KG
11366
v.449

General Catalogue
Observations & Reductions
B~~A~~6 1871-2

Charles W. Sever, University Bookstore, Cambridge.

Zone Catalogue
Observations and Reductions
#6
1871–2

1871–2

τ Piscium

1 4 33 4 33.71 −.11

4 33.71

+29 24

25

Sm 2 +.22 +.56 +.56

−.017 1

1872

Nov 16	1	4 36.57		+29°	24′	35″.0	0.4	
21		.48	.03			35.4	.4	1.3
26		45	3			35.8	.4	
Dec 1	(−.11)	41	4			36.1	.3	
6		37	4			36.3	.2	
11	(−.11)	.32	5			36.4	.1	
16		27	5			36.5	.1	2
21		21	6			36.5	.0	
26		.14	.07			36.5	.0	

Nov. 29 +.27 +2.90		Dec. 1. +.36 +3.85		Dec. 2 +.36 +3.73		Dec. 6 +.46 +3.70		Dec. 17 +.39 +3.76		Dec. 20 36 +3.05	
4 24.2	4 24.2	4 22.75	3.2	4 22.0	4 16.2	4 19.5	4 5.7	4 11.2	4 1.7	4 9.4	4 0.4
26.4	26.4	25.1	4.2	24.4	17.8	21.8	7.2	13.5	3.1	11.7 23	2.0
28.9	28.9	27.4	6.0	26.6	19.0	24.1	9.3	15.8	4.8	14.0 23	3.4
33.5		32.0	13.4	31.3	53.0	29.0	22.2	20.5	9.6	18.7 48	5.8
35.8 5	3.1	34.5		33.6		31.2		23.0		21.2 25	
38.4	6.5	36.8		36.1		32.6		25.3		23.5 23	
40.6	7.0	39.2		38.4		36.0		27.6		25.8 23	
42.9	15.6	41.5		40.8		38.5		29.9		28.1 23	
47.8		46.3		45.4		43.0		34.6		32.5 37	
50.1 5	5.2	48.6 5	4.5	47.5 4	15.7	45.6 4	7.4	37.1 4	3.2	35.4 4	1.9
52.5		50.9		50.2		48.0		39.5		37.7	
421.1		4050		3966		369.3		2780		2583	
38.28		36.82		36.05							
36.43	38.282	36.41	36.818	36.40	36.055	33.57	33.573	25.27	25.273	23.48	23.482
1.85	38.26	+41	36.80	−.35	36.04	36.37	33.56	36.26	25.26	36.22	23.46
	36.31		36.36		36.29	−2.80	36.26	10.99	36.15	−12.74	36.11
	−1.85		+50		−.25		−2.70		−10.89		12.65
38.26	38.26	36.80	36.80	36.04	36.04	33.56	33.56	25.26	25.26	23.46	23.46
	36.43		36.41		36.40		36.37		36.26		36.22
−2.07	+1.83	+72	+0.39	+07	−0.36	+242	−2.81	+1065	−11.00	+12.49	−12.76
+15	+11	+20	+11	+20	+11	+26	+11	+22	+11	+20	+11
−2.71	~~−2.71~~	−2.70	~~−2.70~~	−2.69	~~−2.69~~	−2.66	~~−2.66~~	−2.55	~~−2.55~~	−2.51	~~−2.51~~
	+1.94		+.50 50		−.25		−2.70		−10.89		−12.65
33.63		33.58		33.62		33.58		33.58		33.64	
	38.26		36.80		36.04		33.56		25.26		23.46
	−2.12		−0.74		+.07		+2.49		10.63		+12.49
	±.19		±.22		+.21		+.21		+.21		+.17
	2.72		2.70		−2.69		−2.66		−2.55		−2.51
	33.61		33.61		33.63		33.60		33.57		33.61

55	4 40.6	4 40.3	3 46.7	3 38.3	8 42.2	8 44.2
	22.3	20.2	30.2	18.2	25.2	24.4
	629	625	769	565	674	686
	4 31.45	4 31.25	38.45	28.25	33.70	34.30
	−26.9	−27.7	+18.4	+26.2	+22.1	+21.6
	1.42975n	1.44247n	1.26481	1.41830	1.34439	1.33446
	1.49656n	1.50928n	1.33162	1.48511	1.41120	1.40126
	−31.37	−32.31	+21.46	+30.56	+25.77	+25.19
	59 31.45	59 31.25	58 38.45	58 28.25	58 33.70	58 34.30
	59 0.08	58 58.94	58 59.91	58 58.81	58 59.47	58 59.49
+29°	23′ 48″.27	23 49.41	23 48.44	23 49.54	23 48.88	23 48.86
	−14.89	−14.83	−14.81	−14.80	−14.67	−15.12
	23 33.4	23 34.6	23 33.6	23 34.7	23 34.2	23 33.7
	24 36.0	24 36.1	24 36.1	24 36.3	24 36.5	24 36.5
δ=+29	23 48.27	23 49.41	23 48.44	23 49.54	23 48.88	23 48.86
	−21.60	−21.70	−21.70	−21.90	−22.10	−22.10
I −21	+1 2.6 2.4	+1 1.5 1.3	+1 2.5 2.3	+1 1.6 1.4	+1 2.3 2.1	+1 2.8 2.6

1872
1 4 3700
4 3700

1871 δ = −13 +29° 24′ 14.4″
1872 δ = +29° 24′ 33.6″

33.61	−10
.61	−10
.63	.08
.60	−17
.57	−14
.61	−10
.59	−11
.60	−10
482	
33.60	−.11

1872

+3 87+350
Dec. 27

Dec. 28

+37 ~~+376~~
Jan. 21

4 3.0
5.4
7.7
12.5
14.8
17.3
19.6
21.9
26.7
29.0
31.4
1893

4 33.9
35.3
36.7
10.57
4 35.5

4 0.84
3.0
5.3
9.5
11.8
13.9
16.6
18.4
22.7
25.0
27.3

0.84 4 16.0
18.3
20.7
25.4
27.7
30.2
32.6
34.9
39.6
42.1
44.5
3320

4 5.5
6.5
7.8
19.8
4 6.6

Sin δ 9.69100

cos δ 9.94012
12669
.06681

17.21
36.12
−18.91

17.209
17.19
36.01
−18.82

30.18

30.182
30.16
35.77
−5.61

17.19
+18.58
+.21
−2.41

17.19
36.12
−18.93
+.11
−2.41
18.82
33.60

30.16
35.77
−5.61
+17.11
−5.50

30.16
+5.27
+.22
+1.23

33.57

17.19
+18.61
+.20
−2.41

33.59

30.16 36.88
+5.29
+.21
−2.06

33.60

4 28.6
13.4
42.0
21.00

−18.1
1.25767n
1.32448n
−21.11
59 21.00
58 59.89

23 48.46
−14.99

23 33.5
24 36.5
23 48.46
−22.10

+1 3.0 2.7

3 41.4
12.2
53.6
26.80

+23.6
1.37291
1.43972
+27.53
58 26.80
58 54.33

23 54.02
−14.57

23 39.5
24 35.0
23 54.02
−1.40

+0 55.5 55.3

37 Ceti -0.16

1 7 35

-8 37

-.15

Nov. 29		Dec. 12		Dec. 20		Dec. 27		Dec. 28		Jan. 2	
7 46.5	7 40.3	7 31.6	7 28.8	7	7 25.0	7 25.4	7 14.8	7 24.6	7 15.0	7 18.7	7 9.7
48.5	41.6	39.7	31.1		26.6	27.5	16.5	26.7	16.2	21.7	10.9
50.6	42.7	41.6	32.0		27.9	29.6	17.8	28.8	17.2	24.0	12.2
54.8	124.6	45.8	91.9	40.0	79.0	33.7	49.1	32.9	48.4	28.0	32.8
56.9		47.9		42.1		35.9		35.0		30.0	
58.9		50.1		44.2		38.0		37.0		32.1	
0.9		52.1		46.2		40.0		39.1		34.2	
3.0		54.2		48.4		42.0		41.1		36.3	
7.1		58.3		2209		46.0		45.4		40.4	
9.3	7 41.5	60.4	7 30.6		7 26.5	48.3	7 16.4	47.5	7 16.1	42.5	7 10.9
11.4		62.5				50.3		49.6		44.6	
6479		5502				4167		4077		3525	
58.90	58.900	50.02	50.018	44.18	44.180	37.88	37.882	37.06	37.064	32.05	32.045

55 4 51.1	4 61.2	0 67.0	4 64.2	0 64.1	4 62.5
3 56.0	3 52.9	55.2	3 54.2	60.2	52.2
6 01.1	54.1	13.22	58.4	11.13	11.47
4 0.55	4 57.05	1 01.10	3 59.20	0 55.65	3 57.35
+17.4	+19.4	+15.7	+21.5	+21.0	+21.3
1.24054	1.28780	1.24797	1.33243	1.32221	1.32837
1.36230	1.40956	1.36973	1.45419	1.44397	1.45013
+ 23.03	+ 25.68	+ 23.43	+ 28.46	+ 27.79	+ 28.19
59 0.55	58 57.05	59 1.10	58 59.20	58 55.65	58 57.35
59 23.58	59 22.73	59 24.53	59 27.66	59 23.44	59 25.54
-8° 36 35.23	36 34.38	36 36.18	36 39.31	36 35.09	36 37.19

~~Jan 8th~~
or 9th
Jan. 9th ?

7 14.3
16.4
18.3
22.6
24.7
26.8
28.8
31.0
35.0
37.1
39.2
294.2

26.75 26.745

sin v 9.17558

cos v 9.99507
12669
.12176

Jan. 8th
4 38.0
25.9
63.9
4 31.95

Polaris

1 12 02
11 37.29 = P
88 3 37.88 = 1.H.

+41.84

41.84

38.17 +88
(41.22)
38.01 +72
37.47 +18
38.04 +75
36.33 −.96
36.73 −.56
38.04 +.75
38.27 +.98
39.64 +2.35
~~38.18~~ +.56
37.~~79~~ 85

−63

sin √9.88887

cos √8.38276
12669
8.50945

8.38276
11844
8.50080

1871

+.373
Dec 5
1 3 28.5
4 53.6
6 17.5
9 10.4
10 36.2
12 −2.5
13 27.6
14 52.7
17 44.6
19 13.0
20 37.4
32.40
30.2
24.0
12 2.18
12 18.01 ~~+1.55~~ 18.18
−16.82
−16.63
1.55
18.01
1.55
+1.73
+~~15.61~~
+19.28
−40.13
~~38.17~~
11 38.76

+.370
Dec 6
1 11 2.5
9 9.0
10 37.5
14 54.5
11 2.5
12 03.0
0.5
3.5
7.0
12 2.91 2.28
17.31 17.41
−14.98
−15.13
2.28
17.32
−15.04
+ .50
−14.54
2.28
+2.49
+16.48
+19.97
(41.22)

41.82
+.371
Dec 11 D
1 3 15.0
4 44.4 25.4
6 10.7 26.3
9 0.2 45.5
10 26.8 26.6
11 −55.8 28.7
13 17.6 22.1
14 44.9 27.3
17 33.2 26.3
19 2.9 45.7
20 28.1 25.2
28.33
30.0
58.33
1 11 5.303 5240
14.17 1.427
−21.14
+21.83
52.40
14.18
−21.78
+ .50
−21.28
52.40
+5.98
+15.52
+~~23.11~~
−36.30
~~37.01~~
37.60

+.387
Dec 12
3 3 15.6
4 41.8
8 8.4
8 55.6
10 24.6
11 −51.7
13 17.7
14 41.8
17 35.6
19 1.7
20 27.7
32.60
11 51.46
13.49
−22.02
13.59
50.83
22.76
50.83
13.50
−22.67
+ .50
−22.17
50.83
+6.66
+16.19
+~~23.79~~
−35.63
~~37.47~~
38.00

376
Dec. 17
~~7 25.~~
8 ~~[illegible]~~ 30.8
10 17.8
11 43.2
13 9.0
14 35.5
158.3
6
216.3
11 43.26
25
25.99
5.36
42.63
26.73
42.63
9.26
−26.63
+ .50
−26.13
42.63
+10.68
+15.73
+~~28.03~~
−31.38
~~37.04~~
37.88

7 25.4
14 52.6

45 2 12.1 2 29.6 2 23.8 2 31.1 2 11.9 2 23.2 2 14.7 2 26.8
47.8 4.8 56.4 3.8 51.3 2.0 50.6 2.3
59.9 88.2 63.2 65.3
27.95 40.10 31.60 32.65

Reject the declinations of this star.

8 8 37 5 2

log tang δ = 1.62180
tang δ = 41.86
58.23 − 1.17
1 11 58 23 − (.50)
57.61 − 1

(+.80) to P.

1872.0
Gr. 1870 = 57.00
1869 57.94
1868 57.82 } 57.77
1867 57.94
1866 58.19

Newcomb. 57.85

Wash. 1868 59.32
1867 58.62

57.68
56.65
57.72
56.35
57.60
77
85
57.74

+.44 +.430
(1872) Jan. 9

8 9.984 5.7
9 36.6
10 59.5
12 27.9
13 53.9

11 1.7
2.1
−.04
2.68 8 5.7
2.1

11 1.62 1.62
50.13 0.99
48.51 49.61
48.62
+ 0.~~77~~

0.99 0.99
+29.65 49.61
+18.42 −48.62
+~~57.24~~ + .50
+8.62 49.12

57.68 0.99
29.69
+17.97
57.27 +~~47.68~~ +862
~~13.64~~
~~36.38~~
57.27.

45 2 21.5
56.1
77.6
38.80

+13.9
1.14301
9.65246
0.45

+.41 +.387
Jan. 14

8 .8456 17.0
9 58.3
11 27.4
12 50.3
14 17.1 Ex.

6 17.0

11 23.52 25.52
~~22.89~~ 24.89
44.59 44.59
− 21.70
+~~23.79~~

24.89 24.89
+ 2.96 44.59
+17.16 −18.70
+~~35.84~~ + .50
+13.64 19.20

58.65 24.89
2.95
+16.19
~~+52.70~~ +1364 58.98
57.67
~~36.73~~
57.67

45 27.3
43.4
70.7
35.35

+.37 +.376
Jan. 21

9 +63 52.0 9 5.9
10.2 +11
11 66 17.2
12 −27 43.7
14 9.8
−5.08

9 5.9

11 17.84
31 ~~37.21~~
38.48
21.27
+~~17.21~~

17.21 17.21
+ 5.27 38.48
+15.49 −21.27
+~~41.02~~ + .50
+19.75 20.77

57.72 17.21
+5.29
+15.73
~~58.81~~ +1975
~~38.04~~
57.98

2 7.6
32.9
40.5
20.25

Jan. 23

27.5
52.0

+.38 +.407
−.41
Jan 30

1 2 25.0
3 56.3 31.7
5 22.4 26.1
8 14.4 52.0
9 40.2 25.8
11 − 4.3 27.1
12 30.0 22.7
13 55.0 25.0
16 48.2 53.2
18 14.6 26.4
19 42.8 28.2
356.2
27.0
86.2 7.82
11 ~~6.93~~ 6.93
1 11 30.47 30.47 29.95
23.54 23.54
+~~6.93~~

6.30 6.30
+6.39 29.95
+15.90 −23.65
+~~22.36~~ + .50
+~~34.69~~ 23.05

32.8
56.35 6.30
6.37
+11.26 +
~~7.34~~ +18.28
57.21 ~~38.27~~
59.21

+.330
(1871) Dec 24

8 41.6 22.1
10 3.7
11 35.8 32.1
12 57.6 21.8
14 22.3 24.7
16.10

11 36.200 φ.

35.57
3.75
−28.18
+ .50
27.68

35.57
+16.72
+13.51
+~~33.54~~ + 54.48
25.84
~~39.64~~
40.23

ξ Andromedae
1 14 45
+44 57

11θ beli
1 17 36
− 8 51
+.78 −16

1871 Dec. 1		Dec. 9		Dec. 17		Dec. 27		1872 Jan. 8		Jan. 9	
17 25.3	17 22.8	17 19.9	17 16.0	17 14.0	17 1.8	17 6.0	17 0.7	16 55.4	17 25.0	16 54.8	16 48.8
27.5	23.6	22.2	11.4	16.0	3.3	8.0	1.8	57.6	26.6	56.8	50.3
29.4	~~2~~	24.2	18.8	18.1	4.8	10.0	3.0	59.5	28.0	58.9	52.0
33.6	46.4	28.4	52.2	22.2	9.9	14.2	5.5	3.8	79.6	3.0	151.1
35.7		30.5		24.3		16.2		5.8		5.1	
37.9		32.7		26.3		18.3		− 8.0		−7.0	
39.9		34.7		28.4		20.4	17 38.2	10.0		9.2	
42.0		36.8		30.5		22.5	39.6	12.0		11.4	
46.1		40.9		34.7		26.6	41.3	16.2		15.5	
48.2	17 ~~16~~	43.0	17 17.4	36.5	17 3.3	28.7	17 1.8	18.3	17 26.5	17.6	16 50.4
50.3	23.2	45.1		38.5		30.8		20.4		49.7	
4159		3584		2901		2017		2670		2592	
								570		180	
37.81	37.809	32.58	32.582	26.35	26.464	18.34	18.336	7.91	17	7.92 7.20	7.200

sin δ 9.18710

cos δ 9.99480
12669
,12149

10 3 7.7	3 6.2	2 58.1	3 7.7	4 57.2	3 56.2	3 10.6
57.7	56.4	49.7	0.2	48.7	43.8	−1.4
65.4	62.6	107.8	7.9		100.0	9.2
32.70	31.30	53.90	3.95		50.00	4.60
+14.6	+15.2	+28.2	+16.6		−18.5	+16.8
1.16435	1.18184	1.36548	1.21748		1.26720 ✓	1.22530
1.28584	1.30333	1.48697	1.33897		1.38868	1.34679
+19.31	+20.11	+ 30.68	+21.82		− 24.47	+ 22.22
13 2.70	13 1.30	12 53.90	13 3.95		13 50.00	13 4.60
13 22.01	13 21.41	13 24.58	13 25.77		13 25.53	13 26.82
−8° 50′ 33.66″	50 33.06	50 36.23	50 37.42 ✓		50 37.18	50 38.47 ✓
− 1						

Jan. 21

17	18.8	17	10.0
	21.0		11.5
	23.0		13.1
	27.3		34.6
	29.3		
	31.3		
	33.4		
	35.5		
	39.6		
	41.9		
	44.0	17	11.5
	3451		
	31.37		31378

10 3 38
43.0
46.8
23.40
+19.9
1.29885
1.42034
+2637
12 53.40
13 19.72
50 31.37

ω Andromedae
1 19 55
+44 44
+.99

1871 Nov. 29		Dec. 1		Dec. 2		Dec. 17		~~Dec~~ 2 Jan. 8		Jan. 9	
											11.0
19 44.5	19 27.2	19 43.0	19 37.0	19 42.3	19 25.6	19 31.3	19 22.0	19 12.8	18 57.8	19 11.8	19 12.2
47.4	28.4	45.8	38.2	45.1	26.9	34.3	23.8	15.5	59.8	14.8	14.0
50.3	30.0	48.8	39.8	48.0	28.0	37.0	25.8	18.5	1.5	17.7	37.2
56.0	85.6	54.7	115.0	53.9	80.5	43.0	71.6	24.8	179.1	23.5	
58.9		57.5		56.7		45.7		27.0		26.4	
1.8		0.3		59.3		48.7		29.8		29.1	
4.7		3.2		2.3		51.7		33.0		32.1	
7.7		6.1		5.2		54.4		35.7		35.0	
13.5		11.9		11.1		60.2		41.5		40.7	
16.3		14.8		13.9		63.3		44.5		43.7	
19.2		17.7		16.9		66.1		47.4		46.0	
20 26803	19 28.5	3008	19 38.3	3547	19 26.8	5357	19 23.9	3300	18 59.7	3208	19 12.4
		308.		300							
		3.5		654.7							
61.85		~~0.36~~		59.52		48.70		30.00		29.16	
20	61.845	20 0.35	0.~~36~~ 35	19	59.518	19	48.700	19	30.000		

sin √ 9.84745

cos √ 9.85150
12669
9.97819

Nov. 29	Dec. 1	Dec. 2	Dec. 17	Jan. 8	Jan. 9
77.1	95.3	73.7	84.5	73.4	40.9
35 3 48.4	3 56.8	3 44.9	3 50.5	3 47.0	4 0.7
28.7	38.5	28.8	34.0	26.4	40.2
38.55	47.65	36.85	42.25	36.70	20.45
+33.3	+22.1	+39.7	+24.8	+30.3	+16.7
1.52244	1.34439	1.51454	1.39445	1.48144	1.22270
1.50068	1.32258	1.49273	1.37264	1.45963	1.20089
+31.67	+21.02	+31.10	+23.59	+28.82	+15.88
38 38.55	38 47.65	38 36.85	38 42.25	38 36.70	38 50.45
39 10.22	39 8.67	39 7.95	39 5.84	39 5.52	39 6.33
+44° 43′ 38.13″	43 39.68	43 40.40	43 42.51	43 42.83	43 42.02

Jan. 21

19 36.0 19 19.8
39.0 21.1
41.9 23.0
47.6 63.9
50.6
53.6
56.4
59.2
5.0
8.0
11.0 19 21.3
4083 553
180
588.3
19 53.48 53.482

562
35 3 41.8
.14.4
2810

+32.2
1.50785
1.48604
+3062
38 28.10
38 58.72

43 49.63

=38 Cas

A Cassiopeiae (R. Al.)

1 21 37
21 40.0 21 40.00
−.040
+69 36

+2.69
+2.69

Nov 25.4
Dec 0.4
5.4
10.3
15.9
20.3
25.3
30.3
38.3

~~+.04~~
(+.03)
(−.04)

1 21 44.92 +69° 35′ 83″.0
.78 14
44.62 16
44 18
44.24 20
03 21
43.80 23
56 .24
43.31 .25
.06

84.3
85.4
86.4
87.3
88.0
88.6
89.1
89.5

13
1.39.95
10 89
09 .01
07 05
06 06
05 98
04 39.99

40.01 + 1
39.89 + 11
40.07 + 7
40.00 + 0
39.99 − 1
39.96 − 4
40.03 + 3
39.77 − 23
39.97 − 3
39.96 −.04

1

+.36 +.385 | +.36 +.371 | +.37 +.387 | +.39 +.376 | +.38 +.350 | +.45 +.450

1871 Dec. 1 | Dec. 11 | Dec. 12 | Dec. 17 | Dec. 27 | Dec. 28

(18

−.040
21 32.7
38.6
44.4
50.4
56.3
2224
44.48

21 59.6
61.2
63.0
183.8
22 ~~1~~ 1.8

21 44.73
44.480
44.44
44.75
−.31

44.44
−.71
+.97
−4.75
39.95

44.44
44.75
−0.31
+ 3
−4.75
−10.28

44.44
−0.71
+1.03
−4.75
40.01

21 2.0
7.9
13.6
25.6
31.4
37.4
43.2
48.3
0.9
6.7
12.8
2308
180
4108

20 58.0
60.2
64.2
182.4
21 ~~0~~ 0.8

21 37.34
44.40
7.06
37.345
37.30
44.40
−7.10

37.30
+6.02
+.97
−4.40
39.89

37.30
44.40
−7.10
+ 3
−4.40
−7.07

37.30
+5.99
+1.00
−4.40
39.89

21 1.4
7.0
13.0
24.9
31.0
36.8
42.7
48.7
0.4
6.5
12.3
2247
180
4047

21 0.1
3.3
4.0
7.4
21 2.6

21 36.79
44.37
7.58
36.791
36.75
44.37
−7.62

36.75
+6.64
+.99
−4.37
40.01

36.75
44.37
−7.62
+ 3
−4.37
−7.59

36.75
6.65
+1.04
−4.37
40.07

20 57.4
8.0
9.0
20.7
26.6
32.4
38.4
44.3
56.0
7.1
8.0
4179
60
357.9

20 45.3
48.0
52.5
145.8
20 48.6

21 32.54
44.16
−11.66
32.536
32.50
44.16
−11.66

32.50
+10.66
+1.05
−4.16
40.05

32.50
44.16
−11.66
+ 3
−4.16
−11.62

32.50
10.66
+1.00
−4.16
4000

20 48.5
54.7
8.4
12.4
18.6
24.3
30.1
35.8
47.8
53.8
59.6
3860
120
266.0

20 44.8
48.0
50.8
143.6
21 34.9
38.2
2.0
20 47.9

21 24.18
43.70
19.57
24.182
24.14
43.70
−19.56

24.14
+18.60
+1.02
−3.70
40.06

24.14
44.71
−19.57
+ 3
−3.70
−19.54

24.14
+18.62
+ .94
−3.71
39.99

20 47.1
53.5
59.3
11.1
17.1
22.8
28.7
34.6
46.6
52.7
58.1
4316
180
251.6

20 48.6
51.4
54.8
154.8
21 42.1
43.1
44.3
20 51.6

21 22.87
43.66
20.79
22.873
22.83
43.66
−20.83

22.83
+19.60
+1.21
−3.66
39.98

22.839
43.66
−20.83
+ 3
−3.66
−20.80

22.83
19.58
+1.21
−3.66
39.96

45 3 18.2
2 56.2
6 1.44
3 7.20

−16.8
1.22531 n
0.89428 n
−784
48 7.20
47 59.36
+69° 34′ 48″.99
+ 32.07

35 21.1
36 24.6
δ′=+69 34 48.99
− 7.80

I +1 2.6
+.42 3.5 3.9

45 2 47.5
27.0
7.45
37.25

+36.5
1.56229
1.23127
+17.03
47 37.25
47 54.28
34 54.07
+ 30.74

35 24.8
36 26.6
34 54.07
− 9.80

+1 1.8 2.2

45 2 50.1
28.7
7.8
39.40

+34.3
1.53529
1.20427
+16.01
47 39.40
47 55.41
34 52.94
+ 31.50

35 24.4
36 26.8
34 52.94
− 10.00

+1 2.4 2.8

45
2 44.4 ~~2 47.2~~
23.8
6.82
34.10

+43.9
1.64246
1.31144
+20.48
47 34.10
47 54.58
34 53.77
+ 30.79

35 24.6
36 27.6
34 53.77
− 10.80

+1 3.0 3.5

45
2 47.2 3 20.0
27.0 2 59.3
7.42 6 19.3
37.10 3 9.65

+36.7
1.56466
1.23364
+17.12
47 37.10
47 54.22
34 54.13
+ 31.32

35 25.4
36 28.8
34 54.13
− 12.00

+1 3.4 3.8

45
2 54.5 3 18.6
29.0 2 53.4
8.35 6 1.21
41.75 3 6.00

+31.3
1.49554
1.16452
+14.61
47 41.75
47 56.36
34 51.99
+ 32.41

35 24.4
36 28.9
34 51.99
− 12.10

+1 4.5 4.9

1872.0

1 21 44.35
44.35

δ = 69 36 16.8
: ~~69 36 35.5~~

44.41
11
32
44.31

+38 +380 | +42 +420 | +44 +430

1872 Jan. 2 | Jan. 8 | Jan. 9

20 43.0 21 1.8 21
48.5
54.2
6.2
12.0
17.8
24.0
29.7
41.6
47.6
53.4
3786
160
1486
18.05

2.6
4.4
21 ~~1.5~~
2.2

21 0.9
6.9
12.8
19.0
24.8
~~31.9~~
949

21 35.2 20
39.3
74.5
21 24.8 ×
37.2

36.8 20
42.7
48.5
0.6
6.3
12.1
18.0
24.9
35.9
41.7
47.6
3142
180
134.2
1220

26.3
27.5
28.2
82.0
20 273

Sin √ 9.97187

Cos √ 9.54229
1.2669
9.66898

21 4350
2545
18.055
18.01

1288 1288
21 43.13 12.85
3.025
18.980
18.94

21 43.08
30.88
12.200
12.16

1801 | 18.01 | 18.94 | 1285 18.94 | 12.16 | 12.16

43.41
−25.40

43.11 43.11
3026 24.10

43.06
−30.90

1801
+24.44
+1.02
+.94
44.41

18.01
43.41
−25.40
+3
−25.37

12.85
+28.89
+1.13
+1.24
44.11

12.85
43.10
−30.25
+3
−30.22

12.16
+29.69
+1.18
+1.29
44.32

12.16
43.05
−30.89
+3
−30.86

1801
+24.41
+3.41
+1.02
40.03

12.85
+28.89
−3.10
+1.13
39.77

12.16
+29.70
−3.05
+1.16
39.97

4

2 59.8
86.0
95.8
47.10
+15.9
1.20139
0.87037
+742
47 47.90
47 55.32

34 53.03
+32.36

35 25.4
36 29.4
34 53.03
+~~6.10~~
−12.60
+1 4.0 4.4

4

3 16.5
2 61.5
6 08.0
3 41.00
−~~17.9~~ −243
1.07554n 1.38560n
0.74452n 1.05458
−~~5.88~~ −1134
48 4.00 4.00
4 ~~58.45~~ 47 52.66

34 55.69
+ ~~36.88~~

35 27.6
36 29.6
34 55.69
+~~5.70~~
−12.80
+1 2.0 2.5

4

2 43.1
19.4
62.5
2 31.25
+44.9
1.65224
1.32122
+20.91
47 31.25
4 52.20

34 56.15
+ 20.93

35 27.1
36 29.6
34 56.15
+~~5.90~~
12.80
+1 2.5 2.9

κ Piscium
1 24 36
24 3494
+14 41

24 3494 +.03

+.46 (+.26 +.26)
– 016

Nov. 16		1 24 37.68		+ 14° 40′ 65″.2	.0			
21		66	2	65.2	.0			
26		64	2	65.2	.0			
Dec 1	+.03	62	2	65.2	.1			
6	+.02	.59	3	65.1	.1			
11	(+.03)	.56	3	65.0	.1			
16		.52	4	64.9	.2	6		
21	(+.03)	48	4	64.7	.2			
26		.43	5	64.5	.2			

δ = + 14° 40′ 47″.7
δ = + 14 41 6.4

1871

Dec. 1 +36 +.363

24 25.5 24 18.3
27.7 19.6
29.7 21.1
34.0 59.0
36.1
38.3
40.4
42.5
46.7
48.9 24 19.7
51.0
.4208
38.25
24 37.62 38.255
+0.63 38.24
37.65
+0.59
38.24 38.24
–.06 37.62
+.09 +0.62
–2.68 –0.08
34.94 –2.68
+0.59
38.24
–0.70
+.10
–2.68
34.96

Dec. 2 +.36 +.373

24 24.8 24 15.3
26.9 16.9
29.0 18.3
33.3 51.5
35.4
37.5
39.6
41.7
46.0
48.1 24 16.8
50.3
4126
37.51
24 37.62 37.509
–.11 37.49
37.65
–0.16
37.49 37.49
+.08 37.62
+.09 –0.13
–2.68 –.03
34.98 –2.68
–0.16
37.49
+0.00
+10
–2.68
35.00

Dec. 11 +.36 +.371

24 18.8 24 13.1
20.9 14.8
23.0 15.7
27.3 43.6
29.3
31.4
33.7
35.7
40.0
42.1 24 14.5
44.3
346.5
24 31.50 31.500
37.56 31.48
6.16 37.59
–6.11
31.48 31.48
+6.02 37.56
+.09 –6.08
–2.62 –.03
34.97 –2.62
–6.11
31.48
5.99
+9
–2.62
34.94

Dec. 12 +37 +.387

24 18.3 24 23.7
20.3 25.0
22.4 26.0
26.4 74.7
28.7
30.9
33.0
35.1
39.3
41.5 24 24.9
43.7
3396
24 30.87 30.873
37.55 30.86
6.78 37.58
–6.72
30.86 30.86
+6.64 37.55
+.10 –6.69
–2.61 –.03
34.99 –2.61
–6.72
30.86
+6.65
+10
–2.61
35.00

Dec. 27 +38 +.380

24 6.0 23 58.7
8.1 0.2
10.2 1.3
14.5 180.2
16.6
18.7
20.9 24 37.1
23.0 38.3
27.2 39.7
29.3 24 60.1
31.5
2060
18.72 18.727
37.42 18.71
18.70 37.45
–18.74
18.71 18.71
+18.60 37.42
+.10 –18.71
–2.48 –3
34.93 –2.48
–18.74
18.71
+18.62
+9
–2.48
34.94

Dec. 28 +.45 +.458

24 6.0 23 53.0
7.1 54.2
9.2 55.8
13.4 163.0
15.7
17.7
19.9 24 36.8
22.0 37.8
26.2 38.8
28.4 23 54.3
30.4
1950
17.72 17.727
37.41 17.71
19.69 37.44
–19.73
17.71 17.71
+19.68 37.47
+.12 19.70
–2.44 –3
34.96 –2.47
–19.73
17.71
19.58
+12
–2.47
34.94

Dec. 1

40 1 55.8
42.2
98.0
49.00
+18.6
1.26951
1.38178
+2409
41 49.00
42 13.09
+14° 40′ 35″.26
– 33.01
40 2.2
40 65.2
δ′ = +14 40 35.26
– 17.50
+1 3.0 2.6
–.42

Dec. 2

1 53.0
42.2
95.2
47.60
+20.7
1.31597
1.42924
+2681
41 47.60
42 14.41
40 33.94
– 33.36
40 0.6
40 65.2
40 33.94
– 17.50
+1 4.6 4.2

Dec. 11

1 55.6
45.3
100.9
50.45
+17.0
1.23044
1.34271
+2202
41 50.45
42 17.47
40 35.88
– 32.24
40 3.6
40 65.0
40 35.88
– 17.30
+1 1.4 1.0

Dec. 12

2 10.6
1 58.7
4 9.3
2 4.65
+5.2 +6.0
0.72427 0.77820
0.83654 .89047
+686 +7.77
42 4.65 4.65
42 11.51 12.42
40. 35.93
– 32.96
40 3.0
40 65.0
40 35.93
– 17.30
+1 2.0 1.5

Dec. 27

1 55.3 2 43.9
43.9 33.3
99.2 77.2
1 49.60 2 38.60
+18.6
1.36951
1.38178
+2409
41 49.60
42 13.69
40 34.66
– 32.86
40 1.8
40 64.5
40 34.66
– 16.80
+1 2.7 2.3

Dec. 28

1 50.6 2 46.1
35.0 31.1
85.0 77.2
42.50 38.60
+23.4
1.36921
1.48148
+3021
41 41.50
42 12.81
40 35.54
– 33.94
40 1.6
40 64.4
40 35.54
– 16.70
+1 2.8 2.4

Jan 1 1 24 37.36 +14" 41' 4".3
11 37.24 4.0 .3
21 37.15 3.7 .3
31 36.98 3.4 .3
Fib. 10 36.85 3.1 .3
20

1 24 38.14
38.14

12

34.96 +2
35.00 +6
34.94 +0
35.00 +6
34.94 +0
34.99 +0
34.89 −5
34.99 +5
34.96 +2
35.06 +11
34.97 +03

38.09
18
14
24
38.16

+.39 ~~+398~~
1872.
(1)72 Jan. 1

+.42 +420
Jan 8

+.44 +430
Jan. 9

+.37 +376
Jan. 21

24 1.1 24 1.0 23 53.7 24 21.0 23 54.7 23 47.0 24 19.0 24 10.0
3.2 2.0 57.8 22.5 56.8 48.1 21.2 11.3
5.3 3.6 59.8 23.6 59.0 49.5 23.4 12.6
9.6 5.0 4.1 67.1 3.2 144.6 27.6 33.9
11.7 11.6 6.2 5.4 29.6
13.8 − 8.3 − 7.4 31.9
16.0 10.5 9.7 34.0
18.0 12.6 11.8 36.2
22.3 16.8 16.0 40.3
24.5 18.8 18.0 42.4
26.5 24 3.9 21.0 24 22.4 20.2 23 48.2 44.7 24 11.3
15.20 2.9 27.16 26.22 35.05
180 180
9.16 8.22
8.33 7.47 31.86

24 13.818 13.80 24 37.26 8.327 24 37.25 7.473 31.864
13.80 28.53 8.31 29.78 7.46 31.85
37.36 37.27 ~~37.26~~ 37.26 37.11
23.56 − 28.96 − 29.80 − 5.26

13.80 13.80 8.31 8.31 7.46 7.46 36.85 31.85
+23.41 37.36 +28.89 37.26 +29.69 37.25 + 5.27 37.11
+ .10 − 23.56 + + 11 − 28.95 + .11 − 29.79 + .09 − 5.26
+ .78 − 3 + .87 − 3 + .88 − 3 + 1.03 − 3
− 23.59 − 28.98 − 29.82 − 5.29
38.09 38.18 38.14 38.24

13.80 8.31 7.46 31.85
+ 23.41 + 28.89 + 29.70 + 5.29
+ .10 + 11 + 11 + .09
− 2.42 − 2.32 − 2.31 − 2.17
34.89 34.99 34.96 35.06

40 2 6.8 2 42.8 1 57.8 1 52.7
54.8 26.6 42.0 29.6
16 69.4 99.8 82.3
2 0.80 34.70 49.90 41.15

+ 10.9 − 14.1 + 19.3 + 20.6
1.03742 1.14921n 1.28555 1.31386
1.14969 1.26148n 1.39782 1.42613
+ 14.12 − 18.26 + 24.99 + 26.68
42 0.80 42 34.70 41 49.90 41 41.15
42 14.92 42 16.44 42 14.89 42 7.83

40 33.43 40 31.91 40 33.46 40 40.52
− 32.62 − 33.27 − 32.43

sin δ 9.40394

cos δ 9.98558
12669
,11227

40 0.8 39 58.6 40 1.0
41 4.3 41 4.1 41 4.1
40 33.43 40 31.91 40 33.46
+ 2.10 + 2.30 + 2.30

+1 3.5 3.1 +1 5.5 5.0 +1 3.1 2.7

B.A.C. 461 40 Coro. 128

+1 27 14
-37 32
-77

1871 Dec. 1 Dec. 2 Dec. 12 Dec. 27 Dec. 28 1872 Jan. 8

Dec. 1		Dec. 2		Dec. 12		Dec. 27		Dec. 28		Jan. 8	
27 57.8	27 5.1	26 57.2	26 54.3	26 50.4	26 47.5	26 38.0	26 29.7	26 37.1	26 38.8	26 27.9	26 19.1
0.4	4.5	39.6	55.4	52.8	48.6	40.8	31.7	39.9	40.5	30.5	20.2
3.1	5.8	2.2	56.2	56.0	49.8	43.3	32.0	42.3	79.3	33.0	39.3
8.1	6.7	10.1 75	165.9	0.7	145.9	45.3	92.4	47.5		38.2	
10.7	17.0	-12.6		3.3		51.1		50.2		40.8	
13.3		15.2		5.8		26 53.6	26 30.8	26 52.8	26 39.7	43.3	
27 16.0	27 5.7	26 17.6	26 55.3	26 8.4	48.6	27 56.2	14.9	27 55.5	21.8	26 45.8	17.7
18.7		23.1		11.1		58.8	17.7	58.2	22.7	48.5	
23.7		25.6		16.3		4.1	20.7	3.1	23.6	53.7	
26.4		28.1		18.9		6.7		5.8		56.3	
28.8				24.6		9.3		8.5		59.0	
27 2070	13.364	258.8	12.62	27 2453	5.936	26 5902	53.655	5809	52.809	4770	43.364
60		120		180							
147.0		1388		65.3							
13.36				5.94		53.65		52.81		43.36	

Dec. 1		Dec. 2	Dec. 12	Dec. 27		Dec. 28		Jan. 8
1,5	4 50.1	4 39.2	4 42.4	4 43.1	50 0 29.7	45 4 43.6	50 0 27.1	45 4 43.3
	39.2	28.2	31.5	32.9	19.3	29.5	14.3	29.6
	89.3	67.4	73.9	76.0	49.0	73.1	41.4	72.9
	44.65	33.70	36.95	38.00	24.50	36.55	20.70	36.45
	+7.7	+17.3	+17.3	+22.9		+13.1		+23.7
	0.88649	1.23800	1.23804	1.35983		1.11727		1.37474
	0.91245	1.26356	1.26400	1.38579		1.14323		1.40070
	+ 8.17	+1836	+ 18.37	+ 24.31		+13.91		+ 25.16
	49 44.65	39.20	49 36.95	49 38.00		49 36.55		49 36.45
	49 52.82	49 52.06	49 55.32	50 2.31		49 50.46		50 1.61
-37°	26 4.47	26 3.71	26 6.97	27 13.96		26 2.11		27 13.26

Jan. 21

27 1.4 27 13.3
4.0 14.3
6.6 15.5
9.2 43.1
12.0
33.2
27 14.4

sin δ 9.78478n

cos δ 9.89927
12669
.02596

27 6.640

6.64

50 0 21.1
0.8
21.9
10.95

7.8

0.89209n
0.91805n
8.28
50 10.95
50 2.67
1 1
27 14.32

Exp.

v Persei = 51 Andromedae

1 30 5.04 30 5.04+.03
30 5.04
+47 5.9

-10 +1.11
+1.11

-.022

		α		δ	
Nov. 16	1 30	8.48		+ 47° 58′ 45″.7	.9
21		.45	3	46.6	.9
26	(+.00)	.42	3	47.5	.9
Dec 1		.37	5	48.3	.8
6		8.31	6	49.0	.7
11	(+.04)	.25	6	49.6	.6
16		.18	8	50.1	.5
21		.09	8	50.5	.4
26		7.99	10	50.8	.3

18

δ = + 47° 58′ 24″.5
δ = + 47 58 42.9 (47.83)

1871 Dec. 1	Dec. 2	Dec. 11	Dec. 12	Dec. 17	Dec. 27
+.36 +.385	+.36 +.373	+.36 +.371	+.37 +.387	+.39 +.400	+.38 +.380
29 50.4 30 35.6 53.5 37.7 56.5 39.8 2.6 113.1 5.7 8.8 11.9 30 37.7 14.9 21.0 24.1 27.2	29 49.6 29 34.0 52.6 35.8 55.6 37.8 1.7 107.6 4.8 8.0 10.9 29 35.9 14.0 20.1 23.2 26.2	29 43.5 29 27.5 46.5 29.1 49.6 31.4 55.7 88.0 58.8 2.0 5.0 29 29.3 8.1 14.2 17.2 20.3	29 42.8 29 40.2 45.8 41.5 48.9 42.8 55.0 124.5 58.1 1.3 4.3 29 41.5 7.4 13.7 16.6 19.7	29 38.9 29 27.2 41.1 28 29.6 44.9 32 31.2 51.1 62 88.0 54.1 30 57.1 3.0 0.3 3.2 29 29.3 3.3 3.0 9.3 60 12.5 32 15.6 31	29 30.7 29 18.6 33.7 20.2 36.7 21.7 42.8 60.5 45.9 48.9 29 20.2 52.1 30 11.7 55.1 12.7 1.2 13.9 4.6 7.6
30 27.66 8.782 180 8.76 96.6 8.40 8.76 +0.36 8.37 +.41	30 26.67 7.882 180 7.86 86.7 8.39 7.88 −0.53 8.36 −.48	30 32.09 1.900 300 1.88 20.9 8.28 30 1.90 6.40 8.25 6.35	30 31.36 1.236 300 1.21 13.6 8.27 12.4 −7.06 8.24 −7.00	29 32.88 57.164 300 57.14 62.88 8.18 57.12 11.04 8.15 10.98	53.93 49.027 49.00 8.00 49.08 −19.00 7.97 18.97
8.76	7.86	1.88	1.21	57.14	49.00
−.70 8.76 +.40 8.37 −3.33 +0.39	+.09 7.86 +.40 8.36 −3.32 −0.50	+6.03 1.88 +.40 8.25 −3.21 −6.37	+6.64 1.21 +.41 8.24 −3.20 −7.03	+10.65 57.14 +.43 8.15 −3.11 −11.01	+18.55 49.00 +.42 7.97 −2.93 −18.97
6.13 ~~−3.33~~	6.03 ~~−3.32~~	6.10 ~~−3.21~~	6.06 ~~−3.20~~	6.09 ~~−3.11~~	5.04 −2.93
8.76 −0.70 +.42 −3.33	7.86 +0.09 +.41 −3.32	1.88 6.19 +.41 −3.21	1.21 +6.66 +.42 −3.20	57.14 +10.58 +.44 −3.11	49.00 +18.63 +.39 −2.93
6.15	6.04	5.07	5.09	5.05	5.09
25 0 45.3 26.6 719 35.95	20 4 50.9 30.9 818 40.90	4 44.7 28.5 732 36.60	4 57.9 38.5 964 48.20	4 49.9 32.0 819 40.95	4 50.1 25 0 35.7 31.7 18.6 818 543 4090 27.15
−28.9 1.46089n 1.41323n −2890 25 35.95 25 10.05	+32.0 1.50515 1.45749 +2867 24 40.90 25 9.57	+32.6 1.51321 1.46555 +2921 24 36.60 25 05.81	+19.7 1.29446 1.24680 +1765 24 48.20 25 5.85	~~−32.1~~ +27.9 ~~1.50650n~~ 1.44560 ~~1.45884n~~ 1.39794 ~~−2877~~ +2500 24 ~~40.95~~ 24 40.95 25 5.95	+28.8 1.45939 1.41173 +2581 24 40.90 25 6.71
+47° 57′ 38″.30 + 5.89	57 38.78 + 5.75	57 42.54 + 5.08	57 42.50 + 5.39	57 42.40 + 5.19	57 41.64 ✓ + 5.21
57 44.2 58 48.3	57 44.5 58 48.5	57 47.6 58 49.6	57 47.9 58 49.7	57 47.6 58 50.2	57 46.9 58 50.9
+.09 I +1 4.1 4.2	+1 4.0 4.1	+1 2.0 2.1	+1 1.8 1.9	+1 2.6 2.7	+1 4.0 4.1
δ = +47 57 38.30 −23.86	57 38.78 −24.00	57 42.54 −25.10	57 42.50 −25.26	57 42.40 −25.70	57 41.64 −26.40

18720
1 30 868
868
(+00)

Jan. 1 +4° 58' 51.1"
6 51.1
11 51.1
16 50.9
21 50.7

4
20

5.15 +11
5.09 +0
5.07 +3
5.09 +5
5.05 +1
5.09 +5
5.08 +4
5.06 +2
5.12 +8
5.03 −1
5.07 +3
5.08 +04

8.65
62
68
69
8.66

+.45 +458 | +39 +398 1872 | +42 +420 | +44 +430 | +37 +376

Dec. 28 1872 Jan. 1 | Jan. 8 | Jan. 9 | Jan. 21

29 29.7	29 33.9	29 25.6	29 16.3	29 20.0	29 14.4	29 19.1	29 14.2	29 43.5	30 11.6
32.5	34.6	28.6	18.3	23.1	16.5	22.2	16.0	46.4	12.5
35.6	68.5	31.8	20.5	26.2	17.9	25.3	18.0	49.5	13.1
41.8		37.8	55.1	32.3	48.8	31.3	34	55.6	37.2
44.9	~~34.3~~	41.0		35.4		34.4	48.2	58.7	
47.8	~~34.8~~	44.0		38.5		37.15		1.7	
50.9 30	8.9	47.1 29	18.4	41.5 29	16.3	40.5 29	16.1	4.8 30	12.4
53.9	10.6	50.1		44.6		43.7		8.0	
0.2	12.2	56.3		50.7		49.8		14.0	
3.3	30 10.6	59.4		53.8		52.9		17.1	
6.4		62.5		56.9		56.6		20.2	

sin δ 9.87096

cos δ 9.82565
12669
9.95234

527 0 29 47.909 | 484 2 29 44.018 | 423 0 29 38.455 | 41 27 37.518 30 | 31 95 1.773
47.89 | 44.00 | 38.43 | 37.50 | 300 1.75
7.98 | 7.87 | ~~7.85~~ 7.70 | 7.68 | 19.5 7.42
47.91 −20.09 | 44.02 +23.87 | 38.45 +29.27 | 37.52 +30.18 | 1.77 +5.67
7.95 | 7.87
20.04 | 23.85

47.89 | 44.00 | 38.43 | 37.50 | 1.75
7.95 | 7.87 | 7.70 | 7.66 | 7.42
−20.06 | −23.87 | +29.27 | −30.18 | −5.68
47.89 | +28.89

−2.91 | 44.00 | 38.43 | 37.50 | 1.75
+19.61 | +23.41 | +28.89 | +29.69 | +5.27
+.50 | + .43 | + .47 | + .49 | + .41
−2.98 6.0 | + .81 | + .93 | +1.00 | +1.26
5.09 | 8.65 | 8.62 | 8.68 | 8.69

47.89 | 44.00 | 38.43 | 37.50 | 1.75
19.58 | +23.41 | +28.89 | +29.70 | +5.28
+ .51 | + .48 | + .46 | + .47 | + .42
−2.91 | −2.83 | −2.66 | −2.64 | −2.38
6.08 | 5.06 | 5.12 | 5.03 | 5.07

25 0 12.9 0 | 20 37.4 4 | 62.7 | 4 59.0 | 4 58.0 | 25 0 23.3
45.2 | 15.2 | 83.3 | 35.9 | 35.5 | 0 53.9
88.1 | 52.6 | 86.0 | 94.9 | 93.5 | 1 17.2
0 29.05 | 26.30 | 43.00 | 47.45 | 46.75 | 0 8.60

+13.6 | −22.7 | +25.6 | +22.2 | +21.4 | −10.6
1.13353 | 1.35600n | 1.40824 | 1.34635 | 1.33041 | 1.02530n
1.08587 | 1.30834n | 1.36058 | 1.29869 | 1.28275 | 0.97764n
+12.18 | −20.34 | +22.94 | +19.89 | +19.18 | −9.50
24 59.05 | 25 26.30 | 24 43.00 | 24 47.45 | 24 46.75 | 25 8.60
25 11.23 | 25 5.96 | 25 5.94 | 25 7.34 | 25 5.93 | 24 59.10

57 42.39 + 6.09 | 57 42.41 + 5.21 | 57 41.01 + 5.51 | 57 42.42 + 5.37 | 57 49.25 + 5.41

57 48.5 | 57 47.6 | 57 46.5 | 57 47.8 | 57 55.2
58 51.0 | 58 51.1 | 58 51.1 | 58 51.1 | 58 50.7

+1 2.5 2.5 | +1 3.5 3.6 | +1 4.6 4.7 | +1 3.3 3.4 | +0 55.5 55.6

57 42.39 −26.50 | 57 42.41 − 8.20 | 57 41.01 − 8.20 | 57 42.42 −8.20 | 57 49.25 −7.80

ι Andromedae
1 33 00
+39 55 +84

-020

✓

1871	Dec. 11		Dec. 12		Dec. 17		Dec. 28		1872 Jan. 1	
	32 39.0	32 27.8	32 38.4	32 28.3	32 34.3	32 21.4	32 25.2	32 20.2	32 21.2	32 17.0
	41.6	29.6	41.0	29.2	37.0	23.0	28.0	22.2	24.0	18.4
	44.3	31.0	43.8	31.6	39.7	24.5	31.5	23.9	26.6	20.0
	49.7	88.4	49.0	89.1	45.0	68.9	35.8	66.3	32.0	55.4
	52.4		~~50.9~~		47.8		38.5		34.6	
∫ 9.80731	54.9		51.7		50.5	32 22.9	41.2	32 22.1	37.3	32 18.5
	57.8	32 29.5	-34.3	32 29.7	53.0	33 13.3	43.9	33 2.2	39.8	33 5.3
	0.5		57.1		55.8	14.7	46.5	4.4	42.6	6.5
	5.7		59.8		1.3	16.6	51.8	5.4	48.0	7.9
	8.4		5.2		3.8		54.6		50.6	9.0
aor ∫ 9.88478	11.2		7.8		6.6		57.2		53.4	
12669	32 36 5.5	55.045	10.5	54.418	55 4.8	50.436	45 3.2	41.209	41 10.1	37.264
.01147	240.0	55.02	41 8.6	54.40		50.42		41.19	37 28	37.27
	605.5		59 8.6							
	55.05		54.42		50.436		41.20			

	Dec. 11		Dec. 12		Dec. 17		Dec. 28		Jan. 1	
25	2 ~~45.8~~		2 45.8		2 43.2	3 35.1	2 54.2	3 35.8	2 51.7	3 40.3
	~~27.7~~		29.7		26.4	18.9	31.9	15.7	35.4	24.0
	43.8		75.5		69.6	54.0	86.1	51.5	87.1	
	29.6		37.75		34.80	27.00	43.05	25.75	43.55	
	73.4									
	36.70									
	+25.5		+24.7		+27.5		+19.1		+18.8	
	1.40654		1.39269		1.43933		1.28103		1.27415	
	1.41801		1.40416		1.45080		1.29250		1.28562	
	+26.19		+25.36		+28.23		+19.61		+19.30	
	27 36.70		27 37.75		27 34.80		27 43.05		27 43.55	
	28 02.89		28 3.11		28 3.03		28 2.66		28 2.85	
+39°	54′ 45.46″		54 45.24		54 45.32		54 45.69		54 45.50	

Jan. 8 Jan. 9

32	15.7 32	13.6	32	14.9 32	4.2
	18.4	~~14.3~~		17.4	5.7
	20.4			20.2	8.0
	26.4			25.5	17.9
	29.0			28.2	
	31.7			30.8	
	34.5 32	13.6		33.5 32	5.9
	37.1			36.1	
	42.5			41.6	
	45.2			44.3	
	47.8			47.0	
	349.2	31.745		339.5	30.864
	31.74	31.72	=	30.86	30.84

25 2	56.2	2	48.3
	36.2		28.2
	92.4		76.5
	46.20		38.25

+18.1
1.25767
1.26914
+18.59
27 46.20
28 4.74

54 4.356

+25.0
1.39794
1.40941
+25.67
27 38.25
28 3.92

54 ~~4.4~~3

δ :

δ Piscium
1 34 44
+4 50

1 34 43.19 ±00

+.61 +08
+.08

Nov. 16	1 34 45.89		+4° 49′	77″.2	
21	.87	2		77.0	.2
26	85	2		76.8	.2
Dec 1	84	1		76.6	.2
6	83	1		76.3	.3
11	80	3		76.0	.3
16	77	3		75.7	.3
21	73	4		75.4	.3
26	68	5		75.0	.4

(.00)
(+.02)

δ = +4° 50′ 18″
δ′ = +4 50 20.1

	+.36 +.371	+.39 +.400	.45 +.458	+18.72 +.39 +.398	+.42 +.420
1871	Dec. 11	Dec. 17	Dec. 28	Jan. 1	Jan. 8
−015	34 27.4 34 23.9 29.5 25.1 31.6 26.3 35.5 75.3 37.6 39.7 41.8 34 25.1 43.8 48.0 50.0 52.1	34 22.8 34 13.0 24.8 14.3 26.9 16.3 30.9 43.6 33.0 35.1 34 14.5 37.1 34 58.0 39.2 60.2 43.3 61.7 45.4 47.5	34 13.7 34 02.5 15.7 22.8 17.7 45.5 22.0 24.0 26.0 34 22.6 28.0 30.1 34.3 36.5 38.5	34 9.8 34 9.8 11.8 11.8 13.9 13.9 17.9 28.4 20.0 29.3 22.0 30.6 24.2 34 88.3 49.1 26.2 50.3 30.4 51.9 32.4 34 29.4 34.5	4.2 33 58.0 6.3 59.2 8.4 60.2 12.6 177.4 14.6 16.6 18.6 33 59.1 20.7 24.9 26.9 29.0
sin √ 8.92561 cos √ 9.99845 12669 .12514	34 437.0 39.727 39.73 39.71 45.80 45.80 −6.09 6.07 + 6.03 +03 −2.61 39.73 +03 43.16 +6.03 45.79 −2.61 43.18	38 60 35.091 35.08 45.76 −10.68 35.09 10.57 45.76 +03 10.67 −2.57 35.09 +03 43.09 10.57 45.69 2.57 43.12	28.65 26.045 26.03 45.66 −19.63 26.05 18.60 45.66 +04 19.61 −2.47 26.05 +04 43.20 19.60 45.69 2.47 43.22	24.31 24.2 22.10 45.61 23.51 22.10 +03 23.44 45.57 2.42 43.15	22.100 22.08 45.61 −23.53 43.19 22.08 +28.42 +.03 +.69 46.18
	39.71 45.80 −6.09 −2.61 39.71 −5.99 +.03 −2.61 43.14	35.08 45.76 −10.68 −2.57 35.08 +10.57 +.03 −2.57 43.11	26.03 45.66 −19.63 −2.47 26.03 +19.59 +.04 −2.47 43.19	22.08 45.61 −23.53 22.08 +23.48 +.03 −2.42 43.11	18 28 16.618 16.60 45.53 16.53 −28.93 16.62 16.60 +28.89 +.03 +.77 46.29 16.60 45.52 −28.92 16.60 +28.89 +3 −2.33 43.19
30	50.6 2 30.3 20.3 25.30 +14.6 1.16435 1.28949 +19.47 32 25.30 32 44.97	35.8 2 23.8 3 25.3 12.0 13.4 17.90 +20.6 1.31386 1.43900 +27.48 32 17.90 32 45.38	80.4 2 48.3 32.1 40.20 +3.4 0.53147 0.65661 +4.53 32 40.20 32 44.73	55.0 2 51.0 3 30.2 50.0 17.7 27.50 −7.3 0.86332n 0.98846n −9.74 32 37.50 32 47.76	23.80 2 31.7 15.9 47.6 +17.5 1.24303 1.36817 +23.34 32 23.80 32 47.14
+4°	50 3.58 −47.04	50 2.97 −47.27	50 3.62 −49.55	50 0.59 −47.53	50 1.21 −48.49
	49 16.5 49 76.0	49 15.7 49 75.6	49 14.1 49 74.8	49 13.1 50 14.7	49 12.7 50 14.3
−.58 I	+ 59.5 58.9	+ 59.9 59.3	+ 60.7 60.1	+0 61.5 61.0	+0 61.6 61.0
δ′ = +4	50 3.58 −14.20	50 2.97 −13.80	50 3.62 −13.00	50 0.59 +5.40	50 1.21 +5.80

30

"
1.8
20.1

1872.0

1 34 46 30
46 30

(.00)

Jan 1	+4° 5 0′	14.7″		
6		14.4	.3	
11		14.1	.3	12
16		13.8	.3	
21		13.5	.3	10

43.14	− 5
11	− 8
19	− 0
11	− 8
19	− 0
18	− 1
24	+ 5
43.17	−.02

46.22
29
29
34
46.29

+44 +.430
Jan. 9

+37 +3.76
Jan. 21

34	3.5	34	2.6	34	27.7	34	19.3
	5.5		3.8		29.9		21.0
	7.5		5.1		31.8		22.8
	11.7		11.5		36.0		63.1
	13.7				38.0		
	15.8				40.1		
	17.9	34	3.8		42.3	34	21.0
	19.9				44.3		
	24.0				48.4		
	26.1				50.5		
	28.1				52.5		
	17 3 7		15.791		44 15		40.136
			15.78				40.12
			45.52				45.38
	15.79		+29.74		40.14		+5.26

15.78
+29.69
+ .34
+ .78
46.29

15.78
45.57
−29.73

40.12
+5.27
+ .03
+ .92
46.34

40.12
45.38
−45.26

15.78
+29.70
+ 03
−2.32
43.18

40.12
5.28
+ 03
−2.19
43.24

		64.8		32.4
30	2	40.1	2	27.4
		24.7		5.0
		32.40		16.20
		+ 12.0		+19.1
		1.07918		1.28103
		1.20432		1.40617
		+ 1601		+ 2548
	32	32.40	32	16.20
	32	48.41	32	41.68
	49	59.94	50	6.67
		− 47.32		− 46.84
	49	12.6	49	19.8
	50	14.2	50	13.5
	+0	61.6 6.10	+0	53.7 5.31
	49	59.94	50	6.67
		+ 5.90		+ 6.60

o Piscium − 0.16

1 38 36 38 35.14 ×8
38 35.14

+8 38

+.56 +.15
+.15

Nov. 16		1 38 37.89		+8° 30′ 42″.5			
21		.88	.1	42.4	.1		
26		87	1	42.3	.1		
Dec 1		85	2	42.1	.2		
6	(−.10)	83	2	41.9	.2		
11	(−.14)	80	3	41.7	.2		
16		76	4	41.4	.3	10	
21		72	4	41.2	.2		
26		67	5	40.9	.3		

δ = +8° 30′ 26.4″
δ = +8 30 44.7

+36 +365		+46 +370		+36 +371		+39 +400		+45 +408		+39 +398		
1871 Dec. 1		Dec. 6		Dec. 11		Dec. 17		Dec. 28		1872 Jan. 1		
38 26.0 28.0 30.0 34.1 36.3 38.4 40.4 42.5 46.8 48.8 50.8	38 21.8 23.4 24.7 69.9 38 23.3	38 22.8 24.9 26.9 31.1 33.2 35.2 37.4 39.4 43.6 45.7 47.7	38 16.6 18.2 34.8 38 17.4	38 19.0 21.2 23.3 27.3 29.4 31.6 33.6 35.8 39.9 42.0 44.1	38 7.1 9.1 10.3 27.1 38 9.0	38 14.5 16.6 18.6 22.8 24.8 27.0 29.1 31.1 35.2 37.3 39.4	38 3.5 5.0 6.3 14.8 38 4.9 38 48.0 50.0 37.3	38 5.4 7.4 9.5 13.8 15.8 17.9 20.0 22.0 26.2 28.3 30.3	37 53.1 55.8 57.8 166.7 37 55.6 38 38.2 40.6 41.8	38 1.6 3.6 5.7 9.9 11.9 14.0 16.1 18.2 22.3 24.5 26.5	37 51.6 53.0 54.4 159.0 37 53.0 38 45.0 45.6	
38 422.1 38.37 37.85 +0.52 38.36 −.90 +.05 −2.71 35.02	38.373 38.36 37.73 +0.63 38.36 37.85 +0.51 +.10 ~~−2.71~~ +0.61 38.36 −0.69 +.06 −2.71 35.02	387.9 35.26 37.83 −2.57 35.25 +2.40 +.07 −2.69 35.03	35.264 35.25 37.71 −2.46 35.25 37.83 −2.58 +.10 ~~−2.69~~ −2.48 35.25 +2.51 +.05 −2.69 35.12	347.2 — — 31.57 37.80 6.23 31.55 +6.03 +.05 −2.66 34.97	31.564 31.55 37.68 −6.13 31.55 37.80 −6.25 +.10 ~~−2.66~~ −6.15 31.55 +5.99 +.06 −2.66 34.94	29 64 26.95 37.75 −10.80 26.93 +10.65 +.08 −2.61 34.93	26.945 26.93 37.63 −10.70 26.93 37.75 −10.82 +.10 ~~−2.61~~ −10.72 26.93 +10.57 +.06 −2.61 34.95	19 66 17.87 37.65 19.78 17.86 +19.60 +.07 −2.51 35.02	17.873 17.86 37.53 −19.67 17.86 37.65 −19.79 +.10 ~~−2.51~~ −19.69 17.86 +19.59 +.07 −2.51 35.01	15 43 — 14.03 37.60 23.57 14.01 2.46	14.027 14.01 14.01 37.49 23.48 ~~−2.46~~ 14.01 +23.42 +.06 +.81 38.30	14.01 37.62 −23.61 +.10 −23.51 14.01 +23.42 +.06 −2.48 35.01

1871 Dec. 1	Dec. 6	Dec. 11	Dec. 17		Dec. 28		1872 Jan. 1	
1145 50 2 13.8 0.7 7.25 +15.1 1.17897 1.30084 +19.99 52 7.25 52 27.24	1233 2 9.2 54.1 1.65 +17.9 1.25285 1.37472 +23.70 52 1.65 52 25.35	1139 2 1.8 52.1 56.95 +22.6 1.35410 1.47597 +29.92 51 56.95 52 26.87	1165 2 5.2 51.3 58.25 +22.0 1.34243 1.46429 +29.12 51 58.25 52 28.37	1129 2 2.7 50.2	1149 2 5.0 49.9 57.45 +22.3 1.34830 1.47017 +29.52 51 57.45 52 26.97	3 2.8 47.4	1216 2 7.3 54.3 0.80 +21.0 1.32221 1.44408 +27.80 52 0.80 52 28.60	40 3 15.0 3.0
+8° 30′ 21.11″ − 42.16	30 23.00 − 42.27	30 21.48 − 41.12	30 20.98 − 41.32		30 21.38 − 43.27		30 19.75 − 41.63	
29 39.0 30 42.1	29 40.7 30 41.9	29 40.4 30 41.7	29 39.7 30 41.4		29 38.1 30 40.8		29 38.1 30 40.6	
−52 I +1 3.1 2.6	+1 1.2 0.7	+1 1.3 0.8	+1 1.7 1.1		+1 2.7 2.2		+1 2.5 2.0	
δ = +8 30 21.11 15.70	30 23.00 −15.50	30 21.48 −15.30	30 20.98 −15.00		30 21.38 +4.40		30 19.75 +4.10	

″
26.4
44.7

1872.0
1 38 3830
38.30

(−10)

		″	
Jan. 1	+2° 30′	40.6	
6		40.3	.3
11		40.1	.2
16		39.8	.3
21		39.5	.3

35.02	−12
~~35.12~~	−2
34.94	−20
34.95	−19
35.01	−13
35.01	−13
34.97	−17
34.97	−17
35.03	−11
~~34.99~~	
35.00	−14

38.30
29
23
29
38.26

+.42 +.420
Jan. 8

37 56.0
58.1
0.1
4.3
6.3
−8.5
10.6
12.6
16.7
18.7
20.8
58 21 27
120
927
843
37.44
29.01

37 50.8
51.9
52.9
155.6
37 51.8
8.427
8.41
8.41
37.42
−29.01

+8.41
+28.89
+ .06
+ .88
38.24

8.41
37.53
29.12
+ 10
29.02

8.41
+28.89
+ 06
− 2.39
34.97

+.44 +.430
Jan. 9

37 55.1
57.2
59.3
3.5
5.6
7.6
9.6
11.6
16.0
18.1
20.0
58 26 36
18
83.6
7.60
37.43
29.83

37 49.6
51.0
52.0
152.6
37 50.8
7600
7.58
7.58
37.41
−29.83

+7.58
+29.69
+ 07
+ .89
38.23

7.58
37.51
−29.93
+ .10
−29.83

7.58
+29.70
+ 06
−2.37
34.97

+.37 +.376
Jan. 21

38 19.6
21.5
23.6
27.8
29.8
31.8
34.0
36.2
40.3
42.4
44.4
35 14
31.95

38 9.4
10.7
12.4
32.5
38 10.8
31.945
31.93
31.93
37.27
−5.34

+31.93
+ 5.27
+ .06
+ 1.03
38.29

31.93
37.39
− 5.46
+ .10
− 5.36

31.93
5.29
+ 06
− 2.20
35.03

sin √ 9.17055
cos √ 9.99518
12669
.12187

1346
50 2 15.6
59.0
7.30
+16.6
1.22010
1.34197
+ 2189
52 7.30
52 29.19
30 19.16
− 42.39

29 36.8
30 40.2

+1 3.4 2.9

30 19.16
+ 4.50

1340
2 14.8
59.2
7.00
+16.8
1.22530
1.34717
+ 2224
52 7.00
52 29.24
30 19.11
− 41.38

29 37.7
30 40.2

+1 2.5 1.9

30 19.11
+ 4.50

1071
2 5.3
41.8
53.55
+21.1
1.32428
1.44615
+ 2793
51 53.55
52 21.48
30 26.87
− 40.94

29 45.9
30 39.5

+0 53.6 53.1

30 26.87
+ 5.20

01
.2
.61
.0
.51
.01
.42
.06
.48
5.01

B.A.C. 544
1 41 01
+37 19
+.76

1871 Dec. 1	Dec. 2	Dec. 6	Dec. 11	Dec. 17	Dec. 28
40 50.7 40 48.6	40 49.8 40 41.0	40 47.4 40 36.0	40 43.8 40 35.1	40 49.5 41 6.0	40 30.1 40 20.3
53.2 49.5	52.4 42.6	50.1 37.4	46.3 36.6	53.0 8.8	32.5 22.6
55.7 98.1	55.1 44.0	52.7 39.1	49.0 38.1	54.5 10.4	35.1 23.8
1.0	0.1 127.6	57.8 112.5	54.2 109.8	57.2 25.2	40.2 66.7
3.5	2.8	0.3	56.7	59.7	42.9
6.1	5.3	2.9	59.4	2739	45.5 40 22.2
8.6 40 49.0	7.9 40 42.5	5.5 40 37.5	2.0 40 86.6	41 8.4	48.1 41 0.0
11.2	10.6	8.1	4.6		50.6 1.6
16.4	15.6	13.2	9.7		55.8 3.2
19.1	18.4	15.8	12.2		58.5
21.6	20.9	18.6	14.9		61.1
41 24.71 6.100	41 23.89 5.354	41 27.24 2.945	40 35.28 59.345	40 54.780	50.04 45.491
18.6	18.0	24.01	300		45.50
6.71	5.89	32.4	652.8		
6.10	5.35	2.95	59.35	54.78	

66.5	50.5	42.0	48.3	68.1	47.8
0 4 41.7	4 33.2	4 30.3	4 31.3	5 0 12.0	0 4 34.9 5 0 15.5
24.8	17.3	11.7	17.0	56.1	12.9 55.2
33.25	25.25	21.00	24.15	34.05	23.90
+17.1	+22.8	+25.4	+22.7	−13.6	+23.3
1.23299	1.35793	1.40483	1.35602	1.13353n	1.36735
1.26021	1.38515	1.43205	1.38824	1.16075n	1.39457
+1821	+2428	+27.05	+2417	−1448	+2481
4 33.25	4 25.25	4 21.00	4 24.15	5 4.05	4 23.90
4 51.46	4 49.53	4 48.05	4 48.32	4 49.57	4 48.71
37° 17′ 56.89″	17 58.82	18 0.30	18 0.03	17 58.78	17 59.64

✓

1872 Jan 9 Jan. 21

40	19.7	40	42.7	40	44.1	40	32.8
	22.1		44.0		46.7		34.7
	24.9		46.0		49.1		36.4
	30.0		132.7		54.3		103.9
	32.6				56.8		
	35.1				59.4		
	37.7	40	44.2		1.9	40	34.6
	40.4				4.5		
	45.6				9.8		
	48.2				12.5		
	50.7				15.0		
40	38.70		35.~~20~~189	40	35.44		59.491
					30.0		
	—				65.414		
	35.18				59.49		

sin √ 9.78263

cos √ 9.90053
12669
.02722

		59.0			29.8
5	0	9.0	0	4	28.3
		50.0			1.5
		29.50			14.90
		−9.0			+24.9
		0.95424n			1.39619
		0.98146n			1.42341
		−9.58			+26.57
	4	59.50		4	14.90
	4	49.92		4	41.41
	17	58.43		18	6.94

X Ceti
1 43 16
−11 19
−.20

1871	Dec. 6		Dec. 11		Dec. 17		Dec. 28		1872 Jan. 1	
	43 2.7	42 53.1	42 47.3	42 40.1	43	43 27.4	42 45.4	42 35.1	42 41.5	42 40.4
	4.6	55.0	49.5	41.2		28.6	47.5	36.7	43.6	42.4
	6.9	56.6	51.6	42.3		29.7	49.6	37.8	45.6	43.0
	11.1	164.7	55.7	123.6	3.0	85.7	53.7	43 12.6 189.6	49.8	125.8
	13.1		57.8		4.8		56.0	13.7	52.0	
	15.2		0.0		7.2		−58.0	15.2	54.1	43 22.1
	17.2		2.0		9.2		0.0		56.2	23.1
sin δ 9.29277n	19.4		4.1		11.4		2.0		58.3	24.1
	23.6	42 54.9	8.3	42 41.2	3 5 6	43 28.6	6.3	42 36.5	2.5	42 ~~41.8~~
	25.8		10.4				8.5		4.6	41.9
	27.8		12.5				10.7		6.6	
	1674		29 52				3377		59 46	
cos δ 9.99147			3600				3000			
126619	43	15.218	35 52	59.564		7.120	42 637.7	57.973		54.073
.11816	15.22		59.56		7.12		57.97	42 54.07		

	36.5	57.1	35.1	39.9		75.9	
40	1 23.8	1 31.2	2 21.1	1 25.4 2	14.2	1 42.0 2	83.2
	12.7	25.9	14.0	14.5	3.3	33.9	25.7
	18.25	28.55	17.55	19.95		37.95	
	+20.3	+18.4	−21.5	+21.5		+12.2	
	1.30749	1.26481	1.33243n	1.33243		1.08635	
	1.42565	1.38297	1.45059n	1.45059		1.20451	
	+26.65	+24.15	−28.22	+28.22		+16.02	
	41 18.25	41 28.55	42 17.55	41 19.95		41 37.95	
	41 44.90	41 52.70	41 49.33	41 48.17		41 53.97	
−11°	18′ 56.55″	19 4.35	19 0.98	18 59.82		19 5.62	

	Jan. 9				Jan. 21		
42	35.2	42	31.2	42	59.4	42	52.8
	37.2		31.8		1.6		53.9
	39.3		32.6		3.7		54.9
	43.5		95.6		7.8		161.6
	45.6				9.9		
	−47.7				11.9		
	49.7				13.9		
	51.9	42	31.9		16.1	42	53.9
	56.0				20.3		
	58.1				22.4		
	0.3				24.6		
	524.5				191.6		
			47.682	43	60 138.6		11.964
	4777				11.95		

	67.1		47.6	
1	39.1	1	32.8	
	28.0		14.8	
	33.55		23.80	
	+15.8		+18.1	
	1.19865		1.25767	
	1.31681		1.37583	
	+20.79		+ ~~24.4~~	23.76
41	33.55	41	23.80	23.80
41	54.25	41	~~48.~~	47.56
19	5.94	18	59.21	

ζ Ceti
1 45 07
−10 58
.19

(1871) Dec. 1 | Dec. 2 | Dec. 6 | Dec. 11 | Dec. 17 | Dec. 28

Dec. 1		Dec. 2		Dec. 6		Dec. 11		Dec. 17		Dec. 28	
44 56.3	44 52.8	44 55.8	44 50.8	45	45 20.5	44 49.9	44 55.8	44 45.1	44 36.8	44 36.2	44 26.8
58.4	54.0	58.0	52.5		22.0	51.8	57.2	47.1	38.2	38.2	28.7
0.5	55.0	0.0	54.2		23.5	54.0	58.4	49.2	39.7	40.2	30.3
4.7	161.8	4.0	157.5		66.0	58.2	171.4	53.5	114.7	44.3	85.8
6.8		6.1		1.7		0.2		55.5		46.6	
8.9		8.2		3.7		2.4		57.7		48.6	44 28.6
11.0	44 53.9	10.3	44 52.5	5.8	45 22.0	4.4	44 57.1	59.7	44 38.2	50.7	45 5.4
13.1		12.5		8.0		6.6		1.9		52.8	6.6
17.4		16.7		10.1		10.7		6.1		56.9	7.6
19.4		18.8		293		12.7		8.0		59.2	
21.6		20.8				14.8		10.4		61.2	
45 2181	8.918	45 2112	8291	45	5.860	45 2657	~~2518~~	3942	57.655	5349	48627
120		120				240		240		—	
98.1		91.2				257		6342		—	
8.92		8.29		5.86		234		5765		48.63	

	44.6		40.0		61.7		75.5		36.7		28.9
20 0	27.2	0	23.8	1	6.5	0	40.6	0	22.5	0	19.7 1 10.3
	17.4		18.2		55.2		34.9		14.2		9.2 59.0
	22.30		20.00		30.85		37.75		18.35		14.45
	+15.0		+15.8		−16.1		+5.4 √5.2		+7.95		+20.0
	1.17609		1.19865		1.20682n		0.73239		1.46982 1.29000		1.30103
	1.29477		1.31733		1.32550n		0.85107		1.58850 1.40868		1.41971
	+19.82		+20.46		−21.16		+7.10		+38.78 +25.62		+26.29
20	22.30	20	20.00	21	0.85	20	37.75	20	18.35 20 18.35	20	14.45
20	42.02	20	40.76	20	39.69	20	44.85	20	57.13 20 43.97	20	40.74
° ′	″										
−10° 57	53.67	57	52.41	57	51.34	57	56.50	57	55.62	57	52.39

1872 Jan. 1 · Jan. 9 Jan. 21

44	40.6	45	10.2	44	·	44	49.7	44	50.0	44	46.1	
	42.7		11.8				50.7		52.0		47.6	
	44.7		13.6				51.6		54.3		48.6	
	46.8		35.6		34.1		152.0		58.5		142.3	
	49.0				36.2				0.5			
	2238				38.4				2.6			sin ν 9.27930 n
		45	11.9		40.5	44	50.7		4.6	44	47.40	
					42.6				6.8			
					1918				11.0			
									13.2			
									15.2			cos ν 9.99199
			44.760				38.360	45	2687		2.609	12669
									240			.11868
									28.7			
	44.76				38.36				2.61			

	89.9		67.2		42.8
20 1	24.2	1	10.0	0	30.9
	15.7		57.2		11.9
	19.95		32.60		21.40
	−27.1		−12.3		+15.2
	1.43296 n		1.08990 n		1.18184
	1.55164 n		1.20858 n		1.30052
	−35.61		−16.16		+19.98
21	19.95	21	03.60	20	21.40
20	44.34	20	48.44	20	41.38
57	55.99	57	59.09	57	53.03

β Arietis − 016

1 47 31 47 31.03 −.01

47 31.03

+20 11

δ2 +38 +37

+37

Nov 16	1 47	33.92		+20°	10'	52".1
21		.92	0			52.3 +.2
26		.91	1			52.5 .2
Dec 1		.89	2			32.6 .1
6	(00)	.84	2			52.7 .1
11	(.00)	.84	3			52.8 +.1
16		.81	3			52.8 0
21		.77	4			53.8 0
26		.72	5			52.7 −.1

δ = +20° 10' 34".8

δ = +20 10 52.5

+36 +38.5 +.36 +37.3 +46 +37.0 +36 +37.1 +39 +40.0 +45 +45.8

1871 Dec. 1 Dec. 2 Dec. 6 Dec. 11 Dec. 17. Dec. 28

Dec. 1

47 47 41.0
42.5
44.0
27.5
30.0
32.2
34.4
36.6 47 42.5
38.8
1720
47
3 4.400
34.38
33.88
34.40 −0.50
33.89
+.51 34.38
33.89
34.38 +0.49
−.50 −2.86
+.13
−2.86 34.38
−0.69
30.95 +.14
−2.86
30.97

Dec. 2

47 21.6 47 12.6
22.8 14.0
25.0 15.1
29.3 41.7
31.5
33.7
33.9 47 13.9
38.1
42.5
44.6
46.8
3708 33.709
33.69
33.86
33.71 −.19
33.86
−.17 33.69
33.89
33.69 −0.20
+.09 −2.86
+.13
−2.86 33.69
+0.10
31.05 +.14
2.86
31.07

Dec. 6

47 18.1 47 11.1
20.4 13.0
22.6 14.6
26.9 38.7
29.1
31.2
33.5 47 12.9
35.7
40.0
42.2
44.4
3441 31.282
— 31.27
— 33.86
31.28 −2.59
33.87
−2.59 31.27
33.87
31.27 −2.60
+2.43 −2.84
+.17
−2.84 31.27
+2.52
31.04 +.14
2.84
31.09

Dec. 11

47 14.5 47 5.7
16.7 7.3
18.9 9.4
23.4 22.4
25.5
27.7
29.9 47 7.5
32.2
36.4
38.7
40.8
3047 27.700
— 27.68
— 33.83
2770 6.15
33.84
−6.14 27.68
33.84
27.68 −6.16
+6.03 −2.81
+.13
−2.81 27.68
+6.00
31.03 +.14
2.81
31.02

Dec. 17.

47 10.0 46 59.6
12.1 0.7
14.4 2.8
18.7
20.8 18.2.1
23.0 47 0.7
25.2 47 43.0
27.4 44.4
31.8 46.0
34.0
36.2
2536 23.055
23.04
33.79
2305 10.75
33.80
10.75 23.04
33.80
23.04 −10.76
+10.56 −2.77
+.14
−2.77 23.04
+10.58
30.97 +.10
−2.77
31.00

Dec. 28

47 1.0 47 17.7
3.0 19.5
5.2 20.6
9.7 21.6
11.8 79.4
14.0 47 19.8
16.2 47 44.8
18.4 45.6
22.8
24.9
27.1
1341 14.009
13.99
33.69
14.01 19.70
33.70
19.69 13.99
33.70
13.99 −19.71
+19.61 31.0 2.67
+.17
−2.67 13.99
+19.60
31.10 +.17
−2.67
31.09

Dec. 1

85.4
2 10 2 50.2
35.2
42.70
−8.1
0.90848 n
1.00765 n
−10.18
12 42.70
12 32.52
+20° 10' 15".83
−25.75
9 50.1
10 52.6

Dec. 2

15.4
2 15.1
0.3
7.70
+19.8
1.29666
1.39588
+24.88
12 7.70
12 32.58
10 15.77
−26.05
9 49.7
10 52.6

Dec. 6

17.2
2 16.3
0.9
8.60
+18.4
1.26481
1.36398
+23.12
12 8.60
12 31.82
10 16.63
−25.82
9 50.8
10 52.7

Dec. 11

15.8
2 13.7
2.1
7.90
+20.2
1.30535
1.40452
+25.38
12 7.90
12 33.28
10 15.07
−25.95
−25.21
9 49.9
10 52.8

Dec. 17.

19.1
2 11.9 3 6.2
−1.8 53.0
5.05
+22.4
1.35024
1.44941
+28.15
12 5.05
12 33.20
10 15.15
−25.35
9 49.8
10 52.8

Dec. 28

79.1
2 48.9 3 19.2
30.2 2.0
39.55
−5.8
0.76342 n
0.86259 n
−7.29
12 39.55
12 32.26
10 16.09
−26.55
9 49.5
10 52.7

−35

I +1 2.5 2.2 +1 2.9 2.5 +1 1.9 1.6 +1 2.9 2.5 +1 3.0 2.7 +1 3.2 2.8

δ' = +20 10 15.83 10 15.77 10 16.63 10 15.07 10 15.17 10 16.09

−17.80 −17.80 −17.90 −18.06 −18.66 −17.90

34.8″
52.5

147 3433
34.33

(.00)

Jan 1	+20° 10′ 52.5″	
6	52.4	.1
11	52.2	.2
16	52.0	.2
21	51.7	.3
26	51.4	.3
31	51.0	.4
Feb. 5	50.6	.4
10	50.2	.4

30.97	−6
31.07	+4
31.09	+6
31.02	−1
31.00	−3
31.09	+6
30.98	−5
31.04	+1
31.00	−3
31.01	−2
31.08	+5
31.03	.00

34.28
.33
.28
.35
.41
34.33

+.39 +.398 × +.44 +.430 +.37 +.376 +.38 +.437 +.52 +.505

1872

Jan. 1		Jan. 9		Jan. 21		Jan. 30		Feb. 1	
46 57.0	46 44.2	46 50.6	46 42.0	47 14.8	47 4.1	47 13.6	47 8.5	47 12.7	47 0.2
59.0	45.9	52.8	43.4	17.0	5.4	15.6	9.2	14.8	1.3
1.3	46.9	54.9	44.5	19.2	6.7	18.0	10.5	17.0	2.0
5.6	137.0	59.8	129.9	23.6	16.2	22.5	28.2	21.3	3.5
7.9		1.5		25.7		24.6		23.5	
10.1	46 45.7	3.7		28.0		26.8		25.8	47 8.0
12.3	47 32.8	6.0	46 43.3	30.1	47 5.4	29.0	47 9.4	28.0	10.5
14.4	34.0	8.1		32.3		31.1		30.1	47 9.2
18.7	35.5	12.5		36.7		35.5		34.4	
21.0		14.7		38.9		37.7		36.3	
23.2		16.6		41.2		39.8		39.1	
47 23.05	10.045	47 28.09	3.718	47 30.75	27.955	47 29.44	26.764	47 28.30	25.727
120	10.03	240	3.70	=	27.94	—	26.75	=	25.71
11 0.5		40.9							
10.05		3.72		27.95		26.76		25.73	
33.65						33.27			
47 23.60	10.03		3.70		27.94	6.51	26.75		25.71
	33.65		33.55		33.40		33.28		33.25
10.03	23.62	3.70	−29.85	27.94	−5.46	26.75	−6.53	25.71	−7.54
10.03	10.03	3.70	3.70	27.94	27.94	26.75	26.75	25.71	25.71
+23.43	33.65	+29.69	33.55	+5.27	33.40	+6.41	33.28	+7.43	33.25
+ .14	−23.62	+ .16	−29.85	+ .14	−5.46	+ .14	−6.53	+ .19	−7.54
+ .68		+ .78		+ .93		+1.05		+1.08	
	10.03		3.70		27.94		26.75		25.71
34.28	+.42	34.33	+29.70	34.28	5.29	34.35	+6.37	34.41	+7.40
	+ .15		+ .16		+ .14		+ .14	+	+ .19
	−2.62		−2.52		−2.37		+3.25		−3.22
	30.98		31.04		31.00		31.01		31.08

Sin δ 9.53745

cos δ 9.97248
12669
.09918

65.7
2 10.0 3 9.8
55.7 56.8
62.85
+24.3
1.38560
1.48477
+30.53
12 02.85
12 33.38
10 14.97
− 25.55

9 49.4
10 52.5

+1 3.1 2.8

10 14.97
+0.00

18.3
2 16.8
1.5
9.15
+20.4
1.30963
1.40880
+25.63
12 9.15
12 34.78
10 13.57
− 25.35

9 48.2
10 52.3

+1
~~+1~~ 4.1 ~~3.7~~ 3.7

10 13.57
+0.20

57.3
2 11.2
46.1
28.65
+22.6
1.35410
1.45327
+28.40
12 58.65
12 27.05
10 21.30
— 25.11

9 56.3
10 51.7

+0 55.5 55.2

10 21.30
+0.80

66.9
2 47.7
19.2
33.45
+17.4
1.24054
1.33971
+ ~~21.86~~ −21.86
12 33.45 33.45
12 55.31 12 11.59
9 53.04 10 36.76
− 26.72 − 26.72

9 26.3 10 10.04
10 51.1 10 51.1

~~+1~~ 24.8 +41.1 40.7

9 53.04
+1.40

89.6
2 59.3 2 59.3
30.3 30.3
44.80
+24.5 46.5 + 24.5 1.38917
1.38916 1.27750 1.48834
1.48833 1.37667
+30.78 +30.78
12 44.80 12 44.80 12 14.02
13 5.53 12 14.02
9 42.82 10 34.33
− 26.42 − 26.42

9 16.4 7.51
10 50.89 50.9

~~34.5~~ +43.0 42.7

9 42.82
+1.60

λ Arietis
1 50 44
+22 58
+42

1871 Dec. 1		Dec. 2		Dec. 6		Dec. 11		Dec. 17		Dec. 28	
50 34.7	50 26.2	50 33.9	50 26.3	50 31.5	50 23.2	50 28.0	50 16.7	50 23.1	50 8.4	50 14.2	50 6.2
37.0	27.8	36.2	27.8	33.7	24.6	30.2	18.2	25.5	10.0	16.5	7.3
39.2	29.1	38.5	29.3	36.0	26.3	32.5	19.7	27.7	11.6	18.7	8.8
43.7	83.1	42.9	88.4	40.4	74.1	36.8	54.6	32.0	30.0	23.1	22.3
45.8		45.2		42.6		39.0		34.4		25.4	
48.1		47.3		44.9		41.3		36.7		27.5	50 7.4
50.4	50 27.7	49.6	50 27.8	47.1	50 24.7	43.6	50 18.2	38.9	50 10.0	29.8	50 43.0
52.7		51.8		49.5		45.8		41.2		32.1	44.5
57.1		56.3		53.9		50.3		45.6		36.5	45.6
59.3		58.5		56.1		52.4		47.8		38.7	
61.5		60.8		58.3		54.8		50.1		41.0	
5295	48.136	5210	47.364	4940	44.909	4547	41.336	4030	36.636	3035	27.591
48.14		47.36		44.91		41.34		36.64		27.59	

.09882

21.1	21.2	96.3	89.8	81.0	97.2	
25 0 −1.3	0 −2.7	20 4 57.5	11 51.8	4 48.4	25 0 38.0 0	43.0
−19.8	−18.5	38.8	38.0	32.6	39.2	23.0
10.58	10.60	48.15	44.90	40.50	48.60	
+20.4	+19.6	+20.2	+23.1	+26.6	+20.2	
1.30963	1.29225	1.30535	1.36361	1.42488	1.30535	
1.40045	1.38307	1.39617	1.45443	1.51570	1.39617	
+25.14	+24.16	+24.90	+28.48	+32.79	+24.90	
24 49.45	24 49.40	24 48.15	24 44.90	24 40.50	25 48.60	
25 14.59	25 13.56	25 13.05	25 13.38	25 13.29	25 13.50	
+22° 57' 33.76"	57 34.79	57 35.30	57 34.97	57 35.06	57 34.86	

1872 Jan. 1				Jan. 24				Jan. 30				Feb. 1			
							24.0								
50	10.4	50	15.3	50	28.0	50	25.4	50	26.9	50	17.8	50	25.9	50	17.0
	12.7		16.0		30.2		27.0		29.1	22	19.0		28.2		18.0
	~~14.8~~		16.7		32.4		76.4		31.4	23	22.0		30.6		18.7
	19.4		45.0		36.8				36.0	46	58.8		34.9		53.7
	21.5				39.0				38.1	21			37.0		
	23.7	50	16.0		41.3				40.3	22 23			39.2		
	25.9	50	55.0		43.5	50	25.5		42.6	5 23	17.6		41.4	50	17.9
	28.2		55.7		45.7				44.8	22			43.7		
	32.6				50.2				49.2	3.4			48.3		
	35.0				52.3				51.5				50.7		
	37.1				54.7				53.7				52.9		
	26.13				45.41		41.282		44.16		40.327		43.29		39.355
	23.75				41.28						40.151				
									40.33				39.35		

sin √ 9.59128

cos √ 9.96413
12669
.09082

9.96413
11804
.08217

.08217

70.7
25 0 13.7 1
57.0
85.35
~~77~~
.88650
+.99732
+ 950
25 5.35
25 14.85

57 83.50

38.7
0.8 0 4.8
44.9 4 33.9
19.36
+ 1.58
1.19865
1.28082
+19.09
24 49.35
25 8.94

57 39.91

87.2
0 34.4
2.8
18.60
+20.7
1.31597
1.39814
+ 25.01
25 18.60 24 53.59
25 43.61

~~57 4.74~~ 57 54.76

40.8
0 35.7
5.1
20.40
+21.5
1.33243
1.41460
+ 25.98
25 ~~21.40~~ 24 54.42
~~25 46.38~~

~~57 1.97~~ 57 53.93

60 Cam
1 52 22
27.92
71 48
-.49 +3.04
3.04

-046
52 2792+0.06

Dec 6	1 . 52	33.57		+71° 47' 68".6		28.06	+14
11	(-17) -17	'40	17	69.8	17 27.82	27.82	-10
16	(+07) 14	33.20	20	70.8	14 28.04	27.97	+5
21	-03	32.98	22	71.8	10 27.87	27.99	+7
26		32.75	23	72.6	8 27.96	28.19	+27
31	(.00)	32.50	25	73.3	7 12	27.99	+7
36	(+07)	32.23	29	73.8	5 27.97	27.84	-8
						27.98	+06

δ = +
δ = +

+.36 +385 | ++46 +370 | +36 +371 | +39 +400 | √ +44 +430 | +37 376

1871 Dec. 1 | Dec. 6 | Dec. 11 | Dec. 17 | 1882 Jan. 9 | Jan. 21

1871 Dec. 1

52 52.2
55.0
57.7
164.9
52 20.3
26.8
33.3
40.0 52 54.9
46.4
1668

52 33.360
33.31
33.67
33.36 -.36
33.62

33.31

-.69
+1.09
-5.70
27.92

33.31
33.65
-0.34
-7
-5.70
-0.41

33.31
-0.68
+1.16
-5.73

28.06

63.0
35 1 42.8
20.2
31.50
-21.5
1.33243 n
0.95374 n
-899
36 31.50
36 22.51
+71° 46 25".84
+0 35.24

47 01.1
47 67.45

+45
I +1 06.4 6.8
δ' = +71 46 25.84
-24.50

Dec. 6

52 53.8
57.0
54.5
170.3
52 16.7
23.2
29.8
36.6 52 56.8
43.1
1494

52 29.880
29.83
33.61
29.88 -3.78
33.56

29.83

+2.45
+1.40
-5.64
2804

29.83
33.56
-3.73
-7
-5.64
-3.80

29.83
+2.52
+1.11
-5.64

27.82

60.2
1 42.3
17.8
30.10
-26.9
1.42975 n
1.05106 n
±11.25
36 30.10
36 18.85
46 29.50
+ 35.26

47 04.8
47 68.65

+1 3.7 4.2
46 29.50
-25.56

Dec. 11

51 48.9 52 6.3
53.6 11.2
0.1 14.3
13.1 31.8
19.7
-26.9
32.7 52 10.6
39.6
52.6
59.3
6.0

52 350.0 26.364
6 26.32
290.0 33.44
26.36 -7.12
33.39
7.05

26.32

+6.03
+1.09
-5.47
27.97

26.32
33.39
-7.07
-7
-5.47
-7.14

26.32
+6.00
+1.12
-5.47

27.97

77.1
1 18.1
59.0
38.55
+15.8
1.19865
0.81996
+661
36 38.50
36 15.16
46 33.19
+ 34.14

47 7.3
47 69.7

+1 2.4 2.8
46 33.19
-26.70

Dec. 17

51 41.8 51 30.8
45.4 33.3
55.1 36.2
8.5 38.7
14.8 139.0
21.4
28.0 53 5.0
34.7 7.6
47.8 10.1
54.8 51 34.7
1.1

52 4164 21.491
160 21.44
2364 33.20
21.49 -11.76
33.15
-11.66

21.44

+10.57
+1.18
-5.23
27.96

21.44
33.15
-11.71
-7
-5.23
-11.78

21.44
+10.58
+1.20
-5.23

27.99

48.6
1 4.8 1 42.8 1
43.8 21.5
24.30
+46.8
1.67024
1.29155
+1957
36 54.40
36 13.97
46 34.38
+ 34.05

47 8.4
47 71.1

+1 02.7 3.2
46 34.38
-28.10

1882 Jan. 9

51 21.7 51 50.3
28.3 57.3
35.0 52.3
47.8 153.9
54.6
1.6
7.7 51 51.3
14.4
27.3
34.1
40.5

52 930 11.8
880 1.209
13.0 1.16
0.27 31.94
1.18 -30.78

0.23

1.16
+29.69
+.96
1.33
33.14

0.23
31.99
-30.86
-7
-30.90

1.16
+29.71
+1.31
-4.07

28.11

77.7
20.5
57.2
38.85
+9.9
0.89563
0.61694
+414
36 885
36 12.99
46 35.36
+34.43

47 9.8
48 14.2

+1 4.4 4.8
46 35.36
-13.50

Jan. 21

51 45.9 51 31.7
52.2 34.6
58.6 37.4
11.8 103.7
18.4
24.9
31.3 51 34.6
38.1
50.9
58.1
64.5

52 4547 24.973
1801 24.93
2747 31.28
2497 -6.35

24.93

24.93
+8.27
+1.62
+1.12
33.84

24.93
31.29
-6.36
-7
-6.43

24.93
5.29
+1.13
-3.37

27.99

85.8
0 58.8
27.0
42.90
+50.4
1.70243
1.32374
+2107
35 42.40
36 3.97
46 44.38
+ 33.69

47 18.1
48 14.6

+0 56.5 57.0
46 44.38
-13.90

1 5 2 32 90
32.90
(+.07)

$\delta = +71° 47' 43.0''$
$\delta = +71\ 48\ 0.7$

1872.0
Lee 1868 = 33.02
67 32.95
66 (33.35) [illegible] 33.03 + .13
67 32.95

Newcomb. 32.93 32.93 + 3

Wash. 1867 32.93 32.95 + 5
1868 33.03
1869 32.90

Camb. 32.97 + 7
(+.07)

Jan. 1 +71° 48' 13.3'' .6
6 13.9 .4
11 14.3 .2
16 14.5 .1
21 14.6

33.14
32.94
32.85
32.98

.39 +343

Jan .24

~~44.8~~
~~51.4~~
51 58.8 53 5.4
11.6 9.7
17.9 13.0
24.5 28.1
31.0
37.6
50.8 53 9.4
57.4
4.0
449.0
26.90
52 24.46
24.52
31.20
− 6.68

sin δ 9.97771

cos δ 9.49462
12669
9.62131

24.52 24.52
+ 5.45 31.11
+1.70 −6.57
+1.18 − .07
− 6.66
32.85

24.42
5.48
+ .03
− 3.19
27.74

523
1 440
8.3
26.15
− 44.8
1.65127 n
1.27258 n
− 1873
36 26.15
36 7.42

46 40.93
+ 34.40

47 15.3
48 14.6

40 59.3 59.7

46 40.93
− 13.90

υ Ceti upsilon
1 53 57
−21 42
− 40

1871 Dec. 2		Dec. 28		Jan. 30 1872		Feb. 1		Feb. 7	
53 45.1	53 41.8	53 25.5	53 19.5	53 36.0	53 34.9	53 37.3	53 29.2	53 34.7	53 26.9
47.3	43.0	26.6	20.7	40.4	36.0	39.5	30.6	36.8	28.0
49.5	44.0	29.8	22.2	42.6	37.0	41.7	31.6	39.0	28.8
54.0	128.8	34.2	62.4	47.0	107.9	46.2	91.4	43.5	83.7
56.2		36.5		49.2		48.4		45.6	
58.3		38.7	53 20.8	51.4		50.5		47.8	
0.6	53 42.9	41.0	53 59.5	52.7	53 35.9	52.8	53 30.5	50.0	53 27.9
2.8		43.1	61.3	55.8		55.0		52.4	
7.2		47.6		0.2		59.3		56.8	
9.4		49.7		2.6		61.6		59.1	
11.6		51.9		4.8		63.7		61.2	
53 34.20	58.364	53 42.46	38.600	53 56.56	51.418	53 55.50	50.455	53 52.69	47.980
300									
642.0									
58.36		38.60		51.42		50.45		47.90	

sin √ 9.56790

cos √ 9.96808
12669
.09477

9.96808
11804
.08612

438
342
296

			.08612			
55.6	50.0		43.4	55.9	53.5
0 3 31.7	3 32.1	4 18.7	4 3.2	4 9.7	4 6.5
23.9	17.9	7.5	3 40.12	3 46.2	47.0
27.80	25.00		51.70	27.95	26.75
+15.5	+17.8	−21.8	+15.5	+20.0	+20.0
1.19033	1.25042	1.33846	1.19033	1.30103	1.30103
1.28516	1.34519	42458	1.27645	1.38715	1.38715
+19.28	+22.14	−26.58	+18.90 ✓	+24.39	+24.39
3 27.80	25.00	4 13.10	3 51.70	3 57.95	3 56.75
3 47.08	3 47.14	46.52	4 10.60 3 32.80	4 22.34 3 33.56	4 21.14 3 32.36
−21° 40′ 58″.73	40 58.79	58.17	41 ~~22.25~~ 40 44.45	41 ~~33.99~~ 40 45.21	41 ~~32.79~~ 40 44.01

γ Andromedae
1 56 02 −022
59.28
56 59.28 +04
+41 43
+01 +89
+.89

Nov. 16	1	55 62.67		+41°	42'	52".5	.8
21		66	1			53.3	.8
26		65	1			54.1	.8
Dec 1		63	2			54.8	.7
6	(+.03)	59	4			55.4	.6
11		56	3			55.9	.5
16	(+.03)	51	5			56.4	.5
21		45	6			56.8	.4
26		37	8			57.1	.3

δ = +41° 42' 33.4"
δ = +41 42 50.9

+36 +385	+.36 +373	+.46 +370	+.36 +371	+39 +400	+45 +458
1871 Dec. 1	Dec. 2	Dec. 6	Dec. 11	Dec. 17	Dec. 28

Dec. 1

55 46.7 / 49.3 / 52.0 / 57.6 / 0.2 / 3.0 / 5.7 / 8.4 / 14.0 / 16.8 / 19.7
55 35.2 / 37.4 / 39.4 / 112.0 / 55 37.3
56 27.34 / 2.40 / 33.4 / 3.04 / 2.68 / +41
3.036 / 3.01 / 2.67 / +0.34
3.01 / 2.68 / +0.38
3.01 − 3 / −3.35
−.69 / +.32 / −3.35 / 59.29
+.35 / 3.01 / +0.68 / +.34 / −3.35
59.32

Dec. 2

55 45.8 / 48.5 / 51.3 / 56.8 / 59.5 / 2.3 / 5.0 / 7.7 / 12.3 / 16.2 / 18.8
56 26.8 / 28.1 / 29.6 / 84.5 / 56 28.2
56 32.41 / 30.0 / 24.1 / 2.19 / 2.62 / −.42
2.191 / 2.17 / 2.66 / −0.49
2.17 / 2.63 / −0.46 / −3 / −3.34
2.17
+.10 / +.32 / −3.34 / 59.21
−.49 / 2.17 / +0.10 / +.33 / −3.35
59.25

Dec. 6

55 43.3 / 46.1 / 49.0 / 54.3 / 57.1 / 59.8 / 2.5 / 5.4 / 10.7 / 13.6 / 16.3
28 / 29 / 53 / 28 / 29 / 29 / 29 / 53 / 29 / 29
55 30.0 / 31.2 / 61.2 / 55 30.6
55 35.81 / 30.0 / 65.81 / 59.83 / 2.59 / −2.76
59.827 / 59.80 / 2.63 / −2.83
59.80 / 2.59 / −2.79 / −3 / −3.31
59.80
+2.45 / +.41 / −3.31 / 59.35
−2.82 / 59.80 / +2.52 / +.33 / −3.31
59.34

Dec. 11

55 39.8 / 42.6 / 45.3 / 51.0 / 53.6 / 56.3 / 59.1 / 1.8 / 7.2 / 10.1 / 12.9
55 31.0 / 32.3 / 34.7 / 98.0 / 55 32.7
55 37.97 / 24 / 61.97 / 56.34 / 62.55 / 6.21
56.337 / 5.631 / 2.59 / −6.28
56.31 / 2.56 / −6.25 / −3 / −3.27
56.31
+6.04 / +.32 / −3.27 / 59.40
−6.28 / 56.31 / +6.00 / +.33 / −3.28
59.36

Dec. 17

55 35.1 / 37.9 / 40.5 / 46.0 / 48.8 / 51.6 / 54.3 / 57.0 / 2.6 / 5.4 / 8.2
55 32.2 / 33.1 / 34.0 / 99.3 / 55 33.1 / 56 20.6 / 22.1 / 24.1
55 56.74 / 51.58 / 2.50 / −10.92
51.582 / 51.56 / 2.54 / −10.98
51.56 / 2.50 / −10.94 / −3 / −3.22
51.56
+10.57 / +.35 / −3.22 / 59.26
−10.97 / 51.56 / 10.59 / +.36 / −3.22
59.29

Dec. 28

55 26.0 / 28.7 / 31.4 / 37.0 / 39.7 / 42.5 / 45.0 / 48.0 / 53.3 / 56.3 / 58.9
55 17.7 / 19.8 / 21.7 / 59.2 / 55 19.7 / 56 2.0 / 3.0 / 4.6 / 5.7
55 40.68 / 42.44 / 2.34 / −10.90
42.436 / 42.41 / 2.39 / −19.98
42.41 / 2.34 / −19.98 / −3 / −3.06
42.41
+19.62 / +.40 / −3.06 / 59.37
−19.56 / 42.41 / +19.66 / +.41 / −3.06
59.36

Dec. 1

40 0 63.4 / 40.6 / 22.8 / 31.70 / +25.7
1.40993
1.40962
+25.68
40 31.70
−40 57.38
+41° 41' 50.97"
− 0.93
41 50.0
42 54.8

Dec. 2

1 45.4 / 30.7 / 14.7 / 22.70 / −26.0
1.41497
1.41466
−25.98
41 22.70
40 56.72
41 51.63
− 0.98
41 50.7
42 54.9

Dec. 6

0 51.0 / 34.7 / 16.3 / 25.50 / +29.2
1.46538
1.46507
+29.18
40 25.50
40 54.68
41 53.67
− 0.98
41 52.7
42 55.4

Dec. 11

0 62.2 / 38.0 / 24.2 / 31.10 / +23.6
1.37291
1.37260
+23.58
40 31.10
−40 54.68
41 53.67
− 0.92
41 52.7
42 55.9

Dec. 17

0 69.0 / 42.5 / 26.5 / 34.50 / +18.5
1 30.6 / 15.9
1.26717
1.26686
+18.49
40 34.50
40 52.99
41 55.36
− 0.88
41 54.5
42 56.5

Dec. 28

0 63.5 / 41.2 / 22.3 / 31.75 / +22.7
1 25.2 / 6.6
1.35602
1.35571
+22.68
40 31.75
40 54.43
41 53.92
− 0.96
41 53.0
42 57.3

−.01

I	+1 4.8 4.8	+1 4.2 4.2	+1 2.7 2.7	+1 3.2 3.2	+1 2.0 2.0	+1 4.3 4.2
δ' = +41	41 50.97 21.40	41 51.63 −21.50	41 53.67 −22.00	41 53.67 −22.50	41 55.36 −23.10	41 53.92 −23.90

334
509

Jan 1 1 56 2.28 +41° 42' 57".4
11 2.10 .18 57.5
21 (+.03) 1.92 .18 57.6 +1
31 1.72 .20 57.6
F 10 1.52 .20 41 42 57.5
-16

1 56 2.93
2.93

2.80
3.00
2.95
2.80
2.95
2.94

59.32 +4
.28 -3
.34 +6
.36 +8
.29 +1
.36 +8
.25 -3
.32 +4
.33 +5
.25 -3
.32 +4
59.31 +.03

+39 +.398 — +.44 +.430 — +.37 .376 — √ +.38 .437 — +.40 +.387

Jan. 1 1872 — Jan. 9 — Jan. 21 — Jan. 30 — Feb. 7

55 22.0 55 7.6 55 15.7 55 11.4 55 39.8 55 33.3 55 38.4 55 44.5 55 35.0 55 27.8
24.8 8.8 18.3 12.5 42.6 34.7 41.1 37.8 28.7
27.4 10.3 21.1 14.2 45.4 36.0 44.0 40.5 29.7
33.0 26.7 26.7 38.1 50.7 104.0 49.4 46.0 86.2
35.8 29.4 53.7 52.2 48.7
38.6 32.2 56.4 54.9 51.4 s.i. √ 9.82311
41.2 55 8.9 34.8 55 12.7 54.2 56 34.7 57.6 55 44.5 54.3 56 28.7
44.0 37.6 2.0 0.5 57.0
49.4 43.1 7.4 6.0 2.5
52.2 45.8 10.1 8.7 5.3
55.0 48.6 12.7 59 11.5 8.1 cos √ 9.87300
55 4234 38.491 55 3533 32.118 55 3806 56.364 3643 54.973 55 5666 51.509 12669
38.47 — 32.09 740 56.34 246 54.95 — 51.49 9.99969
-620.0 604.3 —
38.49 32.12 56.36 54.94 55.51
2 2/8
23.79 38.47 32.09 56.34 54.95 51.49 9.87300
2.28 2.13 1.92 1.73 1.57 11804
-23.81 -30.04 -5.58 -6.78 -10.08 9.99104

38.47 38.47 32.09 32.09 56.34 56.34 54.95 54.95 51.49 51.49
23.43 2.28 +29.71 2.14 +5.27 1.92 +6.41 1.79 +9.77 1.58
+.35 -23.81 +.40 -30.05 +.33 -5.58 +.34 -6.78 +.36 -10.09
+.65 3 +.80 3 +1.01 3 +1.20 3 +1.36 3
-23.84 -30.08 -5.61 -6.81 -10.12
2.90 3.00 2.95 2.90 2.95

38.47 32.09 56.34 54.95 51.49
+23.43 +29.71 +5.29 +6.37 +9.78
+.35 +.38 +.34 +.38 +.35
-3.00 -1.86 -1.64 -1.40 -1.80
59.25 59.32 59.33 59.25 59.32

9.99104
48.6 67.5 48.1 85.0 151.9
40 0 31.9 1 39.2 0 43.2 0 37.1 0 58.0 1 9.7
16.7 23.0 24.3 11.0 27.0 42.2
24.30 33.75 24.05 42.60 36.95
+29.6 +19.4 +21.7 +10.5 +22.8
1.47129 1.28780 1.33645 1.02118 1.35793
1.47098 1.28749 1.33614 1.01222 1.34897
+29.57 +19.39 +21.68 +10.28 -22.33
40 24.30 40 33.75 40 24.05 40 42.50 40 55.90 40 33.62
40 53.87 40 53.14 40 45.73 40 52.28 40 32.22 41 18.28

41 54.48 41 55.21 42 2.62 41 55.57 42 16.13 41 30.07 42 14.73
-1.00 -0.86 -0.89 -0.87 -0.87 -1.00 -1.00

41 53.5 41 54.4 42 1.7 41 51.7 42 15.3 41 29.1 42 13.7
42 57.4 42 57.5 42 57.6 42 57.6 42 57.6 42 57.5 42 57.5

+1 3.9 3.9 +1 3.1 3.1 +0 55.9 55.9 +1 ~~2.9~~ 42.3 42.3 +1 ~~28.4~~ +43.8 43.8

41 54.48 41 55.21 42 2.62 41 55.57 41 30.07
-6.50 -6.60 -6.70 -6.70 -6.60

a Arietis

1 59 53 59 54.31 54.31

+22 52

: .017

.27

+.33 42

(+.42)

Nov 16	1 59	54.30		+22° 50'	81".4		54.22	− 9
21		30	0		81.7	.3	.29	− 2
26		30	0		81.9	.2	9 .31	− 0
Dec 1	(−.03)	29	1		~~82.1~~	.2	.34	+ 3
6		27	2		82.3	.2	.20	− 11
11	(−.03)	25	2		82.4	.1	.31	− 0
16		20	8		82.5	.1	.25	− 6
21		18	4		82.5	.0	.33	+ 2
26		12	6		82.5	.0	54.28	−.03

δ = +22° 51' 4".2

δ = 22 51 21.5

+.36 +.385	+.36 +.373	+.46 +.370	+.45 +.418	+.39 +.398 1872	+.44 +.430
1871 Dec. 1	Dec. 2	Dec. 6	Dec. 28	Jan. 1	Jan. 9

Dec. 1

59 44.3 59 35.2
46.6 36.9
48.9 38.6
53.2 110.7
55.6
57.8
59.9 59 36.9
2.2
6.6
8.9
11.1
59 39 51 57.736
240 57.72
635.1 57.29
57.73 − 0.43
57.29
+.44 57.72
57.29
57.72 + 0.43
+ 3
−.69 − 2.98
+.15
−2.98 + 0.46
54.20 57.72
−0.68
+.16
−2.98
54.22

Dec. 2

59 43.7 59 35.8
45.8 37.0
48.1 38.8
52.5 111.6
54.7
57.1
59.3 59 37.2
1.5
5.9
8.1
10.5
57 38 72 57.018
240 57.00
627.2 57.29
57.02 −0.29
57.29
−.27 57.00
57.29
57.00 −0.29
+ 3
+.10 −2.98
+.15
−2.58 −0.26
54.27 57.00
+ 0.11
+ .16
− 2.58
54.29

Dec. 6

59 41.2 59 31.2
43.5 33.1
45.7 34.6
50.1 98.9
52.3
54.6
56.8 59 32.9
59.1
3.5
5.8
8.1
57 42 0.7 54.609
180 54.59
600.7 57.27
54.61 −2.68
57.27
−2.66 54.59
57.27
54.59 −2.68
+ 3
+2.45 −2.96
+ .19
−2.96 −2.65
54.27 54.59
+2.52
+ .16
− 2.96
54.31

Dec. 28

59 24.0 59 11.0
26.1 12.1
28.4 13.4
32.9 36.5
35.1
37.3 59 12.2
39.6 59 53.0
41.9 54.6
46.3 55.7
48.5
50.6
41 07 37.336
37.32
57.09
37.34 −19.77
57.09
19.75 37.32
57.09
37.32 −19.77
+ 3
+ 19.62 −2.78
+ .19
−2.78 −19.74
54.35 37.32
+14.61
+ .19
−2.78
54.34

Jan. 1

59 20.1 59 11.4
22.3 13.0
24.5 14.1
29.0 38.5
31.2
33.4 59 12.8
35.7 59 56.5
37.9 58.0
42.3 59.2
44.7
46.8
36 80 33.454
33.44
57.05
33.45 −23.61
57.05
23.60 33.34
57.05
33.44 −23.71
+ 3
33.44
+23.43 −23.68
+ .16
+ .63
57.66 33.44
+23.42
+ .17
−2.74
54.30

Jan. 9

59 13.7 59 3.8
15.8 5.1
18.1 6.6
22.7 16.5
24.8
27.1
29.3 59 5.2
31.6
36.0
38.3
40.4
29 78 27.073
27.06
27.07
27.06 27.06
56.97 56.96
27.06 −29.91 −29.90
+ 3
27.06
+29.71
+ .18
+ .71 −29.87
57.66 27.06
+39.72
+ .18
−2.65
54.31

Dec. 1

840
30 1 50.7
33.3
42.00
+20.8
1.31806
~~1.40055~~
1.40920
+20.66
31 42.00
32 07.66
+22° 50' 40".69
− 22.45
+22 50 18.24
51 22.1
−32
ℓ = + 1 3.9 3.6
−17.90

Dec. 2

87.4
1 52.2
35.2
43.70
+19.8
1.29666
~~1.37915~~
1.38780
+ 24.42
31 43.70
32 8.12
50 40.23
− 22.69
50 17.54
22.1
1 4.6 4.3
−17.90

Dec. 6

77.3
1 49.3
28.0
38.65
+21.7
1.33645
~~1.41894~~
1.42759
+ 26.77
31 38.65
32 5.42
50 42.93
− 22.49
50 20.44
22.3
1 1.9 1.6
−18.10

Dec. 28

67.5
1 44.3 2 35.4
23.2 15.5
33.75
+25.1
1.39967
~~1.48216~~
1.49081
+ 30.96
31 33.75
32 4.71
50 43.64
− 23.08
50 20.56
22.5
1 2.0 1.6
−18.30

Jan. 1

79.8
1 50.0 2 44.0
29.8 26.4
39.90
+20.6
1.31386
~~1.39635~~
1.40500
+ 25.41
31 39.90
32 5.31
50 43.04
− 22.21
50 20.83
22.4
1.6 1.3
+0.90

Jan. 9

79.9
1 49.3
30.6
39.95
+21.7
1.34044
~~1.42293~~
1.43158
+ 27.01
31 39.95
32 6.96
50 41.39
− 22.06
50 18.33
22.2
2.9 2.6
+0.70

1 59 57.68
57.68

(–.03)

57.66
66
59
75
57.66

+3/ +376
Jan. 21

+.50 +.513
Jan. 31

59 38.0	59 29.0	59 36.3	59 23.0
40.1	30.7	38.4	23.9
42.3	32.0	40.7	25.0
46.9	31.7	45.2	21.9
49.1		47.4	
51.4		49.7	
53.5	59 30.6	51.8	59 23.9
55.9		54.0	
0.2		58.6	
2.4		0.7	
4.7		3.0	
59 56.45	51.318	54.58	49.618
	51.30	49.62	49.60
51.32			

sin ∫ 9.58949

cos ∫ 9.96445
12669
.09114

9.96445
11804
.08249

31.30
56.81
– 25.51

49.60
56.66
– 7.06

51.30
+ 5.27
+ .15
+ .87
57.59

51.30
56.81
25.51
+ 3
– 5.48

49.60
+ 6.92
+ .21
+ 1.02
57.75

49.60
56.66
– 7.06
+ 3
– 7.03

51.30
+ 6.29
+ .16
– 2.50
54.25

49.60
+ 6.87
+ .21
– 2.30
54.383

.08249

668
30 1 47.8
19.0
33.40
+ 30.7
1.31597
~~1.39846~~
1.40711
+ 2553
31 33.40
31 58.93
50 49.42
– 21.83
50 27.59
51 21.7
+ 54.1 53.8
+0.20

.33.0
32.0
1.0
16.50
+25.7
1.40993
1.49242
+ 3108
32 16.50
31 45.42
51 20.78
– 22.84
50 40.09
51 20.4
+ 0 39.8 39.4
+0.80

1871phae.proj.145S.

α Procyonis √
2 0 59
115 00
25 00
65 00

— 2.14

S = √9.95728

cos √ 9.62595n
12669
ξ9.75264n

9.62595n
11804
ξ9.74399n

For I.C.	1871 Dec. 11		Dec. 17		1872 Jan. 24 √		Jan. 30		Feb. 1	
			1 29.6 1	30.2 0	21.5 0	14.1 0	21.0 0	11.2 0	20.3 0	11.3
4.81	0 42.7	47.6	32.0	~~32.6~~	26.4	~~17.5~~	25.9	14.0	25.1	14.4
4.95	47.4	47.4	34.5	~~62.8~~	31.1	~~18.8~~	30.6	17.0	30.4	15.9
9.71	52.4	47.5	39.5		41.2	~~50.4~~	40.6	42.3	40.2	41.6
4.91	57.3	47.5	42.3 2	7.5	45.8 0		45.6		44.8	
-4.90	6.9	47.3	-44.6	10.7	50.9		50.5		49.8	
4.80	11.9	47.4	47.0	12.3	55.6		55.5		54.7	
9.71	16.8	47.4 31	49.7		0.5		0.1		59.6	
4.93			54.6		10.2		10.1		9.6	
4.81			57.1 1	34.4	14.9 0.	16.7	14.6 0	14.1	14.0 0	13.9
			59.7		19.8		19.7		19.3	
			49 0 6		3179		3142		3678	
	Q 0 47.31				2401		240		180	
	51.94		44.60	44.60	5589		5542		5478	
	- 4.63		53.16	44.64	5072	50.4	50.38	50.381	49.80	
			85.6	53.16						
				8.52						

Set.

A. R. only

~~+13.2~~
~~1.12057~~
0.87321n

20 √
48.1
1 44.3
3.8
24.05
+34.0
1.53147
1.28411n
−19.24
20 24.05
21 4.81
01 43.54

9.74399n
61.9
0 52.2
9.7
30.95
+36.3
1.55990
1.30389n
−20.13
20 30.95
20 10.82
2 37.53

58.7
0 48.0
10.7
29.35
+35.9
1.55509
1.29908n
−19.91
0 29.35
0 9.44
02 38.91

Feb. 15

0	28.1	0	22.5
	30.7		23.8
	33.2		24.8
	38.0		7N
	40.6		
	43.0		
	45.6		
	48.1		
	53.0		
	55.6	0	23.7
	58.3		

4742

43109

+19.4
1.28780
1.03179
— 10.76

β Trianguli √
2 1 51
+34 23 52.39 52.39
+68
(+.68)

sin z = +.14

-019

Dec 6 2 1 53.57 2 +34° 22' 52".8
11 .55 4 53.3 .5
16 (.00) 51 4 53.6 .3
21 .00 46 5 53.8 .2
26 40 6 54.0 .2

δ = +34° 22' 32.4"
δ = +34 22 49.7

+36 +45 +4.56 +39 +3.98 +44 +4.30 +50 +5.13

1871 Dec. 11 Dec. 28 1872 Jan. 1 Jan. 9 Jan. 31

sin δ 9.75184

cos δ 9.91660
12669
.04329

9.91660
11804
.03464

1 1 49.4 1
51.8
54.3
59.2
1.8
4.2
11.8
14.0
16.0
26.23
31.47
50.76
9.22
55.55
9.22
+6.04
+.24
-3.16

20.7 1
23.1
25.4
30.5
33.0
-35.5 1
37.8 1
40.4 1
45.4
48.0
50.4
39.02
35.47
55.37
35.45
+19.61
+.31
-2.98
52.39

11.5 1
13.1
14.9
39.5
12.2
~~58.0~~
59.5
~~1.0~~
35.473
35.45
55.37
-19.92
36.45
-2.98
35.45
55.37
-19.92
35.45
+19.41
+.31
-2.98
52.39

16.8 1
19.2
21.7
26.7
29.1
31.6 1
34.1 2
36.6
41.6
44.0
46.6
34.80
31.64
55.34
23.70
31.62
+23.43
+ 27
+ .60
55.92

10.8 1
12.2
14.0
37.0
12.3
4.3
5.6
7.1
31.636
31.62
31.62
55.34
23.72
31.62
55.32
-23.70
31.62
+23.43
+ 27
+ 2.98
52.39

10.3 1
12.8
15.2
20.3
22.6
25.3
27.6 1
30.2
35.2
37.7
40.3
27.75
25.23
25.21
+29.71
+ 30
+ .43
55.45

0.5 1
1.8
3.4
5.7
1.9
25.227
25.21
25.21
55.21
-30.00
25.21
55.20
-29.99
25.21
+39.72
+ 29
-2.81
52.41

32.7 1
35.3
37.7
42.7
45.1
47.6
50.1 1
52.7
57.6
0.1
2.6
52.42
47.65
47.64
+6.92
+ 34
+1.09
56.85

22.8
24.5
26.8
14.1
24.7
47.655
47.64
47.64
~~54.85~~
~~7.38~~
7.21
47.64
54.85
-7.21
47.64
+6.87
+ 35
-2.46
52.40

Use

.03464

0 1 22.5
8.21
15.35
3.47

50.6
0 32.9 1
17.7
20.30
+22.3
1.34830
1.39159
+ 2.64
0 25.30
0 49.94
+34° 21 58.41
- 9.20

24.0
4.7
-24.0
1.38021
1.41486
-25.99
1 14.35
48.36
22 00.1

52.9
0 34.6 1
18.3
26.45
+19.3
1.28555
1.32884
+ 21.32
0 26.45
0 47.77
22 0.58
-8.82

33.7 0
18.0

45.7
32.6
13.1
22.86
+23.3
1.36735
1.41064
+2.574
0 22.85
0 48.59
21 59.76
- 8.81

45.6
1 8.8
36.8
22.80
+23.0
1.36172
1.39636
+ 24.91
0 52.80
1 17.71
21 30.64
- 9.13

0 27.89
0 27.49
22 20.46
- 9.13

21 49.2
22 54.0

21 51.8
22 54.1

21 51.0
22 54.2

21 21.5 22 11.33
22 53.4 22 53.4

-.12
δ = +134

+1 4.8 4.7
21 58.41
- 21.60

+1 2.3 2.2
22 0.58
- 4.40

+1 3.2 3.1
21 59.76
- 4.50

~~+1 41.9~~ +42.1 41.9
21 30.64
- 3.70

	1872	° ′	″	
	Jan. 1	+34 22	54.1	
	6		54.2	+1
	11		54.2	0
	16		54.1	−1
	21		53.9	−2
	26		53.7	−2
	31		53.4	·3
	Feb. 5		53.0	−4
	10		52.5	·5

1872.0
2 01 55.94
55.94

(.00)

55.92
95
95
93
55.94

52.39 0
39 0
41 +2
40 −1
37 −2
52.39 0

+.40 +.387

Feb. 7

1 1 33.3
34.3
67.6

39.7
42.2
44.7
47.1 1 33.8
49.7
223.4

44.680
44.66

44.68

44.66
54.72
−10.06

44.66
+9.78
+ .27
+ 1.22

55.93

44.66
54.72
−10.06

44.66
+9.78
+ .26
− 2.33

52.37

~~44.9~~ 0
1 ~~6.8~~
~~38.1~~
~~2.45~~
~~+1 0.9~~
~~1.03742~~
~~1.07206~~
~~+ 1181~~
1 ~~52.45~~
1 ~~9.26~~

0 53.0
25.0
78.0
39.0

√

65 Camopeine

2) 04 23   04 23.27 +.08
23.27   -037

+65 56

-.40 +2.24
+2.24

Dec 6	2	4	28.20		+65°	54'	88".1	12	
11			.10	10			89.3	19	3.8
16	(+.08)		97	13			90.3	.9	
21			83	14			91.2	.7	
26	(+.07)		27.64	16			91.9	.7	

δ = +65° 55' 3.8" 22
δ = +65 55 21.0

+36 +.071   +.39 +.400   +45 +.458   +.39 +.398   x +.41 +.387

1871	Dec. 11		Dec. 17		Dec. 28		Jan. 1 1872		Jan. 14	
	3 31.3	4 7.8	4 ~~38.4~~	4 31.0	3 36.5	3 32.8	3 33.3	8 45.7	4	4 53.6
	36.1	10.7	38.7	32.1	41.8	34.6	38.3	47.0		56.0
	1.1	14.0	41.8	33.2	46.9	36.1	43.0	48.6		58.6
	11.3	32.5	48.2		57.0	103.5	53.0	50.0	18.3	168.2
sin δ 9.96050	16.3		51.5		2.1		56.0	171.3	18.2	
	-21.3		54.5		7.0		03.1		23.2	
	26.4 4	10.8	54.0 5	26.2	12.1 3	34.5	08.2 3	47.8	28.0 4	56.1
	31.4		4.4	27.8	16.8		13.2		83.4	
	41.5		7.7	30.0	27.2		23.4		1161	
	46.6		11.0		32.3		28.4			
cos δ 9.61045	52.7		14.9		37.3		33.4			
12669	4 355.0	21.364	363.2	548.36	4 316.0	7.091	4 335.3	3.209	4	23.220
9.73714	120	21.33	24	54.80	240	7.05	300	3.17		23.18
	235.0	28.18	603.2	28.02	79.0	27.68	35.3			
9.61045	21.36	-6.85	54.84	~~322~~	7.02	-20.63	3.21		23.22	
11854	28.10		27.64		27.60					
9.72899	6.74	21.33	4.0	54.80		7.05		3.17		23.18
		28.10		27.94		27.60		27.45		26.89
	21.33		54.80		7.05		3.17	-24.28		-3.71
	+16.04	~~-4.83~~	+10.58	~~-4.67~~	+19.62	~~-4.33~~	3.17	3.17	23.18	23.18
	+.81		+.87		+1.01		+23.43	27.45	+2.56	26.92
	-4.83	-6.77	-4.67	-33.14	-4.33	-20.55	+.88	-24.28	+.92	-3.74
		-8		-8		8	+.44	-8	+1.00	-8
	23.35	-6.85		-33.22	23.35	-20.63	27.92	-24.36	28.06	-3.82
		21.33		54.80		7.05		3.17		23.18
		+6.00		+10.60		+19.61		+23.44		+2.95
		+.83		+.90		+1.02		+.89		+.87
		-4.83		-4.67		-4.33		+.44		+.97
		23.33				23.35		27.94		27.97
								-4.62		-4.62
								23.32		23.35

	Dec. 11	Dec. 28	Jan. 1		Jan. 14
	85.4	57.9	60.8		65.1
25	3 52.6	3 43.0	3 43.0	3 53.0	4 14.3
	32.8	16.9	17.8	26.9	50.8
	42.70	29.95	38.40	79.9	32.55
	+10.6	+32.6	+15.4		32.9
	1.02530	1.51321	1.18752		1.51719 n
	0.76244	1.25035	0.92466		1.25433 n
	+5.79	+17.80	+8.41	+8.41	-17.96
	28 42.70	28 29.95	28 30.40	39.95	25 2.55
	28 48.49	28 47.75	28 38.81	48.36	28 44.59
+65°	53' 59.86"	54 0.60	54 9.54	0.99	54 3.76
	+ 26.03	+ 27.21	+ 26.54	26.34	~~+ 26.97~~ + 27.05
	54 25.9	54 27.8	54 35.9	27.33	54 30.8
	54 89.3	55 31.3	55 32.6	32.6	55 33.7
+.36 I	+1 03 H 3.8	+1 3.5 3.8	+ ~~56.7~~ 1	53 5.7	+1 02.9 3.2
δ = +65	53 59.86 - 25.50	54 0.60 - 27.50	54 9.54 - 11.60		54 3.76 - 12.10

Jan. 1	2 04	27.46		
10		27.06	40	
21		26.64	42	
31	+.08	26.19	45	
Feb. 10		25.75	44	
20				
Mch 1		24.94		

65° 55'

32."6		
33.5	+9	12
33.9	+.4	
33.7	−2	9
33.0	−7	
31.7	−13	30
30.0	−17	

23.33	+ 6
35	+ 8
.32	+ 5
.35	+ 8
.33	+ 6
23.34	+.07

27.92
8.06
7.81
(7.99
8.22)

27.96

2 04 27.89
27.89

+.37 +.376	wrong # ~~wrong~~ +.38 +.437	+.505 wrong # +.52
Jan. 21	Jan. 30	Feb. 1

3	50.58	34.84	38.74	25.04	37.44	24.1
	55.4	36.8	41.8	26.7	40.7	25.2
	0.4	39.0	45.2	28.1	43.9	26.6
	10.5	110.6	51.7	29.7	50.4	
	15.5		55.0		53.6	
	20.5		58.0		56.9	
	25.63	36.9	4.3		0.1	
	30.6		4.5		3.4	
	40.8		10.9		9.9	
	45.7		14.4		13.0	
	51.0		6387.5		16.3	
4	3465	20.590	3390	58.091	3256	56873
	120	20.45	300	58.05	300	56.84
	2265		6390		625.6	
	20.59		58.09		56.87	
		20.45		58.05		56.84
		26.63		26.22		26.08
		−6.18		−28.17		−~~27.30~~
				−~~1.95~~		−~~3.10~~
	20.45	20.55	58.05	58.05	56.84	56.84
	+ 5.27	26.62	+ 6.41	26.28	+7.44	26.14
	+ .83	− 6.07	+ .86	−28.17	+1.19	−27.30
	+ 1.26	− 8	+1.67	− 8	+1.81	− 8
		− 6.15		−28.25		−27.38
	27.81		26.99 (+1.5?)		27.28 (+1.8?)	
		20.55		59.05		58.84
		+5.29		+6.37		+7.40
		+ .84		+ .97		+1.13
		+1.27		+1.67		+1.70
		27.95		2.806		−.462
		−4.62		−4.62		−
		23.33				

830
25 3 27.2
55.8
41.50
+43.7
1.64048
1.37762
+ 2386
28 01.50
28 35.36

54 12.99
+ 25.61

54 38.6
55 33.9

+0 55.3 55.7

54 12.99
−12.90

6 Persei ✓

2 5 0 2
5 6.19 − 024
+50 2 6.19 81

(+1.21)

−.14

Dec				
2	5		6.00	
11			5.93	5
16		(+.01)	5.88	6
21			.72	7
26		+.00	5.73	9

Jan	
1	5.62
6	52
11	41
16	30
21	5.18
26	.06
31	4.93
5	.80
10	4.67

6.23	.23	+4
16	.11	−8
22	.23	+4
6.20	6.19	0

δ = +50° 27′ 53.2″
δ = +50 28 10.2

1872

	× +.44 +.430		+.50 +.513		+.40 +.387	
	Jan 9		Jan. 31		Feb. 7	
	4 16.0	4 6.9	4 38.0	4 30.5	4 35.2	4 21.7
	19.1	8.6	41.2 32	31.4	38.3	23.3
	22.4	10.7	44.5 32	32.4	41.5	25.0
	28.8	26.2	50.9 34	94.3	48.0	70.0
	32.1		54.2 32		51.3	
sin 9.88720	35.3		57.5 33		54.6	
	38.4	4 8.7	0.6 31	4 31.4	57.7	4 23.3
	41.7		3.7 31		1.0	
	48.2		10.3 66		7.5	
	51.5		13.6 33		10.8	
cos 9.80382	54.6		6 16.8 32		14.0	
12669	38.81	35.282	83.3	57.391	59.99	54.536
9.93051	—	35.26	3.06	57.37	11	54.51
	—	5.46	631.3	4.92	—	4.74
9.80382	35.28	−30.20	57.39	−7.58	54.54	−10.23
11.804	35.26		57.37		54.51	
9.92186	+29.71	35.26	+6.82	57.37	+9.78	54.51
	+ .53	5.46	+ .60	4.93	+ .48	4.73
	+ .73	−30.20	+1.29	−7.56	+1.45	10.22
		1		1		1
	6.23	30.21	6.16	−7.57	6.22	−10.23
		35.26		57.37		54.51
		+29.72		+6.87		+9.79
		+.52		+.61		+.47
		+.73		+1.26		+1.46
		+6.23		6.11		6.23

9.92186

	34.9	24.1	30.9
55	1 28.3	1 0.0	1 1.2
	6.6	24.1	29.7
	17.45	12.05	15.45
	+26.6	+26.0	+31.2
	1.42488	1.41497	1.49415
	9.35339	9.33683	9.41601
	+2.265	~~+21.72~~ −21.72	+ 26.06 −26.06
	55 17.45	55 42.05 55 42.05	55 45.45 45.45
	56 49.10	56 3.77 55 20.33	56 11.51 55 19.39
+50°	27′ 8.25″	26 44.58 27 28.02	26 36.84 27 28.96
	+ 8.51	+ 8.71 + 8.71	+ 8.64 + 8.64
	27 16.8	26 53.3 27 36.73	26 45.5 27 37.6
	28 19.2	28 18.9 28 18.9	28 18.0 28 18.3
+.12 I	+1 2.4 25	~~+1 25.6~~ +42.2 42.3	~~+1 32.8~~ 40.7 40.8
δ′ = +50	27 8.25 − 9.00	26 44.58 − 8.70	26 36.84 − 8.10

$\delta = +50° \ 27' - 75''.8$

78.4

Jan	1	+50° 28' 18".8	
	6	19.1	.3
	11	19.3	.2
	16	19.3	.0
	21	19.3	.0
	26	19.1	.2
	31	18.9	.2
Feb.	5	18.5	.4
	10	18.1	.4

γ Trianguli √

2 9 38.9   9 39.09 (-.06)
-.019
9 4264 1872.0
+33 14
15

+.16 +.66
+.66

Nov 16	2 9	42.31	0	+33 14' 74.5		
21		.31	0	75.1 .6		
26		.31	0	75.6 .5	39.04	-5
Dec 1		.30	1	76.1 .5	.01	-8
6	(-.04)	.29	1	76.5 .4	.08	-1
11	(-.04)	.27	2	76.9 .4	.07	-2
16		.24	3	77.2 .3	.09	-0
21		.20	4	77.5 .3	12 .04	-5
26		.14	6	77.7 .2	39.05	-.34

δ = +33° 14' 56.9"
δ = +33 15 13.7

+36 +38   +35 +356   +37 387   x   x +41 +38   +38 +437

1871 Dec. 1

9 28.09   17.0
30.5   18.5
32.7   20.3
37.8   55.8
40.4
42.7
45.2   9 18.6
47.6
52.5
54.9
57.4
4697   42.700
42.68
42.24
42.70   +0.44
42.30
+.40   42.68
42.30
+0.38
42.68   + 4
~~-3.21~~
-.69
+.24   +0.42
-3.21
39.02   42.68
-0.68
+ .25
-3.21
39.04

Dec. 9

9 22.84   22.4
25.2   25.3
27.6   27.6
32.6   54.3
35.0   60.8
37.4   62.2
39.9   182.3
42.3
47.2
49.9
52.2 10   40.8
4121   37.44
37.44
42.22
37.46   -4.78
42.28
4.82   37.44
42.28
-4.84
37.44   + 4
~~-3.19~~
+4.53
+ .23   +4.80
-3.19
39.01   37.44
+4.53
+ .23
-3.19
39.01

Dec. 12

9 20.6   9 58.6
23.0   60.2
25.5   62.0
30.4   180.8
33.0
35.4
37.8 10   40.8
40.3
45.1
47.6
50.1
3888   35.345
35.33
42.20
35.34   -6.87
42.26
35.33
42.27
-6.94
35.33   + 4
~~-3.17~~
+6.65
+ .24   -6.90
-3.17
39.05   35.33
+6.68
+ .26
-3.18
39.08

1872 Jan. 9

9   9   4.5 9
7.0   0
9.4
6.0
14.4
16.9
53.7
10.740
10.72
10.74
10.72
41.96
-31.24
10.72

Jan. 14

9 23.8   9 18.0
26.3   19.3
28.8   20.6
33.7   57.9
36.3
38.6
41.1   9 19.3
43.7
48.6
51.0
53.5
4254   38.673
38.65
38.67
38.65   41.88
- 3.23
38.65
38.65   38.65
+2.96   41.88
+ .27   -3.23
+ .76   + 4
-3.19
42.64   38.65
+2.95
+ .26
-2.79
39.07

Jan. 30

9 20.2
22.8
25.0
30.2
32.2
35.0
37.4
39.9
44.7
47.2
49.8

A. R. only

3646   34.964
34.94
34.96
34.94
41.60
6.66
34.94
34.94   34.94
+ 6.41   41.61
+ .25   -6.67
+ 1.04   + 4
-6.63
42.64   34.94
+6.38
+ .29
-3.52
39.07

Dec. 1:
58.0
5 3   6.9
51.1
29.00
+24.1
1.38201
1.43105
+ 26.98
59.00
78   26.98
+33° 14' 22.37"
- 10.37
14   12.0
14   76.1
-14
I +1   4.1 40
δ = +33 14 22.37
- 19.20

Dec. 9:
100.8
4   58.3
42.5
50.40
-23.3
1.36735 n
1.41639 n
- 26.08
9   50.40
9   24.32
13   24.03
~~-10.93~~
-10.50
14
13?   13.5
14   76.7
+1   3.2 3.1
13   24.03
-19.80

Dec. 12:
103.6
4   59.5
44.1
51.80
-25.0
1.39794 n
1.44698 n
-27.98
9   51.80
9   23.82
13   24.53
-10.83
14
13?   13.2
14   77.0
+1   3.8 3.6
13   24.53
-20.10

Jan. 9:
33.2
3   25.6
7.6
16.60

Jan. 14:
61.5
3   9.8
51.7
30.78
+19.4
1.28780
1.33684
+ 21.72
96   0.75
9   22.47
13   25.88
- 10.67
14
13?   15.2
15   17.8
+1   2.6 2.5
13   25.88
-4.10

Jan. 30:
A. R. only

Jan.	1	42.07	+33° 15'	17.9"	
	6	.00		17.9	.0
	11	41.92		17.9	.0
	16	.85		17.8	.1
	21	41.77		17.6	.2
	26	.69		17.4	.2
	31	41.60		17.1	.3
	5	.51		16.8	.3
	10	41.43		16.4	.4

(-.04)

$\sqrt{+.40 + .387}$

Feb. 7

---

9 16.6 9 28.1
19.0 28.6
21.4 56.7
26.6
29.1
31.3
34.0 9 28.3
36.3
41.3
43.7
46.1
345.4 31.400
31.38

31.31

31.38
41.48
-10.10

31.38 31.38
+9.78 41.48
+ 26 -10.10
+1.16 + 4
-10.06
42.58

31.38
+ 9.79
+ .26
- 3.39
39.04

04039

72.2
3 19.2
53.0
36.10
+3.1
0.49136
0.53175
= 341
8 6.10
8 9.51 2.69

13 ~~38.84~~ 46.66
-10.56 -10.56

14
13 ? 28.3 14 36.1
15 16.6 16.6
2

~~+1 48.2~~ 40.5 40.4

13 38.84
— 2.90

sin δ 9.73901

cos δ 9.92235
12669
.04904

~~9.92235~~
~~11804~~
.04039

~~9.92244~~

67 Ceti -016

2 10 33 10 3299
3299
−7 01

+.76 −.12
−.12

Dec 6	2 10	35.73		−7° 0′ 54″.2	32.56	−3
11		.71	2	54.7	32.56	−3
16	(+.007)	68	3	55.2	33.03	+4
21	+.03	64	4	55.7	33.06	+7
26		35.60	4	56.2	33.10	+11
					33.02	+.03

δ = −7° 1′ 4.8″
δ = −7 0 48.0

+.36 +.371 | +39 +.400 | +.37 +.376 | +.50 +.513 | +.50 +.505

	1871 Dec. 11		Dec. 17		1872 Jan. 21		Jan. 31		Feb. 1	
	10 17.4	10 11.0	10 12.6	10 9.8	10 17.8	10 12.3	10 16.0	10 8.8	10 15.5	10 7.3
	19.4	12.9	14.7	10.7	19.7	13.8	18.0	9.6	17.7	8.0
	21.5	14.8	16.5	11.6	21.8	15.3	20.2	10.6	19.8	15.3
	25.6	38.7	21.0	32.1	26.0	41.4	24.5	39.0	23.8	
	27.7		23.1		28.0		26.3		25.8	
Sin δ 9.08692n	29.7		25.1	10 10.7	30.1		28.4		27.9	
	31.8	10 12.9	27.1	10 50.8	32.2	10 13.8	30.6	10 9.7	30.0	10 7.6
	33.8		29.3	52.1	34.3		32.5		32.0	
	38.0		33.4	53.5	38.4		36.8		36.2	
	40.0		35.5		40.5		38.8		38.3	
cos δ 9.99674	42.1		37.6		42.6		40.9		40.4	
12669	32.70	29.727	27.62	25.109	33.14	30.127	31.30	28.455	30.74	27.945
,12343		29.71		25.09		30.11		28.44		27.93
		33.71		35.67						
	29.73	6.00	25.11	−10.58	30.13		28.45		27.95	
9.99674	35.71		35.67							
11804	5.98	29.71	−10.56	25.09		30.11		28.44		27.93
,11478		35.71		35.67		35.32		35.18		35.16
	29.71		25.09			−5.21		−6.74		−7.23
	+6.04	~~−2.72~~	+10.57	~~−2.68~~	30.11	30.11	28.44	28.44	27.93	27.93
	−.04		~~+~~ .05		+5.27	35.32	+6.82	35.18	+7.44	35.16
	−2.72	−6.00	−2.68	−10.58	−.04	−5.21	−.06	−6.74	−.06	−7.23
		−5		−5	+.66	−5	+.80	−5	+.82	−5
	32.99	−6.05	32.93	−10.63	36.00	−5.26	36.10 re.	−6.79	36.18 ep	−7.28
		29.71		25.09		30.11		28.44		27.93
		+6.01		+10.60		+5.29		+6.87		7.40
		−4		−5		−4		−6		−6
		−2.72		−2.68		−2.33		−2.19		−2.17
		32.96		32.96		33.03		33.06		33.10

.11478

	19.3		28.8		77.5		79.3		83.5	
20	3 13.2		3 18.9	4 14.0	3 16.7		3 52.1		3 53.8	
	6.1		9.9	5.1	58.8		27.2		29.7	
	9.65		14.40		38.75		39.65		41.75	
	+16.8		+14.4		+16.3		+18.8		+20.3	
	1.22530		1.15836		1.21218		1.27415		1.30749	
	1.34873		1.28179		1.33561		1.38893		1.42227	
	+22.32		+19.13		+21.66		+24.49	−24.49	+26.44	
	23 9.65		23 14.40		23 38.75		23 39.65	39.65	23 41.75	
	23 31.97		23 33.53		23 30.41		24 4.14	23 15.16	24 8.19	23 15.31
−7°	0 43.52		0 45.18		0 42.06		1 15.79	0 26.81	1 19.84	0 26.96
	1 11.05		−1 11.51		−1 10.78		−1 12.70	−1 13.71	−1 14.48	1 14.48
	1 54.7		1 56.7		1 52.8		2 29.5	1 40.52	2 34.3	1 41.44
	0 54.7		0 55.3		0 55.7		0 58.6	0 58.6	0 58.7	0 58.7

−.69 I +1 0.0 +0 59.3 +1 1.4 0.7 +0 57.1 56.4 ~~+1 20.9~~ +41.9 41.2 ~~+1 25.6~~ +42.7 42.1

δ′ = −7 0 43.62 −16.10 0 45.18 −9.50 0 42.06 +7.70 1 15.79 +10.60 1 19.84 +10.70

1872.0
2 10 35.98
35.98
(+.05)

Jan. 21	−7° 0′ 58.1″	
26	58.4	.3
31	58.6	.2
Feb. 5	58.7	.1
10	58.8	.1

36.00
10
13
36.08

o Ceti

2 12 51 ~~49.82~~

−3 24

2 12 49.82
−015

Nov 16		2 12 52.59		−3° 33′ 39″.8	
21		59	0	40.3	.5
26		59	0	40.8	.5
Dec 1	(+.01)	59	0	41.3	.5
6		.58	1	41.7	.4
11	+.02	56	2	42.2	.5
16		53	3	42.6	.4
21		50	3	43.1	.5
26		.46	4	43.5	.4

19

18

δ = −3° 33′ 53.0″
δ = −3 33 36.5

+.72 −.36
−.06

+36 +.355   +35 +.356

1871 Dec. 1   Dec. 4

12 41.0 12 36.8 12 13 4.0
43.0 37.8 5.3
45.0 39.5 6.6
49.2 114.1 15.9
51.4
53.3 44.0
55.4 12 38.0 46.0 13 5.3
57.6 48.0
61.6 50.0
63.7 52.2
65.8 2403
5570 53.364 48.060
53.35 48.04
52.59 52.57
53.36 ~~24~~ 48.06 −4.53
52.59 +0.76 52.57
+0.77 53.35 −4.51 48.04
52.57 52.57
53.35 +0.76 48.04 −4.53
+.69 −2.77 +4.53 −2.75
−.02 +0.75 −.02 −4.54
−2.77 −2.75
53.30 48.04
49.87 −0.67 49.80 +4.53
−.02 −.02
−2.77 −2.75
49.89 49.80

sin √ 8.99386

cos √ 9.99516
12669
,12585

14.6 99.5
55 1 12.2 1 54.7
2.4 44.8
7.30 47.75
+15.4 −17.2
1.18752 1.23553 n
1.31337 1.36187 n
+20.57 −22.98
56 7.30 56 49.75
5-6 22.87 56 26.77

−3° 33′ 39″.52 −33 38.42
−1 4.69 −1 5.13

34 44.2 34 43.5
33 41.3 33 42.0

−65
I +1 2.9 2.3 +1 1.5 0.8

δ′ = −3 33 39.52 33 38.42
−11.70 −11.00

B.A.C. 427
1 14 48
+40 49
+.86

ι Cassiopeiae

α 2 18 28 2.803

+66 49 5.0

−038

18 2.803+12

−.41 2.34

+2.33

+.36 +.355

Nov. 16	2	18	33.49
21			.47	2
26	(+.04)		.44	3
Dec 1			.38	6
6			33.31	7
11	(+.21)		22	9
16			10	12
21	(+.18)		96	14
26			32.80	16
31			62	18

+66°	49′	30.2	
		31.7	15
		33.1	14
		34.4	13
		35.7	13
		36.8	11
		37.9	11
		38.9	10
		39.8	09

55

δ +66° 49′ 12.6″

δ +66 49 29.1

4′

1871 Dec. 1	Dec. 9	Dec. 11	Dec. 17	Dec. 28	Dec. 29 ~~Jan. 7~~
+.36 +.355	+35 +.353	+36 +.371	+39 +.400	+45 +.458	+45 +.444
18 1.9 7.2 12.5 22.9 28.1 33.4 38.6 43.9 54.3 59.6 64.8	17 ~~51.7~~ ~~56.4~~ ~~2.0~~ 7.1 17.5 22.6 27.9 33.4 38.5 1482	17 55.4 0.4 5.7 16.0 21.3 26.4 31.5 36.9 47.3 52.4 57.9	17 30.2 35.2 0.7 11.0 16.5 21.6 26.8 32.0 42.7 47.8 53.2	17 41.0 46.2 52 51.5 53 0 1.6 101 6.8 52 12.4 17.6 52 22.8 52 33.6 108 38.4 48 43.6 52	17 39.9 45.2 50.5 0.9 6.0 11.2 16.5 22.0 32.6 37.6 42.8
17 40.1 43.2 46.6 129.9 17 48.3	17 52.8 57.5 58.0 169.3 17 56.4	18 13.8 17.6 18.5 50.9 18 16.9	17 36.0 37.7 40.0 113.7 17 37.9 19 11.7 13.7 16.0	17 44.6 17 44.6 18 47.0 51.3 54.4	17 28.5 30.4 33.2 92.1 17 30.7
3672 33.38 33.38 +.00 33.34 −.65 +.84 −5.35 28.15	18 28.04 33.26 5.21 28.00 +4.54 +.82 −5.23 28.13	18 351.2 6 29.12 2647 33.22 6.75 2643 +6.05 +.84 −5.19 28.13	18 3577 120. 237.7 21.61 33.07 11.46 21.57 +10.58 +.91 −5.04 28.02?	18 3155 180 135.5 12.35 32.173 19.78 12.28 +19.63 +1.05 −4.70 28.26	18 3052 180 125.2 11.38 32.70 21.30 11.34 +20.51 +1.05 −4.67 28.23
33.382 33.34 33.50 −.16	28.040 28.00 33.38 −5.38	26.473 26.43 33.34 −6.91	21.604 21.57 33.19 −11.62	12.285 12.28 32.85 −10.57	11.382 11.34 32.82 −21.48
33.34 33.38 −.04 −.21 ~~5.35~~ −.25 33.34 −0.67 +.89 −5.35 28.21	28.00 33.26 −5.26 −.21 ~~5.23~~ −5.47 28.00 +4.53 +.82 −5.23 28.12	26.43 33.22 −6.79 −.21 ~~5.19~~ −7.00 26.43 +6.02 +.86 −5.19 28.12	21.57 33.07 −11.50 −.21 −5.04 −11.71 21.57 +10.60 +.93 −5.04 28.06	12.28 32.78 −21.45 −.21 −4.70 −21.66 12.28 +19.62 +1.06 −4.70 28.26	11.34 32.70 −22.36 −.21 −28.23 28.21 −21.57 11.34 +20.53 +1.53 −4.67 28.23
39.9 30 4 31.6 8.3 19.95 +50.1 1.69983 1.42136 +26.38 34 19.95 34 46.33	30 52.3 4 37.4 14.9 26.15 +31.6 1.49968 1.22121 +16.64 34 26.15 34 42.79	30 71.4 4 45.9 25.5 35.70 +9.6 0.98227 0.70380 +5.06 34 35.70 34 40.76	30 51.3 35 4 26.0 0 16.2 5.3 55.0 15.65 +43.7 1.64048 1.36201 +23.02 34 15.65 34 38.67	30 52.3 35 4 39.6 0 14.0 12.7 47.9 26.45 +27.7 1.44247 1.16400 +14.59 34 26.15 34 40.74	30 34.2 4 28.8 5.9 17.1 +40.7 1.60959 1.33112 +21.43 34 17.10 34 38.53
° ′ ″ +66 48 2.02 + 0 27.41	48 5.56 + 28.38	48 7.59 + 27.07	48 9.68 + 26.94	48 7.61 + 28.38	48 9.82 + 27.44
48 29.9 49 34.4	48 33.9 49 36.3	48 34.8 49 36.8	48 36.6 49 38.1	48 36.0 49 40.2	48 37.3 49 40.4
+39 I +1 4.5 4.9	+1 2.4 2.8	+1 2.0 2.4	+1 1.5 1.9	+1 4.2 4.6	+1 3.1 3.4
δ′+66 48 2.02 −21.80	48 5.56 −23.70	48 7.59 −24.20	48 9.68 −25.50	48 7.61 −27.60	48 9.82 −27.80

Jan 1 2 18 32.59
11 32.19 40
21 (+.21) 31.47 42
Feb. 10 31.30 46
20 30.84 47
29.97

2 18 32.86
32.86

(cor. = +.18) + 66° 49′ 40″.7
41.8 +1.1
42.3 +.5
42.3 +0
41.8 −.5
40.7 1.1
39.2 1.5

16
5
26

+18 28.21 −
+9 12
+9 12
+3 06
+23 26
+20 23
+33 36
+25 28
+20 23
+22 25
+20 23
+18
28.21

33.18
18
08
16
04
33.13

+.39 +.388 +.39 +.375 +.44 +.430 ×+.41 +.387 +.37 +.376

(P) 2 Jan. 1 1872 Jan. 6 Jan. 9 Jan. 14 Jan. 21

---

17 37.6 18 6.5
42.5 7.4
47.7 15.9
58.1 13.9
3.3
8.3 ~~18~~ 6.9 6.9×
13.7 18 49.0
18.8 50.0
29.7
34.6
40.1
18 33.44 8.582
246 8.54
94.4
8.58 +04
32.58
24.04
~~32.36~~
~~8.32~~

8.54
32.58
−24.04
−18
−24.22

8.54
+23.40
+ .91
+ .28
33.18

8.54
32.58
−24.64
−21
−24.25

8.54
+23.44
+ .93
−4.55
28.36

17 33.2 18 46.8
38.5 50.7
43.7 0 54.5
54.0 152.0
59.3
−4.6
9.6 18 50.7
15.0
25.3
30.6
36.0
18 34.98 4.527
3.00 4.49
34.98
4.55
32.36
28.01

4.49
32.34
−27.85
−18
−28.03

4.49
+27.20
+ .91
+ .52
33.18

4.49
32.38
−27.89
−21
28.10

4.49
+27.27
+ .87
−4.35
28.28

17 – 18 25.7
26.1
30.7
84.5
−56.3 +30
1.5 28
7.0 26 18 28.2
12.4 26
−2.75
45.3
1.78
18

1.74
32.27
−30.53
−18
30.71

1.74
+29.72
+ 1.03
+ .59
33.08

1.74
32.26
−30.52
−21
30.73

1.74
29.72
+1.02
−4.23
28.23

17 57.2 17 33.0
2.4 35.7
7.5 38.0
18.2 106.7
23.2
28.6
33.7 17 35.6
38.9
49.3
54.5
59.7
18 37.32 28.494
60 28.43
31.32 32.05
28.47

28.43
32.05
−3.62
−18
−3.80

28.43
+2.96
+ .86
+ .81
33.16

28.43
32.06
−3.63
−21
−3.84

28.43
+2.95
+ .90
−4.03
28.25

17 54.5 17 28.2
59.7 30.8
4.7 33.4
15.5 92.4
20.7
26.0
31.0 17 30.8
36.2
46.7
51.9
57.3
18 40.42 25.836
126 25.80
28.42
25.84

25.80
31.76
−5.96
−18
6.14

25.80
+5.27
+ ~~.87~~
+1.10
33.04

25.80
31.76
−5.96
−21
6.17

25.80
+5.29
+ .84
−3.73
28.23

sin 9.96349

cos 9.59484
12669
9.72153

---

30 76.5 35
4 50.2 0 9.7
26.3 47.7
38.25
+0.? +17
9.84509 0.23040
9.56662 9.45193
+3.69 +0.89
34 38.25 3.825
34 41.94 34 39.14
48 9.21
+ 27.41
48 36.6
49 40.8
+1 4.2 4.6

35 64.1
0 10.8
53.3
33.05
−46.2
1.66464 n
1.38617 n
−24.33
35 2.05
34 37.72
48 10.63
+ 27.39
48 38.0
49 41.2
+1 3.3 3.7
48 10.63
−12.20

35 41.1
0 2.5
38.6
20.55
−26.4
1.42160 n
1.14313 n
−13.90
34 56.55
34 36.65
48 11.70
+ 27.24
48 38.9
49 41.7
+1 2.8 3.2
48 11.70
−12.60

30 77.7
4 20.7
57.0
38.85
+52.9
1.72345
1.44498
+ 27.85
35 8.85
34 36.70
48 11.65
+ 27.97
48 39.6
49 42.1
+1 2.5 2.9
48 11.65
−13.00

30 59.9
4 15.6
44.3
29.95
+55.0
1.74036
1.46189
+ 28.96
33 59.95
34 28.91
48 19.44
+ 26.48
48 45.9
49 42.3
+0 56.4 56.8
49 19.44
−13.20

ξ Ceti -016

Nov 2? 2 21 18 10 (1810) 2 21 18.10 +04

+7 53

+.57 +14 +14

Nov. 16	2 21 20.94		+7° 52'	64.1	1		
21	98	+1		64.0		3	
26	98	0		63.8	2		-9
Dec 1	98	0		63.6	2		
6	.97	1		63.4	2	4	
11	.96	1		63.2	2	5	+3
16	94	2		62.9	3		
21	91	3		62.7	2	-10	
26	.88	3		62.4	3	5	
	.85						

(+04) +07

δ = +7° 52' 49.4"

δ = +7 53 5.8

1871 Dec. 1	Dec. 9	Dec. 11	Dec. 17	Dec. 29	1872 Jan. 1
.36 +385	.35 +373	.36 +371	39 +400	.45 +444	40 +39 +398
21 9.2 11.3 13.4 17.4 19.5 21.5 23.7 25.8 29.8 32.0 34.6	21 4.0 6.0 8.1 12.2 14.4 16.4 18.5 20.6 24.6 26.5 29.0	21 2.6 4.7 6.7 10.8 12.9 14.9 17.0 19.2 23.3 25.4 27.4	20 58.0 0.0 2.0 6.0 8.3 10.3 12.3 14.4 16.6 20.7 22.8	20 47.8 50.0 52.1 56.2 58.4 0.4 2.5 4.5 8.6 10.7 12.8	20 45.0 47.0 49.2 53.2 55.4 57.5 59.5 1.6 5.7 7.8 9.9
21 3.6 5.2 7.0 15.8 21 5.3	20 56.6 57.8 59.5 173.9 20 57.7	20 53.8 55.2 56.6 165.6 20 55.2	20 46.9 49.0 50.2 146.1 20 48.7 21 33.7 33.1 36.3	20 38.6 39.7 40.8 119.1 20 39.7	20 36.2 37.6 38.7 112.5 20 37.5 21 28.4 28.9
21 2377 2161 20.98 +0.63	21 1506 16.41 20.96 +4.55	21 1649 — 1490 20.96 +6.06	21 1734 0 113.4 10.31 20.93 10.62	21 3040 30 4.0 0.36 20.86 20.50	20 63 1 8 — 57.44 20.83 23.41
21.609 21.59 21.02 +.57 -68 +05 -2.88	16.418 16.40 21.00 -4.60 +454 +05 -2.86	14.491 14.97 21.00 -6.03 +605 +05 -2.86	10.309 10.29 20.97 -10.68 +1058 +05 -2.83	0.364 0.35 20.80 2055 +20.57 +07 -2.76	57.436 57.42 +
2161 +.05 +69 20.97 -2.88 18.09 ?	1641 +05 4.49 2056 2.86 18.09	1450 +05 6.07 21.02 2.86 18.16	10.31 +.06 10.59 20.96 2.83 18.13	036 .07 2050 20.93 2.76 18.17	57.42 06 23.46 20.86 2.73 18.11
18.08	18.13	18.21	18.09	18.17	18.14
21.59 20.98 +0.61 4 -2.88 +0.57	16.40 20.96 -4.56 4 -2.86 -4.60	14.97 20.96 -5.99 4 -2.86 -6.03	10.29 20.98 -10.64 4 -2.83 -10.68	0.35 20.86 -20.51 -2.76 -20.58	57.42 57.42 -20.83 20.83 -2.341 2.341 4 -2.75 57.42 23.45 -23.45 + .06
21.59 -0.67 +16 -2.88	16.40 +4.52 +5 -2.86	14.97 +6.02 +6 -2.86	10.29 +10.60 +6 -2.83	0.35 +20.53 + -2.76	57.42 +23.45 +6 -2.73
18.10	18.12	18.19	18.12	18.19	18.20
852 25 4 49.4 35.8 42.60 +16.3 1.21218 1.33475 +2161 29 42.60 30 4.21	25 77.1 4 45.1 32.0 38.55 +18.3 1.26717 1.38974 +2453 29 38.55 30 3.08	25 75.9 4 43.0 32.8 37.90 +19.8 1.29666 1.41923 +26.26 29 37.90 30 4.16	25 71.230 4 42.20 42.3 29.0 30.2 35.60 +21.6 1.33445 1.45702 +2860 29 35.60 30 4.25	25 74.0 4 44.7 29.3 37.00 -37.0 20 31600 1.59439 43857 1.71696 +2745 -5.21 +2745 29 37.00 30 445	25 78.130 4 45.80 52.4 33.3 88.0 39.55 +17.9 1.29885 1.42142 +26.39 29 39.55 30 5.94
+7° 52 44.14" — 43.36	52 45.27 — 43.62	52 44.19 — 42.43	52 44.10 — 42.72	52 43.90 — 43.50	52 42.41 — 43.04
52 0.8 52 63.6	52 1.6 52 63.3	52 1.8 52 63.2	52 1.4 52 62.9	52 0.4 52 62.2	51 59.4 52 62.1
-.53 I +1 2.8 2.3	+1 1.7 1.2	+1 1.4 0.8	+1 1.5 1.0	+1 1.8 1.3	+1 2.7 2.2
δ=+7 52 44.14 -14.20	52 45.27 -13.90	52 44.19 -13.80	52 44.10 -13.50	52 43.90 -12.80	52 42.41 +3.70

18.20
2 21 21.28
~~21.28~~
(+.07)

Jan 1 +7° 52' 62".1 3
6 61.8 3
11 61.5 3 4
16 61.2
21 61.0 2 5
10

18.20 +10
.12 +2
.19 +9
.12 +2
.19 +9
.20 +10
.16 +6
.16 +6
.18 +8
18.17 +.07

21.32
33
34
21.33

45 ~~+~~ +.41 +.392 ~~+~~ +.39 +.375 +.37 +.376
~~1022~~ 25 Jan. 5. Jan. 6 Jan. 21

---

20 50.0 21 4.0 20 41.1 21 9.2 21 3.0 20 54.4
52.0 4.8 43.2 10.1 5.0 56.0
54.0 5.8 45.2 11.7 7.0 56.8
56.1 14.6 49.3 31.10 11.2 170.2
58.3 51.4 13.2
270.4 53.6 15.3
21 4.9 55.6 21 10.3 17.4 21 56.7
57.7 19.5
1.8 23.7
3.8 25.8
6.0 27.8
20 54.080 54.080 20.5887 53.518 16.89 15.355
54.06 53.50 15.34
53.52 15.35

Sin √ 9.13722

cos √ 9.99588
12669
.12257

~~1022~~ 54.08
.07
19.62
20.91
2.76
18.15

54.06 54.06 53.50 53.50 15.34 15.34
20.78 20.78 20.77 20.77 20.61 20.61
26.72 − 26.72 27.27 − 27.27 5.27 − 5.27
4 4 4
− 2.76 − 5.31
54.06 53.50 15.34
+26.70 − 26.76 +27.26 − 27.31 +5.27
+ .06 + .06 + .06
+ .50 + .51 + .67
54.06 53.50 15.34
26.72 +27.28 5.29
21.32 + 6 21.33 + 06 21.34 + 6
− 2.68 − 2.67 − 2.51
5.11 18.16 18.16 18.18
5 ..

30 40.7 30 54.3 25 72.9
0 25.7 0 32.0 4 48.1
15.0 22.3 24.8
20.35 27.15 36.45
10.8 −16.8 +18.7
1.03342n 1.22530n 1.27184
1.15599n 1.34787n 1.39441
− 14.32 − 22.28 + 24.10
30 20.35 30 27.15 29 36.45
30 6.03 30 4.87 30 1.20

52 42.32 52 43.48 52 47.10
− 41.38 − 42.05 − 42.27

52 0.9 52 1.4 52 4.8
52 61.8 52 61.8 52 61.0

+1 0.9 0.3 +1 0.4 +0 59.9 +0 56.2 55.7

52 42.32 52 43.48 52 47.10
+ 4.00 + 4.00 + 4.80

27 Arietis
2 23 46
+17 07
+31

36 Cois 2 25

1871 Dec. 1		Dec. 9		Dec. 11		Dec. 17		Dec. 28		Dec. 29	
23 36.0	23 32.6	23 30.6	23 26.1	23 29.3	23 20.4	23 24.6	23 21.0	23 24.0	23 35.8	23 14.6	23 5.3
38.1	33.5	32.8	27.7	31.4	21.6	26.6	22.2	26.2	37.4	16.7	6.3
40.1	34.6	34.9	28.8	33.7	22.8	28.8	23.7	28.4	38.8	18.9	7.7
44.5	100.7	39.2	82.6	37.9	64.8	33.0	66.9	30.5	112.0	23.1	19.3
46.6		41.3		40.0		35.2		32.6		25.3	
48.8		43.6		42.1		37.4		141.7		27.4	
50.8	23 33.6	45.7	23 27.5	44.2	23 21.6	39.6	23 22.3		23 37.3	29.6	23 6.4
53.0		48.0		46.4		42.0				31.8	
57.3		52.1		50.8		46.1				36.0	
59.6		54.4		53.0		48.1				38.2	
61.7		56.5		55.0		50.3				40.4	
536.5	48.770	479.1	43.554	463.8	42.164	411.7	37.427		28.340	302.0	27.455
48.77		43.55		42.16		37.43		28.34		27.45	

Dec. 1	Dec. 9	Dec. 11	Dec. 17	Dec. 28	Dec. 29
104.9	10 96.8	10 90.9	10 103.1	15 43.9	10 89.2
10 4 58.9	4 54.4	4 50.5	4 57.8	0 30.0	4 51.9
46.6	42.4	40.4	45.3	13.2	37.3
52.45	48.40	45.45	51.55	21.60	44.60
+15.2	+16.1	+20.6	+15.1	−9.0	+21.1
1.18184	1.20682	1.31386	1.17897	1.95424 n	1.32428
1.28886	1.31384	1.42088	1.28599	1.06126 n	1.43130
+1945	+2060	+2634	+1932	−1152	+2700
14 52.45	14 48.40	14 45.45	14 51.55	15 21.60	14 44.60
15 11.40	15 9.00	15 11.99	15 10.87	15 10.08	15 11.60
+17° 7′ 36.45″	7 39.35	7 36.36	7 37.48	7 38.27	7 36.75

1872 Jan. 6 Jan. 21

23	7.7	22	59.2	23	29.6	23	18.4
	9.8		0.5		31.7		20.7
	12.1		1.7		33.9		22.4
	16.4		181.4		38.1		61.5
	18.6				40.4		
	20.7				42.5		
	22.8	23	60.5		44.6	23	20.5
	24.9				46.8		
	29.2				51.0		
	31.4				53.2		
	33.6				55.4		
	2272		20.655		4672		42.472
	20.65				42.47		

sin √ 9.46882

cos √ 9.98033
12669
.10702

10	90.6	10	72.9
4	50.3	4	48.0
	40.3		24.9
	45.30		36.45
	+30.2		+22.0
	1.30535		1.34242
	1.41287		1.44944
	+2585		+2810
14	45.30	14	36.45
15	11.15	15	~~4.5~~
			4.60
7	37.20	7	43.75

σ Ceti
2 26 00
−13 48

1871 Dec. 1		Y Dec. 9		Y Dec. 17		x Dec. 28		x Dec. 29		x 1872 Jan. 5	
25 49.3	26 20.3	25 44.0	25 44.0	25	25 54.9	25 28.8	25 25.5	25 27.9	25 23.0	25 21.5	25 54.0
51.2	22.3	46.8	46.0		55.7	30.9	26.2	30.1	24.1	23.7	55.2
53.3	23.7	48.2	47.5		56.4	33.0	27.8	32.2	25.4	25.9	56.3
57.7	66.3	52.6	48.0	46.3	57.5	37.2	79.5	36.5	72.5	30.0	165.5
59.8		54.7	50.7	48.4	169.6	39.4		38.6		32.2	
2.0		56.7	147.1	50.6		41.6		40.8		34.3	
4.1	26 22.1	58.4	25 49.0	52.7	25 56.5	43.8	25 36.5	42.9	25 24.2	36.5	25 55.2
6.2		0.4		54.8		45.8		45.0		38.8	
10.5		5.4		2528		50.1		49.3		42.8	
12.6		7.5				52.3		51.4		45.0	
14.7		9.7				54.5		53.6		47.2	
26 321.4	1.945	6247	56.791		50560	4574	41.582	4483	40.755	3779	34.355
300		−				−		−		−	
21.4											
1.945		56.791		50,560		41.582		40.755		34.355	

21.4	10 68.9	10 52.0	10 49.8	10 57.4	10 39.0
10 1 15.3	10 39.2	1 0.4	0 31.1	0 33.8	1 25.0
6.1	29.7	51.6	18.7	23.6	16.0
12.70	84.45	26.00	24.90	28.70	19.50
−20.2	+7.8	−5.9	+15.1	+16.6	−20.8
1.20535 n	0.89209	0.77085 n	1.17897	1.22010	1.31806 n
1.41531 n	1.00205	0.98081 n	1.28893	1.33006	1.42802 n
−2602	+1005	−760	+1945	+21.38	−2679
11 10.70	10 34.45	10 56.00	10 24.90	10 28.70	11 19.50
10 44.68	10 44.50	10 48.40	10 44.35	10 50.08	10 52.71
		✓		✓	✓
−15° 47′ 56.33″	47 56.15	48 0.05	47 56.00	48 1.73	48 4.36

Jan. 23 Jan. 24

~~26~~ 53.026 26.5 25 26 11.4

29.0 12.8

31.6 14.0

51.1 38.2

53.2

55.4

57.5 26 12.7

59.6

2768

25 53.360

53.360

sin δ 9.43502

cos δ 9.88327

12649

.10996

~~10~~ 4 ~~78.0~~ ~~24.9~~

79.2

1 20.7

58.5

39.60

— 17.3

1.238044 w

1.348000 w

— 22.29

11 09.60

10 47.31

47 5896

N.A. Wash Eph.

5 ~~Mire~~ Mirrors

Dec 5.9 14 27 45.21 +76° 15' 47".0

10.9 .50 29 45.3 17

+0.64 15.9 45.82 .32 43.7 16

~~28 +26~~ 49.62 20.9 .18 .36 42.2 15

27 49.62 −.02 25.9 (−.04) 46.57 .39 40.7 15

2 28 103 43 30.8 −.15 .99 .42 39.4 13

+7 35.8 (−.10) 47.43 .44 38.2 12

13 43 (−.06)

76 15

−4.10

−4.09 +35 +3.53 +36 +3.71 +37 +3.50 41 +4.58 +39 +3.58

1871 Dec. 9 Dec. 11 Dec. 18 Dec. 28 1872 Jan. 1

---

27 24.3 27 35.2 26 48.9 27 14.4 27 3.8 − 28 30.0 34.0 26 33.9 28 2.8

33.6 36.9 57.5 86 17.1 4.8 − 37.1 42.2 8.6

42.3 72.1 6.1 86 25.4 9.8 − 40.0 50.7 13.1

50.9 23.4 17.3 5.8.9 27 19.0 18.4 − 14.1 27 08.7 17.6

59.6 32.1 87 27.2 − 16.9 42.1

sin √ 9.98737 21 07 40.8 36.0 27 6.1 27 28.8 25.5 27 11.6

27 36.0 49.5 27 19.6 44.8 28 10.0 37.6 28 27.49.60 3.53 34.2 28 10.3

58.2 53.4 10.7 45.6 42.7 17.8

15.3 18 04 28 3.6 28 59.9 22.4

23.8 12.0 28 X8.3

cos √ 9.37600 32.6 20.8 17.2

12669 27 42.14 42.140 27 38.82 40.745 27 36.080 27 20.84 28.52 27 34.02 25.473

950269 42.20 60 40.76 36.14 34.79 28.98 60 25.54

48.2 81 36.08 5.83 28.02 47.11

37600 42.14 +4.54 40.75 +6.05 +11.46 27 28.98 +19.64 25.47 −21.57

~~9.37600~~ 45.41 45.35 −1.43 45.53 ~~46.47~~ −1.48 46.00 −1.52 46.78 −1.84 47.07

12669 −3.21 +4.21 −4.72 +4.09 +3.62 17.77 +2.84 21.99

950269

9.49404 42.16 49.52 40.76 49.54 36.10 49.70 49.62 25.49

+4.52 42.20 +6.03 40.81 +11.47 36.14 28.98 25.54

−1.43 45.39 −1.48 45.51 −1.52 45.98 46.76 +23.45

~~+4.21~~ −3.19 ~~+4.09~~ −4.70 ~~+3.62~~ −9.84 ~~+2.84~~ −17.78 ~~+~~ 1.60 25.54

42.20 40.81 36.14 28.98 + 2.29 47.12

46.42 45.53 46.00 46.78 −21.58

−3.22 −4.72 −9.86 −17.80 49.68 +.10

+.10 +.10 +.10 +.10 −21.48

−3.12 −4.62 −9.76 −17.70

42.20 40.81 36.14 28.98 25.54

+4.54 +6.02 +11.46 +19.62 +23.45

−1.44 −1.52 −1.48 −1.87 −1.63

+4.20 +4.09 +3.62 +2.84 +2.50

49.50 49.40 49.79 49.57 49.86

40 71.6 40 70.1 40 67.9 40 27.6 40 88.8 40 57.6 40

1 47.6 1 46.0 1 43.9 1 25.0 1 25.6 1 1.3 1 20.9

24.0 24.1 24.0 2.6 58.2 56.3 38.0

35.80 35.05 33.95 13.50 41.90 58.80

+6.1 +21.1 +30.0 −66.4 +15.0

0.78532 1.32428 1.47712 1.82216 n 1.17609

0.28801 0.82697 0.97981 1.32485 n 0.67878

−1.94 +6.72 −9.55 +21.13 −4.77

41 35.80 41 35.05 41 33.95 41 11.90 40 58.80

~~41 33.86~~ ~~41 41.77~~ ~~41 42.50~~ 33.03 54.03

41 33.86 41 28.33 41 24.40 41 33.03

Ap.

+103° 41' 14".49 41 20.02 41 23.95 41 15.32 54.32

+ ~~3 3.83~~ ~~+2 56.78~~ ~~+2 55.93~~ ~~3 + 6.77~~ ~~+2 59.66~~

+23.10 +23.70 +25.90 +28.70 +13.70

√4.0

44 18.3 44 16.8 44 19.9 44 22.1

~~15 41.4~~ ~~15 43.2~~ ~~15 40.1~~ ~~15 37.9~~

15 45.5 15 44.9 15 42.7 15 39.9 15 38.8

44 14.5 44 15.1 44 17.3 44 20.1

+.87 I + 3.8 4.7 + 1.7 2.6 + 2.6 3.4 + 2.0 2.9

1

+7

Jan	1.8	14 27 47.16		+76° 15′ 38.″9	
	6	47.61	.45	37.8	1.1
	11	48.08	.47	36.9	.9
	16	48.59	.49	36.1	.8
	21	49.07	.50	35.4	.7
	26	49.57	.50	34.9	.5
	31	50.08	.51	34.6	.3
Feb.	5	50.58	.51	34.5	.1
	10	51.09	.50	34.5	.0

14 27 49.40
49.40

(−.10)

° ′ ″
+76 16 8.6
15 52.5

49.50 −12
40 −22
79 +17
57 −5
86 +24
48 −14
47 −15
39 −23
49.56 −.06

+.37 +.376
Jan. 21

+.38 +.343
Jan. 24

+.40 +.387
Feb. 7

---

26 53.0
1.9
10.3
27.8
36.6
45.1
53.6
2.4
19.6
28.3
37.0

26 26.6
29.0
31.7
87.3

26 29.1

27 31 56
180
495.6
45.05

45.055 38
45.17
49.02?
−3.90

27 28.0
36.7
45.0
53.5
62.5
225.7
4494

28 9.7
10.5
20.2

28 10.1

4574
44.40
45.10
49.32
−4.22

26 50.3
58.5
7.8
24.9
33.4
42.1
51.2
59.6
17.1
25.4
34.2

27 40 45
60
464.5
42.23

26 29.5

26 29.5

42.27
42.29
50.73
−8.44

40.12
+5.27
−1.52
+ .38
49.25

45.12
49.02
−3.90
+.10
−3.80

45.00
+5.45
−1.60
+ .08
48.93

45.10
49.32
−4.22
+.10
−4.12

42.29
+9.78
−1.64
+1.33
49.10

42.29
50.73
−8.44
+.10
−8.34

45.12
+5.29
−1.53
+0.60
49.48

45.20
+5.48
−1.41
+0.30
49.57

42.29
+9.79
−1.58
−1.11
49.39

40 79.1
1 55.5
236
39.55
+76.0
1.88081
1.38350
+24.18
41 39.55
41 15.37

1 79.3
28.2
51.1
39.65
+34.8
1.54157
1.04426
+11.07
41 9.65

−25.0
~~−8.2~~
1.40140
~~0.89544~~
+8.02
41 9.65
41 17.67

9.49404
77.3
1 56.8
20.5
38.65
+12.7
1.10380
0.59784
+3.96
40 38.65
40 39.69

1.86155
1.35559
+22.68
40 38.65
40 15.97

41 1.33

41 32.98
+2 56.83

41 30.68
+3 00.02

~~0.90409~~
8.02

42 32.38
+3 3.32

41 47.02

+17.10

+17.40

+18.00

44 29.8
~~45 30.2~~
15 35.5
44 24.6

44 30.7
~~45 29.3~~
15 35.1
44 24.9

45 35.7
~~44 24.3~~
15 34.5
44 25.5

+ 5.2 6.1

+ 5.8 6.6

+ 1 10.2 11.1

ε Arietis √

2 31 29 31 29.72 −.03
29.72
+21 24 −.016
+.39
+.35
sin z = +.36

Dec 6 2 31 32.81 +21° 24′ 22″.9
11 .79 2 23.0
16 (0) .77 2 23.1 +3
21 .75 2 23.2
26 (−.01) 32.72 .3 23.2

−3
δ = +21° 24′ 6″.7
δ = +22 24 22.5

	+35 +.353		+39 +.400		+37 +.350		+45 +.458		+45 +.444	
1871	Dec. 9		Dec. 17		Dec. 18		Dec. 28		Dec. 29	
		31 4.1								
	31 14.9	57.6	31 8.7	31 2.3	31 8.1	31 5.3	30 59.6	30 47.5	30 58.9	30 49.6
	17.0	6.9	11.0	3.9	10.1	7.2	1.8	49.0	1.0	51.0
	19.3	16.6	13.3	4.9	12.3	8.7	4.1	50.5	3.2	52.5
	23.6		14.6	11.1	16.6	21.2	6.4	147.0	7.5	153.1
	26.0		19.8		18.9		10.6		9.8	
sin δ 9.56215	28.2		22.2		21.1		12.8 30	49.0	12.0	
	30.3 31	5.5	24.3 31	3.7	23.2 31	7.1	15.0 31	32.0	14.2 30	51.0
	32.5		26.4		25.5		17.2	34.0	16.4	
	37.0		31.1		29.9		21.7	35.2	20.9	
	39.2		33.2		32.1		23.9		23.1	
cos δ 9.96898	41.3		35.6		34.3		26.1		25.3	
12669	31 30 9 3	28.118	31 24 3 2	22.109	31 23 2 1	21.100	31 20 1 2	12.836	31 19 2 3	12.027
.09567		28.10		22.09		21.09	60	12.82	16 0	12.01
		32.77		32.73		32.73	141.2	32.68	13 2 3	32.67
	28.12	−4.67	22.11	−10.64	21.01	−11.64	12.83	19.86	12.03	−20.66
	32.80		32.76		32.76		32.71		32.70	
	4.68		10.65						20.67	
	28.10	28.10	22.09	22.09	21.09	21.09	12.82	12.82	12.01	12.01
		32.80		32.76		32.76		32.71		32.70
	+4.55	−4.70	+10.59	−10.67	+11.47	−11.67	+19.64	−19.89	+20.52	39. −20.69
	+.14		+.15		+.14		+18		+18	
	−3.08		−3.04		−3.04		−2.99		−2.98	
		28.10		22.09		21.09		12.82		12.01
	29.71	+4.59	29.79	+10.61	29.66 ?	+11.46	29.61	+19.63	29.73	+20.53
		+14		+16		+14		+18		+17
		−3.08		−3.04		−3.04		−2.99		−2.98
		29.70		29.82		29.65		29.64		29.73
	55 67.2		55 74.4		55 91.0		55 60.4 55		55 23.6	
	3 41.8		3 44.9		3 52.0		3 40.04	36.33	3 45.3	
	25.4		29.5		39.0		20.4	16.1	28.3	
	33.60		37.20		45.50		30.20		36.80	
	+22.6		+18.4		+14.0		+23.8		+21.0	
	1.35410		1.26481		1.14612		1.37657		1.32221	
	1.44977		1.36048		1.24179		1.47224		1.41788	
	+2817		+2293		+1745		+2966		+2617	
	58 33.60		58 37.20		58 45.50		58 30.20		58 36.80	
	59 1.77		59 0.13		59 2.95		58 59.86		59 2.97	
+21°	23 46.58		23 48.22		23 45.40		23 48.49		23 45.38 √	
	−24.50		−24.06		−23.75		−25.19		−24.52	
	23 22.1		23 24.2		23 21.7		23 23.3		23 20.9	
	24 23.0		24 23.1		24 23.1		24 23.2		24 23.1	
−.33 I	+1 0.9	0.6	+0 58.9	58.6	+1 1.4	1.0	+0 59.9	59.6	+1 2.2	1.9
δ′ = +21	23 46.58		23 48.22		23 45.40		23 48.49		23 45.38	
	−16.30		−16.40		−16.40		−16.50		−16.40	

2 31 33.11
33.11

(00)

1872			
Jan 1	+21° 24′ 23.1″		
6	23.1	0	
11	23.0	-.1	
16	22.9	.1	
21	22.7	.2	

33.16
09
09
14
33.12

29.70	- 2
.82	+10
.65	- 7
.64	- 8
.73	+ 1
.77	+ 5
.68	- 4
.69	- 3
.72	- 0
29.71	-.01

✓ +.39 +.398		x +.41 +.392		x +.39 +.375		x +.41 +.396	
Jan. 1 1872		Jan. 5		Jan. 6		Jan. 14	
31 55.8	30 44.5	30 52.5	30 45.5	30 52.0	30 45.8	31 16.2	31 7.4
58.0	45.7	54.7	46.3	54.1	47.1	18.4	8.5
0.3	47.0	57.0	47.8	56.3	48.6	20.8	9.6
4.5	137.2	1.3	139.6	0.7	141.5	25.0	25.5
6.8		3.5		3.0		27.2	
9.0	30 45.7	5.8		5.2		29.5	
11.2	31 35.6	7.9	30 46.5	7.4	30 47.2	31.6	31 8.5
13.4	37.0	10.2		9.6		33.8	
17.9	38.0	14.5		14.0		38.3	
21.1		16.8		16.2		40.5	
22.4		18.9		18.5		42.7	
31 229.4	9.127 9.945	31 243.1	5.736	31 237.0	5.182	31 324.0	29.455
120.1	9.11 9.93	180.1	5.72	18.0	5.17		29.44
109.4	32.67	63.1	32.61	57.0	32.60		-32.53
9.94	-23.56	5.74	-26.89	5.18	-27.43	29.46	-3.09
32.65							
23.53							

Jan. 1		Jan. 5		Jan. 6		Jan. 14	
9.11	9.11	5.72	5.72	5.17	5.17	29.44	29.44
+23.46	32.67	+26.71	32.63	+27.24	32.62	+ 2.96	32.54
+ .15	23.56	+ .16	-26.91	+ .15	-27.45	+ .16	-3.10
+ .44		+ .50		+ .51		+ .58	
	9.11		5.72		5.17	1.01	29.44
33.16	23.45	33.09	+26.72	33.09	+27.28	33.14	+2.95
	+ .16		+ .15		+ .15		+ .16
	-2.95		-2.91		-2.90		-2.82
	29.77		29.68		29.69		29.72

Jan. 1		Jan. 5		Jan. 6	Jan. 14
55 69.0	55	55 77.5	~~55~~	55 79.4	14 68.0
3 42.2	4 45.2	3 46.3	~~3 46.1~~	3 46.1	3 43.2
26.8	28.5	31.2	~~33.3~~	33.3	24.8
34.50		38.75		39.70	34.00
+23.4		+19.2		+18.0	+21.0
1.36921		1.28330		1.25527	1.32221
1.46488		1.37897		1.35094	1.41788
+2917		+2323		+2243	+2617
58 34.50		58 38.75		58 39.70	58 34.00
59 3.67		59 2.68		59 2.13	59 0.17
23 44.68		23 45.67		23 46.22	23 48.18
- 24.28		- 23.57		- 23.94	- 24.93
23 20.4		23 22.1		23 22.3	23 23.2
24 23.1		24 23.1		24 23.1	24 22.9
+1 2.7 2.3		+1 1.0 0.7		+1 0.8 0.5	+0 59.7 59.4
23 44.68		23 45.67		23 46.22	23 48.18
- .60		- .60		- .60	- .40

S Ceti √

2 32 51 32 52.33 -.01
52.33
-0 13 3

(-.01)

(-.00)

Sin z = +.68

Dec 6		2 32 55.18		-0° 13′ 34″.3				
11		.16	2	34.8	.4			
16	(-.07)	14	2	35.1	.4	17		
21		12	2	35.6	.5			
26	(-.07)	55.09	3	36.0	.4			

2

δ = -0° 13′ 46″.1

δ = -0 13 30.4

√ +.39 +.343

1871	Dec. 9 +.35 +.353	Dec. 17 +.39 +.400	Dec. 18 +.37 +.350	Dec. 28 +.45 +.458	1872 Jan. 24
				III	
-.015	32 50.6 33 8.7 52.6 10.0 54.7 11.6 56.8 30.3 0.9 2.9 33 10.1	32 32.2 32 32.2 34.2 33.3 36.5 35.0 40.5 68.3 42.6 44.5 32 34.1 46.6 33 10.9 48.6 12.1 52.8 13.0 54.9 57.0	32 31.3 32 32.0 33.4 33.7 35.5 35.0 39.5 100.7 41.5 43.6 32 33.6 45.7 33 6.6 47.7 7.5 51.8 8.9 53.8 56.0	32 31.3 32 50.3 33.3 51.1 35.4 101.4 ~~37.4~~ 39.5 43.5 45.7 32 52 50.7 47.8	32 37.1 32 31.1 39.0 32.5 41.0 34.1 45.2 97.7 47.3 49.4 51.4 32 32.6 53.4 57.5 59.6 61.6
Sin √ 7.57767n					
cos √ 10.00000 .12669 .12669 .11804	32 50.60 50.58 55.17 +4.55 .00 -2.84 52.29 50.58 55.10 -4.52	32 49.04 44.582 44.57 44.58 +10.58 55.14 .00 -10.55 -2.81 52.24 44.57 55.07 -10.50	32 47.98 43.618 43.60 43.62 +11.46 55.48 .00 -2.80 52.26 43.60 55.06 -11.46	32 26.9 35.38 35.34 35.38 +19.64 55.08 .00 19.69 -2.70 35.34 55.01 52.23 -19.67	32 54.25 50.227 49.309 50.21 49.29 54.79 54.79 50.23 -4.58 5.50 .00
	50.58 55.17 -4.59 + 7 -4.52	44.57 55.14 -10.57 + 7 -10.50	43.60 55.13 -11.53 + 7 -11.46	35.34 55.08 -19.74 + 7 -19.67	49.29 +5.45 49.29 .00 54.80 + .61 -5.51 + 7 49.35 -5.44
	50.58 +4.54 .00 -2.84 52.28	44.57 +10.61 .00 -2.81 52.37	43.60 +11.46 .00 -2.80 52.26	35.34 +19.63 .00 -2.70 52.22	49.29 +5.48 .00 -2.47 52.30
	105.7 35 1 58.4 47.3 52.85 ~~+19.5~~ -19.5 1.29003n 1.41672n -26.11 36 52.85 36 26.74	35 29.6 35 1 19.8 2 9.0 ~~29.8~~ -1.2 14.80 +10.5 1.02118 1.14787 +14.06 36 14.80 36 28.86	35 31.4 35 1 20.4 0 27.71 11.0 56.2 15.70 +10.0 1.00000 1.12669 +13.39 36 15.70 36 29.09	35 94.7 54.7 40.0 47.35 -15.3 1.18469n 1.31138n -20.48 36 47.35 36 26.87	67.2 1 15.6 51.6 33.60 +16.7 1.22271 1.34940 +22.36 36 03.60 36 25.96
-0°	13 38.39 58.16	13 40.51 -56.43	13 40.64 √ -55.75	13 38.52 √ -59.08	13 37.61 -56.99
- -	14 36.5 13 34.6	14 36.9 13 35.2	14 36.5 13 35.4	14 37.6 13 36.2	14 34.6 13 37.9
-.63 I	+1 1.9 1.3	+1 1.7 1.1	+1 1.1 0.5	+1 1.4 0.7	+0 56.7 56.1
δ′ = -0	14 38.39 -11.50	13 40.51 -10.90	13 40.74 -10.76	13 38.52 -9.90	13 37.61 +7.50

12720
2 32 55.40
55.40

Jan. 1	~~+21°~~ 2 -0° 13′	36.4″
6		36.8
11		37.1
16		37.4
21		37.7
26		38.0
31		38.2
Feb. 5		38.4
10		38.6

52.28	-5
(.37)	
.26	-7
.22	-11
.30	-3
.26	-7
52.26	-.07

~~+4~~ 0 +38
Feb. 7

---

32 32.4 32 27.4
34.5 28.4
36.6 29.5
40.6 85.3
42.7
44.8
46.8 32 28.4
48.8
53.0
55.0
57.1
32 49.23 44.755
44.74
54.60
44.75 -9.86

44.74
+ 9.78
.00
+ .80
55.32

44.74
54.60
- 9.86
+ 9.79

44.74
+ 9.79
- 2.27

52.26

11804
65.9
1 44.1
21.1
32.60
+16.4
1.21484
1.33288
2152
36 32.60 36 11.08
36 54.12

14 5.77 13 22.73
58.23 -58.23

15 4.0 14 20.96
13 38.5 13 38.5

~~+1 25.5~~ + 41.5 40.9

14 5.77
+ 8.10

θ Persei

2 35 23.9 35 23.96 –.02
23.96 –022′
+48 41

Nov. 16	2 35 27.40		+48° 40′ 67.″0	
21	90	0	68.1	+1.1
26	.91	1	69.1	10
Dec. 1	91	0	70.0	.9
6	.91 (00)	0	70.9	.9
11	88 +00	3	71.7	.8
16	84	4	72.4	.7
21	79	5	73.1	.7
26	.73	.6	73.7	.6

δ = + 48° 40′ 50.″8
39
δ = + 48 41 6.3

28

–.11 +1.14
+1.14

1871 Dec. 1 +31 +385

35 21.7
25.0
28.2
31.2
34.4
1405

35 45.5
46.9
48.6
141.0
35 47.0

35 28.100
28.08
–.67
+.41
–3.95

28.10
27.91
+.19

23.87

28.08
27.91
+0.17

28.08
27.89
+0.19

28.08
–0.66
+.44
–3.95

23.91

40 3 70.4
15.6
54.8
35.20
–18.9
1.27646n
1.22284n
–1670
43 8.20
42 48.50

+48° 39′ 59.″85
+ ~~6.81~~
+ 6.73

40 6.6
40 70.0

+.09
I + 63.4 63.5

δ′ = +48 39 59.85
–19.20

Dec. 9 +357 +353

35 4.4
7.5
10.6
16.8
20.0
23.0
26.8
29.2
35.4
38.5
41.7

34 53.1
54.7
56.4
164.2
34 54.7

35 25 32
23.02
27.89
–4.87

23.018
23.00
+4.55
+.40
–3.93

24.02

23.00
27.89
–4.89

23.00
27.87
–4.87

23.00
+4.54
+.40
–3.93

24.01

40 2 42.2
30.9
11.13
21.10
+28.3
1.45178n
1.39816n
+2001
42 21.10
42 46.11

40 2.24
+ ~~6.84~~
+ 6.68

40 8.9
40 71.4

+1 2.5 2.6

40 2.24
–20.60

Dec. 17 +39 +400

34 58.1
1.0
4.4
10.5
13.7
– 16.7
19.8
23.0
29.2
32.3
35.5

34 42.1
44.1
45.8
132.0
34 44.0

35 2442
60
184.2
16.74
27.83
11.09

16745
16.72
+11.58
+.44
–3.87

23.87

16.72
27.83
–11.11

16.72
27.81
–11.09

16.72
+10.61
+.46
–3.87

23.92

40 2 23.9
23.0
0.9
11.95
+32.7
1.51454
1.46092
+2890
42 11.95
42 40.85

40 7.50
~~+ 6.43~~
+ 6.19

40 13.7
40 72.6

+0 58.9 59.0

40 7.50
–21.80

Dec. 18 +37 +350

34 57.5
0.4
3.6
9.7
12.8
15.9
19.0
22.2
28.4
31.6
34.7

34 50.6
53.6
55.6
159.8
34 53.3
35 43.2
44.7
46.6

23.94

35 2358
60
175.8
15.98
27.82

15.982
15.96
+11.47
+.42
–3.86

23.99

15.96
27.82
–11.86

15.96
27.79
–11.83

15.96
+11.46
+.40
–3.86

23.96

40 2 47.7
31.9
15.8
23.85
+22.7
1.35602
1.30240
+2006
42 23.85
42 43.91

40 3 18.3
59.9

40 4.44
+ ~~6.36~~
+ 6.25

40 10.7
40 72.7

+1 2.0 2.1

40 4.44
–21.90

1872 Jan. 5 +41 +392

34 41.8
44.9
47.9
54.2
57.3
0.4
3.5
6.7
12.8
15.9
19.2

34 28.0
30.0
31.6
89.6
34 29.9

35 3046
30
4.6
0.42

0.418
0.40
27.57
–27.47

0.40
26.71
+ .47
+ .45
28.03

0.40
27.57
27.47

0.40
+26.72
+ .45
–3.61

23.96

40 2 28.0
23.0
5.0
14.00
+30.5
1.48429
1.43067
+2696
42 14.00
42 40.96

40 7.39
~~+ 6.37~~
+.6 18

40 13.6
41 14.7

+1 1.1 1.1

40 7.39
–8.40

Jan. 6 +39 +375

34 41.2
44.4
47.5
53.5
56.7
59.8
2.9
6.1
12.3
15.4
18.6

34 30.8
32.4
34.2
97.4
34 32.5

34 3584
30.0
65.54
59.85

59.857
59.87
27.55
27.78

59.87
+ 27.26
+ .44
+ .47
28.04

59.87
27.55
–27.68

59.83
+27.27
+ .49
–3.59

23.98

40 2 38.2
27.0
11.2
19.10
+27.4
1.43775
1.38413
+2422
42 19.10
42 43.32

40 5.03
+ ~~6.46~~
+ 6.31

40 11.3
41 14.9

+1 3.5 3.6

40 5.03
–8.50

50.8″
6.3

Jan 1 2 35 27.64 + 48° 41′ 14″.3
11 27.46 .18 15.0 +7
21 (.00) 27.25 .21 15.3 +.3
31 27.01 .24 15.2 −1
Feb.10 26.77 .24 14.7 −.5

28.03
.04
05
03
28.04

23.91 − 5
24.02 + 6
23.92 − 4
.96 − 0
.96 − 0
98 + 2
94 − 2
.97 + 1
23.96 00

2 35 28.02
28.02

+.41 +.387
Jan. 14

+.40 +.387
Feb. 7

---

35 5.4 34 56.4 34 58.0 35 ~~2.0~~
8.3 58.2 1.0 4.6
11.5 60.0 4.2 6.6
17.8 174.6 10.4
20.9 13.6
24.1 16.6
27.1 34 58.2 19.6 35 ~~6.8~~
30.2 22.9 4.6
36.6 29.0
39.7 32.2
42.7 35.4

35 264.8 24.027 35 243.0 16.636
24.00 6.0 16.61
27.42 183.0 26.84
24.03 −3.42 16.64 −10.23

24.00
+ 2.96
+ .47
+ .62
28.05

24.00
27.41
−3.41

16.61
+ 9.78
+ .46
+ 1.18
28.03

16.61
26.84
−10.23

24.00
+ 2.95
+ 44
− 3.45
23.94

16.61
+ 9.79
+ .44
− 3.87
23.97

sin √ 9.87068

cos √ 9.81969
12669
9.94638

9.81969
11804
9.93773

9.93773

40 36.2
2 29.0
7.2
18.10
+ 25.8
1.41161
1.35799
+ 2280
42 18.10
42 40.90

40 7.45
+ 6.62

63.0
2 48.5
14.5
31.50
+ 13.0
1.86510 1.07918
0.80283 .01691
+ 6.35 − 10.39
42 31.50 42 31.50
42 37.85 42 ~~21.11~~
40 10.50 40 23.20
+ 6.64 + 6.64
Rej.

40 14.1
41 15.2

40 17.1 40 29.84
41 14.8 41 14.8

41 1.1 1.2 ~~40 57.7~~ + 45.0 45.1

40 7.45
− 8.90

40 10.50
− 8.50

γ Ceti
2 36 37
3708
+2 42
+05
+.05

36 37.08 -.00

Dec 6	2 36	39.96	+2° 41' 38".1
11		.94	37.8 .3
16	+.03	92	37.4 .4 14
21	(+.03)	90	37.1 .3
26		39.88	36.7 .4

δ = +2° 41' 26.0"
δ = +2 41 41.4

Sin z +.64

1871	Dec. 17 +.39+400		Dec. 28 +.45+458		Dec. 29 +.43+444		1872 Jan. 1 +.38+398		Jan. 24 +.39+343	
-015	36 16.9 19.0 21.3 25.1 27.2 29.3 31.3 33.4 37.5 39.7 41.7	36 9.0 10.8 12.3 32.1 76 10.7 36 52.6 54.0 55.3	36 7.9 10.0 11.9 16.1 18.2 20.4 22.3 24.4 28.4 30.5 32.6	35 56.2 58.0 59.3 173.5 35 57.8	36 7.0 9.0 11.2 15.1 17.2 19.3 21.3 23.4 27.5 29.6 31.7	35 59.6 60.4 61.3 181.3 36 60.4	36 4.1 6.2 8.2 12.5 14.5 16.4 18.5 20.6 24.7 26.6 28.9	36 9.7 10.7 11.7 32.1 36 10.7	36 21.7 23.8 25.9 30.2 32.2 34.2 36.2 38.3 42.4 44.5 46.6	36 13.0 14.7 15.8 43.5 36 14.5
	36 32.24 29.31 39.52 10.61 27	29.309 29.29 39.90 - 10.61 +10.59 + 02 - 2.84 37.06	36 22.27 20.25 39.87	20.245 20.23 39.85 - 19.62 +19.64 + 02 - 2.79 37.10	36 21.23 19.30 39.87 20.57	19.300 19.28 39.85 - 20.57 +20.52 +.02 -2.79 37.03	36 18.12 16.47 39.86 23.39 16.46 +23.46 + .02 + .35 40.29	16.473 16.46 39.83 23.37 16.46 39.83	36 37.59 -1 - 34.17 34.16 + 5.45 + 02 + .60 40.23	34.173 34.16 39.58 -5.42 34.17 34.16 39.58
	29.29 39.52 -10.63 - 3 -10.66		20.23 39.87 -19.64 3 -19.67		19.28 39.86 -20.58 - 3 -20.61			-23.37 - 3 -23.40		-5.42 - 3 -5.45
	29.29 +10.61 + '02 -2.84 37.08		20.23 +19.63 + 02 -2.79 37.09		19.28 +20.54 + 2 -2.78 37.06			16.46 +23.46 + 2 -2.75 37.19		34.16 +5.48 + 2 -2.00 37.16
	40 51.0 1 2.21 48.8 26.50 +18.6 1.26951 1.39572 +24.87 40 55.50 41 20.37	40 58.5 44.4	40 98.9 0 58.6 40.3 49.45 +32.4 1.35024 1.47645 +29.96 40 49.45 41 19.41		40 52.8 1 3.9 48.9 26.40 +18.9 1.27646 1.40267 +25.27 40 56.40 41 21.67		40 26.9 1 20.1 6.8 13.45 +5.8 0.76342 0.88963 +7.76 41 13.45 41 21.21		42.3 1 4.8 37.5 21.15 +19.7 1.29446 1.42067 +26.34 40 51.15 41 17.49	
+2° -	41' 27.98" 50.91		41 28.94 - 53.21		41 26.68 - 57.80		41 27.14 - 51.28		41 30.86 - 51.42	
	40 37.1 41 37.3		40 35.7 41 36.6		40 34.9 41 36.5		40 35.9 41 36.3		40 39.4 41 34.8	
-.60 I	+1 0.2	+0 59.6	+1 0.9	0.3	+1 1.6	1.0	+1 0.4	+0 59.8	+0 55.4	54.8
δ' = +2	41 27.98 -11.36		41 28.94 - 10.66		41 26.68 -10.50		41 27.14 +5.10		41 30.86 + 6.66	

2 36 40.18
40.18

(+.03)

Jan. 1	+2°	41′	36.3″	″
6			35.9	.4
11			35.6	.3
16			35.3	.3
21			35.0	.3
26			34.7	.3
31			34.5	.2
Feb. 5			34.3	.2
10			34.1	.2

37.08 +0
.09 +1
.06 −2
.19 +11
.16 +8
.09 +1
37.11 +.03

~~+.40~~ +.38
Feb. 7

36 25.5 36 2.0
27.6 2.8
29.6 3.9
31.6 4.7
33.7
~~35.7~~
14.80 36 2.9

sin √ 8.64308

3
36

29.600
29.58
39.38
29.60 −9.80

cos √ 9.99952
.12669
.12621

9.99952
11804
.11756

29.58
39.38

29.58
+9.78
+.02
+.80
−9.80
40.18 − 3
−9.83

29.58
+9.79
+ 2
−2.30

37.09

.11756
714
1 47.8
23.6
35.70
+3.6.7
1.42651
1.54407
+ 35.00
41 35.70 41 00.70
42 10.70

41 37.6542 47.65
− 52.60 − 52.60

40 45.0 41 55.05
41 34.2 41 34.2

~~+0 49.2~~ 39.2 38.6

41 37.65
+ 7.20

τ, Eridani
2 39 04
−19 08
−.30

s = √9.51557/

cos √9.97532
12669
,10201

1871 Dec. 17 | Dec. 18 | Dec. 28 | Dec. 29 | 1872 Jan. 5

Dec. 17

38 44.3 38 38.8
46.4 39.7
48.5 40.6
52.7 119.1
55.0
57.3 38 39.7
59.3 39 22.7
1.6 24.0
6.0 25.6
8.1
10.3
38 3895 57.228
240
629.5
57.23

Dec. 18

43.2
38 ~~43.0~~ 38 44.8
46.5
47.6
52.0
54.3
56.4
58.5 38 44.8
0.7
5.0
7.3
9.4
38 61.99 56.355
~~240~~
56,355

Dec. 28

38 35.2 38 31.7
37.3 32.8
39.5 33.7
43.8 98.2
46.0
48.2 38 32.7
50.3 39 16.0
52.5 16.7
57.0
59.1
1.3
38 5302 48.200
48,200

Dec. 29

38 34.3 38 27.0
36.4 28.1
38.6 29.5
42.9 84.6
45.1
47.3
49.5 38 28.2
51.7
56.0
58.3
60.5 47.327
38 5206
47.327

1872 Jan. 5

38 27.9 38 22.3
30.1 23.9
32.2 25.7
36.6 71.9
38.9
41.0
43.2 38 23.9
45.4
49.7
51.9
54.1 41.000
38 4510 40.98
41.000

Dec. 17

25 8.50 25
3 46.0 4 40.2
39.0 32.4
42.50
+17.5
1.24303
1.34504
+22.14
28 42.50
29 4.64
−19° 6′ 16.29″

Dec. 18

25 10.1
4 6.7
1.4
5.05
+11.6
1.06445
1.16646
+14.67
29 5.05
29 19.72
6 31.37 ✓

Dec. 28

25 8.8 25
3 45.9 4 41.1
32.9 29.0
39.40
+15.5
1.19033
1.29234
+19.60
28 39.40
28 59.00
6 10.65

Dec. 29

25 6.29
3 46.7
36.2
41.45
+19.1
1.28103 ✓
1.38304
+~~24.30~~ 24.16
28 41.45 41.45
29 5.65 5.61
6 17.26

1872 Jan. 5

25 9.0
3 ~~48.3~~
~~41.7~~
3 49.3
41.7
45.50
+17.1
1.23299
1.33500
+21.63
28 45.50
29 7.13
6 18.78

	Jan. 6				Jan. 14				Jan. 24				~~Feb. 24~~		
38	27.4	38	20.3	38	51.6	38	45.6	38	49.0	38	50.4	38	~~45.5~~	~~38~~	~~38.3~~
	29.5		21.6		53.8		47.1		51.0				~~48.0~~		~~38.9~~
	31.8		22.8		55.9		48.9		53.1				~~50.5~~		~~40.4~~
	36.1		64.7		0.4		141.6		57.6				[illegible]		
	38.4				2.5				59.7				[illegible]		
	40.6				4.7				2.0				~~0.4~~		
	42.7	38	21.6		6.8	38	47.2		4.2	38	50.4		~~2.6~~		
	44.9				9.2				6.4				~~57.4~~		
	49.1				13.4				10.8				[illegible]		
	51.4				15.6				12.9				[illegible]		
	53.5				17.8				15.0				[illegible]		
38	4454		40.491	39	2317		4.700	39	3217		1.973				
					180				300						
					51.7				21.7						
	40,491				4.700				1.973						

25	86.0	25	75.7		95.7		
3	46.1	3	43.5	3	59.0		
	39.9		32.2		36.7		
	43.00		37.85		47.85		
	+18.9		+11.5		+21.6		+116
	1.27646		1.24303		1.33445		1.06450
	1.37847		1.34504		1.43646		1.16651
	+ 23.90		+ 22.13		+ 27.32		+14.64
28	43.00	28	37.85	28	47.85		47.85
29	6.90	28	59.98	29	18.17	29	2.49
6	17.55	6	11.63	6	14.06		

41 Arietis
2 42 21
23.66
+26 43 4
+50
+.50

√
42 23.66 −01
−0.17'

Dec 6 2 42 26.91 +26° 43' 53".5
11 .88 2 53.7 +.2
16 (.00) .87 2 53.9 .2 8
21 .85 2 54.1 .2
26 (.10) 8.3 2 54.3 .2

δ = +26° 43' 37".0
δ = +26 43 52.1

Sin z +.27

	1871 Dec. 17	Dec. 18	Dec. 28	Dec. 29	1872 Jan. 1
	+39 +400	+37 +350	+45 +458	+45 +444	+39 +398
	42 2.3 4.6 6.9 11.4 13.8 16.1 18.4 20.6 25.2 27.5 30.0	42 1.6 3.8 6.1 10.7 13.0 15.2 17.5 19.8 24.4 26.8 29.0	41 53.2 55.5 57.8 2.3 4.6 6.9 9.2 11.6 16.1 18.5 20.8	41 52.4 54.5 56.9 1.4 3.8 6.0 8.4 10.8 15.3 17.5 19.8	41 49.4 51.6 53.8 58.5 0.8 3.1 5.4 7.8 12.3 14.7 16.9
sin δ 9.65306	41 50.0 57.3 52.8 154.1 41 51.4 42 39.0 40.6 42.5	41 45.3 46.8 48.2 140.3 41 46.7 42 28.1	41 43.2 44.8 46.5 134.5 41 44.8 42 24.8 26.4 28.1	41 45.0 46.6 48.12 139.8 42 3.65 46.6	41 38.4 39.8 41.0 119.2 41 39.7 42 22.8 24.3 26.1
cos δ 9.95090 12669 .07759	42 17.68 46.07 26.87 10.79	42 16.79 15.26 26.86 −11.60	42 25.65 18 0 7.65 6.95 26.82	42 24.68 18 0 6.68 6.07 26.82 20.75	42 27.43 24 0 3.43 3.12 26.81 23.69
9.95090 11804 ,06894	16.073 16.06 26.86 −10.80 +10.58 +19 −3.21 23.62	15.264 15.26 26.85 −11.60 +11.47 +18 −3.20 23.70	6.955 6.94 26.81 −19.87 +19.64 +22 −3.16 23.64	6.073 6.06 26.81 −20.75 +20.52 +23 −3.16 23.65	31.183 3.118 31.16 3.10 26.78 26.78 −25.62 33.10 +23.46 +.20 +.39 27.15
	16.06 26.87 −10.81	15.25 26.87 −11.62	6.94 26.82 −9.88	6.06 26.81 −20.75	3.10 26.78 23.68
	16.06 +10.61 +20 −3.21 23.66	15.25 +11.47 +17 −3.21 23.68	6.94 +19.63 +23 −3.16 23.64	6.06 +20.54 +22 −3.15 23.67	3.10 +23.46 +.20 +.39 27.15 23.64
	35 17.4 40 4 16.1 0 1.3 8.20 +24.7 1.39269 1.47028 +29.53 39 8.20 39 38.23	35 68.1 40 4 10.8 0 57.3 34.05 +28.6 1.45636 1.53395 +34.20 39 34.05 39 38.25	35 23.4 40 4 21.1 0 2.3 11.70 +22.2 1.34635 1.42394 +26.54 39 11.70 39 38.24	35 27.5 4 21.8 5.7 13.75 +19.5 1.29003 1.36762 +23.32 39 13.75 39 37.07	35 21.9 40 4 19.0 0 2.9 10.95 +23.4 1.36921 1.44680 +27.98 39 10.95 39 38.93
	15.1 −0.7	2.0 469	11.2 50.3		11.6 55.4
+26°	43 10.12 −17.87	43 10.10 −17.70	43 10.11 −18.68	43 11.28 −18.18	43 9.42 −18.03
	42 52.2 43 53.9	42 52.4 43 54.0	42 57.4 43 54.4	42 53.1 43 54.4	42 51.4 43 54.4
−.25 I	+1 1.7 1.4	+1 1.6 1.4	+1 3.0 2.7	+1 1.3 1.1	+1 3.0 2.7
δ' = +26	43 10.12 −16.90	43 10.10 −17.00	43 10.11 −17.40	43 11.28 −17.40	43 9.42 −2.30

Jan 1	2 42 26.78		+ 26° 43′ 54″.4		
6	.73	.05	54.4	0
11	26.67	.06	54.4	0
16	.61	.06	54.4	0
21	(.00) 26.54	.07	54.3	.1
26	.46	.08	54.1	.2
31	26.38	.08	53.9	.2
Feb. 5	.30	.08	53.7	.2
10	26.22	.08	53.4	.3
15	26.15	.07		

2 42 27.17
27.17

27.15
20
15
18
17
18
27.17

23.66 +0
.68 +2
.64 −2
.64 +1
.64 −2
.70 +4
.66 +0
.64 −2
.66 −0
.64 +1
23.66 00

+.41 +.392
Jan. 5

41 46.0 41 38.2
48.4 39.4
50.7 40.6
55.2 118.2
57.6
59.9
2.2 41 39.4
4.5
9.0
11.4
13.7
41 358.6 59.873
300 59.86
658.6 26.74
59.87 −26.88

59.86 59.86
+26.71 26.74
+ .20 −26.88
+ .43 59.86
27.20 +26.72
+ .20
+ .43
27.21
23.70

35 26.5
4 20.5
6.0
13.25
+20.5
1.31175
1.38934
+24.51
39 13.25
39 37.76
43 10.59
− 17.46
42 53.1
43 54.4
+1 1.3 1.1
43 10.59
− 2.30

+.39 +.375
Jan. 6

41 45.5 41 39.4
47.8 40.7
50.1 42.0
54.6 122.1
57.0
59.3
1.5 41 40.7
3.8
8.5
10.7
13.2
41 352.0 59.273
300 59.26
652.0 26.73
59.27 −27.47

59.26 59.26
+27.26 26.73
+ .19 27.47
+ .44 59.26
27.15 +27.28
+ .19
+ .44
27.17
23.66

35 31.9
4 22.6
9.3
15.95
+18.6
1.26951
1.34710
+2224
39 15.95
39 38.19
43 10.16
− 17.70
42 52.5
43 54.4
+1 1.9 1.6
43 10.16
− 2.30

√ +.41 +.387
Jan. 14

42 9.7 42 44.0
12.0 5.1
14.3 6.2
18.9 15.3
21.2
23.5
25.9 42 5.1
28.0
32.7
35.0
37.3
42 258.5 23.50
23.47
26.63
23.49 −3.16

23.47 23.47
+2.86 26.68
+ .21 −3.16
+ .54 23.47
27.18 +2.95
+ .19
+ .54
27.15
23.65

35 25.9
4 21.9
4.0
12.95
+18.4
1.26481
1.34240
+2200
39 12.95
39 34.95
43 13.40
− 18.44
42 55.0
43 54.4
+ 59.4 59.2
43 13.40
− 2.30

+.39 +.343
Jan. 24

42 7.1 42 0.3
9.3 1.1
11.7 2.6
16.3 4.0
18.7
20.9
23.2 42 1.3
25.4
30.0
32.3
34.6
42 229.5 20.864
20.85
26.49
20.86 −5.64

20.85 20.85
+5.45 26.50
+ .19 −5.65
+ .68 20.85
27.17 +5.48
+ .17
+ .67
27.17
23.66

79.6
4 24.6
55.0
39.80
+19.6
1.29225
1.36984
+2343
39 9.80
39 33.23
43 15.12
− 18.00
42 57.1
43 54.2
+ 57.1 56.8
43 15.12
− 2.16

+.28 +.290
Feb. 14

42 0.8 42 35.4
3.2 37.5
5.6 38.8
10.1 111.7
12.4
14.7
17.0 42 37.2
19.3
24.0
26.3
28.5
42 161.9 14.718
14.70
26.16
14.72 −11.46

14.70 14.70
+11.33 26.16
+ .14 −11.46
+1.01 14.70
27.18 +11.32
+ .15
+1.01
27.18
23.67

.06894
30.3
4 2.1
38.2
50.15
−22.5
1.35218 m
1.42112 m
+ 26.34
39 50.15
39 ~~37.78~~ 40 16.52
23.78
43 ~~25.17~~ 42 31.83
24.57 −17.64
−17.64 43 14.19
43 6.7 43 14.19
43 53.1 43 53.1
+ 46.2 +38.9 +38.6
43 23.78
− 1.00

1871phae.proj.1453.

τ Persei
2 45 0.3 7.40
+52 14

45 7.40 +.08
− 0.25

+1.29
+1.29

Dec. 11 2 45 11.61 +52° 13′ 75.″8 .9
11 .58 3 76.7 .9
16 (+.05) 53 5 77.6 .9 32
21 48 5 78.3 .7
26 (+.05) 11.42 6 79.0 .7

17

δ = + 52° 13′ 56.″0
δ = + 52. 14 11.1

Iris 2 −.17

1871	Dec. 9 +3.5 +3.53	Dec. 17 +2.9 +4.00	Dec. 18 +.37 +3.50	Dec. 28 +4.1 +4.58	Dec. 29 +.40 +4.44
sin √ 9.89791	44 48.7 44 32.0 49.9 33.8 53.3 36.1 0.1 101.9 3.2 6.6 10.0 44 33.9 13.3 20.0 23.4 26.8	44 40.9 44 35.2 43.7 36.6 46.9 38.2 53.9 110.0 57.3 0.6 44 36.7 4.0 45 36.3 7.3 38.0 14.1 39.6 17.4 20.6	44 37.4 44 21.5 43.0 23.0 24.6 46.3 69.1 52.9 56.4 59.7 44 23.0 3.0 45 23.8 6.3 26.0 13.1 27.7 16.5 19.9	44 31.1 44 11.1 34.5 14.3 37.8 16.6 44.6 42.0 47.9 51.2 44 14.0 54.6 45 21.3 58.0 23.4 4.5 25.2 8.0 11.4	44 30.4 45 22.6 33.5 24.2 36.7 26.1 43.5 72.9 46.9 50.2 1 46 53.6 45 243 57.0 3.7 7.1 10.5
cos √ 9.78707 12669 9.91376	45 25 3.3 6.664 18.0 6.64 7.3 11.65 6.66 +4.55 11.59 +.45 −4.93 −4.19 7.45	45 30.6 2 0.564 30.0 0.54 5.01) 6.2 11.58 0.56 +10.59 11.52 +.50 10.96 −4.12 7.51	44 35 6 5 59.682 30.0 59.66 04 6 5 6.5 11.57 11.91 59.68 +11.46 11.51 +.48 −11.83 −4.19 7.49	44 38 3 6 51.236 18.0 51.21 5.63.6 11.4 12.024 51.24 +19.61 11.39 +.58 −3.99 7.45	44 37 3.1 50.283 18.0 50.27 5 52.1 11.44 −21.17 50.29 +20.53 11.36 +.58 21.21 −3.98 7.40
	6.64 11.59 −4.95 − 5 −5.00	0.54 11.52 −10.98 − 5 −11.03	59.66 11.57 −11.85 5 11.90	51.21 11.39 −20.18 − 5 −20.23	50.27 11.38 −21.11 − 5 −21.16
	6.64 +4.55 +.46 −4.19 7.46	0.54 +10.62 +.52 −4.12 9.56	59.66 +11.4 +.45 −4.11 7.47	51.21 +19.64 +.59 −3.99 7.45	50.27 +20.54 +.57 −3.98 7.40
	5 38.0 4 28.1 9.9 19.0 +32.8 1.51587 1.42963 +2689 9 19.00 9 45.89	5 43.4 10 4 30.3 0 21.8 13.1 4.3 21.7 +23.9 1.37839 1.29215 +19.59 9 21.70 9 41.29	5 23.9 10 4 20.2 0 12.8 3.7 6.49 11.75 +36.7 1.56466 1.47842 +30.08 9 11.95 9 42.03	5 23.0 10 4 22.9 0 19.7 0.1 −3.2 11.50 +37.2 1.57054 1.48430 +30.50 9 11.50 9 42.00	10 0 19.5 0.0 9.70 −34.0 1.53147 n 1.44523 n −2788 10 9.75 9 41.87
+52° +	13′ 2.″46 + 6 10.55	13 7.06 + 4.47	13 6.32 +9.64	13 6.35 + 10.21	13 6.48 + 10.53
	13 13.0 12 76.4	13 17.0 13 77.8	13 16.0 13 77.9	13 16.6 13 79.3	13 17.0 13 79.4
+.16 I	+1 3.4 3.6	+1 0.8 0.9	+1 1.9 2.1	+1 2.7 2.9	+1 2.4 2.5
δ′ = +52	13 2.46 −20.40	13 7.06 −21.80	13 6.32 −21.90	13 6.35 −23.3	13 6.48 −23.40

Jan 1	2 45	11.32		+52° 14'	19.7	.5	11.61
6		11.22	.10		20.2	.4	11.61
11		11.12	10		20.6	.3	7.40
16		11.01	11		20.9	2	4.21
21		10.90	11		21.1	+1	
26 (+.05)		10.77	13		21.2	-0	3
31		10.64	13		21.2	.2	
Feb. 5		10.51	13		21.0	.2	
10		10.37	14		20.8	.3	
15		10.23	14		20.5	.4	
21		10.09	14		20.1	.5	19
26		9.96	13		19.6	.7	
Mar 1		9.83	.13		18.9		

7.46	+6
56	+16
47	+7
45	+5
40	+0
43	+3
45	+5
40	+0
38	-2
47	+7
46	+6
7.45	+05

11.63
67
61
58
70
71
11.65

+.39 +.398
1872
Jan. 1

44 27.3
30.7
34.0
40.7
44.1
47.4
50.6
54.0
0.8
4.3
7.6

44 15.8
17.3
20.0
53.1
44 45 17.7
20.1
21.7
24.3

4452 1.5
47.409
47.38
11.32
47.41 −23.94
11.37
23.96

47.38
+23.46
+ .50
+ .29
11.63

47.38
11.32
−23.94
−23.99

47.38
+23.46
+ .51
+ .29
11.64
7.43

5 34.3 10
4 26.2 0 18.2
8.1 0.2
17.15
+29.7
1.47275
1.38651
+ 2435
9 17.15
9 41.50

13 6.85
+ 9.91

13 16.8
14 19.7

+1 2.9 3.1

13 6.85
− 8.60

+.41 +.392
Jan. 5

44 24.0
27.3
30.7
37.5
40.7
44.1
47.4
50.8
57.4
0.8
4.2

44 17.5
19.1
21.0
57.6
44 19.2

4448 49
44.082
44.06
11.24
44.08 − 27.18

44.06
+26.71
+ .53
+ .37
11.67

44.06
11.24
−27.18
−27.23

44.06
+26.72
+ .51
+ 37
11.66
7.45

5 88.4
4 28.1
10.3
19.20
+24.9
1.39619
1.30995
+2041
9 19.20
9 39.61

13 8.74
+ 9.86

13 18.6
14 20.1

+1 1.5 1.6

13 8.74
−9.00

+.39 +.375
Jan. 6

44 23.5
26.6
30.1
36.8
40.1
43.4
46.6 44
50.3
56.9
0.3
3.7

44 8.5
10.4
12.9
31.8
10.1

4447 8 3
43.482
43.46
11.22
43.48 27.76

43.46
+27.26
+ .50
+ .39
11.61

43.46
11.22
−27.76
−27.81

43.46
+27.28
+ .48
+ .39
11.61
7.40

5 27.0
4 21.8
5.2
13.50
+23.2 4329
1.52113 1.51720
1.43489 1.43096
+ 2722 +2697
9 13.50 9 13.50
9 40.72 9 ~~4653~~ 40.47

13 7.88
+ 9.89

13 17.8
14 20.2

+1 2.4 2.6

13 7.88
−9.10

+.41 +.394
Jan. 10

44
33.2
36.5
39.9
43.3
46.9
199.8

44 38.3
44 38.3

44 39.960
39.93
11.14
39.96 −31.21

39.93
+ 30.65
+ .53
+ .47
11.58

39.94
11.14
−31.21
−31.26

39.94
+30.67
+ .51
+ .47
11.58
7.38

5 74.8
4 46.1
28.7
37.40
+1.7
0.23044
0.14420
+ 1.39
9 37.40
9 38.79

13 9.56
+10.12

13 19.7
14 20.5

+1 0.8 0.9

13 9.56
−9.40

+.41 +.405
Jan. 12

45
1.3
4.5
8.0
11.4
14.8
40.0

45 ~~13~~
26.0
27.5
29.1
82.6
45 27.5

45 8.000
7.97
11.10
8.00 − 3.13

7.97
+2.69
+ .53
+ .51
11.70

7.97
11.10
3.13
−3.18

7.97
+ 2.69
+ .52
+ .50
11.68
7.47

10
0 ~~24.15~~
46.5
19.5
1.29003 n
1.20379 n
− 1599
10

+.41 +.387
Jan. 14

44 47.5
50.9
54.2
1.0
4.3
7.7
11.1
14.3
24.1
24.6
27.8

44 34.1
35.5
37.2
106.8
44 35.6

45 26.45
180
84.15
7.68 − 3.39
7.682
7.66
11.05

7.66
+2.96
+ .53
+ .56
11.71

7.66
11.05
−3.39
−3.44

7.66
+2.95
+ .50
+ .56
11.67
7.46

5 25.1
4 24.1
1.0
12.55
+32.1
1.50650
1.42026
+ 2623
9 12.55
9 38.88

13 9.47
+ 10.38

13 19.9
14 20.8

+1 0.9 1.1

13 9.47
− 9.70

47 Cephei (H)

2 48 38
48 02.89
+78 52
5.5

2 49 2.89+.00
-.080

Dec 6.9 2 49 12.96 +78° 54' 37".4
11 .77 .19 38.9 15 29
16 12.55 .22 40.3 14
21 28 .27 41.7 14 26
26 (+.02) 11.97 .31 42.9 12
31 (+.02) 62 .35 44.0 11 21
36 11.23 .39 45.0 10

δ = +78° 54' 16".8
δ = +78 54 31.7

+5.10
+5.10

sin z = -.59

+35 +.353 | +39 +.400 | +37 +.350 | +41 +.392 | +39 +.375

1871 Dec. 9 | Dec. 17 | Dec. 18 | 1872 Jan. 5 | Jan. 6

+0

sin δ 9.99180

cos δ 9.28448
12669
9.41117

9.28448
11804
9.40252

Dec. 9

2.9
48 13.1 48 27.2 48
23.6 31.6
45.4 38.2
55.8 97.0
6.2
16.5
28.2 48 32.3
49.2
0.3
10.8
252.0
49 18.0 6.545
72.0 6.46
6.55 12.83 -6.37
12.83 +4.55
6.28 +1.78
-9.94
2.85
6.46
12.84
-6.38
-2
-6.40
6.46
+4.55
+1.80
-9.95
2.86

Dec. 17

37.7
49.3 116
0.2 109
10.6 104
21.5 109
11 93
18 0
29 93
48 59.86 59.86 48
5986 59.78
1250 12.50 12.72
1.264 +10.59
+1.99
-9.61
2.75
59.78
12.50
-12.72
-2
-12.74
59.78
+10.62
+2.04
-9.61
2.83

Dec. 18

47 55.1 47 38.0 47
55.8 41.7
16.5 79.7
38.0
48.5
59.3 39.8
9.7 50 4.5
20.6
42.0
53.1
40.8
48 35.2.0 48 59.338
65.27 59.26
48 59.34 12.45 -13.19
12.46 +11.47
-13.11 +1.89
-9.56
3.06
59.26
12.46
-13.19
-2
-13.21
59.26
+11.47
+1.78
-9.56
2.95

Jan. 5

38.8 47 9.8 47
48.9 13.7
0.0 18.6
21.2 41.9
31.6
42.5
52.8 47 13.9
4.0
25.4
35.8
47.0
48 35.80 42.545 48
12.0 42.46
46.0 11.21
42.54 -26.84
28.45
42.46 42.46
+26.71 11.21
+2.09 -28.76
-.68 -2
10.58 -28.77
42.46
+26.72
+2.00
-8.32
2.86

Jan. 6

38.0 47 3.0
48.7 9.6
59.0 14.1
20.8 26.7
31.2
41.9
52.7 47 8.9
3.0
24.0
35.7
46.2
40 18 41.982
60 41.90
48 1.8 11.13
41.96 -28.23
41.90 41.90
+27.26 11.13
+1.99 -29.23
-.60 -2
10.55 -29.25
41.90
+27.28
+1.91
-8.24
2.85

27.9
25 4 56.6
31.3
13.95
+34.2
1.87405 1.53400
1.38522 .94517
+24.28 +882
29 43.95 29 48.95
29 38.23 29 57.77
+78° 52' 50.58"
+ 46.48
53 37.7 ~~42.1~~
54 38.2
~~54~~ 38.2
+54 I + ~~0~~ 1' ~~56.1~~ 1.1" ~~56.6~~ 1.6
- 21.40

30 44.8
0 34.0
10.8
22.40

25 63.6 30
4 42.3 0 20.6
21.3 58.7
31.80
+79.5
1.90036
1.31153
+2049
29 31.80
29 52.29
52 56.06
+ 43.59
53 39.6
40.8
+1 1.2 1.7
- 24.00

25 57.4
4 37.2
14.2
25.70
+88.6
1.94743
1.35860
+2283
29 25.20
29 48.53
52 59.82
+ 43.29
53 43.1
45.1
+1 2.0 2.6
-13.40

25 51.1
4 36.1
15.0
25.55
+93.1
1.96894
1.38011
+2400
29 25.55
29 49.55
52 58.80
+ 43.88
53 42.7
45.2
+1 2.5 3.0
-13.50

Jan 1	2 49	11.55		+78° 54′ 44″.2	1.0
6		14.15	.40	45.2	0.8
11		10.73	.42	46.0	0.6
16	(+.02)	10.27	.46	46.6	0.6
21		9.79	.48	47.2	0.4
26		9.29	.50	47.6	0.3
31		8.78	.51	47.9	0.0
Feb. 5		8.26	.52	47.9	0.0
10		7.74	.52	47.9	

2 49 10.53
10.573

2.86 −3
83 +6
10.58 85 +6
.55 76 −13
.52 85 +6
.66 2.82 −7
.44 3.14 +25
.55 2.80 +1
10.55 2.97 +8
+0 2
2.91

+.41 +394 +.37 +387 +.33 +350 +.44 +445

|| Jan. 10 Jan. 13 Jan. 15 Feb 4

48 44 47 0.9 46 2.0 48 33.7 48 48 33.1 48 52.7 48 27.8
27.3 8.2 12.4 88.3 36.5 4.1 30.2
38.1 12.4 23.0 44.2 40.0 14.5 33.4
48.5 21.5 44.8 116.2 44.3 119.6 36.2 91.4
59.8 55.2 54.7 10.4 46.7
20.8 5.4 5.7 10.0 57.5
32.0 47 7.2 16.5 48 38.7 16.6 48 36.5 8.1 48 30.5
42.6 87.5 26.8 19.0
47 34.2 45.8 40.4
44.7 59.1 51.4
55.6 10.0 62.1
4193 2.1755 49 30 47 5.582 49 1481 5.620 49 39 27 57.518
48 180 21.67 240 5.80 120 5.54 240 57.44
38.12 2393 10.79 647 10.53 281 10.34 6327 8.84
38.04 2175 −29.12 588 473 562 480 57.52 −10.90
10.79
32.75 38.04 38.04 5.80 5.80 5.54 5.54 57.44 57.44
+30.65 10.79 +2.97 10.54 +3.03 10.34 +8.68 8.34
+2.09 −32.75 +1.89 −4.74 +1.68 −4.80 +2.24 −10.90
−.26 −2 .00 −2 +.19 −2 +2.19 −2
−32.77 −4.76 −4.82 −10.92
10.52 10.66 10.44 10.55
38.04 5.80 5.54 57.44
+30.67 +2.92 +3.02 +8.71
+2.01 +1.97 +1.79 +2.27
−7.90 −7.65 −7.45 −5.45

2.82 3.04 2.90 2.97

9.40252

25 48.2 25 45.3 25 86.2 32.8
4 35.0 4 32.9 4 56.0 0 5.1
13.2 12.4 30.2 27.7
24.10 22.65 43.10 16.40
+90.7 +87.2 1.94050 +29.1 +87.0
1.95856 1.43456 1.35167 1.46389 1.98951
1.36973 0.84573 +2247 0.87506 1.84203
+23.43 +7.01 +7.57 +~~21.10~~ +21.99
29 24.10 29 22.65 22.65 29 43.10 29 46.40 4640
29 47.53 9.66 294.72 29 50.61 39 ~~8.29~~ ~~8.39~~
29 24.41
53 0.82 53 3.23 52 57.74 52 29.96 53 23.54
+43.84 42.85 +46.02 +44.14 +44.14

53 44.7 53 46.1 53 43.8 53 24.1 54 80.8
45.8 46.2 46.4 47.9 54 45.9

+1 1.1 1.7 +1 0.1 0.6 +1 2.6 3.1 ~~+1 23.8~~ 39.8 40.4

−14.10 −14.50 −14.70 −16.20

β Urs. Min. F.l.

2 51 1.5 6.31
105 18
74 41
+3,65
−3.65

(+.058)
14 51 06.31 +.14

DEC 16 25.2
28 2.82 .30
26 (+.10) 3.14 .32
31 3.50 .36
36 14 51 3.88 .38
(+.12)

+74° 40′ 34″.0
32.3 1.7 32
30.8 1.5
29.4 1.4 27
28.1 1.3

δ = +74° 40′ 56″.9
δ = +74 40 42.1

Sin z = −.89

1871 Dec. 18 +.37 +.350

Dec. 29 +.45 +.444

1872 Jan. 1 +.39 +.398

Jan. 10 +.41 +.394

Jan. 23 +.38 +.360

sin δ 9.98429

cos δ 9.42186 (n)
12669
9.54855 (n)

9.42186
11804
9.53990 (n)

Dec. 18

51 32.6
33.6
66.2

Last 3 wires 51 33.1

51 23.7
37.4
39.1

5245
32.51 52.57
50 2.63 52.57
+12.57 2.77
− 1.35 −10.26
+3.68
6.41

52.51
2.68
−10.12
− .10
−10.22

52.51
+11.47
− 1.28
+ 3.68
6.38

Dec. 29

49 57.8 49 44.8
5.7 46.2
13.3 48.3
28.7 139.3
36.9
→ 44.5
52.4 49 46.4
0.2
15.9
23.4
31.2
3100
1800
4900
4455 44.55
50 3.38 44.61
18.93 44.61
+20.54 3.47
− 1.64 −18.86
+2.58
6.49

44.61
3.32
−18.71
− .10
−18.81

44.61
+20.54
− 1.62
+ 2.99
6.52

Jan. 1

49 54.9 49 18.6
2.7 21.0
10.5 23.0
26.2 24.7
33.7 29.4
41.4 116.7
49.7 51 4.7
57.3 49 23.3
12.6
20.5
27.8
3363
120
4563
4148
3.57
50 22.03 41.482
41.54
3.55
−22.01

41.54 41.54
+23.47 3.57
− 1.42 −22.03
+ 2.51 − .10
6.10 −22.13

41.54
+23.45
− 1.45
+2.57
6.07
6.32

Jan. 10

51 29.4 50 42.9
50.7
51 6.5
13.7
51 22.0
~~13.58~~
35.06 50 35.06 51
35.12
4.26
−29.14

35.12 35.12
+30.65 4.26
− 1.50 −29.14
+ 1.80 − .10
6.07 −29.24

35.12
+30.67
− 1.44
+1.81
6.16
6.41

Jan. 23

50 14.0 50 4.2
22.0 9.8
29.8 15.6
45.7 29.6
53.8
1.0
9.1 50 9.9
17.2
32.7
39.8
48.1
3132
300
13.2
1.20
1.200
1.26
5.39
−4.13

1.26 1.26
+5.40 6.39
− 1.39 −4.12
+0.67 − .10
5.94 −4.22

1.26
+5.40
− 1.31
+ 0.70
6.05
6.30

Dec. 18

5 75.2
1 19.5
55.7
37.60
+19.4 +17.94
1.28780 1.89910
0.83635 1.44835
+ 6.86 −28.08
6 7.60 9.60
7 14.46 (5 39.52)

Sec. all three

+105° 17′ 8″.83

I +.82

Dec. 29

5 9.3
1 59.4
33.8
46.60
+58.1
1.76417
1.31272
+ 20.54 −20.54
6 46.60 6 46.60
7 7.46 26.06

16 22.29
+1 61.19

105 19 30.0
105 18 23.4
~~40 29.4~~
To 41 36.6
40 30.0

+1 6.6 7.4
− 21.90

Jan. 1

5 40.05
2 2.01 1 25.6
38.0 1.3
20.00
+78.2
1.89320
1.44175
+27.65 −27.65
7 50.00 6 50.00
7 17.65 6 22.35

16 26.00
+1 60.29

19 39.8
18 26.2

41 33.8
40 29.2

+1 4.6 5.4
−12.90

Jan. 10

5 61.3
1 12.6
48.7
20.65
−54.3
1.73479n
1.28334n
+ 19.20
6 0.65
6 19.85

16 28.50
+1 58.59

19 33.0
18 27.1

41 32.9
40 27.0

+1 5.9 6.7
−15.10

Jan. 23

54.1
1 45.1
9.0
27.05
+51.3
1.71011
1.25866
+ 18.14
6 27.05
6 8.91

16 39.44
+1 57.99

19 35.5
18 37.4

41 22.6
40 24.9

+0 58.1 59.0
−17.20

Jan 1		14 51	3.57		74° 4'14 51	29".2		6.06 6.06 6.31 +.25
6			3.95	+.38		27.9	1.3	
11			4.36	41		26.8	1.1	
16	+07		4.79	43		25.9	.9	
21	+13		5.23	44		25.1	.8	
26			5.68	45		24.6	.5	
31	(+10)		6.13	45		24.0	.6	
Feb. 5			6.59	46		23.6	.4	
10			7.04	45		23.4	.2	
15			7.49	45		23.4	0	
20			7.93	.44		23.6	.2	
25			8.35	.42		24.0	.4	
			8.76	.41		24.5	.5	290

6.10
6.07
5.94
5.92
6.53
6.13
6.11

6.38 + 8
.52 +21
.32 + 1
.41 +10
.80 − 1
.40 + 9
.63 +32
.45 +14
6.43 +12

+2.8 ~~+38~~ +41 +40

+39 +343

Jan. 24 Feb. 14 Feb. 22

224 50 147 22.45 54.4 59.7 50 11.0 49 48.7 50 10.0 51 43.6
300 30.0 64.2 18.6 50.4 16.7 67 44.2
45.6 45.6 67.3 26.1 52.4 24.1 7.4 46.3
53.3 53.3 245.6 41.7 53.7 39.9 15.8 47.8
(59.3) 50.2 205.2 47.5 7.6 181.9
9.1 9.1 57.6 54.6 8
17.0 17.0 51 41.4 5.1 49 57.3 3.6 8.0 5.1 45.4
32.4 32.4 12.8 11.2 7.6
400 40.0 28.7 26.7 15.8
48.0 36.2 34.6 7.9
44.3 42.0 7.4

371.8 3323 50 311.9
300 300 300
671.8 632.3 611.9
61.073 57.482 55.627

51 07 1.250 50 57.482 56.627
1.31 57.541 56.69
5.48 7.38 8.08
−4.35 −9.84 −11.39

1.31 1.31 57.54 57.54 56.69 56.69
+5.45 5.47 +11.33 7.38 +12.96 8.08
−1.42 −4.16 −1.02 −9.84 −1.50 −11.39
+0.58 −.10 −1.32 −.10 −2.02 −.10
5.92 −4.26 6.53 −9.94 6.13 −11.49

1.31 57.54 55.69
+5.48 +1.32 +12.99
−1.25 .06 −1.46
+0.61 −1.30 −2.00
6.18 6.15 6.20
6.40 ~~6.38~~ 6.45
6.63

Cant. Madeoria

9.53990
46.7 56.6 54.6
1 12.8 0 45.0 1 15.4
33.9 11.6 39.2
23.35 28.30 27.30
−0.2 +66.2 −49.8
9.30103 n log. 1.82085 1.69722 n
~~+32814n~~ 1.36075 1.23712 n
8.84958 n +2295 −2295 +17.26
5 0.07 53.35 5 28.30 2830 5 57.30
5 53.28 5 57.25 5 5.35 6 14.56
16 55.07 16 57.10 16 43.00 16 33.79
+1.5995 +1 58.40 1 58.40 +1 57.787
19 35.2 19 36.6 19 41.4 19 36.2
18 54.9 18 55.5 18 55.5 18 31.6

41 5.1 41 4.5 41 28.5
40 34.8 40 23.4 40 23.8

+0 40.3 41.1 +0 41.1 +45.9 +1 46
46.7

~~1.28~~ ~~1.30~~
−17.30 −18.70

a [illegible]
2 55 32 ~~32.25~~ −.015
2 55 32.25 +.04
+3 35

Dec 6 2 55 35.21 +3° 34' 66".4
11 .19 66.1 .3
16 (−.01) 18 65.7 .4
21 17 65.3 .4
26 (.00) 16 64.9 .4

δ = +3° 34' 54".6
δ = +3 35 8.9

+.06
+.06

sin z = +.63

1871 Dec. 9 +.35 +3.53

55 18.3 55 8.8
20.4 10.0
22.5 12.0
26.5 31.0
28.7
30.7
32.8 55 10.3
34.8
38.8
41.0
43.1

sin √ 8.79588

55 33.76 30.691
30.68

30.69 +4.56
35.20 +.02
+4.51 −2.95
~~2.95~~

cos √ 9.99915
12669
12584

32.31
30.68
35.24
+4.56

30.68
35.20
−4.52
+ 1
−4.51

9.99915
11804
11719

30.68
+4.56
+ 2
−2.95

32.31

45 57.2
2 31.3
19.9
25.60
+20.4
1.30963
1.43547
+27.26
47 25.60
47 52.86

+3° 34' 55.49"
− 0 50.92

34 4.6
34 66.2

−.59 I +1 1.6 1.0
δ' = +3 34 55.49
−11.60

Dec. 18 +.37 +3.50

55 11.4 55 8.6
13.3 15 10.0
15.6 23 11.8
19.6 40 30.4
21.7 21
23.7 20 10.1
25.8 55 40.5
27.8 20 41.8
31.9 41 43.2
33.9 40
36.1 21

55 23.08 23.709
23.69

23.71 +11.48
35.18 +.02
−11.47 −2.93
~~2.53~~

32.26
23.69
35.22
11.53

23.69
35.18
−11.49
+ 1
−11.48

2.369
+11.47
+ 2
−2.93

32.25

45 71.4 45
2 41.0 3 23.8
30.4 12.1
35.70
+13.6
1.13353
1.25937
+18.17
47 35.70
47 53.87

34 54.48
− 48.99

34 5.5
34 65.45

+1 00.0 +0 59.4
34 54.48
−10.90

Dec. 29 +.45 +4.44

55 2.3 54 54.7
4.3 55.9
6.4 57.2
10.5 167.8
12.6
14.7 32 29
16.6 54 55.9
18.7
22.9
25.0
27.0

55 16.10 14.655
14.64

14.64 +20.54
35.16 +.03
20.51 −2.91
~~2.91~~

32.30
14.64
35.20
−20.56

14.64
35.15
−20.51
+ 1
−20.50

14.64
+20.50
+ 3
−2.90

32.37

45 53.8
2 34.6
19.2
26.90
+18.8
1.27415
1.39999
+28.72
47 26.90
47 52.02

34 56.33
− 50.44

34 5.9
35 4.6

+0 58.7 58.1
34 56.33
−10.00

1872 Jan. 1 +.39 +3.48

54 59.3 54 52.0
1.3 53.0
3.3 54.0
7.5 159.0
9.6
11.6
13.7 54 53.0
15.8
19.8
22.0
24.0

55 18.79 63
68 ~~11.59~~
127.9 11.58
11.59 35.12
35.15 −23.54
23.56

11.58
+23.47
+ 2
+ .26

35.33

11.58
35.12
−23.54
+ 1
−23.53

11.58
+23.47
+ 2
−2.87

32.24

45 59.4
2 36.2
23.2
29.70
+18.6
1.26951
1.39535
+24.85
47 29.70
47 54.55

34 53.80
− 49.93

34 3.9
35 4.4

+1 0.5 +0 59.9
34 53.80
+4.50

Jan. 5 +.41 +3.52

54 56.0 54 49.8
58.0 57.1
0.1 52.0
4.2 152.9
6.3
8.4
10.5 54 50.9
12.5
16.7
18.6
20.7

55 21.20 8.364
120 8.35
92.0 35.09
8.36 −26.74
35.09
26.73

8.35
+26.71
+ 2
+ .29

35.37

8.35
35.09
−26.74
+ 1
−26.73

8.35
+26.73
+ 2
−2.84

32.26

45 64.2
2 38.0
26.2
32.10
+17.5
1.24303
1.36887
+23.38
47 32.10
47 55.48

34 52.87
− 48.617

34 4.2
34 4.1

+0 59.9 59.3
34 52.87
+4.80

Jan 1	2 55	35.12	+3°	35' 4".4	55
6		.08	.04	4.1	.3
11		.03	.05	3.8	.3
16		.98	.05	3.5	.3
21		34.92	.06	3.2	.3
26 (−.01)		85	.07	3.0	.2
31		.78	.07	2.9	.3
Feb. 5		71	.07	2.5	.2
10		34.64	.07	2.3	.2
15		57	.07	2.1	.2
20		48	.08	2.0	.1
26		42	.07	1.9	.1
Mar 1		34.35	.07	1.8	.1

35.38
35.38

35.33
37
35
39
39
35
34
04
35.36

32.31	+ 6
25	+ 0
.32	+ 7
.20	− 5
.26	+ 1
.24	− 1
.28	+ 3
.26	+ 1
.26	+ 1
.20	− 5
.21	− 4
32.25	.00

Jan. 6 +.39 +.375

54 55.4 | 54 47.6
57.5 | 48.9
59.6 | 50.2
3.6 | 146.7
5.6
7.8
9.9 | 54 48.9
12.0
16.0
18.1
20.1

55 2656 | 7.782
180 | 7.77
856 | 35.08
7.78 | 27.31
35.08
27.30

7.77 | 7.77
+27.26 | 35.08
+ 2 | −27.31
+ .30 | + 1
35.35 | −27.30

7.77
727.28
+ 2
−2.83
32.24

Jan. 10 +.41 +.394

54 52.2 | 54 50.0
54.0 | 50.5
56.2 | 100.5
0.1
2.2
4.5
6.6 | 54 50.2
8.5
12.6
14.7
16.7

55 2283 | 4391
180 | 4.38
48.3 | 35.04
4.39 | −30.66

4.38 | 4.38
+30.65 | 35.04
+ 2 | −30.66
+ .34 | + 1
35.39 | −30.65

4.38
30.67
+ 2
−2.79
32.28

Jan 23 +.38 +.360

55 17.2 | 55 12.6
19.2 | 14.0
21.3 | 15.3
25.5 | 41.9
27.5
29.5
31.5 | 55 13.9
33.6
37.7
39.7
41.8

55 3245 | 29500
− | 29.48
− | 34.89
29.50 | −5.41

29.48 | 29.48
+5.40 | 34.89
+ 2 | −5.41
+ .49 | + 1
35.39 | −5.40

29.48
+5.40
+ 2
−2.64
32.26

Feb. 4 +.44 +.445

55 13.6 | 55 6.0
15.6 | 7.0
17.8 | 8.3
22.0 | 21.3
23.9
26.0
28.1 | 55 7.1
30.2
34.2
36.3
38.4

55 2861 | 26,009
− | 25.99
− | 34.72
2601 | −8.73

25.99 | 25.99
+8.68 | 34.72
+ 2 | −8.73
+ .66 | + 1
35.35 | −8.72

25.99
+8.71
+ 3
−2.47
32.26

Feb. 14 +.28 ~~+.887~~ 290

55 10.8 | 55 14.0
12.9
14.9
19.1
21.1
23.2
25.3 | 55 14.0
27.3
31.5
33.6
35.6

55 2553 | 23209
= | 23.19
2321 | 34.58
3460 | −11.39
11.39

23.19 | 23.19
+11.33 | 34.58
+ 2 | −11.39
+ .80 | + 1
35.34 | −11.38

23.19
+11.38
+ 2
−2.33
32.20

Feb. 22 +.41 +.400

55 9.1 | 55 12.0
11.2
13.2
17.3
19.3
21.4
23.5 | 55 12.0
25.6
29.8
31.8
33.8

55 2360 | 21,464
21.44
34.46
21.364 −13.02

21.44 | 21.44
+12.96 | 34.44
+ 2 | −13.02
+ .92 | + 1
35.34 | −13.01

21.49
+12.97
+ 2
−2.21
32.21

45 56.5
2 33.8
22.7
28.25
+18.9
1.27646
1.40230
+ 2525
47 28.25
47 53.50

34 54.85
− 49.38

34 5.5
35 4.1

+0 58.6 58.1

34 54.85
+ 4.80

45 69.4
2 40.3
29.1
34.70
+14.2
1.15228
1.27812
+ 1897
47 34.70
47 53.67

34 54.68
− 49.32

34 5.4
35 3.9

+0 58.5 57.9

34 54.68
+5.00

54.8
2 39.6
15.2
27.40
+15.6
1.19312
1.31896
+2084
47 27.40
47 48.24

35 0.11
−49.15

34 11.0
35 2.1

+0 52.1 51.5

35 0.11
+5.80

.11719
59.5
3 13.4
46.1
29.75
+18.9
1.27646
1.39365
+ 2476
48 57.7 | 47 34.99
48 24.51

34 23.84 | 35 13.36
− 49.84 | − 49.84

34 34.0 | 34 23.52
35 2.5 | 35 2.5

~~+0 28.5~~ + 39.0
38.4

34 23.84
+6.40

93.4
2 57.0
36.4
46.70
+9.2
0.96378
1.08097
+ 1205
47 46.70 | 47 34.65
47 58.75

34 49.60 | 35 13.70
− 49.19 | − 49.19

34 60.4 | 34 24.57
35 2.1 | 35 2.1

+0 61.7 +37.6
37.0

34 49.60
+6.80

55.5
2 39.6
15.9
27.75
+9.5
0.97772
1.09491
+ 1244
47 27.75 | 47 15.31
47 40.19

35 8.16 | 35 33.04
− 48.86 | − 48.86

34 19.3 | 34 44.18
35 2.0 | 35 3.0

+0 42.7 + 17.8
17.2

35 8.16
+6.90

α Persei
2 56 55 55.00
+38 20 21

ρ Persei
− 019

Dec 6 2 56 58.65 +38° 20′ 35″.5
11 .63 36.1 .6
16 (−.014 .012) .61 36.6 .5 20
21 .59 37.1 .5
26 −.03 58.57 37.5 .4

δ = +38° 20′ 18″.4
δ = +38 20 32.7

+.79
+.79

sin z = +.07

	1871 Dec. 9 +356	1872 Jan. 1 +.35 +.348	Jan. 10 +.39 +.41 +.394	Jan. 13 +.37 +.387	Jan. 14 ? +.41 +.387
	56 38.1 56 36.0 40.8 37.6 43.3 39.2 48.5 112.8 51.2 53.8 56.4 56 37.6 59.0 4.3 6.8 9.5	56 19.0 56 12.6 21.5 13.8 24.2 15.8 29.4 42.2 32.0 34.7 56 14.1 37.3 57 0.8 40.0 2.3 45.3 4.5 47.8 50.4	56 56 37.0 – – – – 27.4 7.3 30.0 56 3 37.0 32.6 4 37.9 4 40.5 3 43.2 .2	39.4 56 28.7 42.0 30.0 44.6 31.0 49.9 89.7 52.6 55.2 57.7 56 29.9 0.3 5.5 8.3 10.8	56 39.1 56 33.0 41.8 34.3 44.5 35.3 49.5 52.3 55.0 57.5 0.2 5.6 8.1 10.7
sin δ 9.79256 cos δ 9.89454 .12669 .02123	56 59.17 53.791 53.77 58.64 4.87 53.79 58.64 −4.85	56 38.16 34.691 – 34.67 58.52 34.69 −23.85 58.55 23.86	56 ~~21.16~~ 7.32 34.69 27.37 27.35 58.40 −31.05	56 36.63 55.118 240 55.10 606.3 58.36 55.12 −3.26	36.43 54.936 240 54.92 604.3 58.35 54.94 −3.43
9.89454 .11804 .01258	53.77 58.64 −4.87 + 1 −4.86	34.67 34.67 +23.47 58.52 + .81 −13.85 + .30 + 1 −13.84	27.35 27.35 +30.68 58.40 + .32 −31.05 + .42 + 1 58.74 −31.04	55.10 55.10 + 2.97 58.36 + .29 −3.26 + .46 + 1 58.82 −3.25	54.92 54.59 + 2.96 58.35 + .32 −3.48 + .47 + 1 58.67 −3.42
	53.77 +4.56 + .28 −3.64 54.97	34.67 +23.67 + .32 + .30 58.76 54.94	27.35 30.67 + .31 + .42 58.75 54.93	55.10 + 2.92 + .81 + .46 58.79 54.97	54.92 +2.95 + .81 + .47 58.67
	0 46.6 3 1.7 44.9 23.30 +16.2 1.20951 1.23074 + 17.01 2 53.30 3 10.31	0 95.2 0 2 56.5 3 45.6 38.8 29.8 47.65 +20.6 1.31386 1.33509 +21.63 2 47.65 3 9.28	0 86.7 3 25.6 11.1 18.35 − 9.7 0.98677 n 1.00800 n − 10.19 3 48.35 3 8.16	0 78.1 2 45.9 32.2 39.05 +25.2 1.40140 1.42263 +26.46 2 39.05 3 5.51	0 91.0 2 64.8 36.2 45.50
+38°	19′ 38″.04 4.67	19 39.07 − 4.88	19 40.19 − 4.69 −4.71	19 42.84 − 4.68	
	19 33.4 20 35.9	19 34.2 20 38.0	19 35.4 20 38.5	19 38.2 20 38.6	
−.06 II	+1 2.5 2.4	+1 3.8 3.8	+1 3.1 3.0	+1 0.4 0.4	
δ′ = +38	19 38.04 − 17.50	19 39.07 − 5.30	19 40.19 − 5.80	19 42.84 − 5.90	

2 56 5882

Jan 1	2	56	58.52			+38°	20'	38.0		5882
6			46		.06			38.3		35.00 7
11			.39		.07			38.5	.2	T8
16			32		.07			38.6	.1	3.82
21			58.24		.08			38.7	.1	
26			15	(-02)	.09			38.7	.0	
31			05		.10			38.6	-.1	4
Feb. 5			95	-.02	.10			38.5	.1	
10			57.86		.09			38.3	.2	
15			75		.11			38.0	.3	
20			65		.10			37.7	.3	15
25			56		.09			37.3	.4	
Mar 3			57.46		.10			36.8	.5	

58.74	54.97	-3
82	.94	-6
(671)	.93	-7
85	.97	-3
77	1.01	+1
80	.94	-6
80	.99	-1
58.80	.98	-2
	54.97	-.03

Jan. 23 +.38 +360

56 36.8 | 56 36.1 | 39.3 | 37.0 | 42.2 | 73.1 | 47.3 | 50.0 | 52.6 | 55.1 | 56 36.5 | 57.8 | 3.0 | 5.7 | 8.3

56 5781 | 52.555 | — | 52.54 | 58.21 | 52.55 - 5.67

52.54 | +5.40 | + .30 | + .61 | 58.85

52.54 | 58.21 | -5.67 | + 1 | 5.66

52.54 | +5.40 | .28 | +.61 | 58.83 | 55.01

2 59.5 | 91.0 | 31.5 | 48.50 | +16.1 | 1.20682 | 1.22805 | +1691 | 2 45.50 | 3 2.41 | 19 45.94 | -4.92

19 41.2 | 20 38.7

+0 57.5 57.4 | 19 45.94 | -6.06

Jan. 24 +.39 +343

56 36.8 | 56 25.0 | 39.3 | 26.5 | 42.0 | 28.0 | 47.1 | 79.5 | 49.7 | 52.4 | 55.0 | 56 26.5 | 57.7 | 62.8 | 65.5 | 68.1

56 5764 | 52.400 | — | 52.38 | 58.19 | 52.40 - 5.81

52.38 | + 5.45 | + .31 | + .63 | 58.77

52.38 | 58.19 | -5.81 | + 1 | -5.82

52.38 | +5.48 | + .27 | +.63 | 58.76 | 54.94

2 51.8 | 72.8 | 21.0 | 36.40 | +25.7 | 1.41329 | 1.43452 | +27.20 | 2 36.40 | 3 3.60 | 19 44.75 | -4.89

19 39.9 | 20 38.7

+0 58.8 588 | 19 44.75 | -6.00

Feb. 12 +.32 +338

56 30.6 | 56 18.7 | 33.3 | 20.4 | 36.0 | 21.8 | 41.2 | 60.9 | 43.8 | 46.4 | 49.0 | 56 20.3 | 51.6 | 57.0 | 59.5 | 62.1

56 5105 | 46.409 | — | 46.39 | 57.82 | 46.41 - 11.43

46.39 | +11.16 | + .21 | +1.00 | 58.80

46.39 | 57.82 | -11.43 | + 1 | -11.42

46.39 | +11.15 | + .24 | +1.00 | 58.81 | 54.99

.01258

3 26.1 | 25.4 | — 0.7 | 12.70 | +26.1 | 1.41664 | ~~1.42919~~ 1.42922 | ~~+26.86~~ +26.87 | 3 12.70 | 12.70 | 3 ~~39.56~~ | ~~39.57~~ | 2 45.83 | 19 8.78 | 20 2.52 | - 4.85 | - 4.85

19 3.9 | 20 38.5 | 19 57.7 | 20 38.5

+1 34.6 | +40.8 | 40.7 | 19 8.78 | -5.80

Feb. 14 +.28 +290

56 30.5 | 56 16.0 | 33.1 | 17.0 | 35.7 | 18.3 | 41.0 | 51.3 | 43.5 | 46.3 | 48.9 | 56 17.1 | 51.5 | 56.7 | 59.3 | 1.9

56 5084 | 46.218 | — | 46.20 | 57.77 | 46.22 - 11.57

46.20 | +11.33 | + .22 | + 1.05 | 58.80

46.20 | 57.77 | -11.57 | + 1 | -11.56

46.20 | +11.32 | + .23 | +1.05 | 58.80 | 54.58

3 28.7 | 32.0 | 3.3 | 16.00 | +29.1 | 1.46389 | ~~1.47644~~ 1.47647 | + ~~29.9~~ 29.96 | 3 16.00 | 16.00 | 3 45.95 | ~~45.96~~ | 2 46.04 | 19 2.39 | 20 2.31 | - 4.96 | - 4.56

18 57.4 | 20 38.6 | 19 57.4 | 20 38.6

+1 41.2 | +41.2 41.2 | 19 2.39 | - 5.90

β Persei
2h 59 44 46.93
+40 2 2/8

59 46.93 −03
−020

+85
+.85

sin ν 9.81225
cos ν 9.88126
12669
.00755

~~9.88126~~
~~11804~~
~~9.99930~~

lin z = +.03

Nov. 16		2 59 50.57	2	+40°	27′	37.″8	
21		59	3			38.6	.8
26		62	3			39.4	.8
Dec 1		65	1			40.2	.8
6	(.00)	.66	+1			40.9	.7
11	(−.01)	.65	−1			41.5	.6
16		63	2			42.1	.6
21		61	2			42.6	.5
26		.58	3			43.1	.5

31
22

δ = +40° 27′ 23.″6
δ = +40 27 37.8

+.36 +.35 1871 Dec. 1

59 34.8 59 20.8
37.5 22.0
40.3 23.4
45.6 66.2
48.3
50.9
53.7 59 22.1
56.4
61.7
64.5
67.2
59 560.9 50.991
50.47
50.63
50.99 −.66
50.65 +.31
+0.34 −3.72
46.90
50.97 50.97
50.61 50.62
+0.32 +.35
50.97
−0.65
−3.72
+.33
46.93

+.35 +.353 Dec. 9

59 28.6 59 13.5
32.3 14.8
35.0 16.1
41.4 44.4
43.2
45.9
48.5 59 14.8
51.3
56.6
59.3
2.0
59 30.41 45.827
45.81
45.83 + 4.56
50.65 +.30
−4.82 −3.72
46.95
45.81 45.81
50.65 50.62
−4.84 −4.81
45.81
+4.56
−3.72
+.30
46.95

+.37 .350 Dec. 15

59 22.7 59 10.0
25.4 11.5
28.0 12.8
33.4 34.3
36.0
38.8 59 11.4
41.5 59 58.3
44.1 0.3
49.6 2.0
52.3
55.0
59 42.68 38.800
38.78
38.80 +11.48
50.62 +.31
−11.82 −3.69
46.88
38.78 38.78
50.62 50.59
−11.84 −11.81
38.78
+11.48
−3.69
+.30
46.87

+.43 +.444 Dec. 29

59 13.3 59 1.8
16.1 3.6
18.8 5.7
24.1 11.1
26.7
29.7 1.90
32.4 59 48.7
35.0
40.5
43.2
45.8
59 32.58 29.600
29.58
29.60 +20.52
50.56 +.38
20.96 −3.63
46.87
29.58 29.58
50.56 50.53
−20.98 −20.98
29.58
+20.55
−3.63
+.38
46.88

+.39 +.348 1872 Jan. 1

59 10.6 58 58.1
13.1 60.0
16.0 61.6
21.3 179.7
24.0
26.7 58 59.9
29.4 59 51.0
32.1 52.7
37.5 54.4
40.2
43.0
59 29.39 26.718
26.70
50.52
−23.82
26.72
50.55
23.83
26.70 26.70
+23.47 50.52
+ .33 −23.82
28
50.78
26.70
+23.47
+ .34
+ .28
50.79
46.92

+.41 +.392 Jan. 5

59 7.1 58 55.7
9.8 57.8
12.6 59.6
18.0 173.1
20.7
23.4
26.1 58 57.7
28.8
34.1
36.9
39.6
58 92.51 23.373
23.35
50.47
23.37 −27.12
23.35 23.35
+26.72 50.47
+ .35 −27.12
+ .33
50.75
23.35
+26.73
+ .33
+ .33
50.74
46.87

Dec. 1

55 83.1
0 50.9
32.2
41.55
+29.9
1.46089
1.46884
+29.43
55 41.55
56 10.98
+40° 26′ 37.″37
−0 2.16
38
26 35.0
27 40.2
−.03 +1 5.0 5.2
δ = +40 26 37.37
16.60

Dec. 9

72.6
0 43.9
28.7
36.30
+31.0
1.49136
1.49931
+31.57
55 36.30
56 7.87
26 40.48
− 2.16
41
26 38.1
27 41.63
+1 3.2 3.2
26 40.48
−17.70

Dec. 15

78.8
0 47.3 0 35.7
31.5 20.8
39.40
+27.4
1.43775
1.44570
+27.91
55 39.40
56 7.31
26 41.04
− 2.73
32
26 38.7
27 42.4
+1 3.7 3.6
26 41.04
−18.80

Dec. 29

77.2
0 47.0
30.2
38.60
+25.9
1.41329
1.42124
+26.38
55 38.60
56 4.98
26 43.37
− 2.00
37
26 41.0
27 43.4
+1 2.4 2.4
26 43.37
−19.80

Jan. 1

78.7 55
0 47.71 39.5
31.0 24.2
39.35
−33.2 +26.8
1.52113 m 1.42810
1.52908 m 1.43605
−33.82 +27.29
55 39.35
56 6.64
26 41.71
− 2.78
37
26 39.3
27 43.6
+1 4.3 4.3
26 41.71
−5.80

Jan. 5

75.9
0 45.2
30.7
37.95
+25.7
1.40993
1.41788
+26.18
55 37.95
56 4.13
26 44.22
− 2.17
28
26 41.9
27 43.98
+1 1.9 1.8
26 44.22
−5.80

Jan 1	2	59 50.52	+40°	2/27′ 43″.6	
6		46	06	43.9	+3
11		39	07	44.2	.3
16		31	08	44.4	.2
21		50.23	09	44.5	.1
26	(.00	14	10	44.0	0
31		.04	10	44.5	0
Feb. 5		94	10	44.4	1
10		49.84	10	44.2	.2
15		74	10	43.9	.3
20		69	10	43.6	.3
~~Mar~~ 25		49.59	.10	43.2	.4
Mar 1		49.43	.10	42.7	.5

59 50 80

50.80
46.93
3.87

9
3
15

46.93 +0	50.78
95 +2	75
87 −6	73
88 −5	89
92 −1	78
87 −6	83
88 −5	87
102 +9	50.80
.90 +3	
.93 +0	
.98 −5	
46.92 −.01	

+.39 +.375
Jan. 6

59 6.7 58 54.8
9.3 59 55.9
12.1 57.1
17.4 167.8
20.0
22.8
25.5 58 55.9
28.2
33.7
36.3
39.0
59 25 1 0 = 22.82
2 28 18
22.80
50.46
−27.66

22.80
+27.26
+ .33
+ .34
50.73

22.80
50.46
−27.66

22.80
+27.29
+ .32
+ .34
50.75
46.88

55 76.3
0 45.3
31.0
38.15
+26.9
1.42975
1.43770
+27.40
55 38.15
56 5.55
26 42.80
− 2.47
33
26 40.5
27 43.9
+1 3.4 3.4
26 42.80
− 6.10

+.41 +.394
Jan. 10

59 3.2 58 51.8
6.0 53.7
8.7 55.3
14.2 160.8
16.8
19.4
22.2 58 53.6
25.0
30.3
33.1
35.7
59 21 4 6 = 19.51
19.509
19.50
50.40
−30.90

19.49
+30.65
+ .35
+ .40
50.89

19.49
50.40
−30.91

19.49
+30.67
+ .33
+ .40
50.89
47.02

77.4
0 45.8
31.6
37.70
+25.9
1.41329
1.42124
+26.38
55 38.70
56 5.08
26 43.27
−2.13
30
26 41.0
27 44.3
+1 3.3 3.3
26 43.27
−6.40

+.41 +.405
Jan. 12

59 31.1 59 17.0
33.5 18.7
36.6 20.5
41.9 56.2
44.6
47.3
50.1 59 18.7
52.7
58.1
0.8
3.6
59 52 0 6
47.33
30.
47.327
47.31
50.37
−3.06

47.31
+2.69
+ .35
+ .43
50.78

47.31
50.37
−3.06

47.31
+2.69
+ .38
+ .43
50.77
46.90

66.1
0 39.2
26.0
38.05
+28.6
1.45636
1.46431
+29.13
55 38.05
56 02.18
26 46.17
−2.10
32
26 43.9
27 44.2
+1 0.3 0.2
26 46.17
−6.40

+.37 +.387
Jan. 13

59 31.0 59 20.6
33.6 21.7
36.4 23.0
41.7 65.3
44.4
47.1
49.7 57 21.8
52.7
57.8
0.6
3.4
59 51 8 4
47.13
47.127
47.11
50.36
−3.25

47.11
+2.97
+ .31
+ .44
50.83

47.11
50.36
−3.25

47.11
+2.92
+ .33
+ .44
50.80
46.93

74.7
0 44.7
30.0
37.85
+25.3
1.40312
1.41107
+25.77
55 37.85
56 3.12
26 45.23
−2.09
25
26 43.0
27 44.3
+1 1.3 1.3
26 45.23
−6.50

+.41 +.387
Jan. 14?

59 30.5 59 22.6
33.3 24.4
36.1 25.8
41.2
44.0
47.0
49.6
52.2
57.7
0.4
3.1
51 5 1
46.83
46.827
46.81
50.34
−3.53

46.81
+2.96
+ .33
+ .46
50.56

46.81
50.34
−3.53

46.11
+2.95
+ .33
+ .46
(50.55)

81.9
0 51.0
30.9
40.95

+.38 +.360
Jan. 23

59 28.4 59 19.8
31.0 21.6
33.7 23.0
39.2 64.4
41.9
44.5
47.3 57 21.5
50.0
55.3
58.0
60.8
59 49 6 1
44.55
44.555
44.53
50.19
−5.66

44.53
+5.40
+ .33
+ .61
50.87

44.53
50.19
−5.66

44.53
+5.40
+ .31
+ .61
50.85
46.98

69.9
0 48.8
21.1
34.95
+23.1
1.36361
1.37156
+23.53
55 34.95
55 58.48
26 49.87
−2.13
2.26
26 47.7
27 44.5
+0 56.8 56.8
26 49.87
−6.70

48h Cephei

3 3 50 3 04 27 2.01
4 2.72
+77 18 6 -070

+4.42
+4.41

Dec 6	3 4 12.13		+77° 15' 42".1	15	
11	12.02	12	43.6	14	24
16 (±06)	11.86	15	45.0	13	
21	69	19	46.3	13	26
26	11.43	24	47.6	13	
31	16	27	48.7	11	22
36	10.84	32	49.8	11	

δ=+77° 15' 23".2
δ=+77 15 37.0

sin z = -.57

	1871 Dec. 18 +.37 +.38		Dec. 29 +.45 +.444		1872 Jan. 1 +.39 +.398		Jan. 5 +.41 +.392		Jan. 6 +.35 +.375	
	3 2.7 2	29.5 2	53.1 2	18.0 2	50.0 2	33.3 2	46.6 2	17.8 2	45.6 2	10.0
	12.0	32.7	02.5	20.8	59.0	36.3	55.9	21.0	55.0	12.8
	21.5	37.9	11.6	24.1	08.6	38.6	5.2	24.6	4.4	16.4
	39.9	100.4	30.3	27.6	27.1	42.8	23.6	28.8	23.1	39.2
	49.5		39.5	90.5	36.4	151.0	33.3	92.2	32.5	
sin √ 9.98919	58.6 2	32.5	48.9		46.0 2	37.7	42.3		41.9	
	7.9 5	9.0	57.8 2	22.6	55.0 4	18.4	57.6 2	23.0	51.2 2	13.1
	17.4	15.1	07.5		04.3	19.7	1.1		0.2	
	36.1	19.8	26.2		23.4		19.5		18.6	
	45.3		35.3		32.4		29.3		28.6	
cos √ 9.34324	54.7		44.9		41.7		38.5		37.6	
12669	3 34 56	58.6914 3	35 7 6	48.873 3	38 3 9	45809 3	34 6 9	42.445 3	33 8.7	41.700
9.46993	30 0	58.62	18 0	48.80	12 0	45.74	12	42.37	12 0	41.63
	645.6		537.6		503.9	11.07	4669	10.83	4587	10.75
	58.69	+11.48	48.87	+20.54	45.81	-25.33	4245	-28.46	41.70	-29.12
9.34324	11.79	+1.63	11.27	±1.99	11.10		4 10.74		10.67	
17804	-13.10	-9.07	22.46	-8.55	25.35		28.29		28.57	
9.46128										
		2.66		2.78						
	58.62	58.62	48.80	48.80	45.74	~~45.74~~	42.37	42.37	41.63	41.63
	11.79	11.79	11.27	11.27	+23.48	11.08	+26.73	10.82	+27.29	10.76
	-13.17	-13.17	-22.47	-22.47	-1.01	-25.34	-77	-28.46	-69	-29.13
	+ 5		+ 5		+1.72	+ 5	+1.81	+ 5	+1.72	+ 5
	-13.12		-22.42			-25.29		-28.41		-29.08
					9.93		10.14		9.95	
	58.62		48.80			45.74		42.37	[illegible]	41.63
	+11.48		+20.55			+23.47		+26.73		+27.29
	+1.54		+1.96			+1.75		+1.73		+1.65
	-9.07		-8.55			-1.02		-0.77		-0.70
	2.57		2.76			9.94		10.06		9.87
						2.60		2.72		2.53
	5 42.8		39.8		48.5		36.9		32.1	
	3 32.6 4	19.7 3	32.2 4	19.7 3	35.6 4	5.6 3	29.6		3 26.2	
	10.2	67.0	17.6	57.0	12.9	42.2	7.4		5.9	
	21.40		19.90		24.25		18.45		16.05	
	+85.2		+86.3		+68.1		+79.4		+88.6	
	1.93043		1.93601		1.83314		1.89982		1.94743	
	1.40036		1.40594		1.30307		1.36975		1.41736	
	+25.14		+25.46		+20.09		+23.43		+26.14	
	8 21.40		8 19.90		8 24.25		8 18.45		8 16.05	
	8 46.54		8 45.36		8 44.34		8 41.88		8 42.19	
+77°	14' 1.81"		14 2.99		14 4.01		14 6.47		14 6.16	
	+ 40.90		+ 42.11		+ 41.97		+40.86		+41.31	
	14 42.7		14 45.1		14 46.0		14 47.3		14 47.5	
	15 45.5		48.3		49.0		49.8		51.0	
+.53 I	+1 2.8 3.3		+1 3.2 3.7		+1 3.0 3.5		+1 2.5 3.1		+1 2.5 3.0	
	-22.30		-25.10		-12.00		-12.80		-13.00	

3 04 10.06

	h m							
Jan	3 34	11.09		77° 15′	49.0	10	10.06	
6		10.77	32		50.0	9	2.72	19
11		10.43	34		50.9	8	7.34	
16		10.06	37		51.7	6		14
21		9.66	40		52.3	5		
26		9.24	42		52.8	5		8
31	(−.05)	8.81	43		53.1	3		
~~Mar~~ Feb 5	(−.07)	8.36	45		53.2	+1		2
10		7.91	45		53.3	0		
15		7.46	45		53.1	−.1		4
20		7.07	45		52.9	.2		
25		6.58	43		52.8	.4		"
Mar 1		6.15	43		51.9	.6		

9.93
10.14
9.95
10.04
10.02
9.88

10.01

2.57 −15
.76 +4
.60 −12
.72 −0
.53 −19
.63 −9
.71 −1
.69 −3

2.65 −.07

+41 +39.4 Jan. 10 | +37 +38.7 Jan. 13 | +41 Jan. 14? | +44 +44.5 Feb. 4

Jan. 10:

2 34.1
2 42.0 38.8 3
51.5 35.8
0.7 104.7
19.4
28.8
38.4
47.5 2 34.9
56.7
15.0
24.8
33.9
3 35 8 7 38.064
60 37.99
41 8.7 10.48
38.66 −32.49

37.99 37.99
+30.66 10.49
− 42 −32.50
+ 1.81 + 5
−32.45

10.04 37.99
+30.67
+1.74
−0.43
9.97
2.63

Jan. 13:

2 55.5
9.5 58.7 3
19.0 61.7
28.5 175.7
47.2
56.4
5.7
14.8 2 58.6
24.6
42.9
52.4
1.7
3 62.7 5.700
300 5.63
62.7 10.27
5.70 −4.64
10.19
4.49
5.63 5.63
+2.97 10.27
−21 −4.64
+1.63 + 8
−4.59
10.02 5.63
+2.92
+1.71
−0.21
10.05
2.81

Jan. 14?:

2 39.7
9.7 41.7 43
18.8 44.3
28.2 125.7
46.9
56.0
5.7
14.6 2 41.9
24.4
42.9
52.7
1.5
36 1 4 5.582 3
300 5.51
61.4 10.20
5.58 −4.69
10.11
4.53
5.57 5.51
+2.96 10.19
−14 −4.68
+1.81 + 5
−4.63
(10.24) 5.57

Feb. 4:

1.9 2 31.0
11.1 34.9
20.3 39.2
39.2 105.1
48.5
57.6
7.1 2 35.0
16.4
35.2
44.4
54.0
33 5 7 57.791
30 0 57.72
63 5.7 8.43
57.79 −10.71
57.72 57.72
+8.69 8.43
+1.63 −10.71
+1.94 + 5
−10.66
9.98 57.72
+8.72
+1.96
+1.63
10.03
2.69

9.46128

5
3 46.7
33.7
13.0
23.35
+68.2
1.80071
1.27064
+1865
8 23.35
8 42.00
14 6.35
+41.69
14 48.04
50.8

3 36.1
28.1
8.0
18.05
+67.1
1.82672
1.29665
+1980
8 18.05
8 37.85
14 10.50
+40.71
14 51.2
51.2

3 8.55
30.3
5.2
17.75

3 83.1
59.8
23.3
41.55
+82.8
1.91803
1.37937
~~+~~ 23.98
8 41.55
9 8.50 8 17.60
13 42.85 14 30.75
+41.61 41.61
14 24.45 75 12.4
53.2 53.2

+1 28 33.3 +1 00 06 ~~+1 30.7~~ + 40.8 41.3

−13.80 −14.20 −16.20

1872
τ Piscium ✓
~~1 4 2.3~~
~~+28 84~~

−016

Prec 3 4 14.57
11 .57
16 .57
21 .56
26 .54

15.32 − 4
33 − 3 +19° 14′ 27.0
35 − 1 27.0
31 − 5 27.0
15.33 −.03 27.1
27.1.

δ = +19° 14′ 13.0″
δ = +19 14 26.9

δ Arietis

3 4 13
15.36
Sniz = +.39 +19 14
1872 +35

	Jan. 23 +.38 +360		Jan. 24 +.39 +343		Feb. 1 +.52 +505		Feb. 14 +.28 +290	
(+.36) +.35	3 59.6	3 49.4	3 59.63	50.0	3 57.4	3 48.1	3 53.5	3 48.1
	1.9	50.1	1.7	51.3	59.6	49.0	55.5	49.2
	4.1	52.2	3.9	52.5	1.8	50.0	57.7	50.8
	8.4	151.7	8.3	153.8	6.2	147.1	2.1	148.1
	10.4		10.4		8.4		4.3	
	12.6		12.7		10.6		6.6	
	15.0	3 50.6	14.9	3 51.3	12.7	3 49.0	8.5	3 49.4
	17.1		17.0		14.9		11.0	
	21.4		21.3		19.3		15.2	
	23.6		23.5		21.4		17.4	
sin δ 9.51774	25.8		25.8		23.7		19.6	
	4 1999	12.718	4 1991	12.645	4 2360	10.545 +	2514	6.491
	60	12.70	60	12.63	120	10.53	180	6.47
	1399	18.27	139.1	18.26	116.0	18.14	71.4	17.94
cos δ 9.97506	12.72	−5.57	12.64	−5.63	10.55	−7.61	6.49	11.47
12669	12.70	12.70	12.63	12.63	10.53	~~10.53~~	6.47	
.10175	+5.40	18.27	+5.45	18.26	+7.46	10.53	+11.83	6.47
	+ 13	−5.57	+ 14	−5.63	+ .18	18.14	+ .10	17.94
	+.51	+ 2	+.52	+ 2	+.64	−7.61	+.84	−11.47
9.97506		−5.55		−5.61		+ 2		+ 2
11804	18.74		18.74		18.81	−7.59	18.76	−11.45
.09310		12.70		12.62		10.53		6.47
		+5.40		+5.48		+7.42		+11.82
		+ 13		+ .12		+ .18		+ .10
		+ 0.51		+ .52		+ .64		+ .84
		18.74		18.75		18.77		18.73

			.09310			
	5 50.1	50.9	67.9		57.0	
	3 37.0	3 38.7	4 17.3		4 10.0	
	13.1	12.2	50.6		47.0	
	25.05	25.45	33.95		28.50	
	+22.1	+21.3	+21.5		+17.1	
	1.34439	1.32837	1.33243		1.23299	
	1.44614	1.43012	1.42553		1.32609	
	+ 27.93	+26.92	+26.64		+21.19	
	8 25.05	8 25.45	9 3.93	8 37.38	8 58.50	8 37.31
	8 52.98	8 52.37	9 30.57		9 19.69	
+19°	13′ 55.37″	13 55.98	13 17.76	14 11.04	13 28.66	14 11.04
	− 0 26.54	− 27.04	− 27.99	− 27.99	− 26.61	− 26.61
	13 28.8	13 28.9	12 49.8	13 43.05	13 02.0	13 44.4
	14 26.7	14 26.7	14 26.5	14 26.5	14 25.9	14 25.9
δ′ = +19	13 55.37	13 55.98	13 17.76		13 28.66	
	+ 0.20	+ 0.20	+ 0.40		+ 1.00	1.00
−.36 I	+0 57.9 57.5	+0 57.8 57.5	+1 36.7 36.5	+43.5	+1 23.9	+ 41.5 41.1

Jan 21		3	04	1830		+19°	14'	26".8	
26				18.23	.07			26.6	.2
31				18.16	.07			26.5	.1
Feb. 5	(-.02)			18.09	.07			26.3	.2
10				18.01	.08			26.1	.2
15	(-.03)			17.93	.08			25.9	.2
20				17.85	.08			25.6	.3
~~Mar~~ 25				17.77	.08			25.4	.2
				17.69	.08			25.1	.3

9

10

3 04 1878
1878

18.74	.74
74	.75
81	.77
76	.73
18.76	18.75

All the stars in this book have been re added.

Whole number of stars in this book = 47
" " " Obs " " " = 376