KG
11366
v. 776

ERROR OF SIDEREAL CLOCK

1, 2, 3, 8

Battery

Dec 31-1908

Level

Meridian Circle JAD.hr

3^h 0
ESMT

Telescope South

	W	E	W	E
Screw E	-66.6	-99.4		
E	-66.0	-99.0	-66.30	-99.20
W	+84.6	+52.0		
W	+84.0	+51.6	+84.30	+51.80

Telescope North

	W	E	W	E
Screw W	+71.0	+37.5		
W	+80.5	+48.0		
W	+75.5	+43.0	+76.78	+44.30
W	+80.3	+48.0		
W	+76.6	+45.0		
E	-43.0	-75.0		
E	-41.5	-73.2	-42.25	-74.10

+161.08 +96.10
-108.55 -173.30
+52.53 -77.20
+52.53
8) -24.67 (-3.084
24
67
64
30

~~.0926~~
.18504
1.35
.247

b sec. φ = .247
East end high

Series rejected
see later determinations.

-3.08
1.35
1540
924
308
4.1580
06
.24928

Dec 31-1908 continued

Collimation

3^h 15 ESMT Meridian Circle JAD obs

South collimator on North collimator

825
818
828
825
811

Set at 821

Telescope on North collimator
R.A. Micrometer found at 33.560

31.225
242
245
230

Lines of tel. reticule well adjusted to motion of telescope.

Telescope on South collimator

35.815
840
845
845
845

33.536
Diurnal aberration .012

Set at 33.548

Dec 31 $\frac{5}{10}$ 1908 continued

Meridian Circle

J.A.D. obs.

10 Monoc. −4 42 all
8 Lyncis +61 34 all
51 Aurigae +39 28 all
ε Gemin. +25 13 all
θ Gemin +34 4

New Years Eve

Rattle after 6^h 44^m

	10 Monoc.	8 Lyncis	51 Aurigae	ε Gemin.	θ Gemin.
	6^h 23	6^h 28	6^h 31	6^h 37	6^h 46
	6.1 22.4 43.0	35.5 8.4 53.3	52.5 13.3 40.2	55.5 13.2 36.5	20.6 40.0 5.4
	8.3 25.9 45.7	40.9 17.2 58.6	55.7 18.1 43.5	58.2 17.3 39.1	23.7 44.5 8.4
1.268m	11.0 29.6 48.2	45.9 25.3 3.8	58.9 22.9 46.9	1.0 21.1 41.7	26.6 49.0 11.3
0.3223	13.5 33.2 50.7	51.2 32.5 9.0	2.3 27.5 50.1	3.7 25.6 44.5	29.5 53.5 14.3
1.2662	16.0 36.9 52.8	56.0 40.2 13.9	5.3 32.5 53.1	6.4 29.5 47.0	32.5 58.0 17.3
1.5905	54.9 148.0 240.4	229.5 123.6 318.6	294.7 114.3 233.8	304.8 106.7 208.8	132.9 245.0 56.7
1.5885	10.98 29.60 48.08	45.90 24.72 3.72	58.94 22.86 46.76	0.96 21.34 41.76	26.58 49.00 11.34
28.95	18.61 .04 18.53	38.95 .08 38.77	24.02 .05 23.91	20.49 .05 20.40	22.39 .05 22.28
38.77	29.59 29.64 29.55	24.85 24.80 24.85	22.96 22.91 22.85	21.45 21.39 21.36	48.97 49.05 49.06
T =	6^h 23 $29^s.59$	6^h 29 $24^s.83$	6^h 32 $22^s.91$	6^h 38 $21^s.40$	6^h 46 $49^s.03$
α =	6 23 28.32	6 29 23.60	6 32 21.63	6 38 20.34	6 46 47.87
	1.27	1.23	1.28	1.06	1.16

δ	
−4°	1.27
+25	.06
+34	.16
+39	.28
+61	.23
	100
	1.20

n = .00

1.20
~~= .25~~

1.20
.63 = b sec φ (see page 7)
1.83

Dec 31 $\frac{5}{10}$ 1908
New Years Eve 1909
Frod 1327 is $1^s.83$ fast
at 6^h 30 Sid Time

Thursday Dec. 31. 1908. Continued.

Comparison of Naval Observatory Standard Signals with Sidereal Clock F.1327. Midnight New Year's Eve.

Wash^n M.T. Clock	Cam. Sid^l Clock
$11^h\ 59^m\ 0^s$	$6^h\ 55^m\ 20^s.4$
1	21.4
2	22.5
3	23.5
4	24.5
5	25.5
6	26.5
7	27.5
8	28.5
9	29.5
10	30.5
11	31.5
12	32.5
13	33.5
14	34.5
15	35.5
16	36.5
17	37.5
18	38.5
19	39.5
	20)599.8

mean $11^h\ 59^m\ 9.50$ $6^h\ 55^m$ ~~30.05~~ 29.99

6 55 28.11

Wash clock $1^s.88$ slow of F.1327

16 18.19
18 38 2.28
~~6 55 29.99~~
11 59 9.50
1 58.11
.03

6 55 28.11

ERROR OF THE
Washington Clock Signals

Washington Clock slow of Frod 1327 } $1^s.88$

Frod 1327 fast of true sid. time } 1.83 (see page 3)

Washington Clock signals

Slow $0^s.05$

of true time

determined at Harvard Observatory

~~Jan~~ Dec 31 $\frac{10}{10}$, 1908

Meridian Circle [illegible]

α Lyrae +38° 42

~~Rattle~~ after 18' 36

18' 33

198	40.4	7.4
23.4	455	105
26.3	50.2	138
295	55.0	17.0
328	595	20.0
1318	2506	687
26.34	50.12	13.74
2376	.05	23.65
50.10	50.17	50.09

T = 18 33 50.12
18 33 49.02
1.10
00
1.10

~~Level not yet applied~~

b equ 63 = (subtract 7)

Found 1327 is 1.73 fast
at 18h 35 sid T.

Jan 1-1909

$3^h\ 40^m$ E.S.M.T. Meridian Circle - Level, W.P.G. obs.

Telescope North

		w	E
51.5	Zero W	-21.5	-73.0
51.7	" E	+96.3	+44.6
52.1	" W	-25.9	-78.0
52.9	" E	+94.0	+41.1

Telescope South

		w	E
53.6	Zero E	+108.6	+55.0
53.7	" W	-44.4	-98.1
53.9	" E	+108.5	+54.6
	" W	-43.1	-97.8

+407.4 +195.3
-134.9 -346.9
+272.5 -151.6
-151.6
(16) 120.9 ∟7.56
112 1.35
89 3780
80 2268
90 756
10.2060

10.20
.06
.7120

$\frac{b}{\sec\varphi}$ = .71 West End high.

Jan 1 - 1909

again

Telescope South —

			W	E
54.0	Zero	W	− 41.1	− 95.1
54.2	"	E	+ 104.8	+ 50.6
54.2	"	W	− 40.2	− 94.4
54.1	"	E	+ 105.2	+ 51.1

Telescope North

			W	E
54.6	Zero	E	+ 90.~~4~~2	+ 35.~~1~~6
54.7	"	W	− 18.2	− 72.9
54.8	"	E	+ 88.1	+ 33.3
55.0	"	W	− 16.0	− 71.0

+388~~8~~3 +170.6
−115.5 −333.4
+272.8 −162.8
−162.8
16)+110.0(6.87
96
140
128
120

1.35
343 5
206 1
68 7
9.274 5
06

$b \sec \varphi$ = .5564 West End high
.71

Mean $b \sec \varphi$ = .63 W. end high

11.8
18.2

Jan 19 - 1909

11h 0
23
ESMT

Meridian Circle :-

JAD. obs

Telescope South :-

		W	E
Zero	W	−32.5	−78.7
"	W	−33.5	−79.5
"	E	+92.4	+46.0
"	E	+92.2	+45.5

Telescope North

Zero	W	−12.0	−58.5
	W	−13.7	−59.8
	E	+67.5	+21.5
	E	+68.0	+22.2
		+320.1	+135.2
		−91.7	−276.5
		+228.4	−141.3
		−141.3	

16) +87.1 (+5.44
80
71
64
70

+5.44
1.35
2720
1632
544
7.3440
.06
.4404

$\nu \sec\varphi = .4404$

West end high

Jan 4 - 1909
Clouds

Mer Circle
J A D obs

β Persei +40 36 ~~III 2 tasks star? lost 2nd wire; probably to be rejected~~
~~Rattle after 3h~~ 9

α Persei +49 32; Badly III lost 4 wires; reject 4th task, use the three; good observation of last 3 reject all taps preceding these 4;
Clouds thick

α Persei +49°32'

wires III 1, 2 + 3
11.13
15.20
19.23
56
3h 18m 15.19
~~32.23~~ 24.65
∴T = 3 17 ~~42.96~~ 50.54
α = 3 17 49.04
1.50
00
1.50
b sec φ = .63
2.13

~~1.32069~~
~~0.18777~~
~~1.50983~~
~~32.23~~

1.2041
0.1877
1.3918
24.65

Frod 1327 is fast
0 2s.13
at 3h20m Sid Time

Jan 6 – ~~1908~~ 9

Wednesday

Meridian Circle

JAD Sen

Daylight Observation.

α Cygni +44°57 all

Results after 20^h 40^m

β Pegasi +27 35 all but last line

Results after 23 0

α Cygni

$20^h 37$

45.7 8.2 38.0
49.2 13.6 41.3
52.5 18.7 44.9
56.2 24.0 48.5
59.6 29.1 51.8
263.2 93.6 224.5
52.64 18.72 44.90
26.20 .06 26.08
18.84 18.78 18.82

T = 20 38 18.81
α = 20 38 17.37
1.44
.50
b sec φ = .63
2.07

β Pegasi

22'58

× 13.0 36.7
57.7 17.0 39.5
0.5 21.3 42.3
3.2 25.3 45.0
6.0 29.7 47.8
181.4 106.3 211.3
0.47 21.26 42.26
20.93 05 20.83
21.40 21.31 21.43

22 59 21.37
22 59 19.99
1.38
.50
63
2.01

2,04

Ford 1327 is fast

ō $2^s.04$

at 21^h 50^m Sid T.

Jan 12 10/10, 1909

Meridian Circle   Wednesday

JHW obs

α Lyrae +38°42 Clouds + bad seeing. Wires 2+3 Tab I

Rattle after 18 35

Jan 13.2 – 1909

ξ Androm +23°46 I missed 4th; 4 ditto III missed a wire

Clouds + defective pen.

γ Cass. +60 13.5 all   Rattle after 0h 53

ε Piscium +7°20 I 2+3; III all; these only good check or for approx in clouds;

β Androm +35°8 Good obs.   Rattle after 1h 6

Clouds

α Lyrae	ξ Androm	γ Cass.	ε Piscium	β Androm.
18 33 23.57 20.99 18.55 26.85 19.77 10.42 Log = 1.2960 0.1077 25.21 1.4037 25.33 — 25.33 T = 18 33 50.54 18 33 49.19 1.35 [illegible] 63 1.98	0h 42 I Rest lost on sheet. 5.5 8.3 10.8 x 1.2826 16.4 0.0386 41.0 1.3212 10.25 20.95 20.95 31.20 0 42 31.20 0 42 29.54 1.66	0h 50 25.0 57.9 39.8 30.0 57 45.3 35.0 12.6 50.0 40.2 20.3 55.3 45.0 27.8 59.5 175.2 64.3 249.9 35.04 12.86 49.98 ~~52.36~~ 37.14 37.35 12.39 12.94 12.84 0m 51 12.72 0 51 10.98 1.74	0h 57 58 I 15 x 27.5 55.0 30.0 58.3 32.3 x 34.9 x 37.6 162.3 32.46 186.1 0 58 13.85 0 58 12.07 1.78	1h 4 9.6 29.2 54.9 12.5 33.8 57.9 15.5 38.2 0.7 18.6 42.5 3.9 21.6 47.3 7.0 77.8 191.0 304.4 15.56 38.20 0.88 22.68 .05 22.57 38.24 38.25 38.31 1h 4 38.27 1 4 36.84 1.435

Good obs βAnd = 1.435
63
2.08

Jan 13.2 – 1909
Frodsham 1327 is fast
0m 2s.08
at 1h 0m Sid Time

Jan 18.0+ 1909

Meridian Circle

JAD - obs

α Cygni +44 57

II	III
14.5	34.5

Rattle after 20 40

$20^h 38$

b	1~~1~~	13	14	15
8.2	29.0	44.8	48.4	51.6

1.3 0.8733	0.8675	1.2667	1.3216	1.3678
0.1501	0.1501	0.1501	0.1501	0.1501
1.0234	1.0176	1.4168	1.4717	1.5179
10.55	10.41	26.11	29.63	32.95
18.75	18.59	18.69	18.77	18.65

T = 20 38 $\overset{345}{18.69}$

20 38 17.34

1.35

00

1.35

63

1.98 -

Frod 1327

is fast

0 $\overset{s \; \alpha \text{ Cygni}}{1.98}$

at $20^h 40$ Sid T.

α Androm +28 35

I				II	
14.0	16.7 ×	22.4	25.2	$\overset{3}{41.0}$	$\overset{4}{45.1}$
1.3713	1.3220	1.2058	1.1338	0.5635	
0.0565	0.0565	0.0565	0.0565	0.0565	
1.4278	1.3785	1.2623	1.1903	0.6200	
26.78	23.91	18.29	15.50	4.17	
40.78	40.61	~~2.41~~ 40.69	~~29.70~~ 40.70	41.00	40.93

40.78
61
69
70
100
93
471
40.78

T = 0 3 40.78

α 0 3 39.36

1.42

.00

63

2.05

α Cygni Weight 3 × -02 -04

α Androm " 1 × +05 05

-1 +01

00

Mean 2.00

Frod 1327 is fast

0 2.00

at $22^h 20$ Sid Time

2nd

Jan 20, 1908

Mer Cir   Wells

Qa~~ttte~~ at $1^h 02^m$

β Androm +35°8′ missed 1st wire

ν Pisc +26°47′

δ Cass +59°46′

η Pisc +14°53′

+35°8′		+26°47′		+59°46′		+14°53′	
4^m — — —		14^m 1.654.0	5.6	19^m 4.037.3	1.3	26^m 12.61.0	3.6
12.233	5.5	4.151.3	5.4	9.032.4	1.4	15.058.6	3.6
15.10.3	5.4	7.148.4	5.5	13.927.2	1.1	17.656.1	3.7
18.057.4	5.4	9.845.5	5.3	18.722.2	0.9	20.353.5	3.8
21.354.4	5.7	12.443.0	5.4	23.217.2	0.4	22.751.0	3.7
28.746.8	5.5	19.636.0	5.6	36.75.2	0.9	29.144.6	3.7
33.342.3	5.6	23.731.7	5.4	43.357.8	1.1	33.040.7	3.7
	38.0		27.7		50.6		36.9
	13 | 101		15 | 109		15 | 77		15 | 127
	37.78		27.73		50.51		36.85

$1^h 04^m 37^s.78$	$1^h 14^m 27^s.73$	$1^h 19^m 50^s.51$	$1^h 26^m 36^s.85$
36.72	26.55	49.73	35.68
1.06	1.18	0.78	1.17
.06	.11	.22	.187
1.00	1.07	1.00	~~0.99~~
			1.00

1.72 0.78
.27 1.17
1.45 .390 (.27
290
1000
1015

m = .27

1.00
1.07
1.00
~~1.00~~
4 | 4.067
1.02

1.02
.63 δ sec ϵ.
1.65

.27 .27 .80 .64
.21 .41 27 .27
27 27 .216 448
54 108 128
.0567 .1107 1728

Frod. 1327 is FAST

$0^m 1^s.65$

at $1^h 15^m$ S.T.

Times Jan 21, 1909

Arm Cir Willis.

ε Persei + 50°14'

o Pisc + 8°42'

Rattle at 1h 43m

α Triang + 29°8'

+50°14'		+8°42'		+29°8'	
37m 20.233.3	3.5	40m 11.559.0	0.5	47m 26.520.2	6.7
23.729.6	3.3	14.256.7	0.9	29.417.5	6.9
27.725.7	3.4	16.654.0	0.6	32.214.7	6.9
31.721.7	3.4	19.151.6	0.7	35.011.9	6.9
35.418.0	3.4	21.649.1	0.7	38.09.0	7.0
45.08.3	3.3	27.942.7	0.6	45.01.9	6.9
50.92.3	3.2	31.539.0	0.5	49.257.6	6.8
	57.0		35.3		53.67
	15)95		15)48		15)67
	56.63		35.32		53.45

$1^h 37^m 56^s.63$	$1^h 40^m 35^s.32$	$1^h 47^m 53^s.45$
55.80	34.26	52.46
0.83	1.06	0.99
.07	.19	.09
0.90	0.87	0.90

azo m = 1/4

0.90
.87
.90
3)267
0.89
.63 brace
1.52

Trod. 1327 is FAST

$0^m 1^s.52$

at 1h 40m S.T.

Mon Jan 25, 1909

Mer Cir [illegible]

η Pisc +14° 53'
Rattleat 1h 29m
ν Persei +48° 10'

+14°53'			+48°10'	
26m 12.3 0.7	3.0		31m 48.2 58.6	7.0
14.8 58.4	3.2		52.0 55.0	7.0
17.2 55.6	2.8		55.7 51.2	6.9
19.7 53.0	2.7		59.6 47.3	6.9
22.3 50.2	2.5		3.1 48.8	6.9
28.6 44.1	2.7		12.3 34.6	6.9
32.7 40.0	2.7		17.9 29.0	6.9
	36.4			23.5
	15⌊6 0			15⌊7 0
	36.40			23.47

$1^h\,26^m\,36^s.40$	$1^h\,32^m\,23^s.47$
35.62	22.70
0.78	0.77
~~.16~~	.05
~~.67~~	~~.82~~

~~as. u = 1/4~~

ass u = 0
Jan 26, 09

~~0.72~~	0.77
.63 6 sec δ	.63
~~1.35~~	1.40

Frod. 1327 is FAST

$0^m\,\cancel{1^s.35}\ 1^s.40$

at 1h 30m S.T.

Tues Jan 26, 1909

Amer Cir   Wh Obs.

c Persei + 47°28'.
Rattle at $4^h 05^m$
o' Erid   -7°4'

+47°28'

1^m 28.9 38.3   7.2
32.6 34.5   7.1
36.4 30.9   7.3
39.8 27.0   6.8
43.7 23.7   7.4
52.6 14.4   7.0
58.3 9.0   7.3
3.7
15|88
3.59

-7°4'

07^m 2.4 49.7   2.1
5.0 47.3   2.3
7.4 45.0   2.4
10.0 42.2   2.2
12.4 39.6   2.0
18.4 33.4   1.8
22.2 29.7   1.9
26.0
15|7
26.05

$4^h 02^m 3^s.59$
2.82
0.77

$4^h 07^m 26^s.05$
25.27
0.78

ass n=0

0.77
.63 b sec φ
1.40

Frod. 1327 is FAST

$0^m 1^s.40$

at $4^h 05^m$ S.T.

Wed Jan 27, 1909

Mer Cir Wells.

Rattle at $5^h 29^m$

ξ Tauri +21° 5'

Clouds.

+21° 5'

31^m 47.8 38.7 6.5

50.9 36.0 6.9

53.4 33.4 6.8

56.1 31.0 7.1

59.0 28.0 7.0

5.6 21.3 6.9

9.4 17.6 7.0

13.6

$15\,\overline{)68}$

13.45

ass n=0

$5^h 32^m$ 13.45

12.52

.93

.63 b secle

1.56

Frod. 1327 is FAST

$0^m 1^s.56$

at $5^h 30^m$ S. T.

Glenns Jan 28, 1908

Amer Cir W. L. Collis

Rattle at $1^h 30^m$.

ν Persei +48°10' faint

ε Persei +50°14' (missed 6th wire) faint

α Triang +29°8'

β Arietis +20°22'

+48°10'		+50°14'		+29°8'		+20°22'	
31^m 48.0 58.4	6.4	37^m 19.7 32.9	2.6	47^m 26.2 20.0	6.2	49^m 11.6 1.3	
51.9 54.7	6.6	23.9 29.3	3.2	29.3 17.3	6.6	14.1 58.9	2.9
55.3 51.2	6.5	27.8 25.6	3.4	32.2 14.3	6.5	16.7 56.3	3.0
59.4 47.5	6.9	31.2 21.7	2.9	34.9 11.6	6.5	19.4 53.5	3.0
3.3 43.9	7.2	35.0 17.7	2.7	37.8 8.7	6.5	22.0 51.0	2.9
12.6 34.6	7.2	— 8.0	—	44.8 1.9	6.7	28.6 44.4	3.0
17.9 29.1	7.0	51.0 2.1	3.1	49.0 57.5	6.5	32.7 40.4	3.0
							3.1
	23.3		56.4		53.2		36.5
							~~14~~
	15 | 61		^{3}15 | 63		15 | 37		15 | 74
	23.41		56.48		53.25		36.49

$1^h 32^m 23^s.41$	$1^h 37^m 56^s.48$	$1^h 47^m 53^s.25$	$1^h 49^m 36^s.49$
22.64	55.62	52.35	35.58
0.77	.86	.90	.91

ass n = 0

0.77
.86
.90
.91
4 | 344
0.86
.636 secle
1.49

Frod. 1327 is FAST

$0^m 1^s.49$

at $1^h 40^m$ S. T.

Mon Feb. 1, 1909

Mer Cir Tele Obs.

Rattle at $6^h 56^m$

ζ Gemini +20°42'

63 Aurigæ +39°28'

λ Gemini +16°42' (middle tally)

19 Lyncis seq. +55°27' (missed (1st few) wires)

+20°42'

58m 18.694
21.765 8.0
24.740 8.2
27.412 8.7
~~29.4~~59.0 8.6
~~36~~.352.4 8.4
40.748.2 8.7
8.9
44.0
15 | 35
44.23

+39°28'

05m 54.856.0
58.052.7 0.8
1.749.2 0.7
4.646.0 0.9
7.943.0 0.6
15.934.7 0.9
20.730.1 0.6
0.8
25.5
15 | 58
25.38

~~+16°42'~~

~~12m 45.706 6.3~~
~~49.556.9 6.4~~
~~5 3.4~~
~~5 | 11~~
~~53.22~~

+55°27'

14m 55.2 1.8 7.0
0.757.6 7.3
5.052.7 7.7
15.741.3 6.0
21.934.4 6.3
28.5
9 | 48
28.53

$6^h 58^m 44^s.23$
43.21
1.02
.11
.91

$7^h 06^m 25^s.38$
24.52
0.86
.02
0.84

~~$7^h 12^m 53^s.22$~~
~~52.35~~
0.87
.12
0.75

$17^h 15^m 28^s.53$
27.87
0.66
.11
.76

.38
.30
.34

1.02
.87
2 | 1.89
.90

1.45 0.66
1.11 .24

ass. n = .2

.91
.84
.75
.76
4 | 326
0.82
.63
1.45

Frod. 1327 is FAST

$0^m 1^s.45$

at $7^h 10^m$ S. T.

Wed Feb 3, 1909

Mer Cir Yale Obs.

Rattle at $6^h 51^m$.

ζ Gemin +20°42′

63 Aurigae +39°28′

1 Gemin +16°42′

19 Lyn. seq. +55°27

+20°42′		+39°28′		+16°42′		+55°27′	
58m 18.68.7	7.3	4m 54.655.6	0.2	12m 28.017.0	5.0	14m 46.69.2	5.8
20.96.2	7.1	59.552.2	9.7	30.555.0	5.5	51.65.3	6.9
23.73.3	7.0	1.048.9	9.9	33.212.3	5.5	55.71.0	6.7
26.40.9	7.3	4.345.9	0.2	36.09.4	5.4	0.256.7	6.9
29.058.2	7.2	7.342.6	9.9	38.77.2	5.9	4.052.3	6.3
35.951.9	7.8	15.434.7	0.1	45.00.5	5.5	14.941.5	6.4
40.047.8	7.8	20.329.8	0.1	48.656.3	4.9	21.735.0	6.7
	43.6		25.0		52.7		28.2
	15 | 101		15 | 1		15 | 404		15 | 39
	43.67		25.07		52.69		28.26

$6^h 58^m 43^s.67$	$7^h 5^m 25^s.07$	$7^h 12^m 52^s.69$	$7^h 15^m 28^s.26$
43.22	24.51	52.34	27.86
0.45	0.56	0.35	0.40
.05	.01	.06	.05
0.50	0.57	0.41	0.35

ass n = .1

0.50
.57
.41
.35
4 | 183
0.46
.63 b sec ε.
1.09

Frod. 1327 is FAST

$0^m 1^s.09$

at $7^h 10^m$ S.T.

Mon Feb. 8, 1909

Mer Cir — Wole Obs.

γ Gemin +16°29′ (last 7 wires)
Rattle at $6^h 36^m$.
ε Gemin +25°13′ (9 wires, clds.)
ζ Gemin +13°0′
18 Monoc +2°31′
θ Gemin +34°4′
15 Lyncis +58°33′

+25°13′
38^m 3.339.0 2.3
6.236.0 2.2
12.729.3 2.0
17.025.2 2.2
27.7
9 |7
21.08

+13°0′
39^m 47.936.0
50.483.5 3.9
53.031.0 3.9
55.028.4 4.1
58.026.0 3.4
4.519.4 4.0
8.015.7 3.9
3.7
12.1
15 |140
11.93

2°31′ ~~+34°4′~~
42^m 44.431.2 5.6
47.029.0 6.0
49.526.6 6.1
52.024.2 6.2
54.321.7 6.0
0.915.4 6.3
4.411.8 6.2
8.0
15 |4
8.03

+58°33′
48^m 40.610.3 0.9
45.66.1 1.7
49.90.9 0.6
54.956.3 1.2
59.851.8 1.6
11.640.0 1.6
18.533.0 1.5
25.7
15 |98
25.65

$6^h 38^m 21^s.08$
20.44
0.64

$6^h 40^m 11^s.93$
11.31
0.62

$6^h 43^m 8^s.03$
7.38
~~48.01~~
0.65
~~.02~~

$6^h 49^m 25^s.65$
24.99
0.66

as
m=0

+34°4′
46^m 20.416.9
23.414.0 7.3
26.211.0 7.4
29.37.9 7.2
32.25.2 7.2
39.657.7 7.4
44.253.0 7.3
7.2
48.7
15 |97
48.65

$46^m 48^s.65$
48.01
.64

.64
.62
.65
.64
.66
5 |3.21
0.64
.636 sec δ.
1.27

Frod. 1327 is FAST
on
$0^m 1^s.27$
at $6^h 40^m$ S.T.

Times Feb. 14, 1909

Mer. Cir. Wells.

Ralte at 2h 54m.
ρ Persei + 38°29′
β Persei + 40°36′

+38°29′		+40°36′	
58m 49.7 49.7	9.4	1m 43.0 44.6	
53.0 46.5	9.5	46.3 41.4	7.6
56.2 43.5	9.7	49.5 38.0	7.7
59.6 40.4	0.0	52.7 35.0	7.5
2.5 ~~36.4~~ 37.0	9.5	56.0 31.7	7.7
10.2 29.3	9.5	4.0 23.7	7.7
14.9 24.4	9.3	8.7 18.6	7.7
	19.8		7.3
			14.0
	15 | 117		15 | 122
	19.78		13.81

$$\begin{array}{r} \& \; 2^h 59^m 19^s.78 \\ 19.47 \\ \hline 0.31 \end{array} \qquad \begin{array}{r} 3^h 02^m 13^s.81 \\ 13.62 \\ \hline 0.19 \end{array}$$

assu n = 0

$$\begin{array}{r} 0.25 \\ .636 \sec \\ \hline 0.88 \end{array}$$

Frod. 1327 is FAST

$0^m\ 0^s.88$

at $3^h 0^m$ S.T.

Sat Feb. 13, 1909

Zoe. Obs.

G.

Rattle at $3^h 50^m$

ε Persei + 39°45′ last 7 wires

ξ Persei + 35°32′ (last 8 wires)

ν Tauri + 5°44′ (last 10 wires)

c Persei + 47°28′ (1st 3, 11 - 13 wires)

#232 ν Orion + 14°47′

Rattles after $6^h 4^m$

η Gemini + 22°32′

ψ^1 Aurigae + 49°20′

+14°47		+22°32′		+49°20′	
1^m 58.7 47.0		8^m 58.0 48.6		17^m 17.7 30.0	
1.0 44.5	5.7	0.6 46.0	6.6	21.6 26.0	7.7
3.4 42.0	5.5	3.2 43.2	6.6	25.5 22.3	7.6
6.3 39.3	5.4	6.0 40.7	6.4	29.2 18.6	7.8
8.8 37.0	5.6	8.6 37.9	6.7	33.1 15.0	7.8
15.0 30.3	5.8	15.3 31.2	6.5	42.4 5.3	8.1
19.0 26.6	5.3	19.3 27.2	6.6	48.0 59.6	7.7
	5.6		6.5		7.6
	22.7		23.3		53.8
	15 | 116		15 | 41		15 | 131
	22.77		23.27		53.87

$6^h 2^m 22^s.77$ $6^h 9^m 23^s.27$ $6^h 17^m 53^s.87$

22.73 23.28 53.90

− 0.04 +.01 + 0.03

ass n = 1/15

.04 03 :02

+.00 +.04 +.01

+ 0.02

.63 b secc

0.61

Frod. 1327 is FAST

0^m $0^s.61$

at $6^h 10^m$ S.T.

Wed Feb. 17, 1909

Jewel Cir Wells.

~~Rattle~~ after $8^h 26^m$???

δ Cancri + 18°29'

ι " + 29°6'

ζ Hydrae + 6°18'

ι Urs Maj + 48°24'

+18°29'		+29°6'		+6°18'		+48°24'	
40^m 6.355.7	2.0	41^m 44.938.6	3.5	51^m 11.758.7	0.4	53^m 24.034.7	8.7
8.953.2	2.1	47.936.0	3.9	14.056.3	0.3	27.931.0	8.9
11.550.6	2.1	50.432.9	3.3	16.753.9	0.6	31.627.2	8.8
14.347.9	2.2	53.230.1	3.3	18.951.3	0.2	35.623.7	9.3
16.645.3	1.9	56.227.3	3.5	21.148.7	9.8	39.120.0	9.1
23.238.7	1.9	3.320.2	3.5	27.742.6	0.3	48.310.7	9.0
27.135.0	2.1	7.416.1	3.5	31.539.0	0.5	54.05.0	9.0
	31.1		11.7		35.1		59.7
	15 | 4		15 | 112		15 | 32		15 | 75
	31.03		11.75		35.21		59.50

ass m=.1

$8^h 40^m 31^s.03$	$8^h 42^m 11^s.75$	$8^h 51^m 35^s.21$	$8^h 53^m 59^s.50$
8 39 31.63	8 41 12.38	8 50 35.75	8 52 60.15
0.60	0.63	0.54	0.65
.06	.04	.08	.02
0.66	0.67	0.62	.63

0.66
.67
.62
.63
4 | .18
0.64
.636 wire
0.01

Frod. 1327 is SLOW

$0^m 0^s.01$

at $8^h 45^m$ S.T.

Thurs Feb. 18, 1909

Mer Cir Wlc Obs

Rattle at $4^h 21^m$

ε Tauri +18°59'

A m Persei +42°52'

α Tauri +16°20'

+18°59'		+42°52'		+16°20'	
22^m 52.0417	3.7	26^m 27.031.3	8.3	30^m 16.249	1.1
54.739.3	4.0	30.828.2	9.0	18.52.6	1.1
57.236.7	3.9	34.024.5	8 5	21.3010	1.3
59.934.2	4.1	37.321.2	8.6	24.137.2	1.3
2.631.2	3.8	40.717.7	8.4	26.654.7	1.3
9.024.7	3.7	48.79.3	8.0	33.048.3	1.3
13.2208	4.0	54.34.2	8.5	36.7445	1.2
	16.9		58.7		40.7
	15 | 141		15 | 179		15 | 93
	16.94		59.19		40.62

$4^h 23^m 16.^s94$	$4^h 26^m 59.^s19$	$4^h 30^m 40.^s62$
4 23 17.63	4 26 60.02	4 30 41.45
.69	0.81	.83
.06	.00	.06
.75	0.81	89

ass. m = .1

0.75
.81
.89
3 | 5
0.82
.63 b sec a
0.19

Frod. 1327 is SLOW

$0^m\ 0.^s19$

at $4^h 26^m$ S.T.

Sat Feb. 20, 1909

Mer Cir Wells Obs.

Rattle after $6^h 13^m$

μ Gemin +22°34'

8 Monoc + 4°38' (missed 1st wire)

10 Monoc − 4°42'

8 Lyncis +61°34'

51 Aurigae +39°28'

+22°34'		+4°38'		−4°42'		+61°34'		+39°28'	
17m 1.352.0	3.3	18m − 19.8		23m 4.051.0	5.0	28m 33.011.3	4.3	31m 50.351.2	1.5
4.049.3	3.3	34.917.0	1.9	6.348.6	4.9	38.46.5	4.9	53.548.0	1.5
6.746.8	3.5	37.614.5	2.1	8.846.2	5.0	43.61.1	4.7	56.844.8	1.6
9.344.0	3.3	40.112.3	2.4	11.343.7	5.0	48.856.1	4.9	0.041.4	1.4
12.241.3	3.5	42.79.8	2.5	14.041.0	5.0	54.051.2	5.2	3.038.4	1.4
18.734.7	3.4	48.83.7	2.5	20.235.0	5.2	7.438.1	5.5	11.330.3	1.6
22.530.6	3.1	52.30.0	2.3	23.831.1	4.9	14.730.4	5.1	16.025.8	1.8
	26.7		56.2		27.4		22.5		20.8
	15 |101		13 |19		15 |74		16 |71		15 |116
	26.67		56.15		27.49		22.47		20.77

$6^h 17^m 26^s.67$	$6^h 18^m 56.15$	$6^h 23^m 27.49$	$6^h 29^m 22^s.47$	$6^h 32^m 20^s.77$
27.50	56.95	28.20	23.28	0.56
0.83	0.80	0.71	0.81	0.79

μ = 0

$$\begin{array}{r} 0.83 \\ .80 \\ .71 \\ .81 \\ .79 \\ \hline 5\ \underline{|3.94} \\ 0.79 \\ \underline{.63\ b\sec\delta} \\ 0.16 \end{array}$$

Frod. 1327 is SLOW

$0^m\ 0^s.16$

at $6^h 25^m$ S.T.

Mon Feb. 2$\overset{3}{2}$, 1909

Collimation

S. Coll. on N. Coll.	Tel. on ~~N~~ S Coll.	no colls. Tel. on N. Coll.
22.5	33.~~4~~482	33.813
23.1	.512	.820
23.1	.462	.817
24.9	.477	.827
23.1	.438	.833
24.8	.482	.839 ~~.8?8~~
23.7	.521	.8~~4~~28
23.2	.438	.828
24.3	.522	.829
23.6	.461	.838
23.63	33.4795 ~~48~~	33.8232

Set at 23.6

33.4795
33.8232
2)673027
33.6514
.012 aberration
663

Micrometer found at 33.548
〃 set at → 33.~~67~~ 663

Finished
2:10 PM

Mon Feb. 22, 1909.

Level. ~~[illegible]~~ Wells,

Telescope South.

Level	W End	E End		
~~W~~ E	+ 104.1 ~~105.2~~	+60.0	+ 164.1	+18.2
~~E~~W	∓ 50.9	∓ 95.0	∓ 145.9	
~~W~~E	+ 104.2	+60.1	+ 164.3	
W	− 49.6	−93.8	− 142.4	+ 21.9

Telescope North.

W	∓ ~~+~~ 23.2	− 66.0	− 89.2	
E	+ 86.0	+ 43.1	+ 129.1	+ 39.9
W	− 23.0	− 66.0	− 89.0	
E	+ 86.0	+ 43.0	+ 129.0	+ 40.0

16) 120,0 (7.5
112
80

7.5
.06
.450 b
1.35
675
540
.60.75

φ

φ

b sec. φ = 0.61 west end high

b sec.

Mon Feb 22, 1909

[illegible]

Rattle at $8^h 38^m$
ι Cancri +29°6' (3 cal wires)
ζ Hydrae +6°18'
c Urs maj +48°24'

+6°18'			+48°24'		
~~48~~^{m} 50	11.2 58.1	9.3	52^m	23.8 34.3	8.1
	13.7 59.7	9.4		27.7 30.3	8.0
	16.2 53.3	9.5		31.0 26.9	7.9
	18.9 50.9	9.8		34.7 23.7	8.4
	21.0 48.3	9.3		38.9 19.7	8.6
	27.2 42.1	9.3		47.7 10.2	8.9
	31.0 38.5	9.5		53.4 5.0	8.4
		34.6			59.3
		15 | 107			15 | 26
		34.71			59.17

$8^h\ \overset{50}{\cancel{48}}{}^m\ 34.^s71$
35.74
1.03 ✗

$8^h\ 52^m\ 59.^s17$
60.14
✗ 0.97

1.00
.61 brace
0.39

Frod. 1327 is SLOW

$0^m\ 0.^s39$

at $8^h\ 50^m$ S.T.

Times Feb. 25, 1909

Mer Cir [illegible]

Rattle at $4^h 10^m$

A [γ Tauri] +15°25′

δ Tauri +17°20′

ε Tauri +18°59′

+15°25′		+17°20′		+18°59′	
14^m 10.759.3	0.0	17^m 14.93.8	8.7	22^m 51.441.0	2.4
13.356.9	0.2	17.31.3	8.6	54.238.5	2.7
15.854.2	0.0	20.058.7	8.7	56.9~~38.1~~35.9	2.8
18.351.7	0.0	22.556.1	8.6	59.4~~33.9~~33.2	2.6
21.049.0	0.0	25.153.4	8.5	1.930.5	2.4
27.242.7	9.9	31.847.2	9.0	8.424.1	2.5
31.339.0	0.3	35.543.3	8.8	12.320.2	2.5
	35.1		39.3		16.3
	15|05		15|52		15|42
	35.03		39.35		16.28

$4^h 14^m 35^s.03$	$4^h 17^m 39^s.35$	$4^h 23^m 16^s.28$
14 36.18	17 40.51	23 17.51
1.15	1.16	1.23

ass u = 0

1.15
.16
.23
3|54
1.18
.61 b sece
0.57

Frod. 1327 is SLOW

$0^m 0^s.57$

at $4^h 20^m$ S.T.

Mon Mar 1, 1909

Fine Air. Wh. Obs.

Rattle at $7^h 13^m$

ι Gem +27°59'

ρ Gemin +31°58'

α Gemin +32°5'

9 +27°59'

18^m	37.1 30.0	7.1
	40.0 27.3	7.3
	43 02 4.4	7.4
	45.7 21.7	7.4
	48.4 19.0	7.4
	55.1 12.0	7.1
	59.2 8.1	7.3
		3.7
		15⌊97
		3.65

+31°58'

22^m	47.1 42.4	
	49.8 39.4	9.5
	52.9 36.5	9.2
	55.9 33.8	9.4
	58.7 30.8	9.7
	6.0 23.5	9.5
	10.2 19.0	9.5
		9.2
		14.5
		15⌊105
		14.70

+32°5'

28^m	19.0 14.0	3.0
	22.0 11.7	3.7
	25.0 8.5	3.5
	27.9 5.8	3.7
	30.7 3.0	3.7
	38.0 55.6	3.6
	42.3 51.2	3.5
		46.9
		15⌊116
		46.77

7^h ~~19~~ 20 ^{m} $3^s.65$

7 20 4.97

1.32

$7^h 23^m 14^s.70$

16.02

1.32

$7^h 28^m 46^s.77$

48.05

1.28

asam = 0

1.32

.32

.28

3⌊92

1.31

.61 bracke.

.70

Frod. 1327 is SLOW

$0^m\ 0^s.70$

at $7^h 25^m$ S. T.

Obns Mar-2, 1909

Tran Cir — Wells Obs.

α Tauri +16° 20'

Ratto ~~at~~ $4^h 32^m$

+16° 20'

30^m	15-34.1	9.4
	18-01.7	9.7
	20·759.0	9.7
	23·256.4	9.6
	25·654.0	9.6
	32·047.5	9.5
	36·043.6	9.6

39.7

15 | 118

39.79

4^h 30^m $39^s.79$

4 30 41.24

a so n = 0

1.45

.61 b sec a

0.84

Frod. 1327 is SLOW

0^m $0^s.84$

at $4^h 30^m$ S.T.

Fri Mar 5, 1909

Meri Cir Wells

Rattle at $7^h 14^m$

ι Gemin +27°59'

ρ Gemin +31°59'

α Gemin +32°5' ~~[mean place of dbl observed]~~

25 Monoc −3°54'

24 Lyncis +58°55'

+27°59'		+31°59'		+32°5'		−3°54'		+58°55'	
19^m 37.030.1	7.1	22^m 47.042.2	9.2	28^m 19.014.4	3.4	32^m 21.07.9	8.9	34^m 32.63.6	6.2
39.827.4	7.2	50.039.5	9.5	22.011.7	3.7	23.25.3	8.5	37.658.8	6.4
42.7246	7.3	52.936.5	9.4	25.08.7	3.7	26.93.0	8.9	42.254.0	6.2
45.3218	7.1	— 33.4	—	28.05.9	3.9	28.30.3	8.6	47.249.3	6.5
48.1189	7.0	58.630.7	9.3	30.82.9	3.7	31.057.9	8.7	51.944.6	6.5
55.412.0	7.4	5.923.3	9.2	38.055.5	3.5	36.951.7	8.6	3.732.5	6.2
59.67.9	7.5	10.219.0	9.2	42.451.2	3.6	40.748.0	8.7	11.025.3	6.3
	3.7		14.6		46.7		44.5		18.3
	15)93		13)84		15)122		15)56		15)26
	3.62		14.65		46.81		44.37		18.17

$7^h 20^m 3^s.62$	$7^h 23^m 14^s.65$	~~$7^h 28^m 46^s.81$~~	$7^h 32^m 44^s.37$	$7^h 35^m 18^s.17$
4.91	15.96	~~47.99~~	45.61	19.70
1.29	1.31	~~1.18~~	1.24	1.53
.06	.05	.05	.16	.12
1.35	1.36	1.23	1.40	1.41

1.66
.07
1.23

1.53
1.24
).29(.16
173
1170

m = .16

assm = 1/6

1.41
.40
.23
.36
.35
5)175
1.35
.61 b sec δ
0.74

Frod. 1327 is SLOW

$0^m 0^s.74$

at $7^h 28^m$ S.T.

Sat Mar 6, 1909.

[illegible] [illegible]

Rattle at 9h 47m.

ξ Hyd. +6° 18'

i Urs. Maj + 48° 24'

10 Urs Maj + 42° 09' (last 10 wires)

4 Urs. Maj + 47° 31'

+6° 18'
50m 10.9 58.0 8.9
13.1 55.7 8.8
15.7 53.2 8.9
18.3 50.6 8.9
20.8 48.2 9.0
27.0 42.0 9.0
31.0 38.2 9.2
34.6
15 ⟌74
34.49

+48° 24'
52m 23.3 34.3 7.6
27.0 30.3 7.3
30.7 26.4 7.3
34.2 22.7 6.9
38.2 19.3 7.5
47.3 10.0 7.3
53.0 4.1 7.1
58.4
15 ⟌94
58.63

+42° 09'
54m 33.6 2.1
38.7 5.3
43.7 8.8
48.7 12.1
53.4 15.3
5 ⟌218 1 5 ⟌43 6
43.62 8.72
24.98
43.82
43.72

+47° 31
56m 50.0 59.2 9.2
53.8 56.0 9.8
57.4 52.1 9.5
1.0 48.3 9.3
4.6 44.8 9.4
13.7 35.7 9.4
19.7 30.1 9.8
24.7
15 ⟌1[illegible]1
24.74

8h 50m 34s.49	8h 52m 58s.63	8h 54m 43s.72	8h 57m 24s.74
35.69	60.06	45.20	26.18
1.20	1.43	1.48	1.44
.13	.04	.00	.03
1.33	1.39	1.48	1.41

ass n = 1/6

1.33
.39
.41
.48
4 ⟌1.61
1.40
.61 [illegible]
0.79

Frod. 1327 is SLOW

0m 0s.79

at 8h 56m S.T.

Mon Mar. 8, 1909

Mer Cir

Wells Obs
& Cottrell Obs

Rattle at 4h 49m

η Auriga +41° 7'
β Erid -5° 12' (last 8 wires)
α Aurig. +45°54 (last wires)
t Orion -6° 57 (about 8 wires)
β Tauri +28° 32'

+41° 07'
0m 34.2 36.3 0.5
37.4 33.3 0.7
40.8 30.0 0.8
44.0 26.7 0.7
47.3 23.6 0.9
55.7 15.2 0.9
0.3 10.3 0.6
5.3
15 | 54
5.36

+45° 54'
09m 44.3 14.9
49.9 18.1
55.0 21.9
0.3 25.4
6.1 28.8
5 | 2754 5 | 1091
55.08 21.82
26.53
55.19

+28° 32'
20m 3.2 56.5 9.7
6.2 53.9 0.1
8.9 51.0 9.9
11.7 48.2 9.9
14.4 45.6 0.0
21.4 38.5 9.9
25.7 34.2 9.9
30.0
15 | 14.4
29.96

5h 01m 5s.36
7.20
1.84
.00
1.84

5h 09m 55.14
57.25
2.11
.02
2.13

5h 20m 29s.96
31.86
1.90
.06
1.84

assum = 46

1.84
.61 b sec ρ
1.23

Frod. 1327 is SLOW

0m & 1s.23

at 5h 10m S.T.

Thurs Mar 11, 1909

Am Cir McCollos

Rattle at 4h 59m

α Aurigae +45° 54'

β Tauri +28°32

+45°54'

9m 21.028.3 9.3
24.724.9 9.6
28.221.2 9.4
31.717.8 9.5
35.314.3 9.6
44.15.4 9.5
49.30.0 9.3
54.8
15|110
54.73

5h 09m 54s.73
5 09 57.18
2.45
.01
2.44

use m = .1

+28°32'

20m 2.756.1 8.7
5.653.3 8.9
8.350.5 8.8
11.047.7 8.7
14.044.7 8.7
21.037.9 8.9
25.238.4 8.6
29.3
15|56
29.37

5h 20m 29s.37
20 31.80
2.43
.04
2.47

2.44
.47
2.46
.61 Bruce
1.85

Frod. 1327 is SLOW

0m 1s.85

at 5h 15m S.T.

Fri Mar 12th, 1909

Mer Cir   Wolc Obs

Rattle at $5^h 08^m$

α Aurigae +45°54'

β Tauri +28°31'

+45°54'			+28°31'	
9^m 20.7 27.9	8.6		20^m 2.3 55.9	8.2
24.2 24.7	8.9		5.2 53.0	8.2
27.9 20.9	8.8		8.0 50.2	8.2
31.3 17.7	9.0		10.8 47.2	8.0
34.9 14.1	9.0		13.6 44.6	8.2
43.9 5.0	8.9		20.7 37.4	8.1
49.2 59.9	9.1		24.8 33.3	8.1
	54.5			29.1
	15 | 68			15 | 11
	54.45			29.07

$5^h 9^m 54^s.45$ $5^h 20^m 29^s.07$

57.16   31.78

2.71   2.71

azm = 0

2.71
.61
2.10

Frod. 1327 is SLOW

$0^m 2^s.10$

at $5^h 15^m$ S.T.

☽ Mon Mar 15, 1909

Ques Ci Wells

Rattle at 7h 32m

24 Lyncis +58° 55′ (last 9 wires)

β Gemin +28° 15′

π Gemin +33° 38′

0.2608
.2821
0.5479

.76
150
9|226|25

+58°55′

35m	–	42.6
	– 9.3	47.4
	– 16.0	52.0
	– 23.0	57.0
	30.6	1.3
	~~15~~ 4|789	5|260.3
	19.72	52.06
	3.53	36.76
	16.19	16.30

+28°15′

39m	15.78.7	4.4
	18.26.0	4.2
	21.03.3	4.3
	23.70.3	4.0
	26.457.3	3.7
	33.350.5	3.8
	37.946.2	4.1
		42.0
		15|05
		42.03

+33°38′

41m	7.83.6	1.4
	10.80.9	1.7
	13.657.7	1.8
	16.455.0	1.4
	19.052.0	1.0
	26.744.5	1.2
	31.340.2	1.5
		35.7
		15|102
		35.68

7h 35m 16s.25
19.43
3.18

7h 39m 42s.03
45.23
3.20

7h 41m 35s.68
38.81
3.13

a20 n = 0

3.18
.20
.13
3|51
3.17
.61 bruce
2.56

Frod. 1327 is SLOW

0m 2s.56

at 7h 40m S.T.

Tues Mar. 16, 1909

Mer Cir Wh Obs

Rattle at $5^h\,03^m$

α Aurigae +45°54'

β Tauri +28°32' (2nd tap on 11th wire is correct)

+45°54'		+28°32'			
9^m 20.0 27.2	7.2	20^m 1.7 56.1	7.8	1.7 55.1	6.8
23.7 24.0	7.7	~~5.4 53.3~~	~~8.7~~	4.4 52.3	6.7
27.2 20.3	7.5	~~8.3 50.6~~	~~8.9~~	7.3 49.6	6.9
30.7 16.9	7.6	~~11.2 47.8~~	~~9.0~~	10.2 46.8	7.0
34.0 13.1	7.1	~~13.8 44.9~~	~~8.7~~	12.8 43.9	6.7
43.0 4.4	7.4	~~20.8 37.8~~	~~8.6~~	19.8 36.8	6.6
48.2 59.1	7.3	25.0 33.8	8.8	24.0 32.7	6.7
	53.7		29.6.		28.6
	15 | 105				15 | 60
	53.70				28.40

$5^h\ 09^m\ 53^s.70$

57.06

3.36

.01

3.35

$5^h\ 20^m\ 28^s.40$

31.70

3.30

azm = 0

3.33

.61 b suce

2.72

Frod. 1327 is SLOW

$0^m\ 2^s.72$

at $5^h\ 15^m$ S.T.

7
Wed Mar. 1~~6~~, 1909

Amer. Cir   Wheeler

Rattle at 5h07m
α Aurigae +45°54'
β Tauri +28°32'

+45°54'

9m 19.927.1	7.0
23.5238	7.3
27.020.1	7.1
30.416.7	7.1
34.213.1	7.3
43.04.2	7.2
48.259.0	7.2
	~~4~~53.6
	15 ⌊88
	53.59

5h 09m 53.59s
57.03
3.44
.01
3.43

+28°32'

20m 1.754.8	6.5
4.652.1	6.7
7.149.4	6.5
10.146.5	6.6
12.743.7	6.4
19.736.8	6.5
24.232.7	6.9
	28.3
	15 ⌊44
	28.29

5h 20m 28.29s
31.67
3.38
.04
3.42

Cos m = .1

3.42
.61 Breece
2.81

Frod. 1327 is SLOW

0m 2.81s

at 5h 15m. S.T.

Thurs March 18, 1909

Mer Cir Wm Obs

α Leonis + 12° 25'
Rabble at 10h 06m
λ Urs. Maj + 43° 22'
μ Urs. Maj + 41° 57' (last 7 wires)
31 Leo. Min +37° 10'
36 Urs. Maj + 56° 27'

+12° 25'
3m 5.053.0
7.450.6 8.0
9.848.0 8.0
12.645.2 7.8
15.043.0 7.8
21.336.7 8.0
25.132.7 8.0
7 8
29.1
15 | 145
28.97

+43° 22'
11m 2.36.7 9.0
5.93.3 9.2
9.00.1 9.1
12.556.8 9.3
16.053.2 9.2
24.544.8 9.3
29.539.7 9.2
34.7
15 | 90
34.60

+37° 10'
22m 5.94.5 0.4
9.01.7 0.7
12.058.4 0.4
15.055.3 0.3
18.052.4 0.4
25.744.7 0.4
30.540.0 0.5
35.3
15 | 34
35.23

+56° 27'
24m 4.329.2 3.5
8.925.0 3.9
13.326.4 3.7
18.015.8 3.8
22.311.2 3.5
33.7 0.5 4.2
40.253.5 3.7
47.0
15 | 133
46.89

10h 03m 28s.97	10h 11m 34s.60	10h 22m 35s.23	10h 24m 46s.89
32.40	38.04	38.66	50.45
3.43	3.44	3.43	3.56
.07	.00	.02	.06
3.50	3.44	3.45	3.50

1.51 3.56
.22 3.43
1.29) .13

n = .1

3.50
.44
.45
.50
4 | 189
3.47
.61 sec a
2.86

Trod. 1327 is SLOW

0m 2s.86

at 10h 15m S. T.

Sat Mar 20, 1909

Mer Cir Wolcott.

Rattle at $8^h 24^m$

Gr 1450 +38° 20′ (missed 1st wire)

A δ Hydrae +6° 1′

A σ Hydrae +3° 40′

A ι Cancri +21° 48′

+38°20′		+6°1′		+3°40′		+21°48′	
26^m 30.7 24.1 (−27.4)	—	32^m 23.8 11.0	4.8	33^m 33.7 20.6	4.3	37^m 33.0 23.7	6.7
33.9 21.0	4.8	26.2 8.6	4.8	36.1 18.0	4.1	35.6 21.0	6.6
36.9 17.8	4.9	28.7 6.2	4.9	38.4 15.7	4.1	38.3 18.3	6.6
39.8 14.6	4.7	31.1 3.5	4.6	41.0 13.2	4.2	41.2 15.6	6.8
48.0 6.7	4.4	33.8 1.0	4.8	43.4 10.7	4.1	43.9 13.0	6.9
52.7 2.0	4.7	39.9 55.0	4.9	49.9 4.6	4.5	50.4 6.3	6.7
	4.7	43.9 51.1	5.0	53.3 0.7	4.0	54.3 2.3	6.6
	57.6		47.3		57.2		58.3
	13 | 48		15 | 61		15 | 15		15 | 52
	57.37		47.41		57.10		58.35

$8^h 26^m 57^s.37$	$8^h 32^m 47^s.41$	$8^h 33^m 57^s.10$	$8^h 37^m 58^s.35$
60.82	50.81	60.55	1.82
3.45	3.40	3.45	3.47
.01	.08	.09	.05
3.46	3.48	3.54	3.52

a sec. m = 0

3.45
.40
.45
.47
4 | 177
3.44
.61 b sec a
2.83

3.46
48
54
52
200
3.50
61
289

Frod. 1327 is SLOW

$0^m 2^s.83$

at $8^h 30^m$ S. T.

Mon. Mar 22, 1909

Mer Cir Wells.

Rattle at 8h 24m

A δ Hydrae +6°1'

A σ Hydrae +3°40' (missed 1st wire)

A γ Cancri +21°48'

ι Cancri +29°6'

+6°1'		+3°40'		+21°48'		+29°6'	
		20.0					
32m 23.4 10.4	3.8	33m 35.7 17.9	3.6	37m 32.7 23.3	6.0	40m 41.3 35.0	6.3
26.1 8.1	4.2	38.4 15.3	3.7	35.3 20.7	6.0	44.3 32.3	6.6
28.3 5.7	4.0	40.8 12.9	3.7	37.9 18.0	5.9	47.0 29.6	6.6
31.2 3.3	4.5	43.3 10.4	3.7	40.4 15.4	5.8	50.0 26.8	6.8
33.3 0.7	4.0	49.3 4.1	3.4	43.3 12.7	6.0	53.0 23.8	6.8
39.7 54.4	4.1	53.2 0.6	3.8	58.0 6.0	6.0	59.8 16.9	6.7
43.1 50.7	3.8		56.9	~~57.7~~ 2.0	6.1	4.3 12.7	8.0
	47.0		13 | 108	54.1	~~2.0~~		8.6
	15 | 04		56.83		57.7		15 | 54
	47.03				15 | 145		8.36
					57.97		

8h 32m 47s.03	8h 33m 56s.83	8h 37m 57s.97	8h 41m 8s.36
50.79	60.53	1.80	12.16
3.76	3.70	3.83	3.80
.08	.09	.05	.04
3.84	3.79	3.88	3.84

azon = ϕ

~~3.76~~
~~3.70~~
~~3.83~~
~~3.80~~
4 | 309
3.77

3.84
.79
.88
.84
4 | 335
3.84
.61 [illegible]
3.23

Frod. 1327 is SLOW

0m 3s.23

at 8h 35m S.T.

Tues Mar 23, 1909

Mer Cir — Wh Obs.

i Cancri +29°6'

Rattle at $8^h 45^m$

i Ursae Maj +48°24' ($\overset{11}{8}$ wires)

10 Ursae " +42°9' (13 wires)

κ Ursae " +47°31'

+29°6'		+48°24'		+42°9'		+47°31'	
40^m 41.334.8	6.1	52^m = =		54^m — $\overset{12.3}{12.69.2}$	—	56^m 46.956.3	
44.031.8	5.8	27.7234		16.05.9	1.8	50.852.9	3.2
46.929.2	6.1	31.719.7	1.1	19.22.4	1.9	54.349.2	3.7
49.726.4	6.1	35.216.0	1.4	22.389.1	1.6	58.045.5	3.5
52.4235	5.9	44.66.7	1.2	30.750.8	1.4	1.741.9	3.5
59.616.4	6.0	50.21.1	1.3	36.045.9	1.5	11.032.7	3.6
3.812.3	6.1		1.3		1.9	16.327.2	3.7
	8.0		55.7		41.1		3.5
	15)01		13)70		13)112		21.9
	8.01		55.54		40.86		15)116
							21.77

$8^h 41^m 8^s.01$	$8^h 52^m 55^s.54$	$8^h 54^m 40^s.86$	$8^h 57^m 21^s.77$
12.11	59.81	44.98	25.95
4.10	4.27	4.$\overset{12}{\cancel{08}}$	4.18
.04	.02	.00	.02
4.14	4.25	4.12	4.16

ass. m=.1

4.14
.25
.12
.16
4)67
4.17
.61
3.56

Frod. 1327 is SLOW

$0^m 3^s.56$

at $8^h 50^m$ S.T.

Wed ~~Thurs~~ Mar 24, 1909

Mer Cir

Cole Obs.

x Gemini +24° 37'
β Gemini +28° 15' (last 8 wires)
π Gemini +33° 38'
Rattle at $7^h 43^m$

+24° 37'
38^m 27.4 18.9 6.3
30.2 16.3 6.5
32.9 13.6 6.5
35.7 10.8 6.5
38.4 8.2 6.6
45.0 1.3 6.3
49.2 57.2 6.4
53.0
15 | 31
53.21

$7^h 38^m 53^s.21$
57.46
4.25
.105
4.20

+28° 15'
39^m = 56.3
41.2 59.0
45.2 1.9
49.5 4.7
7.5
3 | 135 9
45.30
4.16
41.14
40.93
107
40.03
5 | 9.4
1.88
20.95
40.93
~~4.17~~
.6

$7^h 39^m 40.93$
45.08
(4.05)
.04
4.11

+33° 38'
41^m 6.4 2.7 9.1
9.4 59.7 9.1
12.3 56.7 9.0
15.3 53.7 9.0
18.2 50.8 9.0
25.7 43.4 9.1
30.0 39.0 9.0
34.5
15 | 78
34.52

$7^h 41^m 34^s.52$
38.66
4.14
.02
4.12

0.5654
.0551
0.6205

assu = .1

4.20 × 3 – .60
.11 × 1 .11
.12 × 3 36
7 | 107
4.15
.61 b secu
3.54

Frod. 1327 is SLOW

$0^m 3^s.54$

at $7^h 40^m$ S.T.

Fri Mar 26, 1909.

Trans Cir — Tele Obs.

ι Ursae Maj +48°24' (17 wires)
10 Ursae Maj +42° 9'
κ Ursae Maj +47°31'
Rattle at $9^h 0^m$.

o^2 Ursae Maj +67°30' (last 11 wires) Catterall Obs.
[36 Lyncis] +43°36' " "

+48°24'
52^m = =
27.6 ~~44~~ 23.3 0.9
31.4 ~~44~~ 19.7 1.1
35.1 ~~44~~ 16.0 1.1
44.3 ~~55~~ 56.4 0.7
49.9 1.1 ~~1.1~~ 1.0
55.5
11 | 53
55.48

+42°9'
54^m 9.0 12.3 1.3
12.4 9.1 1.6
16.0 5.7 1.7
19.0 2.3 1.3
22.3 59.0 1.3
30.8 50.6 1.4
35.7 45.7 1.4
40.9
15 | 108
40.72

+47°31'
56^m 46.9 56.3 3.2
50.7 52.4 3.1
54.3 49.0 3.3
58.2 45.3 3.5
1.7 41.6 3.3
10.7 32.7 3.4
16.3 27.0 3.3
21.7
15 | 98
21.65

+43°36'
7^m 14.8 20.3 5.1
18.4 17.0 5.4
22.1 13.4 5.5
25.9 10.0 5.9
29.0 6.5 5.5
37.5 57.8 5.3
43.2 52.9 6.1
48.0
15 | 118
47.79

assu = .1

$8^h 52^m 55.48$ — $8^h 54^m 40^s.72$ — $8^h 57^m 21^s.66$ — $9^h 7^m 47^s.79$

59.76 — 44.92 — 25.90

4.28 — 4.20 — 4.25
.02 — .00 — .02
4.26 — 4.20 — 4.23

13.61 × 1.613 = 36.28

1.1338
~~.4359~~
~~1.5697~~
.4172
1.5510

1.2662
.4172
1.6834

+67°30'
= 2^m 1.1 56.5
= 12.0 3.1
1^m46.0 21.2 8.7
~~35.56~~ 30.7 15.3
~~22.28~~ 41.0 21.6
21.56
5 | 1060 5 | 452
21.20 9.04
20.81 48.23
2 | 42.01 20.81
21.00

$9^h 02^m 21^s.00$
25.73
4.73
.15
4.58

4.23
.61 b sec ι
3.62

Frod. 1327 is SLOW

$0^m 3^s.62$
at $8^h 55^m$ S. T.

Sat. March 27, 1909

Collimation — 20 in. Obs.

S Coll. on N. Coll. — Micrometer found at 33.662

S Coll. on N. Coll.	Tel. on S. Coll.	Tel. on N. Coll.
51.8		
52.4	33.826	33.~~702~~ 431
53.0	.844	.442
53.4	.844	.417
54.2	.841	.425
54.1	.866	.418
52.8	.851	.440
54.9	.812	.433
52.8	.831	.403
53.4	.831	.428
53.28	.842	.411
Set at 53.3	33.8388	33.4248

33.4248
33.8388
2 | 67.2636
33.632~~8~~
.012 aberration
33.644

Micrometer set at 33.644

Sat Mar 27, 1909

Level. Willson

Telescope South

Zero	~~E~~ W End	~~W~~ E End.		
W	− 25.0	− 67.0	−92.0	
E	+ 75.0	+ 33.0	+108.0	+16.0
W	−22.0	− 64.0	−86.0	
E	+75.25	+ $33.\overset{5}{0}$	109.0	+23.0

Telescope North.

W	− 4.5	−46.5	− 51.0	
E	+69.0	+27.0	+96.0	+45.0
W	−6.0	−48.0	−54.0	
E	+68.0	+26.0	+94.0	+40.0

$16 \,)\, 124.0$
~~8.0~~

secant.

16) 124.0 (7.75
112
120
112
80

$0.^s06$

7.75
.06
.4650 = b
1.35~~4~~ sec a
2325
1395
465
0.62775

$b \sec a = 0^s.63$ west end high.

Mon. Mar. 29, 1909

Mer Cir [illegible]

Rattle at 8h 44m

ζ Hydrae +6°18'
i Ursae Maj +48°24'
10 Ursae Maj +42°09'
κ Ursae Maj +47°31'
δ² Ursae Maj +67°30' (middle wires)

+6°18'		+48°24'		+42°09'		+47°31'		+67°30'	
50m 8.2 54.9	3.1	52m 20.7 31.0	1.7	54m 9.9 12.6	2.5	56m 47.1 56.7	3.8	☰	
10.5 62.7	3.2	24.3 27.3	1.6	12.7 9.3	20	51.0 52.8	3.8	1m 40.0 3.7	3.7
13.0 50.0	3.0	27.8 23.7	1.5	16.0 5.7	1.7	54.4 49.3	3.7	46.3 57.0	3.3
15.3 47.6	2.9	31.6 19.7	1.3	19.1 2.6	1.7	58.2 45.4	3.6	2.3 40.9	3.2
17.9 45.1	3.0	35.3 16.2	1.5	22.7 59.1	1.8	2.2 42.0	4.2	12.0 31.2	3.2
24.0 39.0	3.0	45.0 7.0	2.0	31.0 51.0	2.0	10.9 32.8	3.7		21.5
27.8 35.0	2.8	50.4 1.3	1.7	36.0 46.0	2.0	16.4 27.4	3.8		
	31.7		56.3		41.0		22.0		
	15 ⌊77		15 ⌊136		15 ⌊147		15 ⌊136		9 ⌊59
	31.51		55.91		40.98		21.91		21.66

8h 50m 31.51s 8h 52m 55.91s 8h 54m 40.98s 8h 57m 21.91s 9h 02m 21.66

	35.46	59.70	44.87	25.85	25.62
n = 0	3.95	3.79	3.89	3.94	3.96

3.95
.79
.89
.94
.96
5 ⌊453
3.91
.63 breck
3.28

Frod. 1327 is SLOW

0m 3.28s

at 8h 57m S.T.

Wed. Mar. 31, 1909

Amer Cir Wolb Obs.

Rattle at $8^h 0^m$

27 Lyncis +51°46' (missed 1st 4 wires)

A ζ Cancri +17°55' double star wrong position obs. (?)

β Cancri +9°28'

+51°46'

1 4^m = =
= =
= =
11.7 55.4 7.1
22.1 45.6 7.7
27.7 39.5 7.2
33.7
7 | 47
33.67

+17°55'

6^m 31.7 21.0 2.7
34.2 18.6 2.8
36.9 15.8 2.7
39.6 13.3 2.9
42.0 10.7 2.7
~~52.3~~
~~56.44.~~2
~~0.1~~
48.5 4.2 2.7
52.3 0.1 2.4
56.4
15 | 53
56.35

+9°28'

11^m 7.7 55.0 2.7
10.2 52.7 2.9
12.6 50.0 2.6
15.3 47.7 3.0
17.6 45.1 2.7
23.9 39.0 2.9
27.7 35.0 2.7
31.3
15 | 48
31.32

$8^h 04^m 33^s.67$
37.35
3.68

$8^h 06^m 56.35$ (?)
59.83
3.48 -

$8^h 11^m 31^s.32$
35.05
~~.67~~
3.73

assu = 0

3.68
.73
3.70
.63
3.07

Frod. 1327 is SLOW

$0^m 3^s.07$

at $8^h 05^m$ S.T.

Illinois. April 1, 1909

Mer Cir

Cole Obs

Rattle at 6h 30m.

γ Gemin +16°29'

ε Gemin +25°13'

α Can Maj −16°35'

+16°29'

31m 58.7 47.5 6.2
1.4 45.1 6.5
4.0 42.3 6.3
6.4 39.9 6.3
8.8 37.4 6.2
15.5 31.0 6.5
19.5 27.1 6.6
23.1
15 | 278
23.18

+25°13'

37m 50.2 41.8 2.0
52.8 39.0 1.8
55.6 36.4 2.0
58.3 33.7 2.0
0.9 31.0 1.9
8.0 24.0 2.0
11.7 20.0 1.7
15.9
15 | 143
15.95

−16°35'

40m 39.6 28.6 8.2
42.1 25.8 7.9
44.7 23.3 8.0
47.3 20.7 8.0
50.0 18.1 8.1
56.3 11.9 8.2
0.3 7.8 8.1
4.0
15 | 45
4.03

6h 32m 23s.18
26.90
3.72
.036
3.696

ass m = 1/70

6h 38m 15s.95
19.65
3.70
.074
3.686

6h 41m 4s.03
7.84
3.81
12
~~.06~~
~~3.75~~
3.69

3.66
.66
.69
3.67
.63 b sec δ
3.04

Frod. 1327 is SLOW

0m 3s.04

at 6h 40m. S.T.

Mon. Apr. 5, 1909

Lower Cir. Wells.

Rattle at 8h 44m.
ζ Hydrae +6°18'
ι Ursae Maj. + 48°24'
10 Ursa Maj + 42°09' (missed (at 3 wires)
κ Ursae Maj. +47°31' (Signals stopped during part of meridian passage)

o² Ursae maj +67°30'

+6°18'
50m 7.454.7
9.952.1 2.1
12.549.7 2.0
14.747.3 2.2
17.344.8 2.0
23.338.5 2.1
27.234.9 1.8
2.0
31.1
15|03
31.02

+48°24'
52m 19.830.4 0.2
23.727.0 0.7
27.323.0 0.3
31.119.3 0.4
34.715.7 0.4
44.16.4 0.5
49.70.7 0.4
55.4
15|33
55.22

+42°09'
54m 19.0 2.2
22.358.9 1.2
30.750.5 1.2
35.645.3 1.2
0.9
40.4
9|49
40.54

+67°30
01m 19.822.0 1.8
26.246.4 2.6
32.49.3 1.7
39.02.6 1.6
45.456.7 2.1
1.740.1 1.8
10.830.7 1.5
21.0
15|141
20.94

8h 50m 31s.02 8h 52m 55s.22 8h 54m 40s.54 9h 02m 20s.94

35.36 59.54 44.74 25.34

4.34 4.32 4.20 4.40

m = 0

4.34
.32
.20
.40
4|126
4.32
.63 b sec
3.69

Frod. 1327 is SLOW

0m 3s.69

at 9h 0m S.T.

Wednesday Apr. 7, 1909

Aver Ci Wo. li. Cllbs

Rattle at $12^h 59^m$.

43 Comae Beren. +28°20'

A [20 Can Ven] +41°3'

ζ Ursae Maj +55°24'

+28°20'		+41°3'		+55°24'	
$\overset{7}{6}^m$ 8.0 1.0	9.0	12^m 53.9 56.0	9.9	19^m 32.2 55.0	7.2
10.7 58.2	8.9	57.1 52.9	0.0	36.6 50.8	7.4
13.4 55.4	8.8	0.3 49.5	9.8	40.7 46.1	6.8
16.2 52.7	8.9	3.7 46.2	9.9	45.5 41.9	7.4
19.0 49.8	8.8	7.0 42.9	9.9	49.7 37.7	7.4
26.0 42.8	8.8	15.0 35.0	0.0	0.9 26.7	7.6
30.2 38.7	8.9	20.0 30.0	0.0	7.2 20.1	7.3
	34.4		25.0		13.7
	15)65		15)145		15)98
	34.43		24.97		13.65

$13^h \overset{7}{8}^m 34^s.43$	$13^h 13^m 24^s.97$	$13^h 20^m 13^s.65$
13 7 38.97	29.48	18.08
4.54	4.51	4.43
.02	.00	.03
4.52	4.51	4.46

ass $w = \frac{1}{20}$

4.52
.51
.46
3)149
4.50
.63 b sec le
3.87

Frod. 1327 is SLOW

$0^m 3^s.87$

at $13^h 13^m$ S.T.

Times Apr. 8, 1909.

Mer Cir Wells.

A P ι Leonis +11°2′ (last 9 wires)
Rattle at 11h 22m

A τ Leonis +3°21′
λ Drac +69°50′
ν Leonis −0°19′
3 Drac. +67°15′
ψ Ursa-Maj. +48°17.

+3°21′		+69°50′		−0°19′		+67°15′		+48°17′	
22m 48.1 35.4	3.5	24m 51.7 7.7	9.4	31m 50.3 37.0	7.3	36m 22.5 23.7	6.2	40m 37.0 47.6	4.6
50.7 32.8	3.5	59.0 0.7	9.7	52.7 34.7	7.4	28.9 17.4	6.3	40.8 43.8	4.6
53.1 30.3	3.4	5.7 53.6	9.3	55.0 32.1	7.1	35.3 11.0	6.3	44.2 40.1	4.3
55.9 28.1	4.0	13.2 46.3	9.5	57.3 29.7	7.0	41.8 4.3	6.1	48.2 36.3	4.5
58.2 25.6	3.8	20.3 39.2	9.5	59.8 27.2	7.0	48.0 58.4	6.4	51.9 32.7	4.6
4.2 19.0	3.2	38.0 22.1	0.1	6.2 21.0	7.2	4.0 42.3	6.3	1.3 23.4	4.7
8.0 15.6	3.6	49.0 11.0	0.0	10.0 17.6	7.6	13.0 33.0	6.0	6.7 17.9	4.6
	11.9		0.2		13.9		23.3		12.2
	15)119		15)127		15)95		15)49		15)41
	11.79		59.85		13.63		23.13		12.27

11h 23m 11s.79	11h 25m 59s.85	11h 32m 13s.63	11h ~~12~~ 37m 23s.13	11h 41m 12s.27
16.33	64.~~12~~ 09	18.23	27.35	16.58
4.54	4.2~~1~~ 4	4.60	4.22	4.31
.12	.25	.13	.21	.03
4.42	4.49	4.47	4.43	4.34

2.72
2.38
2.55

4.24
4.22
~~4.23~~
4.23
4.57
~~4.25~~

.06
2.49) .34 (.14
249
910

m = .14

.4.42
.49
.47
.43
.34
5)215
4.43

4.43
.63 b corr.
3.80

85
.14
340
85
.1190

1.81
.14
724
181
.2534

.92
.14
368
92
.1288

1.47
.14
588
147
.2058

.21
.14
84
21

Frod. 1327 is SLOW

0m 3s.80

at 11h 35m S.T.

For Apr. 9, 1909

Mer. Cir Ladd Obs.

γ Ursa Maj. +54°12
Rattle at 11h 52m.
π Virginis +7°7'
o Virginis +9°4'

+54°12'		7°7'		+9°4'	
48m 20.3 40.4	0.7	55m 45.6 32.6	8.2	0m 7.2 54.4	1.6
24.3 36.5	0.8	47.9 30.0	7.9	9.9 52.2	2.1
28.7 32.0	0.7	50.3 27.7	8.0	12.0 49.5	1.5
33.0 27.7	0.7	52.8 25.0	7.8	14.4 47.0	1.4
37.2 23.4	0.6	55.1 22.7	7.8	17.0 44.5	1.5
47.6 13.0	0.6	1.5 16.4	7.9	23.3 38.4	1.7
54.3 6.7	1.0	5.4 12.6	8.0	27.2 34.7	1.9
	0.5		9.0		30.9
	15)56		15)146		15)126
	0.37		8.97		30.84

11h 49m 0.37s	11h 56m 8.97s	12h 0m 30.84s
4.91	13.54	35.42
4.54	4.57	4.58
.02	.04	.04
4.56	~~4.49~~	4.54
	4.53	

ass $m = \frac{1}{20}$

4.56
.53
.54
3)13
4.54
.63 k sec
3.91

Frod. 1327 is SLOW

0m 3.91s

at 12h 0m S. T.

Sat Apr. 10, 1909

Mer Cir Wells.

ε Leonis +24°12′ (missed 1st wires)
υ Ursa Maj +59°28′
A [μ Leonis] +26°26′
A [[illegible] Leon Min] +41°29′
Last minute 9h 53m.

+24°12′
40m —3.0 —
14.40.4 4.8
17.057.4 4.4
19.754.7 4.4
22.452.0 4.4
29.045.3 4.3
33.141.3 4.4
37.3
13⌊30
37.23

+59°28′
42.314.4
43m 47.39.9 6.7
52.05.0 7.2
7.0
56.80.1 6.9
1.955.1 7.0
13.6430 6.6
21.135.5 6.6
28.2
15⌊62
28.41

+26°26′
47m 5.457.7 3.1
8.255.0 3.2
11.052.1 3.1
13.749.5 3.2
16.546.8 3.3
23.039.9 2.9
27.335.8 3.1
31.6
5⌊185
31.57

+41°29′
51m 32.034.4 6.4
35.031.3 6.3
38.327.8 6.1
41.924.5 6.4
45.121.3 6.4
53.213.0 6.2
58.48.2 6.6
3.3
15⌊27
3.18

$9^h 40^m 37^s.23$ $9^h 44^m 28^s.41$ $9^h 47^m 31^s.57$ $9^h 52^m 3^s.18$

41.86	32.94	36.01	7.72
4.63	4.53	4.44	4.54
.02	.03	.02	.00
4.61	4.56	4.42	4.54

ass n = 1/20

4.61
.56
.42
.54
4⌊213
4.53
.63 b sec δ
3.90

Frod. 1327 is SLOW

$0^m 3^s.90$

at $9^h 45^m$ S.T.

Mon Apr. 12, 1909

Mer Cir Wells

Rattle at $7^h 26^m$

α Can Min +5° 28'

β Gemin + 28° 15'

+5° 28'		+28° 15'	
34^m 3.3 50.4	3.7	39^m 12.9 6.1	9.0
5.8 48.0	3.8	15.9 3.5	9.4
8.2 45.7	3.9	18.4 0.7	9.1
10.7 43.0	3.7	21.2 57.7	8.9
13.0 40.3	3.3	24.0 55.0	9.0
19.3 34.3	3.6	31.1 48.0	9.1
23.1 30.7	3.8	35.3 43.7	9.0
	27.0		39.6
	15)128		15)81
	26.85		39.54
$7^h 34^m 26^s.85$		$7^h 39^m 39^s.54$	
32.06		44.73	
5.21		5.19	
.04		.02	
5.17		5.17	

Ass n = 1/20

5.17
.63
4.54

Frod. 1327 is SLOW

$0^m 4^s.54$

at $7^h 37^m$ S.T.

Friday Apr. 16, 1909

Inner Cir Fuller

Rattle at 14h 38m

β Bootis + 40° 45′ (last 10 wires) } Stiff throughclds

4 Bootis + 27° 18′

δ Bootis + 33° 39′

Rattle at 15h 13m

+40°45′

58m 17.3	44.7
22.1	48.2
27.2	51.4
31.8	54.9
37.3	57.9
5 | 1357	5 | 2571
27.14	51.42
	24.37
	27.05

+27°18′

0m 2.055.0	4.0
4.752.7	7.4
7.349.3	6.6
10.346.5	6.8
13.244.0	7.2
20.037.3	7.3
24.633.0	7.6
	28.6
	15 | 85
	28.57

+33°39′

11m 17.113.7	0.8
20.241.0	1.2
23.17.6	0.7
26.347	1.0
29.3 1.8	1.1
36.654.3	0.9
41.250.1	1.3
	45.7
	15 | 77
	45.51

14h 58m 27.10	15h 0m 28s.57	15h 11m 45s.51
32.64	34.02	51.39
5.54	5.45	5.88
		.04
		5.84
		.63 b sec δ
	.25	5.21

ass n = 0

Apr. 17, 1909
ass n = 0.15

5.54
.45
.88
3 | 187
5.62
.63 b sec δ
4.99

Frod. 1327 is SLOW

0m 4s.99

at 15h 0m S.T.

Sat Apr. 17, 1909

Inner Cir Evl. Wells

Rattle at 9h 38m.

ε Leonis +24°12'

ν Urs. Maj + 59°28'

A [μ Leonis] +26°26' (missed 14th wire)

+24°12'		+59°28'		+26°26'	
40m 9.9 1.2	1.1	43m 40.912.6	3.6	47m 3.856.0	9.8
12.758.6	1.3	45.88.5	4.3	6.6 —	—
15.355.7	1.0	50.43.2	3.6	9.260.9	0.1
18.153.1	1.2	55.258.5	3.7	12.047.7	9.7
20.950.4	1.3	59.853.3	3.1	14.845.0	9.8
27.543.6	1.1	12.041.7	3.7	21.638.1	9.7
31.639.5	1.1	19.534.3	3.8	25.734.2	9.9
	35.7		26.7		30.0
	15)88		15)125		13)120
					92
	35.59		26.83		29.~~77~~

-.47 6|18
+.78 5.91
1.25 .27

~~=.21~~

.44 6.09
.78 5.91
1.22 .18
122/580

n = .15

9h 40m 35s.59
41.77
6.18
.~~99~~ 10
6.08
6.18
.07
6.11

9h 44m 26s.83
32.74
5.91
.16
6.07
5.91
.12
6.03

~~x~~9h 47m 29s.92
35.92
6.00
.06
5.94

.47 .21 48 94 98
.78 .21 78 8.156 1638
.47 .15 235 47 705
.78 .15 390 78 117
.42 .15 210 42

5.94
6.03
6.11
3)08
6.03
.63 6 secs
5.40

Frod. 1327 is SLOW

0m 5s.40
at 9h 45m S.T.

Times Apr 22, 1909

Trans Cir EOL Obs

33 Sextantis	−1°16'		
A [41 Leon. min]	+23°40'		
42 Leon. min	+31°10'		
l. Leonis	+11° 2' Rattle at 10h 46m		
A [46 Leon min]	+34°42'		
β Ursae Maj	+56°52'		
α Ursae Maj	+62°15' (9 wires)		
ψ Ursae Maj	+44°59'	S.C.C. Obs	
δ Leonis	+21° 1'	"	"
ν Ursae Maj	+33° 35' (last 10 wires)	"	"
A [t Leonis]	+11° 1'.	"	"
3 Draconis	+67° ~~#~~ + 15'	"	"
β Virginis	+2° 16' (12 wires)	"	"
o Virginis	+9° 14'	"	"

−1°16'

36m 17.23.9 1.1
19.41.4 0.8
22.059.0 1.0
24.5564 0.9
27.054.3 1.8
33.047.9 0.9
37.044.1 1.1
40.7
15 |78
40.52

31° 10'
~~+23°40'~~

40m 15.210.0 5.2
18.27.2 5.4
21.24.3 5.5
24.01.4 5.4
26.958.4 5.3
34.151.4 5.5
38.447.0 5.4
42.8
15 |105
42.70

11°2'
~~+31°10'~~

44 1.2440 5.0
3.7+1.5 5.2
6.2389 5.1
8.7363 5.0
~~11.336.3~~ —
15.030.0 5.0
18926.3 5.2
~~22.530.0~~ 22.5
~~26.3~~
13 |70
22.64

+23°40'

37m 56.947.8 4.7
59.4452 4.6
2.0426 4.6
4739.7 4.4
7.537.1 4 6
14.330.4 4.7
18.226.4 4.6
22.3
15 |45
22.30

10h 36m 40.52	10h 40m 42s.70	10h 44m 22s.54	10h 38m 22s.30
47.03	49.28	29.17	28.94
6.51	6.58	6.63	6.64
.13	.04	.10	.07
6.38	6.54	6.53	6.57

Thurs. Apr. 22, 1909.

+34° 42'

47^m 39.4 36.1 5.5
42.3 33.5 5.8
45.3 30.3 5.6
48.5 27.3 5.8
51.4 24.4 5.8
58.9 16.9 5.8
3.4 12.4 5.8
8.0
15 | 131
7.87

+56° 52'

55^m 33.7 59.2 2.9
38.3 55.2 3.5
42.7 50.3 3.0
47.3 46.1 3.4
51.7 41.7 3.4
3.0 30.0 3.0
9.6 23.3 2.9
16.4
15 | 85
16.57

+62° 15'

57^m 28.4 37.3 5.6
33.6 32.1 5.7
47.1 18.9 6.0
54.4 10.9 5.3
2.9
9 | 76
2.84

$10^h 48^m 7^m.87$
14.44
6.57
.03
6.54

$10^h 56^m 16^s.57$
22.95
6.38
.08
6.46

$10^h 58^m 2^s.84$
9.08
6.24
.14
6.38

1.54
1.90
1.72

6.38
6.24
6.31

6.51
6.63
6.57

−.02
+.19
+.08
1.64 (.26 1.16
164
96

$m = \frac{1}{7}$

6.38
.54
.53
.57
.54
.46
.38
7 | 340
6.49
.63 b sec δ
5.86

Frod. 1327 is SLOW

$0^m 5^s.86$

at $10^h 45^m$ S.T.

Thursday, April 22, 1909.

+44° 59′

3^m
~~38.5~~
~~54.5 59.58 0.3~~
~~58.0 57.1 6.1~~
~~2.9~~
~~1.5 53.6 5.1~~
~~4.9 50.1 5.0~~
~~8.1 44.8 4.9~~
~~17.1 38.2 5.3~~
~~22.6 34.0 4.0~~
3 27.9

+44° 59′

3^m
54.5 1.0 5.5
58.0 57.3 5.3
1.5 53.9 5.4
4.9 50.4 5.3
8.0 47.0 5.0
17.0 38.4 5.4
22.5 33.0 5.5
27.9
~~65.3~~
15) 10.3 (.
27.69

+21° 1′

9^m
45.1 35.2 0.3
47.9 32.9 0.8
50.4 30.1 0.5
53.1 27.2 0.3
56.0 25.0 1.0
2.4 18.5 0.9
6.5 14.5 1.0
10.6
15) 5.4
10.36

+33° 35′

13^m
19.5
24.0
28.5
32.8
37.2
5) 142.0
28.4

44.8
47.5
50.6
53.5
56.6
5(253.0
50.6
22.16
28.44

11^h 4^m $27^s.69$
34.30
6.61
.03
6.64

11^h 9^m $10^s.36$
~~34.~~
17.07
6.71
.18
6.53

11^h 13^m $28^s.42$
35.00
6.58
~~.26~~
.08
6.50

.38
2.38
2.00

6.71
6.05
2) .66
.33

n = .33

67° 15′

36^m
~~17.8~~
~~26.6~~
~~38.~~
~~45.1~~
~~2.1~~
~~11.3~~
~~21.1~~
~~30.6~~

67° 15′

36^m
19.8 21.4 1.2
26.6 15.5 2.1
33.8 8.9 2.7
38.9 2.7 1.6
45.3 56.8 2.1
2.2 40.5 2.7
11.4 30.6 2.0
21.1
~~15) 15.3~~
~~1.~~
15 (.5
21.03
~~27~~

11^h 36^m $21^s.03$
27.08
6.05
.49
6.54

6.64
6.53
6.50
6.54
4 | 26.21
6.552
.63
5.92

Frod. 1327 is Slow.
0^m $5^s.92$
11:20 S.~~D.~~ T.

Fri Apr. 23, 1909

Tuer Cii — Tolcllis

Rattle after $10^h 14^m$.

μ Urs Maj +41°57'

31 Leon. Min +37°10'

36 Ursa Maj. +56°27'

+41°57'		+37°10'		+56°27'	
16^m 17.4 20.9		22^m 2.3 1.2		24^m 0.8 25.7	6.5
20.9 17.4	8.3	5.5 58.2	3.5	5.7 21.6	7.3
24.2 14.0	8.3	8.6 55.0	3.7	10.0 17.0	7.0
27.5 10.5	8.2	11.7 51.7	3.6	14.5 12.4	6.9
30.8 7.2	8.0	14.7 48.8	3.4	19.0 7.9	6.9
39.3 59.0	8.0	22.3 41.0	3.5	30.1 57.0	7.1
44.2 54.0	8.3	27.2 36.4	3.3	36.7 50.3	7.0
	8.2		3.6		43.7
	49.2		32.0		15 | 74
	15 | 15		15 | 16		43.49
	49.10		31.77		

$10^h 16^m 49^s.10$	$10^h 22^m 31^s.77$	$10^h 24^m 43^s.49$
55.52	38.26	49.82
6.42	6.49	6.35
.00	.042	.129
6.42	6.447	6.474

assu = 1/7

6.42
.44
.47
3 | 1.33
6.444
.63
5.821

Frod. 1327 is SLOW

$0^m 5^s.821$

at $10^h 20^m$ S. T.

Sat. Apr. 24, 1909

Mer. Cir. L. C. Obs.

Rattle after 9:29.

ε Leonis +24 12
~~δ Hydrae +5 9 28~~ missed
μ Leonis +26 26

~~9.2 0.4~~
~~11.8 57.8~~

Read by Cattell
+24° 12'
9h 40m 9.2
12.0 0.5
14.7 57.9
17.5 55.0
20.0 ~~59.5~~
26.8 43.0
31.0 39.0
35.0

Read by Campbell
+24° 12'
9h 40m 9.2 0.4
11.8 57.8
14.6 55.0
17.4
19.9 49.4
26.7 42.8
30.9 38.8
34.8

Read by Campbell ~~Micro Obs.~~
+26° 26'
9h 47m 2.7 55.3 8.0 9
5.4 52.6 8.0
8.6 49.8 8.4
11.3 46.8 8.1
13.9 44.4 8.3
20.7 37.3 8.0
25.2 31.3 8.5
29.2
15 | 10.5
29.70
29.10

Read by ~~Cattell~~
+26° 26'
47m 2.8 55.3 8.1
5.5 52.7 8.2
8.6 50.0 8.6
11.4 46.0 8.4
14.0 44.5 8.5
20.7 37.3 8.0
25.2 33.3 8.5
29.3
15 | 11.26
~~29.77~~
29.17

5 | 734
14.68
20.33
~~18.54~~
~~33.22~~
35.01

5 | 174.8
34.96
+ .04
35.00

4 | 229
~~40.7~~
55.72
-20.90
34.82

14.58 34.80 55.65
20.33 .04 20.90
34.91 34.84 34.75

mean 34.94

9 47 29.70
35.81
6.71
-.06
6.65
-.63
~~5.42~~
6.02

29.77
35.81
6.74
.06
6.68
~~5.98~~
-.63
~~5.35~~
6.05

6.08
~~5.38~~

9 40 34.94 = T
9 40 41.66 = α
6.727
-.097
6.635
-.63
6.002

34.83
41.66
6.83
.07
6.76
.63
6.13

6.08

Final mean = ~~5.73~~ 6.06 at 9h 43.5m Sd.T.

Fixed 1327 is slow 0m 6.08s at 9h 44m S.T.

Sat Apr. 24, 1909

Mer Cir Wh-Obs

A [19 Leon Min] +41°29'
π Leonis +8°29' Rattle at $9^{h}\,58^{m}$
η Leonis +17°12'
λ Ursa. Maj +43°22'

+41°29'		+8°29'		+17°12'		+43°22'	
51^{m} 29.7 32.0	1.7	54^{m} 54.3 41.9	6.2	1^{m} 51.7 40.6	2.3	10^{m} 58.7 3.1	1.8
33.2 29.0	2.2	56.9 39.2	6.1	54.3 38.2	2.5	2.1 0.0	2.1
36.3 25.7	2.0	59.4 36.9	6.3	56.9 35.5	2.4	5.6 56.2	1.8
39.7 22.3	2.0	2.0 34.3	6.3	59.3 33.0	2.3	8.8 53.0	1.8
42.9 19.1	2.0	4.4 31.9	6.3	2.0 30.3	2.3	12.2 49.7	1.9
51.1 10.9	2.0	10.6 25.5	6.1	8.3 24.0	2.3	20.8 41.0	1.8
56.0 5.7	1.7	14.3 21.8	6.1	12.3 20.2	2.5	25.8 36.0	1.8
	0.9		18.0		16.3		31.0
	15)14.5		15)14		15)29		15)14.0
	0.97		18.09		16.19		30.93

$9^{h}\,52^{m}\,0^{s}.97$	$9^{h}\,55^{m}\,18^{s}.09$	$10^{h}\,2^{m}\,16^{s}.19$	$10^{h}\,11^{m}\,30^{s}.93$
7.48	24.7~~3~~3	22.8~~4~~3	37.5~~8~~5
6.51	6.~~38~~ 6~~2~~4	6.~~57~~ 64	6.652
.00	.11	.09	.50
6.51	6.53	6.55	6.62

ass n=1/7

6.51
.53
.55
.62
4)22.1
6.55
.636 sec a
5.92

Frod. 1327 is SLOW

$0^{m}\,5^{s}.92$

at $10^{h}\,0^{m}$ S.T.

Mon Apr. 26, 1909

Amer Cir

Wells.

Rattle at $11^h\,28^m$

ν Leonis −0° 19′

3 Draco. +67°15′

χ Urs. Maj +48°17′ (Harris)

β Leonis +15°5′

β Virg +2°17′

−0°19′		+67°15′		+48°17′		+15°5′		+2°17′	
31^m 48.034.6	2.6	36^m 20.121.0	1.1	40^m 41.937.4	9.3	43^m 55.043.1	8.1	45^m 27.814.9	2.7
50.332.1	2.4	25.914.8	0.7	46.033.5	9.5	57.641.0	8.6	30.312.3	2.6
52.829.7	2.5	32.087	0.7	49.030.1	9.1	59.938.2	8.1	32.99.9	2.8
55.227.1	2.3	38.72.0	0.7	58.620.7	9.3	2.635.7	8.3	35.27.4	2.6
57.924.7	2.6	45.255.4	0.6	3.715.0	8.7	5.033.1	8.1	37.74.9	2.6
3.918.7	2.6	1.539.7	1.2		9.4	11.326.9	8.2	43.958.7	2.6
7.415.0	2.4	10.629.6	0.2		11⌊63	15.222.9	8.1	47.655.1	2.7
	11.2		20.5		9.57		19.1		51.3
	15⌊36		15⌊57				15⌊16		15⌊49
	11.24		20.38				19.11		51.33

$11^h\,3\overset{2}{1}{}^m\,11^s.24$	$11^h\,37^m\,20^s.38$	$11^h\,41^m\,9^s.57$	$11^h\,44^m\,19^s.11$	$11^h\,45^m\,51^s.33$
18.15	26.93	16.40	25.96	58.17
6.91	6.55	6.83	6.85	6.8~~6~~4
.13	.21	.03	09	.12
6.78	6.76	6.80	6.76	6.72

2.39 6.55
.02 6.88
2.37) .33 (.14
237
930
948

$m = \frac{1}{7}$

6.78
.76
.80
.76
.72
5⌊32
6.76
.61 brecce
6.15

Frod. 1327 is SLOW

$0^m\,6^s.15$

at $11^h\,40^m$ S.T.

~~Tuesday~~ Wednesday. Apr. 28, 1909

23h 30m Collimation W.R. Oles

Micrometer found at 33.543

S. Coll on N. Coll.	Tel on S. Coll.	Tel on N. Coll.
54.2		
56.9	33.663	33.579
56.7	.661	.617
57.2	.659	.541
57.7	~~.685~~	.596
57.9	.661	.571
57.5	.641	.608
58.0	.662	.541
57.7	.689	.611
58.1	.641	.541
10)719	.668	.590
57.19	.642	33.5795
Set at 57.2	10)587	33.6587
	33.6587	2)1.2382
		33.6191
		.012 aberration
		33.631

24h 10m Micrometer set at 33.631

Thursday Apr. 29, 1909

Mer Cir   Wol. Obs.

Level Obs.

Telescope South

Zero	W. End	E End		
W	−54.0	−89.3	−143.3	
E	+97.1	+62.0	+159.1	+15.8
W	−52.8	−88.0	−140.8	
E	+97.1	+62.0	+159.1	+18.3

Telescope North.

W	−31.0	−67.1	−98.1	
E	+86.1	+45.0	+131.1	+33.0
W	−30.1	−66.2	−96.3	
E	+80.0	+43.9	+123.9	+27.6
			16	94.7

16)94.7(5.92
80
147
144
30

5.92
.06
.3552
1.35
17760
10656
3552
0.47952

b sec φ = 0.48 West end high.

See p. 69.

Thursday Apr. 29. 1909.

Telescope North.

Zero	W End	E End		
W	-28.0	-71.2	-99.2	
E	+84.0	+39.8	+123.8	+24.6
W	-24.0	-68.2	-92.2	
E	+84.2	+40.0	+124.2	+32.0

Telescope South.

W	-42.0	-96.5	138.5	
E	+103.0	+49.0	152.0	+13.5
W	-41.0	-95.0	136.0	
E	+103.0	+48.5	151.5	+15.5
				$\boxed{856}$

16) 85.6 (5.35
80
56
48
80

.06
.321
~~.06~~
~~26~~

.321
1.35
1605
963
321
.43335
.47995
2) .91128
.456

mean of 2 obs, b sec φ = 0.46 West end high.

Sat. May 1, 1909

Mer Cir Zol. Obs.

Rattle at $14^h 59^m$

δ Bootes +33°19'
μ Bootis +37°42'
β Coron. +29°25'

+33°19'			+37°42'			+29°25'		
11^m	16.212.3	8.5	20^m	28.026.0	4.0	23^m	31.825.6	7.4
	19.19.5	8.6		30.924.0	4.9		34.723.0	7.7
	22.06.6	8.6		33.921.0	4.9		37.820.0	7.8
	25.03.6	8.6		37.217.8	5.0		40.317.2	7.5
	28.007	8.7		40.314.7	5.0		43.214.3	7.5
	35.353.1	8.6		48.16.9	5.0		50.27.2	7.4
	40.049.0	9.0		52.92.4	5.3		54.53.0	7.5
		44.3			57.5			58.8
		$15\overline{)49}$			$15\overline{)66}$			$15\overline{)1196}$
		44.33			57.44			58.71

$15^h 11^m 44^s.33$	$15^h 20^m 57^s.44$	$15^h 23^m 58^s.71$
51.59	4.77	6.07
7.26	7.33	7.36
.04	.02	.05
7.22	7.31	7.31

azzm = $\frac{1}{7}$

7.22
.31
.31
$3\overline{)84}$
7.28
.46 b sec e
6.82

Frod. 1327 is SLOW

$0^m 6^s.82$

at $15^h 20^m$ S.T.

Mon May 3, 1909

Mer Cir L. C. Obs

~~Rattle at~~ 10h 9m

μ Urs Maj +41 57 ~~?o~~ missed 1st wire

μ Hydrae −16 22 last 5 taps only once

41 Leo Min +23 40 good for much

fall when on 41 Leo Min

Last ~~Rattle~~ between 10:40 & 10:41

+41° 57′ −16 22 +23 40

~~15 39.8~~
missed 19.0
16 19.9 16.0
22.8 12.9
26.4 9.4
29.5 4.9
38.0 56.7
42.8 52.7
47.7

last 5 wires
21 48.2
51.0
53.5
56.0
58.6

37 55.8 47.2 3.0
57.5 44.6 3.1
1.2 41.4 2.6
3.8 38.8 2.6
6.0 36.0 2.0
12.9 29.5 2.4
17.4 25.8 3.2
21.2 21.2
15 | 20.
21.3

10 38 21.3

+41° 57′
− 19.0
16m 19.0 20.0 16.0 6.0
21.9 22.9 12.9 5.8
25.3 26.3 9.3 5.6
28.3 29.3 6.0 5.3
37.9 57.6 5.5
42.8 52.7 5.5
47.7
13 | 104
47.80

asc n = 1/7

+23° 40′
37m 55.8 47.2 3.0
58.4 44.6 3.0
1.2 41.2 2.4
3.9 38.7 2.6
6.0 36.0 2.0
12.9 29.3 2.2
17.3 25.7 3.0
21.2
15 | 44
21.29

10h 16m 47s.80
55.34
7.54

7.49
.46 b secδ
7.03

10h 38m 21s.29
28.80
7.51
.07
7.44

Sid. 1327 is SLOW
0m 7s.03
at 10h 30m S.T.

Tues May 4, 1909

Mer Cir

Rattle at 10h 30m

41 Leo Min	+23° 40′	Obs by L.C.
46 Leo Min,	+34 42	" " H Edmunds
β Urs Maj.	+56 52	" " H Ed
~~α " "~~	~~+62 15~~	~~" " L.C~~
ψ Urs Maj	+45 0	" " L.C.

Last long rattle before 11h 06m

+23 40

10h 37 56.4 46.8 3.2
58.6 44.5 3.1
1.0 42.0 3.0
4.1 38.8 2.9
6.8 35.6 2.4
12.8 29.5 2.3
17.3 25.0 2.3
21.3 21.3
15 20.5

mean 21.37

+34 42

47 38.1 35.2 3.3
41.5 32.5 3.0
44.5 29.2 3.7
47.1 26.4 3.5
50.4 23.4 3.8
57.5 15.8 3.3
2.0 11.2 3.2
~~6.5~~ 6.5 65
15 (103
6.69

+56 52

55 32.0 57.9 9.9
36.8 57.9 10.7
41.1 49.1 10.2
45.6 44.3 9.9
50.2 39.7 9.9
1.5 28.9 10.4
8.0 21.8 9.8
15.4 15.4
12
15.08

+45 0

3 53.4 59.6 3.0
57.1 56.3 3.4
0.4 ~~57.3~~ 52.8 3.2
3.8 49.4 3.2
7.4 45.6 3.0
16.2 37.0 3.2
21.3 32.0 3.3
26.8 26.8
9.1
26.61

10 ~~37~~ 38 21.37
28.78
~~29.11~~

10 ~~47~~ 48 6.69
14.29
~~14.63~~

10 ~~55~~ 56 15.08
22.70
~~22.28~~

11 4 26.61
13
34.~~50~~

assum n = $1/3^{s}$

7.41 ~~7.74~~ 16
+09 ~~+.07~~
7.50 ~~7.67~~
7.50
7.50 7.90
.46 7.86
7.04 7.88
-.46
7.42

7.60 ~~7.94~~
+04 +.03 7
7.64 ~~7.91~~
7.49
7.56 8.01
66 7.89
7.10 8.00
-.66
7.54

7.62 ~~7.20~~
-.21
-13 ~~+.09~~
7.49 ~~8.29~~
7.99

7.52 7.89
-02 -.03 ~~+.07~~
7.50 ~~7.90~~
7.86

Final mean 7.07s slow at 10h 50m S.T.

Wednesday May 5, 1909

Mer Cir Zole Obs.

Rattle at $11^h 10^m$.

ν Ursae Maj +33°35'

Gr. 1771 +64°50'

A τ Leonis. +3°21'

+33°35'		+64°50'		+3°21'	
12^m 59.1 55.6	4.7	16^m 27.0 17.0	4.0	22^m 45.1 32.2	7.3
2.1 52.7	4.8	32.7 11.7	4.4	47.7 29.7	7.4
5.0 49.6	4.6	38.0 5.8	3.8	50.1 27.3	7.4
8.0 46.7	4.7	44.2 0.0	4.2	52.6 24.9	7.5
10.9 43.7	4.6	50.0 53.7	3.7	55.0 22.5	7.5
18.4 36.3	4.7	4.4 39.2	3.6	1.5 16.0	7.5
23.0 32.0	5.3	13.3 30.5	3.8	5.1 12.2	7.3
	27.1		22.0		8.7
	15 | 56		15 | 145		15 | 106
	27.37		21.97		8.71

2.13 | 6.93
.06 | 7.35
2.07 | .42 | .2
414
6

m = .2

$11^h 13^m 27^s.37$	$11^h 17^m 21^s.97$	$11^h 23^m 8^s.71$
34.71	28.90	16.06
7.34	6.93	7.35
.05	.24	.17
7.29	7.22	7.18

7.29
.22
.18
2 | 69
7.23
.46
6.77

Frod. 1327 is SLOW

$0^m 6^s.77$

at $11^h 20^m$ S.T.

May 5 — 1909

Mer. Cir. L.C. Ob

~~Flat rattle at 11:5~~ H.E. Ob.

Rattle between 11:55 & 11:56

o Virginis +19 14 L.C. Ob

δ Urs Maj. +57 32 H.E. Obs.

δ Corvi −16 0. H.E. Obs

χ Draconis +70 17 L.C. Ob.

+19 14

12 0 3.5 51.8 5.3
6.5 49.0 5.5
9.1 46.6 5.7
11.4 44.7 5.6
14.1 41.6 5.7
20.2 35.3 5.5
24.2 31.6 5.8
280
121

12 0 2.81
12 0 35.32
7.51
−.02
7.49
7.45

mean 7.47 L.C. Obs
−.46
7.01

+57 32

6.6 36.5 15.3
11.3 43.2 19.9
15.5 50.2 —
20.7 57.0 —
24.6 6.7 34.0
78.7 253.6
15.74 50.72
18.54

12 10 50.36
57.62
7.26
+13
7.39
7.01
7.13
~~7.20~~
−.46
~~6.96~~ H.Ed. Ob.
6.67

−16 0

38.7 27.1 5.8
41.8 24.6 6.4
43.4 21.9 5.3
46.0 19.5 5.5
48.9 17.0 5.9
55.0 10.3 5.3
59.0 6.6 5.6
2.7
12.5

~~02.08~~
12 25 02.83
12 25 10.18
7.25
−24
7.01

+70 17

22.7 41.8 4.5
29.7 34.7 4.4
38.0 27.4 5.4
45.0 20.3 5.3
52.0 12.8 4.8
10.6 53.8 4.4
21.4 43.7 5.1
32.9
6.8

12 29 32.45
12 29 39.53
7.08
+37
7.45

assume x = 1/5

∴ Chron. 1327 is
7.01 slow at
12:20 S.T. by L.C. Obs.

Thurs. May 6, 1909

Mer Cir L. C. Obv.

Rattle after 11:15

A ι Leonis +11 2
λ Draco +69 50 ← fourth tap false alarm on λ Draco.

β Leonis +15 5

last rattle at 11:45

+11 2

48 40.4 27.9 8.3
42.7 25.6 8.3
45.3 27.9 23.0 8.3
47.7 25.6 20.9 8.0
50.2 23.0 17.5 7.7
56.5 20.3 .15 8.0
0.3 17.5 8.0 8.3
~~8.1~~ 3.9
15.8

11 19 4.02
11.55
7.53
assumed n = 1/5 −14
7.39

n = −.21

7.37
7.42
28

Mean 7.39
−46
6.93

+69 50

24 48.1 3.7 1.8
55.2 57.6 2.8
2.9 49.9 2.8
9.5 42.8 2.3
16.0 36.1 2.1
34.5 17.7 2.2
45.7 6.7 2.4
56.6
30

11 25 56.20
63.21
7.01
+.36
7.37

+15 5

43 54.4 42.7 7.1
56.9 39.8 6.7
59.3 37.3 6.6
1.7 34.9 6.6
4.4 32.4 6.8
10.9 26.0 6.9
14.6 22.3 6.9
18.5
61

11 44 18.41
25.96
7.55
−.13
7.42

Frods. 1327 is $\overset{s}{6}.93$ slow at 11:30 S.T.

Stat. May 8, 1909

Mer Cir

Rattle after 10:36

LC } Ob.
HE
SCC

ν Hydrae	−15 43	all wires } L.C. Obs
β Urs Maj.	+56 52	" "
ψ " "	+45 00	" "
δ ~~ψ~~ Leonis	+21 1	all wires H.E. Obs
~~ν Urs Maj.~~	~~+33 35~~	~~" "~~
ι Leonis	+11 2	all wires HE Obs
λ Draco	+69 50	SCC. Obs

−15 43			+56 52			+45 00		
36.9	25.3	2.2	32.5	58.0	0.5	53.7	0.2	.3.9
39.0	22.9	1.9	36.9	54.0	0.9	57.0	56.2	3 2
41.8	20.3	2.1	41.7	49.0	0.7	0.2	52.9	3 1
44.4	17.8	2.2	46.6	44.0	0.6	3.9	48.9	2.8
46.7	14.9	1.6	51.6	39.9	1.5	6.8	46.0	2.8
53.4	8.6	2.0	1.9	29.0	0.9	16.0	36.9	2.9
57.3	4.8	2.1	8.8	22.7	1.5	21.4	31.3	2.7
		1.3			15.0			26.9

1.3
.4
~~+.01~~
1.03

8.47
7.44
−.24
7.20
7.26
7.51
97
7.32
46
6.86

15.0
6.6
15.44

22.58
7.14
+12
7.26

26.9
8.3
26.55
~~34.04~~
~~7.49~~
+.02
~~7.51~~

26.55
34.04
7.49
+.02
7.51

assumed n
0.2

Frod. 1327 is slow
0^m 6.86 by LC Obs.
at 10:50 S^r. T.

Frod 1327 is slow
0^m 6.81 by H-Ed. Obs.

Sat May 8, 1909.

Mer Cir — Ladd Obs.

Rattle at 11h 39m

χ Ursae Maj +48°17'
β Leonis +15°5'
β Virginis +2°17'
γ Ursae Maj. +54°12'

~~+48°17'~~
~~40m 33.7~~
~~37.3~~
~~41.0~~
~~44.6~~
~~48.4 36.9~~
~~3.4 29.1~~
~~9.0 20.3~~ 14.3

48°17'

40m 33.7	44.0	7.7
37.3	40.6	7.9
41.0	36.9	7.9
44.6	33.0	7.6
48.4	29.1	7.5
57.9	20.3	8.2
3.4	14.3	7.7
		9.0

15 | 133 5
8.90

+15°5'

43m 54.3	42.7	7.0
56.9	40.1	7.0
59.3	37.9	7.2
2.0	35.1	7.1
4.3	32.6	6.9
11.0	26.0	7.0
14.8	22.3	7.1

~~22.3~~
18.8
15 | 81
18.54

+2°17'

45m 27.1	14.1	1.2
29.7	11.6	1.3
32.0	9.1	1.1
34.5	6.8	1.3
36.9	4.3	1.2
43.1	58.1	1.2
47.0	54.3	1.3

50.7
15 | 93
50.62

+54°12'

48m 17.0	37.1	4.1
21.5	33.3	4.8
25.4	29.0	4.4
29.9	24.6	4.5
34.1	20.4	4.5
44.5	9.9	4.4
51.0	3.7	4.7

57.3
15 | 37
57.25

1.39 7.21
.04 7.47
1.35 26

m = .2

11h 41m 8s.90	11h 44m 18s.54	11h 45m 50s.62	11h 48m 57s.25
16.22	25.95	58.09	4.46
7.32	7.41	7.47	7.21
.04	.13	.18	.09
7.28	7.28	~~7.29~~ 7.30	7.30

7.29
.46 b sec δ
6.83

.9131
.0402
8729
2
.17458

Frod. 1327 is SLOW

0m 6s.83

at 11h 45m S.T.

Mon May 10, 1909

Amer Cin Wohlells

Rattle at 11h06m.

δ Leonis +21°1'

ν Ursa Maj +33°35'

σ δ Leonis +6°32' (missed 1st 2)

A [i Leonis] +11°2'

+21°1

8m44.134.3 8.4
46.931.8 8.7
49.429.1 8.5
52.026.3 8.3
54.723.9 8.6
1.319.2 8.5
5.313.2 8.5
9.3
15)138
9.25

+33°35'

12m 59.055.3 4.3
2.052.4 4.4
5.049.4 4.4
8.046.4 4.4
11.043.3 4.3
18.336.2 4.5
22.931.7 4.6
27.2
15)131
27.21

+6°32'

16m 1.138.3 9.4
3.535.7 9.2
6.033.1 9.1
12.227.0 9.2
16.023.3 9.3
19.8
11)170
19.64

+11°2'

18m 40.127.9 8.0
42.626.4 8.0
45.122.9 8.0
47.720.3 8.0
50.117.9 8.0
56.611.6 8.2
0.117.7 7.8
4.0
4.00

$11^h 09^m 9^s.25$	$11^h 13^m 27^s.21$	$11^h 16^m 19^s.64$	$11^h 19^m 4^s.00$
16.89	34.78	27.30	11.51
7.64	7.57	7.66	7.51
.10	.05	.16	.14
7.54	7.52	7.50	7.37

assm = 1/5

7.54
.52
.50
.37
4)193
7.48
.46
7.02

Frod. 1327 is SLOW

$0^m 7^s.02$

at $11^h 15^m$ S.T.

Tues May 11, 1909

Mean Cir

Fole Obs.

12 Can. Ven. +38°49'
Rattle at $12^h 56^m$
ε Virginis +11°27'
43 Comae +28°20'

+38°49'		+11°27'		+28°20'	
51m 10.8 10.6	1.4	57m 8.6 56.3	4.9	7m 5.0 58.1	3.1
13.6 7.4	1.0	11.0 53.9	4 9	7.8 55.4	3.2
16.7 4.3	1.0	13.4 51.3	4.7	10.6 52.5	3.1
19.8 1.0	0.8	16.2 48.7	4.9	13.4 49.8	3.2
22.9 58.1	1.0	18.5 46.1	4.6	16.0 47.0	3.0
31.0 50.0	1.0	24.7 40.0	4.7	23.3 39.9	3.2
35.8 45.2	1.0	28.6 36.3	4.9	27.5 35.7	3.2
	40.4		32.4		31.7
	15 | 76		15 | 60		15 | 87
	40.51		32.40		31.58

$12^h 51^m 40^s.51$	$12^h 57^m 32^s.40$	$13^h 07^m 31^s.58$
47.76	39.90	38.93
7.25	7.50	7.35
.02	.14	.07
7.27	7.36	7.28

ass
u = .2

7.27
.36
.28
3 | .91
7.30
.46
6.84

Frod. 1327 is SLOW

$0^m 6^s.84$

at $13^h 0^m$ S.T.

Wednesday May 12, 1909

Clear Cu [illegible]

η Virginis * −0°10′ ~~−0°9′~~ 1st wire doubtful

Rattle at $+2^h 18^m$

20 Comae $+21°24′$

8 Can. Ven. $+41°51′$

24 Comae $+18°53′$ last 10 wires

−0°10′
14^m 44.9 31.6 6.5
47.2 29.4 6.6
49.7 26.8 6.5
52.3 24.3 6.6
54.8 21.9 6.7
~~4.7~~
1.0 15.8 6.8
4.7 12.0 6.7
8.3
15 | 47
8.31

+21°24′
24^m 37.4 27.9 5.3
40.0 25.3 5.3
42.7 22.7 5.4
45.5 19.9 5.4
48.0 17.1 5.1
54.8 10.7 5.5
58.7 6.6 5.3
2.7
15 | 100
2.67

+41°51′
28^m 47.9 50.8 8.7
51.3 47.7 9.0
54.6 44.1 8.7
57.9 41.0 8.9
1.2 39.4 8.6
9.4 29.3 8.7
14.4 24.4 8.8
19.4
15 | 68
9.39

$12^h 15^m 8^s.31$
15.85
7.54
.18
7.36

ass m = .2

$12^h 25^m 2^s.67$
10.05
7.38 ~~7.42~~
.10
7.28

$12^h 29^m 9^s.39$
26.75
7.36
.00
7.36

7.36
.28
.36
10 | 100
7.33
.46 b sec e
6.87

Frod. 1327 is SLOW

$0^m 6^s.87$

at $12^h 23^m$ S.T.

Saturday May 15, 1909

Mer Cir Eve Obs

Rattle at $11^h 29^m$
υ Leonis −0°19′
3 Draconis +67°15′
χ Ursae Maj +48°17′
β Leonis +15°5′
γ Ursae Maj +54°12′

−0°19′	+67°15	+48°17′	+15°5′	+54°12′
31^m 47.7 34.5 2.2	36^m 19.0 20.3 9.3	40^m 34.2 44.6 8.8	44^m 54.9 43.3 8.2	48^m 17.7 37.7 5.4
50.1 32.1 2.2	26.0 14.2 0.2	38.2 41.0 9.2	57.3 40.9 8.2	22.0 33.9 5.9
52.6 29.6 2.2	31.7 7.8 9.5	41.6 37.1 8.7	0.0 38.1 8.1	26.2 29.5 5.7
55.0 27.2 2.2	38.3 0.9 9.2	45.5 33.6 9.1	2.4 35.7 8.1	30.3 25.3 5.6
57.3 24.7 2.0	44.8 54.8 9.6	49.0 29.8 8.8	5.1 33.1 8.2	34.3 21.0 5.3
3.7 18.4 2.1	0.7 39.7 0.4	58.3 20.6 8.9	11.4 26.7 8.1	45.1 10.4 5.5
7.2 14.9 2.1	10.3 29.7 0.0	4.0 15.0 9.0	15.3 22.9 8.2	51.3 4.3 5.6
				57.9 ~~10.4~~ 57.9
11.0	19.6	9.6	19.0	~~4.3~~
15 | 1 0	15 | 12 2	15 | 7 1	15 | 1 1	15 | 11 9
11.07	19.81	9.47	19.07	57.79
$11^h 32^m 11^s.07$	$11^h 37^m 19^s.81$	$11^h 41^m 9^s.47$	$11^h 45^m 19^s.07$	$11^h 48^m 57^s.79$
18.00	26.27	16.10	25.88	4.22
6.93	6.46	6.63	6.81	6.53
.23	.47	.054	.183	.19
~~6.70~~	~~6.82~~	6.687	6.658	6.55
6.75	6.75			62

2.38
1.39
1.88

6.46
6.53
6.~~44~~ 50

−.01
.27
+.13

6.93
6.81
6.87

1.75 | .376 .350 80 78 20 .241 21

$u = .2~~4~~1$

assu $u = \frac{1}{~~4~~5}$

6.75
.75
.67
.68
.62
5 | 347
6.69
.46 b sec u
6.23

Frod. 1327 is SLOW

$0^m 6^s.23$

at $11^h 40^m$ S.T.

Thursday May 20, 1909

Amer Cir [illegible]

Rattle at ~~10h0m~~.

Rattle ~~at~~ between 11:38 & 11:39 L.C. Obs.

β Leonis +15 5 } L.C. Obs
γ Urs Maj +54 12

A π Virginis +7°7'
O " +9°14'
Rattle at 12h06m.
δ Urs. Maj + 57°32' } W.W.W. Obs

+15 5
43 56.0 43.9 9.9
58.5 41.8 0.3
0.8 39.0 9.8
3.4 36.6 0.0
5.7 34.1 9.8
12.5 27.5 0.0
16.4 24.0 0.4
20.4
.6
20.04

+54 12
18.4 38.9 7.3
22.9 — -
27.3 — -
31.6 25.7 7.3
35.4 22.3 7.9
45.9 11.4 7.3
52.2 5.1 7.3
59.0
~~101~~
81
58.91
58.74

+7°7'
55m 44.0 31.1 5.1
46.7 28.6 5.3
49.0 26.3 5.3
51.3 23.7 5.0
53.6 21.3 4.9
0.1 15.0 5.1
4.0 11.5 5.5
8.0
15 | 92
7.61

+9°14'
0m 5.9 53.2 9.1
8.3 50.9 9.2
10.7 48.0 8.7
13.1 45.9 9.0
16.0 43.0 9.0
22.0 37.3 9.3
25.9 33.4 9.3
29.7
15 | 83
29.55

+57°32
10m 8.0 35.0 3.0
12.7 30.8 3.5
17.3 26.0 3.3
21.9 22.0 3.9
26.3 17.3 3.6
~~44.7~~
~~51.8 5.1~~
~~59.2~~
38.0 5.7 3.7
44.7 59.2 3.9
51.8
15 | 117
51.79

1.39
.07
1.12

5.79
5.47
.32 1.28
224
960
896

h m s
11 44 20.04
25.83
5.79
- .12
5.73
.67

h m s
11 49 58.91
49 4.21
5.47
+.0412
5.34 5.59
.57
.63
5.5
.46
5.00
.17

11h 56m 7s.61
13.31
5.70
.09
5.61

12h 0m 29s.55
35.20
5.65
.08
5.57

12h 10m 51s.79
57.31
5.52
.07
5.59

ason = 1/4

.14 | 5.68
5.52
1.57 | .16 | .41
1.43 | 143
170

n = 1/9

5.59
.46
5.13

slow by L.C. Obs. at 11h 46m S.T.

Frod. 1327 is SLOW

0m 5s.13 W.W.W. Obs

at 12h 0m S.T.

Monday May 24, 1909

Mer Cir Tolles.

~~Rattle~~ at 12h 29m.

ε Ursa Maj +56°27′ (Experiment tapping both wires of each set. (1-4, 8-15, missed 5 caught tap on 6 & 7)

12 Can Ven +38°49′ (dble taps)

ε Virg. +11°27′ dble taps.

Last min 12h 58m.

+56°27′		+38°49′		+11°27′	
49m 16.2 40.9	7.1	51m 12.6 12.7	5.3	57m 10.6 58.5	9.1
20.5 36.6	7.1	15.9 9.6	5.5	13.2 56.0	9.2
25.1 3[illegible]	7.2	18.9 6.3	5.2	15.8 53.4	9.2
29.5 27.7	7.2	22.0 3.1	5.1	18.2 50.8	9.0
34.1 23.2	7.3	25.2 0.1	5.3	20.7 48.6	9.3
45.0 12.0	7.0	33.2 52.1	5.3	27.0 42.2	9.2
52.0 5.3	7.3	38.0 47.3	5.3	30.9 38.4	9.3
	58.7	4	42.8		34.7
	15)89		15)92		15)90
	58.59		42.65		34.60

12h 49m 58.59s	12h 51m 42.65s	12h 57m 34.60s
3.51	47.64	39.83
4.92	4.99	5.23
.15	.03	.18
5.07	4.96	5.05

+.60 4.92

−.72 5.23

1.32).31 (.23

264

460

396

640

.23

assu = $\frac{1}{4}$

5.07

4.96

5.05

3)8

5.03

.466 secα

4.57

Frod. 1327 is SLOW

0m 4.57s

at 12h 50m S.T.

Tuesday May 25, 1909

mean Em Lobelles.

Rattle at 12^{h} 47^{m}

ε Ursae Maj +56°27′

12 Can. Ven. +38°49′

ε Virg. +11°27′

+56°27′

49^{m} 16.040.9 6.9
21.036.4 7.4
25.132.0 7.1
29.627.7 7.3
34.123.6 7.7
45.212.0 7.2
52.05.2 7.2
58.6
15 | 94
58.63

12^{h} 49^{m} 58^{s}.63
3.48
4.85
·09
4.94

+38°49′

51^{m} 12.412.5 4.9
16.09.7 5.7
19.06.7 5.7
22.23.1 5.3
25.30.3 5.6
33.252.2 5.4
38.047.5 5.5
42.7
15 | 108
42.72

12^{h} 51^{m} 42^{s}.72
47.62
4.90
-.01
4.89

+11°27′

57^{m} 11.058.9 9.9
13.656.1 9.7
15.953.7 9.6
18.457.1 9.5
21.148.7 9.8
27.142.3 9.4
30.938.4 9.3
34.7
15 | 119
34.79

12^{h} 57^{m} 34^{s}.79
39.82
5.03
.10
4.93

.60 4.85
.21 5.03
131 1.18 .14
131
490

m = 1/7

4.94
4.89
4.93
3 | 6
4.92
·46 brace
4.46

Frod. 1327 is SLOW

0^{m} 4^{s}.46

at ~~11~~ 12^{h} 50^{m} S.T.

Wed May 26, 1909

Mer Cir LeC Obs

Rattle after 12h 11m

η Virg − 0° 10′

β Corbr − 16 1 last 10 wires only

χ Draco + 70 17

−0°10′		−16°01′		+70°17′	
14m 47.5 34.1	1.6	24m 57.3	19.1	28m 24.1 43.7	
49.9 31.7	1.6	1.0	21.7	31.9 36.3	7.8
52.3 29.3	1.6	5.0	24.3	39.4 29.0	8.2
55.0 26.9	1.9	8.7	26.9	46.7 21.7	8.4
57.2 24.2	1.4	12.6	29.2	53.7 14.2	8.4
3.5 18.0	1.5	5)24.6	5)121 2	11.9 66.2	7.9
7.0 14.6	1.6	4.92	24.24	23.4 46.0	8.1
	10.9		19.21		8.4
	15)121		5.03		34.1
	10.81				15)1 3
					34.09

12h 15m 10.s81	12h 25m 4.98	12h 29m 34.s09
4	4	
15.78	10.06	38.71
4.95	5.08	4.62
.13	.17	.27
4.80	4.89	4.89

3.29
2.79
3.08

5.06
4.62
.44
.31
1304

m = 1/7

4.80
.89
.89
3)18
4.86
.46
4.40

Y rod. 1327 is SLOW

0m 4.s40

at 12h 20m.

Fri May 28, 1909

Mer Cir Jos. Collis.

Rattle at $17^h 21^m$.

[ν Herculis] +48° 20'±

β Drac. +52° 22'

α Ophi +12° 38'

+52° 22'

23^m ~~42.9~~ ~~45.7~~ 47.7 27^m

42.3 59.1 1.4

46.7 55.3 2.0

50.5 51.2 1.7

54.5 47.0 1.5

58.5 43.0 1.5

8.4 33.0 1.4

14.9 27.0 1.9

21.0

15 | 124

20.83

+12° 38'

30^m 16.3 34.0 0.3

18.7 1.6 0.3

21.1 59.0 0.1

23.7 56.5 0.2

26.3 54.0 0.3

32.6 47.8 0.4

36.3 44.0 0.3

40.2

15 | 21

40.14

$17^h 28^m 20^s.83$

24.80

~~4.03~~

3.97

~~.05~~

~~4.02~~

$17^h 30^m 40^s.14$

44.06

3.92

~~.10~~

azz n. 0

3.94

.46 b sec δ

3.48

Frd. 1327 is SLOW

$3^s.48$

$0^m 3^s.48$

$17^h 30^m$.

at $17^h 30^m$

Sat May 29, 1909

Amer Cir — Folcells

Rattle at $15^h 07^m$
μ Bootis +37°42′
β Coron. +29°25′
α Coron. +27°1′
Last min $15^h 32^m$

+37°42′		+ 29°25′		+27°1′	
20^m 32·031·0	3.0	23^m 36·029·8	5.8	30^m 22·014·5	6.5
35·028·1	3.1	38·827·0	5.8	24·812·0	6.8
38·325·0	3.3	41·724·0	5.7	27·69·1	6.7
41·321·8	3.1	44·521·2	5.7	30·36·4	6.4
44·318·7	3.0	47·218·3	5.5	33·03·5	6.5
52·311·0	3.3	54·311·3	5.6	40·056·5	7.0
57·16·3	3.4	58·67·0	5.6	44·252·4	6.6
	1.7		3.0		48.3
	15 ⌊89		15 ⌊127		15 ⌊38
	1.59		2.85		48.25

$15^h 20^m 1^s.59$	$15^h 24^m 2^s.85$	$15^h 30^m 48^s.25$
4.93	6.27	51.72
$3.\overset{3}{\cancel{4}}4$	3.42	3.47
.02	.05	.06
3.32	3.37	3.41

assm = 1/7

3.32
.37
.41
3 ⌊11 0
3.37
.46
2.91

Frod. 1327 is SLOW

$0^m 2^s.91$

at $15^h 30^m$ S.T.

Tuesday June 1 1909

Trans Cir   E. Willis.

Rattle at 13h 15m

α Virginis −10°41'

6916 Urs. Maj +60°25'

17 H. Can Ven +37°39'

−10°46'		+60°25'		+37°39'	
19m 59.3 47.0	6.3	24m 20.3 55.0	5.3	30m 14.4 13.6	8.0
2.0 44.6	6.6	25.1 50.3	5.4	17.6 10.7	8.3
4.4 42.0	6.4	30.2 45.0	5.2	20.9 7.4	8.3
7.0 39.5	6.5	35.1 40.2	5.3	24.0 4.3	8.3
9.4 37.0	6.4	40.1 35.3	5.4	27.0 1.3	8.3
15.7 30.8	6.5	52.8 22.9	5.7	34.9 53.4	8.3
19.5 27.0	6.5	0.4 15.3	5.7	39.6 48.8	8.4
	23.3		7.8		44.0
	15⌊35		15⌊108		15⌊19
	23.23		7.72		44.13

13h 20m 23s.23	13h 25m 7s.72	13h 30m 44s.13
24.87	8.89	45.47
1.64	1.17	1.34
.28	.21	.03
1.36	1.38	1.31

+.85 1.17
−1.10 1.64
1.95 .47 24
.390
800
880
200

Assu m = 1/4.

1.36
.38.
.31
3⌊15
1.35
.46 b sec φ
0.89

Frod. 1327 is SLOW

0m 0s.89

at 13h 25m S.T.

Wed June 2, 1903

Tran Cir — Wells.

43 Comae +28°20'
A [20 Can Ven] +41°03'
Rattle at 13h 16m.
Ursae Maj + 55°24'

+28°20'		+41°03'		+55°24'	
07m 11.44.5		12m 57.359.5	6.8	19m 35.658.0	3.6
14.21.9	5.9	0.756.3	7.0	40.054.0	4.0
17.059.0	6.1	3.853.0	6.8	44.349.4	3.7
19.856.2	6.0	7.249.7	6.9	48.745.0	3.7
22.653.4	6.0	10.446.3	6.7	53.040.8	3.8
29.446.3	6.0	18.738.3	7.0	4.129.9	4.0
33.742.1	5.7	23.633.4	7.0	10.323.4	3.7
	5.8		28.5		17.0
	38.0		15)67		15)135
	15)145		28.45		16.90
	37.97				

13h 07m 37s.97	13h 13m 28s.45	13h 20m 16s.90
38.77	29.19	17.59
0.80	0.74	0.69
.09	.01	.13
0.71	0.73	0.82

ase n = 1/4

0.82
0.71
.73
3)226
0.75
.46 brace
0.29

Frod. 1327 is SLOW

0m 0s.29

at 13h 15m S.T.

Thursday June 3 1909

Mer Cir ——— Wells.

Rattle at 13h 27m.

17 H. Can. Ven. + 37°39'

η Ursae Maj + 49°46'

+37°39'

30m 16.0 15.0
19.0 12.0 1.0
22.1 8.8 1.0
25.2 5.8 0.9
28.32.7 1.0
36.1 54.8 1.0
40.9 50.2 0.9
1.1
45.5

15 | 74

45.49

$13^h\,30^m\,45^s.49$

45.44

+0.05

.04

+0.09 fast

+49°46'

43m 22.8 35.3 8.1
26.6 31.7 8.3
30.6 27.7 8.3
34.3 24.0 8.3
38.0 20.3 8.3
47.7 10.7 8 4
53.5 5.0 8.3
59.3

15 | 23

59.15

$13^h\,43^m\,59^s.15$

59.08

+ 0.07

.07

0.00

assu u = 1/4

+ 0.04
+ .46 sec ε
+ 0.~~46~~ 50

Frod. 1327 is FAST

$0^m\,0^s.$~~40~~ 59

at $13^h\,40^m$ S. T.

Tuesday June 8, 1899

Mer Cir Tel Obs.

Rattle at $1\overset{3}{\cancel{2}}^h 27^m$

17 16· Can Vens +37°39'

η Ursa Maj +49°46'

+37°39'		+49°46'	
30^m 18.417.4	5.8	43^m 25.337.8	3.1
21.514.5	6.0	29.034.0	3.0
24.711.3	6.0	32.930.3	3.2
27.98.0	5.9	36.926.4	3.3
30.85.0	5.8	40.622.4	3.0
38.657.6	6.2	50.013.0	3.0
43.252.7	5.9	56.07.6	3.6
	47.8		1.7
	15 ⌊144		15 ⌊89
	47.89		1.59

$13^h\ 30^m\ 47^s.89$ $13^h\ 44^m\ 1^s.59$

30 45.38 59.00

2.51 2.59

.04 .07

ass n = 1/4 2.55 2.52

2.54

.46 b sec a

~~2.08~~

3.00

Frod. 1327 is FAST

$3^s.00$

0^m ~~$2^s.08$~~

at $13^h\ 36^m$ S.T.

~~to~~ Tuesday June 8, 1909

ime of beginning. Collimation — Cole Obs.

22h 45m — S. Coll on N-Coll. — Wamsley Recorder

Micrometer found at 33.631

S. Coll on N-Coll:

64.7
64.2
64.1
65.0
63.6
65.7
64.4
63.7
61.9
64.5
10 (641.8
64.18
Set at 64.2.

Tel. on S. Coll.	Tel. on N. Coll.
33.389	33.793
.411	.813
.419	.793
.417	.809
.407	.804
.435	.798
.385	.810
.403	.821
.398	.808
.417	.817
~~10 (370.089~~	~~10 (41.066~~
~~37~~ 33.4081	33.8066
	33.4081
	2 (67.2147
	33.607~~4~~
	.012 aberration
	33.619

Micrometer set at 33.619

Tuesday June 8, 1909

Level

Yale Obs.

Telescope South.

Zero	W End	E End		
W	− 40.0	− 81.0	−121.0	+ 20.8
E	+ 91.0	+ 50.8	+141.8	
W	− 39.0	− 80.3	−119.3	+ 21.7
E	+ 9$\overset{1}{2}$.0	+ 50.0	+141.0	

Telescope North

W	−26.7	−52.9	−79.6	+ 3$\overset{5}{\cancel{4}}$.8
E	+70.8	+44.6	+115.4	
W	−27.0	−53.0	−80.0	+ 35.4
E	+70.6	+44.8	115.4	

$$16\overline{)113.7}\,(7.106$$
112
17
16
.100

7.106
.06
.42636 b
1.35
213180
127908
42636
0.5755860

b sec φ = $0^s.58$ W. End high.

Finished at $23^h 59^m$.

Wed June 9, 1909

Level Obs. Zeh. Obs.

Time of beginning $2^h 20^m$.

Telescope South

Zero	W End	E End		
W	-41.4	-81.1	-122.5	
E	+89.7	+50.0	139.7	+17.2
W	-39.8	-79.3	-119.1	
E	~~+91.3~~	+ ~~51.7~~	+ ~~143.0~~	~~+23.9~~
E	89.0	49.0	+138.0	+18.9

Telescope North

~~E~~W	-16.4	-55.8	-72.0	
E	+74.6	+35.0	+109.6	+37.6
W	-13.8	-53.2	-67.0	
E	+73.0	+34.0	+107.0	+40.0

16) 113.7 (7.106
112
1.7
1.6

7.106
.06
.42636
1.35
.5755

b sec φ = 0.58 west End high

Mean of 2 observations

b sec φ = 0.58 west end high

Thur June 11 1909

Mercier — L.C. Obs

α Drac +64 49 all
d Boot +25 31 all
χ Virg −9 51 last 8 wires
ι " −5 34 all

Rattle at 14:13

+64 49			+25 31			−9 51		−5 34		
14^h 1^m			5^m			8		10^m		
6.7	55.8	2.5	54.3	46.2	0.5	~~7.8~~	21.1	57.0	43.0	00.0
12.8	51.3	4.1	57.0	43.5	0.5	—	23.7	58.6	40.8	9.4
16.6	45.2	1.8	59.7	40.8	0.56	7.5	26.2	0.8	36.4	9.2
24.1	39.7	3.8	2.7	37.9	0.6	11.2	28.8	3.4	35.8	9.2
29.8	33.9	3.7	5.1	35.1	0.2	15.0	31.0	5.8	33.2	9.0
44.4	19.2	3.6	12.0	28.4	0.4		30.8	12.1	27.0	9.1
53.1	10.4	3.5	16.1	24.3	0.4		26.16	15.8	23.3	9.1
	20			20.4						19.4
	270			35						94
	1.8			20.2						19.6

14 2 1.80	14 6 20.23		14 11 19.63
14 1 57.89	14 6 16.26	14 8 3.59	14 11 15.66
+3.91	+3.97		+3.97
+03	01		−03
3.94	3.96		3.94

2.12 391
0.09 397
2.21).0600 (.027
442
158

+3.94
+3.96
+3.94
+3.95
+0.58
+4.53

Frod 1327 is Fast
$0^m\ 4^s.53$

at $14^h\ 7^m$ S.T.

Sat June 12, 1909

Mer Cir W. h. Obs

ξ Bootis +14°7'
μ Virg −5°16', (9 wires)
109 Virg +2°17'
Rattle at $14^h 46^m$
Gr. 2164 +59°40'

+14°7'		−5°16'		+2°17'		+59°40'	
36^m 29.818.0	7.8	38^m = =		41^m 21.18.0	9.1	47^m 28.41.0	9.4
32.315.6	7.9	5.437.7	3.1	23.75.6	9.3	33.356.5	9.8
35.013.0	8.0	8.035.1	3.1	26.03.0	9.0	38.151.4	9.5
37.510.3	7.8	14.029.0	3.0	28.50.7	9.2	43.246.7	9.9
40.08.0	8.0	17.925.2	3.1	31.058.2	9.2	47.841.7	9.5
46.31.6	7.9		21.5	37.252.0	9.2	0.129.5	9.6
50.257.9	8.1		9)48	40.948.3	9.2	7.622.2	9.8
	54.0		21.53		44.7		15.0
	15)145				15)89		15)11~~7~~5
	53.97				44.59		14.77

$14^h 36^m 53.^s97$	$14^h 38^m 21.^s53$	$14^h 41^m 44.^s59$	$14^h 48^m 14.^s77$
49.53	17.10	−40.17	10.19
4.44	4.43	4.42	4.58
.06	+.09	.08	.07
4.50	4.52	4.50	4.51

+1.70 4.58
+.07 4.43
1.63) .15
147 (.09

Assu m = $\frac{1}{11}$

+.25
−.09
+.04
3)+.20
+.07

4.51_8
$.5\overset{8}{\cancel{3}}$ brace
$5.0\overset{9}{\cancel{4}}$

Frod. 1327 is FAST

$0^m 5.^s04$

at $14^h 40^m$ S.T.

Tuesday June 15, 1909

Mer. Cir. Wh. Obs.

Rattle at $13^h 56^m$

α Drac.	+64°49′
d Bootis	+25°31′
ι Virginis	−5°34′
λ Bootis	+46°30′

$14^h 01^m$ +64°49′		+25°31′		−5°34′		+46°30′	
8.558.5	7.0	5^m 55.547.7	3.2	10^m 57.344.3	1.6	12^m 28.736.3	5.0
14.6~~68.6~~ 52.7	7.3	58.745.0	3.7	59.942.0	1.9	32.133.0	5.1
20.2~~52.7~~ 47.0	7.2	1.342.1	3.4	2.439.5	1.9	35.729.6	5.3
26.041.3	7.3	4.039.5	3.5	4.937.0	1.9	39.5~~28.0~~	5.5
31.935.3	7.2	6.536.9	3.4	7.234.4	1.6	43.022.7	5.7
46.021.0	7.0	13.630.0	3.6	13.628.3	1.9	52.013.5	5.5
55.012.6	7.6	17.725.8	3.5	17.324.6	1.9	57.78.3	6.0
	3.6		21.8		20.9		2.7
	15)92		15)111		15)136		15)108
	3.61		21.74		20.91		2.72

tan u = .91

$02^m 3^s.61$	$14^h 6^m 21^s.74$	$14^h 11^m 20^s.91$	$14^h 13^m 2^s.72$
57.41	16.23	15.65	57.11
6.20	5.51	5.26	5.61
.51	.18	.42	.06
5.69	5.69	5.68	5.55

2.127
.10
2.23

6.20
5.26
.94 | .42
892
480

u = .42

5.69
.69
.68
.55
4)21
5.65
.538
6.18
23

Trod. 1327 is FAST

$0^m 6^s.18$

at $14^h 10^m$ S.T.

Wednesday June 16, 1909

Am. Ci. Wells.

Rattle after 14^{h}06^m

ι Virg. −5°34′

λ Bootis +46°30′ ← changed focus

ν Bootis +52°16.

−5°34′		+46°30′		+52°16′	
14^h 10^m 57.544.7	2.2	12^m 28.836.7	5.5	21^m 35.051.7	6.7
0.042.3	2.3	32.333.4	5.7	39.047.7	6.7
2.539.8	2.3	36.129.9	6.0	43.243.9	7.1
5.037.3	2.3	39.726.3	6.0	47.139.7	6.8
7.534.7	2.2	43.122.7	5.8	51.135.7	6.8
13.728.7	2.5	52.013.7	5.7	1.525.7	7.2
17.525.0	2.5	57.78.3	6.0	7.619.6	7.2
	21.2		3.0		13.6
	15 | 25		15 | 13 7		15 | 71
	21.17		2.91		13.47

14^h 11^m 21^s.17	14^h 13^m 2^s.91	14^h 22^m 13^s.47
15.64	57.09	7.74
5.53	5.82	5.73
.25	.04	.09
5.78	5.78	5.64

ass. u = ~~.4~~ ~~2~~ $\frac{1}{4}$

5.78
.78
.64
3 | 238
5.79$_8$
.5~~3~~8 Bruce
6.3~~2~~7

Frod. 1327 is FAST

0^m 6^s.32

at 14^h 14^m S.T.

Friday June 18, 1909

Mer. Cir. Zol. Obs.

ι Virginis −5°34′
λ Bootis +46°30′

Rattle at 14h 16m.

ϑ Bootis + ~~32~~ 52° 16′
γ Bootis +38°42′

−5°34′		+46°30′		+52°16′		+38°42′	
10m 58.145.1		12m 29.337.0	6.3	21m 35.7520	7.7	28m 2.72.7	5.4
0.642.7	3.2	32.833.6	6.4	39.848.2	8.0	5.759.6	5.3
3.040.2	3.3	36.630.1	6.7	43.744.1	7.8	9.156.7	5.8
5.738.0	3.2	40.026.6	6.6	48.040[illegible]	8.0	12.153.3	5.4
8.135.3	3.7	43.323.1	6.4	51.636.2	7.8	15.350.0	5.3
14.429.0	3.4	52.614.3	6.9	2.025.9	7.9	23.142.0	5.1
18.025.3	3.4	57.98.9	6.8	7.820.0	7.8	27.737.3	5.0
	3.3		3.4		13.9		32.7
	21.7						
	15 | 10.2		15 | 45		15 | 13.9		15 | 100
	21.68		3.30		13.93		32.67

14h 11m 21s.68	14h 13m 3s.30	14h 22m 13s.93	14h 28m 32s.67
15.63	57.06	7.71	26.35
6.05	6.24	6.22	6.32
.20	.02	.08	.02
6.20	6.22	6.14	6.34

ass m = $\frac{1}{4.5}$

6.20
.22
.14
.34
490
6.22_8
.536 sec a
~~6.75~~
6.80

Frod. 1327 is FAST
0m 6s. ~~75~~ 80
at 14h 20m S.T.

Saturday June 19, 1909

Mer Cir Wells.

δ Bootis +33°39'
Rattle at $15^h 15^m$
μ Bootis +37°42'
ν' Bootis +41°09'

+33°39'
11^m 30.0 26.2 6.2
33.0 23.3 6.3
35.9 20.3 6.2
~~41.7~~
38.8 17.3 6.1
41.7 14.5 6.2
49.3 7.0 6.3
53.7 2.4 6.1
58.2
15 | 16
58.11

+37°42'
20^m 41.7 $\overset{41.0}{38.0}$ 2.7
45.0 34.7 3.0
48.0 2.7
51.0 31.6 2.6
54.0 28.5 2.5
2.0 20.8 2.8
6.7 16.0 2.7
11.3
15 | 53
11.35

+41°09'
$+27^m$ 16.7 18.8 5.5
20.0 15.7 5.7
23.3 12.4 5.7
26.6 9.3 5.9
29.9 5.8 5.7
38.0 57.7 58.7
42.9 52.7 5.6
47.7
15 | 125
47.83

$15^h 11^m 58^s.11$
51.66
6.45
.05
6.40

$15^h 21^m 11^s.35$
4.86
6.49
.03
6.46

$15^h 27^m 47^s.83$
41.43
6.40
.00
6.40

aso n = $\frac{1}{5}$

6.42
.58
7.00

Frod. 1327 is FAST
0^m $7^s.00$ ~~$6^s.46$~~
at $15^h 20^m$ S.T.

Tues. June 22, 1909

Mer. Cir. L.C. & Waugh Obs.

Rattle at 14:16

δ Bootis +52° 16′ Wa. Obs.
γ Bootis +38 42 Wa. Obs.
ξ Bootis +14 7 L.C. Obs.
East only. 109 Virg +2 16 7 L.C. Obs *
α Librae? −15 40 L.C. Obs.

Rattle at 14:50

+52° 16′			+38° 42′			+14° 7′			−15° 40′		
14h ~~16~~ 21m 36.4	53.2	9.6	28m 03.5	03.7	7.2	36m 32.4	20.8	3.2	45m 23.2	11.8	5.0
41.1	49.4	0.5	06.6	00.7	7.3	35.2	18.3	3.5	26.8	09.3	5.1
44.8	44.9	9.7	09.7	57.5	7.2	37.8	15.8	3.6	28.3	06.8	5.1
48.8	41.1	9.9	12.8	54.2	7.0	39.9	13.3	3.2	30.8	04.3	5.1
52.5	37.0	9.5	16.3	51.0	7.3	42.8	10.7	3.5	33.5	01.5	5.0
02.8	27.1	9.9	23.9	43.0	6.9	49.0	04.1	3.1	39.7	55.0	4.7
08.8	20.9	9.7	28.8	38.1	6.9	52.8	00.4	3.2	43.8	51.5	5.3
		14.7			33.6			56.7			47.7
		15 ⟌ 135			15 ⟌ 84			15 ⟌ 100			15 ⟌ 80
		14.90			33.56			56.67			47.53

14h 22m 14.90s	14h 28m 33.56	14h 36m 56.67s	14h 45m 47.53s
7.61	26.31	49.45	~~51.847~~?
7.29	7.25	7.22	
.02	.01	.05	
7.27	7.26	7.27	

1.29
.25
1.04

7.29
7.22
.07
~~.39~~

n = .07

7.27
7.26
7.27
3 ⟌ 21.80
7.266
~~.58~~
~~6.69~~

7.26
.58
7.84

.39
.07
.0243

.61
.07
.0077

.66
.07
.0462

Frod 1327 is FAST

0m 7.84s

at 14h ~~13~~ 30m S.T.

Wed June 23, 1909

Mer Cir Wells

α Cor. Bor. +27°1'
Rattle at 15h 34m
α Serp. +6°43'
β Serp. +15°42'
γ Serp. +18°25'

~~+27°1'~~
~~30m 58.4~~
~~58.4~~
~~59.7~~
~~03.7~~
~~07.7~~
~~14.7 26.9~~
~~17.4 23.3~~
~~20.4~~

+ 27°1'
30m 33.3 26.0 9.3
36.2 23.4 9.6
39.0 20.5 9.5
41.7 17.5 9.2
44.4 14.8 9.2
51.5 07.7 9.2
55.5 03.7 9.2
59.7
~~66~~ 199
59.66

+ 27°1'
36m 33.2 26.9 9.1
36.0 23.3 9.3
38.8 20.5 9.3
41.5 17.5 9.0
44.3 14.7 9.0
51.4 07.7 9.1
56.4 03.7 9.1
59.7
15 | 186.0
59.~~12~~ 57

+ 6°43'
39m 32.8 20.1 2.9
35.3 17.6 2.9
37.7 15.0 2.7
40.3 12.5 2.8
42.6 10.0 2.6
49.1 03.7 2.8
52.7 59.9 2.6
56.4
15 | 5.7
56.38

+15°42'
41m 44.3 32.9 7.2
46.8 30.5 7.3
49.4 27.9 7.3
51.9 25.3 7.2
54.5 22.7 7.2
01.0 16.4 7.4
04.9 12.5 7.4
08.7
15 | 97
8.64

+18°25'
44m 29.4 12.7 6.1
26.3 10.2 6.5
28.6 07.5 6.1
31.0 04.9 5.9
33.7 02.4 6.1
40.3 55.8 6.1
44.2 51.9 6.1
48.0
15 | 0.90
48.06

assume m = .07
.04 .07 .028
.77 .07 .0539
.63 .07 .0431
.58 .07 .0406

15h 30m 59s.57
51.68
7.89
.03
7.92

15h 39m 56s.38
48.62
7.76
.05
7.81

15h 41m 8s.64
60.80
7.84
.04
7.80

15h 44m 48s.06
40.157
7.89
.04
7.875

7.92
7.81
7.80
7.875
4 | 31.40
~~7.86~~
7.85
.58
8.43

Frod. 1321 is FAST

0m 8s.43

at 15h 40m 8.7.

Thurs. June 24, 1909

Mer. Cir. Wa. Obs.

13.41

η Bootis + 18° 51'
π Virg. + 1° 59'
α Drac. + 64° 49' (missed 1st wire)
Least min. 14^{h} 04^{m}

+ 18° 51'			+ 1° 59'			+ 64° 49'		
50^{m} 05.7^{s}	54.3	0.0	56^{m} 46.7	33.6	0.3	~~16~~ 14^{h} 1^{m} 00.0	00.0	0.0
08.4	52.7	1.1	49.2	31.3	0.5	17.0	56.0	3.0
11.0	50.2	1.2	51.8	28.8	0.6	23.2	50.1	3.3
13.5	47.4	0.9	54.1	26.3	0.3	28.7	44.3	3.0
16.3	44.9	1.2	56.6	23.7	0.4	34.5	38.4	2.9
22.8	38.4	1.2	02.7	17.7	0.4	49.1	24.0	3.1
26.7	34.5	1.2	06.5	14.0	0.5	57.9	16.4	3.3
		30.7			10.0			06.6
		15⌊~~66~~ 15⌊7.5			15⌊30			15⌊72
		~~30.4~~4 30.50			10.20			6.48

9.07
8.27
.80

2.13
.03
2.10

.38 = n
x10/.80.0
63.0
170.0
168.0

13 ~~14~~^{h} 50^{m} 30.44^{s}
22.17
8.27
.04
~~8.27~~ 8.23
~~8.27~~
~~9.07~~
3 ~~(25.61~~
~~8.53~~
~~8.54~~

~~8.23~~
~~8.21~~
~~8.98~~
3 (25.42
8.47
.58
~~9.05~~

13 ~~14~~^{h} 56^{m} 10.20^{s}
61.93
8.27
.06
~~8.21~~

14^{h} 1^{m} 6.48^{s}
57.41
9.07
.69
~~8.98~~

ass. n = .07
.07
.57
.0399
.88
.07
.0616
1.23
.07
.0861
.67
.38
456
171
.2166
.88
.38
704
264
.3344
122
.38
976
366
.4636

13^{h} 50^{m} 30.50^{s}
22.18
8.32
22
8.54
8.60
8.61
3 (25.75
8.58
.58
9.16

13^{h} 56^{m} 10.20^{s}
61.93
8.27
.33
8.60

14^{h} 1^{m} 6.48^{s}
57.41
9.07
.46
8.61

Frod. 1327 is FAST
0^{m} 9.16^{s}

at 13^{h} 55^{m} S.T.

Friday, June 25, 1909

Time of beginning 22h 30m

Collimation. Wa. Obs.

[illegible] Recorder

S. Coll on N-Coll. Micrometer found at 33.619

S. Coll on N-Coll.	Tel on S. Coll.	Tel on N. Coll.
59.0	33.303	34.317
57.0	.309	.345
55.3	.107	.308
57.8	.147	.345
57.5	.120	.329
57.8	.152	.310
57.5	.096	.339
57.5	.096	.340
57.6	.090	.339
58.0	.100	.338
57.50	33.1520	34.3310

Set at 57.5

34.3310
33.1520
2) 67.4830
33.74~~15~~2
.012 aberration
33.754

Micrometer set at 33.754

Sat ~~July~~ June 26, 1909

Level

Wa. Obs.
Wh. Recorder

Telescope South.

Zero	W. End	E End		
E	+89.0	+45.0	+134.0	
W	-32.0	-76.0	-108.0	+26.0
E	+89.5	+ ~~54.9~~ 44.1	+ ~~144.4~~ 133.6	
W	-31.0	-75.5	106.5	+27.1

Telescope North.

Zero	W. End	E End		
W	-20.5	-6~~5~~4.0	-84.5	
E	+83.5	+ ~~40.3~~ 39.7	+123.2	+38.7
W	-18.0	-62.0	-80.0	
E	+80.0	36.0	+116.0	+36.0

Telescope North.

Wh. Obs.
Wa. Recorder.

Zero	W. End	E. End		
W	-18.0	-62.0	-80.0	
E	+84.0	+40.0	+124.0	+ ~~4.0~~ 44.0
W	-18.0	-62.0	-80.0	+44.0
E	+84.0	+40.0	+124.0	

Telescope South

Zero	W. End	E. End		
W	-40.0	-85.0	-125.0	
E	+93.0	+48.0	+141.0	+16.0
W.	-40.0	-85.0	-125.0	
E.	+92.0	+47.0	+139.0	+14.0

32) 245.8 (7.6
224
210
192
180
120

7.656
.06
45936 = b
1.35 = sec c
229680
137808
...01360

b sec c = $0^s.62$ West end high.

Sat June 26, 1909

4h 15m

Collimation		Wh Obs
N. Coll on S Coll	~~N. Coll.~~ Tel on S Coll.	Tel on N Coll
57.8	~~32.963~~	3.
58.6	~~.913~~	
57.1	33.026	34.411
58.7	.042	.410
59.1	.047	.410
58.9	.031	.410
59.4	.092	.417
59.7	.089	.412
58.2	.063	.409
58.2	.012	.418
58.5 7	.052	.407
Set at 58.6	.046	.411
	33.0500	34.41175

33.0500
34.4115
2)67.4615
33.7308
.012
33.7428

Time finding

Col. set at 33.743

4h 40m

Sat June 26, 1909

Mer Cir — Wells.

Rattle at 15h 39m.

ν Serpentis +18°25'

ε Serpentis +4°45' (missed 1st wire)

ε Coron. Bor. +27°8'

ϑ Drac. +58°48'

+18°25'			~~+4°45'~~		+4°45'			+27°8'		
44m 23.9	13.3	7.2	~~46m 05.9~~		46m ~~00.0~~	~~00.0~~		53m 33.2	25.6	8.8
26.5	10.8	7.3	~~08.2~~		05.9	47.7	3.6	36.9	23.0	8.9
29.0	08.0	7.0	~~10.5~~	~~50.2~~	08.2	45.3	3.5	38.4	20.0	8.4
31.7	05.4	7.1	~~13.0~~	~~47.7~~	10.5	42.7	3.2	41.3	17.3	8.6
34.3	02.8	7.1	~~19.4~~	~~45.3~~	13.0	~~45.3~~ 40.3	3.3	44.0	14.7	8.7
40.9	56.4	7.3	~~22.9~~	~~42.7~~	19.4	~~42.7~~ 33.9	3.3	51.3	07.8	9.1
44.7	52.4	7.1	~~26.7~~	~~43.0~~	22.9	~~40.3~~	3.4	55.4	03.6	9.0
		48.6		~~0.3~~ ~~33.9~~ ~~30.5~~		30.5	26.7			59.4
		15 | 8.7					~~8~~ 13 | 9.9			15 | 5.9
		48.58					26.69			59.39

+58°48'

~~59m~~ 60m 37.0	07.3	4.3
41.5	02.6	4.1
46.5	57.8	4.3
51.1	53.0	4.1
55.8	48.3	4.1
08.1	36.3	4.4
14.9	29.2	4.1
		22.0
		15 | 1.40
		22.09

1.65 ~~.08~~
.08 8.12
1.57 8.40
1.57.1 3.26 / 3.4 .0.20
60

~~loss~~ h = .0.2

~~loss. h = .58~~

.58 .83
~~.38~~ .38
~~.464~~ 664
174 249
.2204 .3154
.40 .73
.38 .38
320 584
120 219
.1520 .2774
.58 .82
0.2 .02
.116 .164
40 .75
.2 .2
.080 .150

15h ~~59~~ 44m 48.58s	15h 46m 26.~~60~~ 569	15h 53m 59s.39	~~15h~~ 16h ~~59~~ 60m 22s.09
40.15	18.0529	50.82	13.37
8.43	~~8.66~~ 8.40	8.67 .08	8.72
~~.22~~ .12	~~.22~~ 8	~~.40~~	~~.28~~
8.65 8.55	~~8.87~~ 16	~~8.72~~ 8.65	~~8.44~~
~~8.87~~ 8.56	8.56	~~8.72~~	.15
~~8.72~~ 8.65			8.57
~~8.44~~ 8.57			
4 ~~34.68~~ 4 34.33			
~~8.67~~ 8.7581			
~~.62~~ 8.58			
~~9.29~~ .62			
9.20			

Frod. 1327 is FAST

0m 9s.20

at 15h 50m S.T.

Monday June 28, 1909

Mer. Cir. Wa. Obs.

Rattle at $15^h 16^m$

ν^1 Bootis +41° 8'

α Coron. Bor +27° 1'

+41° 8'

$27^m 19^s.0$ 21.1	0.1
22.4 18.0	0.4
25.8 14.7	0.5
29.0 11.3	0.3
32.0 08.2	0.2
40.3 00.0	0.3
46.3 56.2	0.5

50.3

15)26.1.0

50.17

$15^h 27^m 50.17$
41.34
8.83
.01
8.84
8.77
2)17.61
8.805 or 8.81
0.62 b secd
9.43

Ass.h = 0.20
.20 .04
.04
.0080

.40
.20
.0800

+27° 1'

$30^m 34^s.0$ 26.4	0.4
36.8 23.9	0.7
39.7 21.1	0.8
42.4 18.4	0.8
44.9 15.5	0.4
52.0 8.8	0.8
56.2 4.5	0.7

00.5

15)51

00.34

$15^h 30^m$ 00.34
51.65
8.69
.08
8.77

Frod. 1327 is Fast
$0^m 9^s.43$
at
$15^h 28^m$ Siderial Time.

Mer Cir. Wednesday June 30, 1909 Wa Obs.

~~Rattle at. 17h 57m~~

~~36 Draconis + 64° 21'~~

~~109 Herculis + 21° 43'~~

~~b Draconis + 58° 44'~~

Rattle at 18h 30m

α Lyrae + 38° 41'

110 Herculis + 20° 27' — missed 1st three.

~~θ Serpentis pr. + 4° 5'~~

θ Draconis + 59° 16'

ε Aquilae + 14° 56'

Pen gave out — record no good.
see next page.

ass. n = .20

Wednesday, June 30, 1909

Mer. Cir

W.a.Bk.

Rattle at 19h 25m

β Cygni +27° 46'

ξ Cygni +50° 0'

γ Aquilae +10° 23'

+27° 46'

~~28~~ 27m 48.0s 41.1 9.1
50.9 38.3 9.2
53.4 35.4 8.8
56.4 32.4 8.8
59.0 29.8 8.8
06.0 22.8 8.8
10.1 18.4 8.5
14.3
15 ⌊63.
14.4
.42
4.95
9.47

19h 27m 14.42s
19 27 04.95
9.47
.08
~~8.39~~
9.55
9.46
9.67
3 ⌊28.68
9.56
.62 b sec. φ
10.18

9.47
.08
9.55
10.42
9.63
3 ⌊29.60
9.87
.62 β sec φ
10.49

+50° 0'

~~33~~m 35.4s 48.3 3.7
39.3 44.6 3.9
42.9 40.7 3.6
46.9 36.9 3.8
50.8 33.0 3.8
~~88.6~~ 23.3 3.4
~~02.0 23.3~~ 3.8
06.0 -17.8 ~~17.8~~
12.0
15 ⌊120
12.80
~~62.32~~

19h 3~~3~~4m ~~6~~12.80s
19h 34 0~~62.32~~
~~9.62~~
~~.06~~
~~9.46~~
10.48

10.48
.06
10.42

+10° 23'

~~41~~m 43.4s 31.0 4.4
46.0 28.6 4.6
48.3 26.0 4.3
50.9 23.4 4.3
53.4 20.9 4.3
58.8 14.8 3.6
03.4 11.0 4.4
07.3
15 ⌊42
7.28

19h 4~~1~~2m 7.28s
19 41 57.80
~~9.52~~
~~73~~
~~.13~~
~~9.67~~
9.48

9.48
.15
9.63

Frod. 1327 is FAST

0m. 10s.18

at

19h 30m S.T.

Ass. n = .20

.73
.20
.1460

.41
.20
.0820

.28
.20
.0560

Saturday July 3. 1909

G. obsr.

Rattle $15^{h}\ 32^{m}$

α Serpentis	6° 42′
χ Serpentis	18° 25′.
ε Coron Bor	27° 08′
19 Urs. Min	76° 06′
σ Herculis	42° 37′

1

$15^{h}\,39^{m}\,59^{s}.31$
$15^{h}\,39^{m}\,48^{s}.59$
10.72
.15
10.87
10.81
10.82
3 | 32.50
10.83
.62 b sec φ
11.45

2

$15^{h}\,44^{m}\,50^{s}.82$ ~~26~~
$15^{h}\,44^{m}\,40^{s}.13$
10.69
.12
10.81

3

$15^{h}\,54^{m}\,01^{s}.54$
$15^{h}\,53^{m}\,50^{s}.80$
10.74
.08
10.82

Frod. 1327 is FAST
$0^{m}.\,11^{s}.45$
at
$16^{h}.\ 05^{m}$ S.T.

Wires = 7

1

6°42′

$16^{h}\ 39^{m}\ 35^{s}.6$	22.9	8.5
38.2	20.5	8.7
40.6	18.0	8.6
43.3	15.5	8.8
46.7	13.0	8.7
52.0	06.7	8.7
56.4	03.0	8.4
		59.3
		15 | 4.7
		59.31

+ 42° 37′

$30^{m}\ 51^{s}.0$	54.8	5.8
54.2	51.5	5.7
57.9	48.2	6.1
01.2	44.8	6.0
04.4	41.3	5.7
12.8	32.9	5.7
17.8	28.0	5.8
		22.8
		15 | 13.6

16^{h} 31^{m} 22.91
16 31^{m} 12.08
10.83
.00
10.83
.62
11.45

2

+18°25′.

$44^{m}\ 26^{s}.2$	15.7	1.9
28.7	13.0	1.7
31.3	10.4	1.7
34.0	07.6	1.6
36.5	05.0	1.5
43.0	58.7	1.7
47.0	54.7	1.7
		50.9
		15 | 12^{s}
		50.82

3

27° 08′ 5

$53^{m}\ 35^{s}.2$	27.9	3.1
38.0	25.1	3.1
40.7	22.3	3.0
43.6	19.4	3.0
46.4	16.8	3.2
53.3	9.9	3.2
57.4	05.7	3.1
		01.5
		15 | 8.27
		1.54

Wednesday July 1, 1909

Mer Cir. 80a Obs.

Rattle at; $16^h 25^m$

σ Herculis +42°37'
η Herculis +39° 5'
49 Herculis +15° 7'
ε Herculis +31° 3'
ζ Draconis +65° 49'

Assume .20
.10
.2
.020
.64
.02
.0128
.31
.062
1.26
.20
.252

+42°37'

$16^h 30^m$	$~~30~~$ $53^s.7$	57.5	1.2
	57.0	54.2	1.2
31^m	00.5	50.7	1.2
	03.9	46.8	0.7
	07.0	43.7	0.7
	15.5	35.3	0.8
	20.5	30.7	1.2
			25.4
			15)37.4 40
			25.~~24~~ 49

+39°5'

$16^h 39^m$	$31^s.9$	32.0	3.9
	35.0	29.0	4.0
	38.0	25.4	3.4
	41.2	22.4	3.6
	44.6	19.5	4.1
	52.6	11.8	4.4
	57.1	6.9	
			62.0
			15)2.4
			2.16

+15°7'

$16^h 47^m$	$47^s.5$	36.0	3.5
	50.0	33.1	3.1
	52.3	30.6	2.9
	55.0	28.0	3.0
	57.5	25.8	3.3
	03.9	19.0	2.9
	07.9	15.6	3.5
			11.8
			15)9.0
			11.60

+31° 3'

$16^h 56^m$	$36^s.6$	31.1	7.7
	39.4	28.4	7.8
	42.2	25.5	7.7
	45.1	22.7	7.8
	48.0	19.8	7.8
	55.3	12.4	7.7
	59.8	68.0	7.8
			03.9
			15)13.2
			3.88

+65°49'

17^h ~~16~~ 07^m ~~08~~	$50^s.8$	45.4	6.2
	56.7	39.5	6.2
08^m	02.8	33.4	6.2
	08.9	27.1	6.0
	14.8	21.0	5.8
	30.0	05.9	5.9
	38.5	56.8	6.3
			47.7
			15)14.3 80
			47.95

$16^h 31^m 25^s.$~~24~~ 49	$16^h 40^m 02^s.16$	$16^h 48^m 11^s.60$	$16^h 57^m 3^s.88$	17^h ~~16~~ 08^m ~~07~~ $47^s.95$
$16^h 31^m$ 12.05	$16^h 39^m$ 48.44	$16^h 47^m$ 57.98	$16^h 56^m$ 60.29	17 08 34.31
13.~~19~~ 44	13.72	13.62	13.59	13.64
	.02	.0~~4~~1	.06	
	13.74	~~14.26~~	13.65	
		13.63		

Mer. Cr. Thursday July 8, 1909 Wa Ok.

Rattle 16h 5m.

Cloudy — with slight rain.

Mer Cir. Friday July 9, 1909 Wa. Obs.

Rattle at. $14^h 47^m$
B Bootis +40°44'
[3 Serpentis +5°16'
~~u Bootis +37°~~ 91' clouds in way
V' Bootis +41°8'
Rattle at $15^h 30^m$.

+40°44'			+5°16'			+41°8'		
$1\overset{4}{\cancel{5}}^h 58^m 16^s.8$	18.6	5.4	$15^h 10^m 33^s.0$	19.7	2.7	$15^h 27^m 25^s.0$	27.5	2.5
20.1	15.5	5.6	35.3	17.~~2~~	2.5	28.4	24.1	2.5
23.1	12.1	5.2	37.7	15.0	2.7	31.7	20.9	2.6
26.6	08.8	5.4	40.1	12.5	2.6	35.0	17.5	2.5
29.7	05.6	5.3	42.8	09.9	2.7	38.2	14.4	2.6
38.0	57.5	5.6	49.0	03.9	2.9	46.4	06.1	2.5
42.8	52.5	5.3	52.6	00.1	2.7	51.3	01.1	2.4
~~47.8~~		47.8			56.3			56.3
		15)10.5			15)5.1			15)3.9
		47.70			56.34			56.20

Ass. n = .20
.05 add to S star
.20
.0000
.04
.20
.0080

$14^h 58^m 47^s.70$
$14^h 58^m 32.49$
15.21
~~15.01~~
~~2)30.22~~
~~15.11~~
15.21
.01
15.22
15.01
2)30.23
15.115 or 15.12
.62 b sec φ
15.74

15^h

$15^h 27^m 56^s.20$
$15^h 27^m 41.19$
15.01
.00
15.01

Frod. 1327 is Fast.

$0^m\ 15^s.74$
at
$15^h\ 11^m$ S.T.

Saturday July 10, 1909

$10^h 27^m$ S. J. Removed 1 gr. from #1327. Sod = 0.

Monday July 12. 1909.

Mer. Cir.

Wa Bb.

Rattle at ~~$15^h 10^m$~~ $15^h 35^m$

~~ι Draconis +59° 17'~~
~~ψ Bootis +41° 8'~~
δ Herculis +42° 37'
ε Coron Bor +27° 8'
θ Draconis +58° 48'
ρ Herculis +45° 10' not in book
Rattle at $16^h 31^m$

+27° 8'

$15^h 51^m 28^s.3$
31.2
33.9
36.6
39.4
46.3
50.6

~~18.3~~
~~15.4~~
~~12.7~~
~~09.9~~
~~58.9~~

20.9
18.3
15.4
12.7
09.9
03.0
58.9
~~54.7~~

9.2
9.5
9.3
9.3
9.3
9.3
9.5
54.7

$15 \overline{)\,19.1}$
54.66

+58° 48'

$15^h 57^m$ ~~34.7~~
~~36.5~~
~~41.3~~
~~46.1~~
~~50.8~~

$15^h 58^m 02.7$
09.9
17.0
24.3
31.2

$6 \overline{)\,85.10}$
17.02

~~+45° 10'~~ +42° 37'

$16^h 28^m$ 44.1
47.5
51.0
54.0
57.3
29^m 05.7
11.0

47.7
44.6
41.6
37.6
34.4
26.0
21.0

1.8
2.1
2.0
1.6
1.7
1.7
2.0
16.0

$15 \overline{)\,2.9}$
16.19

Corr n = .20
add to S. star
with clock ~~slow~~ fast

.40
.20
.0880

.73
.20
.1460

$15^h 51^m 54^s.66$
$15^h 53^m 50.71$
$1^m 56^s.05$
.08
~~$1^m 55^s.97$~~
$1^m 56^s.13$
$1^m 55^s.86$
$1^m 58.80$
~~$4^m 50.79$~~
$3 \overline{)\,8}$
$3 \overline{)\,170.79}$
$1^m 56^s.93$
+.62 b sec δ
$1^m 57.55$

$15^h 58^m 17^s.02$
$16^h 0^m 13.03$
$1^m 56.01$
.15
$1^m 55^s.86$

$16^h 29^m 16^s.19$
$16^h 31^m 11.99$
$1^m 55.80$
$1^m 55^s.80.$

Frod 1327 is SLOW

$1^m 57^s.55$
at $16^h 5^m$ S.T

Tuesday July 13 - 1909.

Mer. Circle G-obs.

Until further notice observations are with Mean Solar Clock B.394

Rattle $8^{h}\ 05^{m}$

γ Serpentis ~~β Serpentis~~ ~~+15° 42′~~ (out)

γ Herculis 19° 21′

β Herculis $21^{\circ}\ 41^{m}$

$8^{h}\ 36^{m}$ 52.2 41.8 4.0

54.9 3.9.1 4.0

57.5 36.4 3.9

55.94 .08 37 0.1 34.0 4.1

3 .4

55.91 .32 2.8 31.5 4.3

9.4 24.9 4.3

13.1 20.9 4.0

17.1

15) 15.7

8 37 17.05

1 24.93

.05

16 18.19

7 22 54.08

16 17 54.30

1.61 16 17 55.91

73

.88 — 1.61 (slow)

+ .11

+ .62

— .88 error, (clock slow)

Clock F1327 taken away to be cleaned by William Bond & Son.

Mer. Cir. Wednesday July 14, 1909 Wa Cb.

Rattle at 7h 48m
β Serpentis +15° 42'
ε Cor. on Bor. +27° 8'

+15° 42'

7h ~~48~~ 57m

8.7	57.0	5.7
11.3	54.7	6.0
13.7	52.2	5.9
16.3	49.7	6.0
18.8	47.0	5.8
25.4	40.5	5.9
29.1	36.8	5.9
		33.0
		15 | 4.2...
		33.28

8h 8m

8m	54s.8	47.3	2.1
	57.6	44.7	2.3
9m	00.3	41.9	2.2
	03.1	38.9	2.0
	05.9	36.2	2.1
	12.7	29.3	2.0
	16.9	25.3	2.2
			21.0
			15 | .90
			21.06

Ass. n = .20
+ for S. Star

.63
.20
.1260

.46
.20
.0800

75
12
63

70
21
49

70
41
29

7h	57m	33s.28
	16m	18.19
7	26	50.64
	01	18.36
		00.09
	~~5~~	00.56
15	42	
15	42	00.68
		− .12
		+ .13
		+ .62 b sec φ
		+.63

8h	9m	21s.06
	16	18.19
7	26	50.64
	1	20.33
		.06
		~~70~~s.28
15h	63m	~~00~~ 50.28
15h	63m	50.69
		~~−.61~~
		~~+.08~~
		~~+.62~~ b sec φ
		~~+.19~~

50.28
50.69
− 00.41
+ .08
+ .62
+ .19
.29

+.63
+.29
2 | .92
+ .46

Bond 394 fast 0.46.

~~Clock Frod. 1327 taken away to be cleaned by William Bond & Sons.~~

Thursday July 15, 1909

Mer-Cir. 9 obsr

Rattle 9h 25m
α Ophiuchi 1st wire missed 12° 37'
i ~~Ophiuchi~~ Herculis 46° 02'
μ Herculis missed 3rd wire 1st tally 27° 46'

12° 37'	46° 02'				27° 46'		
~~45.7~~	9h 47m	39.3	46.9 ~~43.5~~	6.2	45.7	38.6 ~~35.8~~	4.3
~~48.5~~		43.0	43.5 ~~39.8~~	6.5	48.5	35.6 ~~33.0~~	4.1
		46.3	39.8 ~~36.3~~	6.1	—	33.0 ~~27.4~~	
~~54.0~~		50.1	36.3 ~~32.9~~	6.4	54.0	30.1 ~~20.2~~	4.1
~~56.7~~		53.7	32.9 ~~23.9~~	6.6	56.7	27.3 ~~16.2~~	4 0 ~~2.9~~
~~04.0~~	48	02.8	23.9 ~~20.1~~	6.7	04.0	20.3 ~~12.0~~	4.3 ~~6.0~~
		08.0	18.5	6.5	08.2	16.2	4 4 ~~8.0~~

.12
.2
.024

13.2
15) 3.3

12.0
13) 1.2

9	48	13.21	9	54	12.09
	16	18.19		16	18.19
7	30	47.20	7	30	47.20
	1	36.59		1	37.58
		.04			.03
17	36	55.23	17	42	55.09
17	36	55.86	17	42	55.67
		− .63			− .58
		− .02			+ .08
		+ 62			+ .62
		− .03			+ .12

.39
.2
.078

Saturday, July 17, 1909.

Mer Cir. G obsr.

Rattle 5h 45m

η Urs Maj 49° 45′

~~43~~ 5h	47	26.3	38.6	5.9
		30.2	35.0	5.2
		34.0	31.1	5.1
		38.1	27.3	5.4
		41.6	23.4	5.0
		51.1	14.0	5.1
		56.9	08.5	5 4
	48			02.7

15) 9.8

~~13~~ 5	48	02.65
	16	18.19
7	38	40.31
	0	57.17
		.01
13	43	58.33
13	43	58.85
		− .52
		− .05
		+ .63
		+ .06

.18
.8
.144

.27
.2
.654

Monday July 19, 1909

Mer. Cir. Wa Obs.

Rattle at $11^h 35^m$ ~~$19^h 40^m$~~

ψ Cygni $+52°11'$

o' Cygni 09 $+46° 27'$

Rattle at $12^h 08^m$

$+52° 11'$

$11^h 47^m$	$53.^s2$	09.1	2.3
	57.1	05.2	2.3
48^m	00.9	01.2	2.1
	05.0	57.1	2.1
	08.8	53.2	2.0
	19.2	43.4	2.6
	25.3	37.3	2.6
	3		31.2
			15⟌22
			31.14

$11^h 48^m$	$31.^s14$
16	18.19
7 46	33.43
01	56.81
	.09
$19^h 53^m$	19.16
$19^h 53^m$	19.11
+	0.05
−	.07
+	.62
+	.60
+	.70
2	1.30
+	.65

.37
.20
.0740

.13
.20
.0260

$+46° 27'$

$12^h 05^m$	$23.^s6$	31.4	5.0
	27.3	27.9	6.2
	30.8	24.2	5.0
	34.2	20.5	4.7
	38.0	17.0	5.0
	46.6	88.3	4.9
	52.3	02.9	5.2
			57.4
			15⟌74
			57.49

$12^h 05^m$	$57.^s49$
16	18.19
7^h 46	33.43
01	59.10
	.16
$20^h 10^m$	48.37
$20^h 10^m$	48.26
+	0.11
−	.03
+	.62
+	.70

Bond 394 is FAST

0^m $0.^s65$

at $12^h 0^m$.

Tuesday July 20, 1909

Mer. Cir — Wa Obs.

Rattle at 13h 45m

Clouds in Way.

Wednesday July 21. 1909

Collimation of Mer.-Circle — 9 obsr.

Micrometer found at 33.743 Wa Recorder

S col. on N. Col.	Tel on N. Col.	Tel on S. Col.
3.5	33.939	33.362
3.2	.936	.379
4.9	.952	.371
4.2	.940	.384
4.5	.958	.398
4.7	.962	.378
4.5	.961	.362
4.8	.953	.372
6.0	.949	.392
4.9	.946	.389
45.2	9.496	$3.\overset{7}{8}87$
Set at 4.5	33.950	$33.3\overset{7}{8}9$

$$
\begin{array}{r}
33.950 \\
33.379 \\
2\,)\overline{67.329} \\
33.664 \\
.012 \\
\hline
33.676
\end{array}
$$

.012 diurnal aberration

Micrometer set at — 33.676

Clock # 1327 returned by William Bond & Son today.

Wednesday July 21, 1909

Level —

J. Gla..
Wa. Recorder.

Telescope South.

Zero	W End	E End		
W	−34.3	−73.0	−107.3	+19.9
E	+83.3	+44.9	+127.2	

Telescope North.

W	−10.2	−49.0	−59.2	+37.4
E	+67.7	+28.9	+96.6	

$8 \,\boxed{57.3}$
+7.16
.06 l
.4296
1.35 arc φ
21480
14888
4296
.599960

Telescope ~~South~~ North

Zero	W End	E End		
W	−11.3	−49.9	$-\overset{6}{\cancel{5}}1.2$	+35.8
E	+67.8	+29.2	+97.0	

Telescope ~~North~~ South.

W	−31.0	−69.8	−100.8	+16.0
E	+77.8	+39.0	+116.8	

8) 51.8
6.48
.06
$\overset{3}{\cancel{4}}8.88$
1.35
19440
11664
3888
.524880
.599
1.123
.561

b sec φ = +0ˢ.56 (West end high)

Wednesday July 21. 1909.

Merid. Circle G. obsr.

Rattle 13^{h} 35^{m}.

η Urs. Maj. 49° 45 first rattle omitted
α Bootis 19° 38'

19° 38
1~~3~~^{4h} 11^{m} 07.0 56.6 3.6
09.8 54.1 3.9
12.4 51.6 4.0
14.9 48.9 3.8
17.5 46.3 3.8
- - - - -
24.1 39.8 3.9
28.1 35.8 3.9
31.9
15) 13.8
14^{h} 11^{m} 31.92
14 11 31.46
+ 0.46
+ .11
+ .56
+ 1.13

.56
.2
.112

7^{h} ± Sid Time Oiled the jewel of the signal break on 71327
Clock seems to have lost over 8 seconds over night. G.

Thursday. July 22, 1909

~~Rallte 14^h 09^m~~

15^h 27

α Serpentis 6° 42′

γ " 18° 25′ wires 1, 2, 14 & 15 out

ε Cor. bor. 27° 8′

27° 8′

15 53	15.0	07.6	2.6
	17.8	05.1	2.9
	20.5	02.1	2.6
	23.3	59.4	2.7
	26.1	56.6	2.7
	33.1	49.5	2.6
	37.2	45.6	2.8

41.2
15) 5.1

15 53 41.34
15 53 50.59
− 9.25
+ .08
+ .56
− 8.61

.38
.2
.076

Saturday July 24. 1909

Mer Circle   G obs

~~Ratte 14h 00m.~~
~~β Coron bor. 29° 26'~~
~~δ " " 27° 0'~~
Ratte 15h 36m
β Serpentis 15° 42'
π " 18° 25'

18° 25'

15h 44m 07.1 56.6 3.7
09.8 54.0 ~~56.6~~ 3.8
12.3 51.3 ~~54.0~~ 3.6
14.9 48.7 ~~51.3~~ 3.6
17.5 46.2 3.7
24.1 39.7 3.8
28.0 35.8 3.8

31.9
15) 12.9

15 44 31.86
15 44 39.93
− 8.07
+ .12
+ .56
− 7.39

.58
.2
.116

Removed 1g at 16h 04 from F 1327 Loa = 0

Monday July 26. 1909

Mer-Cir. 9 obs.

Rattle 5h 33m (Clock B 394)

γ Bootis 38°41′

~~30° 45′~~
38° 41′

5h 56m 29.0 28.8 7.8

32.1 25.8 7.9

35.2 22.4 7.6

38
~~41.6~~ 19.4 8.0

41.6 16.3 7.9

49.5 08.4 7.9

54.3 03.8 8.1

59.0

15) 14.2

5 5~~7~~6 58.95

16 18.19

8 14 9.32

0 58.~~65~~48

.16

14 2~~7~~8 25.19
~~28.27~~

14 28 25.76

− .66

+ .02

+ .56

− .08

.11
.2
.022

Mer. Cir. Tuesday July 27, 1909 - G. Blz.

Rattle at ~~4~~ 5^h 38^m

α Bootis ~~38° 41'~~ 19°38'

19° 38'

~~38° 41'~~

5^h 35^m 46.1 35.8 1.9

48.9 ~~35.8~~ 33.1 2.0

51.2 ~~33.1~~ 30.4 1.6

53.9 ~~30.4~~ 28.0 1.9

36^m 56.6 25.3 1.9

03.1 18.8 1.9

07.0 14.9 1.9

~~11.0~~ 11.0

15 | 14.6

5^h 36^m 10.94

16 18.19

8 1.8 05.88

0 55.20

.03

14^h 11^m 30.24

14^h 11^m 31.38

− 1.14

+ .11

+ .56

− .47

.56
.2
.112

− 1.14
+ .67
− .47

Bond 394 is
SLOW $0^m.47^s$
at
14^h 11^m S.T.

Wednesday July 28. 1909

Mer. Cir. Wa. Obs.

Rattle at 8h 02m
η Herculis +39° 5'

+39° 5'

7h 59m 37.8s 38.0 5.8
41.1 34.9 6.0
44.1 31.7 5.8
47.3 28.4 5.7
50.4 25.3 5.7
58.3 17.3 5.6
8h 00m 03.1 ~~22.6~~ ~~0.8.0~~ 5.7
12.6
08.0
15 | 13.3
8.08

7h 59m 8.08s
16 18.19

8h 22m 02.44

01 18.69

.02

16h 39 47.42

16h 39 46.55.

+0.87
+ .02
+ .56
+ ~~1.44~~
+ 1.45

Bond 397 is FAST
0m 1.45s
at.
16h 39m S.T.

.10
.2
.020

.87
.56
1.43
.02
1.41

Thursday July 29, 1909 —

Mer Cir. Waugh. Obs.

Rattle at $17^h\ 0^m$

ε Hercules + 31° 3'

+ 31° 3'

$16^h\ 56^m$	22.5	17.1	9.6
	25.6	14.6	0.2
	28.3	11.7	0.0
	31.3	08.8	0.1
	34.2	05.8	0.0
	41.4	58.6	0.0
	45.7	54.8	0.5

$$\begin{array}{r} 50.1 \\ \hline 15\,\underline{)\,16.5} \\ 50.11 \end{array}$$

$16^h\ 56^m\ 50^s.11$

$16^h\ 56^m\ \underline{50^s.10}$

+ .01

+ .06

+ .56

+ ~~.51~~

+ .63

.31
.2
.062

Frod. 1327 is Fast

$0^m\ 0^s.63$ ~~.51~~

at

$16^h\ 56^m$ S.T.

Friday July, 30, 1909.

Mer. Cir. Waugh Obs.

γ Bootis +38° 42'
Rattle at 14h 32m

+38° 42'

14h 27m	55.s4	55.6.	1.0
	58.6	52.4	1.0
28m	02.0	49.1	1.1
	04.8.	45.9	0.7
	08.0	42.8	0.8
	15.7	34.9	0.6
	20.8	30.2	1.0

26.3
15) 6.5.
25.43

14h 28m 25.s43
14h 28m 25.s68
-.25
+.02
+.56
+.33

.11
.2
.022

Frod. 1327 is Fast.
0m 0.s33
at
14h 28m S.T.

Mr. Gerrish added 1 gm to Frod. 1327 at 14h 51m Led 1gm

Friday July 30, 1909.

Mer. Cir. Waugh Obs.

Rattle at $16^h 2\overset{3}{\theta}^m$
B Herculis +21°41'.

+21°41'

$16^h 25^m$	$54^s.0$	44.4	8.4
	57.0	41.6	8.6
	59.7	39.3	9.0
26^m	02.0	36.6	8.6
	04.6	34.0	8.6
	11.4	27.6	9.0
	15.4	23.5	8.9

19.4

15 | 65.5

19.56

.52
.2
.104

$16^h 26^m 19^s.56$
$16^h 26^m 19^s.92$
− .36
+ .10
+ .56
+ .30

Frod. 1327 is Fast.
$0^m 0^s.30$
at
$16^h 26^m$ Siderial Time.

Saturday July 31, 09

Mer Cir   Rattle $16^h 23^m$ G-ob

β Herculis	σ Herculis	η Herculis
21' 40'	42° 37'	39° 5'
middle tally	wires 2 + 3 poor.	lost last tally

$16^h 30^m$ 39.6 43.1 2.7

~~43.0 39.6~~

~~46.4 36.4 .8~~

49.3 33.0 2.3

52.7 29.6 2.3

- - - - - - -

31^m 01.1 21.1 2.2

06.2 16.1 2.3.

11.3

11) $\overset{2}{\cancel{8}}.1$

$16^h 31^m$ 11.~~60~~ 79

16 31 11.68

~~0.03~~

− 0.49

− .00

+ 56

~~5~~

+ .07

+.01
.2
.002

~~Clock 0.07~~

Clock $0.^s07$ fast at $16^h 31$.

Monday August 2, 1909

Mer.-Cir. Waugh Obs.

Rattle at. 16h 53m
π Herculis +36° 54′
B Draconis +52° 22′ missed 1st three
Rattle at 17h 32m

+36° 54′

17h 11m	24.6s	23.3	7.9
	27.6	20.4	8.0
	30.8	17.3	8.1
	33.9	14.2	8.1
	37.0	10.9	7.9
	45.0	02.9	7.9
	49.4	58.7	8.1
			53.6
			15 | 14.6
			53.97

+52° 22′

17h 27m	~~58.0~~s	00.0	0.0
28m	~~02.3~~	00.0	0.0
	00.0	00.0	0.0
	58.0	50.5	8.6
	02.3	46.7	9.0
	12.3	36.3	8.6
	18.4	30.1	8.5
			24.3
			9 | 2.9
			24.32

~~37~~

.16 .39
.2 .2
.032 .078

17h 11m 53.97s
17h 11m 54.29s
−0.32
+0.03
−0.29
~~−0.07~~
~~+0.36~~
~~+0.56~~
~~+0.20~~

~~0.29~~
~~−0.07~~
~~2 | 0.36~~
~~−0.18~~
~~+0.56~~
~~+0.38~~

17h 28m 24.32s
17h 28m 24.47s
−0.15
~~+0.08~~
~~+0.03~~
−0.07

−0.15
−0.08
−0.23

−0.29
−0.23
2 | −0.52
−0.26
+0.56
+0.30

Trod. 1321 is FAST
0m 0s.30
at
17h 15m S.T.

Friday, ~~July~~ August, 6, 1909

Mer. Cir. Waugh Clk.

Rattle at 23h 57m

22 Androm. +45° 33m (Not in book)

Rattle at 0h 30m

71 Androm. +33°, 13m (missed 1st wire in middle group)

θ Cassiopeja l +47° 47m

+33° 13′			+47° 47m		
0h 24h 31m 35s.2	31.2	6.4	0h 24h 39m 06s.2	16.3	2.5
38.3	28.4	6.7	10.2	12.7	2.9
41.1	25.3	6.4	13.7	08.7	2.4
44.0	22.3	6.3	17.5	05.1	2.6
46.9	19.8	6.7	21.1	01.6	2.6 ~~62.3~~
54.4	12.0	6.4	30.6	52.3	2.9 ~~47.0~~
58.8	07.7	6.5	36.9	47.0	2.9
		03.2			41.3
		15 | 3.6			15 | 5.1
		3.24			41.34

0h
24h 32m 3s.24
24h 32m 2s.77
+ .47
+ .05
+ .52
+ .49
2 | 1.01
+ .505
+ .56
+ 1.06

0h
24h 39m 41s.34
24h 39m 40.81
+ .63
− .04
+ .49

.26 .18
.2 .2
.052 .036

Frod. 1321 is Fast
0m 1s.06
at.
24h 35m Sidereal Time.

Monday Aug. 9. 1907

Mer Cir. Waugh Obs.

Rattle at $16^h 24^m$

σ Herculis 42°37'

+42°37'

$16^h 30^m$	$41.^s2$	45.0	6.2
	44.7	41.7	6.4
	48.0	38.3	6.3
	51.3	35.0	6.3
	54.7	31.6	6.3
31^m	03.2	23.3	6.5
	08.0	18.1	6.1

13.0
15)21
13.14

$16^h 31^m 13.^s14$
$16^h 31^m 11.^s50$
+1.64
+ .56
+2.20

.01
.2
.002

Frod. 1327 is Fast
$0^m 2.^s20$
at
$16^h 31^m$ Sidereal Time.

Tuesday Aug: 10, 1909

Mer. Cir. Waugh Clk.

Rattle at 22^h ~~26~~ 33^m

10 Lacertae +38° 34'

+38° 34'

$22^h 34^m 44^s.7$ 44.8 9.6

48.0 42.0 0.0

51.2 38.4 9.6

54.3 35.3 9.6

57.2 32.2 9.4

35^m 08.0 24.1 9.1

10.0 19.7 9.7

~~14.9~~ 14.9

~~10~~ 15 | 11.8

[illegible]

14.78

.12
.2
.024

$\frac{2}{10} \times \frac{18}{1} \frac{36}{2}$.

$22^h 35^m 14^s.78$ (4 corrected to 5)

$22^h 35^m 12.76$

+2.02

+ .02

2.04

+ .56

+2.60

Frod. 1321 is Fast.

$0^m\ 2^s.60$

at

$22^h. 35^m$ Sid. Time.

Waugh

Friday Aug. 13. 1909.

Mer. Cir.   Waugh Obs.

Rattle at $17^h 14^m$

B Draconis +52° 22'.

6 Herculis +46° 3'

+52° 22'

$17^h 27^m$ $48^s.9$ 05.7. 4.6
52.9 01.7 4.6
56.9 57.5 4.4
28^m 01.0 53.5 4.5
05.1 49.4 4.5
~~+5.2~~
15.2 39.5 4.7
4.6
21.3 33.3 ~~27~~.3
~~27~~
27.3
15 ⌊4.2
27.28

$17^h 36^m$ $25^s.0$ 32.2 7.2
28.4 28.7 7.1
31.9 26.0 6.9
35.5 21.7 7.2
38.9 18.1 7.0
47.8 09.1 6.9
53.0 03.8 6.8
58.5
15 ⌊7.6
58.60

$\frac{5}{10} \times 27$ 135
24.34
.13
24.21

$\frac{5}{10} \times 22 = 120$
12
56.49
.12
56.37

.39
.2
.078
.12
.2
.024

$17^h 28^m$ $27^s.28$
$17^h 28^m$ $24^s.21$
+3.07
− .08
+2.99
+3.11
2 ⌊6.10
+3.05.
+ .56
+3.61

$17^h 36^m$ $58^s.60$.
$17^h 36^m$ 55.37
+3.13
− .02
+3.11

Frod. 1327 is Fast
0^m $3^s.61$
at.
$17^h 32^m$ S.T.

Mer Cir. Monday Aug 23, 1909 Wa. 6h.

Rattle at $22^h 40^m$

θ Androm. $+41° 50'$

$+41° 50'$

$22^h 57^m 22^s.7$ 25.4 8.1

25.9 22.3 8.2

29.2 19.0 8.2

32.5 15.6 8.1

35.9 12.2 8.1

57^m 44.3 04.0 58^m 8.3

49.0 59.0 8.0

54.2

15 | 1.20

64.08

$22^h 57^m$ 54.08

$22^h 57^m$ 46.29

+7.79

+0.00

+7.79

.56

+8.35

.02

.2

.004

Fod 1327 is Fast

$0^m 8^s.35$

at.

$22^h 57^m$ S.T.

Mer. Cir. Tuesday Aug. 24. 1909 Wa. 6 lbs.

Rattle at 16h 27m after 1st star.
β Herculis. +21° 41m
Final rattle at 16h 33m

+21° 41m

16h 26m	02s.3	52.7	5.0
	07.6	50.2	5.3
	07.6	47.3	4.9
	10.2	44.7	4.9
	12.9	42.1 – –	5.0
	19.7	35.4	5.1
	23.5	31.5	5.0

27.4
15 ⟌ 76.
27.50

$\frac{3}{5} \times \frac{17}{} = \frac{51.10}{5}$

.52
.2
.104

16h 26m 27s.50
16h 26m 19s.53
+7.97
+ .10
+8.07
+ .56
+8.63

Frod. 1327 is Fast
0m 8s.63
at
16h 26m S.T.

Mer Cir. Thursday Aug 26, 1909.

Waugh C.B.

σ Herculis +42°37'
Rattle at 16h 32m at end

+42.° 37'

16h 30m	48.s0	51.6	9.6
	51.3	48.5	9.8
	54.7	45.0	9.7
	58.0	41.7	9.7
31m	01.2	38.2	9.4
	09.7	29.7	9.4
	14.7	24.8	9.5
			19.9
			15 | 12.0
			19.80

16h 31m 19.s80
16h 31m 11.s34
+ 8.46
+ 0.00
+ 8.46
+ .56
+ 9.02

Frod. 1327 is Fast
0m 9.s02
at
16h 31m S.T.

Mer. Cir. Friday Aug. 27, 1909 Waugh Obs.

17

Rattle at 17h 38m

μ Herculis + 27° 46′

+27° 46′

17h 42m	37.6	30.5	8.1
	40.3	27.8	8.1
	43.0	24.9	7.9
	45.9	22.0	7.9
	48.7	19.3	8.0
	55.7	12.6	8.3
	59.8	08.1	7.9

43m
04.1

15 | 63
04.42

.39
.2
.078

$\frac{2}{3} \times 2$ 1

$\frac{9}{10} \times 18 = \frac{162}{.16}$

55.32
.16
55.16

17h ~~43~~ 42m 64s.42
17h 42m 55s.16
+ 9.26
+ .08
+ 9.34
+ .56
+ 9.90

Frod. 1327 is Fast
0m 9s.90
at
17h 42m 64s.42 S.T.
Waugh.

Monday Aug. 30, 1909

Mer. Cir. Waugh. Obs.

Rattle after 16h 45m
E Herculis + 31° 3'
Final Rattle at 16h 59m

+ 31° 3'

16h 56m 32.0s	26.9	8.9
35.1	24.2	9.3
38.0	21.2	9.2
40.8	18.2	9.0
43.7	15.2	8.9
51.0	08.2	9.2
55.3	03.8	9.1

59.6
15 | 8.2
7.570
69.64

31
.2
.062

16h 56m 59.54s
16h 56m 49.53s
+ 10.01
+ .06
10.07
.56 · b sec φ
+ 10.63

Frod. 1327 is Fast
0m 10s.63
at
16h 56m 59s.54 Sidereal Time
Waugh.

220
144
46

Aug 30, 1909.

Mean Cair. L.C. Obs.

δ Aquilae at +2° 56′ all O.K.
β Cygni at +27 46 obs. both comp.
" " at +50 1 last 6 taps = δ Cygni
previous 15 taps to last 6 those on a
preceding and fainter star.

δ Cygni at +44 55 all O.K.

Last rattle just before 19:44

?
comp to β Cyg.
50.3
~~47.9~~ 43.2 3.5 ✓
12.9 40.7 3.6 ✓
53.9 37.8 3.5 ✓
56.7 32.9 1.3 ✓
59.4 29.8 9.2 ✓
6.4 23.0 9.4 ✓
10.7 18.8 9.5
14.8
8

+2 56
h m
19 20 43.0 29.9 2.9
45.6 27.7 3.3
47.8 24.6 2.4
50.4 22.7 3.1
52.8 20.2 3.0
58.8 13.8 2.6
2.6 10.2 2.8
6.5
66

19 21 6.44
19 20 56.59
+ 9.95
04
9.99
10.00

10.00
.56 brac φ
10.56

assumed n = .05

+27 46 ?
m
26 47.9 41.3 9.2
51.0 38.5 9.5
53.8 35.6 9.4
56.7 31.9 8.6
58.8 25.4 4.2
1.4 21.0 2.4
8.6 16.8 5.4
13.7
74

19 27 13.50
19 27 4.92
8.58
?

star near +50° 1
~~comp~~
m
33 5.3 17.9 13.2
9.1 13.9 13.0
13.4 10.7 14.1
16.5 6.3 12.8
20.6 2.7 13.3
30.0 53.0 13.0
35.9 47.2 41.6 13.1
9.1

19 4 41.61
~~19 42 9.81~~
19 37

+50 1
— 33.3
— 36.8
— 41.1
~~2.3.4~~ 44.8
~~3.3.3~~ 48.7
4.7
40.94

19 34 02.01

+44 55
m s
41 46.7 53.1 9.8
50.4 49.6 10.0
53.5 46.1 9.6
57.4 42.5 9.9
0.7 38.7 9.4
9.4 30.2 9.6
14.4 25.1 9.5
19.8
12.6

19 42 19.81
19 42 9.81
+10.00
00
10.00

△ 9.8
10.0

First & last stars
only ever used
in the reduction

Fired 1327 in Fast
0m 10.56
at
19 30 S.T.
L.C.

Tuesday Aug 31, 1909

Mer. Cir. Waugh Obs.

Rattle at. ~~$19^{h}\ 52^{m}$~~
$20^{h}\ 01^{m}$

Clouds in way
Impossible to observe.
Waugh.

Wed Sept 1, 1909

L.C. Obs.

Mer Cir

δ Cephei	+62	41	too cloudy
β Delph	+14	17	" "
α Cygni	+44	57	" "

chronograph would not run well.

Thursday September 2, 1909

Mer. Cir.

Waugh Obs.

Rattle at $16^h 21^m$
β Herculis +21°41′
σ Herculis +42°37′

+21°41′				+42°37′			
$16^h 26^m$	$05^s.5$	55.8	1.3	$16^h 30^m$	$50^s.4$	54.0	4.4
	07.9	53.2	1.1		53.8	50.8	4.6
	10.7	50.6	1.3		57.0	47.3	4.3
	13.3	47.8	1.1		00.3	44.0	4.3
	16.0	45.2	1.2		03.7	40.6	4.3
	22.5	38.4	0.9		12.1	32.3	4.4
	26.4	34.4	0.8		17.1	27.1	4.2
			30.7				22.0
		16	8.4			15	2.6
			30.56				22.17

.52
.2
.104

$16^h 26^m 30^s.56$
$16^h 26^m 19^s.37$
$+ 11^s.19$
$+ .10$
$+ 11.29$

$16^h 31^m 22^s.17$
$16^h 31^m 10^s.90$
$+ 11^s.27$
$+ 00.00$
$+ 11.27$

+ 11.29
+ 11.27
2 | 22.56
+ 11.28
+ .56
+ 11.84

Frod. 1327 is Fast
$0^m 11^s.84$
at.
$16^h 28^m$ Sid. Time

Waugh

Friday September 3, 1909

Mer. Cir.

Waugh Obs.

Rattle at 16h 29m
O Herculis. 42° 37'.

+42° 37'

16h 30m	~~47~~ 50.9	54.3	5.2
	54.[illegible]	51.3	6.3
	57.4	47.9	5.3
	00.8	44.4	5.2
	04.2	41.1	5.3
	12.6	32.7	5.3
	17.7	27.7	5.4

22.7

15 | 9.7

22.64

$$\begin{array}{r} 16^h\ 31^m\ 22^s.64 \\ 16^h\ 31^m\ 10^s.88 \\ \hline +11.76 \\ +\ \ .56\ b\sec\varphi \\ \hline +12.32 \end{array}$$

Frod. 1327 is fast
0m 12s.32
at
16h 31m S.T.
Waugh.

Sept 3, 1909

Mer cir L. C. Obs.

Chronograph wouldnot run good

Tuesday Sep. 7. 1909

Mer. Cir.; Rattle 17h 14m. G obsr.

π. Herculis
36° 54′

17	11	37.4	36.1	3.5
		40.7	33.1	3.8
		43.8	30.0	3.8
		46.9	27.0	3.9
		50.0	24.0	4.0
		57.7	16.2	3.9
17	12	02.2	11.6	3.8

07.0
15) 13.7

17 12 06.91
17 11 53.57

+ 13.34
+ .03
+ .56
+ 13.93

.16
.2
.032

Wed. Sept 8. 1909

LC obs   Meri Cir.

Rattle after 19:36
γ Aquil at +10 23   all OK
ψ Cyg. at +52 12   all OK
θ Aquilae at ~~A~~ -1 6   all OK
γ Cyg at +39 58   all OK

rattle at 20:21

+10 23
h m s
19 41 47.7   35.0   2.7
50.4   32.8   3.2
52.6   30.3   2.9
55.2   27.7   2.9
57.6   25.1   2.7
42 4.1   18.8   2.9
7.3   15.1   2.4
~~11.5~~ 11.5
6.2
19 42 11.41
41 57.90
19 ~~42 9.63~~

13.51
+.12
13.63

+52 12
h m
19 52
s
54.1   10.2   4.3
58.1   6.3   4.4
53 1.8   2.3   4.1
6.1   58.5   4.6
10.0   54.3   4.3
20.1   44.2   4.3
26.3   38.1   ~~38.1~~ 4.4
32.4
2.8
19 53 32.19
19 53 18.50

13.69
-.06
13.63

-1 6
20 6
29.0   15.6   4.6
31.4   13.3   4.7
33.6   10.8   4.4
36.0   8.3   4.3
38.7   5.8   4.5
44.8   59.7   4.5
48.6   56.1   4.7
52.3
40
20 06 52.27
20 06 38.68

13.59
+.15
13.74

+39 58
20 18
42.8   43.8   6.6
45.9   40.8   6.7
49.2   37.2   6.4
52.3   34.2   6.5
55.7   31.0   6.7
3.5   23.0   6.6
8.2   18.3   6.5
13.2
41
20 19 13.27
20 18 59.67

13.60
+.01
13.61

~~+1.29~~ ~~13.69~~
~~+0.18~~ 13.51
~~1.57~~) 18 (32
171
~~1.11~~ 90

1.29   13.69
0.18   13.51
1.11) .18 (.16
111
690
666

n = .16

13.63
13.63
13.74
13.61
21
13.65
+.56
+14.21

Frod 1327 is Fast
14.21 at
20h : 00m S.T.
L.C.

Mon Sept 13, 1909

Mer Cir L.C. Obs.

~~Rattle~~ at 20:01

o' Cygni at +46 28 all OK

γ " at +39 58 all OK

+46 28

20ʰ 18ᵐ 9.4 17.5 6.9
13.0 14.0 7.0
16.5 10.4 6.9
20.2 6.7 6.9
23.9 3.2 7.1
32.7 54.3 7.0
38.2 48.8 7.0
43.5
73

20 10 43.49 wrong * ok.
20 10 47.79

+39 58

20ʰ 18ᵐ 43.6 45.4 9.7
47.1 42.3 +9.9
50.7 39.2 9.9
54.2 35.7 9.9
57.2 32.5 9.7
5.2 24.5 9.7
10.2 19.4 14.8
11.6

20 19 14.77
20 18 59.59

+15.18
+.01
+15.19
+.56
+15.75

Hods 1327 is fast 15.75ˢ at

20ʰ 19ᵐ S.T.

L.C.

Wed Sept 15, 1909

Mer Cir L.C. Obs

~~Rattle~~ at 19:50

o' Cygni +46 28 last seven wires only
f Cygni +39 58 all, but through clouds

clouds prevented observing first 8 wires on o' Cygni.

+46 28
h m s
20 11 9.2
14.4
23.3
25.7
29.5
33.3
36.7
48.5
29.70
-19.38
20 11 10.32
20 10 47.75 not to be used.
22.57

+39 58
h m s
20 18 45.1 45.1 0.2
48.1 42.1 0.2
51.5 38.6 0.1
54.7 35.3 0.0
57.8 32.7 ~~9.9~~ 0.0
6.0 24.1 0.1
10.6 20.4 1.0
1.5.9
2.45
20 19 15.16
20 18 59.55
+15.61
+ .01
15.62
+.56
+16.18

Frods 1327 is Fast
16.18 secs
at
20 19 S.T.

L.C.

Fri: Sept 17, 1909

Mer. Cir   LCOb.
Rattle at 20:27

α Cyg. +44 57 lost it.
ε Cyg +33 38 O.K.

20^h 42	22.2	18.6	0.8
	25.3	15.6	0.9
	28.4	12.5	0.9
	31.3	9.5	0.8
	34.1	6.5	0.6
	41.5	59.2	07
	45.9	54.7	0.6
			50.1
			54

20 42 50.36
20 42 33.68

16.68
+.04

~~16.67~~ 1672
~~+.56~~ 56

~~+17.23~~ 17.28

.014

Frodsham 1327 is Fast

$17.2\overset{8}{3}$ secs

at

20:43 S.T.

L.C.

Sat Sept. 18, 1909
Meridian Circle. L. C. Obs

Started at 20-34

α Cygni +44 57 L.C. Ob

ε ~~α~~ Cygni +33 38 H.E. Ob

All wires: O.K. on α Cygni
" " " " ε Cygni

+44 57

20 38 5.8 \ 7.5
9.2 \ 11.7 7.6
12.7 \ 8.4 7.5
16.0 \ 4.8 7.4
\ 1.4
19.3 \ 57.8 7.1
28.0 - 49.3 7.3
33.5 - 43.9 7.4
39.1
39
39.26
− .01
39.25
+ 56
39.81
21.65
L.C. Ob. + 18.16

+33 38

20 4.2
22.8 18.8 1.6
25.9 16.0 1.9
28.2 13.1 1.3
31.6 10.3 1.9
34.5 7.2 1.7
42.0 59.8 1.8
46.3 55.3 1.6
50.9
127
50.85
+ .04
50.89
+ 56
51.45
33.66
+17.79 H.E. Ob.

−.25
.16
150
25
.0400

.16
.80
.1280

Frode 1327 is Fast
18.16 secs
at 20:39 S.T.

L.C. Ob.

Monday September 20, 1909.

Mer. Circle.

Waugh Ob.

Rattle at $23^h 56^m$ after 1st star.
W Piscium +6°21'
B Cassiop. +58°38'
Final Rattle before $0^h 6^m$

+6°21'

$23^h 54^m$	$35\overset{s}{.}0$	22.2	7.2
	37.3	19.8	7.1
	39.9	17.0	6.9
	42.6	14.8	7.4
	44.9	12.1	7.0
	51.2	06.9	7.1
	54.9	02.2	7.1
			58.6

15 ⟌ 8.4
58.56

+58°38'

$0^h 3^m$	$58\overset{s}{.}2$	25.2	0.4
	59.9	20.3	0.2
4^m	04.3	15.7	0.0
	09.2	11.0	0.2
	13.9	06.3	0.2
	25.9	54.4	0.3
	32.3	47.2	9.5
			40.0

15 ⟌ 0.8
40.00

$\frac{3}{10} \times 6$ 1
39

h = .16

.80 .72
.16 .16
480 432
80 .72
.1280 .1152

$23^h 54^m 58\overset{s}{.}56$
$23^h 54^m 40\overset{s}{.}69$
+17.87
+ .13
+18.00
+ .56 b sec φ
+18.56
+18.28
2 ⟌ 36.84
18.42

$0^h 4^m 40\overset{s}{.}00$
$0^h 4^m 22\overset{s}{.}17$
+17.83
− .11
+17.72
.56
+18.28

Frod 1327 Fast.
$0^m 18\overset{s}{.}42$
at
$23^h 57^m$ S.T.

Waugh Ob.

W Thursday Sept. 23, 1909

Mer. Cir. Waugh Obs.

Rattle at 19h 32m.
9 Cygni +50° 0'
δ Cygni +44° 54'

+50° 0'

19h 33m	44s.3	57.2	1.5
	48.0	53.5	1.5
	52.0	49.5	1.5
	55.7	46.5	1.2
	59.7	41.8	1.6
19h 34m	09.2	32.4	51.4
	14.8	26.4	~~14.8~~ 1.2 ~~20.7~~

20.7
15 | 10.5
20.70

+44° 54'

19h 41m	55s.4	01.3	6.7
	59.0	58.1	7.1
19h 42m	02.3	54.7	7.0
	05.8	51.0	6.8
	09.1	47.6	6.7
	18.1	39.0	7.1
	23.2	33.7	6.9

28.6
15 | 6.9
28.46

3/5 × 26 478 / 13
94.2
.5
9.27
6s/105 × 30 / 170 / 18
61.53
.18
1.37
.28
.16
168
28
.8448
.09
.16
.0144

19h 34m 20s.70
19h 34m 01s.37
+19.33
.04
+19.29
+19.18
2 | 38.47
+19.24
+ .56 break
+19.80

19h 42m 28s.46
19h 42m 09s.27
+19.19
− .01
+19.18

Fauth 1321 Fast
0m 19s.80
at
19h 38m S.T.
E.C. Waugh Obs.

Wednesday Sept 28, 1909

Mer Cir.
Rattle at $17^h 58^m$ Waugh Ob.
O Herculis +28° 44'
109 Herculis +21° 43' middle wires
B Draconis +58° 44' " "

+28° 44'　　+21° 43'　　+ ~~58° 44'~~
$18^h 03^m 55^s.8$ 49.1　　middle wires　　middle wires
58.7 46.4　　$18^h 19^m 04^s.3$　　~~$18^h 21^m 43^s.2$~~
04^m 01.3 43.5　　4.9 5.1 4.8　　08.4　　~~50.2~~
04.2 40.6　　4.8　　12.3　　~~57.4~~
06.9 38.0 – 4.9　　16.3　　~~22^m 04.5~~
14.0 30.9　　4.9　　20.4　　~~11.9~~
18.3 26.1　　5.0　　5)61.7　　~~5)167.2~~
22.6　　12.34　　~~33.44~~
15)7.0
22.46

.37
.16
222
37
.0592
n = .16

.52
.16
312
52
.0832

$18^h (02)^m$
~~03^m 28^s~~

$18^h 04^m 22^s.46$　　$18^h 19^m 72^s.34$　　~~$18^h 22^m 33^s.44$~~
$18^h 04^m 00^s.40$　　$18^h 19^m 50^s.23$　　~~$18^h 22^m 36^s.24$~~
+22.06　　+22.11
+ .06　　+ .08
+22.12　　+22.19
+22.19
2).31
+22.16–
+ .56
+22.72

Tod. 1327 ~~Slow~~ Fast
$0^m 22^s.72$
at
$18^h 11^m$ S.T.
E. C. Waugh Ob.

Friday, October 1, 1909

Mer. Cir.

Waugh Ob.

~~Rattle at~~ $18^h 13^m$
Star went behind cloud
1st observation are good.
Alpha Lyrae + 38° 41'

+ 38° 41'

$18^h 33^m$	$45^s.5$	45.3	0.8
	48.7	42.3	1.0
	51.6	39.2	0.8
	54.8	36.0	0.8
	58.1	32.8	0.9
34^m	06.0	25.0	1.0
	10.8	20.2	1.0

15.3
15 | 66
15.44

.16
.11
16
16
.176

($18^h 34^m$ 15.44)
$18^h 33^m$ 75.44
$18^h 33^m$ 52.50 ~~43.90~~.
+ 22.94
+ .18
+ 23.12
+ .56
+ 23.68

Frod. 1321 is Fast.
$0^m 23^s.68$
at.
$18^h 33^m$ S.T. Waugh Ob.

Saturday, October 2, 1909

Mer. Cir.

Waugh Ob.

Rattle at 18h 21m after 1st star.
109 Herculis. +21° 43'
a. Lyrae. +38° 41'
Final Rattle after 18h 35m.

+21° 43'

18h 19m	48s.8	39.2	8.0
	51.4	36.7	8.1
	54.0	33.9	8.3
	56.6	31.2	7.8
	59.4	28.6	8.0
20m	06.0	21.9	7.9
	09.9	18.0	7.9

14.0
15) 27.0
14.18

+38° 41'

18h 33m	46s.0	46.1	2.1
	49.3	43.0	2.3
	52.3	39.8	2.1
	55.6	36.7	2.3
	58.6	33.7	2.3
	06.6	25.6	2.2
	11.4	20.8	2.2

16.1
15) 16
16.10

.16
.11
16
16
.017652
.16
312
62
.0832

18h ~~20~~ 19m 74s.18
18h 19m 50s.15
+24.03
+ .08
+24.11
+23.17
2) 47.28
~~+~~ 23.64
+ 56
+24.20

18h ~~34~~ 33m 76s.10
18h 33m 52s.95
+23.15
+ .02
+23.17

Frod. 1321 is Fast.
0m 24s.20
at
18h 25m S.T. Waugh Ob.

Monday October 4, 1909

Mer Cir

Waugh Obs.

Rattle at $18^h 37^m$

110 Herculis $+20°27'$ missed 1st wire.

β Lyrae $+33°15'$

$+20°27'$

$18^h 41^m$ ~~$48^s.2$~~		00.0	
	48.2	33.1	1.3
	51.0	30.3	1.3
	53.6	27.8	1.4
	56.1	25.0	1.1
42^m	02.7	18.5	1.2
	06.8	14.8	1.6
			10.8
			15 ⌊8.7
			10.58

$18^h 46^m$	$41^s.2$	36.1	7.9
	44.0	34.0	8.0
	46.9	31.1	8.0
	49.9	28.1	8.0
	52.8	25.1	7.9
47^m	00.0	17.8	7.8
	04.6	13.5	8.1
			08.9
			15 ⌊14.6
			08.97

.54
.16
3 24
54
.0 ~~8~~0 83
183
$\frac{1}{10} \times 11$
10.

44.27
.14
44.13

.26
.16
1 5 6
2 6
.04 1 6

$18^h 41^m 70^s.58$
$18^h 41^m 45^s.79$
$+24.79$
$+ .09$
$+24.88$

$+24.88$
$2 \lfloor 49.76$
$+24.88$
$+ .56$ b sec φ
$+25.44$

~~18~~^{h}
$18^h 46^m 68^s.97$
$18^h 46^m 44^s.13$
$+24.84$
$+ .04$
$+24.88$

Frod. 1327 is Fast.
$0^m 25^s.44$
at
$18^h 43^m$ S.T.
Waugh. Obs.

Tuesday Oct. 5, 1909

Mer Cir.

Waugh Obs.

Rattle at $18^h 31^m$

a Lyrae +38° 41'

110 Herculis +20° 27'

+38° 41				+ 20° 27'			
$18^h 33^m$	$47^s.4$	47.4	4.8	$18^h 41^m$	$46^s.1$	36.1	2.2
+	50.7	44.3	5.0		48.8	33.7	2.6
	53.8	41.1	4.9		51.1	30.8	1.9
	56.9	38.0	4.9		54.0	28.1	2.1
34^m	00.0	35.0	5.0		56.7	25.3	2.0
	07.9	27.0	4.9	42^m	03.2	19.0	2.2
	12.7	22.2	4.9		07.2	15.0	2.2
			17.5				11.1
			15) 6.9				15) 1.2
			17.46				11.08

.11
.16
66
11
.0176

4.
5.
16

45.88
45.89
16
45.73

.54
.16
324
54
.0864

$18^h 33^m 77^s.46$
$18^h 33^m 52^s.14$
+25.32
+ .04
+ ~~25.43~~
+ 25.34
+ 25.43
2) 50.77
+25.38
+ .56 b sec φ
+25.94

18^h ~~47~~ 41 $^m 71^s.08$
$18^h 41^m 45^s.73$
+25.36
+ .08
+25.43

Frod. 1327 is Fast.
$0^m 25^s.94$
at
$18^h 37^m$ S.T.
Waugh Obs.

Wednesday, Oct 6, 1909

Mer. Cir.

Waugh Obs.

Rattle at 18h 30m
α Lyrae. +38° 41'
110 Herculis. +20° 27'
Final Rattle at 18h 43m

+38° 41'				+20° 27'			
18h 33m 47s.9	47.9	5.8		18h 41m 46s.6	36.4	3.0	
51.1	44.8	5.9		49.2	34.0	3.2	
54.1	41.6	5.7		51.8	31.3	3.1	
57.3	38.4	5.7		54.5	28.7	3.2	
34m 00.3	35.3	5.6		57.0	26.0	3.0	
08.6	27.3	5.9		42m 03.7	19.4	3.1	
13.1	22.7	5.8		07.7	15.6	3.3	
		17.9				11.7	
		15)13.3				1)8.6	
		17.88				11.57	

.11
.16
66
11
.0176

.54
.16
324
54
.0864

18h 33m 77s.88
18h 33m 52s.$\overset{11}{\cancel{64}}$
+25.77
+ .02
+25.79
+25.94
2)51.73
+25.86
+ .56
+26.42

18h 41m 71s.57
18h 41m 46s.71
+25.86
+ .08
+25.94

Frod. 1327 is Fast.
0m 26s.42
at.
18h 37m S.T.
Waugh Obs.

Friday Oct. 8, 1909

Mer. Cir.

Waugh Obs.

Rattle at $18^h 31^m$
α Lyrae $+38° 41'$
110 Herculis $+20° 27'$

$+38° 41'$			$+20° 27$		
$18^h 33^m 48.^s8$	48.9	7.7	$18^h 41^m 47.^s5$	37.4	4.9
51.9	46.8	7.7	50.1	34.9	5.0
55.0	42.6	7.6	52.7	32.1	4.8
58.4	39.2	7.6	55.2	29.7	4.9
01.3	36.2	7.5	57.9	27.0	4.9
09.3	28.3	7.6	04.4	20.3	4.7
14.1	23.7	7.8	08.7	16.4	5.1
		18.9			12.5
		15)13.41(			15)68
		18.89			12.46

$18^h 33^m 78.^s89$
$18^h 33^m 62.^s06$
$+26.83$
$+.02$
26.85
$+26.86$
$2)53.71($
$+26.855$
$+.560$ b sec φ
27.415

$18^h 41^m 72.^s46$
$18^h 41^m 45.^s67$
$+26.78$
$+.08$
26.86

Frod 1327 is Fast
$0^m 27.^s415$
at
$18^h 31^m$ S.T.
Waugh Obs.

Saturday October 9, 1909

Mer. Cir.

Rattle after $18^h 49^m$ Waugh. Obs.

R. Lyrae. + 43°49'

γ Lyrae. + 32°33'

+43°49'			+32°33'		
~~$+8^h$~~ $19^h 02^m 29^s.4$	343	3.7	$19^h 05^m 32^s.8$	28.3	1.1
32.9	31.1	4.0	35.7	26.5	1.2
36.3	27.7	4.0	38.7	22.5	1.2
39.6	24.1	3.7	41.6	19.7	1.3
43.0	20.9	3.9	44.4	16.7	1.1
51.8	12.2	4.0	51.7	09.2	0.9
56.9	07.0	3.9	56.2	04.8	1.0
		01.9			00.2
		15)14.1			15)8.0
		01.94			00.63

$19^h 03^m 01^s.94$

$19^h 06^m 00^s.53$

Mer. Cir.

Wednesday Oct, 13, 1909

Waugh Obs.

Rattle at $19^h\ 00^m$
ζ Aquilae $+13° 43^m$.
ζ Lyrae. $+37° 58'$

$+13° 43'$				$+37° 58'$		
$19^h 01^m 20^s.3$	08.3	8.6		$19^h 13^m 13^s.1$	12.6	5.7
22.8	05.9	8.7		16.2	09.1	5.3
25.2	03.3	8.5		19.2	06.2	5.4
27.9	00.7	8.6		22.76	03.2	5.8
30.5	58.1	8.6		25.7	00.2	5.9
36.6	51.9	8.5		33.3	52.3	5.6
40.7	48.0	8.7		38.0	47.1	5.7
		44.2				43.0
		15 ⌊44.40				15 ⌊3.7
		44.29				43.24

.67
.16
402
67
.1072
.13
.16
78
13
.0208

$19^h\ 01^m\ 44^s.29$
$19^h\ 01^m\ 14^s.72$
$+29.67$
$.11$
$+29.68$
$+29.94$
$2 ⌊59.62$
$+29.81$
$+.56$ b sec φ
30.37

$19^h\ 13^m\ \cancel{37}^s\ 43.24$
$19^h\ 13^m\ 13.32$
$+29.92$
$.02$
$+29.94$

Frod. 1327 is Fast
$0^m\ 30^s.37$
at $19^h\ 07^m$ S.T.
Waugh Obs.

Friday Oct. 15, 1909

Mer Cir – Rattle at 18h 58m. Waugh Obs

Final rattle 19h 15m

ζ Aquilae +13° 43'

δ Lyrae +37° 58'

+13° 43'

19h 01m 20.8s	09.2	0.0
23.7	06.8	0.6
26.1	03.9	0.0
28.7	01.7	0.4
31.2	57.1	0.3
37.3	52.8	0.1
41.3	49.0	0.3

45.3

15) 1.9

46.12

+37° 58'

19h 13m 14s.0	13.7	7.7
17.0	10.7	7.7
20.3	07.4	7.7
$2\overset{3}{4}.3$	04.1	7.4
$2\overset{6}{7}.6$	00.8	7.4
34.3	$6\overset{3}{4}.0$	7.3
$\overset{3}{4}9.0$	48.3	7.3

447

3

15) 11.2

43.74

8/10 × 18 = 144/10 =

14

14.82

.14

14.68

.18

.8

25:0 14.4

.8

20.0

13.47

.20

13.27

.67

.16

402

67

.1072

.13

.16

78

13

.0200

19h 01m 46s.12

19h 01m 14s.68

+30.44

+ .10

+30.54

+30.52

2) 61.04

+30.52

+ .56 b sec ζ

+31.08

19h 13m 43s.74

19h 13m 43s.27

+30.47

+ .03

30.50

Frod. 1327 is Fast.

0m 31s.08

at

19h 08m S.T.

Waugh Obs.

~~Mo~~ Tuesday Oct 19, 1909

Mer. Cir. Waugh 6 b.

Rattle at 19h 26m

Could not locate stars.

Wednesday Oct. 20, 1909

Mer. Cir.

Rattle at $19^h 20^m$ Waugh Obs.

β Cygni +27° 46'
δ Cygni +44°. 54'

Rattle $19^h 44^m$

+27° 46'

$19^h 27^m 09^s.1$	02.0	1.1
11.7	59.2	0.9
14.6	56.3	0.9
17.4	53.7	1.1
20.0	50.7	0.7
27.2	44.0	1.2
31.2	39.4	0.6

35.3
15) 6.8
35.45

+44° 54'

$19^h 42^m 06^s.6$	12.8	9.4
10.2	09.5	9.7
13.3	05.8	9.1
17.3	02.7	0.0
20.9	58.7	9.6
29.4	50.3	9.7
34.7	44.9	9.6

39.4
15) 9.6
39.63

.39
.16
234
39
.0624

4.02
.06
3.96

$\frac{3}{10}\times 28$ 8.4

8.60
.08
8.52

.09
.16
.0144

$19^h 27^m 35^s.45$
$19^h 27^m 03^s.96$
+31.49
+ .06
+31.55
+31.13
2) 62.68
+31.34
+ .56 b sec C.
31.90

$19^h 42^m 39^s.63$
$19^h 42^m 8^s.52$
+31.11
+ .02
+31.13

Frod. 1327 is fast.
$0^m 31^s.90$
at
$19^h 35^m$ S.T.
Waugh

Friday, Oct 22, 1909

Mer. Cir.

Waugh Obs

Rattle at 20^h00^m

O' Cygni $+46°27'$

γ Cygni $+39°57'$

Final rattle 20^h20^m

$+46°21'$				$+39°57°$			
20^h10^m	$44^s.3$	52.3	6.6	20^h18^m	$59^s.9$	01.0	0.9
	48.0	48.9	6.9	19^m	03.1	57.8	0.9
	51.8	45.1	6.9		06.2	54.6	0.8
	55.1	41.8	6.9		09.3	51.3	0.6
	58.5	38.2	6.7		12.7	48.0	0.7
11	07.7	29.1	6.8		20.7	40.1	0.8
	13.0	23.7	6.7		25.8	36.1	0.9
			18.3				30.4
			15)5.8				15)60
			18.38				30.40

$20^h10^m18^s.38$

$20^h10^m46.77$

$+31.61$

$+.03$

$+31.64$

31.69

2)133

$+31.66$

$+.56$ b. sec ζ

$+32.22$

$20^h18^m30^s.40$

$20^h18^m58.72$

$+31.68$

$+.01$

$+31.69$

46.91

.14

46.77

68.84

.12

58.72

1.8

.16

108

18

.0288

.07

.16

.0112

Frod. 1327 is Fast

$0^m 32^s.22$

at

$20^h 14^m$ S.T.

Waugh Obs.

Monday Oct. 25, '09

Mer. Cir.

Waugh Obs.

Br. 3077 + 56° 39′
τ Pegasi + 23° 14′
Rattle at 23h 18m

+ 56° 39′

23h 8m	46s.4	11.5	7.9
	50.7	07.3	8.0
	55.3	02.7	8.0
9m.	00.0	58.0	8.0
	04.3	54.1	8.4
	15.7	42.5	8.2
	22.3	36.0	8.3
			29.0

15 | 1.8
29.1

+ 23° 14′

23h 16m	17s.3	08.2	5.5
	20.0	05.3	5.3
	22.7	03.0	5.7
	25.6	00.2	5.8
	28.3	57.5	5.8
	34.8	50.9	5.7
	38.8	46.9	5.7
			43.0

45
15 | 3.8
43.25

52.60
.15
52.46

8/10 × 19 = 15.2

10.22
.06
10.16

8/10 × 8.64
8
6.4

.60
.16
360
60
.0960

49
.16
294
49
.0784

23h 8m 89s.11
23h 8m 56.45
+ 32.66
+ .10
32.76
+ 33.01
2 | 65.77
+ 32.88
+ .56 b. sec. φ
33.44

23h 16m 43s.25
23h 16m 10s.16
+ 33.09
− .08
+ 33.01

Chron. 1327 is fast.
0m 33s.44
at.
23h 12m S.T.
Waugh Obs.

Friday Oct. 29, 09

Mer Cir.

Waugh Obs.

Rattle at $19^h 50^m$.

o' Cygni og. + 46° 27′ middle wire only.
24 Vulpecul. + 24° 23′

+ 46° 27′ | + 24° 23′

$20^h 00^m 00^s$ 54.2 0
00. 00 51.0 0
00 47.2 0
00 43.7 0
00 40.0 0
00 31.0 0
21^m 00 25.6 0
20.40
20.40

$20^h 13^m 02^s.7$ 64.0 6.1
05.3 57.6 6.9
08.0 48.7 6.7
10.8 46.0 6.8
13.6 43.1 6.7
20.2 36.4 6.6
24.2 22.3 6.6
28.3
$15 \overline{)5.2}$
28.34

$27 \times \frac{2}{10}$
$5\overline{)4}$ 46.57
.14
.16
184
14
.0224
.46
.16
276
46
.0736

$20^h 10^m 20^s.40$
$20^h 10^m 46^s.57$
+ 33.83
− .02
+ 33.81
+ 33.90
$2\overline{)67.71}$
+ 33.85
+ .56 b. sec. Q.
34.41

$20^h\ \overset{12}{\cancel{13}}{}^m\ \cancel{88}^s.34$
$20^h 12^m$ 54.57
+ 33.83
+ .07
33.90

Frod. 1327 Fast.
$0^m 34^s.41$
at
$20^h 11^m$ S.T.
Waugh Obs.

Saturday Oct 30, 1909

Mer Cir.

Rattle at $20^h 05^m$ Waugh Obs.
o' Cygni Sq. +46°27'
24 Vulpec +24°23' missed, cloud.
Rattle at $20^h 15^m$

+46°27'

$20^h 10^m$	$46^s.7$	54.3	1.0
	50.1	51.1	1.2.
	53.7	47.2	0.9
	57.3	43.8	1.1
	00.8	40.1	0.9
	09.9	31.3	1.2
	15.0	25.8	0.8

20.8
15 | 6.9
20.46

+24°23'

$20^h 13^m$	$05^s.9$	52.0	7.9
	08.3	49.0	7.3
	11.0	46.1	7.1
	13.9	43.4	7.3
	20.3	36.8	7.1
	24.5	32.7	7.2

28.6
15 | 8.5
28.56

81/8 545

$20^h 10^m 80^s.46$
$20^h 10^m 46^s.54$
+33.92
− .02
+33.90
+33.14
2 | 1.04
+33.52
+ .56 b.sec. Q.
+34.08

$20^h 12^m 88^s.56$.
$20^h 12^m 64^s.49$
+33.07
+ .07
+33.14

Frod. 1327 is fast.
$0^m 34^s.08$
at.
$20^h 11^m$ S.T.
Waugh Obs.

Friday, Nov. 5, 1909.

Mer. Cir.

Waugh Ob.

~~Rattle~~ at 21h 40m
α Cephei + 62° 11'
β Cephei + 70° 9'
74 Cygni + 40° 0'
~~Rattle~~ at 22h 36m

+ 62° 11'				40° 0'			
16h 21h 16m	10s.7	51.0	1.7	21h 33m	24s.7	26.0	0.7
	16.8	46.8	1.6		28.1	22.8	0.9
	21.3	40.5	1.8		31.0	19.6	0.6
	26.7	36.2	1.9		34.2	16.2	0.4
	31.8	29.9	1.8		37.6	13.1	0.7
	46.0	16.8	1.8		45.8	05.0	0.8
	52.9	08.8	1.7		50.6	00.2	0.8
			00.8				56.3
			16)13.1				16)5.2
			00.87				65.34

43
.9
38.7
22
.9
19.8
.97
.16
.68
.97
.1562

26.47
.38
25.09
19.51
.19
19.32
.67
2.0112

21h 16m 60s.87
21h 16m 25.09
+ 35.78
+ .15
+ 35.93

21h 33m 55s.34
21h 33m 19.32
+ 36.02
+ .01
+ 36.03
+ .66 & sec. δ
+ 36.59

Frod 1367 is fast
0m 86s.59
at
21h 33m S.T.
Waugh Ob.

Saturday Nov, 6, 1909

Mer. Cir. — Waugh Obs.

Rattle at $20^h 33^m$
α Cygni +44° 57',
λ Cygni. +36° 09'
Rattle at $20^h 46^m$

+44° 57'			+36° 09'		
$20^h 38^m 23^s.2$	29.8	3.0	$20^h 43^m 59^s.7$	58.0	7.7
27.1	26.4	3.6	44^m 02.7	54.9	7.6
30.5	23.0	3.5	06.0	41.9	7.9
33.9	19.2	3.1	09.1	48.7	7.8
37.2	16.0	3.2	12.1	45.6	7.7
46.0	07.1	3.1	19.8	38.1	7.9
57.3	01.8	3.1	24.3	33.4	7.7
		56.4			28.9
		15)8.9			15)13.2
		56.59			28.88

.16 19
.09 .16
.0144 114
19
.0304

$20^h 38^m 56^s.59$
$20^h 38^m 20^s.43$
+36.16
− .01
+36.15
+ 36.19
2)34
+36.17
+ .56 b sec φ
+36.73

$20^h 43^m 88^s.88$.
$20^h 43^m 52^s.72$
+36.16
+ .03
+36.19

Fraod. 327 is Fast
$0^m 36^s.73$
at
$20^h 40^m$ S.T.
Waugh Obs.

11

Tues. Nov. 9, 1909

Mer Cir   L C Ob

~~Rattle at~~ just before 3:5

α Persei $3^h 17^m.8$ + 49° 32′ seeing very bad
o Tauri 3 19.9 + 8 43 only last 10 wires
+12 38 missed.
δ Persei 3 36.4 +47 30 missed.
λ Tauri 3 55.6 +12 14 OK.

+49 32

3 17 52.8 5.3 8.1
56.8 2.0 8.8
0.6 58.1 8.7
4.7 54.7 9.4
8.5 50.4 8.9
18.2 41.2 9.4
24.6 35.9 0.5
29.5
8.3
29.55

~~+47 30~~
+12 14

3 55 53.5 41.3 4.8
56.1 39.1 5.2
58.8 36.7 5.5
1.3 34.0 5.3
4.0 31.7 5.7
10.1 25.7 5.8
13.7 21.4 5.1
17.7
10.1
17.67

+8 43

3 20 =
–
–
–
12.3 22.0 4.3
14.1 19.2 3.3
16.5
4.1 Reject.
16.14
not to be used.

3 18 29.55
3 17 53.22
+ 36.33
+.04
36.37

3 56 17.67
5
3 58 41.19
+ 36.48
−11
36.37

~~3 20 16.14~~
~~3 19 57.81~~
~~8.33~~

1.17 36.33
0.22 36.48
95) .150 (.16
93
550
570

36.37
36.37
+.56 b sec φ
36.93

Thod 1327 in Hart
0^m 36.93
at
~~20~~
3 37 S.T. L.C. Ob.

Wednesday Nov. 10, 1909

Mer. Cir.

32 Vulpeculae +27°42' Waugh Obs.
V Cygni +40°48'

Final Rattle at 20h 55m

+27°42'				+40°48'			
20h 52m	52s.2	44.8	7.0	20h 53m	53s.2	55.0	8.2
	55.0	42.2	7.2		56.4	52.0	8.4
	57.7	39.2	6.9		59.4	48.5	7.9
	00.3	36.3	6.6		02.9	45.1	8.0
	03.1	34.0	7.1		06.0	42.1	8.1
	10.1	27.0	7.1		14.3	33.9	8.2
	14.3	22.6	6.9		19.2	29.0	8.2
			18.5				24.1

15 ⟌ 7.3
.6 .30
18.48

15 ⟌ 110
24.07

18
.3
.054

42.54
.05
42.49

23
.3
.069

48.41
.07
48.34

.39
.16
234
39
.0624

.05
.16
.0080

20h 52m 18s.48
20h 52m 42s.49
+35.99
+ .06
+36.05
+35.73
2 ⟌ 71.78
+35.89
+ .66 b sec d
+36.46

20h 53m 84s.07
20h 53m 48s.34
+35.73
+00.00
35.73

Frod 1327 is fast
0m 36s.45
at
20h 51m S.T.
Waugh Obs.

Thursday Nov. 11, 1909.

Mer. Cir.

Rattle at $20^h 46^m$. Waugh Obs.
32 Vulpeculae +27°42′
V Cygni +40°48′
Final rattle $20^h 53^m$

+27°42′		
$20^h 50^m 52^s.3$	45.1	7.4
55.1	42.4	7.6
57.8	39.7	7.5
51^m 00.6	36.8	7.4
63.3	34.0	7.3
10.3	26.9	7.2
14.3	22.9	7.2
		18.5
		15⟌ 188
		18.66

+40°48′		
$20^h 53^m 53^s.3$	55.4	8.7
56.9	52.0	8.9
60.0	48.8	8.8
03.2	45.6	8.8
06.5	42.2	8.7
14.7	34.3	9.0
19.6	29.3	8.9
		24.3
		15⟌ 61
		24.40

18 42.57
.4 42.47
7.2 41.97
18 41.90
27 47.71
.5 .11
11.8 47.60

$20^h 50^m 78^s.66$
15.90
$20^h 50^m 48^s.47$
+36.76
+ .06
+36.82
+36.80
262
+36.81
+ .56 b sec. el.
+37.37

$20^h 53^m 84^s.40$
$20^h 53^m 47^s.60$
+36.80
+00.00
+36.80

Fred. 1327 is fast
$0^m 37^s.37$
at
$20^h 50^m$ S.T.
Waugh Obs.

Saturday Nov, 13, 1909

Mer. Cir.

Rattle at 21h 30m Waugh Obs.
74 Cygni +40° 0'
η^2 Cygni +48° 53'
Final Rattle 21h 47m

+40° 0m			+48° 53'		
21h 33m 26.s1	27.0	3.1	21h 43m 28.s5	31.8	8.3
29.0	23.7	2.7	32.6	36.3	8.9
32.4	20.4	2.8	36.0	32.4 ~~36.3~~	8.4
35.4	17.2	2.6	39.8	28.3 ~~32.4~~	8.1
38.7	14.1	2.8	43.7	24.7 ~~28.3~~	8.4
46.7	06.2	2.9 ~~46.7~~	52.9	16.3	8.2
51.6	01.4	3.0	58.1	10.0	8.1
		56.4			04.3
		15 | 69			15 | 21
		56.42			64.18

22
.7
1.54
19.29
.15
19.14

27
.1
18.9
27.05
.18
26.87

.16
.07
.0112

.23
.16
138
23
.6368

21h 33m 56.s42
21h 33m 19.s14
+37.28
+ .01
+37.29
+ 37.33
21.62
+37.31
+ .56 b sec d.
+37.87

21h ~~44m 04.s18~~ 43m 64.18.
21h 43m 26.81
+37.37
− .04
+37.33

Dacd. 1327 is Fast.
0m 37.s87
at.
21h 38m S.T.
Waugh Obs.

Monday Nov. 15, 1909

Mer Cir. Waugh Obs.

Rattle at $20^h 55^m$

61 Cygni pr. + 38° 18' missed 2nd wire:

Σ Cygni. + 29° 57'

τ Pegasi + 19° 24'

Final Rattle $21^h 19^m$

+ 29° 57'

$21^h 09^m 15^s.4$	09.4	4.8
18.4	06.4	4.8
21.0	03.7	4.7
23.9	60.8	4.7
26.9	58.0	4.9
33.8	53.9	4.7
38.1	46.5	4.6
		42.4

15 | 5.6

42.37

+ 19° 24'

$21^h 18^m 06^s.8$	56.2	3.0
09.2	53.9	3.1
11.9	57.1	3.0
14.7	48.3	3.0
17.1	46.9	3.0
23.8	39.3	3.1
27.6	35.4	3.0
		31.5

15 | 1.40

31.09

18
.9
162

16
.9
154

54.08
.16
53.93

.56
.16
336
56
.0896

4.97
.16
4.81

.34
.16
204
34
.0340

$21^h 09^m 42^s.37$
$21^h 09^m 04^s.81$
+ 38.66
+ .05
+ 37.61
+ 37.21
2 | 82
+ 37.41
+ .66 b sec C.
37.97

$21^h 17^m 91^s.09$
$21^h 17^m 53^s.93$
+ 37.16
+ .05
+ 37.21

Fodd. 1327 is fast

$0^m 37^s.97$

at

$21^h 13^m$ S.T.

Waugh Obs.

Thurs. Nov. 18, 1909

Mer Cir. L.C. Obs.

~~ι Andr. +42 46~~

~~4~~5

1st rattle at 23:36 ?

41 H Cephei +67 18 missed
φ Pegasi +18 37 O.K. L.C. Obs.
β Cass +58 39 O.K. Flint Obs
~~C. Tucanae~~
ω Piscium +6 22 OK by L.C. Obs
22. Androm +45 34

last rattle at 0:1~~8~~1

assumed n = -.16

+18 37 L.C. Obs.
~~+67 18~~

23 47 7.6	56.8	4.4
9.8	54.2	4.0
12.8	51.8	4.6
15.4	49.2	4.6
17.8	46.4	4.2
24.5	40.0	4.5
28.2	36.1	4.3
	32.2	

28

23 47 32.19
23 47 53.64
+ 38.55
+ .09
+ 38.64
+ 56
+39.20
+39.23
+39.22

+6 22

53 55.5	42.6	8.1
58.0	40.4	8.4
0.4	37.9	8.3
2.8	35.4	8.2
5.7	32.6	8.3
11.6	26.4	8.0
15.5 ~~19.4~~	22.7	8.2
		19.1
		16

23 54 19.11
23 54 40.57
+ 38.54
+ .13
+ 38.67
+ 56
+ 39.23

+58 39 Flint Ob.

0h 4m 8 14.4	44.8	9.2
19.0	40.0	9.0
24.1 ~~22.8~~	35.2	9.3
28 ~~8~~ 33.8	30.8	9.6
33 8	25.1	9.9
45.7	13.7	9.4
52.5	7.2	9.7
		59.4
		105

00 08 59.70
00 04 21.65
+ 38.05
− 12
+ 37.93
+ 56
38.49

Flocks 1327 is Fast
0m 39.22 sec
at 23:52 S.T. L.C. Obs.

Fri. Nov. 19, 1909

Mer Cir. L.C. Obr.

Rattle at 23:19
70 Pegasi +12 16 OK Hazy } L.C.
ι Andr +42 46 O.K.
41 Cephei +67 18 OK. Hazy Flint Obs.

Rattle at 23:47

+12 16

23h 24 49.6	37.9	7.5
52.5	35.6	8.1
54.9	33.0	7.9
57.7	30.3	8.0
59.6	27.7	7.3
6.4	21.4	7.8
10.1	18.0	8.1
		14.0
		69

23 25 13.46
23 24 35.19
+38.27
~~+.32~~
+38.59
+11
+38.38
+.56
+38.94

+42 46

23h33 49.2	53.0	2.2
52.5	49.4	1.9
55.6	45.8	1.4
58.7	42.9	1.6
2.0	39.9	1.9
11.0	31.0	2.0
15.8	26.1	1.9
		20.7
		136

23 34 20.91
23 33 ~~42~~.32
+38.59
~~.00~~
~~+38.59~~
.00
+38.59
+.56
+39.15
+38.94
+39.04

+67 18

23h 43m 13.8	13.4	7.2
18.8	7.0	5.8
26.4	1.1	7.5
33.7	54.9	8.0
39.1	50.3	9.4
54.6	31.8	6.4
3.8	22.9	6.7
		12.7
		237

23 44 ~~12.5~~ 13.78
23 43 35.72
+37.86
~~-.67~~
~~+37.19~~
-.24
+37.62
+.56
+38.18

0.22 +38.27
0.93 +38.59
-.71) -.320(+.45
284
360

assumed nar -.16
due to difficulty of observation on acct of haze.

Frods 1327 is fast
$0^{m}\ 39^{s}.04$
at 23:30 S.T.

Friday Nov. 26, 1909

Mer. Cir. Waugh.

7 Lacertae +49° 48'
middle ~~Final~~ rattle 22h 29m
Final Rattle 22h 37m
10 Lacertae +30° 34'

49° 48'

	38.0	50.6	8.6
22h 27m	41.7s	46.5	8.2
	45.6	42.7	8.3
	49.5	39.2	8.7
	53.1	35.1	8.2
28m	02.7	25.3	8.0
	08.4	19.9	8.3
			14.3
		15	2.6
			14.17

+30° 34'

22h 35m ~~18.6s~~

22.8	22.3	5.1
25.7	19.4	5.1
29.3	16.2	5.5
32.2	13.1	5.3
35.3	10.0	5.3
43.5	02.2	5.7
48.0	57.2	5.2
		52.8
	15	10.0
		52.66

.27 32
.16 .16
162 176
27 32
.0432 .0516

~~22h 28m 14.17s~~
22h 27m 74.17s
22h 27m 33.61s
+40.66
− .04
+40.62
40.59
2 | 1.11
+40.55
+ .56 ls sec δ
+41.11

22h 35m 62.66s
22h 35m 12.02s
+40.64s
− .05
+40.59

Frod. 1327 Fast
0m 41.11s
at
22h 31m S.T.
Waugh & Bz.

Saturday, Nov. 27, '09

Mer. Cir.

Waugh Obs

Rattle at $21^h 41^m$

h^2 Cygni $+48°53'$

16 Pegasi $+25°29'$

Final rattle at $21^h 50^m$

$+48°53'$			$+25°29'$		
$21^h 43^m 31.^s0$	42.7	3.7	$21^h 49^m 11.^s3$.	03.1	4.4
35.1	39.4	4.5	14.1	00.8	4.9
39.2	36.4	4.6	16.8	57.5	4.3
42.8	31.3	4.1	19.4	54.5	3.9
46.8	27.8	4.6	22.0	52.2	4.2
55.8	18.7	4.5	29.0	45.4	4.4
44^m 01.4	12.9	4.3	33.1	41.3	4.4
		07.1			37.2
		15 ⌊24			15 ⌊27
		67.16			37.18

$21^h 43^m 67.^s16$

$21^h 43^m 26.^s49$

$+40.67$

$-.03$

$+40.64$

$+40.77$

2⌊1.41

$+40.70$

$+.56$ for sec. d.

$+41.26$

$21^h 48^m 97.^s18$

$21^h 48^m 56.48$

$+40.70$

$+.07$

$+40.77$

24 .44

.16 .16

144 264

24 44

.0384 .0704

Tacd 1327 fast

$0^m 41.^s26$

at

$21^h 45^m$ S.T.

Waugh Obs.

Monday Nov. 29, 1909

Mer. Cir.

Waugh C. B.

Rattle at 22h 04m
π ~~A.~~ Pegasi +32° 43'
I Cephei + 57° 45'
Final Rattle 22h 10m

+ 32° 43'				+ 57° 45'			
22h m	25.9s	21.7	7.6	22h m	39.2s	67.0	6.2
	29.0	18.7	7.7		44.2	02.3	6.5
	31.8	15.6	7.4		48.2	57.8	6.0
	34.7	12.7	7.4		53.1	53.0	6.1
	37.5	09.8	7.3		57.6	48.2	5.7
	45.0	02.3	7.3		09.1	37.0	6.1
	49.2	58.0	7.2		16.1	30.0	6.1
			53.7				23.0
		15	10.6			16	07.0
			53.70				23.04

Wrong star observed for π Pegasi
Observations rejected.

Mer. Cir

Tuesday Nov. ~~29~~ 30, 1909

Waugh Ob.

Rattle at 22h 03m
π Pegasi +32° 43' Started on wrong star
3 Lacertae +51° 46' Take last observations
Final rattle 22h 22m

+32° 43'

22h 05m	11.s0	06.8	7.4
	14.1	04.0	8.1
	17.0	00.9	7.9
	19.8	57.9	7.7
	22.7	55.0	7.7
	29.8	47.8	7.6
	34.6	43.2	7.8
			39.1

15)133
38.88

+51° 46'

22h 19m	02.s7	18.5	1.2
	06.9	14.6	1.5
	10.8	10.4	1.2
	14.8	06.6	1.4
	18.7	02.3	1.0
	28.7	52.8	1.6
	34.8	46.6	1.4
			40.2

15)9.4
40.62

.27
.16
162
27
.0432
35
.16
210
350
0560

22h 05m 98.88
22h 05m 57.88
+ 41.00
+ .04
+ 41.04
40.86
2)81.90
+ 40.95
+ .56 δ sec φ.
41.51

22h 19m 40s.62
22h 19m 69.71
+ 40.91
− .05
40.86

Faod. 1327 is Fast
0m 41s.51
at
22h 12m S.T.
Waugh Ob.

Saturday, Dec. 4, 1909

Mer. Cir

Waugh Obs.

Rattle at 22h 15m

3 Lacertae +51° 46'

Rattle at 22h 26m

7 Lacertae +49° 48'

10 Lacertae +38° 32'

Final rattle at 22h 37m.

+51° 46'

22h 19m 03.7 19.1 2.8
07.7 16.0 2.7
11.5 11.2 2.7
15.7 07.1 2.8
19.4 03.2 2.6
29.4 53.3 2.7
35.3 47.3 2.6
41.4
16)53
41.35

+49° 48'

22h 27m 38s.8 61.2 0.0
42.8 47.7 0.5
46.7 43.8 0.6
50.5 40.0 0.6
54.1 36.2 0.3
28 03.7 26.6 0.3
09.4 20.9 0.3
16.2
16)2.60
15.16

+38° 32'

22h 36m 23.9 23.6 7.5
27.0 20.6 7.6
30.1 17.3 7.4
33.2 14.2 7.4
36.4 11.0 7.4
44.2 03.3 7.5
49.1 58.5 7.6
53.8
15)11.2
53.74

22h 19m 101s.35
22h 19m 59s.59
+41.76
+ .06
+41.71
+41.71
+41.88
3)230
+41.76
+ .56 b sec. δ
+42.32

22h 27m 76s.16
22h 27m 33s.41
+41.76
− .04
+41.71

22h 35m 53s.74
22h 36m 11s.87
+41.87
+ .01
41.88

27
.8
21.6

25
.8
200

29.81
.22
29.59

33.61
.20
33.41

19
.8
15.2

12.02
.15
11.87

35
.16
210
35
.056

.27
.16
162
27
.0432

1.2
.16
70
12
.0192

Frod. 1327 is fast
0m 42s.32
at
22h 27m S.T.
Waugh Obs.

Monday, Dec. 6, 1909

Mer. Cir.

Waugh Obs.

Rattle at 22h 30m
10 Lacertae +38° 34′
η Pegasi +29° 44′
λ Pegasi +23° 05′
Final rattle at 22h 44m

+38° 34′			+29° 44′			+23° 05′		
22h 36m 24.3s	23.9	8.2	22h 39m 00.8s	54.7	6.6	22h 42m 27.1s	18.0	5.1
27.3	20.9	8.2	03.7	51.9	5.6	29.8	15.3	6.1
30.3	17.2	7.5	06.4	49.1	5.5	32.7	12.2	4.9
33.4	14.4	7.8	09.4	46.0	5.4	36.1	09.9	6.0
36.5	11.3	7.8	12.4	43.2	~~5.6~~	39.1	07.3	5.2
44.8	06.6	8.4	19.2	36.2	6.4	44.6	00.7	6.3
49.2	58.7	7.9	23.4	32.0	5.4	48.6	52.7	5.3
		54.1			27.9			54.4
								2
	15)14.9				15)11.3			15)8.3
		54.99			27.75			62.66

.12 36
.16 .16
72 216
12 36
.0192 .0660

49
.16
294
49
.0784

22h 35m 54s.99
22h 35m 11s.83
+42.16
+.02
+42.18
+42.28
42.30
3)126.76
.25
+42s.25
+.56 b sec. δ.
+42.81

22h 38m 87s.75
22h 38m 45s.52
+42.23
+.05
42.28.

22h 42m 52s.55
22h 42m 10s.32
+42.23
+.07
42.30

Frod. 1321 is Fast
0m 42s.84
at
22h 43m S.T.
Waugh Obs.

Wednesday Dec. 8, 1909.

Mer. Cir.

Waugh Obs.

Rattle at $22^h 27^m$

η Pegasi +29° 44′

λ Pegasi +23° 05′

O Androm. +41° 50′

Final rattle at $23^h 00^m$

+29° 44′			+23° 05′				+41° 50′		
$22^h 39^m 01^s.1$	55.0	6.1	$22^h 42^m 27^s.7$	18.5	6.2		$22^h 57^m 56^s.4$	59.2	6.6
03.8	52.2	6.0	30.4	15.8	6.2	68	59.8	56.1	5.9
06.8	49.4	6.2	33.0	13.2	6.2		03.1	52.6	5.6
09.7	46.7	6.4	36.0	10.3	6.3		06.2	49.2	5.4
12.6	43.8	6.4	38.2	07.8	6.0		09.3	46.0	5.3
19.8	36.6	6.4	45.1	01.0	6.1		18.0	37.8	5.8
23.7	32.6	6.3	48.9	57.2	6.1		22.9	32.8	5.7
	28.0			53.0					27.9
	15⌊18			15⌊110					15⌊122
	28.12			53.07					27.81

.35 .16
21 0
35
.0560
.16
.02
.0032

.49
.16
294
49
.0784

$22^h 38^m 88^s.12$
$22^h 38^m 45^s.49$
+42.63
−.06
+42.57
.71
.60
3⌊1.78
.59

$22^h 42^m 53^s.07$
$22^h 42^m 10^s.28$
+42.79
−.08
+42.71

$22^h 57^m 87^s.81$
$22^h 57^m 45^s.31$
+42.50
−00.00
+42.50.

.6

+42.69
+ .56 sec δ
+43.15

Frod. 1327 Fast.
0^m ~~$42^s.69$~~ $43^s.15$
at
$22^h 48^m$ S.T.
Waugh Obs.

Thursday Dec 9, 1909

Mer. Cir.

Waugh Obs.

Rattle at $22^h 50^m$
θ Androm $+41°50'$
Br. 3077 $+56°39'$
Final ~~rattle~~ at $23^h 11^m$

$+41°50'$ $+56°39'$

$22^h 57^m 56^s.8$	59.6	6.4	$23^h 08^m 54^s.9$	20.7	6.6
58^m 00.3	56.3	6.6	59.8	16.4	6.2
03.2	52.9	6.1	09^m 04.2	11.7	6.9
06.5	49.8	6.3	09.0	07.1	6.1
58^m 10.0	46.3	6.3	13.2	02.6	5.8
18.1	38.1	6.2	24.6	51.8	6.4
23.2	33.0	6.2	31.3	44.9	6.2
		28.2			37.8
		15 ⟌ 2.3			15 ⟌ 15.0
		28.16			38.00

.16
.02
.0032

.16
.60
.0960

$22^h 57^m 88^s.15$
$22^h 57^m$ ~~$46^s.29$~~
45.29
+ 42.86
+ 00.00
+ 42.86
.86
2 ⟌ 1.71
+ 42.85
+ .56 b sec δ
43.41

$23^h 08^m 98^s.00$
$23^h 08^m$ ~~$56^s.29$~~
$55^s.25$
+42.75
+ .10
+42.85

Frod. 1827 is Fast.
$0^m 43^s.41$
at
$23^h 02^m$ S.T.
Waugh Obs

Friday Dec. 10, 1909

Mer. Cir.

Waugh Obs.

Rattle at $22^h 28^m$
10 Lacertae +38°34′
λ Pegasi +23°05′
Final rattle $22^h 44^m$

+38°34′			+23°05′		
$22^h 36^m 24.^s8$	24.6	9.4	$22^h 42^m 28.^s1$	18.9	7.0
28.1	21.3	9.4	30.9	16.2	7.1
31.0	18.2	9.2	33.2	13.3	6.6
34.2	16.2	9.4	36.6	10.6	6.6
37.3	12.4	~~9.7~~	38.7	08.1	6.8
46.6	04.2	9.8	45.6	01.4	7.0
60.2	59.4	9.6	49.4	67.6	7.0
		54.9			53.5
	15)1.1.4			15)66	
		54.76			63.43

18
.4
7.2

13
.4
5.2

11
.16
16
16
.0176

49
.16
294
49
.0784

$22^h 36^m 64.^s76$
$22^h 36^m 11.^s76$
± 43.00
∓ .01
+ 42.99
+ 43.08
2)86.07
+ 43.03
+ .56 b sec δ
+ 43.59

$22^h 42^m 63.^s43$
$22^h 42^m 10.^s27$
± 43.16
∓ .08
+ 43.08

Frod. 1327 is Fast.
$0^m 43^s.59$
at
$22^h 38^m$ S.T.
Waugh. Obs.

Tuesday Dec. 14, 1909.

Mer. Cir.

Waugh Obs.

Rattle at 22h 55m
o Androm. +41° 50'.
α Pegasi +14° 42'.
Final rattle 23h 02m

+41° 50'

22h 57m 57s.0	59.7	6.7
58m 00.2	56.7	6.9
03.6	53.2	6.8
06.8	50.0	6.8
10.3	47.0	7.3
18.4	38.8	7.2
23.4	33.6.	7.0
		28.8

15 ⌊75
28.50

+14° 42'

23h 00m 34s.4	22.8	7.2
37.1	20.1	7.2
39.3	17.7	7.0
42.0	16.3	7.3
44.8	12.9	7.7
51.0	06.2	7.2
56.0	02.6	7.6
		58.4

15 ⌊96.
68.64

20
.8
16.0
8.8

45.35
.16
46.19

15.35 16
.08
15.27

.65
.16
390
65
1040

22h 57m 88s.50
22h 57m 45s.19
+43.31
+60.00
+43.31
+43.27
2⌊58
+43.29
+.66 b sec d.
+43.85

23h 00m 68s.64
23h 00m 15s.27
+43.37
−.10
+43.27

Frod. 1327 is Fast.
0m 43s.85
at
22h 58m S.T.
Waugh Obs.

Thursday Dec. 16, 09

Mer. Cir.

Waugh Obs

Rattle at 23h 13m
T Pegasi + 23° 14'
L Androm. + 42° 45'
Final rattle 23h 35m

+23° 14' +42° 45'

23h 16m	28s.1	19.0	7.1	23h 33m	53s.9	67.2	1.1
	30.8	16.7	7.5		57.2	64.2	1.4
	33.2	13.8	7.0	34m	01.3	50.9	2.2
	36.0	11.1	7.1		04.0	47.2	1.2
	39.0	08.2	7.2		07.1	44.2	1.3
	46.8	01.7	7.6		15.8	36.8	1.6
	49.8	57.6	7.4		20.6	30.9	1.5
			53.7				25.9
			16)95.0				15)112
			53.63				25.74

16
.01
.16

.44
.16
294
49
.0784

23h 16m 53s.63
23h 16m 09s.53
±44.10
.08
+44.02
+43.92
2)87.94
+43.97
+ .66 b sec d
+44.63

23h 33m 85s.74
23h 33m 41s.82
+43.92
−00.00
+43.92

Frod. 1327 is Fast
0m 44s.53
at
23h 24m S.T.
Waugh Obs.

Saturday Dec. 18, 1909

Mer. Cir. Waugh Obs

~~Rattle at~~ 23h 05m.
Br. 3077 + 56°39′
τ Pegasi + 23°14′
ι Androm. + 42°45′
Final rattle 23h 35m

+56°39′			+23°14′			+ ~~56 39~~ 42°45′		
23h 08m 56s.9	21.8	8.7	23h 16m 28s.9	19.8	8.7	23h 33m 54.2	58.3	2.5
01s.7	17.4	9.1	31.6	17.0	8.6	58.0	55.2	3.2
05.8	12.8	8.6	34.0	14.8	8.8	34m 01.0	51.6	2.6
10.2	08.2	8.4	36.8	11.3	8.2	04.8	48.1	2.9
15.0	04.0	9.0	39.2	09.1	8.3	08.0	44.8	2.8
26.0	52.9	8.9	46.2	02.2	8.4	16.6	36.3	2.9
32.7	46.0	8.7	50.2	58.2	8.4	21.4	31.8	3.2
		39.2			54.2			26.3
		15⟌546,110			15⟌36			16⟌64
		39.37			54.24			26.42

~~23~~h

23h 08m 99s.37	23h 16m 64s.24	23h 33m 86s.42
23h 08m 54s.98	23h 16m 09s.51	23h 33m 41s.78
+ 44.39	+ 44.73	+ 44.64
+ .10	− .08	± 00.00
+ 44.49	+ 44.65	+ 44.64
	+ 44.64	
	2⟌129	
	+ 44.64	
	+ .56 b. sec. δ	
	+ 46.20	

29 19
.2 .2
5.8 3.8
.16 .60 .0960 .16 .02 .0832
49 41.78.
.16 .294 49 .0784

Frod. 1327 is fast
0m 46s.20 at 23h 16m S.T.
Waugh Obs.

Monday Dec. 20, 1909.

Mer. Cir.

Waugh Obs.

Rattle at $23^h 22^m$
70 Pegasi $+12°15'$
ι Androm. $+42°45'$
Final Rattle $22^h 36^m$

$+12°15'$				$+42°45'$			
$23^h 24^m$	$56^s.1$	44.2	0.3	$23^h 33^m$	$54^s.9$	58.7	3.6
	58.6	41.8	0.4		58.2	55.8	4.0
25^m	01.4	39.0	0.4	34^m	01.2	52.0	3.2
	03.8	36.2	0.0		04.6	48.7	3.3
	06.2	34.0	— 0.2		07.8	44.8	— 2.6
	12.7	27.6	0.3		16.0	37.0	3.0
	16.3	23.9	0.2		21.8	31.8	3.6
			20.1				26.7
			15 | 19.0				15 | 10.0
			20.12				26.66

4.4 19
.4
7.6

.16
.70
.1120

$23^h 24^m 80^s.12$
$23^h 24^m 34^s.85$
+45.27
− .11
+45.16
+44.92
2 | 90.08
+45.04
+ .56 b sec. δ
+45.60

$23^h 33^m 26^s.66$
$23^h 33^m 41^s.74$
+44.92

Frod. 1327 is fast.
$0^m 45^s.60$
at
$23^h 29^m$ S.T.
Waugh Obs.

Tuesday, Dec. 21, 1909.

Mer. Cir.

Waugh Obs.

Rattle at $23^h 15^m$
T Pegasi $+23°14'$
70 Pegasi $+12°15'$
Final rattle at $23^h 26^m$

$+23°14'$			$+12°15'$		
$23^h 16^m 29^s.3$	20.6	9.9	$23^h 24^m 62^s.3$	44.1	0.4
32.1	17.6	9.7	68.9	41.7	0.6
34.8	15.0	9.8	01.1	39.2	0.3
37.3	12.2	9.5	04.0	36.7	0.7
40.1	09.8	9.9	06.2	34.1	0.3
46.9	03.0	9.9	12.8	27.9	0.7
51.1	58.9	0.0	16.6	24.2	0.8
		54.9			20.8
	15 | 136			15 | 43	
	64.90			20.28	

.16
.49 .70
.16 = .1120
294
49
.0784

$23^h 16^m 64^s.90$
$23^h 16^m 09^s.47$
+45.43
− .08
+46.35
+45.31
2 | 6
+46.33
+ .56 b sec. d.
+46.89

$23^h 24^m 80^s.28$
$23^h 24^m 34^s.86$
+45.42
− .11
+45.31

Frod 1327 is fast
$0^m 45^s.89$
at
$23^h 20^m$ S.T.
Waugh Obs.

Wednesday Dec 22, 1909

Mer. Cir.

Waugh Ob.

Rattle at $23^h 22^m$
70 Pegasi +12° 15'
b Androm. +42° 45'
Final rattle at 23^h

+12° 15'			+42° 45'		
$23^h 24^m 56.^s7$	44.3	1.0	$23^h 33^m 56.^s2$	59.1	4.3
59.2	42.1	1.3	58.8	56.9	4.7
01.6	39.4	1.0	02.2	52.3	4.6
04.2	37.0	1.2	05.4	48.8	4.2
06.7	34.6	1.3	08.9	45.7	4.6
13.0	28.2	1.2	17.2	37.1	4.3
16.8	24.3	1.1	22.2	32.1	4.3
		20.7			27.1
		15) 8 8.30			15) 30
		20.58			27.20

$23^h 24^m 80.^s58$
$23^h 24^m 34.^s82$
+46.76
− .11
+ 45.66
45.49
2) 11 4
+ 45.57
+ .56 b sec δ
+ 46.13

$23^h 33^m 87.^s20$
$23^h 33^m 41.^s71$
+ 45.49
− 00.00
+ 45.49

.19
.6
11.4

.76
.70
.1120

Frod. 1327 is fast.
$0^m 46.^s13$
at
$23^h 28^m$ S.T.
Waugh Ob.

Friday, Dec. 24, 1909 (Christmas Eve)

Mer. Cir.

Rattle at $23^h 40^m$ Waugh Obs.
α Androm. +28°35′.
γ Pegasi +14°40′
Final ~~rattle~~ $0^h 10^m$.

+28°35′			+14°40′			
$0^h 04^m 02^s.7$	55.8	8.5	$0^h 08^m 57^s.0$	46.5	2.6
05.3	53.1	8.4	59.7	43.0	2.7
08.1	50.1	8.2	02.1	40.4	2.5
10.9	47.2	8.1	04.6	37.8	2.4
13.8	44.7	8.6	07.1	35.3	2.4
20.8	37.2	8.0	13.8	29.0	2.8
24.9	33.2	8.1	17.6	25.1	2.6
		29.0			21.2
		15 ⌊18			15 ⌊41 110
		29.12			21.27

14 42.90
.8 .11
11.2 42.79
96 1 34.99
.10
34.89
.37
.16
222 .66
37 .16
.0592 390
37
66
.1040

$0^h 03^m 89^s.12$
$0^h 03^m 42^s.79$
+46.33
+ .06
+46.39
46.48
2 (92.87
+46.43
+ .62 b sec. α
+46.99

$0^h 08^m 21^s.27$
$0^h 08^m 34^s.89$
+46.38
+ .10
46.48

Frod. 1321 is Fast.
$0^m 46^s.99$
at
$0^h 05^m$ S.T.
Waugh Obs

Monday Dec. 27, 1909

Mer. Cir.

Waugh Obs

Rattb at $23^h 55^m$
α Androm + 28° 38'
71 Androm +33°
Final rattb at $0^h 34^m$

+28° 38'			+33° 13'		
$0^h 04^m 03^s.3$	56.8	0.1	$0^h 32^m 22^s.5$	18.7	1.2
06.3	54.1	0.4	25.4	15.9	1.3
09.1	51.2	0.3	28.3	12.7	1.0
12.1	48.3	0.4	31.6	09.8	1.4
14.7	45.7	0.4	34.5	06.9	1.4
21.9	38.3	0.2	41.9	59.5	1.4
25.9	34.2	0.1	46.2	55.0	1.2
		30.1			50.6
	15⌊20				15⌊95
	80.13				50.63

$0^h 03^m 90^s.13$
$0^h 03^m 42^s.75$
+ 47.38
+ .06
+ 47.44
47.52
2⌊96
+ 47.48
.56 b sec. δ.
± 48.04

$0^h \overset{31}{\cancel{32}}{}^m \overset{110}{\cancel{63}}{}^s.63$
$0^h 31^m 63^s.15$
+47.48
+00.04
47.52

.37 .26
.16 .16
.222 .166
.37 .26
.059 .0410

Frod. 1327 is fast
$0^m 48^s.04$
at
$0^h 17^m$ S.T.
Waugh Obs.

Thursday Dec. 30, 909

Mer. Cir.

Rattle $23^h 58^m$
B Cassiopejae $+58°38'$
γ Pegasi. $+14°40'$
Final Rattle $0^h 18^m$.

Waugh Obs.

$+58°38'$

$00^h 04^m$	$23^s.2$	53.2	6.4
	27.9	48.8	6.7
	32.7	43.8	6.5
	37.6	39.0	6.6
	42.2	34.4	6.6
	53.8	22.4	6.2
	01.3	15.4	6.7
			08.4
	~~084.~~	~~11.4~~	
			~~15.4~~

15⌊41
08.27

$+14°40'$

$00^h 08^m$	$59^s.2$	47.3	6.5
09^m	01.4	45.1	6.5
	04.0	42.3	6.3
	06.5	39.9	6.4
	09.1	37.1	6.2
	15.4	30.8	6.2
	19.4	27.0	6.4
			23.3

15⌊28
23.18

.72
.16
432
72
.1152

31
.4
124
4.4

20.68
.12
20.40
34.87
4
34.83

.65
.16
390
65
1040

$00^h 04^m 68^s.27$
$00^h 04^m 20^s.46$
+ 47.81
+ .12
+ 47.93
48.25
2⌊16.18
+48.09
+ .56
+ 48.66

$00^h 08^m 83^s.18$
$00^h 08^m 34^s.83$
+48.35
+ .10
+ 48.25

Frod 1327 is fast
$0^m 48^s.66$
at
$0^h 06^m$ S.T.
Waugh Obs.

Friday Dec. 31, 1909 (New Years Eve)

Mer Cir.

Waugh Obs.

Rattle after 1st star $0^h 05^m$
α Androm. +28°35′
γ Pegasi. +14°40′
Final rattle $0^h 10^m$.

+28°35′

$0^h 04^m 04^s.3$	58.0	2.3
07.3	55.2	2.6
10.2	52.3	2.5
13.0	49.3	2.3
15.4	46.8	2.2
23.2	39.7	2.9
27.2	35.6	2.8
		31.2

15 | 37 (70)
31.24

+14°40′

~~$0^h 08^m 59^s.3$ 47.9~~
~~04.3 46.2~~
~~07.1 42.4~~
~~09.6 40.0~~
~~12.0 37.8~~
~~16.0 49.8 31.2~~
~~19.8 23.7 27.2~~
~~27.2~~
~~23.7~~

$0^h 08^m 59^s.3$	47.8	7.1
$09^m 02.0$	46.1	7.1
04.3	42.4	6.7
07.1	40.0	7.1
09.6	37.8	7.4
16.0	31.1	7.1
19.8	27.3	7.1
	23.7	

15 | 83 (70)
23.55

14 42.76
.5 .07
7.0 42.69
.37 .66
.16 .16
222 .39
37 .66
.0592 .1056

$0^h 03^m 91^s.24$
$0^h 03^m 42^s.69$
+48.55
− .06
+48.49
48.63
2 | 97.12
48.56
+00.56
+49.12

$0^h 08^m 83^s.66$
$0^h 08^m 34^s.8$
+48.79
− .16
+48.63

Frod. 1327 is Fast.
$0^m 49^s.12$
at
$0^h 05^m$ S.T.
Waugh Obs

Monday Jan. 3, 1910

Mer. Cir.

Waugh Ob.

Rattle at 0h 10m

π Androm. +33°13m

δ Androm. +30°22m

Final rattle 0h 36m

+33°13m				+30°22m		
$0^h 32^m 24^s.3$	20.3	4.6		$0^h 34^m 51^s.8$	45.8	7.6
27.3	17.5	4.8		54.6	43.1	7.1
30.2	14.5	4.7		57.3	40.0	7.3
33.2	11.6	4.8		00.3	37.2	7.5
36.1	08.4	4.6		03.1	34.6	7.1
43.7	01.1	4.8		10.4	27.6	8.0
47.8	56.8	4.6		14.7	23.1	7.8
		52.3				18.9
		15 | 51				15 | 126
		+52.34				18.83

.16
.3
.046

.14
.3
.042

.26
.16
156
26
.0416

3.09
.05
3.04

29.61
.06
29.67

.33
.16
198
33
.0528

$0^h 32^m 52^s.34$
$0^h 32^m 03^s.04$
+49.30
+.04
+49.34
.31
2 | 65
+49.32
+.56 b sec φ
+49.88

$0^h 34^m 78^s.83$
$0^h 34^m 29^s.57$
+49.26
+.05
+49.31

Frod. 1327 is Fast.
$0^m 49^s.88$
at
$0^h 33^m$ S.T.
Waugh Ob.

Friday Jan. 7, 1910

Mer. Cir.

Waugh Obs

Rattle at 0h 45m
μ Androm +38° 0.
β Androm. +35° 08'
Find rattle 01h 07m.

+38° 0			+ 35° 08'		
0h 52m 04s.2	03.7	7.9	0h 05m 01s.6	58.9	0.5
07.4	00.3	7.7	04.7	56.0	0.7
10.4	57.2	7.6	07.7	53.8	1.5
13.7	54.2	7.9	10.5	49.8	0.3
16.8	51.2	8.0	13.9	47.1	1.0
24.8	43.3	8.1	21.3	39.3	0.6
29.3	38.8	8.1	25.7	34.9	0.6
		34.0			30.3
	15 ⟌13.3			15 ⟌6.6	
		33.88			30.36

17
.7
11.9
16
.7
11.2
.13 .21
.16 .16
78 126
13 21
.0218 .0336

44.15
.12
44.03
40.37
.11
40.26

0h 51m 93s.88
0h 51m 44s.03
+49.85
+ .02
+49.83
50.06
2 ⟌99.89
+49.94
+ .56 β sec. δ
+50.50

0h 04m 90s.36
0h 04m 40s.26
+50.10
− .04
+50.06

Frod. 1327 is Fast.
0m 00s.60
at.
0h 58m S.T.
Waugh Obs

Saturday, Jan. 8, 1910

Mer. Cir.

Rattle at $0^h 40^m$ Waugh Ob.
ι Androm. +23°46′ (accidental tap after 1st wire; 2nd group.)
υ Androm. + 38°0′
Final rattle at $0^h 54^m$.

+23°46′			+38°0′		
$0^h 42^m 57^s.8$	48.6	6.4	$0^h 52^m 04^s.2$	03.8	8.0
00.3	46.0	6.3	07.2	00.7	7.9
02.8	43.2	6.0	10.2	57.4	7.6
05.3	40.7	6.0	13.2	54.0	7.2
08.0	37.7	5.7	16.3	51.3	7.6
16.0	31.0	6.0	24.7	43.3	8.0
18.9	27.1	6.0	29.3	38.8	8.1
		23.1			34.1

15)15
23.10

15)12.5
34.83

13
.8
10.4
17
.8
13.6
.48
.16
288.
48
.0768

32.90
.10
32.80
44.16
.14
44.01
.13
.16
78
13
.0208

$0^h 42^m 83^s.10$
$0^h 42^m 32^s.80$
+50.30
+ .08
+50.38
+50.84
2)122
+50.61
+ .56 b sec δ
+51.17

$0^h 51^m 94^s.83$
$0^h 51^m 44^s.01$
+50.82
+ .02
+50.84

Frod. 1327 is fast
$0^m 51^s.17$
at
$0^h 46^m$ S.T.
Waugh Ob.

Monday Jan. 10, 1910

Mer. Cir.

Waugh Obs.

Rattle at $0^h 49^m$
. B Androm +35° 08′
U Piscium +26° 47′
Final rattle $01^h 16^m$

+35° 08′			+26° 47′		
$01^h 05^m 02^s.1$	59.2	1.3	$01^h 14^m 54^s.2$	46.9	1.1
04.9	56.2	1.1	57.1	44.0	1.1
07.9	53.2	1.1	59.8	41.2	1.0
10.9	50.2	1.1	02.7	38.3	1.0
14.0	47.2	1.2	05.2	36.7	0.9
21.5	39.7	1.2	12.2	28.8	1.0
26.2	36.1	1.3	16.5	24.3	0.8
		30.7			20.4
		15)90			15)73
		30.60			20.38

21
.16
126
21
.0336

41
.16
246
41
.0656

$01^h 04^m 90^s.60$
$01^h 04^m 40^s.21$
+50.39
+ .03
+50.42
.44
2)86
+50.43
+ .56 b sec d.
+50.99

$01^h 14^m 80^s.38$
$01^h 14^m 30^s.00$
+50.38
+ .06
+50.44

Frod. 1327 is Fast.
$0^m 50^s.99$
at.
$01^h 09^m$ S.T. Waugh Obs.

Wednesday Jan. 12, 1910.

Mer. Cir.

Waugh Obs.

Rattle at 01h 00m.
β Androm. +35° 08′
ν Piscium +26° 47′
Final rattle 01h 16m

+35° 08′			+26° 47′		
01h 05m 02s.0	59.2	1.2	01h 14m 54s.2	46.9	1.1
05.1	56.3 -3	1.4	57.0	44.0 ~~46.9~~	1.0
08.1	53.0	1.1	59.8	41.1 ~~44.0~~	0.9
11.1	50.2	1.3	02.3	38.5 ~~41.1~~	0.8
14.1	47.2	1.3	05.2	35.8	1.0
21.4	39.4	0.8	12.2	28.9	1.1
26.0	35.1	1.1	16.2	24.5	0.7
		30.3			20.2
		15 ⌊ 8.5			15 ⌊ 6.8
		30.56			20.450

16 40.37
.2 40.21
3.2 .03
40.18
14 30.50
.2 .03
2.8 29.97

01h 04m 90s.56.
01h 04m 40s.18
+50.38
+ .03
+ 50..41
.54
2.96
+ 50.47
+ .56 b sec. d.
51.03

01h 14m 80s.46
01h 14m 29s.97
+50.48
+ .06
+ 50.54

Frod. 1327 is Fast.
0m 51s.03
at
01h 09m S.T.
Waugh Obs.

Thursday Jan. 13, 1910

Mer. Cir.

Rattle at $01^{h}26^{m}$ Waugh Cb.

U Persei +48°10'

α Triang. +29°08'

Final ~~rattle~~ $01^{h}50^{m}$

+48°10'		
$01^{h}32^{m}41.^{s}6$	51.8	
46.4	48.3	3.1
49.1	44.3	3.4
52.8	40.4	3.2
56.4	37.1	3.5
05.6	29.0	4.6
16.6	23.0	4.6
		17.2
	15	11.2
		16.74

+29°08'		
$01^{h}48^{m}19.^{s}8$	13.3	3.1
22.5	10.8	3.3
25.3	07.7	3.0
28.2	04.8	3.0
31.0	02.0	3.0
38.1	56.0	3.1
42.3	52.9	3.2
		46.3
	15	8.0
		46.53

22
.3
6.6

26.64
.07
26.57

56.05
.04
56.01

14
.3
4.2

22
.16
132
22
.0352

.36
.16
216
36
.0576

$01^{h}32^{m}76.^{s}74$.
$01^{h}32^{m}26.^{s}57$
+50.17
+ .04
+50.21
46
2⟌67
+50.33
+ .56 b sec. δ
+50.89

$01^{h}47^{m}106.^{s}63$
$01^{h}47^{m}56.^{s}01$
+50.62
− .06
+50.46

Frod. 1321 is Fast.
$0^{m}50.^{s}89$
at.
$01^{h}39^{m}$ S.T.
Waugh Cb.

Saturday Jan. 15, 1910

Mer. Cir.

Waugh, Obs.

Rattle at 01h 43m
α Triang. +29°08
β Arietis, +20°22'
Final rattle 01h 52m

+29°08'			+20°22'		
01h 48m 20s.1	13.7	3.8	01h 50m 05s.2	55.0	0.2
22.9	11.0	3.9	07.9	52.6	0.5
26.8	08.1	3.9	10.3	49.9.	0.2
28.3	05.2	3.5	13.1	47.3	0.4
31.2	02.4	3.6	15.9	44.8	0.7
38.3	55.7	4.0	22.3	38.2.	0.6
42.6	51.1	3.7	26.2	34.1	0.3
		46.9			30.2
		15)133			15)30
		46.88			30.20

.36
.16
216
36
.0576

14
.5
7.0
13
.5
6.5

56.05
.07
55.98
39.18
.07
39.11

.56
.16
336
65
.0886

01h 47m 106s.88
01h 47m 55s.98
+50.90
− .06
+50.84
51 00
2)101.84
+50.92
+ .66 β secδ.
+51.48

01h 49m 90s.20.
01h 49m 39s.11
+51.09
− .09
+51.00

Frod 1327 is Fast
0m 51s.48
at
01h 48m S.T.
Waugh Obs

Monday Jan. 17, 1910

Mer. Cir.

Rattle at — Waugh Clk
β Arietis +22°20'
γ Androm. +41°53'
Final rattle .02h 00m

+22°20'   +41°53.

$01^h 50^m 05^s.3$	55.6	0.9	$01^h 58^m 40^s.8$	43.5	4.3
07.9	52.8	0.7	44.2	40.2	4.4
10.6	60.2	0.8	47.4	37.1	4.5
13.1	47.4	0.5	50.6	33.9	4.6
15.9	46.1	1.0	54.0	30.2	4.2
22.7	38.2	0.9	02.3	22.1	4.4
26.7	34.2	0.9	07.3	16.9	4.2
		30.3			12.6
		15)50			15)31
		30.33			12.20

13
7
9.1

18
.7
12.6

21.35
.13
2[illegible]

.57
.16
306
51
.0816

.01
.16
.0016

$01^h 49^m 90^s.33$ $01^h 58^m 72^s.20.$
$01^h 49^m 39^s.09$ $01^h 58^m 21^s.22.$
+51.24   +50.98
.08   + 0.00
+51.16   + 50.98
50.98
2)102.14
+51.07
+ .56 b sec δ.
51.63

Frod. 1327 is Fast
$0^m 51^s.63$
at
$01^h 13^m$ S.T.

Thursday Jan. 20, 1910.

Mer. Cir.

ν Persei +48°10' Waugh 6 la
γ Androm. +41°53'

Time of rattle 02"04"

+48°10'			+41°53'		
01h 32m 43s.4	53.4	6.8	01h 58m 42s.0	44.7	6.7
47.0	49.9	6.9	45.2	41.7	6.9
50.6	45.8	6.4	48.4	38.2	6.6
54.4	42.4	6.8	51.7	34.9	6.6
58.1	38.9	7.0	55.0	31.7	6.7
07.3	29.6	6.8	03.2	23.3	6.5
12.9	23.9	6.8	08.2	18.0	6.2
		18.2			13.2
		15⌊57			15⌊44
		18.38			13.29

.21 .04
.16 .16
126 .0064
21
.8336

01h 32m 78s.38
01h 32m 26s.42
+51.96
.04
+52.00
52.11
2⌊111
+52.05
+ .56 b sec d
+52.61

01h 58m 73s.29
01h 68m 21s.17
+52.12
.01
+52.11

Frod. 1327 is Fast
0m 52s.61
at.
01h 45m S.T.

Monday Jan. 24, 1910

Mer Cir.

Waugh Obs.

Rattle at $01^h 57^m$
α Arietis +23°02'
β Triang. +34°33'
Final rattle at $02^h 06^m$

+23°02' | +34°33'

$02^h 02^m 33^s.3$	24.3	7.6	$02^h 04^m 35^s.3$	32.0	7.3
35.9	21.3	7.2	38.3	29.2	7.5
38.3	18.7	7.0	41.0	26.1	7.1
41.2	15.9	7.1	44.2	22.9	7.1
44.0	13.2	7.2	47.1	20.2	7.3
50.8	06.7	7.5	54.7	12.6	7.3
54.8	02.4	7.2	59.1	08.1	7.2
		58.6			03.3
		16 | 9 4			15 | 9 1
		58.62			63.60

14
.4
5.6
1.7
.4
6.8

4.99
4.93
10.14
.07
10.17

.49
.16
.294
.49
.0784

.22
.16
136
22
.0366

$02^h 02^m 58^s.62$
$02^h 02^m 04^s.93$
± 53.69
.08
~~53.77~~
+ 53.61
53.39
2 | 100
+ 53.50
+ .56 b sec δ
+ 54.06

$02^h 04^m 63^s.60$
$02^h 04^m 10^s.17$
± 53.43
.04
53.39

Frod. 1327 is fast.
$0^m 54^s.06$
at
$02^h 03^m$ S.T. Waugh.

Tuesday Feb. 1, 1910

Mer. cir.

Waugh Obs.

Rattle at 2h 42m
δ Arietis +19°23'
α Persei +49°32' missed 1st 2 wires
Final rattle at 03h 20m

+19°23' +49°32'

03h 07m	01s.0	50.6	1.7	03h 18m	00.0 ~~00.00~~	00.0		
	03.4	47.8	1.2		~~00.00~~	00.0.	~~22.5~~	
	06.2	45.2	1.4		000 ~~18.9.~~	21.3	18.5	9.8
	08.7	42.7	1.4		~~21.3~~	25.3	14.7.	0.0
	11.3	40.0	1.3		~~25.5~~	29.1	10.9	0.0
	18.0	38.7	1.7		~~29.~~	38.7	01.4.	0.1
	21.9	29.7	1.6			44.3.	53.6.	9.9
			25.9					50.0

15 ⟌ 1.12
25.74

11 ⟌ 198
60.18

14
.2
2.8
25
.2
5.6
56
.16
336
56
.0896

28.12
.03
28.09
52.82
.05
52.77
.26
.10
.156
.26
6.0416

03h 06m 85s.74
03h 06m 28s.09
+57.65
− .09
+57.56
.45
2 ⟌ 1.01
+57.50
+ .62 b sec. δ
+68.06

03h 17m 110s.18.
03h 17m 52s.77
+67.41
+ .04
+57.45

Fred. 1327 is Fast.
0m 68s.06
at.
03h 11m S.T. Waugh.

Wednesday Feb. 2, 1910.

Mer. Cir. Waugh Obs.

Rattle at $02^h 50^m$
ρ Persei. +38° 29′
β Persei. +40° 36′
Final rattle $03^h 05^m$.

+38° 29′				+40° 36′			
$02^h 59^m$	$51^s.6$.	51.6	3.2	$03^h 02^m$	44.7	46.2	0.9
	54.3	47.9	2.2		48.1	43.2	1.3
	57.6	45.0	2.6		51.2	40.1	1.3
	00.8	42.2	3.0		54.2	36.5	1.7
	04.2	38.6	2.8		57.2	33.7	0.9
	12.1	30.7	2.8		05.7	25.2	0.9
	17.0	26.0	3.0		10.6	20.7	1.3
			21.4				10.7
			15)60				15)90
			21.40.				15.60

23.56.
.06
23.50
19
.3
5.7
17.78
.06
17.72
20
.3
6.0
.16
.06
.0096
.12
.16
72
12
0192

$02^h 59^m 81^s.40$
$02^h 59^m 23^s.58$
+57.90
± .02
+57.88
.87
2)175
+57.87
+ .56 for sec φ.
+58.43

$03^h 02^m 75^s.60$.
$03^h 02^m 17^s.72$
+57.88
+ .01
+57.87

Chron. 1327 is fast.
$0^m 58^s.43$
at.
$03^h 00^m$ S.T.

Waugh Obs.

Friday Feb. 4, 1910

Mer. Cir.

δ Arietis +19°23' Waugh. Gb.
Rattle after 1st star $03^h 8^m$.
α Persei +49°32'
Final rattle $03^h 20^m$
Shutters closed $03^h 23^m$

+19°23'			+49°32'		
$03^h 07^m 02^s.4$	52.0	4.4	$03^h 18^m 15^s.3$	27.6	2.9
04.9	49.4	4.3	19.2	24.0	3.2
07.6	46.7	4.3	23.2	20.2	3.4
10.1	44.2	4.3	27.2	16.4	3.6
12.7	41.7	4.4	31.0	12.6	3.6
19.4	35.2	4.6	40.3	03.0	3.3
23.3	31.2	4.5	46.2	57.2	3.4
		27.2			51.8
	15 | 30			15 | 102	
	27.20			57.68	

28.26
.07
28.19

25
.6
12.5

52.82
.13
52.69

.57
.16
342
57
.0912

.26
.16
156
26
.0416

$03^h 06^m 87^s.20$
$03^h 06^m 28^s.19$
+59.01
− .09
+58.92
+59.03
2 | 117.96
+58.97
+ .56 b sec δ.
+59.53

$03^h 17^m 111^s.68$.
$03^h 17^m 52^s.69$
+58.99
+ .04
+59.03

Frod. 1327 is Fast
$0^m 59^s.53^m$
at.
$03^h 11^m$ S.T.

Waugh Gb.

Saturday Feb. 5, 1910.

Mer. Cir.

Rattle at 02h 53m Waugh Clk.
ρ Persei +38°29'
β Persei. +40° 36.
Final rattle at 03h 04.

+38°29'

02h 59m 53s.0 52.9 5.9
56.1 49.7 5.8
59.1 46.3 5.4
02.3 43.2 5.6
05.4 40.2 5.6
13.3 32.2 6.6
17.9 27.3 6.2
22.8
15 | 117
22.78

+40° 36'

03h 02m 46s.3 47.9 4.2
49.7 44.8 4.5
52.8 41.6 4.3
55.9 38.1 4.0
59.0 35.0 4.0
07.1 26.8 3.9
12.1 21.8 3.9
17.1
15 | 149
16.99

23.56
.11
23.45

17.78
.12
17.56

.12
.06
.0072

.12
.16
72
12
.0192

02h 59m 82s.78
02h 59m 23s.46
+59.33
+ .02
+59.35
.44
2 | 79
+59.39
+ .56 b sec. d.
59.95

03h 02m 76s.99
03h 02m 17s.56
+59.43
+ .01
+59.44

Frod. 1327 is Fast
0m 59s.95
at
03h 00m S.T.
Waugh Clk.

Monday Feb. 7, 1910.

Mer. Cir

Waugh Gb.

Rattle at. $03^h 14$
a Persei $+49°32'$
2 H. Camelop. $+59°37'$
Final rattle at $03^h 24^m$

$+49°32'$				$+59°37'$		
$03^h 18^m$	$16^s.4$	28.8	5.2	$03^h 21^m$	$68^s.9$	31.0	9.9
	20.2	25.0	5.2		03.8	25.9	9.7
	24.0	21.1	5.1		08.3	21.6	9.9
	27.9	17.1	5.0		13.4	16.8	0.2
	31.8	13.7	5.5		18.3	11.7	0.0
	41.6	04.0	5.6		30.4	59.7	0.1
	47.1	68.2	5.3		37.3	52.3	9.6
			62.7				45.0
			15 | 96				15 | 134
			62.64				44.89

25
.8
20.0
34
.8
27.2

62.82
.20
52.62
46.62
.27
46.35

.26
.16
156
26
.0416

.78
.16
468
78
.1248

$03^h 17^m 112^s.64$
$03^h 17^m 52^s.62$
+ 60 .02
− .04
+ 59.98
.66
2 | 164
+ 59 .82
+ .56
+ 60 .38

$03^h 21^m 104^s.89$
$03^h 21^m 45^s.35$
+ 59 .54
+ .12
+ 59.66

Frod. 1327 is Fast
0^m ~~19~~ $60^s.38$
at.
$03^h 19^m$ S.T. Waugh Gb.

Mon Feb 7, 1900

Mer Cir experimented { L.C. Obs / Flint Obs

5
Rattle ~~at~~ after 5: ~~8~~3

η Gem +22 32 Flint Obs
~~μ Gem +22 34~~ " "

6
Rattle after ~~5~~: 21

Thursday Feb. 10, 1910

Mer. Cir. Waugh Obs.

Rattle at $03^h 23^m$.
δ Persei + 47°30'
ν Persei + 42°17'
Final rattle $03^h 41^m$

+ 47°30'

$03^h 36^m$	$56^s.4$	05.7	2.1
	00.0	02.2	2.2
	03.6	58.5	2.1
	07.2	54.9	2.1
	10.9	51.2	2.1
	20.2	42.2	2.4
	25.7	36.3	2.0
			31.1

$15\,\lfloor 1\,10$
31.07

+ 42°17'

$03^h 39^m$	$33^s.7$	$3\overset{6}{7}.8$	0.6
	36.8	33.4	0.2
	39.8	29.9	9.7
	43.3	26.4	9.7
	46.7	23.4	0.1
	55.1	15.1	0.1
	00.0	10.0	0.0
			06.0

$15\,\lfloor 1\,4\,\overset{8}{3}$
$0\overset{}{8}.95$
4

$$
\begin{array}{r}
03^h 36^m 91^s.07 \\
03^h 36^m \underline{29^s.97} \\
+61.10 \\
-\underline{.03} \\
+61.07 \\
\underline{.10} \\
2\lfloor 1.17 \\
+61.08 \\
+\underline{.56}\ b \sec \delta. \\
+61.64
\end{array}
$$

$$
\begin{array}{rr}
.18 & .16 \\
\underline{.16} & \underline{.01} \\
108 & .0016 \\
\underline{18} & \\
.0288 &
\end{array}
$$

$$
\begin{array}{r}
03^h 39^m 6\overset{4}{8}^s.95 \\
03^h 39^m \underline{03^s.85} \\
+61.10 \\
+\underline{00.00} \\
+61.10
\end{array}
$$

Frod. 1327 is Fast.
$0^m 61^s.64$
at.
$03^h 37\tfrac{1}{2}^m$ S.T.
Waugh Obs.

Monday Feb. 14, 1910.

Mer. cir.

Waugh Obs.

Rattle at.
η Tauri +23°49'
ζ Persei +31°37'
Final rattle $03^h 50^m$

+23°49'				+31°37'			
$03^h 42^m$	$44^s.6$	35.7	0.3	$03^h 49^m$	$03^s.0$	57.9	0.9
	47.3	33.1	0.4		06.0	55.1	1.1
	49.9	30.3	0.2		08.8	52.2	1.0
	52.7	27.6	0.3		11.5	49.3	0.8
	55.2	25.2	0.4		14.4	46.3	0.7
	02.3	18.1	0.4		21.9	39.3	1.2
	06.0	14.1	0.1		26.2	34.7	0.9
			10.2				30.7
			15 | 2.3				15 | 7.3
			10.15				30.48

.48 × .16
288
48
.0768

.30 × .16
180
30
.0480

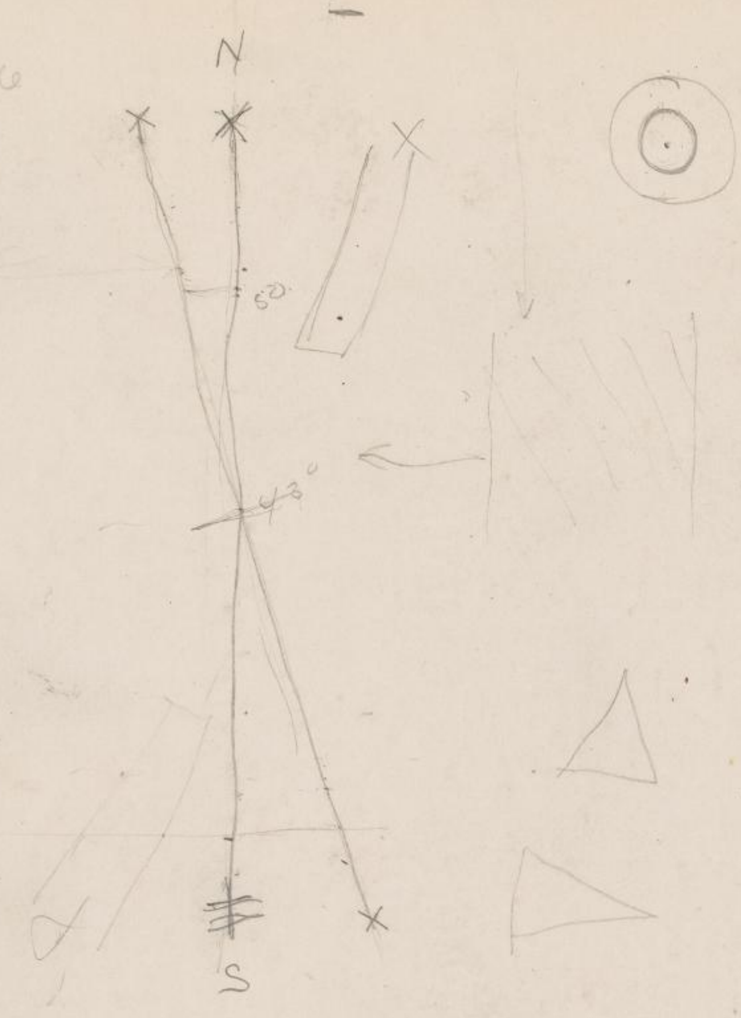
$03^h 42^m 70^s.15$
$03^h 42^m 07^s.35$
+62.80
+ .08
62.88
.82
2170
+62.85
+ .56 b sec. cl.
63.41

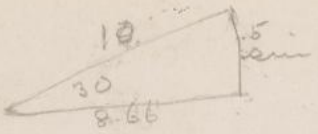
$03^h 48^m 90^s.48$
$03^h 48^m 27^s.71$
+62.77
+ .05
+62.82

Frod. 1327 is Fast
$1^m 03^s.41$
at
$03^h 46^m$ S.T.

Waugh Obs.

sec 6

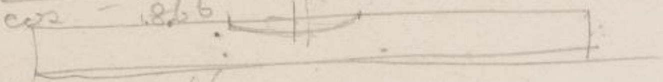




$\sin 30 = \frac{5}{10} = 0.5$

$\cos = \frac{8.66}{10} = .866$

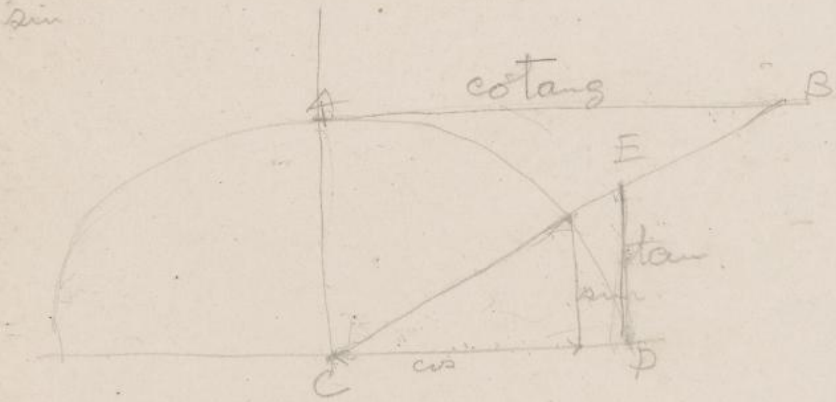
$\tan = \frac{\sin}{\cos} = \frac{.5}{.866}$



$\frac{1}{\tan} = \text{cotang} \quad \frac{8.66}{5}$

$\frac{1}{\cos} = \sec$

$\frac{1}{\sin} = \text{cosec}$



$\frac{DE}{CD} = \frac{AC}{AB}$

$AB \times DE = CD \times AC$

$AB = \frac{1}{DE}$

$\cancel{\frac{DE}{AB} = \frac{CD}{AC}} = 1$

$DE = \frac{1}{AB}$

57.91
60
117.91
53.70
64.21