</i>	<i>- .01</i>
		<i>1.06.47.42</i>	<i>1.59.34.56</i>	<i>11.06.56.66</i>	<i>13.06.46.46</i>	<i>14.09.37.64</i>
Tab. R.		<i>1.05.54.33</i>	<i>1.58.43.93</i>	<i>11.06.05.63</i>	<i>1.05.54.13</i>	<i>14.08.46.82</i>
		<i>+53.04</i>	<i>+50.63</i>	<i>+51.03</i>	<i>+52.33</i>	<i>+50.82</i>

cor of mean of DEF 2 to mean of wires = -20.593 sec
 $= -21.91$

384
384
4225

MERIDIAN TRANSITS observed at Cambridge, Mass.

Corrections for Collimation

Clock rate

Clock error at 0 hrs. sidereal time

Azimuth

Illumination

Nov 15/16

Nov 21

cor = +0.49

g F D C d d

Polaris SP

 α Bootis

+20

 α Lygne

+45

 β Pegasi

+10

Fomalhaut

-30

Nov 15

c -0.12

l +.07

a -.04

Nov 21

Nov 21

c -0.11

l +.03

a -.08

43.13
+2.85
46.08
53.72
52.46
50.81
29) 1.55 1.05
-0.05
wz
Polaris SP

Nov 21

c -0.11

l +.03

a -.08

13.06.43.13 14.09.37.69

+4.61

-12

-1.76

+.07

-1.16

-.01

13.06.44.82 14.09.37.63

1.05.53.72 14.08.46.83

+51.10

+50.80

 α Pegasi

+14

 α Androm.

+28

 γ Pegasi

+14

53.14
53.85
53.33

20.37.11.30 22.34.51.67 22.50.13.41

-16

-12

-12

+.04

+.03

+.03

+.01

-.04

-.08

20.37.11.19 22.34.51.54 22.50.13.24

20.36.18.30 22.33.58.30 22.49.20.07

+52.89

+53.24

+53.17

 α Androm.

+28

 γ Pegasi

+14

 α Androm.

+20

266
798
46.21
-3.48
42.73
51.23
51.56
53.34
29) 1.78 1.06
wz -0.06
Polaris above

44.26
+3.47
47.73
51.00
56.73
53.20
29) 3.31 1.19
wz -0.11
Polaris below

22.58.10.26 0.01.32.01 0.06.24.20 1.06.46.21 13.06.44.26 14.09.40.22

-11

-12

-11

-4.22

+4.22

-11

+.03

+.03

+.03

+0.80

-.75

+.03

-.04

-.02

-.04

+2.22

-2.32

-.03

22.58.10.14 0.01.31.91 0.06.24.08 1.06.45.01 13.06.45.41 14.09.40.11

22.57.17.09 0.00.38.57 0.05.30.79 1.05.51.23 1.05.51.00 14.08.46.93

+53.05

+53.34

+53.29

+53.78

+54.40

+53.18

cor -.49

cor +.08

cor -14.60

MERIDIAN TRANSITS observed at Cambridge, Mass.

18 49

Corrections for Collimation,

Level,

Azimuth,

Illumination, East

Clock rate,

Clock error at 0 hrs. sidereal time,

Nov 23

Nov 25

MONTH AND DAY.	WIRES.	Dec.	Dec.	Dec.	Dec.	Dec.
		Andromeda	Pegasi		Andromeda	Pegasi
		Dec. +28	Dec. +14		Dec. +28	Dec. +14
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	Nov 23	Nov 23		Nov 25	Nov 25
	C	c - 0.11	c - 0.11		c - 0.11	c - 0.11
	D	l + .04	l + .04		l + .06	l + .06
	E	a - .08	a - .08		a - .08	a - .08
Tab. R.		0 ^h 01 ^m 33.11	0 ^h 06 ^m 25.34		0 ^h 01 ^m 34.02	0 ^h 06 ^m 26.37
	Col.	- .12	- .11		- .12	- .11
	Level	+ .04	+ .04		+ .06	+ .06
	Az.	- .02	- .04		- .02	- .04
		0 ^h 01 ^m 33.01	0 ^h 06 ^m 25.23		0 ^h 01 ^m 33.94	0 ^h 06 ^m 26.28
		0 ^h 00 ^m 38.55	0 ^h 05 ^m 30.77		0 ^h 00 ^m 38.52	0 ^h 05 ^m 30.75
		+ 54.46	+ 54.46		+ 55.42	+ 55.53
29 21/2	WIRES.	Leonis	Polaris S P	Arcturus	Berlin	
		Dec. + 21	Dec.	Dec. + 20	Dec.	Dec.
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	55.72	44.56		55.24	Berlin
	C	55.79	+ 2.70		55.26	2.04
	D		47.26		55.28	1632
	E		48.90		55.30	
			58.36		55.32	
			55.26		55.34	
			29 26.0		55.36	
			26.1		55.38	
					55.40	
					55.42	
					55.44	
					55.46	
					55.48	
					55.50	
					55.52	
					55.54	
					55.56	
					55.58	
					55.60	
					55.62	
					55.64	
					55.66	
					55.68	
					55.70	
					55.72	
					55.74	
					55.76	
					55.78	
					55.80	
					55.82	
					55.84	
					55.86	
					55.88	
					55.90	
					55.92	
					55.94	
					55.96	
					55.98	
					56.00	
					56.02	
					56.04	
					56.06	
					56.08	
					56.10	
					56.12	
					56.14	
					56.16	
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					56.66	
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					60.30	
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					60.40	
					60.42	
					60.44	
					60.46	
					60.48	
					60.50	
					60.52	

18

MERIDIAN TRANSITS OBSERVED AT CAMBRIDGE, MASS.

384
768
374
460

Corrections for Collimation

Nov 26^z

Clock error at 9 hrs. sidereal time

Nov 28

Clock rate

Nov 29^{2.2}

Polaris SP	Arcturus +20	Polaris SP	Arcturus +20	Antares +28
Nov 26	40.59 +2.70 43.29 48.35 54.94 56.60 29 11.66 (06)	Nov 28	43.17 +3.61 46.78 47.22 51.56 52.10 (08) 29 12.48	
c - 0.11		c - 0.12		
l + .06		l + .04		
a - .06		a - .08		
	az + 0.06 Polaris SP az + 0.02		az - 0.08 Polaris SP	
13.06.40.59	14.09.43.67	13.06.43.17	14.09.44.24	0.01.35.86
+4.21	-.12	+4.61	-.13	-.13
-1.51	+ .06	-1.00	+ .04	+ .04
1.05.1.74	-.02	1.05.2.32	-.03	-.02
13.06.41.55	14.09.43.59	13.06.44.46	14.09.44.12	0.01.35.75
1.05.48.35	14.08.47.02	1.05.47.22	14.08.47.06	0.00.38.48
+53.20	+56.57	+57.24	+57.06	+57.27
δ Pegasi	Nov 29	α Cygni	α Cygni	
+14		+39	+45	
	Nov 29			
	c - 0.12			
	l + .04			
	a - .09			
0.06.28.18	18.32.46.77	20.37.15.31		
-.12	-.15	-17		
+ .04	+ .05	+ .05		
-.04	-.01	+ .01		
0.06.28.06	18.32.46.66	20.37.15.20		
0.05.30.72	18.31.49.49	20.36.17.87		
+57.34	+57.17	+57.33		

MERIDIAN TRANSITS observed at Cambridge, Mass.

1849

Corrections for Collimation,

Level,

Azimuth,

Illumination, *Sc-H*

Clock rate,

Clock error at 0 hrs. sidereal time,

*Dec 4^h**Dec 5*

MONTH AND DAY.	WIRES.	<i>10 Leonis</i> Dec. <i>+15</i>	<i>Dec.</i>	<i>alpha gmi</i> Dec. <i>+45</i>	<i>2 Pegasi</i> Dec. <i>+9</i>	<i>3 Pegasi</i> Dec. <i>+10</i>
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	<i>Dec 4^h 22^m 14^s</i>		<i>Dec 5</i>		
	C	<i>C -0.15</i>		<i>C -0.15</i>		
	D	<i>L +.05</i>		<i>L +.06</i>		
	E	<i>u -.10</i>		<i>u -.11</i>		
Tab. A.		<i>11^h 42^m 20.14</i>		<i>20^h 37^m 15.01</i>	<i>21^h 37^m 45.13</i>	<i>22^h 34^m 55.37</i>
	Col.	<i>-.15</i>		<i>-.21</i>	<i>-.15</i>	<i>-.15</i>
	Level	<i>+.05</i>		<i>+.07</i>	<i>+.06</i>	<i>+.06</i>
	Az.	<i>-.05</i>		<i>+.01</i>	<i>-.06</i>	<i>+.06</i>
		<i>11^h 42^m 19.99</i> <i>11^h 41^m 22.98</i> <i>+57.01</i>		<i>20^h 37^m 14.88</i> <i>20^h 36^m 17.75</i> <i>+57.13</i>	<i>21^h 37^m 44.98</i> <i>21^h 36^m 47.89</i> <i>+57.09³²</i>	<i>22^h 34^m 55.22</i> <i>22^h 33^m 58.00</i> <i>+57.22</i>
Tab. A.	WIRES.	<i>Fomalhaut</i> Dec. <i>-30</i>	<i>2 Pegasi</i> Dec. <i>+14</i>	<i>Dec 6^h</i>	<i>12 Can. Ven</i> Dec. <i>+39</i>	<i>8 Pica</i> Dec. <i>-10</i>
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B			<i>Dec 6</i>		
	C			<i>C -0.16</i>		
	D			<i>L +.05</i>		
	E			<i>u -.11</i>		
Tab. A.		<i>22^h 50^m 17.03</i>	<i>22^h 58^m 13.87</i>		<i>12^h 49^m 56.26</i>	<i>13^h 18^m 14.40</i>
	Col.	<i>-.19</i>	<i>-.16</i>		<i>-.20</i>	<i>-.16</i>
	Level	<i>+.03</i>	<i>+.05</i>		<i>+.05</i>	<i>+.03</i>
	Az.	<i>-.11</i>	<i>-.06</i>		<i>-.01</i>	<i>-.09</i>
		<i>22^h 50^m 16.75</i> <i>22^h 49^m 19.69</i> <i>+57.06</i>	<i>22^h 58^m 13.70</i> <i>22^h 57^m 16.78</i> <i>+56.92</i>		<i>12^h 49^m 56.10</i> <i>12^h 48^m 58.18</i> <i>+57.92</i>	<i>13^h 18^m 14.18</i> <i>13^h 17^m 16.23</i> <i>+57.95</i>

384
23
1152
768
8832

Dec 10^h

384
960

Dec 11^h

cor - 0.58

cor + 0.3

3 wires

5 wires

Polaris SP

Arcturus

2 Bootis

Betquarii

5 wires cor + 0.07

B. Cephei

+20

+28

-6

+70

Dec 10

c - .23

l + .03

a - .17

33.09
+8.83
41.92
39.64
1.01.53
-57.18
29.44.9
+28
42-0.14
Polaris S.P.

45.01
-29
41.72
41.35
57.37
21.71
-24
21.40
21.40
24.07
57.23

17
29
153
34
493

Dec 11

c - 0.29

l + .03

a - .22

13. 08. 33.09	14. 09. 45.01	14. 39. 21.71	21. 24. 36.26	21. 27. 39.49
+8.83	- .24	- .27	- .25	- .73
- 0.75	+ .03	+ .03	+ .02	+ .08
- 4.93	- .07	- .05	- .17	+ .29
13. 06. 36.24	14. 09. 44.73	14. 39. 21.42	21. 24. 35.86	21. 27. 39.13
1. 05. 39.64	14. 08. 47.35	14. 38. 24.07	21. 23. 37.96	21. 26. 41.37
+56.60	+57.38	+57.35	+57.90	+57.76
Fomalhaut	γ Ceti	α Ceti	Polaris S.P.	Spica
-30	+3	+3	-10	+20

33.58
+8.83
42.43
38.95
03.48
1. 03.48
57.23
29.44.9
+28
42-0.22
Polaris S.P.

14.03
-35
13.68
16.38
57.30
58
638

44.83
-29
44.54
47.23
57.16
9.60
2.13
2.47
41

22. 50. 18.03	2. 36. 30.10	2. 55. 24.90	13. 06. 33.58	13. 18. 14.03	14. 09. 44.83
- .29	- .25	- .29	+9.60	- .25	- .26
+ .02	+ .02	+ .02	- 0.75	+ .02	+ .03
- .24	- .14	- .14	- 6.38	- .18	- .09
22. 50. 17.52	2. 36. 29.73	2. 55. 24.49	13. 06. 36.05	13. 18. 13.62	14. 09. 44.51
22. 49. 19.60	2. 35. 32.14	2. 54. 26.85	1. 05. 38.95	13. 17. 16.38	14. 08. 47.38
+57.92	+57.59	+57.60	+57.10	+57.24	+57.13

5 wires cor + 0.02

5 wires cor - .88

MERIDIAN TRANSITS observed at Cambridge, Mass.

Corrections for Collimation,

Level,

Azimuth,

Illumination, *East*

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	5 Cygni	Polaris S.P.	Spica	Arcturus	Dec.
		Dec. +30	Dec.	Dec. -10	Dec. +20	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
29 23 57 58 5.67	A					
	B	Dec 12				
	C	c - 0.26				
	D	l + .03				
	E	a - .24				
Tab. R.	Col.	21.07.29.36	13.06.32.10	13.18.13.27	14.09.44.19	
		- .30	+9.98	- .26	- .27	
	Level	+ .03	- 0.75	+ .02	+ .03	
	Az.	- .06	- 6.67	- .18	- .09	
		21.07.29.03	13.06.34.66	13.18.12.85	14.09.43.86	
		21.06.31.90	13.05.38.25	13.17.16.41	14.08.47.41	
		+57.13	+56.41	+56.44	+56.45	
Dec 13 84 29 28 232 58 81.12	WIRES.	Polaris S.P.	Spica	Arcturus	Dec.	Dec.
		Dec.	Dec. -10	Dec. +20	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	Dec 13				
	C	c - 0.26				
	D	l + .03				
	E	a - .28				
Tab. R.	Col.	13.06.33.00	13.18.12.99	14.09.43.86		
		+9.98	- .26	- .27		
	Level	- 0.75	+ .02	+ .03		
	Az.	- 8.12	- .23	- .11		
		13.06.34.11	13.18.12.52	14.09.43.53		
		13.05.39.54	13.17.16.44	14.08.47.43		
		+56.57	+56.08	+56.10		

curt. 57

MERIDIAN TRANSITS observed at Cambridge, Mass.

Corrections for Collimation, Level, Aximuth, Illumination.

Clock rate, Clock error at 0 hrs. sidereal time.

Dec 14

Polaris SP	Spica	Dec 16	Spica	Dec 14	North and Day
Dec 14	-10	Dec 16	-10	Dec 14	
c -0.25		c -.24		35.27	12.24
l +.04		l +.04		+8.60	-2.40
a -.30		a -.28		43.87	11.80
				136.83	16.47
				107.84	55.33
				100.55	
				29.71	
				11.0	
				11	
				12.24	
				13.06.35.27	
				+9.60	
				-1.00	
				-8.41	
				13.06.35.46	
				1.05.38.88	
				+58.63	
				13.18.12.24	
				-1.25	
				+1.03	
				-1.24	
				13.18.11.78	
				13.17.16.47	
				+55.31	
				13.18.12.04	
				-1.24	
				+1.03	
				-1.23	
				13.18.11.60	
				13.17.16.53	
				+55.07	
Dec 17	Antares	ε Pegasi	Polaris SP	Spica	γ Aurigae
-6	+9		-10		+50
Dec 17					
c -.24				27.77	
l +.04				+8.22	
a -.28				35.99	
				34.63	
				21.36	
				55.26	
				29.71	
				11.0	
				11	
				12.27	
				-4.5	
				11.82	
				16.56	
				55.26	
				12.27	
				13.06.27.77	
				+9.22	
				-1.00	
				-8.12	
				13.18.12.27	
				-1.24	
				+1.03	
				-23	
				13.42.30.74	
				-1.37	
				+1.05	
				+1.06	
				21.24.33.57	
				-1.24	
				+1.03	
				-1.22	
				21.37.43.41	
				-1.24	
				+1.03	
				-1.16	
				13.06.27.87	
				13.18.11.83	
				1.05.34.68	
				13.17.16.56	
				+53.24	
				+55.27	
				21.24.33.14	
				21.37.43.04	
				21.23.37.91	
				21.36.47.76	
				+55.23	
				+55.28	
				+55.13	

err -1.23

MERIDIAN TRANSITS observed at Cambridge, Mass.

Dec 17

1849

Corrections for Collimation,

Level,

Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

[illegible]

What is the raised bench for 4'

1849 P. East.

Dec 20

Dec 22

Dec 24

Spica
-10Arcturus
+20Arcturus
+20Spica
-10

Dec 20

c -.22

l +.03

u -.27

Dec 22

c -.22

l +.02

u -.27

Dec 24

c -.22

l .00

u -.27

13. 18. 12.99 14. 09. 44.06

-.22

-.23

+.02

+.03

-.22

-.11

14. 09. 44.96

-.23

+.02

-.11

13. 18. 15.49

-.22

.00

-.22

13. 18. 12.57 14. 09. 43.75

13. 17. 16.66 14. 08. 47.63

+55.91

+56.12

Dec 25

Spica
-10Arcturus
+20

14. 09. 44.64

14. 08. 47.69

+56.95

Dec 26

Arcturus
+202. Bootis
+28

13. 18. 15.05

13. 17. 16.78

+58.27

a² Libra
-15

Dec 25

c -.22

l .00

u -.26

Dec 26

c -.22

l -.01

u -.26

13. 18. 15.46 14. 09. 46.22 14. 09. 47.10 14. 39. 23.56 14. 43. 33.04

-.22

-.23

-.23

-.24

-.22

.00

.00

-.01

-.01

-.01

-.21

-.10

-.10

-.07

-.22

13. 18. 15.03 14. 09. 45.89 14. 09. 46.76 14. 39. 23.24 14. 43. 32.59

13. 17. 16.82 14. 08. 47.77 14. 08. 47.80 14. 38. 24.49 14. 42. 38.89

+58.21

+58.12

+58.96

+58.75

+58.70

³⁵⁴
⁷⁶⁴
^{764.444}
MERIDIAN TRANSITS observed at Cambridge, Mass.

Dec 27

1849

Corrections for Collimation,

Level,

Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	Polaris SP	Spica	Arcturus		
		Dec.	Dec.	Dec.	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	Dec 27		24.93	15.99	46.44
	C	C - .22		+8.20	-44	47.83
	D	C - .01		26.13	15.55	58.61
	E	C - .26		26.44	16.48	
				1.06.30	58.67	
				29) 7.486		
				WZ - 0.26		
				189 Polaris SP		
	Col.	13.06.24.93	13.18.15.99	14.09.46.76		
	Level	+8.45	-1.22	-1.23		
	Az.	+0.25	-1.01	-1.01		
		-7.54	-1.21	-1.10		
		13.06.26.09	13.18.15.55	14.09.46.42		
		1.05.26.84	13.17.16.88	14.08.47.83		
		+59.25	+58.67	+58.59		
Tab. A.						
Dec 29	WIRES.	Polaris SP	Spica	Arcturus		
		Dec.	Dec.	Dec.	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A					
	B	Dec 29		23.73	17.09	48.73
	C	C - 0.22		+8.20	-89	47.89
	D	C - .01		21.53	16.70	58.64
	E	C - .26		25.24	16.45	
				1.06.29	59.75	
				29) 7.529		
				WZ - 0.26		
				189 Polaris SP		
	Col.	13.06.23.73	13.18.17.09	14.09.48.03		
	Level	+8.45	-1.22	-1.23		
	Az.	+0.25	-1.01	-1.01		
		-7.54	-1.21	-1.10		
		13.06.24.89	13.18.16.65	14.09.47.69		
		1.05.25.24	13.17.16.95	14.08.47.89		
		+59.65	+59.70	+59.80		
Tab. A.						

Dec 31

Adultra
-9

Jan 1
132
Spica
-10

cor = +11.66 = 10964 neJ
Ed G lost
a Bootis
+20

Dec 31

c - .22
l - .01
a - .24

Jan 1

c - .22
l - .01
a - .23

15.09.52.85
- .22

- .01
- .19

15.09.54.43

15.08.55.02

+59.41

Jan 4 1850 a Ceti
+3

13.18.17.37 14.09.47.92
- .22 - .23

- .01 - .01
- .18 - .09

13.18.16.96 14.09.47.59

13.17.17.01 14.08.47.96

+59.95 +59.63
5.00

a Persei
+49

Jan 4

c - 0.22
l - .01
a - .19

cloudy & scarcely
visible
to wt.

2.55.28.54 3.14.40.49

- .22 - .33

- .01 - .01

- .12 + .03

2.55.28.19 3.14.40.18

2.54.26.74 3.13.39.16

+1.01.45 cor +.01.02

cor - +.03

MERIDIAN TRANSITS observed at Cambridge, Mass.

Page 4

1850

Corrections for Collimation.

Level,

Azimuth,

Illumination.

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	Polaris SP	Spica	a Cos. Bos.	a Serpentis
		Dec.	Dec.	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.
529 24 41	A	29		+18.66	19.93
	B	21		+0.20	-45
	C	29		26.86	17.98
	D	58.9		20.35 + 50	17.14
	E	60.9		1.00.54	60.84
		21.27		19+02	
				29) 52.77	
				WZ - 0.14	
				Mg Polaris	
		13.06.18.66	13.18.18.43	15.29.19.93	15.37.52.67
	Col.	+8.45	-1.22	-1.24	-1.22
	Level	+0.25	-1.01	-1.01	-1.01
	Az.	-6.09	-1.17	-1.07	-1.13
		13.06.21.27	13.18.18.03	15.29.19.62	15.37.52.37
		1.05.20.35	13.17.17.14	15.28.18.66	15.36.51.44
		+1.00.92	+1.00.89	+1.00.95	01.00.87
Tab. R.					
Emr Xd 9/10	WIRES.	#10 = 10.22 a Lyra +39	#10 = 10.22 or 10.22 a Lyra	#10 = 10.22 a Tauri +16	
		Dec.	Dec.	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.
	A	4.10		10.2	
	B	Jan 10			
	C	c - 0.22			
	D	d - .02			
	E	e - .18			
		18.32.50.21		4.28.20.71	
	Col.	-1.28		-1.23	
	Level	-1.02		-1.02	
	Az.	-1.02		-1.08	
		18.32.49.89		4.28.20.38	
		18.31.49.58		4.27.19.65	
		+1.00.31		+1.00.73	
Tab. R.					

Jun 12

α Tauri	Capella	β Tauri	σ Orionis	ϵ Orionis
+16	+46	+28	0	-1

Jun 12

c - 0.22

l - .02

u - .18

4.28.21.29	5.06.39.74	5.17.51.21	5.25.23.07	5.29.38.73
- 22	- .32	- .24	- .22	- 22
- .02	- .03	- .02	- .02	- .02
- .08	+ .01	- .06	- .11	- .11

4.28.20.97	5.06.39.40	5.17.50.89	5.25.22.72	5.29.38.38
4.27.19.63	5.05.37.97	5.16.49.55	5.24.21.44	5.28.36.91
+1.01.34	+1.01.43	+1.01.34	+1.01.28	+1.01.47

Jun 14	ϵ Bootis	α Bootis	Jun 15	α Androm.
	+ 28	+ 20		+ 28

Jun 14

c - 0.22

l - .02

u - .17

Jun 15

c - 0.21

l - 0.02

u - .17

14.39.27.05

- .24

- .02

- .06

14.39.26.73

14.38.25.10

+1.01.63

cor + 0.03

14.09.50.26

- .23

- .02

- .07

14.09.49.94

14.08.48.41

+1.01.53

cor + 0.02

0.01.39.59

- .23

- .02

- .05

0.01.39.29

0.00.37.79

+1.01.50

MERIDIAN TRANSITS observed at Cambridge, Mass.

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Corrections for Collimation,

Level,

Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	<i>α Pauri</i> Dec. <i>+16</i>	<i>Capella</i> Dec. <i>+46</i>	<i>Fam 19</i> Dec.	<i>α Androm</i> Dec. <i>+28</i>	Dec.
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	<i>Jan 16</i>		<i>Jan 19</i>		
	C	<i>c - 0.21</i>		<i>c - 0.21</i>		
	D	<i>l - 0.02</i>		<i>l - 0.02</i>		
	E	<i>u - .17</i>		<i>u - .16</i>		
		<i>4.28.22.06</i>	<i>5.06.40.33</i>		<i>0.01.42.13</i>	
	Col.	<i>-.22</i>	<i>-.30</i>		<i>-.23</i>	
	Level	<i>-.02</i>	<i>-.03</i>		<i>-.02</i>	
	Az.	<i>-.08</i>	<i>+01</i>		<i>-.05</i>	
		<i>4.28.21.74</i>	<i>5.06.40.01</i>		<i>0.01.41.83</i>	
Tab. R.		<i>4.27.19.60</i>	<i>5.05.37.94</i>		<i>0.00.37.73</i>	
		<i>+1.02.14</i>	<i>+1.02.07</i>		<i>+1.04.10</i>	
<i>Jan 22</i>	WIRES.	<i>α Serpenti</i> Dec. <i>+7</i>	<i>α Lysa</i> Dec. <i>+39</i>	<i>α Coronis</i> Dec. <i>+7</i>	<i>α Pauri</i> Dec. <i>+28</i>	<i>α Geminor</i> Dec. <i>+23</i>
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	<i>Jan 22</i>		<i>Jan 23</i>		
	C	<i>c - .21</i>		<i>c - .21</i>		
	D	<i>l - .03</i>		<i>l - .03</i>		
	E	<i>u - .15</i>		<i>u - .15</i>		
		<i>15.37.58.84</i>	<i>18.32.56.64</i>	<i>5.48.11.17</i>	<i>5.17.57.54</i>	<i>6.15.01.47</i>
	Col.	<i>-.21</i>	<i>-.26</i>	<i>-.21</i>	<i>-.23</i>	<i>-.22</i>
	Level	<i>-.03</i>	<i>-.03</i>	<i>-.03</i>	<i>-.03</i>	<i>-.03</i>
	Az.	<i>-.09</i>	<i>-.01</i>	<i>-.06</i>	<i>-.04</i>	<i>-.06</i>
		<i>15.37.58.51</i>	<i>18.32.56.34</i>	<i>5.48.10.87</i>	<i>5.17.57.24</i>	<i>6.15.01.16</i>
Tab. R.		<i>15.36.51.96</i>	<i>18.31.49.78</i>	<i>5.47.03.83</i>	<i>5.16.49.48</i>	<i>6.13.53.92</i>
		<i>+1.06.55</i>	<i>+1.06.56</i>	<i>+1.09.04</i>	<i>+1.07.76</i>	<i>+1.07.24</i>

Jan 23^h 24^h ~~Feb~~
~~Level changed to +0.03 (not a change)~~
 Jan 23 Jan 25

48.97
 48.67
 37.65
 11.02

384
 21
 384
 768
 8064

18.00
 -2.56
 10.44
 03.04
 1.07.40
 1.11.00
 29 13.60 13
 23 70

22 - 0.13
 by Polaris U.C.

α Bootis
 +28

α Arctis
 +22

Jan 26 α Androm.
 +28

above
 Polaris

18.00

Jan 25

Jan 26

c - .21

c - .21

c - .02

c - .02

a - .15

a - .15

27.7
 13.9
 41.6

14.39.32.99
 -23
 -102
 -04

1.59.52.70
 -122
 -02
 -06

0.01.48.97
 -123
 -02
 -04

1.06.18.00
 -8.06
 -0.50
 +4.16

14.39.32.70
 14.38.25.40
 +1.07.30

1.59.52.40
 1.58.43.30
 +1.09.10

0.01.48.68
 0.00.37.65
 +1.11.03

1.06.13.60
 1.05.03.04
 +1.09.56

α Arctis
 +22

α Arctis
 +3

α Arctis
 +16

Capella
 +46

Capella

54.53
 -30
 23
 54.23
 43.29
 10.94

1.59.54.53 2.36.43.07 4.28.30.70 5.06.49.14
 -122 -121 -121 -130
 -102 -102 -102 -103
 -06 -10 -07 +01

1.59.54.23 2.36.42.74 4.28.30.40 5.06.48.82
 1.58.43.29 2.35.31.70 4.27.19.50 5.05.37.82
 +1.10.94 +1.11.04 +1.10.90 +1.11.00

MERIDIAN TRANSITS observed at Cambridge, Mass.

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Corrections for Collimation,

Level,

Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

Jan 26

MONTH AND DAY.	WIRES.	<i>α Tauri</i> Dec. +28	<i>δ Orionis</i> Dec. 0	<i>ϵ Orionis</i> Dec. -1	Dec.	Dec.
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	Jan 26				
	C	C - 0.21				
	D	L - .02				
	E	u - .15				
	Col.	5. 18. 00.91 - .23	5. 25. 32.67 - .21	5. 29. 48.50 - .21		
	Level	- .02	- .02	- .02		
	Az.	- .04	- .10	- .10		
		5. 18. 00.62	5. 25. 32.34	5. 29. 48.17		
Tab. R.		5. 16. 49.45	5. 24. 21.35	5. 28. 36.82		
		+1. 11. 17	+1. 10. 99	+1. 11. 35		
Jan 25	WIRES.	<i>α Lyrae</i> Dec. +39	<i>α Aquila</i> Dec. +8	Jan 30 ⁹ <i>α Lyrae</i> Dec. +39	Dec.	Dec.
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	Jan 29		Jan 30		
	C	C - 20		C - .20		
	D	L - 0.01		L - .082		
	E	u - .14		u - 14		
	Col.	18. 33. 02.80 - .25	19. 44. 39.29 - .20	18. 33. 04.39 - .25		
	Level	- .01	- .01	- .03		
	Az.	- .01	- .08	- .01		
		18. 33. 02.53	19. 44. 39.00	18. 33. 04.10		
Tab. R.		18. 31. 49.92	19. 43. 26.24	18. 31. 49.93		
		+1. 12. 61	+1. 12. 76	+1. 14. 17		

334
768381
76220.84
4 168148
444

Jan 30

cor + 0.03

5 quires
α Cyriopeia
+ 56

Polaris

α Arctis

γ Eri

β Aurin SP

51 Cephei

Jan 30

c - 0.20

l - .03

a - .14

29
118
129
406

19.78
11.85
59.03
1.1282
1.1464
29.12.32
02 - 0.08 = 0.08
By Polaris

46.67
- 3.6
46.37
1.1474

24.50
+ 8.5
25.35
10.32
15.03
14.7
33 (16)

08.66
- 4.67
04.59
52.79
11.28
14.16
147) 3.34 (22
360

02 - 0.16
β Aurin

02 - 0.22
α Cephei

0.33.15.55	1.06.19.78	1.59.58.06	2.36.46.67	2.52.24.50	6.30.08.66
- .36	- 7.68	- .21	- .20	+ 1.76	- 4.17
- .06	- 0.75	- .03	- .02	+ .09	- 0.46
+ .06	+ 4.06	- .05	- .10	+ .29	+ 2.06

0.33.15.19	1.06.15.41	1.59.57.77	2.36.46.35	2.52.25.64	6.30.06.11
0.32.00.80	1.04.59.03	1.58.43.22	2.35.31.63	14.51.10.32	6.28.52.77
+ 1.14.39	+ 1.16.38	+ 1.14.55	+ 1.14.72	+ 1.15.32	+ 1.13.34

α Persei	η Tauri	γ Eridani	α Tauri	Capella	β Tauri
+ 49	+ 24	- 14	+ 15	+ 46	+ 28

3.14.53.70	3.39.49.60	3.52.16.93	4.28.34.33	5.06.52.49	5.18.04.24
- .30	- .21	- .20	- .20	- .29	- .22
- .04	- .02	- .02	- .02	- .04	- .03
+ 1.01	- .05	- .12	- .06	+ .01	- .04
3.14.53.37	3.39.49.32	3.52.16.59	4.28.34.05	5.06.52.17	5.18.03.95
3.13.38.61	3.38.34.73	3.51.02.00	4.27.19.45	5.05.37.77	5.16.49.42
+ 1.14.76	+ 1.14.59	+ 1.14.59	+ 1.14.60	+ 1.14.46	+ 1.14.53

MERIDIAN TRANSITS observed at Cambridge, Mass.

18

Corrections for Collimation.

Level,

Azimuth,

Illumination, *East*

Clock rate

Clock error at 0 hrs. sidereal time,

Page 30

[illegible]

Ans 4.88%

Think of Polaris was taken by F.H.S. I think it not improbable that he did not use 1491 but some other perhaps 424 set near it

13 ² Feb 3	13'	Feb 4	Feb 5	
α Libra	α Lyra	α Lyra	α Ophiuchi	
-15	+39	+39	+13	
Feb 3	Feb 4	Feb 5		
c - 21	c - 21	c - .22		
l - .06	l - .06	l - .07		
a - .17	a - .17	a - .18		
14 ^h 43 ^m 55.90	18 ^h 33 ^m 10.56	18 ^h 33 ^m 11.23	17 ^h 29 ^m 17.93	
- .22	- .26	- .27	- .22	
- .04	- .08	- .08	- .06	
- .15	- .01	- .01	- .09	
14 ^h 43 ^m 55.49	18 ^h 33 ^m 10.21	18 ^h 33 ^m 10.87	17 ^h 29 ^m 17.56	
14 ^h 42 ^m 35.13	18 ^h 31 ^m 50.03	18 ^h 31 ^m 50.06	17 ^h 27 ^m 57.26	
+1 .20.36	+1 .20.18	+1 .20.81	+1 .20.30	
α Lyra	Feb 7	13 ² Scorpi	Feb 10	δ Ophiuchi
+39	- 19	- 19	- 3	- 26
Feb 7	Feb 10			
c - 0.22	c - .23			
l - .09	l - .10			
a - .20	a - .23			
18 ^h 33 ^m 10.80	15 ^h 58 ^m 03.49	16 ^h 07 ^m 52.21	16 ^h 21 ^m 36.09	
- .27	- .23	- .23	- .25	
- .10	- .04	- .06	- .04	
- .01	- .19	- .14	- .21	
18 ^h 33 ^m 10.42	15 ^h 58 ^m 03.03	16 ^h 07 ^m 51.78	16 ^h 21 ^m 35.54	
18 ^h 31 ^m 50.08	15 ^h 56 ^m 42.79	16 ^h 06 ^m 28.80	16 ^h 20 ^m 12.49	
+1 .20.34	+1 .20.24	+1 .22.98	+1 .23.10	

MERIDIAN TRANSITS observed at Cambridge, Mass.

18

Corrections for Collimation,

Level,

Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	Dec.	Dec.	Dec.	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
50.79 -2.28 48.51 26.40 1" 22.11 1" 23.03 48.94 44	A B C D E	<i>ε UMi</i> Feb 10 c -.23 f -.10 a -.23	<i>α Aquila</i> +8	49.87 2.0 49.86 26.43 23.03	Feb 12-13 wz = -0.27 By Polaris = -0.24 By <i>ε UMi</i> UC & L = -0.30 By <i>ε UMi</i> UC & L -0.27 <i>Mean</i>	
17.02.50.79 -1.71 -0.57 +1.10	Col. Level Az.		19.44.49.87 -.23 -08 -13			
17.02.49.61 17.01.26.40 +1.23.21			19.44.49.43 19.43.26.43 +1.23.00			
Feb 12 57.64 -1.71 55.93 30.08 1" 25.85 1" 26.97 29.11.12.39 29.11.12.39 See <i>ε UMi</i> 52.46 wz -0.39 <i>ε UMi</i> -0.26 4.91 29.46 9.97 1.77	A B C D E	<i>ε UMi</i> Feb 12 c -.25 f -.12 4 -.26	<i>10 Scorpii</i> Dec. -19 5.41	<i>3 Cygnus</i> Dec. -3 14.92 42.25 1.28.97 56.36 51 55.85 28.84 27.00	<i>Antares</i> Dec. -26 40.11 -56 39.55 12.56 1.27.00	<i>ε UMi</i> Dec. 53 55.00 1.14 52.54 57 52.46 64 26.21 1.25.79 1.27.05 1.25
15.50.57.64 -1.23 -0.48 +1.28	Col. Level Az.		15.58.10.49 -.26 -.06 -.25	16.07.56.36 -.25 -.09 -.18	16.21.40.11 -.27 -.04 -.27	17.02.55.00 -1.86 -0.68 +1.24
15.50.57.21 15.49.30.08 +1.27.13			15.58.09.92 15.56.42.95 +1.26.97	16.07.55.84 16.06.28.86 +1.26.98	16.21.39.53 16.20.12.56 +1.26.97	17.02.53.70 17.01.26.77 +1.26.94

MERIDIAN TRANSITS observed at Cambridge, Mass.

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Corrections for Collimation,

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Azimuth,

Illumination,

Clock rate,

Clock error at 0 hrs. sidereal time,

Feb 19 13²

MONTH AND DAY.	WIRES.	<i>1st Gemini</i> Dec. +22	<i>2^d Gemini</i> Dec. +32	<i>Feb 21st</i> Dec.	<i>2^d Pauri</i> Dec. +26	Dec.
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	<i>Feb 19</i>		<i>Feb 21</i>		
	C	<i>c - .23 - .18</i>		<i>c - .23 - .17</i>		
	D	<i>d - .11</i>		<i>d - .11</i>		
	E	<i>e - .20</i>		<i>e - .18</i>		
		<i>7^h 12^m 46.67</i>	<i>7^h 26^m 38.53</i>		<i>4^h 28^m 58.67</i>	
	Col.	<i>- .24</i>	<i>- .28</i>		<i>- .24</i>	
	Level	<i>- .11</i>	<i>- .12</i>		<i>- .10</i>	
	Az.	<i>- .08</i>	<i>- .05</i>		<i>- .08</i>	
Tab. R.		<i>7^h 12^m 46.24</i>	<i>7^h 26^m 38.08</i>		<i>4^h 28^m 58.25</i>	
		<i>7^h 11^m 10.44</i>	<i>7^h 25^m 02.16</i>		<i>4^h 27^m 19.10</i>	
		<i>+ 1^m 35.80</i>	<i>+ 1^m 35.92</i>		<i>1^m 39.15</i>	
<i>Feb 22</i>	WIRES.	<i>2^d Pauri</i> Dec. +16	<i>1st Gemini</i> Dec. +23	Dec.	Dec.	Dec.
	A	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
	B	<i>Feb 22</i>				
	C	<i>c - .23 - .16</i>				
	D	<i>d - 0.11</i>				
	E	<i>e - .18</i>				
		<i>4^h 28^m 59.91</i>	<i>6^h 15^m 34.67</i>			
	Col.	<i>- .24</i>	<i>- .24</i>			
	Level	<i>- .10</i>	<i>- .11</i>			
	Az.	<i>- .08</i>	<i>- .07</i>			
Tab. R.		<i>4^h 28^m 59.49</i>	<i>6^h 15^m 34.25</i>			
		<i>4^h 27^m 29.08</i>	<i>6^h 13^m 53.64</i>			
		<i>+ 1^m 40.41</i>	<i>+ 1^m 40.59</i>			

adopted altitudes

Azimuths from transits of Circumpolar stars.

		az	wt.			
- .08	Oct 26 th	- 0.08	3	By Polaris, & Arct		
- .05	" 31	+ .20	1/2	a Mr. Mug. SP alt + 15°		
- .04	Nov 1	- .04	1	Polaris SP 3 wires		
- .04	2	- .06	1	Polaris UC 2 wires		
- .04	2	.00	1/2	a Cephei		
- .02	13	- .06	2	Polaris SP	} one result by upper & lower cul = .00	
- .02	14	+ .06	2	" UC		
- .02	14	- .06	2	" SP		
- .04	15	- .05	2	" SP		
- .08	21	- .06	2	" UC	} = az = - 0.08	
- .08	21	- .11	2	" SP		
- .08	25	- .08	1/2	" SP one wire		
- .08	25	- .24	1/3	Arct		
- .06	26	+ .06	1	Polaris SP	mean of 5 wires gives az = + .002	
- .08	28	- .08	2	"		
- .17	Dec 10	- .14	1	Polaris SP 3 wires		
- .22	11	- .22	2	" 7		
- .24	12	- .23	2	" 7		
- .28	13	- .29	1	" 3 wires		
- .30	14	- .40	1/2 one wire	" 7		
- .28	17	- .21	1/2 one wire	" 1		
- .26	27	- .26	2	" 7		
- .26	Dec 29	- .26	2	" 7		
- .24	Jan 4	- .24	2	" 7		
- .15	Jan 23	- .13	2	" UC		
~~- .15~~	~~Jan 23~~	~~- .13~~	~~2~~	~~UC~~		
- .14	Jan 30	- .08	2	Polaris UC	} {	Arct UC & SC = - 0.24 2
	30	- .16	1/3	Arct UC		Arct UC & SC = - 0.30 2
	30	- .22	1/2	a Cephei		Polaris UC - 0.27 2
						mean - 0.27 6
- .26	Feb 13	- .27	6			
	21	- .18		By mistake		

MERIDIAN TRANSITS observed at Cambridge, Mass.

18

Corrections for Collimation,

Level,

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Clock rate,

Clock error at 0 hrs. sidereal time,

MONTH AND DAY.	WIRES.	Dec.	Dec.	Dec.	Dec.	Dec.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.
Tab. R.	A					
	B					
	C					
	D					
	E					
	Col.					
	Level					
	Az.					
Tab. R.	A					
	B					
	C					
	D					
	E					
	Col.					
	Level					
	Az.					

1992

