KG
11366
v.446

General Catalogue
Observations & Reductions

BA3. 1871-2

Charles W. Sever, University Bookstore, Cambridge.

G. C. 1871-2
A 3

1871

θ Aquilae

19 40 11

+10 18

7.18

1871 Nov 2

40	5.5	40	9.0
	7.5		10.4
	9.7		11.4
	13.8		3 08
	16.0		10.3
	18.0		
	20.1		
	22.3		
	26.4		
	28.5	40	10.3
	30.6		
	1984		
	—		
	1804		18.036
	8.54		
	9.60		

0 4.48.2
48.0
962
48.10

+7.7

671 √ δ = +18° 13′ 3.9″

δ Sagittae

19 41 42 41 38.22 (-10)
38.18

+18 13

-7
-12
-5
-6
-9
-15
-10
-9

Sept 17	18 41 39.89	.09	+18° 13′ 18.7″	
22	.80		19.0	+3
27	71		19.3	+3
Oct 2	63		19.5	+2
7	39.54		19.6	+1
12	.45		19.6	+0
17	36		19.5	-1
22	27		19.3	-2
27	39.17	.10	19.1	-2

+.41 +.33
1871

	1871 Sept 24		Sept 25		Sept 28		Oct 8		Oct 16	
	+02	+027	+04	+045	+05	+100	+07	+065	+057	+079
-.016	41 50.5	42 23.1	41 59.2	42 15.7	41 32.7	41 26.0	41	41 58.7		42 11.1
	52.6	23.8	1.4	17.0	34.8	27.3		59.7		13.5
	54.8	25.0	3.6	18.0	37.0	133		61.4		15.4
	59.1	119	5.8	207	41.3	26.6	42.0	1798		100
	1.2	23.9	7.9	16.9	43.4		44.1	59.9		13.3
	-3.4		77.9		-45.6		46.3		47.5	
	5.5		60		47.8	42 6.3	48.5		49.7 22	
sin δ 9.49500	7.8		17.9		50.0 54.3	7.7	50.7		51.8 21	
	12.1				56.5	8.9	231.6		56.2 44	
	14.3				58.7	229			58.3 21	
	16.4				50 21	7.6			60.5 22	
	277.7	42 23.9	17.9	42 16.9		41 26.6		41 59.9	47.48	42 13.3
cos δ 9.97767	24.6 37.7									
12669 T	42 3.43	3.427	42 3.58	3.580	41 45.64	45.645	41 46.32	46.320	41 47.48	47.48
.10436 ℓ ✱	39.76	3.41	39.74	3.56	39.69	45.63	39.52	46.30	39.38	47.46
T-ℓ ✱	23.66	39.66	23.83	39.64	5.95	39.59	6.80	39.42	8.10	39.28
		23.75		23.92		6.04		6.88		8.18
	-23.75		-23.58		-5.95		-6.89		-8.18	
	+.1	3.41	+.1	3.56	+.2	45.63	+.2	46.30	+.2	47.46
	-1.54		-1.52		-1.47		-1.30		-1.16	
		-23.76		-23.97		-6.03		-6.88		-8.22
	41 38.15	+.01	38.09	+.01	38.20	+.03	38.15	+.02	38.16	+.03
		-1.54		-1.52		-1.47		-1.30		-1.16
		38.13		38.08		38.16		38.14		38.11
		15		10		17		16		13
	10 15.5		10 0 54.9		0 14.3	1 65.3	0 20.3		100 35.7	
	35.9		25.2		45.0	35.2	25.4		42.6	
	1014		801		593	1005	457		783	
	50.70		40.05		59.65	50.25	22.85		39.15	
	-20.5		-13.3		+19.0	-220	-13.6		-35.8	
	1.31175		1.12385		1.27875	1.34292	1.13354		1.41162	
	1.41611		1.22821		1.38311	1.44678	1.23790		1.51598	
	-26.07		+16.91		+24.16	-27.98	-17.29		-32.81	
	10 50.70		11 40.05		9 59.65	10 50.25	10 22.85		10 39.15	
	10 24.63		10 23.14		10 23.81	22.27	10 5.56		10 6.34	
	84									
+18°	12′ 23.72″		12 25.21		12 24.54	26.08	12 42.79		12 42.01	
	-25.49		-26.10		-26.22	-26.22	-26.75		-26.73	
+18	11 58.2		11 59.1		11 58.8	59.86	12 16.0		12 15.3	
+18	13 19.1		13 19.2		13 19.3	19.3	13 19.6		13 19.5	
δ′ = +18	12 23.72		12 25.21		12 24.54	12 24.54	12 42.79		12 42.01	
~~.37~~	-15.20		-15.30		-15.40	15.40	-15.70		-15.60	
-.37	+1 20.9	20.5	+1 20.1	19.8	+1 21.0	2 19.4 190	+1 03.6	3.3	+1 04.2	3.8

+.06 +100 Oct 23　　−+17 +192 Nov. 2

41	2	41	18.5				
	34.1		19.7			41	54.6
	36.2 21		21.0				55.8
	38.4 22		592				58.0
	42.7 20		19.7	41	44.0		184
	44.9 22				46.3		56.1
	47.0 21				48.4		
	49.2 22				50.6		
	51.4 22				528		
	55.6 22				2421		
	57.9 23						
	60.0 21						
	517.4	41	19.7			41	56.1

41　47.04　47.036　　4842　　48.420 1 3 4
39.25　47.02　39.04　4840
7.79　39.15　937　3894
−7.95　7.87　−9.56　9.46
+ 2　　+ 6　41　38.12
−1.03　47.02　−.82　48.40
0.8.08　−7.96　38.11　−9.63
+.63　　+.06
−1.43　　−.52
38.06　　38.11
7　　12

5 4 28.0　　10 0 15.2
34.5　　15.0
625　　302
31.25　　15.10

+27.3　　−7.7
1.48616　　0.88649
1.54052　　0.99085
.3471　　−.972
9 31.25　　10 15.10
10 5.96　　10 5.31

12 42.39　　12 43.04
− 26.38　　− 26.80

12 16.0　　12 16.2
13 19.3　　13 18.8

12 42.39　　12 43.04
− 15.40　　− 14.90

+1 3.3 2.9　　+1 2.6 2.3

ζ Sagittae
19 43 18
+18 49

+34

1871	Sept 25		Sept 28.		Oct 8		Oct 16		Oct 22.	
	43 27.7	43 17.4		43 34.3	43 10.443	13.4		43 33.2	43 11.0	43 18.07
	29.8	18.4		35.5	12.5	14.1		35.8	13.0	
	31.9	19.3		36.5	14.6	27 5		37.8	15.0	
sin δ 9.50859	36.3	20.8	43 18.1	16 3	18.9	13 7		168	19.4	
	38.5	7 59	20.4	35.4	21.0			35.6	21.6	
	40.5	18.9	22.5		23.2		43 20.0		23.8	
	42.6	44 11.8	24.8		25.4	43 54.8	22.3		26.0	
	44.9	12.8	26.9		27.5	56.0	24.4		28.1	
cos δ 9.97615	49.1	13.9	11 2.7		31.9	57.2	26.6		32.5	
12669	51.4	38 5			34.1	18 0	28.8		34.7	
.10284	53.6	12.8			36.3	56.0	122.1		36.8	
	446.3				255.8.				261.9	
		43 18.9		43 35.4		43 13.7		43 35.6		43 18.0
	43 40.57	40.573	43 22.54	22.540	43 23.25	23.255	43 24.42	24.420	43 23.81	23.809

		Mean								
30	4 63.2	35 0 69.7	4 43.8		3 57.5	4 35.1	4 8.7		3 48.8	
	33.2	30 4 40.0	12.9		46.7	40.2	15.4		53.5	
	964	1097	567		1042		241		102.3	
	48.20	54.85	28.35		52.10				51.15	
	+27.1	−32.2	−12.9		+9.5		−11.2		+16.8	
	1.83646	1.50785	1.11059		0.97772		1.04822		0.76343	
	1.43930	1.61069	1.21393		1.08056		1.15206		0.86627	
	+27.50	− 40.50	−16.35		+12.04		− 14.19		+7.35	
	33 48.20	54.85	34 28.35		33 52.10		34 12.05		33 57.15	
	34 15.70	14.05	34 12.00		34 4.14		33 57.86		33 58.50	
+18°	48′ 32.65″	34.30	48 36.35		48 44.21		48 50.49		48 49.85	

Oct 23

43	—	43	31.2
	13.1		32.2
	15.4		33.6
	19.7		70
	21.8		32.3
	24.0		
	26.2		
	28.4		
	32.7		
	34.9		
	37.1		
		43	32.3

30 4 6.8
12.4
19.2
4 9.60

—.083

0.91908
1.02192
— 10.53
34 9.60
33 59.07

48 49.28

α √√

α Aquilae

19 44 83   44 29.35 (ast)   29.31

+8 21

			h m s					δ = +8° 31′ 45.7″
-3	Oct. 7	19 44	30.80	9	+8° 31′	59.0″		
-0		12	.71	9		58.9	-1	
-8		17	.62	9		58.8	-1	
-5		22	.54	8		58.6	-2	
-7		27	.46	8		58.4	-2	
-1	Nov.	1	.38	8		58.1	-3	
-4		6	.31	7		57.8	-3	
		11	.24	7		57.4	-4	
		16	.18	.06		56.9	-5	

+.15 +.56 1871	Oct. 4 +.07 +059		Oct. 5 +07 +048		Oct. 16 +05 +079		Oct. 24 +06 3 +100		Oct. 29 +11 +119	
-015	44 33.0	44 ~~33.0~~	44 24.8	44 ~~24.9~~		44 56.7		44 48.6	44 27.2	44 17.0
	35.1	~~35.1~~	27.0	~~25.5~~		57.8		49.7	29.3	18.8
	37.2	~~37.2~~	29.0	26.2		59.4		51.2	31.4	20.7
	39.2		33.1	27.5		239	34.2	149.5	35.6	56.5
	41.4		35.2	28.8		57.9	36.4	49.8	37.5	18.8
	185.9		37.3	82.5	C 38.6		38.4		39.5	
			39.4	27.5	40.8		40.5		41.6	
sin ∫ 9.16203			41.5		42.9		42.6		44.0	
	44 37.18		45.5		47.1		192.1		48.1	
			47.6		49.3				50.1	
			49.7 44	27.5	51.3 44	57.9	44	49.8	52.3 44	18.8
			410.1		4628				4372	
cos ∫ 9.99537					7.44					
12669	37.18	37.180	44 37.28	37.282	38.84	38.78 44	38.42	38.420	39.75	39.745
.12206	30.86	37.16	84	37.27	38.80	38.76	30.52	38.40	30.42	39.73
	6.32	30.81	6.44	30.79	30.64	30.59	7.90	30.47	9.32	30.37
		6.35		6.48	8.16	8.17		7.93		9.36
	-1.39	37.16	-6.47	37.27	-8.18	38.76	-7.95	38.40	-9.41	39.73
	+1		+1		±1		±1		+1 2	
	-1.51	-6.36	-7.49	-6.48	±1.29	-8.22	±1.17	-7.96	-1.07	-9.42
		+.01		+.01		+.01		+.01		+.02
	44 29.29	-1.51	29.33	-1.49	29.34	-1.29	29.31	-1.17	29.29	-1.07
		29.30		29.36		29.26		29.38		29.26
		.32		35		27		30		28

50 1 ~~19.0~~	0 56.8	1 34.7	1 ~~26.7~~ 1 26.7	0 42.2
25.0	62.0	40.8	32 32.0	43.2
440	1188	755	587	854
1 22.00	0 59.40	1 37.75	1 29.35	0 42.70
	+9.8	-19.1	-11.4	+20.9
	0.99123	1.28103n	1.05690	1.82015
	1.11329	1.40309n	1.17896n	1.44221
	+1297	-2530n	-1510n	+2768
	50 59.40	51 37.75	51 29.35	50 42.70
	51 12.37	51 12.45	51 14.25	51 10.38
+8	31 35.98	31 35.90	31 34.10	31 37.97
	- 38.60	- 39.87	- 38.83	- 39.97
+8	30 57.4	30 56.0	30 55.3	30 58.0
+8	31 59.0	31 56.8	31 58.6	31 58.3
δ = +8	31 35.98	31 35.90	31 34.10	31 37.97
	-13.30	-13.10	-12.90	-12.60
-.52	+1 1.6 1.1	+1 2.8 2.3	+1 3.3 2.7	+1 0.3 +0 59.8

+.17 +192
Nov 2

44 27.444 20.0
29.5 20.7
31.5 21.8
35.7 22.8
37.7 853
39.8 21.3
42.0
44.0
48.1
50.2
52.444 21.3
4385

39.87 39.864
30.36 39.85
9.51 30.81 29.378
9.54 29.30
−9.58 44
+ 2 39.852
−1.01
−9.53
29.30 +.02
−1.01

29.33
34

0 47.8
48.1
959
0 47.95

+ 18.6
1.26957
1.39157
+2464
50 47.95
51 12.59

31 35.76
— 40.10

30 55.7
31 58.0

31 35.76
— 12.30

41 231.8

η Aquilae √

19 45 54 45 54.05
54.07

+0 40

+.01 +.67

+1
+8
+1
−2
+3
+1
+2

Sept. 27	19 45	44	10	+0° 40′ 44.7		
2	19	64	9			
Oct. 7		55.55	9	44.7	.1	δ = +0° 40′ 34.″2
12		.46	9	44.6	.1	
17		.38	8	44.5	.2	
22		.30	8	44.3	.2	
27		55.23	7	44.1	.2	
Nov. 1		.15	8	43.9	.3	
6		.08	7	43.6	.4	
11		.01	7	43.2	.4	
16		54.95	6	42.8	.4	

1871 Sept 25 +.04 +.045 Oct. 4 +.07 +.059 Oct. 5 +.07 +.048 Oct. 8 +.07 +.065 Oct. 22. +.10 −.147

sin δ 8.06578

cos δ 9.99998
.12669
.12667

Sept 25
46 15.6 46 24.8
17.4 26.0
19.6 27.3
21.6 181
23.7 26.0
97.9
46 26.0
46 19.58 19.580
55.78 19.56
23.80 55.78
23.78
−23.98 19.56
0
−1.73
(53.47) −23.97
+ .00
− 1.73
(53.86)

Oct. 4
45 49.7 46 21.7
51.7 22.6
53.8 23.8
57.8 81
59.9 22.7
−2.0
4.0
6.1
10.1
12.2 46 22.7
14.3
321.6
300.
21.6
46 1.96 1.964
55.60 1.95
6.36 55.60
6.35
−6.38 1.95
0
−1.55
− 6.36
54.03 + .00
−1.55
54.04
.06

Oct. 5
45 49.9 46 16.3
51.9 17.8
53.9 19.0
58.0 231
0.1 17.7
2.1
4.1
6.2
10.3
12.4 46 17.7
14.4
263.3
240
23.3
46 2.12 2.118
55.58 2.10
6.54 55.58
6.52
−6.47 2.10
0
−1.53
− 6.46
54.12 + .00
− 1.53
54.12
13

Oct. 8
46 16.1
17.5
45 58.4 18.7
60.3 223
62.4 17.4
64.5
66.5
312.1
46 17.4
46. 62.42 62.4224
55.53 2.41
6.89 55.53
688
−6.89 2.41
0
−1.48
− 6.88
54.05 + .00
− 1.48
54.05
.06

Oct. 22.
45 50.7 45 41.2
52.8 43.0
54.9 44.5
59.0 87
1.0 42.9
3.1
5.1
7.2
11.3
13.4 45 42.9
15.5
273.0
240
34.0
46 3.09 3.090
55.30 3.07
7.79 55.30
7.77
−7.79 3.07
0
−1.25
− 7.81
54.05 + .00
− 1.25
54.01
03

Sept 25
40 2 51.0
21.7
727
36.35
− 6.4
680618
1.93285
− 8.57
42 36.35
42 27.78
+0° 40 20.″57
− 51.82
39 28.7
+0 40 44.8

Oct. 4
2 37.9
43.3
81 2
40.60
+ 39.3 − 20.7
1.59440 1.31600
1.72107 1.44267
+ 20.88 − 27.71
42 40.60
2 40.6 42 12.89
40 35.46
− 51.83
39 43.6
40 44.7

Oct. 5
2 30.3
37.0
673
33.65
− 15.6
1.19812
1.31979
− 20.882
42 33.65
42 12.77
40 35.58
− 51.41
39 44.2
40 44.7

Oct. 8
2 28.0
33.5
615
30.75
− 15.0
1.17609
1.30276
− 20.082
42 30.75
42 10.67
40 37.68
− 53.222
39 44.5
40 44.7

Oct. 22.
1 44.8
50.6
954
47.70
+ 20.2
1.30585
1.43202
+ 27.04
41 47.70
42 14.74
40 33.61
− 51.55
39 42.1
40 44.5

−.62 +1 16.1 15.5 +1 1.1 0.5 +1 0.5 +0 59.8 +1 0.2 +0 59.6 +1 2.2 1.6

δ′ = +0 40 20.57 40 35.46 40 35.58 40 37.68 40 33.61
−10.60 −10.50 −10.56 −10.50 −10.10

″
4.2

~~+0~~6 3 +100 +.17 +192

Oct. 2~~4~~3 Nov. 2

46	2.6	45	50.9	45	52.3	46	23.7
	3.7		53.0		54.3		25.2
	4.8		55.0		56.5		26.6
	11 1		59.2		0.5		155
	3 7		81.2		2.7		25.2
			3.2		4.7		
			5.2		6.7		
			7.4		8.8		
			11.5		12.9		
46	3.7		13.6		15.0	46	25.2
			15.6		17.0		
			2758		2314		
			240		180		
			35.8		51.4		

46 3.25 3.255 4.67 4.673
55.28 3.245 55.13 4.66
7.97 55.25 9.54 55.13
9.53 54.060
−7.91 7.96 −9.55 − 945 54.05
.0 3.24 0 4.966
−1.23 −1.08
−7.96 −9.53
54.07 +.00 54.04 +.00
−1.23 −1.08
54.06 54.05
08 06

2	13.2	2	38.8
	20.1		39.9
	33 3		78.7
	16.65		39.35
	−10.5		−20.5
	9.69897		1.31175
	9.82569		1.43842
	−067		+2744
42	16.65	42	39.35
42	15.98	42	11.91
40	32.37	40	36.44
	−50.85		−53.45
39	41.5	39	43.0
40	44.2	40	43.9
+1	2.7 20	+1	0.9 0.3
40	32.37	40	36.44
	−10.06		−9.70

-.041

ε Draconis

19 8 46 (48 35.87 (-.02) 35.88 +.04)
+69 56

-13	Sept. 17	19 48 37.71	.31	+69° 56′ 40.7″	.9
+6	22	.40	.31	41.6	.8
-7	27	.09	31	42.4	.6
-4	Oct- 2	77	32	43.0	.5
+6	7	36.45	32	43.5	.3
+17	12	12	33	43.8	.3
+3	17	35.79	33	44.1	.1
+1	22	35.45	34	44.2	.0
	27	35.11	.34	44.2	
	Nov. 1				

δ = +69° 56′ 20.9″

+274 -.46 +10.147

1871 Oct-22.	Sept 24 +02 +027	Sept 25 +14 +045	Oct-5 +07 .048	Oct. 8 +07 +065	Oct-16 +05 +079
48 ~~6.8~~ 48 23.7 12.8 60 24.9 18.7 5.9 86 30.9 122 243 36.8 5.9 -42.8 6.0 48.8 6.0 54.8 6.0 6.8 120 13.0 62 18.9 59 2911 18 48 24.3 4701	48 25.3 48 9.7 30.9 13.3 36.9 16.3 49.0 393 55.1 13.1 -1.0 7.0 50 31.2 13.0 32.1 25.0 33 31.1 31.1 37.0 3113 300 48 13.1 11.3	48 25.4 48 4.9 30.9 6.2 31.0 9.0 49.0 11.4 54.9 315 1.0 7.9 7.0 49 44.4 13.0 46.5 25.0 49.6 31.0 1405 36.8 46.8 311.0 300 48 7.9 11.00	48 6.8 47 ~~21.0~~ 12.9 ~~23.0~~ 19.0 ~~24.3~~ 30.9 47 46.6 36.8 48.5 42.8 51.6 48.9 54.0 54.9 2007 6.7 50.2 12.9 18.8 291.4 180 47 50.2 471.4	48 7.3 47 50.2 13.1 52.8 19.1 57.1 31.2 1601 37.2 53.4 43.0 49.1 49 31.0 55.2 33.6 67.1 37.8 13.1 1024 19.1 34.1 47 4.5 47 53.4	48 8.1 47 54.7 14.1 57.8 20.2 0.4 32.2 1729 38.1 57.6 -44.0 49.9 56.0 8.0 13.9 19.9 3044 180 47 57.6 484.4
4274 42.98 35.47 43 42.69 7.29 35.41 7.28	29 1.03 1.027 37.30 26 0.99 23.78 37.22 23.77	49 1.00 1.000 37.24 20 0.96 23.78 37.18 23.78	49 42.85 42.855 36.60 54 42.81 6.27 36.54 6.27	48 43.14 43.136 6.40 36 43.10 6.72 36.34 6.76	49 44.04 44.036 35.86 84 44.00 8.18 35.82 8.18
-7.79 +.27 42.98 +.40 -7.81 48 35.82 +.40 +.44 35.72	-23.75 +.5 0.99 -1.43 -23.75 35.80 +.06 -1.39 35.91	-23.58 +11 0.96 -1.37 -23.97 35.76 +.12 -1.33 35.78	-.64 +.19 42.81 -.73 -6.45 35.84 +.13 -0.67 35.82	-.18 +.19 43.10 -.53 -6.88 35.91 +.18 -0.49 35.91	-8.18 +.14 44.00 -.01 -8.22 35.99 +.21 ~~+.0~~ +.026 36.02
83	93	80	83	93	04

sin δ
9.97280

cos δ
9.83544
12669
9.66213

25 2 28.2 27.1 553 27.65	25 2 48.0 3 51.3 11.8 15.1 598 664 29.90 33.20	2 48.7 3 32.8 12.0 57.2 607 900 30.35 45.00	2 13.0 12.0 250 12.50	2 14.9 3 1.8 12.5 59.6 274 1214 13.70 4 0.7	2 17.7 15.7 334 16.70
+18.4 1.26482 0.92695 +1845 27 37.65 27 36.10	+47.9 -9.01 1.68084 1.95472 1.34247 1.61681 +22.00 -41.39 27 29.90 33.20 27 51.90 9.39 51.81	+53.1 1.72509 1.38722 +24.39 27 30.35 27 54.74	+52.6 1.72099 1.38312 +24.16 27 12.50 27 36.66	+49.7 1.69686 1.35849 +22.83 27 13.70 27 36.53	+46.4 1.66652 1.32865 +21.31 27 16.70 ~~27~~ 38.01
+69° 55′ 12.25″ + 29.65	54 56.45 + 28.76	54 53.61 + 29.44	55 11.69 + 29.10	55 11.82 + 30.22	55 10.34 + 30.12
+ 55 41.9 + 56 44.2	55 25.2 56 42.0	55 23.0 56 44.2	55 40.8 56 43.3	55 42.0 56 43.6	55 40.5 56 44.1
+.44 +1 2.3 2.7	+1 16.8 17.2	+1 19.2 19.7	+1 2.5 2.9	+1 1.6 2.1	+1 3.6 4.0
δ′=+69 55 12.25 - 23.30	54 56.45 - 21.10	54 53.61 - 21.30	55 11.69 - 22.40	55 11.82 - 22.70	55 10.34 - 23.20

+ 11 +119

~~Oct - 24~~ Oct - 29 Nov - 2

48 55.3 48 43.1 48 8.3 47 45.6
57.4 44.3 14.4 48.3
59.4 43.7 20.1 51.3
3.6 32.0 14 5 2
5.6 38.1 48.4
7.7 44.1
9.8 50.1
11.8 56.3
16.0 7.8
18.1 14.2
20.2 20.0
3D 5.4
180
485.4 47 48.4
49 4413 44.127
3495 96 4409
9.18 3019
9.20
− 9.42
+ .80 198
+ .92 4409
35.93 − 9.42
+ .30
+ 0.91
35.88

90

2 14.2
7.9
22 1
11.15

+ 55.7
1.74586
1.40799
+ 25.58
27 11.05
27 3663

55 11.72
+ 30.14

55 41.9
56 44.2

+1 2.3 2.7

55 11.72
− 23.38

δ = +6° 5′ 10.9″

β Aquilae 19 48 58.58 (-02)
58.58

19 48 59 Sept 27. +0.2 +112 Oct 4 +07 +059 +06 Oct 24 +100 Oct 31 -348 +18 +1.50

7.59 1871

-4
+5
-1
+1
0

Sept. 17	19 48 55.84	16 48	60.37	δ +6° 5′ 22.6″
22	.78		29	22.8 +2
27	70		21	22.9 +1
Oct 2	62		13	22.9 +6
7	55		60.05	22.9 +6
12	47		59.97	22.8 -1
17	39		.89	22.7 -1
22	31		81	22.5 -2
			59.72 .09	22.3 -2

+6 05

+11

48 53.6	19 49 25.6	48 54.1	49 22.0	48 55.3	48 43.2	48 56.6	49 18.3
55.7	26.6	56.2	23.0	57.4	44.3	58.6	19.8
57.8	28.5	58.2	24.3	59.4	45.8	0.7	20.7
2.0	29.8	2.3	93	~~2.0~~	133 3	4.8	588
3.9	11 05	4.4	23.1	3.6	44.4	7.0	19.6
-5.9	27.6	6.5		5.6		9.0	
8.1		8.6		7.7		11.1	
10.2		10.6		9.8		13.2	
14.4		14.8		11.9		17.3	
16.5 49	27.6	16.8 49	23.1	16.0 48	44.4	19.3 49	19.6
18.5		18.8		18.1		21.4	
246.6		251.3		~~20.2~~		219.0	
180		180		265 0		120	
66.6		71.3		180		99.0	
49 6.05	6.055	49 6.48	6.482	85 0	7.727	49 9.00	9.000
0.21	6.04	58.09	6.47	49 7.72	7.71	59.66	8.98
5.84	0.19	6.38	07	55.79	59.77	9.32	59.64 -8.5/3
	5.85		6.40	7.91	7.94		9.348 5856
+5.85		-6.47		-7.95		-9.29	19 9.48
0	6.04	0	6.47	+ 1	7.71	+ 2	8.98
-1.63	-5.89	1.51	-6.36	-1.21	-7.95	-1.08	-9.31
48 58.57	+.01	58.50	+ .11	58.57	+ .01		+.02
	-1.63		-151		-1.21		-1.08
48 58.57	58.53	58.50	58.61	58.57	58.56	58.65	58.69
	.54		63		57		63

sin δ 9.02520

cos δ 9.99755
12669
.12424

15	3 42.0	3 63.9	2 12.9	2 56.2
	14.0	69.3	19.4	57.3
	53 0	133 2	32 3	113 5
	26.50	3 6.60	16.15	56.75
	-21.6	-16.6	+23.3	-10.6
	1.33445	1.22011	1.36736	1.02581
	1.45869	1.34435	1.49160	1.14955
	-2832	-2210	+ 3102	-1417
	18 26.50	18 6.60	17 16.15	17 56.75
	17 57.75	17 44.50	17 48.17	17 42.64
+6°	4 50.60″	5 3.86	5 1.18	5 5.71
	- 42.97	- 42.91	- 42.06	- 44.71
	4 7.6	4 20.9	4 19.1	4 21.0
+6	5 22.9	5 22.9	5 22.4	5 22.1
-.54	+1 15.3 14.8	+1 2.0 1.4	+1 3.3 2.8	+1 1.1 0.6
δ′ = +6	4 50.60	5 3.85	5 1.18	5 5.71
	-12.00	-12.00	-12.50	- 11.20

P. Mus. Min √
19 53 ~~44~~ 17.97 = N.A.
17.57 ~~18~~.52 = P.A.
B − b = +4 49!
a − D = −1 50!
c − E − 3 39.8
88 ~~55 39~~
+.05.9
Exp. carefully,
88 55 13.47 = N.A.
14.43 = P.
δ = +88° 55′ 14.4″

+88 55
+53.38 1871
53.36

	Sept 27 (+.112)	Oct 4 (+.05.9)	Oct 8 (+.06.5)	Oct 16 (+.07.9)	Oct 22 (+.14.7)

(−82)

53 17.4 / 19.2 / 23.5 — 53 20.0, 55 8.7, 57 0.9
51 β 20.2, 24.1, 29.2 } 24.5 — 51 2.4, 5.2, 7.6
51 b 15.2, 21.0, 25.8 — 49; 30.7, 51 20.7 — 51 59.6
51 b 3.3, 9.3, 14.7 — 19.1, 53, 9.1 — 31.8, 32.8, 34.0, 50.7 — 49, 50
53.5, 56.3, 59.4 — 6.4, 51 66.4 — 9.0, 10.0

55 5.1 / 8.7 / 12.2
53 b 7.8, 12.0, 18.0 } 12.6
53 c 25, 7.3, 12.5 — 7.4
52 c 53.4, 0.6, 5.5 — 55.8
86 52 — 42.3, 47.6, 52.1 — 47.3
46.4 / 47.3 / 46.9 / 46.5 / 46.78

200 53 20.0
18.7 18.7
21.0 20.7
1.4
19.90
56 57.1 / 1.0 / 4.5
54 d 56.1, 2.4, 8.7 } 2.4
54 d 50.2, 61.0, 65.5 — 58.9 — 10.7, 7.4, 8.9, 7.8
54 d 42.9, 50.0, 54.8 — 45.2 — 59.1, 59.8, 59.2, 59.5, 59.40
54 — 31.8, 37.6, 41.1 — 56 36.9 — 42.6, 43.5, 44.0

Sin √ 9.99952

56 e 41.7, 48.3, 52.9 — 47.7 — 34.8, 8.70
56 e 33.5, 39.9, 44.8 — 39.4
56 — 22.0, 23.8, 31.3 — 26.4

53 18.71 √
51 24.5, 53 12.6, 55 2.4 — 51 14.6, 12.6, 13.3, 9.9, 13.20
59 — ~~36.7~~

cos √ 8.27326 ~~270~~
12669
~~8.39934~~
8.39955

53.2020 — −5.90 — + 5.58 — + 74
53 1260 — −6.36 — +3.15 — +7.84
15 53 1260 — 10.13 √ — 2.47
53 7.40 — −4.41 √ — 2.99
53 7.40 — −6.88 — +3.47 — +13.56
56.8, 59.8, 59.7, 59.1 — 4 — 58.35
52 58.35 — −8.22 — +4.22 — 23.76
45.5, 47.3, 46.8, 46.7
52.4658 — −7.81 — +7.84 — 32.46

53 21.02 — 17.23 — 51 3.8 — 17.55 (51 59.6)
52 − 54.21 √ — 59.8 — 54.4 — 4.14 — 18.11
46.58 — −46.51 — 1.07 — 19.07

16.54, 120, 4.54
17.6.6, 120, 29.66 — 53 32.9
23.34, 46.62 — 51 9.5

53 1962, −82, 53 1881, 53 18.88, −.07, 53 ~~19.90~~, 53 19.08, −5.90, +5.98, +74, 19.90
53 13.30, −82, 12.48, 10.33, +215, 53 13.20, 53 12.35, −6.36, +3.15, +7.84, 16.99
53 9.08, −82, 8.26, 4.62, +3.64, 53 8.70, 53 7.88, −6.88, +3.47, +13.56, 18.03
59.32, −82, 58.50, 54.41, +4.09, 59.40, 58.58, −8.22, +4.22, +23.76, 18.34
46.62, 82, 45.80, 45.72, +08, 46.78, 45.96, −7.81, +7.84, +32.46, 18.45

Use.

25 4 16.5, 11.4, 27.9, 13.95 — +12.94 — 2.11123 — 0.51188 — + 325 — 29 13.95 — 29 17.20
4 19.3, 12.7, 32.0, 16.00 — +6.91 — 1.83948 — 0.23913 — + 173 — 29 16.00 — 29 17.73
4 20.4, 15.9, 36.3, 18.15 — +265 — 1.42325 — 9.82320 — +0.66 — 29 18.15 — 29 18.81
−345 — 1.53782 — 9.53767 — − 0.87 — 29 18.15 — 17.28
4 13.7, 9.1, 22.8, 11.40 — +15.73 — 2.19673 — 0.59668 — + 395 — 29 11.40 — 29 15.35
4 21.0, 16.3, 37.3, 18.65 — −2367 — 2.37420 — 0.77415 — −594 — 18.65 — 12.71

+88° 53′ 31.15″ — + 59.90 — 54 31.0
53 30.62 — +61.69 — 54 32.3
53 29.54 — + 59.88 — 54 29.4 — 31.07
53 33.00 — + 59.66 — 54 32.7 — 35.64

+1.00 — 88 55 33.4 — + 34.4 — +.67 — + 1 3.4 — 4.1 — − 19.9
55 34.9 — + 35.9 — +1 3.6 — 4.3 — −21.4
55 35.6 — + 36.6 — + + 7.2 — 7.8 — −22.4
55 35.9 — + 36.9 — +7 4.2 — 4.9 — − 22.4

a-c'	+3	384	402	402	358	429	= +3	403	a-c
b-c'	+1.	484	502	502	49.6	48.5	+1	49.4	
c'-c	+0	+1.7	-0.5	-0.7	+00	-0.6	+	00	
c'-d	-1.	49.8	49.5	50.3	50.1	50.1	-1	50.0	
c'-e	-3	38.6	40.1	39.8	39.5	40.5	-3	39.7	

19.90	21.02	+250
16.99	17.23	-1.29
18.03	17.55	-97
18.34	18.11	-41
18.45	19.07	+55
18.30	18.18	+36
18.21	18.56	+44
18.19	21.01	+2.49
13.79	18.93	+.41
+17.80		

+100
Oct 23

50 56.6 51 15.5
58.8 59.3
63.7

54 —
=

54 33.0 56 44.2
32.3 36!
43.1

56 21.6
56 24.6 28!
32.1
34.3

48.9 41.17
46.1 7.40
48.4
28.9
47.63 48.57
-44.11
3.52

57 15.5

53 48.7 49.3
46.1 46.1
48.4 48.2
23.6
47.87

52 47.63
-7.95
+5.34
33.86

18.88

+200
Oct. 30

~~46~~ ~~58.0~~
50 45.2 B
52 34.8 B
54 24.9 D
56 14.3 E

35.2
34.8
34.8
34.6
17.5

52 34.38
+9.31
+10.67
+42.82

52. 34.84
-35.15
0.77
17.42

18.56

+182
Nov. 2

48 48.3 56 26.0
50 42.7
52 31.8
54 21.3
56 11.7

52 31.16
-30.83
+0.33
15.58

52 31.16
-9.03
+10.24
+47.14

19.01

56 260

+200
Nov 5

19 59 42.1
1 30.8
3 22.4

19 52 22.9
21.1
22.3
53
62

52 22.07
-9.60
10.67
51.47

52 21.77
-26.50
-4.73

(14.31)

+240
Nov. 7

1 22.0
3 18.2

52
17.0
13.0
10.6
11.2

52 15.30
23.87
52 13.7

52 15.30
-8.99
12.81
54.10

(13.22)

47.73
82
46.91
44.33
+2.58
47.87
47.05
-7.95
+5.34
+33.86
18.30

34.84
82
34.02
35.35
-1.33
34.85
34.03
-9.31
+10.67
+42.82
18.21

31.16
82
30.34
31.04
-0.70
30.34
-9.53
+10.24
+47.14
18.19

21.77
82
20.95
26.73
-5.78
52 22.07
21.25
-9.60
+10.67
+51.47
13.79

15.311
82
14.48
24.09
-9.61

Eq. Intervals Log. Int.

6-1	12.360	1.09202	10 59.6
6-2	10.300	1.01284	9 9.7
6-3	8.240	.91593	7 19.8
6-4	4.180	.61490	3 39.9
6-5	2.06	.31387	1 50.0
6-6	.00		

10	59.6
9	9.7
7	19.8
3	39.9
1	50.0

4 15.5 4 18.9
12.2 16.2
27.7 35.1
13.85 17.55

+ 152.4 -175.8
2.18299 2.24502
0.58294
+ 3.83 -4.41
29 13.85 17.55
29 17.68 13.14

53 30.67
58.77
54 29.4

4 18.2 4 27.0 4 27.0
10.4 17.9 15.3
28.6 44.9 42.3
14.30 22.45 21.15

-.44757
2.24472
0.64472
-4.41
29 21.15
29 16.74

53 31.61
+63.40
54 35.0

+6.84
1.83506
0.23501
+.472

55 35.9
36.2
+1 7.5 8.2

-22.1

55 36.0
36.0
+1 2.0 2.7

-22.5

e Draconis

20 0 12

1871 464 27

+2.09

	Sept 25		Oct. 8		Oct - 16			Oct - 23	Oct - 30	
	~~3.4~~									
	0 7.9	0 29.1	59 45.3	59 24.5		0 59 58.6		0 2.0	59 46.4	59 29.0
	12.4	×	50.0	27.8		60.7		4.0	51.2	31.6
	22.4		54.8	31.3		63.4		6.6	55.9	34.8
	27.0		0 4.4	83.6		182.7		12.6	5.2	54
	– 31.9 –		9.0	27.9		60.9	0 4.7	4.2	10.0	31.8
	36.5		13.9		0 5.3		9.3		14.8	
	41.1 1	10.8	18.7 1	0.8	9.9		14.0		19.6	
	50.7	13.9	23.4	5.1	14.9		19.0		24.6	
sin δ 9.95531	55.4	16.5	33.0	5.9	19.8		23.6		34.0	
	0.3	11.2	37.9	2.9	24.1		70.6		38.9	
	~~40.9~~ 0	13.7	42.6		74.0				43.5	
	60		333.0						349.1	
cos δ 9.63478	349 0	0 29.1	180 59	27.9		0 0.9		0 4.2	180 59	31.8
12669			153.0						164.1	
	31.73		0 13.91	13.909	0 14.80	14.800 0	14.12	14.120 0	14.97	14.92
9.76147										

	Sept 25	Oct. 8	Oct - 16	Oct - 23	Oct - 30
55	1 50.1 2 15.2	0 49.4 1 43.3	1 8.7	1 8.7	0 53.5
	13.2 37.2	45.4 38.5	5.2	7.3	45.7
	63.3 52.4	94.8 81.8	13.9	16.0	99.2
	31.65 26.20	47.40 40.90	6.95	8.00	49.60
	+26	+46.0	+13.9	+9.9	+43.1
	~~0.27575~~ 0.41500	1.66276	1.14301	0.98564	1.63448
	0.40822 .17647	1.42423	0.90448	0.75711	1.39595
	~~+1.49~~ +1.50	+26.56	+ 8.03	+ 5.73	+ 24.88
	56 31.65 31.65	55 47.40	56 6.95	56 8.00	55 49.60
	56 ~~[illegible]~~ 33.15	56 13.96	56 14.98	56 13.73	56 14.48
+64°	26′ 15.20″	26 34.39	26 33.37	26 34.62	26 33.87

Nov_ 2

59 — 0 48.0
51.0 49.4
55.5 51.3
5.5 1487
10.1 49.6
—14.9
19.8
24.60 49.6
34.0
38.8
437

1496

1 39.7
29.0
687
34.35—

—+347
1.54033
1.30188
—+ 2004
56 34.35
56 14.31

26 34.04

BAC 6924
20 2 32
+55 50
~~+148~~

1871	Oct – 8		Oct 16		Oct – 2~~4~~3		Oct. 30		Nov. 2	
	2 11.4	1 56.0	1 32.1	2 6.8	2 11.8	1 50.6	2 12.7	2 7.0	2 12.7	2 4.6
	14.9	58.6	35.8		15.5	53.1	16.4	8.4	16.5	6.4
	18.6	0.6	39.6		19.2	55.3	20.3	10.6	20.0	9.6
	26.0	175 2	46.8		26.5	90	27.3	260	27.5	206
	29.8	58.4	50.6		30.1	53.0	31.0	8.7	31.2	6.9
	33.4		-54.2		33.9		34.8		34.9	
	37.0	2 59.0	58.0		37.4		38.5		38.4	
	40.6	60.3	1.6		41.1		42.1		42.1	
sin δ 9.91840	48.1	62.3	9.0		48.4		49.6		49.6	
	51.5	1816	12.5		52.3		53.2		53.1	
	55.4	60.5	16.3		56.9		56.8		57.0	
	366.7		356.5		372.1		3827		3830	
cos δ 9.74794		1 58.4	240	2 6.8		1 53.0		2 8.7		2 6.9
			59.6.5							
12669	2 33.34	33.336	1 54.23	54227	2 33.83	33827 2	34.79	34791	34.82	34818
9.87463										
25	0 7.5	0 536	1 35.0		0 60.2		0 15.4		0 15.7	
	3.9	50.9	33.0		61.5		8.9		9.0	
	11 4	1045	680		1217		243		247	
	5.70	52.25	34.00		+ 0.85		12.15		12.35	
	+34.9		-12.6		+40.8		+26.1		+27.9	
	1.54283		1.10037		1.61066		1.41664		1.44560	
	1.41746		0.97500		1.48529		1.29127		1.32023	
	+2615		-994		+3087		+1956		+2041	
	25 5.70		26 34.00		26 0.85		25 12.15		25 12.35	
	25 31.85		26 24.56		26 31.42		31.71		25 33.26	
+55	57 16.50		56 23.79		57 16.93		57 16.64		57 15.09	

θ Aquilae 20 04 38.88 (+02)
38.91

20 4 42

1871
+.69 −1 13
−.02

δ = −1° 12′ 8.5″

+7
+3
+1
−1
+5
+5
+3
+3

	Sept 25 +04 +045		Sept 27 +02 +112		Oct. 8 +07 +065		Oct. 9 +03 +025		Oct. 24 +06 +100	
	4 52.5 54.4 56.5 0.5 2.6 4.7 6.8 8.9 13.0 15.0 17.0 2319 180 51.9	4 42.0 43.4 44.8 102 43.4 5 23.2 24.4 25.5 131 24.4 4 43.4	4 34.2 36.2 38.3 42.5 44.5 46.6 48.7 50.7 54.5 56.8 58.9 5122	4 26.0 27.2 29.8 830 27.7 4 27.7	4 35.0 37.2 ~~39.2~~ 43.3 45.3 47.4 49.5 51.5 55.6 57.6 59.6 5212	4 25.3 26.5 27.7 795 26.5 5 4.7 5.9 4 6.8 5.8 5 12.0 13.0 4.265 13.8 88	43.1 4 45.2 47.3 49.4 51.5 2365	4 56.2 57.3 58.7 1722 57.4 4 57.4	4 36.0 38.0 40.0 44.1 46.2 48.3 50.3 52.3 56.4 58.5 60.6 5307	4 32.6 33.8 34.7 111 33.7 4 33.7
sin √ 8.32702 cos √ 9.999 90 12669 12659	5 4.72 40.67 24.05 −23.98 0 −1.79 4 38.95	4.718 4.70 40.69 24.01 4.70 −23.98 −.00 −1.79 38.93 .95	4 46.56 40.64 5.92 ~~+~~5.85 0 −1.76 38.95	46.563 4655 40.66 5.89 46.55 −5.90 −.00 −1.76 38.89 .91	47.38 40.48 6.90 −6.89 0 −1.60 38.89	12.9 47.382 4736 40.50 686 47.36 −6.88 −.00 −1.60 3888 89	4730 40.47 6.83 −6.85 0 −1.59 3886	473004 4728 40.49 6.79 47.28 −6.84 −.00 −1.59 38.85 87	46.24 40.24 8.00 −7.95 0 −1.36 38.93	48.245 4823 40.24 7.99 48.23 −7.96 −.00 −1.36 38.91 93
30	4 55.9 26.6 825 41.25	35 0 45.3 21.6 669 33.45	4 56.5 28.9 854 42.70		4 19.3 24.8 441 22.05	35 0 30.4 27.3 577 25.85	4 63.0 10.0 730 36.50		4 30.2 38.9 691 34.55	
	+21.3 1.32838 1.45497 +28.51 34 41.25 35 9.76		+18.9 1.27646 1.40305 +25.30 34 42.70 35 8.00		+20.9 1.32015 1.44674 +27.97 34 22.05 34 50.02		−10.1 1.00432 1.13091 −13.57 35 6.50 34 52.93		+14.5 1.16137 1.28796 +19.41 34 34.55 34 53.96	
−1°	13′ 21.41″ −55.61		12 19.65 −55.65		12 1.67 −57.12		12 4.58 −54.76		12 5.61 −54.67	
−1 −1	14 17.0 11 57.8		13 15.3 11 57.8		12 58.8 11 57.8		12 59.3 11 57.8		13 00.3 11 58.42	
−.64	+1 19.2	18.6	+1 17.5	16.8	+1 1.0	0.4	+1 1.5	0.9	+1 2.6	1.4
δ′ = −1	13 21.41 −10.70		12 19.65 −10.70		12 1.67 −10.70		12 4.58 −10.70		12 5.61 −10.30	

Sept.17	20 04	40.79	07	−1° 11'	57.9"
22		.72	08		57.9
27		.64	07		57.8
Oct.2		.57	07		57.8
7		40.50	08		57.8
12		42	08		57.9
17		34	08		58.0
22		26	08		58.2
27		40.18	08		58.4

Oct 30 ~~+18~~ +200 Nov 2 ~~+17~~ +192

4	37.2	4	34.3	4	37.3	4	40.0
	39.1		35.5		39.4	31	41.0
	41.3		36.5		41.4	20	41.8
	45.3		163		45.6	42	28
	47.5		35.4		47.6		40.9
	49.5				49.7		
	51.5				51.7		
	53.6	4	35.4		53.7	4	40.9
	57.7				57.9		
	59.8				59.8		
	61.9				61.9		
	5444				5460		

38914

4 49.49 49.491 49.64 39636 38.90

40.13 49.47 40.08 2004 49.62

9.36 − 40.15 9.56 20 40.10

− 9.29 9.32 − 9.55 9.52

− 1.25 49.47 − 1.20 49.62

38.95 38.89

− 9.31 − 9.53

− .00 − .00

− 1.25 − 1.20

38.91 38.89

93 91

2

30 4 30.1 4 39.3

32.5 40.8

626 801

31.30 40.05

+14.1 +8.7

1.14922 0.93952

1.27581 1.06611

+1887 +1165

34 31.30 34 40.05

34 50.17 34 51.70

12 1.82 12 3.35

− 57.96 − 57.42

12 59.8 12 60.8

11 58.85 11 58.46

+1 1.3 0.7 +1 2 1.5

12 1.82 12 3.35

− 10.00 − 9.90

2e Vulpeculae

21 06 40 1871	Sept 25		Oct. 8		Oct. 9		Oct 2~~4~~3		Oct. ~~24~~ 30	
+26 05	6 48.0	6 45.8	6 30.7	6 26.5	6 30.7	6 23.0	6 31.4	6 21.8	6 32.5	6 23.1
	50.3	46.5	32.9	27.5	33.0	24.3	33.7	22.8	35.0	24.6
+,49	52.6	48.3	35.2	29.0	35.2	25.7	36.0	23.9	37.2	26.3
	57.2	1406	39.8	230	39.8	130	40.5	24.6	41.7	140
	59.4	46.9	42.0	27.7	42.0	24.3	42.8	131	44.0	24.7
	-1.7		44.4		44.3		45.1	23.3	46.4	
	4.0	7 26.6	46.6	7 7.6	46.7		47.4		48.6	
	6.3	27.8	48.9	9.0	49.0		49.6		50.9	
sin √ 9.64313	11.0	29.2	52.5	10.3	52.5		54.3		55.5	
	13.2	836	55.8	269	55.9		56.6		57.7	
	15.5	27.9	58.2	8.9	58.2		58.8		60.0	
	3192		487.0		488.3		4962		5095	
	300	6 46.9		6 27.7		6 24.3		6 23.3		6 24.7
cos √ 9.95335	19.2									
12669	7 1.75	1.745	6 44.27	44.273	6 44.30	44.391	6 45.47	45.018	6 46.32	46.318
.08004										

15	2 47.33	37.4	2 10.4	3 59.7	2 8.7		2 64.6		2 7.2	
	16.1	4.6	11.0	61.3	9.9		67.8		3.7	
	634	420	214	1210	186		1324		109	
	31.70	21.00	10.78	60.50	9.30		66.20		5.45	
	+14.8		+16.6		+20.1		+21.7		+21.6	
	1.17027		1.22011		1.30320		1.33646		1.38445	
	1.25031		1.30015		1.38324		1.41650		1.41449	
	+17.80		+19.96		+24.17		+26.09		+25.97	
	17 31.70		17 10.70		17 9.30		17 6.20		17 5.45	
	17 49.50		17 30.66		17 33.47		17 32.29		17 31.42	
+26°	4′ 58.85″		5 17.69		5 14.88		5 16.06		5 16.93	

Nov– 2 Nov– 5

6	32.8	6	24.8	—	6	40.8
	35.1		26.0	—		41.5
	37.3		27.5	—		26
	41.9		18.3	—		41.3
	44.1		26.1 6	44.1		
	46.4			46.6 –		
	48.7			48.7		
	51.0			51.0		
	55.6					
	58.0	6	26.1		6	41.3
	60.2					
	51.07					
	46.43		46.427	46.51	✡'	

2	8.8	2	30.7	
	5.2		23.0	
	14.0		53.7	
	7.00		26.85	
	+ 20.3		+ 5.2	
	1.30750		0.42428	.71600
	1.38754		0.80432	.79604
	+ 2441		+ 6.37	+ 625
17	7.00	17	26.85	26.85
17	31.41	17	~~33.22~~	33.10
5	16.94	5	15.25	

Q Aquilae

20 of 22

1871 +14 48	Sept 25		Oct 8		Oct 9		Oct 2~~4~~3		Oct 30	
+,26	8 31.4	8 27.4	8 14.1	8 5.3		8 34.7	8 14.9	8 24.2	8 16.0	8 9.5
	33.5	28.7	16.3	6.5		35.8	16.0	24.7	18.2	11.0
	35.7	30.0	18.5	7.6		37.0	19.1	89	20.3	12.3
	40.0	861	22.6	194	22.5	175	23.5	24.4	24.6	328
	42.0	28.7	24.7	6.5	8 24.7	35.8	25.4		26.7	10.9
	44.0		26.9		26.9		27.6		28.8	
	46.3	9 10.7	28.9	8 51.3	29.0		29.7		30.9	
	48.3	12.2	31.1	52.6	31.1		31.9		33.1	
	52.6	13.1	35.3	54.0	135.2		36.1		37.2	
	54.8	60	37.4	79	8 26.84		38.3		39.4	
	56.8	12.0	39.6	52.6			40.4		41.5	
	485.4		295.4				302.9		316.7	
sin δ 9.40730		8 28.7		8 6.5		8 35.8		8 24.4		8 10.9
	8 44.13	44.127	8 26.85	26.855	4 27.04	27.040	8 27.54	27.536	8 28.79	28.791

cos δ 9.98535

12669

.11204

δ										
~~30~~ 4	54.0	35 0 47.9	4 11.8	0 11.7	4 51.7		4 36.7		4 17.9	
	24.7	19.5	16.9	16.6	56.3		~~41~~.5		19.0	
	787	674	287	283	1086		782		369	
	39.35	33.70	14.35	14.15	54.00		39.10		18.95	
	+15.1		+20.3		9.0		+3.1		+17.9	
	1.18752		1.30750		0.~~94448~~	.95420	0.49136		1.25285	
	1.29956		1.41954		~~1.05655~~	.06624	0.60346		1.36489	
	+1995		+2628		~~11.39~~	−11.65	+401		+23.17	
	34 39.35		34 14.35		54.00	54.00	39.10		18.45	
	34 59.30		34 40.63		34 ~~42.61~~	34 42.35	34 43.11		34 41.62	
+14°	47′ 49.05″		48 7.72		48 6.00		48 5.24		48 6.73	

	Nov_ 2		Nov_ 5	
8	16.3 8	9.8 8	16.2 8	11.4
	18.4	11.2	18.4	12.7
	20.6	12.6	20.6	13.9
	24.7	3 6	24.7	8 6
	26.9	1 1.2	26.8	1 2.7
	29.0		29.0	
	31.1		31.1	
	33.3 8	11.2	33.3 8	12.7
	37.5		37.4	
	39.8		39.6	
	41.8		41.8	
	3194		3189	
	29.03	29.036	28.99	28.991

4	15.1	4	21.7
	19.0		18.6
	37 1		40 3
	1 8.55		20.15
	+17.8		+16.3
	1.25042		1.21219
	1.36246		1.32423
	+2304		+2110
	18.55		20.15
34	41.59	34	41.25
48	6.76	48	7.10

V #

α₁ Capricorni   obs. a_2

21 10 56

1871 −12 57

-.23

sin δ 9.35044n

cos δ 9.98881
12669
.11550

Sept. 25		Oct 8		Oct 9		Oct 23		Oct. 30	
10 43.0	10 32.9	10 26.0	10 23.1	3′	10 44.5	10 50.6	10 45.9	10 51.8	10 45.8
45.2	33.6	28.0	24.3		46.0	52.7	47.1	53.8	47.2
47.2	65	30.1	25.2		47.2	54.8	48.4	56.0	49.2
51.4	33.2	34.3	12.6	10 34.1	177	59.0	48.8	0.2	222
53.6		36.4	24.2	36.3	45.9	1.1	302	2.4	47.4
-55.7		38.4		38.4		3.2	47.5	4.5	
57.8	11 25.0	40.6	11 1.0	40.4		5.3		6.6	
0.0	26.0	42.7	4.2	42.7		7.4		8.7	
4.1	27.9	46.9	5.3	191.9		11.6		12.9	
6.2	189	49.0	10 5	10 38.38		13.8		15.1	
8.4	26.3	51.1	3.5			15.9		17.2	
372.6		423.5				275.4		229.2	
240	10 33.2		10 24.2		10 45.9	240	10 47.5	180	10 47.4
612.6						35.4		49.2	
10 55.69	55.691	10 38.50	38.500	38.38	38.380	11 3.221	3.218 11	4.47	4.473
		55.84				55.21		55.11	
	55.68	9.66	38.48		38.36	8.01	3.2[illegible]	9.36	4.46

	Sept. 25		Oct 8		Oct 9		Oct 23	Oct. 30
15	1 38.7	3 46.9	1 12.7	2 4.7	1 44.8	~~3 32.0~~	3 32.0	3 27.0
	13.4	21.2	20.3	13.2	52.5	~~42.4~~	42.4	32.0
	521	681	330	179	973		74.4	59.0
	26.05	34.05	16.50	8.95	48.65		37.20	29.50
	+22.5		+14.3		−7.5		+15.7	+17.1
	1.35218		1.15584		0.87506		1.19590	1.23300
	1.46768		1.27084		0.99056		1.31140	1.34850
	+29.35		+18.66		−9.79		+20.48	+22.31
	16 26.05		16 16.50		16 48.65		18 37.20	18 29.50
	16 55.40		16 35.16		16 38.86		18 57.68	18 51.81
−12°	54′ 7.05″		53 46.81		53 50.51		56 9.33	56 3.46

a
Nov – 2 Nov – 5

10	27.9	11	0.8	10	52.0	11	3.2
	30.2		2.4		54.2		4.0
	32.3		4.1		56.3		7 2
	36.4		7 3		0.6		3.6
	38.5		21 4		2.6		
	40.7				4.7		
	42.7				6.8		
	44.9	11	2.4		8.9	11	3.6
	49.1				13.1		
	51.3				15.3		
	53.3				17.5		
	447 3				232 0		
					180		
					52,0		
10	40.66		40.663	11	4.72		4.727
			4065		55.53		4.71
					9.69		

2	4.1	3	53.3
	7.3		53.2
	1 4		106 5
	5.70		53.25
	—21.7		+1.1
	1.33646		0.04139
	1.45796		0.15689
	— 2837		+×1.43
17	5.70	18	53.25
16	37.39	18	54.68
53	49.04	56	6.33

κ Cephei √ A

20 13 25 20 13 1112 +12

+77 19

1871

11.28

+04 +045

δ = +77° 19′ 17.7″

+5
+26
+4
+24
+23
82
+16
+112

Sept 25 | Sept 27 +02 | ~~Sept 30~~ Oct 8 +07 +065 | ~~Oct 24~~ | Oct 30 +18 +280

(+04)

-57 +4.44

-.070

sin δ 9.98927

cos δ 9.34156
12669
9.46825

Sept 25

12 47.2 13 2.3
12 50.3 91
59.5 92
17.4 125
-27.4 100
-37.8 102
~~37.3~~ 94 13.0
46.4 91
14.9 185
24.0 91
33.3 93
4074
13 2.3

13 37.04 37.036
13.13 16 36.97
23.88 13.20
23.97
-23.88
+18 36.97
-2.01
-23.98
13 11.23 +.20
~~-2.01~~
-1.95
11.15
11.23
.17
11.27

Sept 27

12 22.0 12 0.6
31.6 96 3.7
41.3 97 11.8
0.1 88 161
9.2 91 5.4
-18.9 97
28.0 91
37.7 97
56.3 186
5.7 94
14.8 91
265.6
60 12 5.4
205.6

13 18.69 18.691
12.54 87 18.62
6.98 13.10
6.62
-5.85
+9 18.62
-1.82
-5.90
11.11 +.49
~~-1.88~~
-1.76
11.36
11.45
38
11.46

Oct 8

12 22.3 11 55.4
31.9 60.6
40.9 ? 77.9
59.6 193.9
9.4 98 64.6
-18.6 92
27.9 93 13 44.8
37.3 54 53.8
986
49.3
14.4
1588
60 12 ? 4.6
928

13 18.56 18.36
11.84 87 18.49
6.65 11.90
6.59
-6.89
+31 18.49
-1.72
-6.88
11.26 +.29
-0.66
11.15
11.29
16
11.26

Oct 24

13 42.5 13 50.4
44.6 51.3
46.7 52.3
133.9
55.2
57.3
59.5
63.7
66.0
68.0

Oct 30

12 22.8 12 45.0
31.3 49.4
41.1 54.4
59.5 148.8
8.6 49.6
-18.3
27.2
36.7
13 55.6
5.1
14.4
3204
120 12 49.6
200.4

13 18.22 18.218
9.47 18.15 51
8.62 9.54
8.61
-9.29
+.80 18.15
+1.65
-9.31
11.38 +1.69
+.84
11.34
11.42
2.6
11.44

Sept 25

5 0 20.2 0 40.3
43.5 4 59.3
63.7 99.6
01.85 49.80

+34.7
1.54033
1.00858
+10.20
5 01.85
5 12.05

+77° 17′ 36.30″
+40.33

+77 18 16.6
+77 19 38.4

+.53 +1 21.8 22.3

δ′ = +77 17 36.30
-20.70

Sept 27

0 63.9
23.6
87.5
43.75

+78.3
1.86510
1.33335
+21.54
5 43.75
5 5.29

17 43.06
+39.26

18 22.8
19 38.7

+1 16.4 16.9

17 43.06
-21.00

Oct 8

0 4 28.2 5 0 61.7
23.2 55.7
51.4 117.4
25.70 58.70

+74.0
1.86923 (Rej)
1.33748
21.75
4 25.70
4 47.45

18 0.90

18 1.90

Oct 30

0 4 45.8
36.8
82.6
41.30

+28.6
1.41637
0.92462
+8.41
4 41.30
4 49.71

17 58.64
+41.19

18 39.8
19 42.1

+1 2.3 2.9

17 58.64
-24.40

Sept. 27	3	20	13	12.90		+77°	19	387	
Oct. 2				41	.48			38.6	.9
7				11.90	.51			40.3	7
12				37	.53			40.9	6
17				10.84	.53			41.4	5
22				10.30	.54			41.7	3
27				9.76	.54			42.0	3
Nov 1				9.23	.53			42.1	+1
6				8.69	.54			42.0	−1
11				8.16	.53			41.8	−2
16				7.64	.52			41.4	−4

+.10 +200

~~Nov~~ – ~~4~~ Nov – 5

13 29.6 14 5.8 12 30.7 12 52.5
31.8 7.1 40.4 7 37.6
33.8 8.6 46.3 10
38.3 58.9 13.6 55.0
40.4 8.2 9.3
43.5 − 18.2 10.0
44.6 26.9 8.7
46.8 36.6 18 9.7
51.1 54.9 18.3 55.0
53.2 5.0 10.1 17.75
55.3 13.8 8.8
3419
24

17.79 13 17.75 17.86 11.24 ~~2.48~~
8.64 84 17.79 8.86
−9.60 8.97 8.89
−9.58 8.80
~~+2.00~~ + .66 ~~+.89~~
~~+.59~~ +2.28
+2.34 11.22
~~11.34~~
11.42
11.43

0 4 49.4
35.0
8.44
42.20

+ 2.29
1.35984
0.82809
+6.73
4 42.20
4 48.93

17 59.42
+ 42.14

18 41.6
19 42.0

+1 0.4 0.9

17 59.42
− 24.30

β Capricorni

20 13 48

−15 12

−27

1871

	Oct. 16		Oct. 2~~4~~3		⊗ Nov. 2		Nov. 9	
S.C	13 42.4	13 41.2						
	44.5	41.9	13 42.5	13 50.4	13 29.6	14 5.8	13 43.0	13 41.3
	46.6	42.9	44.6	51.4	31.8	7.1	45.1	42.9
	50.9	60	46.6	52.3	33.8	6.6	47.3	43.9
	53.0	42.0	51.0	41	38.3	21 5	51.4	81
	55.1		53.1	51.4	40.4	7.2	53.5	42.7
	57.2		55.3		43.5		55.7	
	59.3		57.3		44.6		57.7	
	63.6		59.5		46.8		59.9	
sin ∫ 9.41861	65.8	13 42.0	63.7	13 51.4	51.1	14 7.2	64.3	13 42.7
	67.9		66.0		53.2		66.4	
	606.3		68.0		55.3		68.6	
			607 6		468 4		612.9	
cos ∫ 9.98452								
12669	13 55.12	55.118	13 55.24	55.236	13 42.56	42.582	13 55.72	55.718
.11123								

30	3 2.7	3 19.8	4 4.9	2 8.0
	11.9	29.6	7.8	7.9
	14 6	49 4	12 7	15 9
	7.30	24.70	6.35	7.95
	+13.1	+3.8	−24.5	+18.0
	1.11727	0.57978	1.88917	1.11294
	1.22850	0.69101	1.50048	1.22517
	+1692	+491	−3165	+1679
	33 7.30	33 24.70	34 6.35	33 7.95
	33 24.22	33 29.61	33 34.70	33 24.74
−15°	10′ 35.″87	10 41.26 ✓	10 46.35	10 36.39

BAC 7008

W 1538

1871 +38 59

	Sept 25		Oct. 8		Oct. 9		Oct. 22.		Oct. 2~~4~~3
	15 44.4	15 32.0	15 27.0	15 39.6	~~26.8~~	15 27.0	15 26.6	15 33.7	15 27.8	15 22.0
+.81	47.0	33.2	29.7 29.6	40.8	15 29.6	28.8	30.3	35.6	30.3	22.8
	49.6	35.0	32.3	42.6	32.2	30.4	33.0	36.5	33.0	24.8
	54.9	102	37.6	30	37.6	862	38.1	161	38.4	96
	57.6	33.4	40.3	41.0	40.2	28.7	40.8	35.4	40.9	23.2
	-0.2		43.0		42.9		43.4		43.6	
	2.8	16 25.9	45.5	16 7.5	45.5	16 9.4	46.1		46.2	
	5.5	27.6	48.1	8.9	48.2	11.0	48.6		48.9	
Sin 9.79872	10.9	30.0	53.4	10.3	53.4	12.6	54.0		54.2	
	13.5	835	56.1	267	55.9	30	56.7		56.8	
	16.1	29.8	58.8	8.9	58.7	11.0	59.4		59.4	
	302.5		4719		4710		4770		479.5	
	300	15 33.4		15 41.0		15 28.7		15 35.4		15 33.2
cos 9.89060	2.5									
12669	16 0.23	0.227	15 42.88	42.891	42.82		15 43.36	43.3645	43.59	43.591
.01729										

20	3 41.4	4 39.1	3 31.0	4 0.9	3 21.0	4 2.9	3 26.7		3 14.0	
	8.0	5.7	33.0	1.9	23.6	6.0	29.3		18.0	
	494	446	640	26	446	89	560		326	
	24.70	22.40	32.00	1.40	22.30	4.45	28.00		16.00	
	+26.8		+1.9		+14.2		+8.0		+20.4	
	1.42813		0.27875		1.15229		0.90309		1.30963	
	1.44542		0.29604		1.16958		0.92038		1.32692	
	+27.89		+1.98		+14.78		+8.33		+21.23	
	23 24.70		23 32.00		23 22.30		23 28.00		23 16.00	
	23 52.59		23 33.98		23 37.08		23 36.33		23 37.23	
+38°	58′ 55.″76		59 14.37		59 11.27		59 12.02		59 11.12	

Oct 29		Oct 30		Nov 5	
				15	15
15 29.0	15 20.2		15 52.3 ~~24~~	29.1 ~~24~~	25.6
31.6	21.8		54.8	31.6	27.1
34.3	22.8		56.7	34.1	28.6
39.6	48	15 39.3	138	39.6	213
42.3	27.6	42.0	54.6	42.2	27.1
44.8		44.6		44.8	
47.5		47.3		47.4	
50.3		50.0		50.1	
55.4		223.2		55.4	
58.0				58.1	
60.6				60.7	
493.4				493.1	
	15 22.4		15 54.6		15 27.1
15 44.85	44.855,5	44.64	44.640 15	44.83.	44.827

3 11.7	3 45.8	3 20.6
9.0	43.7	8.9
20.7	89.5	29.5
10.35	44.75	14.75
+ 23.3	−10.0	+17.7
1,~~35025~~ 36740	1.00000 √	1.24497
1.36754 1.38469	1.01729	1.26526
+2331 +2425	−1040	+1842
23 10.35 10 35	23 44.75	23 14.75
2 3 ~~33.66~~23 34.60	23 34.35	23 33.17
59 13.75	59 14.00	59 15.18

−.020 +,83

γ Cygni

(Subtract − 10^s 2 ?)

+1
−3
−7
−2
−4
−4
−0
−4
−3

δ = +39° 50′ 41″.7

~~+14~~ 20 17 41 17 35.93 (−07) 35.~~93~~ 90 +02 +112

1871 +39 50 +10 +147 Oct 22 Sept 27 +10 Sept 30 +07 +065 Oct 8 +03 +025 Oct 9 +05 +079 Oct 16

84

+.83 17 16.3
17 28.6 17.8
31.2 18.8
34.0 229
39.3 17.6
42.0
44.6
47.2
50.0
55.3
58.1
60.7
491.0 17 17.6

17 44.64 44.636
36.94 44.62
7.80 36.87
−7.79 7.75
+.08 44.62
−1.01
−7.81
+.12
17 35.92 −1.01
35.92
,94

sin δ
9.80656

cos δ
9.88531
12669
.01200

30 2 ~~15.0~~ 3 ~~1.8~~
~~15.2~~ ~~3.4~~
30 2 18.2 ~~5.8~~
18.8
370
18.50

+27.1
1.43136
1.44336
+27.76
32 18.50
32 46.26
+39° 50′ 20″.9
− 3.13

+39 49 58.9
51 3.3

δ′ = +39 50 20.9
−21.6

−.03 +1 4.4 4.4

17 27.2 17 12.2
29.9 14.0
32.6 15.5
380 40.5 117
43.3 13.9
46.0
48.6
53.9
56.8
59.6
4764
17 13.9

17 43.31 43.309
37.58 43.29
5.77 37.46
−5.85 5.83
+2 43.29
−1.60
−5.90
+.09
35.88 −1.60
35.88
90

1 47.1
12.9
60 0
00.80

+29.4
1.46835
1.48035
+30.23
32 30.00
32 00.23
49 48.12
− 3.04

49 45.1
51 1.7

50 18.12
− 20.00

+1 16.6 166

58.9 18 49.5
1.1 51.3
3.7 53.2
1540
51.3
25.1
27.6
30.6
4465
18 51.3

+37.16
+8
~~−1.85~~

2 24.6
22.0
466
23.30

28.1 17 16.0
17 30.7 26 16.7
33.3 26 18.2
38.7 5.4 20.9
41.4 27 16.9
44.0 26
46.7 27 18 2.8
48.4 2.7 5.0
54.8 5.4 6.6
57.4 28 144
0.2 28 4.8
4846
17 16.9

17 44.05 44.055
37.28 −10 44.03
6.82 37.21
6.82
−6.85
+6 44.03
−1.35
−6.88
+.05
35.83 −1.35
35.85
,86

2 15.6 3 4.0
16.1 5.9
317 99
15.85 4.95

+27.1
1.43297
1.44497
+27.66
32 15.85
32 43.51
50 4.64
− 3.19

50 1.4
51 2.7

50 4.64
− 21.00

+1 1.3 1.2

17 28.0 17 10.8
30.7 13.2
33.4 14.6
38.7 86
41.4 12.9
44.0
46.6 18 0.8
49.4 2.8
54.7 4.5
57.5 81
60.0 2.7
484.6
17 12.9

17 44.05 44.055
37.26 44.04
6.87 37.19
6.85
−6.85
+8 44.04
−1.35
−6.84
+.02
35.50 −1.33
35.89
91

2 11.8 3 3.4
15.2 5.8
270 92
13.50 4.60

+31.1
1.49276
1.50476
+ 31.97
32 13.50
32 45.47
50 2.88
− 3.15

49 59.7
51 2.8

50 2.88
− 21.10

+1 3.1 3.1

28.7 17 24.8
31.3 25.9
34.0 27.8
39.3 185
42.0 26.2
44.7
47.4
50.0
55.4
58.2
60.8
491.8
17 26.2

17 44.71 44.709
37.06 44.69
7.65 37.01
7.68
−7.70
+4 44.69
−1.15
−7.73
+.06
35.50 −1.15
35.87
89

2 24.7
27.2
519
25.95

+18.5
1.26717
1.27917
+19.02
32 25.95
32 44.97
50 3.38
− 3.08

50 0.3
51 3.2

50 3.38
− 21.50

+1 2.9 2.9

Sept. 17	20	17	37.75	+39° 51′	03″	
22			.65		1.0	7
27			54		1.7	7
Oct. 2			43		2.2	5
7			37.31		2.7	5
12			19		3.0	3
17			.06		3.2	2
22			94		3.3	1
27			36.82	12	3.4	1
Nov. 1			.71		3.3	−1
6			.59		3.1	−2
11			.48		2.7	−4
16			36.36		2.2	−5

Oct 24 +063 +100	Oct 30 ″+18 +200	Nov 5 +117 +200	Nov 9 +20 +213
17 28.8 · 17 16.7	17 30.0 · 17 14.4	30.0 · 17 17.3	17 28.8 · 17 24.0
31.4 · 18.5	32.4 · 17.0	32.6 · 18.9	31.6 · 25.6
34.1 · 20.0	35.1 · 18.5	35.3 · 20.5	34.1 · 27.0
39.4 · 552	40.5 · 199	40.6 · 567	39.6 · 766
42.0 · 18.4	43.3 · 16.6	43.2 · 18.9	42.1 · 25.5
44.7	45.9	46.1	44.9
47.4	48.6	48.6	47.6
50.2	51.3 · 17 16.6	51.4 · 17 18.9	50.3 · 17 25.5
55.4 · 17 18.4	56.7	56.7	55.5
58.1	59.3	59.5	58.4
60.8	62.0	62.1	61.0
492.3	505.1	506.1	493.9

17 44.75	44.755	17 45.92	45.918	17 46.01	46.009	17 44.91	44.809 50
37.52	4	36.65		36.61		36.57	35.878
7.23	44.74	9.27	45.90	9.40	45.99	8.29	44.79 35.018
	36.85	27	36.68		36.54		36.44 35.860
−7.95	7.89	−9.29	9.22	−9.18	9.45	−8.61	8.35
+15	44.74	+15	45.90	+12	45.99	+17	44.79
−99		−82		−.68		−.58	
	−7.96		−9.23		−9.60		−8.63
35.86	+08	35.96	+.15	35.84	+16	35.79	+.17
	−99		−.82		−.68		−.58
	35.87		~~35.90~~		35.87		(35.74)
			35.92				
	89		.93		.89		

2 16.7	2 16.5	2 21.5	2 33.3
20.3	12.6	14.3	28.1
37.0	29.1	35.8	61.4
18.50	14.55	17.90	30.70

+26.3	+29.3	+27.1	+19.3
1.41996	1.46687	1.43297	1.28556
1.43196	1.47887	1.44497	1.29756
+27.03	+30.12	+27.86	+19.84
32 18.50	32 14.55	32 17.90	32 30.70
32 45.53	32 44.67	32 45.76	32 50.54
50 2.82	50 3.68	50 2.59	49 57.81
−3.07	−3.25	−3.06	−2.96

49 59.7	50 0.4	49 59.5	49 54.8
51 3.3	51 3.4	51 3.1	51 2.9
50 2.82	50 3.68	50 2.59	49 57.81
−21.60	−21.70	−21.40	−21.20
+1 3.6 3.5	+1 3.0 3.0	+1 3.6 3.6	+1 8.1 8.0

π Capricorni
AR 19 56
−18 39
−34

1871	Oct 8.		Oct 9		Oct 15		Oct 2~~4~~ 3		Oct. 29	
	19 57.0	19 48.3	19 51.9	19 42.0		20 29.8	19 52.7	19 43.8		20 15.7
	54.2	49.6	54.1	43.8		31.4	55.0	45.0		16.8
	56.3	51.0	56.2	44.9		33.6	57.0	46.2		16.6
	0.6	148.9	0.6	107	94.8	148	1.3	150	20 29	211
	2.8	49.6	2.8	43.6	31.6	34.9	3.6	45.0	5.0	17.0
	−5.0		−4.9		~~3.~~2		5.7		7.1	
	7.2	20 27.6	7.0	20 22.0	3.3		7.9		9.2	
	9.4	29.0	9.1	23.5	5.4		10.1		11.4	
	13.8	30.8	13.6	24.7	7.5		14.4		356	
	15.8	874	15.7	102	9.7		16.5			
	17.9	29.1	17.8	23.4	27.1		18.7			
	2350		2337			31.6	242.9			
	180	19 47.6	180	19 43.6		20 ~~34.7~~	180	19 45.0	20	17.0
sin √ 9.50486	55.0		53.7				62.9			
	20 5.00	5.000	20 4.88	4.862	20 5.421	5.420	20 5.72	5.718	20 7.12	7.120
									57~~56~~58	
									9.54	

cos √ 9.97657
.12669
.10326

55	4 31.1	0 0 20.9	4 25.6	0 0 16.7	0 0 26.9		4 30.3		0 0 3.9	
	38.8	31.0	37.0	27.0	41.5		40.8		10.2	
	699	519	626	437	684		711		141	
	34.95	25.95	31.30	21.85	34.20		35.55		7.05	
	+15.4		+21.9		~~−20.2~~ ✓		+20.7		−9.9	
	1.18752		1.32838		~~1.46982~~	.41830	1.31597		0.99563	
	1.29078		1.43164		~~1.57308~~	1.52156	1.41923		1.09889	
	+19.53		+27.02		~~−37.42~~	−33.24	+26.26		−12.56	
	59 34.95		59 31.30		60 34.20	60 34.20	59 35.55		60 7.05	
	59 54.48		59 58.32		60 56.78	60 0.96	59 61.81		60 54.49	
					Ex				59 54.49	
							13.46			
−18°	37′ 6.13″		37 9.97		37 12.61		37 8.46		37 6.14	

Oct 30 Nov 2 Nov 5 Nov 9

19	53.5	20	0.2	19	54.1	20	26.8			20	16.7	19	53.3	19	47.1
	56.1		1.3		56.4		28.4				17.8		55.4		48.5
	58.3		2.4		58.4		30.0				19.3		57.6		50.0
	2.7		3.9		2.7		85.2	20	2.9		23.8		1.9		145.6
	4.9		1.3		4.8		28.4		5.0		17.9		4.1		48.5
	7.0				7.1				7.2				6.3		
	9.0				9.1				9.3				8.4		
	11.3				11.5				11.5				10.4		
	15.6				15.8				35.9				15.0		
	17.8				17.9								17.1		
	20.0				20.3								19.3		
	256.2				258.1								248.8		
	180	20	1.3		180	20	28.4			20	17.9		180	19	48.5
	78.2				78.1								68.8		
20	6.93		6.93	20	7.10	20	7.100		7.18	20	7.180		6.26		6.255
	57 60														
	9.33														

4 46.0	0 0 22.2	0 0 8.9	4 34.0
51.0	26.3	10.4	34.5
97.0	48.5	19.3	68.5
48.50	24.25	9.65	34.25
+5.6	−21.3	−10.8	+17.7
0.94819	1.32838	1.02988	1.24497
0.85145	1.43164	1.13264	1.35123
+7.11	−27.02	+13.57	+22.45
59 48.50	60 24.25	60 9.65	59 34.25
59 55.61	60 57.22 59	59 56.08	59 56.70
			8.35
37 7.26	37 8.88	37 7.73	37 7.35 ✓

ζ Capricorni
R 21 33
−18 15
−33

1871

	Oct 9		Oct 15		Oct. 16		Oct 22.		Oct. ~~24~~ 30	
	21 25.9	21 16.2		21 49.8	21 26.6	21 20.0	21 35.3	21 52.7	21 27.5	21 36.0
	28.0	18.8		50.8	28.7	21.3	37.3	54.0	30.0	37.0
	30.2	20.2		52.0	30.8	22.8	39.6	55.6	32.3	38.2
	34.4	552		26	35.1		41.7	123	36.6	212
	36.6	18.4	34.9	50.9	37.4		43.8	54.1	38.9	37.1
	38.7		37.1		39.7		197.7		- 41.0	
	40.9	21 58.5	39.2						43.1	
	43.1	59.6	41.4						45.2	
sin δ 9.49577n	47.4	61.0	43.5						49.6	
	49.6	179.1	196.1						51.7	
	51.9	59.7							53.9	
	426.7								449.5	
cos δ 9.97759		21 18.4		21 50.9				21 54.1		21 37.1
12669	21 38.79	38.791	21 39.22	39.220 :			21 39.54	39.5402)	40.89	40.891
.10428										

Stel ~~Sun~~

35	0 47.8	1 39.7	1 31.0	1 36.2	1 9.5
	57.5	49.1	46.0	44.0	13.7
	105.3	88.8	77.0	80.2	23.2
	52.65	44.40	38.50	40.10	11.60
	+ 20.4	−20.9	−11.7	−14.6	+ 3.5
	1.30963		1.06819	1.16435	0.57978
	1.41391		1.17247n	1.26863n	0.68406
	+ 25.94	−25.44	−14.87n	−18.56n	+ 4.84
	35 12.65	36 44.40	36 38.50	36 40.10	36 11.60
	36 18.59	17.96	36 23.63	36 21.54	36 16.44
−18°	13 30.24	29.61	13 35.28	13 33.19	13 28.09

Nov. 2. Nov. 5 Nov. 9

21	36.7	21	58.0	21	28.2	21	50.3	21	27.2	21	44.3
	38.9		59.8		30.3		51.3		29.3		46.9
	41.0		61.8		32.4		53.1		31.4		48.6
	43.2		179.6		36.9		47		35.8		198
	45.4		59.9		38.9		51.6		38.0		46.6
	205.2				41.4				40.1		
					43.3				42.3		
					45.5				44.6		
					49.8				48.8		
					52.0				51.0		
					54.0				53.1		
					452.4				441.6		
		21	57.9			21	51.6			21	46.6
2.	41.04		41.040	21	41.13		41.036	21	40.15		40.145

1	40.1	1	30.3	1	27.4
	43.8		31.0		26.9
	83.9		61.3		54.3
	41.95		30.65		27.15
	−18.9		−10.6		−6.5
	1.27646n		1.02531		0.81291
	1.38074		1.12959n		0.91719n
	−2403n		−1348n		−827n
36	41.95	36	30.65	36	27.15
36	17.92	36	18.17	36	18.88
13	29.57	13	28.82	13	30.53

41 Cygni

2024 11
1871
+29 57
+.58

Sept 30		Oct 8		Oct 9		Oct 15		Oct 16	
25 32.0	25 20.3	24 1.5	23 53.5	24 1.5	23 58.6	24 2.1	23 54.1	24 2.4	24 0.8
34.2	21.4	4.0	54.8	3.9	59.6	4.4	55.7	4.6	2.0 3.2
36.7	22.6	6.3	56.9	6.3	61.0	6.9	56.9	7.0	2.0
41.4	43	11.0	152	11.0	1792	11.5	167	11.8	6.0
43.8	21.4	13.4	55.1	13.4	59.7	13.9 16.2	55.6	14.2	2.0
-46.2		15.8		15.8		18.6		-16.6	
48.6		18.1	24 39.2	18.2	24 44.0	20.9	24 37.7	19.0	
50.9		20.6	40.7	20.5	45.9	25.7	39.0	21.3	
55.8		25.3	42.4	25.3	47.4	28.0	40.6	26.0	
57.9		27.6	23	27.6	173	30.5	1173	28.4	
0.4		30.1	40.6	30.0	45.8	1787	39.1	30.8	
447.9		173.7		173.5				182.1	
66	25 21.4		23 55.1		23 59.7		23 55.6		24 2.0
50.7.9									
25 46.17	46.62	24 15.79	15.791	24 15.77	15.773	16.24	16.245	24 16.55	16.55

sin δ 9.69831

cos δ 9.93775
12669
.06444

Chase   Pure.

	Sept 30		Oct 8		Oct 9		Oct 15		Oct 16	
25	1 29.7		1 24.7	2 23.0	1 36.1	2 28.7	1 30.4	2 20.6	1 37.1	
	25.3		32.4	23.0	38.2	29.1	35.9	25.9	39.8	
	550		561	460	743	578	663	465	769	
	27.50		28.05	23.00	37.15	28.90	33.15	23.25	38.45	
	+24.8		+20.7	-250	+16.1		+20.6	-229	+14.6	
	1.39445		1.31597	1.39794	1.20683		1.31387	1.35983	1.~~15836~~	.16440
	1.45889		1.38041	1.46238	1.27127		1.37831	1.42427	1.22280	1.22884
	+2877		+2401	-2900	+1868		+2390	-2656	+1670	+16.93
	26 27.50		26 28.05	23.00	26 37.15		26 33.15	23.25	26 38.40	38.45
	26 56.27		26 52.06	54.00	26 55.83		26 57.05	56.69	26 55.10 26	55.38
+29°	55′ 52.08″		55 56.29	54.35	55 52.52		55 51.30	51.66	55 52.97	

Oct_ 22		Oct_ 24		Oct. 29		Oct_ 30		Nov_ 5		Nov_ 9	
24 11.7	24 27.8	24 2.7	~~24 31.5~~	24 3.8	23 53.8	24 3.5	23 54.2	24 3.7	.3 24 58.8	24 2.6	23 56.0
14.2	29.0	4.9		6.0	55.0	5.8	55.6	6.0	60.2	5.0	57.3
16.4	30.2	7.4		8.5	57.0	8.2	56.8	8.5	61.8	7.4	58.8
18.8	870	11.9		13.2	158	12.9	166	13.1	08	12.1	221
24.1	29.0	14.4		15.6	55.3	15.3	55.5	15.5	60.3	14.5	57.4
82.2		16.8		17.9		17.7		17.8		16.8	
		18.6		20.4		20.0		20.2		19.1	
	24 29.0			22.7	23 55.3	22.4	23 55.5	22.7	24 0.3	21.5	23 57.4
				27.3		27.2		27.4		26.1	
24 16.44	16			29.8		29.5		29.8		28.7	
				32.2		31.9		32.0		31.1	
				1974		1944		1967		1849	
	16.440			24 17.94	~~17.945~~ 17.945	24 17.67	17.673	17.88	17.882	16.81	16.809

2 8.3	1 29.4	1 30.0	1 38.7	1 38.1
10.4	26.3	26.8	30.4	30.2
187	557	568	691	683
9.35	27.85	28.40	34.55	34.15
−12.6	+22.6	+22.2	+17.6	+19.4
1,10037	1.35411	1.34635	1.24551	1.28780
1.1648 m	1.41855	1.41079	1.30995	1.35224
−1462 m	+2621	+2575	+2042	+2250
27 9.35	26 27.85	26 28.40	26 34.55	26 34.15
26 54.73	26 54.06	26 54.15	26 54.97	26 56.65
55 53.62	55 54.29 ✓	55 54.20	55 53.38	55 51.70

ε Delphini

2.97
~~2.90~~

W 2706 20 27 ~~47~~ +02.96(-.01)

(1871) +10 52

+6
+3
+2
+2
+1
+3
+0
+2
-3
-4
+1

δ = +10° 51′ 58.4″

+.52 +19

sin δ 9.27537

cos δ 9.99215
12669
.11884

Sept 30 +082 N.C.		+07 +065 Oct. 8		+03 +025 Oct. 9		+05 +079 Oct. 15		+05 +079 Oct. 16	
27 29.4	27 21.4	26 59.0	26 51.6	26 59.0	26 50.8	59.4	27 2.8	26 59.7	26 50.0
31.4	22.8	0.9	53.0	1.0	52.6	1.5	4.5	1.7 20	52.0
33.5	24.1	3.1	54.5	3.0	53.9	3.6	7 3	3.7 20	53.4
37.7	8 3	7.2	9 1	7.3	3	7.8	3.6	8.0 43	5 4
39.7	22.8	9.4	53.0	9.3	7	9.9		10.0 20	51.8
41.8		-11.5		-11.4	52.4	12.0		12.2 22	
43.9		13.6	27 35.8	13.5	27 33.7	14.1	27 39.8	14.2 20	
46.0		15.7	37.3	15.6	34.8	16.2	40.9	16.4 22	
50.2		19.7	38.7	19.8	36.2	20.3	42.3	20.6 42	
52.4		22.0	21 8	21.9	147	22.5	1230	22.7 21	
54.5		24.4	37.3	24.0	34.9	24.6	41.0	24.8	
460.5	27 22.8	186.2	26 53.0	185.8	26 52.4	191.9	27 3.6	194.0	26 51.8
		60		60		160		160	
		126.2		125.8		131.9		134.0	
27 41.86	41.864	27 11.47	11.478	27 11.44	11.436	27 11.99	11.991	27 12.18	12.182
4.09		4.58		4.57		4.47		4.45	
37.16	41.85	6.88	11.46	6.87	11.42	7.52	11.97	7.72	12.16
	4.68		4.57		4.56		4.46		4.44
-37.16	37.17	-6.89	6.89	-6.85	6.86	-7.49	7.51	-7.70	7.72
+ 2	41.85	+ 1	11.46	+ 1	11.42	+ 1	11.97	+ 1	12.16
-1.73		-1.62		-1.61		-1.07		-1.49	
	-37.13		-6.86		-6.84		7.51		-7.73
27 2.99	+.02	2.97	+.01	2.99	+.00	3.00	+.01	3.00	+.01
	-1.73		-1.62		-1.61		-1.51		-1.49
	3.01		2.97		2.97		2.96		2.95
	3.02		2.99		2.98		2.98		2.97

	Sept 30	Oct. 8		Oct. 9		Oct. 15		Oct. 16
30	0 35.0	0 33.0	1 29.2	0 33.0	1 27.6	0 48.4	1 35.3	0 29.8
	35.3	37.8	32.2	39.0	34.1	58.8	46.3	35.0
	70 3	70 8	61 4	72 0	61 7	107 2	81 6	64 8
	35.15	35.40	30.70	36.00	30.85	53.60	40.80	32.40
	+19.1	+18.5		+19.0		+8.4		+20.4
	1.28103	1.26717		1.27875		0.92428		1.30863
	1.39987	1.38601		1.39759		1.04312		1.42847
	+25.11	+24.33		+24.98		+11.05		+26.82
	30 35.15	30 35.40		30 36.00		30 53.60		30 32.40
	31 00.26	30 59.73		31 00.98		31 04.65		30 59.22
+10°	51′ 48.09″	51 48.62		51 47.37		51 43.70		51 49.13
	-36.85	-36.59		-35.56		-36.15		-36.58
+	51 11.2	51 12.0		51 11.8		51 07.6		51 12.7
+	52 13.0	52 13.3		52 13.3		52 13.3		52 13.3
δ′ = +10	51 48.09	51 48.62		51 47.37		51 43.70		51 49.13
	- 14.60	- 14.90		- 14.90		- 14.90		- 14.90
-.48	+1 1.7 1.2	+1 1.3 0.8		+1 1.5 1.1		+1 5.7 5.2		+1 0.6 0.1

Sept 17	20 27	4.88	07	+10° 52'	12.4"	
22		.81	7		12.7	+3
27		74			12.9	+2
Oct 2		67	7		13.1	+2
7		4.60	7		13.3	+2
12		.52	8		13.3	+4
17		44	8		13.3	+4
22		36	8		13.3	−1
27		4.27	9		13.2	−1
Nov 1		19	8		13.1	1
6		.11	8		12.9	2
11		03	8		12.5	5
16		3.96	7		120	

Oct 22 +10 +147 · Oct 29 +100 · Oct. 29 +11 119 · Nov 2 +17 +192 · Nov 5 +15 +200

26 59.7	26 48.8	26 59.8	26 56.7	27 1.0	26 52.4	27 1.1	26 55.5	27 1.2	26 54.0
1.7	50.0	1.8	56.8	3.1	53.6	3.2	56.9	3.3	55.0
3.7	51.0	4.0	58.0	5.3	55.7	5.3	58.3	5.3	56.1
7.9	149.8	8.1	205	9.5	117	9.5	207	9.4	151
10.2	49.9	10.2	56.8	11.5	53.9	11.6	56.9	11.5	55.0
12.2		12.2		13.6		13.7		13.7	
14.3	26 49.9	14.4	26 56.8	15.8	26 53.9	15.7	26 56.9	15.7	26 55.0
16.4		16.4		17.8		17.8		17.8	
20.5		20.6		22.0		22.0		22.0	
22.6		22.8		24.1		24.1		24.0	
24.7		24.8		26.3		26.2		26.2	
193.9		195.1		150.0		150.2		150.1	
60		60							
133.9		135.1							
27 12.17	12.173	27 12.28	12.282	27 13.64	13.636	27 13.65	13.645	13.65	13.645
4.36	12.16	4.34	12.27	4.22	13.62	4.17	13.63	4.13	13.63
7.81	4.35	7.94	4.33	9.41	4.21	9.48	4.16	9.52	4.11
−7.81	7.81	−7.95	7.84	−9.41	9.41	−9.55	9.47	−9.58	9.52
+ 2	12.16	+ 1	12.27	+ 2	13.62	+ 8	13.63	+ 3	13.63
−1.40		−1.38		−1.26		−1.21		−1.16	
	−7.81		7.96		−9.42		−9.53		−9.60
2.98	+.03	2.96	+ .01	2.99	+ 02	2.92	+.03	2.94	.03
	−1.40		−1.38		−1.26		−1.21		−1.16
	2.98		2.94		2.96		2.92		2.90
	2.99		2.96		2.98		2.93		2.92

2.964

21

20

0 28.4	0 39.6	0 32.0	0 39.0	0 37.2
35.0	46.8	34.0	37.0	33.6
634	864	660	760	708
31.70	43.20	33.00	38.00	35.40
+22.3	+15.5	+19.7	+16.7	+18.6
1.34830	1.19033	1.29447	1.22272	1.26957
1.46714	1.30917	1.41331	1.34156	1.38835
+29.32	+20.38	+25.90	+21.96	+24.46
30 31.70	30 43.20	30 33.00	30 38.00	30 35.40
31 01.02	31 3.58	30 58.90	30 59.96	30 59.86
51 47.33	51 44.77	51 49.45	51 48.39	51 48.49
−35.47	−34.97	−36.61	−36.74	−37.49
51 11.8	51 09.8	51 12.8	51 11.7	51 10.9
52 13.2	52 13.2	52 13.1	52 13.1	52 12.9
51 47.33	51 44.77	51 49.45	51 48.39	51 48.49
−14.80	−14.80	−14.70	−14.70	−14.50
+1 1.4 1.0	+1 3.4 2.9	+1 0.3 +0 59.8	+1 1.4 1.0	+1 2.9 2.4

η Delphini Gr. 3241 20 30

20 29 19

+14 14

+.25

1871 Oct. 22		Oct. 8		Oct. 9		Oct. 15		Oct. 16		Oct. 21	
29 13.1	29 6.7	29 17.4	29 4.5	29 12.3	29 2.0	29 12.9	29 8.3	29 13.2	29 9.1	29 21.5	29 27.
15.3	7.7	14.5	6.2	14.5	3.2	15.0	9.7	15.2	10.8	23.7	37.2
17.3	9.0	16.7	7.8	16.6	4.6	17.0	11.7	17.3	12.1	25.7	38.0
21.6	23.4	20.9	18.5	20.8	9.8	21.4	29.7	21.6	20	28.0	39.2
23.7	7.8	23.0	6.2	22.9	3.3	23.4	9.9	23.7	10.7	30.2	39.8
25.8		25.2		25.1		25.5		25.9		129.1	154.2
27.8		27.2	29 51.5	27.2	29 52.4	27.7	29 53.5	128.0 30.0			38.5
30.0		29.3	53.5	29.3	53.9	29.7	54.8	34.3			
34.2		33.6	54.6	33.6	55.1	34.0	56.0	36.5			
36.4		35.7	96	35.7	114	36.2	143	38.7			
38.5		37.9	53.2	37.8	53.6	38.3	54.8				
283.7		276.4	29 6.2	275.8	29 3.3	281.1	29 9.9	284.3	29 10.7		29 38.5
29 25.79	25.791	29 25.13	25.127	29 25.07	25.073	29 25.55	25.555	29 25.85	25.845	29 25.82	25.820

sin δ 9.39071

cos δ 9.98646
12 669
.11318

5 3 ~~46.7~~	3 44.2	4 45.2	3 41.2	4 48.3	3 49.4	4 47.0	3 49.7		4 27.5
~~53.0~~	50.3	50.9	48.0	53.9	60.3	56.7	55.9		27.8
~~99.7~~	94.5	96.1	89.2	101.2	109.7	103.7	105.6		55.3
~~49.85~~	47.25	48.05	44.60	50.60	54.85	51.85	52.80		27.65

	Oct. 8	Oct. 9	Oct. 15	Oct. 16	Oct. 21
	+18.9	+21.8	+15.7	+15.1	−12.7
	1.27646	1.33846	1.19590	1.17898	1.10380n
	1.38961	1.45161	1.30905	1.29213	1.21695
	+24.53	+28.29	+20.37	+19.59	−16.48n
	8 47.25	8 44.60	8 54.85	8 52.80	? 8 27.65
	9 11.98	9 12.89	9 15.22	9 12.39	9 11.17
+14°	13 36.57	13 35.46	13 33.13	13 35.96	13 37.18

Oct 2~~4~~3		Oct - 29		Oct - 30		Nov - 2	
29 13.3	29 3.9	29 14.7	29 6.0	29 14.4	29 4.7	29 14.6	29. 6.6
15.3	5.3	16.8	7.1	16.5	5.9	16.7	7.9
17.4	6.3	18.8	8.0	18.7	7.3	18.8	9.0
21.6	15 5	23.1	21 1	22.9	17 9	23.0	23 5
23.7	5.2	25.2	7.0	25.0	5.9	25.1	7.8
25.9		27.3		27.0		27.3	
28.0		29.4		29.3		29.4	
30.2		31.5		31.3		31.5	
34.4		35.8		35.5		35.7	
36.5		38.0		37.7		37.8	
38.7		40.0		39.9		40.0	
285 0	29 5.2	30 0.6	29 7.0	298 2	29 5.9	299 9	29 7.8
29 25.91	25.909	29 27.33	27.327	29 27.11	27.109	27.26	27.264

3 45.0	3 43.9	3 43.3	3 46.2
47.0	45.0	45.3	46.1
1020	8 8 9	8 8 6	9 2 3
5460	44.45	44.30	46.15
+ 20.7	+ 20.3	+ 21.2	+ 19.5
1.31597	1.30450	1.32634	1.29004
1.42912	1.42065	1.43949	1.40319
+2686	+2634	+ 27.51	+ 25.30
8 4600	8 44.45	8 44.30	8 46.15
9 1256	9 10.89	9 11.81	9 11.45
13 35.49	13 37.56	13 36.54	13 36.90

5 64

β Delphini

20 31 32 20 31 29.94 (+03)
29.99

+14 09

+5
+9
−3
+10
+7
+1
+7
+1
+8
+10
−4
+5

Oct 7	20 31 31.58	08	
12	50		
17	41		
22	33		
27	31.24		
Nov 1	16		
6	.08		
11	30.01		
16	30.93	.08	
21			
~~Dec~~ 26			

log sin δ 9.3882
cos δ 9.9866
log sin δ cos δ 9.3748
log C 6.7887
6.1115

log cos δ 9.9866
log C 10.2?
δ = +14° 8' 51.9"
~~0.1041~~
11 28

+.47 +.25

log 5' 5 = 8.94917
1.17649
log 15 = 12616

	1871 Oct 8 +07 +065		Oct 9 +03 +.025		Oct 15 +05 +079		Oct 21 +12 +133		Oct 22 +10 +1.47	
	31 25.8	31 14.0	31 25.8	31 13.2	31 26.3	31 21.5	31 26.5	31 19.6	31 26.4	31 20.4
	27.9	14.9	28.0	14.8	28.4	22.8	28.6	21.1	28.6	21.4
	30.0	16.8	30.0	16.0	30.4	24.0	30.6	22.4	30.8	22.4
	34.2	18.5	34.2	14.0	34.6	63	35.0	6 31	34.9	42
	36.3	16.0	36.2	14.7	36.8	22.7	37.0	21.0	37.1	21.4
	38.4		38.4		38.9		39.2		39.1	
	40.6	31 57.6	40.5	32 2.3	41.1	31 59.6	41.3		41.3	
	42.8	58.8	42.7	3.7	43.1	61.2	43.4		43.4	
	46.9	164	46.9	4.8	47.4	62.8	47.7		47.6	
	49.1	58.2	49.1	10 8	49.5	183 6	49.8		49.8	
	51.2		51.2	3.6	51.7	61.2	52.0		51.9	
	4232	31 16.0	423 0	31 14.7	428.2	31 22.7	431.1	31 21.0	430.9	31 21.4
sin δ 9.38821										
	3847	38.473	31 38.45	38.455	3893	38.927	31 39.19	39.191	31 39.17	39.173
	1.56		54		31.46		31.34		31.33	
	6.91	38.46	6.90	38.44	7.49	38.91	7.84	39.17	7.84	39.16
		31.59		31.57		31.49		31.37		31.36
cos δ 9.98662	− 6.89	6.87	− 6.85	6.87	− 7.49	7.42	− 7.77	7.80	− 7.81	7.80
12669	+ 2	38.46	+ 1	38.44	+ 1	38.91	+ 3	39.17	+ 3	39.16
.11331	− 1.62		− 1.60		− 1.52		− 1.40		− 1.39	
		6.89		− 6.84		− 7.51		− 7.78		− 7.82
	31 29.98	+ .02	30.01	+ .01	29.93	+ .02	30.05	+ .03	30.00	+ .04
		− 1.62		− 1.60		− 1.52		− 1.40		− 1.39
		29.97		30.01		29.90		30.02		29.99
		.99		03		.91		04		.01
	+225	−197	+234	−252	+162	−223				
	+1.35228	−1.2945	+1.3747	−1.4014	+1.2095	−1.3483				
	485	+.03	56.1	−.01		+.15	46.6	−04	58.1	−07
	3037		3020				3020		63.0	
	58.8		47.3				63.9		58.1	
10	3 39.4	4 33.2	3 37.2	4 40.3	3 48.0	4 37.3	3 44.7		3 45.8	
	43.9	38.2	44.1	46.9	57.2	47.2	44.9		52.0	
	83 3	12 0	81 3	87 2	105 2	84 5	89 6		97 8	
	3 4165	4 36.00	3 4065	4 4360	3 5260	4 4225	3 4480		3 4890	
	+2917	−25.54	+3074	−3268	+2100	−28.92				
	4 1082	4 10.46	4 11.39	10.92	13.60	13.33				
Runs R.L.m.u.	+.11	+.11	−.04	−.04	+.55	+.55				
	0	0	0	0	0	0				
	14 10.36	11.07	14 10.71	11.52	14 12.75	14.46				
	+22.5		+23.7		+16.2		+18.2		+17.8	
	1.35218		1.37475		1.20952		1.26007		1.25042	
	1.46549		1.48806		1.32283		1.37338		1.36373	
	+2421		+3077		+21.03		+2362		+2311	
	13 41.65		13 40.65		13 52.60		13 44.80		13 48.80	
	14 10.86		14 11.42		14 13.63		14 8.42		14 12.01	
+14°	8' 37.49"		8 36.93		8 34.72		8 39.93		8 36.34	
	− ~~30.29~~		− ~~29.07~~		− ~~29.96~~		− ~~30.15~~		− ~~29.39~~	
	− 32.63		−31.71		− 32.20		− 32.42		−31.67	
+	8 4.8		8 5.2		8 2.5		8 7.5		8 4.7	
	9 7.8		9 7.9		9 8.0		9 7.9		9 7.9	
δ' = +14	8 37.49		8 36.93		8 34.72		8 39.93		8 36.34	
	−15.90		−16.00		−16.10		−16.00		−16.00	
	+1 ~~0.6~~		+1 ~~0.5~~		+1 ~~3.3~~		+0 ~~58.1~~		+1 ~~1.0~~	
−.44	3.0	26	2.7	22	5.5	51	+1 0.4	0.0	3.2	2.7

51.9

+14° 91 78″ oct 7
7.9 +1 12
80 +1 17
7.9 −1 22
7.8 −1 27
7.6 −2 1
7.3 −3 6
7.0 −3 11
6.6 −4 16
~~6.6~~ 21
26

(44

+.06 3 +100 Oct. 27		+11 +119 Oct. 29		+18 +200 Oct. 30		+17 +192 Nov. 2		−8.96 8.12 3 +240 Nov. 7		−8.61 220 +213 Nov. 9	
31 26.5	31 17.4	31 28.0	31 19.8	31 27.7	31 17.8	31 28.0	31 20.5	31 27.4	31 18.6	31 26.9	
28.7	18.7	30.1	20.7	29.8	18.9	30.1	22.2	29.5	19.8	29.0	
30.8	19.8	32.2	22.1	32.0	20.4	32.1	23.3	31.6	21.0	31.1	
35.9 37.1	25.9	36.4	26	36.2	57.1	36.4	60	35.9	59.4	35.3	
39.3	18.6	38.5	20.9	38.3	19.0	38.0	22.0	38.0	19.8	37.3	
41.4		40.6		40.5		40.7		40.0		39.6	
43.5		42.7		42.6		42.8		42.2		41.7	
47.8		44.9		44.8		44.9		44.4		43.9	
49.8		48.1		49.0		49.2		48.5		48.1	
52.0		51.3		51.0		51.2		50.6		50.1	
		53.4		53.2		53.4		52.7		52.3	
4319	31 18.6	4472	31 20.9	4451	31 19.0	4468	31 22.0	4408	31 19.8	4353	
31 39.26	39.264	31 40.65	40.655	31 40.46	40.464	40.71	62 40.709	40.07	40.073	39.57	39.573 980
31.31	39.25	31.20	40.64	31.19	40.45	31.14	40.69	31.06	40.06	31.03	39.56
7.95	31.24	9.45	31.23	9.28	31.22	9.57	31.17	9.01	31.09	8.53	31.06
−7.95	7.91	−9.41	9.41	−9.29	9.23	−9.55	9.52	−8.96	8.97	−8.61	8.50
+ 1	39.25	+ 3	40.64	+ 4	40.45	+ 4	40.69	+ 5	40.06	+ 0	39.56
−1.37	−7.96	−1.26	−9.42	−1.25	−9.31	−1.20	−9.53	−1.12	−8.98	−1.09	−8.64
29.95	+.02	30.01	+.03	29.96	+.04	30.00	+.05	30.04	+.06	29.92	.03
	−1.37		−1.26		−1.25		−1.20		−1.12		−1.09
	29.94		29.99		29.93		30.01		30.02		29.88
	95		01		95		93		04		90
618	−.06		+.06		+.06		+.14		+.08		
29.96				43.0		38.3		50.9			
68.0				30.43		29.93		29.87			
				69.5		64.0		64.0			
3 42.7		3 41.8		3 42.1		3 45.1		3 48.2			
49.8		43.6		42.1		45.14		43.2			
925		854				5		114			
3 46.20		3 42.70		3 42.10		3 45.25		3 45.70			

88

+20.7	+19.7	+21.5	+18.7	+20.3
1.31597	1.29447	1.38244	1.27184	~~1.313~~ 1.30540
1.42928	1.40778	1.44575	1.38515	~~1.427~~ 1.41871
+2687	+2557	+2791	+24.27	~~+26.74~~ +26.23
13 46.25	13 42.70	13 42.40	13 45.25	13 45.40 45.70
14 13.12	14 8.27	14 10.01	14 9.52	14 ~~12.44~~ 11.93
8 35.23	8 40.08	8 38.34	8 38.83	8 36.42
− ~~28.94~~ −31.23	− ~~30.33~~ −31.66	− ~~30.70~~ −33.06	− ~~30.44~~ −32.44	~~−30.19~~ −32.61
8 4.0	8 8.4	8 5.3	8 6.4	8 3.8
9 7.9	9 7.7	9 7.6	9 7.5	9 7.2
8 35.23	8 40.08	8 38.34	8 38.83	8 36.42
− 16.00	− 15.80	− 15.70	− 15.60	− 15.30
+1 ~~1.6~~	+0 ~~59.9~~	+1 ~~0.0~~	+0 ~~59.1~~	+1 ~~1.4~~
3.9 3.5	59 3 58.8	2.3 1.9	+1 1.1 0.7	4.6 4.1

5 05

▽3 Draconis 20 33

a Delphini δ = +15° 27' 30.3"

20 33 42 2033 38.79(-01)
38.78

+15 28

+2
+3
−2
+1
+2
−4
+4
−6
−3
+1
−4

Oct 7	20 33 40.43	08	+15° 27' 46.6"	
12	35	08	46.8	+2
17	.27	08	46.9	+1
22	19	08	46.8	−1
27	40.10	09	46.7	−1
Nov 1	02	08	46.5	−2
6	.94	08	46.2	−3
11	86	08	45.9	−3
16	39.78	.08	45.5	−4

+.45 +28 1871 Oct 8 +07 +065 Oct 9 +03 +025 Oct 15 +05 +079 Oct 16 +05 +079 Oct 22 +10 +147

log sin ζ 9.4260
log cos ζ 9.9840
log C 6.7367
6.1467

log cos ζ 9.9840
log C 10265
.1015
87
1102
070
.11070

Oct 8		Oct 9		Oct 15		Oct 16		Oct 22	
33 34.6	33 23.7	33 34.5	33 20.8	33 35.0	33 25.0	33 35.2	33 27.5	33 35.2	33 27.6
36.6	24.7	36.6	22.3	37.1	26.0	37.3	28.6	37.3	28.5
38.7	26.4	38.7	23.9	39.2	27.2	39.4	30.0	39.4	29.6
42.9	148	43.0	70	43.5	182	43.8	861	43.7	257
45.2	249	45.1	223	45.6	261	45.9	28.7	45.8	28.6
47.3		47.3		47.6		48.0		−48.0	
49.4	34 10.8	49.4	34 12.3	49.9	34 9.7	50.2		50.1	
51.6	12.0	51.5	13.7	52.0	10.8	52.2		52.3	
55.6	13.1	55.7	15.0	56.5	12.3	56.5		56.5	
58.0	59	57.9	110	58.5	328	58.7		58.6	
60.1	11.9	60.0	137	0.5	109	60.8		60.8	
520.2		579.7		465.6		528.0		527.7	
	33 24.9		33 22.3	60	33 26.1		33 28.7		33 28.6
				525.6					
33 47.27	47.291	33 47.25	47.245	33 47.78	47.782	33 48.00	48.000	33 47.97	47.973
40.41		40.39		40.30		40.28		40.19	
6.86	47.28	6.85	4723	7.47	47.76	7.71	4798	7.78	4796
	4040		40.38		40.29		40.27		40.18
−6.85	6.88	−685	6.85	−7.49	7.47	−7.70	7.71	−7.81	7.78
+ 2	47.28	+ 1	47.23	+ 1	47.76	+ 1	47.98	+ 3	47.96
−1.62		−1.60		−1.51		−1.49		−1.40	
	−6.89		−6.84		−7.51		−7.83		−7.81
33 38.78	+.02	38.81	+.01	38.79	+.02	38.82	+.02	38.79	+.04
	−1.62		−1.60		−1.51		−1.49		−1.40
	38.79		38.80		38.76		38.78		38.79
	.81		82		77		80		81

+223 +247 +249 +265 +21.7 −23.1
+1.3483 −1.3927 +1.3962 −1.4232 +1.3365 −1.3636

48.5
30.37 +03
58.5

Oct 8		Oct 9		Oct 15		Oct 16		Oct 22
55 0 2.4	1 1.3	0 −0.7	1 4.8	0 4.3	1 1.2	0 5.4		0 9.2
6.2	6.3	5.9	12.2	13.8	11.0	11.9		14.2
8.6	7.6	5.2	170	181	122	17.3		23.4
0 4.30	1 3.80	0 2.60	1 8.50	0 9.05	1 6.10	0 8.65		11.70
+28.74	−31.84	+32.11	−34.14	+27.92	−29.77			
0 33.04	31.96	34.71	34.36	36.97	36.33			

	Oct 8	Oct 9	Oct 15	Oct 16	Oct 22
	+22.4	+24.9	+21.7	+19.3	+19.4
	1.35025	1.39620	1.33646	1.28556	1.28780
	1.46095	1.50690	1.44716	1.39626	1.39850
	+2880	+3213	+2800	+2490	+2503
	55 4.30	55 2.60	55 9.05	55 8.65	55 11.70
	55 33.20	55 34.73	55 37.05	55 33.55	55 36.73
+15°	27' 15.15"	27 13.62	27 11.30	27 14.80	27 11.62
	−30.39	−29.47	−29.96	−30.13	−29.39
	26 44.8	26 44.1	26 41.3	26 44.7	26 42.2
	27 46.6	27 46.7	27 46.9	27 46.9	27 46.8
δ' = +15	27 15.15	27 13.62	27 11.30	27 14.80	27 11.62
	−16.30	−16.40	−16.60	−16.60	−16.50
−.42	[+1 1.8 1.4	+1 2.6 2.2	+1 5.6 5.1	+1 2.2 1.8	+1 4.6 4.2

+06 +100
Oct 24 (3 written over 4)

33 35.3 37.4 39.5 43.8 45.9 48.1 50.2 52.3 56.6 58.8 60.9 528.8

33 29.0 30.3 31.7 910 30.3

33 48.07

+11 +119
Oct 29

33 36.6 38.5 41.0 45.1 47.3 49.4 51.5 53.7 59.0 60.1 62.2 5447

33 27.7 28.8 29.7 262 28.7

+18 200
Oct 30

33 36.5 38.7 40.7 45.0 47.1 49.2 51.4 53.5 57.7 59.8 62.0 5416

33 22.6 24.2 25.5 123 24.1

+17 +192
Nov 2

33 36.7 38.8 40.9 45.1 47.3 49.4 51.6 53.6 58.0 60.2 62.3 5439

33 25.0 26.6 27.4 198 26.3

+22 +24.9
Nov 7

33 36.0 38.2 40.3 44.6 46.7 48.9 51.0 53.2 57.3 59.5 61.6 5373

33 30.0 31.1 32.5 36 31.2

+20 +213
Nov 9

33 35.6 37.7 40.0 44.2 46.3 48.4 50.6 52.6 57.0 59.1 61.2 5327

33 38795

33 30.3 | 33 28.7 | 33 24.1 | 33 26.3 | 33 31.2

33 48.07 40.17 7.90 −7.95 +1 −1.38 38.75

48.073 48.06 40.16 7.90 48.06 −7.96 +.02 −1.38 38.74 75

33 49.52 40.06 946 −941 +3 −1.27 38.87

49.518 4950 4005 9.45 4950 −9.42 +.03 −1.27 38.84 86

33 49.24 40.04 9.19 −9.29 +5 −1.25 38.79

49.236 4922 40.03 9.19 49.22 −9.31 +.05 −1.25 38.71 73

33 49.45 40.00 9.45 −9.55 +5 −1.21 38.74

49.445 4943 39.99 944 49.43 −9.53 +.05 −1.21 38.74 76

48.85 39.52 8.93 −8.56 +6 −1.10 38.82

48.845 4883 39.91 8.92 4883 −8.98 +07 −1.13 38.79 80

48.43 39.89 8.54 −8.61 6 −1.10 38.78

48.427 20 4841 39.88 8.53 48.41 −8.64 +06 −1.10 38.73 75

0 10.4
1 16.3
3 6.7
2 13.35

0 4.1
6.2
10 3
0 5m.15

4? 60.7
60.2
8.9
4 8.45

0 3.3
1.3
46
0 2.30

0 15.2
11.1
263
13.15

+17.8
1.25042
1.36112
+22.97
55 13.35
55 36.32

+20.8
1.31806
1.42876
+26.84
55 5.15
55 31.99

+25.1
1.39967
1.51037
+32.39
55 0.45
55 32.84

+23.1
1.36361
1.47431
+29.81
55 2.30
55 32.11

+17.6
1.24551
1.35621
+22.71
55 13.15
55 35.86

27 1703
−28.94

27 1636
−30.33

27 1551
−30.70

27 1624
−30.44

27 1249
−30.59

26 43.1
27 46.8

26 46.0
27 46.6

26 44.8
27 46.5

26 45.8
27 46.5

26 41.9
27 46.1

27 12.02
−16.50

27 16.36
−16.30

27 15.51
−16.20

27 16.24
−16.20

27 12.49
−15.80

+1 3.7 3.2

+1 0.6 0.2

+1 1.7 1.3

+1 0.7 0.2

+1 4.2 3.8

α Cygni

2.05 ~~2.04~~

20 37 06 37 2.06(−02)

δ = +44° 49′ 13.2″

−04 +44 49 Sept 27. +2 +112 Sept 30 +5 +9 −8 +2 ±4 −6 −2 +4 ~~+10~~ −1 +082 Oct 9 +03 +025 Oct 15 +10 +074 Oct 16 +05 +079

1871 +100

−1122

	Sept 27.		Sept 30		Oct 9		Oct 15		Oct 16	
	36 52.2	36 39.0	37 23.3	37 9.8		37 20.8	36 53.4	36 39.3	36 53.6	36 41.3
	55.1	40.6	26.4 31	11.1		22.1	56.4 30	41.3	56.5	43.3
	57.9	41.8	29.2 28	12.8		23.8	59.2 28	43.3	59.4	45.5
log sin δ 9.8481	3.8	14	35.0 58	37	37 4.44	24.8	5.0 58	1239	5.2	181
" cos δ 9.8509	6.7	40.5	37.8 28	11.2	7.40	115	7.9 29	41.3	8.0	43.4
" C 1.7367	9.5		40.8 30		10.35	229	10.9 30		−10.9	
6.4357	12.6		43.8 30		13.00 37	47.3	13.6 37	36.7	13.8	
	15.5		46.6 28		16.00	49.6	16.6 30	38.0	16.9	
log cos δ 9.8509	21.3		52.3 57		51.29	51.3	22.3 57	40.6	22.6	
.1285	24.2		55.2 28			1482	25.3 30	1153	25.5	
9.9684	27.0		58.0			994	28.2 29	384	28.4	
87	2556		448.4				298.8		300.8	
9.9771	180	36 40.5		37 11.2		37 22.9	180	36 41.3	180	36 43.4
9.97760	105.6						118.8		120.8	
	37 9.62	9.618	37 40.96	40.764	37 10.26	10.256	37 10.80	10.800	37 10.98	10.982
	3.78	9.60	3.74	40.74	3.50	10.23	3.34	10.78	3.32	10.96
	5.83	3.76	37.22	3.69	6.74	3.48	7.46	3.32	7.66	3.30
		5.84		7.05		7.75		7.46		7.66
	−5.81		−37.16		−6.85		−7.49		−7.70	
	+2	9.60	+10	40.74	+3	10.23	+5	10.78	+5	10.96
	−1.72		−1.65		−1.44		−1.28		−1.26	
		−5.90		−37.13		−6.84		−7.51		−7.73
	37 2.07	+.11	2.05	+.08	2.00	+.02	2.08	+.08	2.07	+.08
		−1.72		−1.65		−1.44		−1.28		−1.26
		2.09		2.04		1.97		2.06		2.05
		.11		.06		98		08		06

−127 −392 +305 −266

+1.1038 −1.5933 +1.4843 −1.4249

30 4 22.7		3 54.6		4 28.9	4 53.2	3 49.7	4 42.2	3 51.7	
35 49.0		50.0		30.2	54.9	53.2	46.8	52.7	
10 11.7		1046		591	108.1	102.9	89.0	104.4	
5 35.85		52.30		4 2955	4 5405	3 51.45	4 44.50	52.20	
				− 1204	− 3721	+ 28.94	− 25.24		
				4 17.51	16.84	2039	19.26		
+29.1		+29.6		−12.7		+29.5		+27.6	
1.46389		1.47129		1.10380		1.46982		1.44091	
1.44149		1.44889		1.08140		1.44742		1.41851	
+2264	1264	+2811		−1206		+2802		+2621	
34 05.85	34 5.85	33 52.30		34 29.55		33 51.45		33 52.20	
34 18.49	34 18.49	34 20.41		34 17.49		34 19.47		34 18.41	
	+44°	48 27.94		48 30.86		48 28.88		48 29.94	
+ 01.72		+ 1.66		+1.72		+ 1.65		+ 1.70	

		48 29.6		48 32.6		48 30.5		48 31.6	
	+	49 34.2		49 35.3		49 35.7		49 36.0	
δ′ =	+ 44	48 27.94		48 30.86		48 28.88		48 29.94	
		−21.10		−22.10		−22.60		−22.80	
	+.03	+1 4.7 4.7		+1 2.7 2.7		+1 5.3 5.4		+1 4.4 4.4	

Sept. 17	20	37	4.01		+44° 49' 32.0"	10
22			3.90	.11	33.0	8
27			3.79	.12	33.8	.7
Oct. 2			3.67	.12	34.5	.6
7			3.55	.12	35.1	.5
12			3.42	.13	35.6	.4
17			.29	.13	36.0	.4
22			16	.13	36.3	.3
27			3.02	.14	36.4	.1
Nov. 1			2.89	.13	36.3	.1
6			2.76	.13	36.2	.1
11			2.63	.13	36.0	.2
16			2.50	.13	35.7	.3

Oct 24 +103 +100		Oct 27 +11 +119		Oct 30 +18 +200		Nov 2 +17 +192		Nov 7 +.22 +240		Nov 9 +.20 +213	
36 53.6	36 47.6	36 54.9	36 39.0	36 54.7	36 47.3	36 55.0	37 33.2	36 54.1	36 45.1	3.6 53.7	36 46.3
56.6	49.2	57.7	41.1	57.6 29	49.6	57.8	34.7	57.0 29	46.3	56.6	47.1
59.5	50.5	0.6	42.6	0.4 28	57.8	0.6	37.9	59.9 29	47.8	59.4	134
5.2	147 3	6.4	27	6.3 59	148 7	6.4	138	5.7 58	192	5.1	467
8.1	49.1	9.2	40.9	9.1 28	49.6	9.3	35.3	8.5 28	46.4	8.1	
11.0		12.2		12.0 29		−12.3		−11.5 30		11.0	
13.9		15.1		14.9 29		15.1		14.3 28		14.0	
16.8 36	49.1	18.1 36	409	17.8 36 29	49.6	18.0 37	35.3	17.3 36 60	46.4	16.9 36	46.7
22.6		23.8		23.7 59		24.0 26.8		23.0 59		22.7	
25.5		26.7		26.6 29		29.7		26.0 30		25.6	
28.5		29.7		29.4 28				28.8 28		28.6	
301 3		254 4		252 5		255 0		306 1		301 7	
180		120		120		120		180		180	
121.3		134.4		132.5		135.0		126.1		121.7	2.056
37 11.03	11.027	37 12.22	12.218	37 12.04	12.045	12.27	12.273	11.46	11.464	11.06	11.064
3.13		2.56		2.94		2.86		2.73		2.68	
7.90	11.00	9.26	12.20	9.10	12.02	9.41	1225	8.73	11.44	8.38	11.04
	3.11		2.94		2.92		2.84		2.71		2.66
−7.95	7.89	−9.41	9.26	−9.29	9.10	9.55	9.41	−8.96	8.73	−8.61	8.88
+10	11.00	+.11	12.20	+18	12.02	+17	12.25	+.22	11.44	+.20	11.04
−1.07	−7.96	−90	−9.43	−88	−9.31	−80	−9.53	−.67	−8.98	−.62	−8.69
2.11	+10	2.02	+.12	2.05	+20	2.09	+18	2.05	+24	2.03	+21
	−1.07		−.90		−.88		−.80		−.67		−.62
	2.07		1.98		2.03		2.11		2.03		1.99
	09		02		04		13		05		.01

3 56.4	3 49.1	3 58.1	4 42.2	4 1.2	
58.4	45.0	52.2	36.7	3 50.0	
114 8	94 1	110 3	78 9	10 101 2	
57.40	47.05	55.15	39.45	.5 50.60	
+21.9	+31.8	+22.4	−23.0	+25.1	+24.4
1.34044	1.~~49226~~ .49550	1.35025	1.36173	1.39967	1.38739
1.31804	1.~~47036~~ 1.47310	1.32785	1.33933	1.37727	1.36499
+2080	+2854 +29.73	+2127	−2184	+2384	+2317
33 57.40	33 47.05 47.05	33 55.15	34 39.45	33 55.60	
34 18.20	34 ~~16.17~~ 16.78	34 16.42	34 17.61	34 19.44	
48 30.15	48 31.57	48 31.93	48 30.74	48 28.91	
+1.62	+1.63	+1.77	+1.62	+2.09	
48 31.8	48 33.2	48 33.7	48 32.4	48 31.0	
49 36.4	49 36.4	49 36.3	49 36.3	49 36.2	
48 30.15	48 31.57	48 31.93	48 30.74	48 28.91	
−23.20	−23.20	−23.10	−23.10	−23.60	
+1 4.6 4.7	+1 3.2 3.2	+1 2.6 26	+1 3.9 4.0	+1 5.2 5.2	

ε Cygni
20 41 01
1871 +33 29

δ = +33° 29′ 17.″6

59.47
20 40 59.53 (−08)

Sept 17 20 40 61.50 —08 +33° 29′ 35.7 35.8 .8
22 .48 — 37.2 .7
27 .38 — 37.7 .5
Oct 2 24 — 38.2 .5
7 61.14 — 38.5 .3
12 04 — 38.8 .3
17 60.93 — 39.0 .2
22 82 — 39.05 .1
27 60.72 +079

Sept 27 +02 +112 | Sept 30 +10 +.04 | Oct 5 +07 +048 | Oct 9 +025 +03 | Oct 16

+.15 +16
−019

δ 9.74170

cos δ 9.92119
12669
.04788

Sept 27

40 52.4 40 40.8
54.9 25 42.0
57.2 23 43.6
2.1 25 64
4.7 26 42.1
7.0 23
9.5 25
12.1 26
17.1 50
19.5 24
22.0 25
2585
180 40 42.1
78.5 7.14
41 7.05 7.045
1.33
5.71 7.03
1.25
−5.85 5.78
+1 7.03
−1.80
40 59.41 −5.90
+.07
−1.80
59.40
57

41 38.4 41 31.8
40.7 33.4
43.3 35.8
49.0 41.0
51.6 26 32.7
53.7 21
37.7
41 33.7
−37.16
+7
~~−1.65~~
~~59.48~~

Sept 30 / Oct 5

40 52.8 40 38.5
56.3 25 40.0
57.6 41.7
2.6 120
5.0 40.1
7.5
10.0 41 30.0
12.5 31.5
17.4 33.3
20.0
22.3
2630
180 40 40.1
83.0
41 7.55 7.545
1.18
6.37 7.52
1.11
−6.47 6.41
+5 7.52
−1.65
59.48 −6.46
+.03
−1.65
59.44
.46

Oct 5 / Oct 9

41 3.0 40 58.6
5.4 59.5
7.9 181
10.4 41 28.6 59.0
12.9 29.6
39.6 31.0
882
29.4
40 59.0
41 7.92 7.920
1.09
6.82 7.90
1.02
−6.92 6.88
+2 7.90
−1.56
59.46 −6.94
+.02
−1.56
59.42
.43

Oct 16

40 53.8 40 43.0
56.3 44.1
58.7 45.4
3.6 125
6.2 44.2
8.5
11.0
13.5
18.6
20.9
23.4
274.5
180 40 44.2
94.5
41 8.59 8.591
0.95
7.64 8.57
6.88
−7.70 7.69
+8 8.57
−1.42
59.50 −7.93
+.05
−1.42
59.47
49

X

Sept 27

50 4 7.7
3 34.8
1210 25
5 51.25
+24.9
1.39620
1.44408
+27.80
53 51.25
54 19.05
+33° 28′ 29.″30
−9.76
28 19.5
29 37.2
−.14 +1 17.7 17.6
δ′ = +33 28 29.30
−19.60

4 20.7
17.1
378
4 18.90

Sept 30 / Oct 5

3 31.2 4 29.2
35.8 28.8
1270 580
3 3.50 4 29.00
+27.4
1.43775
1.48563
+30.87
53 53.50
54 04.09
28 44.26
−9.78
28 34.5
29 38.0
+1 3.5 3.4
28 44.26
−20.40

Oct 9

3 52.1
53.7
1658
3 52.90
+5.7
0.94939
0.99727
+9.94
53 52.90
54 02.84
28 45.51
−9.73
28 35.8
29 38.4
+1 2.6 2.4
28 45.51
−20.80

Oct 16

3 33.1
37.7
1308
3 35.40
+24.4
1.38739
1.43527
+27.24
53 35.40
54 02.64
28 45.71
−10.00
28 35.7
29 38.7
+1 3.0 2.9
28 45.71
−21.10

−11
−7
−16
−9
−10
−8
−3
−3
−.2
−6

Oct. 27	δ =	+33°	29′	39″.1	1
Nov. 1				39.0	2
6				38.8	2
11				38.0	3
16				38.3	

Oct – 21
+12 +133

40 53.7 40 44.8
56.3 26 46.7
58.7 24 48.0
3.5 28 195
5.8 28 46.5
8.4 26
71.1 27
13.6 25
18.4 28
21.0 26
23.4 24
270.9
180 41 46.5
99.9
42 8.45 8445
0.84
7.61 842
.77
7.65
−7.77 7.42
+.8 ~~7.74~~
−1.31 7.79
59.45 −7.09
−1.31
59.41
43

Oct. 29
+11 +119

40 55.1 40 40.3
57.6 41.3
0.0 42.5
5.0 44
7.5 41.5
9.9
12.5
14.8 40 41.5
19.9
22.3 ~~12136~~
24.9
229.5 229.5
120 120
111.5 109.5
41 10.14 9.95 9.95
0.67 9.93
9.25 60
9.33
−9.41 9.93
+.7
−1.17
−9.43
59.47 +.08
−1.12
59.44
45

Oct – 30
+18 +200

40 55.0 40 43.0
57.5 44.7
59.9 46.3
4.8 140
7.4 44.7
9.8
12.3
14.8 40 44.7
19.6
22.2
24.6
287.9
180
107.9
41 9.81 9.809
65 9.79
9.12 58
9.21
−9.28 9.79
+.12 −9.31
−1.62 +.13
59.50 −1.12
59.49
50

Nov – 2
+17 +192

40 55.3 40 52.0 40
57.5 22 53.1
0.0 35 54.6
5.0 40 97
7.6 24 53.2
10.0 24
12.5 25
14.9 24 40 53.2
19.9
22.3
24.8
229.8
120
109.8
~~10.07~~ 9.982
0.69 9.96
9.47 53
9.43
−9.15 9.96
+.11 −9.53
−1.07 +.12
59.47 −1.07
59.48
52

Nov – 7
+22 +240

40 54.5 40 46.5
57.0 48.0
59.5 49.8
4.4 243
6.8 48.1
9.3
11.8
14.3 40 48.1
19.1
21.6
24.0
282.3
180
102.3
9.30 9.300
6.49 9.28 468
8.81 .82
40 8.86
−8.96 w 9.28
+.16 −8.98
−.96 +.16
59.47 −.96
59.50
57

Nov – ~~8~~ 17

3 19.9
26.5
3 33.20
+21.9
1.34044
1.38832
+24.45
53 28.20
54 ~~27.65~~
0265
28 45.70
−9.97
28 35.7
29 39.0
+1 3.3
~~58.3~~ ~~58.1~~
3.1
28 50.70
−21.40

3 30.2
28.8
590
3 29.50
+28.4
1.45332
1.50120
+3170
53 29.50
54 01.20
28 47.15
−10.12
28 37.0
29 39.2
+1 2.0 1.9
28 47.15
−21.40

3 35.1
32.6
677
3 33.85
+25.1
1.39964
1.44755
+2803
53 33.85
54 1.88
28 46.47
−10.20
28 36.3
29 39.0
+1 2.7 2.6
28 46.47
−21.40

3 45.6
42.8
884
3 44.20
+16.8
1.22531
1.27319
+1876
53 44.20
54 2.96
28 45.39
−10.07
28 35.3
29 39.0
+1 3.7 3.5
28 45.39
−21.40

3 45.1
35.6
807
3 40.35
+21.2
1.32634
1.37422
+23.67
53 40.35
54 4.02
28 44.33
−9.83
28 34.5
29 38.78
+1 4.3 4.2
28 44.33
−21.20

-032 ✓ 5 0 2 δ = +61° 20' 17.5"

η Cephei

39.69
20 42 48 42 39.46 (-09)

1871 +61 19 (+031 / 027)

-32 +1.53

	sept-17 ~~20~~ 20	42 42.02	.18	+61°20' 37.3"	11
	22	.84	.18	38.4	11
	27	.66	.18	39.5	10
	oct-2	.47	.19	40.5	8
	7	41.28	.19	41.3	.6
	12	.08	.20	41.9	.6
	17	40.87	.21	42.5	.4
	22	.65	.22	42.9	.2
	27	40.43	.22	43.3	

Sept 28 +05 +100 · Oct 5 +07 +048 · Oct 9 +03 +025 · Oct 16 +05 +079 · Oct 24

log sin δ 9.9431
" cos δ 9.6812
" C 6.7367
6.3610

log cos δ 9.6812
" b 1175
9.7987
87
9.8074

9.68121
.2669
9.80790

Sept 28		Oct 5		Oct 9		Oct 16		Oct 24	
41 54.0	42 12.0								
57.8	13.4	42 21.9	42 31.0	42 22.0	42 35.6	42 ~~23.5~~	42 23.8	42 22.7	42 34.1
1.5	254	26.2 43	33.3	26.5	38.2	27.8	25.3	27.0	35.8
9.0	1230	30.4 42	36.4	30.8	138	31.2	26.8	31.2	36.6
12.9		39.0 86	107	39.5	369	40.0	159	39.5	35.6
-16.9		43.3 43	336	43.5		44.0	253	44.0	185
20.6		-47.6 43		-48.0		48.5		-48.3	36.2
24.5 42	46.1	51.9 43	28.4	52.1 43	23.4	52.8 43	262	52.9	
31.9	48.7	56.3 44	30.1	56.7	26.1	57.3	28.4	57.0	
35.6	50.7	4.7 84	32.9	4.9	28.5	5.6	30.8	5.6	
39.5	1455	9.0 43	914	9.5	180	9.9	854	9.8	
3042	485	13.3 43	305	13.8	26.0	14.3	28.4	14.2	
120		343.6		347.8		354.9		352.5	
184.2 42	12.7	180 42	33.6	180 42	36.9	180 42	25.3	180 42	36.2
		523.6		527.8		534.9		532.5	
42 16.75	16.745	43 47.60	47.600	43 47.94	47.936	48.63	48.627	42 48.41 +1⁵	48.409
41.68 63		41.37 .37		1.18 19		40.93 90		40.68 60	
24.13	16.71	6.24	47.57	6.74	47.90	7.72	48.59	7.80	48.88
+ 9	41.52		41.26		41.12		40.82		40.52
	36.19	-6.47	6.31	6.92	6.78	-7.70	7.77	-7.91	7.86
9	16.71	+ .13	47.57	+ 5	47.90	+ 9	48.59	+ .11	48.38
-1.87		-1.61		-1.47		-1.17		-.87	
	-6.04		-6.46		-6.94		-7.78		7.86 / 7.75
	+.18	42.3965	+.09	39.60	+.04	39.85	+.14	39.70	+.11
	-1.87		-1.61		-1.47		-1.14		-.89
	(38.98)		39.59		39.57		39.86		39.69
			61		59		67		72

Rej loosing II

+4.0	-318	+14.0	-429	+11.0	-381	+233	-398
0.6020	-1.5024	+1.1461	-1.6325	+1.0414	-1.5809	+1.3674	-1.5999
1.2040	3.0048	2.2922	3.2650	2.0828	3.1618	1.7348	3.1998

15 2 15.3	2 41.8	0 3 20.8	3 56.6	0 3 22.4	3 53.9	0 3 14.2	3/4 54.7	3 20.5
2 35.8	1.5	20.0	55.7	19.0	51.3	139	54.2	19.5
2 51.1	6033	408	1123	41.4	105.2	281	9	400
2 2555	2 5165	3 2040	3 5615	3 2070	3 5260	3 1405	3 5445	3 2000
+ 252	- 2040	+ 898	- 2754	+ 706	- 2444	1495	- 2554	
3 2807	2 3125	3 2931	2861	2776	2816	2900	2891	
- 0	- 28	- 5	- 42	- 9	- 38	- 10	- 36	

+4.0	+14.0	+11.0	+28.3	+12.2
0.60206	1.14613	1.04139	1.36736	1.08636
0.40996	0.95403	0.84929	1.17526	0.89426
+2.57	+9.90	+4.07	+14.97	+7.84
16 55.55	3 18 20.40	3 18 20.70	3 18 14.05	3 18 20.00
16 58.12	18 29.40	18 27.77	18 29.02	18 27.84
+61 4 57 50.23 ✓	19 18.95	19 20.58	19 19.33	19 20.51
+ 19.64	+ 19.15	+ 19.36	+ 19.73	+ 18.97
5 09.9	19 38.1	19 39.9	19 39.1	19 39.5
20 39.8	20 41.0	20 41.6	20 42.4	20 43.1
δ' = +61 5 50.23	19 18.95	19 20.58	19 19.33	19 20.51
- 22.30	- 23.50	- 24.10	- 24.90	- 25.60
+30 +15 29.9	+1 02.9 3.2	+1 1.7 20	+1 3.3 3.6	+1 3.6 3.9

−15	Oct 27	20 42 40.43	+61° 20'	43.3	
+7	Nov 1	21	22	43.5	+2
+11	6	39.91	22	43.5	+0
−4	11	78	21	43.4	−1
−11	16	39.54	21	43.2	−2
−4	21	37	20	42.8	−4
+2	26	18	19	42.3	−5
−18	Dec 1	00	18	41.7	−6
−7	6	38.83	17	40.9	−8

Oct 30 +18 +200 Nov 2 +17 +192 Nov 7 +22 +240 Nov 9 +20 +213

42 23.3 43 4.2
27.9 46 7.0
32.1 47 8.9
40.5 44 20.1
44.7 42 6.7
49.4 47
53.4 40
57.5 43 6.7
6.1 43
10.6 45
14.7 41
360.5
180
540.5
43 49.14 49.136
40.32 29
8.84 49.10
40.21
−9.29 8.89
+.33 49.10
−.56
−9.31
39.62 +.37
−.58
39.63
65

42 40.7 43 6.0
45.0 9.3
49.3 12.0
53.6 27.3
58.0 9.1
246.6
43 9.1
49.32
~~22.42~~
49.32 49.320
40.15 16
9.17 49.29
40.67
−9.15 9.22
+.31 49.29
−.42
−9.53
39.66 +.35
−.40
39.71
72

42 22.7 43 21.7
27.0 23.3
31.3 26.2
40.1 10.2
44.3 23.4
48.4
52.7
57.1 43 23.4
5.7
10.0
14.3
353.6
180
533.6
48.57 48.509
39.97 94
8.36 48.48
35.86
−8.96 8.62
+.40 48.48
−.21
−8.98
39.74 +.44
−.18
39.76
78

42 22.3 41 56.8
26.6 59.3
30.8 62.7
39.4 178.8
43.7 59.6
47.9
52.0
56.5 41 59.6
5.0
9.3
13.6
347.1
180
527.1
47.92 47.918 43
39.86 85 39.6
8.06 47.89
39.66 2
−8.61 8.23
+.37 47.89
−.12
−8.63
39.56 +.39
−.09
39.56
58

0 3 42.2
35.4
77.6
3 38.80

0 3 45.3
36.9
82.2
3 41.10

0 4 0.2
44.3
104.5
3 52.25

0 3 05.2
52.8
118.0
3 59.00

−17.6
1.24551
1.05341
−1137
18 3 38.80
18 27.44
19 20.86 √
+20.04

−19.8
1.29667
1.10457
−1272
3 41.10
18 28.88
19 19.97
+19.86

−34.9
1.54282
1.35072
−2243
3 52.25
18 29.82
19 18.53
+20.09

+48.3
1.68395
1.49185
+3103
3 59.00
3 18 30.03
19 18.32
+20.05

19 40.9
20 43.54

19 39.8
20 43.5

19 38.6
20 43.5

19 38.4
20 43.4

19 20.86
−25.90
+1 2.5 2.8

19 19.97
−26.00
+1 3.7 4.0

19 18.53
−26.00
+1 4.9 5.2

19 18.32
−25.90
+1 5.0 5.3

μ Aquarii
20 45 44
−9 29
1871 :17

41.78
45 41.61 +11

+100 Sept 28.

45 37.4 | 45 37.9
39.4
41.5
45.7
47.8
49.8
51.9 | 46 18.1
54.1 | 19.2
58.4 | 20.4
0.4 | 57.7
2.5 | 19.2
4289
120 | 45 37.9
548.9
49.90 | 49.900
4364
6.26 | 49.88
43.75
4988 | 6.13
− 6.04
− .02
− 2.03
41.78
41.80
.80

Sept 30

45 20.8 | 45 16.3
22.9 21 | 19.2
25.1 22 | ~~20~~
− 32.9 8 | 155
34.9 | 17.7
36.9
173.5
45 17.7

+03 +025 Oct. 9

45 38.0 | 45 28.2
40.2 | 29.4
42.2 | 30.4
46.4 | 880
48.5 | 29.3
50.6
52.6 | 46 9.1
54.7 | 10.5
58.8 | 11.5
61.0 | 311
63.0 | 10.4
5560
45 29.3
45 50.54 | 50.545
43.48
7.06 | 50.53
43.59
−6.92
− 1 | 694
−1.87 | 50.53
45 41.74 | − 694
− .01
−1.87
41.71
73

+12 +133 Oct. 21

45 38.7 | 45 ~~23.0~~
40.8 | 24.7
42.9 | 26.3
47.0 | 27.8
49.1 | 188
51.3 | 26.3
53.3
55.4
59.6
61.5
63.7
5633
45 26.3
45 51.21 | 51.209
43.30
51.19
43.41
−7.77
− 2 | 7.78
−1.69 | 51.19
41.73 | − 7.79
− .02
−1.69
41.69
71

+06 3 Oct 24

45 38.9 | 45 35.6
40.9 | 36.7
43.0 | 38.0
47.2 | 203
49.3 | 36.8
51.3
53.4
55.5
59.7
61.7
63.7
564.6
45 36.5
45 51.33 | 51.327
43..27
51.31
43.28
−7.95
− 1 | 7.93
−1.66 | 51.31
41.71 | 7.96
− 01
− 1.66
41.68
70

50 0 36.7 1 30.2
7.5 | 2.8
442 | 330
0 22.10 1 | 16.50
+12.0
1,07918
1,19989
+15.84
50 22.10
50 37.94
−9° 27′ 49.″59

45 4 51.7 50 0 44.4
59.7 | 52.4
171.4 | 1568
4 25.70 0 18.40
+21.2
1,32634
1,44705
+ 27.79
49 25.70
50 23.69
27 35.34

45
4 46.9
50.1
1570
4 48.50
+24.9
1,39620
1,51691
+32.88
49 48.50
50 21.38
27 33.03

50 0 3.7
13.3
45 0 8.50
+14.5
1,16137
1,28208
+19.15
50 8.50
50 27.65
27 34.30

sin δ 9.21685
cos δ 9.99402
12669
12071

+15
+12
+10
+9
+5
+12
+7
+15
+19
+12

Oct-29 +11 +119

45 40.245
42.3
44.3
48.6
50.6
52.8
54.8
56.9 45 33.0
61.1
63.2
65.2
5800

31.4
33.1
34.5
90
33.0

45 52.721
43.18
−9.41
−2
−1.57
41.72

52.727
5271
43.29
9.42
52.71
−9.43
−.02
−1.57
41.69
70

45 4 51.2
56.9
4 24.05
54
+19.7
1.29447
1.41518
+2601
49 54.05
50 20.06
27 31.71

Oct-30 +18 +200

45 40.1
42.2
44.3
48.4
50.5
52.6
54.7
56.5 45 39.2
61.0
63.1
65.1
5785

45 37.5
39.0
40.7
1175
39.2

45 52.62
43.16
−9.29
−3
−1.55
41.75

52.618
5260
43.27
9.33
52.60
−9.31
−.03
−1.55
41.71
73

50 0 3.2
5.0
0 4.10
+13.4
1.12710
1.24781
+17.69
50 4.10
50 21.79
27 33.44

Nov-2 +17 +192

45 40.3
42.3
44.5
48.7
50.7
52.8
54.8
56.9 45 31.5
61.0
63.0
65.2
5802

45 30.0
31.5
33.0
45
31.5

45 52.755
43.12
−9.51
−3
−1.54
41.66

52.745
5273
43.23
9.50
52.73
−9.53
−.03
−1.51
41.66
68

45 4 54.0
56.1
1101
4 55.05
+21.2
1.32634
1.44705
+27.99
49 55.05
50 23.04
27 34.69

Nov-7 +22 +240

45 39.8
41.8
43.8
48.0
50.1
52.1
54.3
56.3 45 35.3
60.6
62.6
64.8
5742

34.0
45 35.1
36.9
160
35.3

52.20
43.05
−8.96
−4
−1.41
41.79

52.200
5218
43.16
9.02
52.18
−8.98
−.04
−1.41
41.75
76

50 0 3.6
0.3
39
0 1.95
+16.9
1.22789
1.34860
+2232
50 1.95
50 24.27
27 35.92

Nov-9 +20 213

45 39.4
41.4
43.6
47.7
49.8
51.8
54.0
56.1 45 34.2
60.0
62.4
64.4
5706

45 33.0
34.2
35.5
127
34.2

51.87
43.02
−8.61
−3
−1.41
41.82

41.740
51.873 41.73
20 5186
43.13
8.73
51.86
−8.63
−.04
−1.41
41.78
80

50 0 1.2
0.2
0 1 4
0.70
+17.7
1.24494
1.36868
+23.37
50 0.70
50 24.07
27 35.72

-.118

32 Vulpeculae

20 49 05 49 3.74 (-.112) 3.76 +.02

+27 33 1871

δ = +27° 34′ 5.1″

+.25 +5 2

Sept 27 +112		Sept 28 +05 +100		Sept 30 +10 +082		Oct 5 +07 ~~+048~~		Oct 9 +.03 +.025	
48 57.7	48 46.8	48 59.8	48 51.6	49 28.8	49 26.1	48 58.0	48 47.8	48 56.4	48 45.3
59.8	47.8	0.0	52.9	31.0	26.8	0.3	49.6	0.8	46.8
2.4	49.0	2.4	54.0	33.3	27.9	2.7	51.5	3.0	48.0
6.9	23.6	6.9	8.5	38.0	20.8	7.2	148.9	7.5	28.1
9.1	47.9	9.3	52.8	40.2	26.9	9.5	49.6	10.0	46.7
-11.6		11.7		42.6		-11.8		12.3	
13.8		14.0	49 31.2	45.1		14.1	49 37.4	14.6	49 33.0
16.0		16.3	32.7	47.3		16.8	38.8	17.0	34.5
20.8		20.9	34.0	52.0		21.1	40.6	21.5	36.0
23.0		23.2	9.5	54.3		23.5	116.8	24.0	13.5
25.4		25.5	32.6	56.6		25.8	38.9	26.2	34.5
246.4		189.0		469.2		190.6		195.3	
120	48 47.9	60	48 52.6		49 26.9	60	48 49.6	60	48 46.7
126.4		128.0				130.6		135.3	
49 11.49	11.491	49 10.97	11.686	49 42.65	42.655	49 11.87	11.873	49 12.30	12.300
5.58	11.47	5.36	11.64	5.53	42.64	5.44	11.85	5.37	12.28
6.51	6.56	~~6.26~~	6.54	37.12	5.51	6.42	5.42	6.53	5.35
-5.85	5.91		6.08	-37.16	37.13	-6.47	6.43	-6.92	6.93
+11	11.47	+ 3	11.62	+ 5	42.64	+ 4	11.85	+ 2	12.28
-1.84	-5.90	-1.82	-6.04	-1.79	-37.13	-1.70	-6.47	-1.63	-6.94
49 3.81	+.06	~~3.71~~	+.05	3.75	+.04	3.74	+.03	3.77	+.01
	-1.84		-1.82		-1.79		-1.70		-1.63
	3.79		3.81		3.76		3.71		3.72
	.81		83		77		73		74

log sin δ 9.6657
" cos δ 9.9477
" C 6.7367
6.3495

log cos δ 9.9477
" C 0.1175
9.7464
.0652
87
.0739

9.9477
12 67
.07440

	Sept 28		Sept 30		Oct 5		Oct 9	
	+19.0	-20.8	+22.3	-27.0	+22.3	-27.0	+25.6	-22.2
	1.2787	-1.3181			+1.3483	-1.4314	+1.4082	-1.3463
	45 4 21.3	50 0 10.0	45 3 52.9		45 3 43.4	4 40.2	45 3 38.1	4 36.1
	45.1	33.5	50.1		46.5	43.8	38.8	36.9
	126.4	43.5	103.0		89.9	84.0	76.9	73.0
	4 3 3.20	2 4.75	51.50		44.95	42.00	38.45	36.50
	+27.52	-24.66			+26.44	-32.00	+30.35	-26.32
	6.57	57.09			11.36	10.00	8.70	10.18
	+15.8		+15.7		+22.3		+25.6	
	1.27416		1.19590		1.34830		1.40824	
	1.34856		1.27030		1.42270		1.48264	
	+22.31		+18.63		+26.47		+30.38	
	49 3 3.20		48 51.50		48 44.95		48 38.45	
	49 3 3.51		49 10.13		49 11.42		49 8.83	
+27°	33 42.84		33 38.22		33 36.93		33 39.52	
	-15.97		-16.59		-15.97		-16.07	
	33 26.9		33 21.6		33 21.0		33 23.4	
	34 23.6		34 23.8		34 24.2		34 24.5	
δ′ = +27	33 32.84		33 38.22		33 36.93		33 39.52	
	-18.50		-18.70		-19.10		-19.40	
-.24	+1 16.7		+1 2.2 2.0		+1 3.2 2.9		+1 1.1 0.9	

Ang. Mah. out. Rej.

+7	Sep. 17	2h	49	5.72	08	+24	34	22.2	
+9	22			.65	7			22.9	7
+3	27			.58	7			23.5	6
−1	Oct. 2			.50	8			24.0	5
−6	7			5.41	9			24.4	4
−2	12			.32	9			24.7	3
−1	17			.22	10			25.0	3
−1	22			.13	9			25.1	1
−0	27			5.03	10			25.2	1
+1	Nov. 1			.94	9			25.1	
+2	6			4.84	10			24.9	
+2	11			45	9			24.7	
	16			4.66	9			24.4	

Oct 21 +12 +133

48 58.9
49 1.3
3.5
8.3
10.5
12.9
15.1
17.5
22.1
24.4
26.8
2013
60
141.3
~~50 13.84~~
49 12.84
5.14
7.69
−7.77
+ 6
−1.40
3.73

48 46.3
48.2
49.6
241
48.0
48 48.0
12845
12.83
5.12
7.71
12.83
−7.79
+.07
−1.40
371
72

Oct 22 +10 +147

48 58.9
1.3
3.6
8.3
10.6
12.8
15.2
17.4
22.0
24.5
26.7
208.3
60
147.3
49 1285
5.43
7.72
7.84
+ 5
−1.38
3.71

48 50.6
52.0
53.6
62
52.1
48 52.1
12845
12.83
5.10
7.73
12.83
−7.81
+.08
−1.38
371
73

Oct 24 +06 3 +100

48 59.1
1.3
3.7
8.4
10.7
13.0
15.2
17.7
22.3
24.6
27.0
203.0
60
143.0
49 1300
5.10
7.89
7.95
+ 3
−1.36
3.72

48 50.7
51.8
53.6
61
52.0
48 52.0
13.000
12.98
5.08
7.90
12.98
−7.96
+.05
−1.36
371
73

Oct 29 +11 +119

49 0.5
2.7
5.0
9.8
12.1
14.3
16.6
19.0
23.6
26.0
28.3
1579
49 14.35
4.99
9.34
−9.41
+ 6
−1.25
3.75

48 50.2
52.3
54.0
65
52.2
48 52.2
14.355
14.34
4.97
9.37
14.34
−9.42
+.06
−1.25
373
74

Oct 30 +16 +180

49 9.4
11.8
14.1
16.5
18.18
706
49 14.12
14.12
4.97
9.12
−9.29
+ 9
−1.23
3.69

49 28.7
30.0
31.1
898
29.9
49 29.9
14.120
14.10
4.95
9.15
14.10
−9.29
+.09
−1.23
367
69

Nov 2 +17 +192

49 0.4
2.8
5.1
9.8
12.0
14.4
16.7
19.0
23.6
26.0
28.4
1582
14.38
4.92
9.46
−9.55
+ 9
−1.18
3.74

48 52.5
54.1
55.5
121
54.0
48 54.0
14.382
~~14.36~~
14.36
4.90
9.46
3.72
49 14.36
20
−9.53
+.10
−1.18
375
76
141

45 3 40.8
37.0
778
3 38.90

+24.8
1.39446
1.46886
+2948
48 38.90
49 8.33

33 40.02
−16.41

33 23.6
34 25.1

33 40.02
−20.00

+1 1.5 1.3

3 43.2
45.0
882
3 44.10

+20.7
1.31597
1.39037
+2457
48 44.10
49 8.67

33 39.68
−16.02

33 23.7
34 25.1

33 39.68
−20.00

+1 1.4 1.1

3 45.0
48.2
932
3 46.60

+21.0
1.32222
1.39662
+2493
48 46.60
49 11.53

33 36.82
−15.80

33 21.0
34 25.1

33 36.82
−20.00

+1 4.1 3.9

3 44.1
44.4
885
3 44.25

+22.9
1.34635
1.42075
+2635
48 44.25
49 10.60

33 37.75
−16.54

33 21.2
34 25.2

33 37.75
−20.10

+1 4.3 4.0

+15.8
1.19866
1.27306
−1279

45 3 47.2
41.8
890
3 44.50

+20.4
1.30963
1.38403
+2421
48 44.50
49 8.71

33 39.64
−16.57

33 23.9
34 25.1

33 39.64
−20.00

+1 2.1 1.9

−1120

b
2 Cygni

W S 225 — 20 52 ~~21.86~~ 21.86 (.04)

+40 40

B 2 27 49 20 5 3

δ = +40° 40′ 17″.3

+.03 +.86 1871	Sept 23.	+02 +040	Sept 28	+05 +100	Sept 30	+10 +082	Oct 5	+07 +048	Oct 9	+03 +025
	52 41.9	53 0.6	52 13.7	52 3.3	52 44.5	52 32.0	52 13.7	52 1.0	52 14.1	51 57.0
	44.6	3.1	16.3	4.8	47.1	33.7	16.4	3.2	16.8	58.6
	47.4	5.9	18.9	6.3	49.9	35.7	19.1	4.7	19.5	60.0
	50.1	96	24.4	144	55.3	114	24.5	89	24.9	175.6
	52.8	3.2	27.1	4.8	58.1	33.8	27.3	2.9	27.6	58.5
	236.8		29.8		0.5		30.0		30.4	
			32.5 52	53.0	3.4		32.7 52	~~40.8~~	33.1 52	55.8
9.81402			35.4	55.4	6.0		35.4	44.1	35.8	57.7
			40.6	56.7	11.6		40.8	~~45.3~~	41.2	59.5
			43.4	151	14.1		43.5	46.7	43.9	230
			46.1	55.0	17.0		46.2		46.6	57.7
			328.2		307.5		329.6		333.9	
9.87996		53 2.2		52 4.8	310	52 33.8		52 2.9		51 58.5
12.669				?	7.5					
.00665	52 47.36	47.360	52 29.84	29.836	52 0.68	0.682	52 29.96	29.964	52 30.35	30.409
	23.80		23.71		23.67		23.56		23.47	
	23.56	47.34	6.13	29.82	37.01	0.66	6.40	29.94	6.93	30.39
		23.76		23.67		23.63		23.52		23.43
	−23.66	23.58		6.15	−37.16	37.03	−6.47	6.42	−6.52	6.96
	+ 2		+4		+ 9		+ 6		+ 3	
	−1.92	47.34	−1.83	29.82	−1.79	0.66	−1.68	29.94	−1.59	30.39
	52 21.86	−23.60	~~21.82~~	−6.04	21.82	−37.13	21.87	−6.46	21.93	−6.94
		+.03		+.19		+.07		+.04		+.03
		−1.92		−1.83		−1.79		−1.68		−1.59
		21.85		(22.04)		21.81		21.84		21.89
		.87		(06)		82		86		85
40		4 61.7	3 19.0	4 11.4	2 45.2		2 42.7	3 25.0	2 35.8	3 36.8
		3 34.0	2 44.2	3 36.1	42.0		45.3	27.9	37.6	38.1
		957	32	1075	872		680	529	734	749
		3 47.85	3 1.60	3 53.75	2 43.60		2 44.00	3 26.45	2 36.70	3 37.45
	−15.8		+250		+269		+27.2		+31.9	
	1.19866		~~1.41162~~	.39790	1.42975		1.43457		1.50379	
	1.20531		1.41527	1.40455	1.43640		1.44122		1.51044	
	− 1665		+ 1660	+25.39	+27.32		+27.62		+32.39	
	43 47.85		43 1.60	1.60	42 43.60		42 44.00		42 36.70	43
	43 31.80		43 28.0	26.99	43 10.92		43 11.62		43 9.09	
+40°	39′ 16.55″		39 21.36		39 37.43		39 36.73		39 39.26	
	−2.25		−2.31		−2.45		−2.37		−2.42	
	39 14.30		39 19.0		39 35.0		39 34.4		39 36.8	
	40 36.7		40 37.6		40 37.89		40 38.5		40 39.61	
δ′ = +40	39 16.55		39 21.36		39 37.43		39 36.73		39 39.26	
	−19.40		−20.30		−20.60		−21.20		−21.80	
−.03	+1 22.4	224	+1 18.6	186	+1 2.9	2.8	+1 4.1	41	+1 2.3	22

-1

-6	Sept. 17	5 2 23.91	9	+40° 40′ 35.6″	9	
-2	22	.82	9	36.5	.9	
+2	27	.73	9	37.4	.9	
+6	.001 -2	.63	10	38.1	.7	
+1	7	.52	11	38.8	.7	
+2	12	.41	11	39.3	.5	
-6	17	.29	12	39.7	.4	
-6	22	.18	11	40.0	.3	
-5	27	.06	12	40.2	.2	
-2	Nov. 1	22.95	11	40.3	.1	
	6	.83	12	40.2	.2	
	11	.71	12	40.0		
	16	.59	12	+136	3	

Oct. 21 +12 +133 — Oct. 22 +10 +147 — Oct. 24 +36 +100 — Oct. 29 +14 +119 — Nov. 2 +17 +192 — Nov. 5 +15 +200

Oct. 21

52 14.7 / 17.3 / 20.0 / 25.5 / 28.1 / 30.9 / 33.5 / 36.4 / 41.7 / 44.4 / 47.1 / 339.6

52 0.5 / 2.1 / 3.1 / 5.7 / 1.9 — 52 1.9

52 30.87 / 23.20 / 7.67 / -7.77 / +10 / -1.32 / 21.88

30.873 52 / 30.86 / 23.16 / 7.70 / 30.86 / -7.79 / +.11 / -1.32 / 21.86 / 88

Oct. 22

52 14.6 / 17.2 / 20.0 / 25.4 / 28.2 / 30.9 / 33.5 / 36.4 / 41.7 / 44.4 / 47.2 / 339.5

52 37.0 / 38.4 / 39.7 / 2.51 / 38.6 — 52 38.5

52 30.86 / 23.18 / 7.68 / -7.81 / +9 / -1.29 / 21.85

30.864 52 / 30.84 / 23.13 / 7.71 / 30.84 / -7.81 / +.13 / -1.29 / 21.87 / 89

Oct. 24

52 14.9 / 17.5 / 20.3 / 25.6 / 28.4 / 31.1 / 33.8 / 36.4 / 41.7 / 44.6 / 47.3 / 341.6

52 19.3 / 21.2 / 22.9 / 3.4 / 21.1 — 52 21.1

52 31.05 / 23.15 / 7.89 / -7.95 / +5 / -1.27 / 21.88

31.055 52 / 31.04 / 23.11 / 7.93 / 31.04 / -7.96 / +.08 / -1.27 / 21.89 / 90

Oct. 29

52 16.0 / 18.8 / 21.4 / 26.8 / 29.4 / 32.2 / 35.0 / 37.8 / 43.1 / 45.9 / 48.7 / 355.1

52 7.1 / 8.3 / 9.3 / 24.7 / 8.2 — 52 8.2

52 32.28 / 23.01 / 9.27 / -9.41 / +9 / -1.13 / 21.83

32.282 / 32.26 / 22.97 / 9.29 / 32.26 / -9.42 / +.09 / -1.13 / 21.80 / 82

Nov. 2

52 16.0 / 18.7 / 21.4 / 27.0 / 29.6 / 32.2 / 35.0 / 37.0 / 43.1 / 45.8 / 48.7 / 354.5

52 10.8 / 12.5 / 14.4 / 37.7 / 12.6 — 52 12.6

32.21 / 22.82 / 9.38 / -9.55 / +.15 / -1.04 / 21.77

32.227 / 32.21 / 22.88 / 9.33 / 32.21 / -9.53 / +.16 / -1.04 / 21.80 / 82

Nov. 5

52 16.0 / 18.7 / 21.4 / 26.8 / 29.6 / 32.2 / 34.9 / 37.7 / 43.1 / 45.7 / 48.6 / 354.7

52 5.8 / 7.5 / 8.6 / 21.9 / 7.3 — 52 7.3

32.25 / 22.85 / 9.40 / -9.58 / +.13 / -.97 / 21.83

32.245 / 32.222 / 22.81 / 9.41 / 32.21 / -9.60 / +.17 / -.97 / 21.81 / 83

Oct. 21: 2 41.7 / 37.5 / 79.2 / 2 39.60 / +29.0 / 1.46240 / 1.46905 / +29.45 / 42 39.60 / 43 9.05 / 39 39.30 / -2.43

Oct. 22: 3 16.5 / 18.0 / 34.8 / 3 17.40 / -7.6 / ~~0.85733~~ / 0.86398 / -7.30 / 43 17.40 / 43 ~~10.10~~ / .88080 / .88745 / -7.72 / 17.40 / 9.68 / 39 38.67 / -2.31

Oct. 24: 2 58.3 / 2.6 / 60.9 / 2 00.45 / +9.9 / 0.99564 / 1.00229 / +10.05 / 42 00.45 / 43 10.50 / 39 37.85 / -2.24

Oct. 29: 2 45.2 / 43.6 / 88.8 / 2 44.40 / +24.1 / 1.38202 / 1.38867 / +24.47 / 42 44.40 / 43 8.87 / 39 39.48 / -2.39

Nov. 2: 2 50.8 / 46.2 / 97.0 / 2 48.50 / +19.6 / ~~1.29885~~ / 1.30550 / +20.21 / 42 48.50 / 43 ~~8.71~~ / .29230 / .29895 / +19.90 / 48.50 / 8.40 / 39 39.95 / -2.37

Nov. 5: 2 48.3 / 41.0 / 89.3 / 2 44.65 / +24.9 / 1.39620 / 1.40285 / +25.29 / 42 44.65 / 43 9.94 / 39 38.41 / -2.22

---

39 36.9 40 39.9	39 36.4 40 40.0	39 35.6 40 40.0	39 37.1 40 40.2	39 37.6 40 40.3	39 36.2 40 40.2
39 39.30 -22.60	39 38.67 -22.70	39 37.85 -22.70	39 39.48 -22.90	39 39.95 -23.00	39 38.41 -22.90
+1 3.0 3.0	+1 3.6 3.6	+1 4.4 4.3	+1 3.1 3.1	+1 2.7 2.7	+1 4.0 3.9

BAC 7294
20 59 24
+49 57
+1.19

50

1871	Sept 23		Sept 27		Oct 8		Oct 9		Oct 21	
	54 28.5	54 19.5	54 10.7	53 51.6	54 11.4	53 58.5	54 11.5	53 57.1	54 10.9	53 58.8
	31.8	21.4	13.8	52.9	14.7	59.6	14.6	59.7	15.0	60.2
	34.9	23.4	17.0	54.1	17.9	1.8	17.8	1.5	18.3	63.0
	41.2	43	23.5	86	24.3	1799	24.2	1783	24.5	63.8
	44.6	21.4	26.7	52.9	27.5	59.9	27.5	59.4	27.7	2458
	47.7		29.9		30.6		30.6		30.9	61.4
	51.0	55 7.9	33.1		33.8		33.8	54 58.0	34.2	
	54.1	9.4	36.3		37.0		37.0	59.4	37.4	
sin ∫ 9.88393	60.5	10.8	42.7		43.4		43.3	62.0	43.8	
	63.7	281	45.8		46.7		46.6	1794	46.9	
	66.9	9.4	49.0		49.8		49.7 +	59.8	50.1	
	524.9		328.5		337.1		336.6		339.7	
cos ∫ 9.80852		54 21.4		53 52.9		53 59.9		53 59.4		54 1.4
12669	54 47.72	47.718	54 29.86	54 29.864	54 30.65	30.645	54 30.60	30.600	54 30.88	30.882
993521										
35	0 68.0	1 49.5	250 35.0		250 26.8		0 26.4	1 18.1	0 28.4	
	0 30.5	8.1	18.3		23.1		24.3	17.0	22.2	
	985	576	533		499		507	351	506	
	0 49.25	28.80	26.65		24.95		25.35	17.55	25.30	
	+26.3		+37.0		+30.7		+31.2		+29.5	
	1.41986		1.48126	1.56802	1.48714		1.49416		1.46982	
	1.35517		1.36657	1.50323	1.42235		1.42937		1.40503	
	+22.66		+23.26	31.86	+26.44		+26.88		+25.41	
	25 49.25		25 26.65	26.65	25 24.95		25 25.35		25 25.30	
	26 11.91		25 49.91	58.51	25 51.39		25 52.23		25 50.71	
+49°	56 36.44		56 58.44		56 56.96		56 56.12		56 57.64	

Cant. Make out.

Oct. 24 3		Nov. 2		Nov. 5		Nov. 7		Nov. 9	
54 12.1	54 23.0	54 13.2	54 ~~6.5~~	54 13.1	53 59.0	54 12.4	54 4.0	54 12.2	54 3.1
15.3	23.7	16.4	~~8.3~~	16.4	60.4	15.5	1.7	15.3	
18.5	6 7	19.6	~~10.5~~	19.5	61.5	18.8	7	18.4	
25.0	23.3	26.1		25.7	18 04	25.2	1.3	24.8	
28.1		29.3	54 57.5	29.1	60.3	28.3		28.1	
31.2		32.4		32.3		31.5		31.1	
34.4		35.6		35.7		34.6		34.4	
37.5		39.0		38.6		37.9		37.7	
44.0		45.2		45.1		44.4		44.1	
47.3		48.4		48.2		47.5		47.4	
50.5		50.7		50.4		50.8		50.4	
3439		3559		3551		3469		3439	
	54 23.3		54 57.5		54 0.3		54 1.3		54 3.1
54 31.26	31.264	32.35	32355	32.26	32.292	31.54	31.536	31.26	31.264

25	0 44.6	1 17.0	D 30.5	0 33.2	0 33.3
	44.7	9.0	19.4	19.1	21.8
	893	260	499	523	551
	0 44.165	1 13.00	1 24.95	0 26.15	0 27.55
	+8.1	−25.1	+31.9	+30.2	+28.2 ✓
	0.90309	1.39967	1.50379	1.48007	1.~~46090~~ 45020
	0.83830	1.33488	1.43968	1.41522	~~1.39611~~ 1.38541
	+ 6.89	−21.62	+27.48	+26.02	~~+ 3490~~ +24.29
	25 44.65	26 13.00	25 24.95	25 26.15	25 27.55 27.55
	25 51.54	25 51.38	26 52.43	25 52.17	25 ~~52.45~~ 25 51.84
	56 56.81 ✓	56 56.97	56 55.92	56 56.18	56 56.51

p Capricorni
20 57 01
− 20 22
−.37

1871	Sept 23		Sept 30.		Oct 8		Oct 9	
	57 16.4	57 9.6	57 30.0	57 24.0	56 59.6	56 46.0	56 37.8	56 18.1
	18.7	11.4	32.0	25.0	1.8	46.2	43.0	20.8
	21.0	12.8	34.0	26.3	3.9	50.7	48.4	24.0
	25.3	38	38.6	153	8.5	1429	59.6	629
	27.5	11.2	40.8	25.1	10.7	47.6	4.5	20.9
	29.7		43.0		−12.8		9.9	
	31.9		45.2		15.0		15.7	57 59.0
	34.0		47.4		17.1		21.0	63.0
sin δ 9.54161n	38.4		51.7		21.7		31.3	67.3
	40.6		54.0		23.8		36.7	93
	42.9		56.2		26.0		42.0	63.1
	326.4		472.9		200.9		349.9	
cos δ 9.97196		57 11.2		57 25.1	60.0	56 47.6	24.0	56 20.9
12669					140.9		104.9	
.09865	57 29.67	29.673	57 42.99	42.991	57 12.81	12.809	57 9.99	9.991

	Sept 23	Sept 30	Oct 8	Oct 9
40	3 48.2	3 10.3	3 60.3	
	18.5	15.2	10.2	
	667	255	705	
	3 33.35	3 12.75	3 05.25	
	+18.5	+17.9	+25.2	~~+19.1~~
	1.26717	1.25285	1.40140	~~1.69108~~
	1.36582	1.35150	1.50005	~~1.78973~~
	+2322	+2240	+3163	~~.7 6162~~
	43 33.35	43 12.75	43 5.25	
	43 56.57	43 35.22	43 36.88	
−20°	21 8.22	20 46.87	20 48.53	

	Oct 2~~4~~3		Oct 29		Nov 2		Nov 7		Nov 9	
57	0.2 56	57.0 57	1.7 56	52.3 57	1.8 56	56.7 57	1.2 56	52.3 57	9.6 56	~~[illegible]~~
	2.5	55.0	3.8	53.5	4.0	58.6	3.5	53.8	12.0	57.3
	4.8	150	6.1	54.7	6.2	60.0	5.6	55.1	14.1	58.8
	9.1	57.5	10.5	105	10.6	1753	10.0	112	16.1	59.8
	11.3		12.7	53.5	12.7	58.4	12.2	53.7	18.4	319
	13.6		14.9		15.0		14.3		702	~~57.9~~
	15.7		17.0		17.1		16.5			
	17.9		19.1		19.4		18.7			
	22.3		23.5		23.7		23.1			
	24.5		25.7		26.0		25.1			
	26.7		28.0		28.2		27.4			
	1487 56	57.5	1630 56	52.5	1647 56	58.4	1576 56	53.7	56	58.6
57	13.52	13.518 57	14.82	14.818	14.97	14.973	14.33	14.327	14.04	14.040

Use

Use

40 3 17.9	3 15.2	3 14.0	3 14.3	3 19.8
28.9	2 11.2	17.5	11.8	20.2
46.8	764	315	261	400
3 23.40	2 38120	3 15.75	3 13.05	3 20.00
+16.0	+21.3	+16.6	+20.6	+154
1.~~[illegible]~~ 2.0410	1.32838	1.22011	1.31387	1.18753
1.2[illegible]5 1.30475	1.42703	1.31876	1.41252	1.28617
+1970 42007	+2673	+20.83	+25.86	+19.33
43 23.40 23.40	43 8.20	43 15.75	43 13.05	43 20.00
~~43.10~~ 43.47	43 34.93	43 36.58	43 38.91	43 39.33
			20 50.56	
20 55.12	20 46.58 ✓	20 48.23 ✓	20 49.56 ✓	20 ~~51.55~~ 50.98

σ₂ Urs Maj Σ6

67 39 18.28 = NA
19.26 = ρ

20 58 44 20 5~~8~~ 0.42
112 20
−2.43
−.94

	1871 Oct. 21		Oct. 22.		Oct 2~~2~~3		Nov. 5		Nov. 13	
	58 38.0	58 ~~4~~56.9	58 59.5	59 40.7		59 48.7	58 40.7	58 31.4	58 39.1 20	58 29.7
	43.3	10.5	5.1	43.3		49.4	46.1	32.8	44.7	32.0
	48.7	13.3	10.4	47.0		50.2	51.6	42	50.1	17
	59.6	30~~7~~	15.8	110		1483	2.3	32.1	1.1	30.8
	5.0	~~11.9~~	21.1	43.7	59 10.1	49.4	8.0		6.4	
	10.4	10.2	111.9		15.7		13.3		12.0	
	15.8		60		21.1		18.6		17.3	
	21.1		51.9		32.0		24.1		22.7	
sin δ 9.96614	31.8 58	~~11.9~~		59 48.7	37.5	59 49.4	34.9	58 32.1	32.5	58 30.8
	37.4	10.2			42.7		40.2		38.7	
	42.7				1597		45.5		44.1	
	353.8						3253		3090	
	240						180		180	
cos δ 9.57978	113.8				~~3182~~		145.3		129.0	
12669ᵘ	59 10.34	10.345	10.18	10.180	~~1447~~	31.820	13.21	13.209	11.73	11.727
9.70647ₘ										

Camp Mohawk

5 1 11.8
−1.0
9.8
1 4.90
+60.1
1.76644 1.77890
1.34619 1.48537
−6.13 30.58
6 4.90
5 42.77 6 4.50
1.47288 5 34.32
−8971
6 4.90
5 33.19
112° 17 1316 17 1403
+2 3962 3962
19 528 53.65
+1.0 6.738 58.5
59.5
112 21 0.5
I 1 1.8 10.647
+87 +19.8

0 13.3
9.3
220
0 11.90
−33.6
1.52634
1.10612
+1277
5 11.00
5 22.78
1.23286
+17.09
5 11.04
28.09
17 19.96
2 35.56
+19 55.5
38 58.3
59.3
21 0.7
1 5.2 6.1
+20.0

0 9.3
6.1
15 4
0 7.70
−17.6
1.24551
0.82529
−669
5 7.20
.95198
−895
~~6 7.70~~
~~4 58.75~~
~~17 4960~~

1 3.8
0 47.0
11 0 8
0 55.40
+41.1
1.61384
1.19262
−1562
5 55.40
1.32031
−2091
5 53.40
5 34.49
17 1386
2 45.18
19 59.0
38 56.1
57.1
21 2.9
1 3.9 4.8
+22.2

5 16.0
0 44.6?
11 5 6
0 57.80
+40.9
1.61172
1.19150
−1154
5 57.00
1.31819
−2081
5 57.40
5 36.99
17 1136
2 45.89
19 57.2
38 55.2
16.4
21 3.6
1 6.4 7.3
+22.9

61, Cygni
21 01 06
+38 07

6.94
1 6.92+01

δ = +38° 6′ 58.4″

+07 +78

1871	Oct 9 +.03 +.025		Sept 23 +03 +040		Sept 30 +10 +082		Oct 5 +07 +048		Oct 8 +07 +065	
−020								48.9		
	1 0.1	0 45.0	1 17.1	1 6.0	1 30.5	1 17.3	0 59.7	0 50.3	1 0.2	0 49.3
	2.7	46.5	19.8	8.0	33.2 27	18.8	2.3	52.0	2.7	50.7
	5.4	48.4	22.4	9.5	35.6 24	20.5	4.9	12 50.4	5.3	52.8
	10.6	199	27.7	235	41.0 5.4	566	10.1	1 43.2	10.7	218
	13.2	466	30.2	7.8	43.4 24	18.9	12.8	45.3	13.1	50.9
	15.8		32.9		46.0 26		15.4	46.7	15.8	
	18.4	1 38.0	35.3	1 56.3	48.8 28		18.0	~~59.7~~	18.5	
	21.1	39.3	38.0	58.0	51.4 26		20.6	~~2.3~~	21.0	
sin δ 9.79047	26.3	41.7	43.3	59.9	56.6 52		25.8	~~4.9~~	26.4	
	28.9	1160	46.0	242	59.3 27		28.4		29.0	
	31.5	39.3	48.6	58.1	1.9 26		31.0		31.5	
	174.0		361.3		507.7		229.0		174.2	
			1	7.8	50 1	18.9	60	0 50.4	0	50.9
cos δ 9.89584	+1						169.0			
12669	1 15.82	15.818 1	32.85	32.845	46.15	46.155 1	15.36	15.364 1	15.84	15.836
.02203	9.85		9.13		9.01		8.92		9.87	
	6.97	15.80	23.72	32.82	37.14	46.14	6.43	15.34	6.97	15.82
		9.86		9.14		9.02		8.93		8.88
	−6.92	6.94	−23.60	23.68	−37.16	37.12	−6.44	6.41	−6.99	6.94
	+ 2	15.80	+ 2	32.82	+ 8	46.14	+ 5	15.34	+ 5	15.82
	−2.93		−2.21		−2.09		−2.00		−1.95	
		−6.94		+23.60		−37.13		−6.46		−6.99
	1 6.99	+.02	(7.06	+.03	6.98	+.06	6.94	+.04	6.95	+.05
		−2.93		−2.21		−2.09		−2.00		−1.95
		5.95		7.04		6.98		6.92		6.93
		97		06		99		94		95

	Oct 9		Sept 23		Sept 30		Oct 5		Oct 8	
15	0 51.1	1 47.3	1 32.6	2 25.0	0 58.4		0 57.2	1 54.6	0 55.3	
	52.0	49.0	1 40.5	41.9	54.0		0.0	57.4	56.5	
	1031	963	331	749	724		572	1120	1121	
	0 51.55	1 48.15	1 16.55	2 37.45	0 36.20		0 56.60	1 56.00	0 56.05	
			+25.0		+27.2		+25.0		+24.9	
			1.39794		1.48457		1.40312	.39790	1.39620	
			1.42047		1.45710		1.42565	1.42043	1.41873	
			+2633		+2465		+2061	+2633	+2622	
			16 16.55		15 36.20 F		15 58.60	58.60	15 56.05	
			16 42.88		16 24.85		16 25.21	24.93	16 22.27	
		+ 38°	6 5.47		6 23.50		6 23.42		6 26.08	
			− 4.62		− 4.90		− 4.63		− 4.78	
		+ 38	6 0.84		5 58.6		06 18.8		6 21.3	
			7 19.9		7 21.1		7 21.89		7 22.20	
		δ′ = +38	6 5.47							
		−.06	+1 19.1	19.0	+1 2.5	2.5	+1 3.1	3.0	+1 0.7	0.7
		δ′ = +38	6 5.47		6 3.50		6 23.42		6 26.08	
			−21.50		−22.70		−23.50		−23.60	

+5
+4
+7
+2
+3
−1
+2
−8
+1
+2
−1
+2

+5	Sept 17	21	01	9.23	8	+38° 7'	18.8"	.9
+4	22			.15	8		19.7	.9
+7	27			.07	8		20.6	.8
+2	Oct 2			.98	9		21.4	.7
+3	7			8.89	9		22.1	.5
−1	12			79	10		21.6	.5
+2	17			69	10		23.1	.4
+8	22			59	.10		23.5	.3
	27			8.48	.11		23.8	
+1	Nov 1			.37	.11		23.6	
+2	6			.26	.11		23.7	
−1	11			.16	.11		23.7	
+2	16			8.05	.10		23.6	

+12 +133 Oct 21

1 ~~18.9~~ 1 ~~[illegible]~~
~~21.6~~ ~~13.7~~
11.1 ~~16.4~~
13.6 27.6
16.3 29.3
18.9 169
21.6 28.4
81.5

1 16.30

1 28.4

1 16.30 16.300 1
8.61 1628
7.69 8.62
−7.77 766
+ 9 16.28
−1.69 −7.79
6.93 +.10
−1.69
6.90

91

+11 +119 Oct 29

1 2.20 49.3 1
4.7 50.7
7.3 52.2
12.6 152.2
15.2
17.8
20.4
23.0
28.3
30.8 0 50.7
33.5
1956

0 50.7

17.80 17.800
8.43 17.78
9.36 8.44
−9.11 9.34
+ 9 +17.78
−1.51 −9.43
6.97 +.09
−1.51
6.93

94

+17 +192 Nov 2

2.1 0 53.8 1
4.7 55.6
7.3 57.1
12.5 166.5
15.0
17.8
20.4
23.0
28.1
30.8 0 55.5
33.4
1951

0 55.5

17.74 17.736
8.34 17.72
9.39 8.85
−9.15 9.37
+.13 17.72
−1.42 −9.53
6.90 +.15
−1.42
6.92

94

+22 +240 Nov 7

1.5 0 51.6 1
4.0 53.0
6.6 54.8
11.7 159.4
14.4
17.0
19.6
22.3
27.5
30.1 0 53.1
32.7
1874

0 53.1

17.03 17.036
8.28 17.02
8.79 8.24
−8.96 8.88
+.18 17.02
−1.31 −8.98
6.93 +.19
−1.31
6.92

93

+20 +213 Nov 9

1.0 0 47.9 0
3.5 49.2
6.3 50.5
11.4 147.6
14.0
16.6
19.2
22.0
27.1
29.8 1 49.2
32.6
1835

0 49.2

16.68 16.682
8.19 16.66
8.49 8.20
−8.61 8.46
.16 16.66
−1.27 −8.63
6.96 +.16
−1.27
6.97

94

+21 +220 Nov 13

59.7 1 33.2
2.3 34.9
4.9 36.0
10.1 104.1
12.7
15.3
17.9
20.7
25.8
28.4 1 34.7
31.0
2288
60 1 34.4
188.8

15.35 15.345
8.10 15.33 948
7.24 8.11 6.93
−7.40 7.22
−.16 15.33
−1.18 −7.43
6.93 +.17
−1.18
6.89

91

---

15 1 37.0
33.0
700
35.00

−12.1
1.08279
1.10532
−12.75
16 35.00
16 22.25

6 26.10
−4.72

6 21.4
7 23.4

+1 2.0 1.9

6 26.10
−25.00

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0 54.5
51.4
1059
0 52.95

+27.1
1.43297
1.45550
+2884
15 52.95
16 21.49

6 26.86
−4.80

6 22.1
7 23.7

+1 1.6 1.5

6 26.86
−25.20

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1 60.4
0 55.8
1162
0 58.10

+22.2
1.34635
1.36888
+2338
15 58.10
16 21.48

6 26.87
−4.77

6 22.1
7 23.6

+1 1.5 1.5

6 26.87
−25.20

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1 63.0
0 56.4
1194
0 59.70

+23.9
1.37840
1.40093
+2517
15 59.70
16 24.87

6 23.48
−4.72

6 18.8
7 23.7

+1 4.9 4.8

6 23.48
−25.30

---

0 59.0
51.0
1100
0 55.00

+27.5
1.43933
1.46186
+2896
15 55.00
16 23.96

6 24.39
−4.79

6 19.6
7 23.7

+1 4.1 4.1

6 24.39
−25.30

---

1 46.3
39.0
853
1 42.65

−19.3 ✓
1.~~[illegible]~~ 28560
1.30356 1.30813
−20.12 −20.33
16 42.65 42.65
16 ~~22.53~~ 2232

6 26.03
−4.75

6 21.8
7 23.7

+1 2.4 2.3

6 26.03
−25.30

Equulei
21 04 04
+9 37
+.17
1871

	Oct 8		Sept 23.		Sept 27		Sept 30		Oct 4		Oct 9	
	4 0.4	3 50.5	4 10.4	4 8.9	3 59.5	3 48.4	4 30.7	4 29.4	4 10.9	4 3.5	4 0.3	3 50.8
	2.5	51.8	19.3	9.8	1.5	50.3	32.5	31.6	13.2	4.8	2.4	52.4
	4.6	52.9	21.4	11.0	3.5	51.7	34.7	36.7	15.2	6.0	4.6	53.8
	8.8	155.2	25.6	29.7	7.8	150.4	39.1	97.8	19.4	14.3	8.7	157.0
	10.9		111		10.0		41.0		21.4		10.9	
	12.9		29.8		-12.0		-43.3		23.5		12.9	
	14.9	4 32.0	31.8	4 50.6	13.9		45.3		25.6	4 45.2	14.9	4 31.3
	17.0	33.8	33.9	52.0	16.0		47.4		27.7	47.0	17.0	32.7
sin √ 9.22986	21.2	35.3	38.1	53.5	20.2		51.5		31.8	48.7	21.2	34.0
	23.2 3	51.7	40.2 4	9.9	22.3 3	50.1	53.6 4	32.4	34.0 4	4.7	23.2 3	52.3
	24.3		42.3		24.5		55.8		36.1		25.4	
	140.7				191.2		475.2		258.8		31.	
					60						141.5	
cos √ 9.99385					131.2							
12669 .12054	4 12.79	12.791	2980		4 1193	11.927	4 45.20	43200	4 23.53	23527	4 12.86	12.864

	Oct 8		Sept 23.		Sept 27		Sept 30		Oct 4		Oct 9	
45	0 37.5	1 31.4	1 14.5	1 41.3	1 10.7		0 53.5		50 0 59.8	1 57.6	0 39.0	1 33.1
	39.9	35.1	44.0	41.2	40.3		52.0		5.4	3.9	44.0	38.1
	774	665	1185	1125	1110		1055		6352	606	830	712
				0 56.25	0 55.50		0 52.75		0 32.60	1 30.30	0 41.50	1 35.60
	0 38.70	1 33.25	0 59.25									
	+21.1				+21.8		+10.8		+18.8		−89.4 +20.5	
	1.52428				1.33846		1.03842		1.27416		1.59550	1.31185
	1.44482				1.45900		1.15396		1.39470		1.71604	1.43239
	+2785				+ 2878		+1425		+2481			+2706
	45 38.70				45 55.50		45 52.75		57 02.60			45 41.50
	46 6.55				46 24.28		46 7.00		51 27.40			46 8.06
+9°	36′ 41.80″				36 24.07				31 20.94		36 39.79	

	Oct-21				Oct. 2~~4~~3				Oct. 29				Nov. 2				Nov. 13		
4	1.0	3	54.2	4	1.2	3	56.0	4	2.5	3	51.0	4	2.6	3	54.0	4	0.3	4	6.8
	3.1		55.4		3.3		57.4		4.6		51.8		4.6		55.5		2.4		8.1
	5.1		56.8		5.3		58.6		6.7		52.6		6.7		56.9		4.6		10.1
	9.3		166.4		9.5		172.0		10.8		154.4		10.9		166.4		8.7		25.0
	11.4				11.6				12.9				12.9				10.7		
	13.5				13.6				15.0				15.0				12.6		
	15.6				15.7				17.0				17.0				14.8		
	17.7				17.8				19.3				19.2				16.9		
	21.8				22.0				23.3				23.4				21.1		
	24.0	3	55.5		24.0	3	57.3		25.4	3	51.5		25.5	3	55.5		23.1	4	8.3
	26.0				26.1				27.5				27.4				25.2		
	148.5				150.1				165.0				165.2				140.4		
								4	15.00										
4	13.50		13.955	4	13.65		~~13.646~~ 13.645		33.00		15.000		15.02		15.018		12.76		12.764

45 0 42.8	0 46.2	0 35.9	0 43.2	1 5.5
44.8	52.5	37.3	41.7	−1.0
87.6	98.7	73.2	84.9	4.5
0 43.80	0 49.35	0 36.60	0 42.45	1 2.25
+18.4	+16.3	+23.5	+19.5	+4.5
1.26482	1.21219	1.37107	1.29003	0.65321
1.38536	1.33273	1.49161	1.41057	0.77375
+2429	+2151	+3102	+2574	+594
45 43.80	45 49.35	45 36.60	45 42.45	46 2.25
46 8.09	46 10.86	46 9.62	46 8.19	46 8.19
36 40.26	36 37.49	36 40.73	36 40.16	36 40.16

ζ Cygni

26.79

21 07 29 7 26.86 (-.09)

+29 42

~~+.59~~

+.22 +.57

77 Draconis 21 07

Sept. 17	21	07	28.93	07	+29° 42′ 13.7″	.8
22			.86	7	14.5	.7
27			.79	7	15.2	.6
Oct. 2			.71	8	15.8	.6
7			28.63	8	16.4	.4
12			.54	9	16.8	.3
17			.45	9	17.1	.2
22			.36	9	17.3	
27			28.26	10	17.5	.2
Nov. 1			.17	9	17.6	
6			.07	10	17.5	
11			27.98	9	17.3	
16			27.88	10		

δ = +29° 41′ 56.5″

-7
+5
-1
-13
-1
-12
-1
-5
-3
-12
-9
-11

1874	Oct. 9		Sept. 23.		Sept 27		Sept 30		Oct. 4		Oct. 8	
	+02 +025		+02 +040		+02 +112		+10 27.88 +081		+07 ~~100~~ +059		+07 +065	
-.018 sin δ 9.69501	7 21.1 23.6 26.0 30.7 33.1 35.4 37.8 40.2 45.0 47.3 49.7 389.9	7 6.7 8.0 9.7 24.4 7 59.8 61.1 62.8 7 8.1	7 38.3 40.7 43.0 47.7 50.1 -52.4 54.9 57.2 1.9 4.3 6.7 397.2 180 577.2	8 10.7 11.9 13.1 8 11.9	7 20.4 22.8 25.0 29.0 32.3 34.6 36.9 39.2 44.0 46.4 48.8 379.4	7 10.8 12.2 14.0 37.0 7 12.3	7 51.6 53.8 56.1 1.0 3.4 5.8 8.0 10.4 15.2 17.5 19.9 242.7 180 62.7	7 41.2 42.5 43.6 127.3 7 42.4	7 20.8 23.0 25.6 30.3 32.6 35.0 37.3 39.8 44.5 46.9 49.2 385.0	7 6.7 8.2 9.5 24.4 8 1.0 2.8 4.3 7 8.1	7 21.3 23.6 26.0 30.8 33.0 35.4 37.8 40.1 45.0 47.3 49.6 389.9	7 8.5 10.1 12.2 30.8 7 55.4 57.5 59.6 7 10.3
cos δ 9.93884 12669 .06553	7 35.45 28.59 6.86 -6.92 +1 -1.73 26.81	35.445 35.43 28.50 6.93 35.43 -6.94 +.01 -1.73 26.77 79	62.47 28.84 23.62 -23.60 +1 -1.98 26.50	52.473 52.40 28.75 23.70 52.45 -23.60 +.02 -1.98 26.80 91	7 34.49 28.79 5.70 -5.85 +1 -1.93 26.72	34.491 34.47 28.70 5.77 34.47 -5.90 +.06 -1.93 26.70 71	5.70 28.74 36.96 -37.16 +5 -1.88 26.71	5.700 6.68 28.65 37.03 5.68 -37.13 +.04 -1.88 26.71 73	7 35.00 28.67 6.33 -6.39 +3 -1.81 26.83	35.000 34.98 28.58 6.40 34.98 -6.37 +.03 -1.81 26.83 88	7 35.45 28.61 6.84 -6.99 +4 -1.75 26.75	35.445 35.43 28.57 6.91 35.43 -6.99 +.03 -1.75 26.73 75
									Stet			
40 +29°	0 47.8 49.1 96.9 0 48.45 +27.3 1.43616 1.50169 +31.70 40 48.45 41 20.20 41 28.15 -13.38 41 14.8 42 16.6	0 49.1 51.0 100.1 0 50.05	-19.4 1.28480 1.35333 -22.56 42 0.75 41 38.19 41 10.16 13.30 40 56.9 42 14.7	2 18.0 1 43.5 121.5 2 0.75	1 ~~33.5~~ ~~57.1~~ 60.9 1 15.45 +22.2 1.34635 1.41188 +25.81 41 15.45 41 41.26 41 7.09 -13.39 40 ~~53.7~~ 42 15.2	27.8 52.9 10.35 25.81 10.35 36.16 12.19 588	0 56.2 51.3 107.5 0 53.75 +23.3 1.36786 1.43289 +27.09 40 53.75 41 20.84 41 27.51 -13.82 41 13.7 42 15.6		0 47.8 48.5 96.3 0 48.15 +26.9 1.43902 2.00455 +32.24 40 48.15 41 19.44 41 28.91 -13.38 41 14.5 42 16.1	1 50.4 51.8 102.2 51.10 -26.9 1.42850 1.49333 +31.29 51.10 19.84 ~~28.87~~	0 49.7 48.8 98.5 0 49.25 +25.1 1.39867 1.46520 +24.19 40 49.25 41 18.44 41 29.91 -13.72 41 16.2 42 16.5	1 44.2 44.2 88.4 44.2 41 44.20
-.21	+1 1.8	1.6	+1 17.8	17.6	+1 ~~21.5~~ 16.4	~~21.3~~ 16.2	+1 1.9	1.7	+1 1.6	1.4	+1 0.3	0.1
δ′ = +29	41 28.15 -20.10		41 10.16 -18.20		41 7.09 -18.70		41 27.51 -19.10		41 28.91 -19.60		41 29.91 -20.00	

−7
+5
−15
−13
−1
−12
−1
−5
−3
−12
−9
−11
−7

	Oct 21 +.12 +133		Od. 22 +10 +147		Oct. 28 +063		Oct 29 +11 +119		Nov 7 +22 +240		Nov 13 +21 +220	
7	21.9 7	5.0 7	22.0 7	12.0 7	22.0 7	11.0 7	23.2 7	12.2 7	22.7 7	10.3 7	21.1 7	12.7
	25.1	6.1	24.2	13.0	24.4	12.3	25.6	13.3	25.0	11.6	23.3	13.7
	26.6	7.4	26.6	14.7	26.7	13.3	28.0	15.7	27.3	12.7	25.6	14.7
	31.3	18.5	31.3	39.7	31.5	36.6	32.8	41.2	32.0	34.6	30.4	41.0
	33.6		33.7		33.9		35.1		34.5		32.9	
	36.0		36.0		36.3		37.5		36.8		35.1	
	38.3 7	58.2	38.4		35.6		39.8		39.1		37.5	
	40.7	59.6	40.8		41.0		42.3		41.6		39.8	
	45.5	61.1	45.4		45.7		46.9		46.3		44.7	
	47.8 7	6.2	47.9 7	13.2	45.0 7	12.2	49.2 7	13.7	48.9 7	11.5	47.0 7	13.7
	50.2		50.2		50.4		51.7		51.0		49.3	
	397.0		3965		398.5		4121		4050		3867	

7	36.09	36.091 7	36.04	36.045 7	36.23	36.227 7	37.46	37.464	36.62	36.818	35.15	35.155
	28.37		28.36		28.34		28.22		28.05		27.94	
	7.87 72	36.07	7.86	36.03	7.89	36.21	9.22	37.45	8.57	36.80	7.21	35.14
		28.28		28.27		28.25		28.13		27.96		27.85
	−7.77	7.79	−7.71	7.76	−7.95	7.96	−9.41	9.32	−8.56	8.84	−7.40	7.29
	+ 6	36.07	+ 5	36.03	+ 3	36.21	+ 5	37.45	+ 11	36.80	+ 11	35.14
	−1.57		−1.50		−1.46		−1.36		−1.19		−1.08	
		−7.79		−7.81		−7.96		−9.43		8.98		−7.43
	26.87	+.07	26.77	+.08	26.85	+.03	26.74	+.07	26.78	+.14	26.78	+.13
		−1.51		−1.50		−1.46		−1.36		−1.19		−1.08
		26.84		26.80		26.82		26.78		26.77		26.76
		85		82		83		>5		>9		>5

115 to here

Oct 21		Oct 22	Oct 28	Oct 29	Nov 7	Nov 13
40 0 45.0	1 48.0	0? 52.2	0 51.7	0 52.6	0 56.8	
44.0	45.7	54.0	54.2	49.7	43.9	
890	937	1062	1059	1023	1007	
0 4450	1 46850	53.10	0 52.95	1 51.15	0 50.35	
+29.8		+22.5	+24.0	+23.8	+26.3	+24.4
1.47567		1.35793	1.38021	1.37658	1.40312	1.33041
1.54120		1.42346	1.44574	1.44211	1.46865	1.39594
+3477		+2651	+2791	+2768	+2942	+2488
40 44.50		40 53.10	40 52.95	40 51.15	40 50.35	
41 19.27		41 19.61	41 20.86	41 18.83	41 19.77	
41 29.08		28.74 41 28.64 ✓	41 27.49	41 29.52	41 28.58	
−13.71		−13.30	−13.16	−13.92	−13.79	
41 15.4		41 15.3	41 14.4	41 15.6	41 14.8	
42 17.3		42 17.3	42 17.3	42 17.65	42 17.45	
+1 1.9 1.7		+1 2.0 1.9	+1 2.9 2.6	+1 1.9 1.7	+1 2.7 2.5	
41 29.08		41 28.74	41 27.49	41 29.52	41 28.58	
−20.80		−20.80	−20.80	−21.00	−21.00	

τ Cygni

55
59
38.5

21 09 41   9 38.52 (+01)

+09 +37 30

~~+61~~
+77

Sept. 17	21 9 40.64	.07	+37° 30' 1.9"	.9	δ = +37 29 43.6
22	.57	.8	2.8	.9	
27	49	8	3.7	.7	
Oct. 2	40	9	4.4	.7	
7	40.31	9	5.1	.5	
12	21	10	5.6	.5	
17	10	11	6.1	.3	
22	00	10	6.4	.3	
27	39.89	11	6.7		
Nov. 1	78	11	6.8		
6	67	11	6.9		
11	56	11	6.8		
16	46	10	6.6		

1871	Oct 21	+12 +133	Sept. 23	+02 +040	Sept 27	+02 +112	Oct 4	+07 +058	Oct 8	+07 +065	Oct 9	+03 +025
-.020 sec δ 9.78445	9 32.2 34.8 37.3 42.4 45.1 47.7 50.3 53.0 58.1 60.7 63.2 524.8	9 19.9 20.9 22.6 63.4 10 11.0 13.0 14.6 9 21.1	9 48.7 51.2 53.8 59.1 ~~1.6~~ -4.2 6.9 9.3 14.6 17.2 19.8 2864 240 464	9 38.9 40.8 42.5 122.2 9 40.7	9 30.9 33.4 36.0 41.1 43.8 46.4 48.9 51.5 56.8 59.3 1.9 450.0 60 510.0	9 26.7 27.7 28.7 83.1 9 27.7	9 31.3 33.8 36.4 41.7 44.2 -46.7 49.3 52.0 57.2 59.6 62.3 514.4	9 17.6 19.3 20.8 57.7 10 11.6 13.3 15.8 9 19.2	9 31.7 34.3 26 36.9 26 42.0 51 44.6 26 47.3 27 49.8 25 52.4 26 57.6 52 60.2 26 62.8 26 519.6	9 16.6 18.3 20.0 54.9 10 15.0 16.4 17.8 9 18.3	9 31.7 34.2 25 36.8 26 42.0 52 44.6 26 47.2 26 49.7 25 52.5 28 57.6 51 60.2 26 62.8 26 519.3	9 13.5 15.0 16.6 45.1 10 10.4 12.4 14.0 9 15.0
cos δ 9.89947 12669 .02616	9 47.71 40.02 7.69 -7.77 +7 -1.50 38.51	47.709 47.69 40.03 7.66 47.69 -7.79 +.10 -1.50 38.48 50 50 52	10 42.2 40.55 2366 -2360 +1 -2.03 3860	42.182 42.0 40.56 23.60 4.21 -23.60 +.03 -2.03 38.61 63	46.36 40.49 5.87 -5.85 +1 -1.97 38.55	46.364 46.34 40.50 5.84 46.34 -5.90 +.08 -1.97 38.55 56	9 46.76 40.38 6.39 -6.39 +4 -1.84 38.57	46.764 46.74 40.37 6.37 46.74 -6.36 +.04 -1.84 38.57 58	9 47.24 40.29 6.95 -6.95 +4 -1.77 38.52	47.236 47.22 40.30 6.92 47.22 -6.89 +.06 -1.77 38.51 53	9 47.21 40.27 6.94 -6.92 +2 -1.75 38.56	47.209 47.19 40.78 6.51 47.19 -6.94 +.02 -1.75 38.52 54
50	3 11.3 7.8 191 3 9.55	4 4.9 2.3 72 4 3.60	3 49.0 16.0 650 3 32.50		3 52.2 18.0 402 3 35.10		2 49.8 11.4 81 2 2 40.60	4 67.2 57.8 1250 4 2.50	3 6.6 6.2 12 8 3 6.40	4 8.2 8.4 166 4 8.30	3 3.8 4.7 8 5 2 4.25	4 4.8 5.8 10 6 4 5.30
+37°	+26.6 ~~1.42488~~ 1.45104 +28.25 53 9.55 53 37.80 29 10.55 ~~-5.50~~ -5.79		+23.5 1.37107 1.39723 +24.96 53 32.50 53 57.46 28 50.89 ~~-5.43~~ -5.50		+18.7 1.27184 1.29800 +19.86 53 35.10 53 54.96 28 53.39 ~~-5.74~~ -5.55		+27.6 1.44091 1.46707 +29.31 53 10.60 53 39.91 29 8.44 28 48.44 ~~-5.85~~ -5.70		+28.9 1.46090 1.48706 +30.69 53 6.40 53 37.09 29 11.26 ~~-5.74~~ -5.85		+32.2 1.50786 1.53402 +34.20 53 4.25 53 38.45 29 9.90 -5.74	
	29 4.8 30 6.4		28 45.4 30 3.0		28 47.8 30 3.7		29 2.7 ~~28 42.7~~ 30 4.7		29 5.4 30 5.32		29 4.2 30 5.3	
δ' = +37	29 10.55 -22.80		28 50.89 -19.40		28 53.39 -20.10		29 8.44 -21.10		29 11.26 -21.60		29. 9.90 -21.70	
-.08	+1 1.6	1.5	+1 17.6	17.5	+1 15.9	15.9	+1 22.0	1.9	+0 59.8	59.7	+1 1.1	1.0

−2	+0
+0	+11
+3	+4
+5	+6
+0	+1
+1	+2
+0	+3
−1	+1
+2	+5
−1	−4
+1	

+06+100 Oct-28		+x+119 Oct. 29		+17+192 Nov-2		+2 2+240 Nov. 8		+2 0+220 Nov. 12	
	9 21.0								
7 32.4	22.8 9	33.6 9	22.4 9	33.7 9	23.7 9	32.8 9	24.0 9	31.4 9	27.1
35.0 26	24.3	36.3	24.1	36.3	25.4	35.4	25.6	33.8	28.1
37.5 25	68.1	38.9	25.8	38.7	49.1	38.0	26.8	36.4	29.3
42.7 52		44.1	72.3	46.7		43.3	76.4	41.6	30.2
45.2 25		46.6		49.2		45.8		44.2	114.7
48.0 28		49.2		51.7		48.4		46.8	
50.4 24		51.7		~~77~~		51.0		49.4	
53.0		54.4		54.3		53.6		52.0	
55.2		59.5		59.5		58.8		57.1	
60.8 9	22.7	62.2 9	24.1	62.2 9	24.5	61.4 9	25.5	59.6 9	28.7
63.4		64.7		64.8		64.0		62.3	
526.6		541.2		541 1		532 5		514 6	

9 47.87	47.873 9	49.20	49.200	49.19	49.191	48.41	48.409	46.78	46.782 9 38.548
39.58		39.86		39.76		39.65		39.54	
	47.86	9.24	49.18	9.43	49.17	8.76	48.39	7.24	46.77 0
~~7.89~~	39.99		39.87		39.77		39.66		38.54
−7.95	7.87	−9.41	9.31	−9.55	9.37	−8.56	8.73	−8.01	7.23
+ 4	47.86	+ 0	49.18	+.10	49.17	+.13	48.39	+.12	46.77
−1.46		−1.39		−1.24		−1.13		−1.02	
	−7.95		−9.42		−9.53		−8.98		−8.06
38.60	+.08	38.52	+.09	38.50	+.15	(38.45)	+.18	(38.87)	+.17
	−1.46		−1.34		−1.24		−1.13		−1.02
	38.58		38.49 57		38.55		38.46		(38.87)
	545		57 53		57		48		(.89)

50 3 10.7	3 11.6	3 13.8	3 19.3	
13.7	8.7	10.0	8.7	
24.4	20.3	23.8	28.0	
3 12.20	3 10.15	3 11.90	3 14.00	
+23.2	+25.1	+24.7	+22.9	+18.1
1.40140	1.39967	1.39270	1.35984	1.25768
1.42756	1.42583	1.41886	1.38600	1.28384
+2677	+2660	+2623	+2432	+1922
53 12.20	53 10.15	53 11.90	53 14.00	
53 38.97	53 36.81	53 38.13	53 38.32	
29 9.38	29 11.54	29 10.22	29 10.03	
− 5.58	− 5.82	− 5.84	− 5.55	

29 3.8	29 5.7	29 4.4	29 4.5
30 6.45	30 6.8	30 6.8	30 6.8
29 9.38	29 11.54	29 10.22	29 10.03
−22.90	−23.20	−23.20	−23.20
+1 2.7 2.7	+1 1.1 1.0	+1 2.4 2.3	+1 2.3 2.2

-03

τ Cygni
21 12 24
+38 52

sin ∫ 9.7976
cos ∫ 9.8913
C 6.7367
6,4256

cos ∫ 9.8913
C 1262
.0175

+.80

1871	Oct. 21		Sept. 23		Sept 30		Oct. 4		Oct. 8		Oct. 9	
	12 14.4	11 53.0	12 30.9	12 13.8	12 44.1	12 33.3	12 13.3	12 5.0	12 13.7	11 57.4	12 13.8	12 3.8
	17.0	54.6	33.6	15.8	46.7	34.0	16.0	6.5	16.5	58.8	16.4	5.1
	19.6	56.0	36.0	17.6	49.4	35.0	18.8	7.8	19.1	60.3	19.0	7.0
	24.8	136	41.4	172	54.7	102.3	24.0	19.3	24.3	1765	24.3	159
	27.5	54.5	44.0	15.7	57.2		26.6	12 6.4	27.0	58.8	27.0	5.3
	30.1	12 48.4	46.6		59.9		29.3		29.7		29.7	
	32.8	50.1	49.3	13 3.7	2.5		32.0	12 53.7	32.3	12 56.6	32.3	12 49.9
	35.5	51.6	52.0	4.8	5.4		34.6	55.0	35.0	58.1	35.0	50.6
sin ∫ 9.79762	40.8	150 1	57.2	8 0	10.6		39.8	57.0	40.3	59.6	40.2	57.9
	43.4	50.0	59.9	2.2	13.3	12 34.1	42.5		42.9	24 3	43.0	157 4
	46.0		62.6		15.7		45.0		45.6	58.1	45.5	50.5
	331.9		51 35		359 5		322.0		326.4		326.2	
		11 54.5		12 15.7	300	12 34.1		12 6.4		11 58.8		12 5.3
cos ∫ 9.89132					654.5							
12669 .01801	12 30.17	30.173	12 46.66	46.682	12 59.95	59.955	12 29.27	29.273	12 29.67	29.673	12 29.65	29.655
	+357	−198	+31.0	−17.5					+309	−284	+243	−209
	1,5527	1,2967	1,4914	1.2430					1.4900	1.4533	1.3856	−1.3201
	3,1054	2,5934	2,9828	2,4860					2,9800	2,9066	2,7712	2,6400
					X		X					
30	1 31.7	2 28.3	2 11.3	3 0.7	1 44.2		1 42.9		1 33.1	2 35.1	1 41.1	2 28.1
	28.0	24.7	1 36.8	2 25.4	34.3		44.3		33.0	34.0	42.7	29.0
	59.7	53.0	3 48.1	5 26.6	83.5		87.2		66.1	69.1	53.8	57.1
	1 29.85	2 21.50	1 54.05	2 43.30	1 41.75		1 43.60		1 33.05	2 34.55	1 41.90	2 28.55
	+37.15	20.62	32.28	18.22					27.17	29.57	25.31	21.56
	7.00	2 5.88	26.33	25.08					5.22	04.98	7.21	6.79
	−33	−10	−25	−8					25	21	16	11
	+35.7		+31.0		+25.8		+22.9		+30.9	✓	+24.3	
	1.55267		1.49136		1.41162		1.35984		1, ~~.47~~	1.49000	1.38561	
	1.57068		1.50937		1.42963		1.37785		1.49658	1.50801	1.40362	
	+37.21		+32.31		+26.89		423.87		+31.87	+32.21	+25.33	
	31 29.85		31 54.05		31 41.75		31 43.60		31 33.65	33.05	31 41.80	
	32 7.06		32 26.36		32 8.64		32 7.47		32 ~~4.42~~	8.26	32 7.23	
+38°	50′ 41.29″		50 21.99		50 39.71		50 40.88		50 43.09		50 41.12	

	Oct-22				Oct-29				Nov-2		
12	14.4	12	0.7	12	15.8	12	6.1	12	15.4	12	14.0
	17.0		2.3		18.4		7.7		18.5		15.4
	19.6		3.8		21.0		9.5		21.0		15.8
	24.9		6.8		26.4		23.3		26.3		17.4
	27.6		2.3		29.0				29.0		62.6
	30.2				31.6				31.7		
	32.8	12	53.0		34.3				34.4		
	35.4		54.7		36.9				37.0		
	40.7		56.3		42.2				42.2		
	43.4		14.0		44.9	12	7.8		44.8	12	15.6
	46.0		54.7		47.4				47.4		
	332.0				3479				3477		
		12	2.3			12	7.8			12	15.6
12	30.19		30.182	12	31.63		31.627		31.61		31.609

+279 −245
1,4456 1,3852
2,8912 2,9784

X X

133 h here

30 1	36.6	2	31.8	1	41.3	1	51.9
	36.5		31.2		38.2		47.2
	131		10		795		991
1	3655		3105	1	39.75	1	49.55
	29.04		2550				
	5.59		5.55				
	20		16				

+27.9	+22.8	+16.0
1,44560	1,37658	1,20412
1.46369	1.39459	1.22213
+29.08	+24.81	+1668
31 36.55	31 39.75	31 49.55
32 5.63	32 4.56	32 6.23
50 42.72	50 43.79	50 42.12

05

δ Cephei

21 15 36

+62 03 +03 +065

sin δ 4.9461
cos δ 9.6709
C 6.7367
6.3537

cos δ 9.6709
C 1262
9.7971

21 15 29.95 (-09)
29.86

δ = +62° 2′ 21″.3

-24 -21
-9 -10
-33 -25
-15 -13
+4 +4
-13 -11
+4 -11
-11 +8
-1 -9
-8 -1
+4 -8
-10
-9 +4

1871 -34	+1.86 Oct 8 +6991 +07		Sept 23 +02 +040		Sept 30 +0.5 +082		Oct 3 +04 +057		Oct 4 +07 +059		Oct 5 +07 +048	
-.033 sin √9.94614	15 29.7 45 34.2 43 38.5 44 42.9 47.3 44 19 2 6	15 14.0 17.4 19.3 20.7 16.9 16 9.0 11.9 14.6 35.5 11.8 15 16.4	15 29.5 33.9 38.2 47.1 51.6 55.8 0.3 4.6 13.4 17.8 22.1 314 3 300 61 4 3	15 20.3 22.0 25.0 23 22.4 16 31.0 34.3 36.7 120 34.0 15 22.4	15 42.5 47.0 51.4 0.4 4.6 9.0 13.3 17.7 26.2 30.7 35.2 2780 180 980	15 37.0 34.0 36.2 12.2 34.1 15 34.1	15 11.7 44 16.1 43 20.4 88 29.2 33.5 43 38.0 45 42.4 44 46.7 43 55.5 88 59.9 44 4.3 44 357.7 60 417.7	14 54.1 55.0 54.5 15 14.8 16 5.3 7.1 9.3 21.7 7.2 14 54.5	15 11.7 ~~12.3~~ 16.1 48 20.7 46 29.7 50 34.0 43 38.3 43 42.9 47.1 42 55.8 87 60.4 46 64.7 43 421.4	14 52.8 55.3 58.3 164 55.5 16 10.8 13.5 15.1 9.4 13.1 14 55.5	15 12.2 46 16.2 20.6 45 29.4 88 33.9 45 38.3 44 42.5 42 47.0 45 55.8 88 60.3 45 64.6 43 420.6	
cos √9.67090 12669 9.79759	15 38.52 31.86 85 6.66 -6.99 +13 -1.93 15 29.73	38.520 38.49 31.76 6.73 38.49 -6.99 +.12 -1.90 29.72 .74	15 55.84 32.36 35 23.48 -23.60 +4 -2.43 29.85	55.845 55.81 32.25 23.56 55.81 -23.62 +.08 -2.40 29.83 85	8.91 32.15 12 36.78 -37.10 +09 -2.20 29.74	8.909 8.87 32.03 36.84 8.87 -37.13 +.15 -2.20 29.69 70	15 37.97 32.05 02 5.93 -6.20 +8 -2.10 29.75	37.973 37.94 31.93 6.01 37.94 -6.16 +.10 -2.09 29.79 80	15 38.31 32.01 31.98 6.31 -6.39 +13 -2.06 29.99	38.309 38.28 31.89 6.39 38.29 -6.37 +.11 -2.06 29.97 99	15 38.24 31.94 94 6.28 -6.47 +13 -2.02 29.88	38.236 38.20 31.85 6.35 38.20 -6.46 +.09 -2.01 29.82 84
	+21.6 1.3345 2.6690	-33.3 1.5224 3.0448	+33.4 1.5237 3.0474	-38.6 1.5766 3.1532					+42.8 1.6314 3.2628	-34.8 1.5416 3.0832		
20	1 17.1 10.4 27.5 1 13.75 +15.54 29.29 -10	48.6 42.7 91.3 45.65 -20.87 24.78 -.25	1 43.0 4.0 47.0 1 24.50 20.94 45.44 -25	2 26.8 1 49.7 4 16.5 2 8.25 24.20 44.05 -33	1 12.6 4.3 16.9 1 8.45		0 59.0 58.0 117.0 0 58.50	4 44.6 44.3 88.9 44.45	1 1.9 59.0 120.9 1 0.45 26.82 27.27 -40	2 49.9 47.2 97.1 2 48.55 21.81 26.74 -27		
+62°	+21.6 1.33440 1.13204 +13.55 21 13.75 21 27.30 1 21.05 +20.28	-33.3 -20.92 45.65 24.73 23.62 +20.28	+33.4 1.52375 1.32134 +20.96 21 23.50 21 44.46 1 3.89 +20.12		+34.8 1.54158 1.33917 +21.84 21 08.45 21 30.29 1 18.06 +21.02		+43.5 1.63649 1.43408 +21.17 20 58.50 21 ~~25.67~~ 1 22.56 +20.00	1.63850 1.43609 +27.29 58.50 25.79	+42.8 1.63144 1.42903 +26.86 21 0.45 21 27.31 1 21.04 +20.16			
	1 41.3 2 44.4	43.90 44.4	1 24.0 2 41.2		1 39.1 2 42.8		1 42.6 2 43.4		1 41.2 2 43.6			
δ′ = +62	1 21.05 -23.10		1 3.89 -19.90		1 18.06 -21.50		1 22.56 -22.10		1 21.04 -22.30			
+.32	~~+1 3~~ +1 0.5	0.8	+1 17.2	17.5	+1 3.7	4.1	+1 0.8	1.1	+1 2.4	2.7		

Sept. 17	21	15	32.55	+62° 2′	39.5	14
22			'39	16	40.9	12
27			28	16	42.1	11
Oct 2			06	17	43.2	10
7			31.89	17	44.2	9
12			69	20	45.1	
17			48	21	45.9	8
22			28	20	46.6	7
27			31.08	20	47.2	6
Nov 1			88	20	47.5	3
6			68	21	47.7	2
11			45	22	47.9	2 1133
16			30.22	23	48.0	

Nov 2   +17 +192

Oct 9   +18 +025

Oct 21

Oct 22   +10 +147

Oct 23   +06 +100

Oct 29   +11 +119

Nov 2
15 13.8 15 26.8
18.0 28.8
22.6 30.3
31.1 85.9
35.6
40.0
44.7
48.8
57.6
62.0 15 28.6
66.6
440.8
15 28.6

Oct 9
15 12.4 14 51.7
16.6 54.0
21.0 56.3
29.7 120
34.4 54.0
38.5
43.0 16 8.4
47.4 10.7
56.3 13.5
60.6 326
65.0 10.9
424.9
3
14 54.0

Oct 21
15 12.5 14 52.1
16.9 44 54.0
21.4 45 56.2
30.1 87 123
34.5 44 54.0
38.8 43
43.4 16 7.3
47.7 43 10.6
56.4 87 13.8
60.8 44 31.7
65.3 45 10.6
427.8
14 54.0

Oct 22
15 12.5 14 53.0
16.8 43 54.9
21.1 43 58.0
30.3 92 15.9
34.3 46 55.3
38.7 44 46
43.1 16 15.3
47.6 45 16.7
56.2 86 19.5
60.8 46 21.5
65.2 44 17.2
426.6
14 55.3

Oct 23
15 12.7 14 59.0
17.2 60.6
21.5 62.7
30.5 182.3
34.8
39.0
43.5
47.8
56.8
60.9 15 60.8
65.3
430.0
15 0.8

Oct 29
15 13.7 15 0.1
18.2 1.3
22.6 3.4
31.5 4.8
35.8
40.1
44.4
48.7
57.6
62.1 15 1.6
66.6
441.3
15 1.6

15 40.09   40.09 15   38.63   38.62 15   38.89   38.891 15   38.78   38.782 15   39.09   39.091 15   40.12   40.118
30.83 83   31.84 81   31.31 31   31.30 27   31.26 23   30.82 30.09
9.25   40.06   6.81   38.69   7.60   38.86   7.50   38.75   7.85   39.06   9.12   40.08
30.74   31.72   31.22   31.18   31.14   30.90
−9.55   9.32   −6.92   6.87   −7.77   7.64   −7.88   7.57   −7.95   7.92   −9.41   9.185   −29.460
+.32   40.06   +.6   38.59   +.23   38.86   +.19   38.75   +.11   39.06   +.20   40.08
−0.91   −1.89   −1.39   −1.35   −1.31   −1.07
−9.53   −6.94   −7.79   −7.81   −7.96   −9.41
29.95 +.36   29.88 +.06   29.96 +.24   29.81 +.27   29.94 +.14   29.84 +.23
−0.88   −1.87   −1.39   −1.35   −1.31   −1.05
29.98   29.84   29.92   29.86   29.97   29.88
30.01
30.93   84   94   87   99   .87

+446   −323   +449   −317   +435   −384
1.6493   1.5092   1.6522   1.5011   1.6385   1.5843
3.2986   3.0184   3.3044   3.0022   3.2770   3.1686

X   X   X

138

20 59.1
53.6
112.7
1 56.35

0 59.0 1 47.7   0 59.4 1 47.7   0 66.4 1 46.7   0 59.9   1 63.0
55.1 44.2   52.3 40.3   53.9 45.7   59.1   53.6
114.1 91.9   111.7 88.0   110.3 94.9   119.0   110.6
0 57.05 1 45.95   0 55.85 1 44.00   0 55.15 1 47.20   0 59.50   0 58.30
27.95 20.25   28.13 19.86   27.27 24.07
25.00 25.70   23.98 24.14   22.42 23.13
−.45 −.23   −.45 −.23   −.43 −.33

+11.5   +44.6   +44.9   +43.5   +58.3   +38.5
1.06070   1.64933   1.65225   1.63849   1.58820   1.58546
0.85829   1.44692   1.44984   1.43608   1.38079   1.38305
+4.22   +27.98   +28.18   +27.30   +24.03   +24.16
21   20 57.05   20 55.85   20 55.15   20 59.50   20 58.30
21 25.03   21 24.03   21 22.45   21 23.53   21 22.46

1 23.32   1 24.32   1 25.90   1 24.82   1 25.89
~~+20.71~~   ~~+20.28~~   ~~+20.75~~   ~~+20.18~~   ~~+20.68~~   + ~~20.87~~
+20.73   +20.18   +20.68   +20.87   +20.96

1 44.1   1 44.5   1 46.6   1 45.7   1 46.8
2 44.6   2 46.5   2 46.6   2 46.8   2 47.8

1 23.32   1 24.32   1 25.90   1 24.82   1 25.89
−23.30   −25.20   −25.30   −25.50   −26.20

+1 0.5 0.8   +1 2.0 2.4   +1 0.0 0.3   +1 1.1 1.4   +1 0.7 1.0

1 Draco L6. W

21 18 06   9 18 ~~28.96~~ 29.44 +00 29.36

98 06 (−10)

−19
+3
+5
−10
−3
+8
−23
−23
−8

81° 53′ 35″.21 = P
35.05 = NA

−.83 −7.09

1871	Oct 8 (+07 +065)		Sept 23 (+02)		Sept 30 (+10)		Oct 3 (+04 +057)		Oct 4 (+07 +059)		Oct 5 (+07 +048)	
+1.09 sin 9.99565 cos 9.14891 12669 9.27560	7.5 17 22.1 38.1 18 7.1 21.1 35.6 50.9 19 5.5 35.3 49.0 20 3.3 27.55 120 35.55 35.55 28.75 7.12 −6.99 −.49 +.69 29.18	18 2.6 20 39.2 44.3 52.8 18 2.6 35.955 36.06 28.88 28.83 7.23 ~~28.83~~ 36.06 −6.99 −.45 +.61 29.313 .28	49.8 18 ~~48.8~~ 19 4.6 19.5 ~~34.0~~ ~~48.9~~ 20 3.0 17.6 2661 −23.60 −.44 +2.23	38.0 148 42.1 145 46.3 54	5.1 19 19.6 33.6 27.65 −37.16 −.70 +1.79	19 49.5 52.0 56.5 158.0 19 52.7 19 52.7	18 5.6 20.3 47 34.8 45 49.0 42 3.2 42 1829 18 34.58 28.09 6.49 6.20 −.28 +1.44 29.54	17 ~~27.1~~ ~~27.8~~ ~~31.5~~ ~~34.0~~ ~~36.0~~ 30.0 31.5 33.2 ~~36.0~~ 19 1.5 ~~4.2~~ 3.2 17 34.2 34.580 34.68 28.09 28.10 6.59 34.68 −6.18 −.40 +1.34 29.45 47	18 5.5 20.4 34.8 49.8 64.3 179.8 18 34.96 28.45 6.74 −6.39 −.49 +1.29 29.47	17 45.1 48.5 52.8 58.4 20.48 19 27.8 32.8 38.0 17 51.2 17 51.2 34.960 35.06 28.24 .24 6.82 35.06 −6.37 +.41 +1.20 29.48 49	18 6.0 20.5 34.8 49.8 64.2 175.3 3 35.06 28.30 6.67 −6.47 −.49 +1.14 29.24	17 45.9 52.8 62.0 161.7 19 14.9 19.0 26.7 17 53.6 17 53.6 35.060 35.16 28.39 6.77 35.16 −6.45 −.33 +1.04 29.41 43
15 +98° +0.2 I +.76	3 37.2 29.9 671 3 33.55 +33.4 ~~1.52375~~ ~~0.67266~~ n .79935 − 6.20 18 33.55 18 27.25 4′ 21″.0 + 1 26.24 5 47.3 81 53 15.1 15.3 98 06 44.7 +0 57.4 58.2 +19.9	3 8.7 0.6 93 3 4.65			3 59.0 17.1 761 3 38.05	3 33.2 21.4 546 3 27.30	3 42.0 37.9 799 3 39.95 +63.0 1.79934 ~~0.94825~~ n 1.07494 n −11.89 18 39.95 18 28.06 4 20.29 +1 23.44 5 43.7 53 16.3 16.5 43.5 +0 59.8 60.5 +18.7		3 41.0 35.0 760 3 38.00 +43.8 1.64147 ~~0.79038~~ n 0.91707 n − 8.26 18 38.00 18 29.74 4 18.61 1 23.93 5 42.5 53 16.1 16.3 43.7 +1 1.2 2.0 +18.9	3 21.1 16.2 373 3 18.65	3 38.5 35.2 737 3 36.85 +41.6 1.61805 ~~0.76696~~ n 0.89365 n −7.84 18 36.85 18 29.01 4 19.34 1 23.26 5 42.6 53 15.9 16.7 43.9 +1 1.3 2.0 +19.1	3 23.8 19.0 428 3 21.40

+03 +025 Oct - 9		+12 +133 Oct-21		+10 +147 Oct-22		+06 +100 Oct. 23		+17 +192 Nov. 2	
17 8.4	17 45.1	17 12.2	17 48.9	18 10.6	17 38.0	18 10.5	19 30.5	17 15.2	
22.8	47.7	26.6	57.3	25.2	39.5	24.7		31.0	158
37.9	51.9	41.3	63.5	39.5	43.0	39.9		45.2	142
18 6.6	144.7	10.7	169.1	53.7	120.5	54.2		13.1	279
21.1		25.1		68.9		68.7		28.7	156
-36.0	17 48.2	-39.6	14.8	1979	19 38.5	2980		-43.3	146
50.6	19 12.2	54.3	19 22.4		44.4			58.0	149
19 5.4	15.6	8.7	31.6		49.4			12.7	147
34.4	19.8	37.9						42.2	295
49.0	24.0	52.4	17 56.6		17 40.2			35.7	135
20 3.3		67.0						10.6	149
2755		3758						3567	
120		60						126	
395.5	17 48.2	335.8	17 56.6		17 40.2		19 30.5	4767	
35.95	35.955 18	39.62	39.61 18	39.58	39.580	3960	18 39.600	4334	43.336
28.99 28.88 ~~97~~		30.83		30.99		31.73		32.64	306
	36.05		39.72		39.68		39.70	1026	4842
6.97	28.97	8.69	30.94 93	8.48	31.08 09	8.31	31.22 28	10.11	33.03
~~6~~	7.08		8.78		8.60		8.48		10.39
-6.92	36.05	-7.78	39.72	-7.81	+39.68	-7.95	+39.70	9.55	43.42
-21		-84		-70		-42		-1.19	
+56	-6.94	+1.39	-7.79	+1.55	-7.81	+1.69	-7.95	+3.50	-9.53
	-.17		-.98		-1.03		-.70		-1.38
29.38	+.45	29.62	+1.49	29.52	+1.55	29.54	-1.84	(29.10)	+3.61
	29.39		29.51		29.19		29.19		(28.84)
	41		52		21		21		

154

~~15 3~~	1/15						
	3 40.6	3 23.2	3 43.5	3 26.1	3 38.5	3 15.3	3 17.3
	34.8	18.0	32.5	16.2	32.9	9.5	13.6
	754	412	760	423	714	248	309
	3 37.70	3 20.60	3 38.00	3 21.15	3 35.70	3 12.40	3 15.45

+47.7	+43.0	+59.4	-50.9
1.67852	1.63347	1.77379	1.70672
~~0.82743~~	~~0.78238~~	~~0.92270~~	~~0.85563~~
0.95412	.90907	1.05339	0.98232
-900	-871	-1121	+960
18 37.70	18 38.00	18 35.70	18 15.45
18 28.70	18 29.89	18 24.39	18 25.05
4 19.65	4 18.46	4 23.96	4 23.30
1 27.15	1 26.07	1 22.53	1 26.97
5 43.8	5 44.5	5 46.5	5 50.3
53 14.9	58 12.3	53 12.1	53 11.9
15.1	12.8	12.3	12.1
44.4	47.5	47.7	47.9
+1 1.1 1.9	+1 3.0 3.7	+1 1.2 2.0	+0 57.6 58.3
+20.1	+22.7	+22.9	+23.1

b Capricorni
21 21 24
−22 22
−41

1871	Oct. 21		3 Sept 29		Sept 27		Oct 3		Nov 9	
	21 18.5	21 12.6	21 34.7	21 26.3	21 16.9	21 7.7	21 17.0	21 22.5	21 19.0	21 10.3
	20.6	14.5	37.0	28.0	19.1	9.4	19.2	24.0	21.1	11.2
	22.9	15.7	39.2	29.4	21.3	10.9	21.4	25.0	23.4	13.8
	27.3	42.8	~~[illegible]~~	43.7	25.8	28.0	26.0	71.5	28.0	35.3
	29.5				27.9		28.1		30.1	
	31.7		~~[illegible]~~		30.1		30.4		32.3	
	34.0	21 54.7			32.2		32.5		34.5	
	36.3	55.9	56.9		34.5		34.7		36.7	
sin 9.58039	40.7	57.4	59.2		39.1		39.1		41.1	
	42.9	21 14.3	1.3	21 27.9	41.3	21 9.3	41.5	21 23.8	43.5	21 11.8
	45.2		2899		43.6		43.7		45.7	
	349.6				331.8		3336		3554	
cos 9.96603			4815							
12669	21 31.78	31.782			21 30.16	30.164	21 30.33	30.327	32.31	32.309
.09272										
40	3 16.1	3 66.5	3 48.1		3 45.9		3 35.0		3 16.7	
	22.8	13.3	3 21.8		18.2		41.6		16.7	
	788	798	699		641		766			
	2 49.45	3 39.90	3 34.95		3 32.05		3 3830		3 16.70	
	+17.5		+20.9		+20.9		+6.5 ✓		+20.5	
	1.24304		1.32015		1.32015		0.81291		1.31175	
	1.33576		1.41287		1.41287		0.90563		1.40447	
	+2166		+2587		+2587		+ ~~824~~ +8.05		+2558	
	43 19.45		43 34.55		43 32.05		43 38.30 38.30		43 16.70	
	43 41.06		44 00.82		43 57.92		43 ~~46.61~~ ~~46.42~~		43 ~~[illegible]~~ 42.08	
	41.11						43 46.35		~~[illegible]~~	
−22°	20′ 52″.76				21 9.57		20 58.00		20 53.73	

40

Nov. 13

18.0 21 12.1
20.0 13.7
22.1 15.4
26.6 41.2
28.9
31.1
33.3
35.5
39.9
42.2 21 13.7
44.4
3420

31.09 31.091

161

40 3 19.7
19.8
395
3 19.75

+17.4
1.24055
1.33827
+21.54
43 19.75
43 41.29

20 5294

24 Urs Maj = d

21 22 56 2123 1.94 1.82 (+.19)

109 36 (−04)

−.92 −2.81

+19
+17
+13
+20
+30
−1

70 23 41.53 = N H
42.33 = P.

1871

	Sept 30 (+10 +082)	Oct 8 (+07 +065)	Oct 22 (+10 +147)	Nov 7 (+22 +240)	Nov 13 (+21 +220)
+043	22 2.1 22 55.6 8.0 57.6 14.1 0.4 26.6 113.6 33.0 −38.5 45.0 51.1 4.0 9.9 22 57.9 15.6	22 32.5 23 32.0 38.7 36.0 45.0 38.8 57.1 106.8 3.6 9.5 14.8 15.1 24 13.9 21.8 16.6 34.1 40.4 23 35.6 45.9	22 34.7 22 9.0 41.0 10.7 47.0 13.1 59.2 32.8 5.4 11.4 17.6 23 51.0 23.7 53.0 36.0 57.4 41.8 22 10.9 48.0	22 37.6 22 3.4 43.6 7.4 49.6 11.1 8.1 21.9 −13.9 20.4 26.4 38.7 44.9 50.8 22 7.3	— 23 39.0 — 42.0 — 46.6 — 127.6 6.8 13.3 18.9 25.6 37.9 23 42.5 44.0 49.7
sin ∫ ~~9.52563~~ 9.97408 cos ∫ 9.52563 12669 9.65232	246.9 180 426.9 23 38.81 38809 23 1.60 1.63	343.7 240 103.7 23 9.43 9.427 2.11 2.15	365.8 240 125.8 23 11.44 11.436 3.10 3.14	334.0 120 214.0 60 23 15.58 14.164 14.16 4.37	13.18 13.18 4.93 4.89
	38.84 −37.16 1.82 −14 37.02 +22 38.84	9.47 −6.99 2.34 −1.20 7.13 −.25 9.47	11.48 −7.81 3.32 −.28 8.16 −1.28 11.48	14.21 −8.96 4.38 −.62 9.83 −2.53 14.21	13.22 −7.40 5.15 −.59 8.07 −3.11 13.22
	(23 1.59) −37.13 −.23 +.29	1.95 −6.99 −.18 −.38	2.07 −7.81 −.41 −1.32	2.08 −8.98 −.67 −2.53	208 −7.43 −.62 −3.07
	1.80	2.47	1.94	2.08	2.00
	1.83	1.99	1.95	2.02	2.12

	Sept 30	Oct 8	Oct 22	Nov 7	Nov 13
	50 0 55.3 0 52.3 Auf. 117.6 58.60 Mohr auf.	45 4 25.0 10.6 15.0 58.0 40.0 129.6 20.00 4 4.80	4 58.5 4 12.1 50.9 4.0 109.4 16.1 4 54.70 4 8.05	50 0 15.3 −6.0 9.3 0 4.65	4 30.3 13.9 44.2 4 22.10
	−79.1 1.28103n 1.89818 0.93335 1.85450 +8.57 3852 49 58.80 5880 50 1.37 3432	+26.2 1.41830n 1.07062 +11.77 49 20.00 49 31.77	+60.5 1.78176 1.43408 −27.17 49 54.70 49 27.53	+66.9 1.82543 1.47775 −30.09 50 4.65 49 34.61	−39.3 ✓ 1.46687 1.11917 +~~13.75~~ +13.16 49 22.10 22.10 49 ~~35.xx~~ 35.26
+109°	14.03 32 ~~40.78~~ + 2 20.14	33 16.58 2 19.17	33 20.82 2 15.12	33 13.74 2 21.06	33 13.09 2 24.17
	+ 35 1.1	35 35.7	35 35.9	35 34.8	35 37.2
<+0.8	70 23 25.9 26.7 109 36 33.3	23.9 24.7 35.3	20.8 21.6 38.4	18.2 19.0 41.0	17.6 18.4 41.6
±	+1 32.2 3.30 +15.6	+0 59.6 0.5 +17.6	+1 2.5 3.3 +20.7	+1 6.2 7.1 +23.3	+1 4.4 5.2 +23.9

+.85

26 +280

Nov. 28 Dec. 6

22 32.622 3.3 — 32 45.1
39.0 49.1
45.1
57.3 32 51.4
3.5 53.5
9.5 53.7
16.1 57.8
22.0 0.0
34.2 4.3
40.2 22 3.3 6.1
45.8 8.5
3453
-40
105.3 2.012
23 9.57 9.573 23

6.08 6.12 6.74
~~282~~ 9.62
— ~~270~~ 264 6.20
— .73 3.32 9.62
— 4.26 2.98
1.91 2.74
— .79
— 4.30
1.97
1.81

169

50 0 20.0
— 2.8
172
0 8.60

1.663
1.82151
1.47383
29.72
50 8.60
49 38.83

33 9.52
2 28.71

35 38.2

165
1.73
92.7

+1 4.5 54
+25.0

β Aquarii
21 24 46
— 6 08
+75 —11
1871

46.06
24 45.99 (+.057)

Sept. 17	21	24 48.23	4	+4	−6° 8′ 30″
22		19	4	+7	30
24		15	4	−2	31
Oct. 2		10	5	+7	32
7		04	6	+16	33
12		98	6	+14	34
17		91	7	+03	36
22		84	7	+7	3.8
27		47.77	7		4.0
Nov. 1		70	9		4.2
6		64	6		4.5
11		57	7		4.8
16		50			5.1

δ = −6° 8′ 15.0″

−.016

sin δ 9.02874

cos δ 9.99751
.12669
.12420

+02 +112 Sept. 27	+07 +059 Oct. 4	+06 +100 Oct 23	+2 +240 Nov. 7	+20 +213 Nov. 9
24 41.7 24 34.2 43.8 21 35.2 45.8 20 36.3 50.0 42 105.7 52.1 21 54.1 20 56.1 20 58.2 21 2.3 41 4.4 24 35.2 6.5 21 4150 180 565.0	42.0 24 41.5 24 44.2 42.8 46.4 84.3 50.2 52.4 54.6 56.6 25 26.5 58.6 2.8 4.8 24 42.0 7.0 5996	24 43.4 24 33.0 45.5 34.3 47.5 35.5 51.6 102.8 53.7 55.8 57.9 60.0 64.1 66.0 24 34.3 68.2 6137	25 16.6 17.7 18.8 53.1 25 0.7 5.0 7.0 25 1.7 9.1 567 8 7	24 43.9 24 38.1 46.0 21 39.2 48.1 21 40.9 52.1 4.0 118.2 54.1 2.0 56.3 2.4 58.4 1.9 60.5 21 64.6 41 66.6 2.0 39.4 68.7 2.1 62.03 19
24 54.09 54.091 48.15 54.08 6.54 48.20 6.88 −6.85 −0 54.08 −2.16 −5.90 24 46.08 −.01 −2.16 46.01 03	54.51 54.500 48.06 54.49 6.45 48.11 6.38 −6.39 −1 54.49 −2.07 −6.37 46.04 −.01 −2.07 46.04 06	24 55.79 55.791 47.82 55.77 7.96 47.87 7.90 −7.95 −1 55.77 −1.83 −7.97 46.00 −.01 −1.83 45.96 97	24 56.68 56.68 47.62 56.66 9.04 47.67 8.99 −8.96 −2 56.66 −1.63 −8.97 46.07 −.02 −1.63 46.04 06	56.30 56.391 47.59 56.37 8.70 47.64 8.73 −8.63 −2 56.37 −1.60 −8.63 46.05 −.02 −1.60 46.14 08
30 0 50.3 21.8 721 36.05	0 25.0 25.1 33.2 31.1 582 582 29.10 28.10	0 15.1 22.7 3796 18.98	1 15.9 11.5 274 13.70	0 25.2 23.0 482 24.10
+18.9 1.27646 1.40066 +2510 30 36.05 31 01.20	+12.4 1.09842 1.21762 +16.51 30 29.10 30 45.61	+21.5 1.33244 1.45664 +28.62 30 18.90 30 47.52	−21.0 1.32222 1.44642 −27.96 31 13.70 30 45.74	+17.0 1.23045 1.35465 +22.63 30 24.10 30 46.73
8 12.85 9 12.85 65.59	7 57.26 −65.30	7 59.17 −64.07	7 57.39 −67.83	7 58.38 −68.22
9 18.4 8 3.1	9 02.6 8 3.2	9 3.2 8 3.8	9 5.2 8 4.6	9 6.6 8 4.7
1 15.3 14.6	0 59.4 58.7	0 59.4 58.8	0.6 +0 59.9	1 1.9 1.2
8 12.85 −11.90	7 57.26 −11.80	7 59.17 −11.20	7 57.39 −10.40	7 58.38 −10.30

−6°

−6

−68

δ′ = −6

46.03
06
97
06
15
13
2
92
0

Nov. 13 +21 +220 Nov. 19 +32 +350

24 25 12.1 40.7 24 38.3
13.6 42.7 39.3
14.8 44.8 41.1
40.5 49.0 118.7
51.0
55.0 55.0 00 − 53.0
50 57.1 21 55.1
52 59.4 42 57.1
51 63.4 83 1.3
52 65.5 103 12.5 3.3 24 39.6
52 67.6 124 5.4
55.11
40 3.4
180
24 55.12 56.13 58 34
47.54 55.11 53 04 53.03 65-1
7.54 47.59 47.46 55.01 46
7.62 6.58 47.50 46.04
− 7.43 − 5.56 5.51
2 3 21
− 1.55 55.11 − 1.46 53.03
46.13 − 7.42 45.99 − 5.52
− .02 − .04
− 1.55 − 1.46
46.12 46.01
13 .02

177

30 1 7.2 0 28.2
4.3 26.7
11.5 54.9
5.75 27.45
− 18.4 + 13.4
1.26482 1.12410
1.38902 1.25130
− 2449 + 1.274
31 5.75 30 27.45
30 41.26 30 45.29
7 52.91 7 56.94
− 69.28 − 68.84
40 22.2 40 5.8
8 5.0 8 5.3
? w ? w
+ × 0 57.2 56.5 + × 1 0.5 + 0 59.9
8 52.91 8 56.94
10.00 − 9.70

5

β Cephei

21 27 07 26

+70 02 (+04)

sin δ 9.9730
cos δ 9.5340
log C 6.7367
6.2437

59.22
59.18 = P -.08
59.16 = A

cos δ 9.5340
1262
9.6602

Sept 17 +69° 59′ 57.2″
22 55.7 13
Oct 2 60.0 13
2 61.3 13
Oct 07 62.5 12
12 63.5 10
17 64.5 10
22 65.3 8
Oct 27 66.1 8
1 66.6 5
Nov 6 67.1 5
11 67.4 3
16 67.6 2

δ = +69° 59 39.9″

sin δ 9.97299

cos δ 9.53405
12669
9.66074

-.46

-041

1871 Oct 22

+275 +10 +147

26 32.1
38.1
43.9
56.1
2.4
8.1
14.1
20.1
32.3
38.3
44.3
3298
298
89.8
27 8.16
0.6763
7.53
-7.81
+27
-1.51
26 59.11

26 12.0
14.5
17.5
140
147
27 46.8
49.3
52.0
1481
49.4
26 14.7
8.16
8.12
63
7.49
8.12
-7.81
+.40
-1.41
59.24
26

+5.35 +412
1.7283 1.6149
3.4566 3.2298

20 3 50.3
46.2
965
3 4825
+24.47
12.78
- .50

4 32.3
28.4
612
4 3060
-1884
11.76
- .30

+53.5
1.72835
1.38909
+2450
23 48.25
24 12.75

+69° 58 35.60″
+ 29.07

69 59 04.7
70 00 05.3

δ′ = +69 58 35.60
-25.40

+.42 + +1 0.6 1.0

Sept 23

+02 +040

27 13.3
19.8
25.5
31.7
37.7
1280
25.60
2.1812
23.52
~~23.61~~
-23.61
+5
-3.02
59.02

27 54.7
56.5
58.4
186
565
28 13.7
17.9
20.9
525
185
27 56.5
25.600
2.556
2.14
23.42
25.56
-23.63
+.11
-2.96
59.08
10

+291 -519
1.4639 -1.7152
2.9278 3.4304

25 0 11.0
20 4 31.0
9 421
20 4 5105
+1331
436
- 16

25 0 20.2
40.5
10007
5 0035
-2343
662
- .47

-30.9
1.48996
1.15070
- 1415
24 51.05
24 36.90

58 11.45
+ 29.24

58 40.7
59 59.1

58 11.45
-19.20

+2 18.4 18.8

Sept 30

+10 +082

27 2.4
9.0
14.6
26.9
32.9
39.1
45.1
51.3
2.3
9.0
14.6
2472
150
427.2
28 38.86
1.8581
37.03
-37.16
+27
-2.69
59.26

26 54.8
57.5
0.8
173.1
26 57.7
26 57.7
38.636
38.79
1.81
36.98
483
38.79
-37.13
+.27
-2.65
59.20
27

20 4 46.7
56.8
4 35
4 1.75

+41.1
1.61384
1.27458
+1182
24 1.75
24 20.57

58 27.78
+ 30.44

58 58.2
60 00.89

58 27.78
-21.00

+1 2.7 3.1

Oct 3

16 +04 +057

26 55.9
1.9
7.8
13.6
19.5
987
60
387
27 7.74
27 1.0066
6.06
-6.20
+9
-2.54
59.09

26 10.2
12.8
15.5
385
12.8
27 25.8
28.0
31.0
848
283
26 12.8
7.740
7.70
1.66
6.04
7.70
-6.16
+.16
-2.50
59.20
22

+549 -206
1.7396 -1.3139
3.4792 2.6278

20 3 52.7
51.2
1039
3 5795
+2511
17.06
- 53

4 28.3
26.9
1552
2776
- 942
18.34
.06

+54.9
1.73957
1.40031
+2514
23 51.95
24 17.09

58 31.26
+ 28.80

58 59.6
60 01.6

58 31.26
-21.70

+1 2.4 2.9

Oct 4

+07 +059

26 56.0
1.6
8.2
14.1
20.2
100.1
60
40.1
27 8.02
1.6561
6.41
-6.39
+19
-2.49
59.33

56
66
58
61

27 21.8
25.1
28.9
158
25.3
27 44.0
47.4
49.8
212
47.1
27 25.3
8.020
7.98
1.61
6.37
7.98
-6.37
+.16
-2.48
59.38
33

-17.3 +42.4 -391
+1.6304 -1.5922
3.2608 3.1844

4 27.7
25.1
528
4 2640
1953
1553
32

4 35.7
32.3
680
3408
1788
1612
.27

-17.3
1.23805
0.89879
-7922
24 28.40
24 18.48

58 29.87
+ 29.55

58 59.4
60 01.8

58 29.87
-21.90

+1 2.4 2.8

Oct 8

+07 +065

26 32.3
38.3
44.3
56.0
2.0
8.1
14.2
20.3
32.4
38.3
44.5
330.7
240
90.7
27 8.25
1.4541
6.84
6.99
+19
-2.29
59.16

26 46.8
49.8
966
484
28 0.2
4.5
7.4
121
40
26 48.4
8.245
8.21
1.41
6.80
8.21
-6.99
+.10
-2.28
58.99
57.13
98

+198 -55.8
+1.2967 -1.7466
2.5934 3.4932

4 8.8
2.9
11.7
585
9.06
14.91
.06

4 43.7
38.0
81.7
4085
2551
1534
65

+19.8
1.24667
0.95741
+ 406
24 5.85
24 14.91

58 33.44
+ 30.40

59 03.8
60 02.7

58 33.44
-22.80

+0 58.9 59.3

+10
−8
+9
+4
+15
−12
+3
+19
+5
+5
−1
+6
+4

+18 +180
Oct. 31

26 27 32.5 26
34.1
38.0
40.5
145.1
56.8
3.0
9.0
14.8
20.9
104.5
66
44.5
27 36.3
27 36.3
27 8.90
0 0.13 09
8.79
8.90
8.86
09
− 9.26 6.86 8.77
+ 49
− 57 −923
+.49
59.16 −.93
59.19
21

+17 +192
Nov− 2

33.2 26 15.6 26
39.0 58 18.7
45.0 60 21.7
57.0 120 56.0
2.8 58
−9.2 64
15.3 61
21.3 60
33.4 121
39.5 26 18.7
45.5 60
3412
240 26 18.7
1017
9.200 27
920
59.01 .97
9.20
9.16
59.97
− 9.55 −9.16 9.19
+ 46
− 85 −953
+.53
59.26 −.81
59.35
37

+15 +200
Nov− 5.

32.8 26 22.2 26
38.8 26.2
45.0 29.0
56.8 77.4
2.8
9.0
15.0 28 13.3
21.0 17.0
33.0 22.5
39.0 26 25.8
45.0
3382
240 26 25.8
982
8.93 27
8.93
59.78 82 .78
9.15
8.89
59.78
− 9.58 8.89 9.11
+ 41
− 66 −960
+.55
59.10 −.62
59.22
23

+22 +240
Nov. 7

32.0 28 3.3 26
38.3 6.6
44.1 12.5
56.0 22.4
2.0
8.0
14.1
20.0
31.9
38.2 28 7.5
44.2
3288
240 28 7.5
48.8
8.927 27
8.07
59.66
59.71 67
8.41
8.073 27
8.08
59.67
− 8.96 8.03 8.36
+ 60
− 55 −897
+ 66
59.16 −.51
59.27
23

+20 +213
Nov− 9

32.0 26 33.8
37.4 36.2
43.6 38.8
55.5 108.8
1.7
7.4
13.7
19.7
31.6
37.6
43.7 26 36.3
3237
210
837 26 36.3
7.61
5957 .57 7.609 27
62
8.08
7.67
59.83
− 8.60 257 8.04
+ 55
− 41 −862
+.58
59.15 −.88
59.15
18

+21 +220
Nov. 13

30.1 26 38.7
36.1 40.6
42.3 42.9
54.0 121.7
0.1
6.1
12.1
18.4
30.5
36.4 26 40.6
42.2
3083
240 26 40.6
683
6.21 6.209
5939 .29
166
6.93 6.17
59.29
59
− 7.92 6.88 6.17
+ 54
− 17 742
+.60
59.19 −.13
59.22
24

183

20 4 29.8
23.2
530
26.50

3 56.7
46.6
1033
51.65

4 61.2 4 52.5 4 49.1
49.6 40.4 34.7
1108 929 838
0 55.40 46.45 41.90

4 66.8
3 54.7
121 5
4 0.75

−27.4
1.43775
1.09849
− 12.54
24 26.50
24 13.96
58 34.39
+ 29.77
59 04.1
60 06.5
58 34.39
−26.60
+1 2.4 2.8

+50.5
1.70329
1.36403
+23.12
23 51.65
24 14.77
58 33.58
+ 30.26
59 03.8
60 06.7
58 33.58
−26.80
+1 2.9 3.4

+43.1
1.63448
1.29522
+19.73
23 55.40
24 15.13
58 33.22
+ 31.46
59 04.7
60 07.0
58 33.22
−27.10
+1 2.3 2.7

−59.4
1.77378
1.43452
−27.20
24 41.90
24 14.70
58 33.65
+ 30.50
59 04.2
60 07.2
58 33.65
−27.30
+1 3.0 3.4

+31.3
1.49554
1.15628
+ 14.33
24 0.75
24 15.08
58 33.27
+ 31.21
59 04.5
60 07.3
58 33.27
−27.40
+1 2.8 3.2

+25.6
1.40824
1.06898
+ 11.72
24

α Cygni
21 29 10
+45 02
+100
1871

	~~Sept 23~~ Oct 8		Oct 31		Nov 5		Nov 7		Nov 13	
sin ∫ 9.84974 cos ∫ 9.84923 12669 9.97592	28 59.2 2.1 5.0 10.7 13.7 -16.6 19.6 22.5 28.2 30.2 34.1 241.9 60 181.9 29 16.54	~~29~~ 28 54.6 56.4 58.4 169.4 29 43.7 45.1 46.8 28 56.5 ~~18.036~~	29 1.0 2.7 6.4 12.5 15.3 18.3 21.0 24.0 29.9 32.7 35.9 199.7 29 18.15	29 42.4 43.8 45.6 131.8 29 48.9 18.155	29 12.5 15.5 18.5 21.4 24.2 92.1 29 18.42	29 30.3 32.2 33.8 96.3 29 32.1 18.420	29 12.0 14.7 18.0 20.6 23.5 88.5 29 17.76	29 32.6 35.4 37.3 105.3 29 35.1 17.760	28 58.7 1.4 4.3 10.4 13.1 16.0 18.9 21.7 27.7 30.5 33.4 235.8 60 175.8 29 15.98	28 55.9 57.4 59.1 172.4 28 57.5 15.982
20	1 51.9 49.9 101.8 50.90 +20.0 1.30103 1.27695 ~~+15.02~~ +18.92 21 50.90 22 ~~[illegible]~~	2 36.6 35.4 72.0 36.00 ✓ 50.90 09.82	2 34.1 31.1 65.2 32.60 -25.8 1.41162 1.38754 -24.41 22 32.60 22 ~~57.01~~ 8.19		2 27.1 18.8 45.9 22.95 ±13.7 1.13672 1.11264 -12.96 22 22.95 22 9.99		2 31.1 19.1 50.2 25.10 -17.3 1.23805 1.21397 -16.36 22 25.10 22 8.74		1 56.7 47.1 83.8 41.90 +18.5 1.26717 1.24309 +17.50 21 41.90 22 59.40	
+45°	0′ 38.53″		0 40.16 ✓		0 38.36		0 39.61		0 38.95	

Nov. 19 Nov. 28

55.9	28	56.6	28	52.1	28	53.3	28	46.6
57.4		59.3		53.8		56.4		48.3
59.1		2.3		56.0		59.4		50.9
2.4		8.0		161.9		4.8		145.8
		10.9				7.9		
		13.8				10.9		
		16.8				13.9		
		19.8				16.7		
		25.5				22.4		
57.5		28.5	28	53.9		25.4	28	48.6
		31.4				28.4		
		272.9				299.5		
		120				180		
		152.9				119.5		
15.982	29	13.90		13.900	29	10.86		[illegible]

20 1	54.8	1	57.5
	46.3		43.0
	101.1		100.5
	50.55	1	50.25
	+ 20.1		+ 22.2
	1.30103		1.34635
	1.27695		1.32227
	+ 1842		+ 2100
	21 50.55		21 50.25
	22 847		22 1125
0	38.88	0	37.10

ξ Aquarii
21 30 55
−8 27
−15
1871

Oct. 22		Oct. 31		Nov. 7		Nov. 13	
		51.6					
30 50.3	30 41.8	30 53.7	31 24.8	30 51.3	30 46.2	49.7	41.5
52.3	43.2	55.8	26.3	53.3	47.6	51.7	42.7
54.5	44.6	59.9	28.0	55.4	44.0	53.8	44.4
58.6	129.6	2.1	79.1	59.5	142.8	58.0	128.6
0.6		4.0		1.6		0.0	
−2.8		6.2		3.7		2.0	
4.9	31 27.0	8.3		5.8		4.1	
6.9	28.7	12.5		7.8		6.2	
11.0	30.0	14.5		12.0		10.4	
13.1	30 43.2	16.7	31 26.4	14.1	30 47.6	12.4	30 42.9
15.2				16.1		14.5	
2702		2853		2806		2638	
240		453		240		240	
30.2				406		228	
31 2.75	2.745	4.12		3.69	3.600	31 2.09	2.091
						2.07	

sin √ 9.16716m

cos √ 9.99526
12669
.12195

Oct. 22		Oct. 31	Nov. 7	Nov. 13
45 2 51.6	3 51.4	3 47.8	3 61.2	2 53.4
59.9	60.2	53.2	57.3	52.0
1115	1116	1010	1155	1054
2 55.75	55.80	3 50.50	59.25	2 52.70
+19.5		−22.4	+16.0	+19.2
1,29093		1,35025m	1,20412	1,28330m
1,28529		1,34551	1,19938	1,27856
+ 19.29		− 22.16m	+ 15.83	− 18.99m
47 55.75		48 50.50	47 59.25	4.
48 15.04		48 28.34	48 15.08	
1,41198		1,47220	1,32607	1,40525m
+25.82		− 29.67	+21.19	+25.42
47 55.75		48 50.50	47 59.25	47 52.70
48 21.57		48 20.83	48 20.44	48 18.12
		32.48		
−8° 25′ 33.22″		25 31.48 ✓	25 32.09	25 29.77

Nov. 19 Nov. 28

	~~44.9~~						
30	47.5	31	11.1	30	44.9	30	46.0
	49.8		13.1		46.5		47.4
	51.8		24.2		48.7		49.2
	58.0				53.0		142.6
	0.3				55.0		
	2.2				57.1		
	4.3				59.3		
	8.4				1.3		
	10.5				5.4		
	12.6	31	12.1		7.5	30	47.5
	~~2444~~				9.6		
	240				6283		
	4.4						
31	0.40		0.132				
			~~0.1400~~		57.12		57.118

45 3 36.4 3 7.3

35.3 1.1

71.7 8.4

3 35.85 3 4.20

120 ✓ 9.6

~~1.06849~~ 1.07920 0.98227

1.06845 1.20115 0.97758

− 15.42 − 15.89 + 9.07

1.19014 1.20115 1.10422

− 15.49 − 15.89 + 12.71

48 35.85 35.85 48 4.20

48 ~~19.86~~ 19.96 48 16.91

~~20.36~~

25 3161 25 2856

κ Capricorni
21 35 26
−19 27
−35

1871

sin δ 9.52242n

cos δ 9.97448
12669
.10117

1871	Sept 23		Oct 4		Oct 8		Oct. 22.	
	40.8	35 40.2	35 22.7	35 11.1	35 23.4	35 16.8	35 24.0	35 13.6
	35 43.0	41.4	24.9	12.8	25.5	18.1	26.1	15.0
	44.8	81.6	27.1	14.8	27.6	20.4	28.4	16.0
	48.9		31.4	38.7	32.0	55.3	32.8	44.6
	51.0		33.7		34.2		35.0	
	– 53.3		35.8		36.4		37.0	
	55.4		38.0	35 58.0	38.6	36 1.8	39.2	35 56.7
	57.6		40.4	59.6	40.8	3.2	41.4	57.9
	2.0		44.5	62.0	45.2	4.7	45.8	59.0
	4.2	35 40.8	46.7	35 12.9	47.4	35 18.4	47.9	35 14.9
	6.4		49.0		49.5		50.0	
			394.2		400.6		407.6	
	58 74 53.40		35 35.84	35.836	35 36.42	36.418	35 37.05	37.055
45	4 20.9		3 29.6	4 25.1	3 33.6	4 28.8	3 35.3	4 27.9
	53.8		37.9	35.0	40.7	38.0	43.0	36.0
	1347		1275	1201	1343	1268	1383	1239
	4 57.35		3 33.75	3 30.05	3 37.15	4 3.40	3 39.15	4 31.95
	+12.6 ∫		+22.9		+18.6 ∫		+22.1	20.9
	1.~~19030~~	1.10400	1.35984		1.~~20412~~	1.25530	1.34439	1.32010
	1.~~27150~~	1.20517	1.46101		1.~~36529~~	1.35647	1.445566	1.42127
	~~13.57~~	+16.05	+28.91		~~+20.20~~	+22.73	+27.90	−26.38
	49 7.35	7.35	48 33.45		48 37.15	37.15	48 39.15	49 31.95
	49 ~~25.92~~	23.40	49 02.66		48 ~~52.3~~	59.88	49 57.05	49 5.57
					11.53			
−19°	26′ 35″.05		26 14.31		26 11.43		26 18.70	

	Nov. 5		Nov. 7		Nov. 9		Nov. 19.		Nov. 28	
35	25.8 35	16.1 35	25.0 35	18.2 35	24.7 35	15.6 35.	21.3 35.	53.7 35	18.3 35	10.6
	28.0	17.2	27.1	19.4	26.7	16.6	23.5	55.1	20.5	11.9
	30.1	19.1	29.4	21.1	28.9	18.3	25.8	56.3	22.7	13.3
	34.2	20.8	33.7	58.7	33.4	50.5	30.1	165.1	27.0	35.8
	36.5	73.2	35.8		35.5		32.3		29.1	
	38.7		38.0		37.7		34.5		31.3	
	41.0 35	52.4	40.3		39.8		36.6		33.7	
	43.1	54.1	42.4		42.1		38.8		35.7	
	47.4	55.5	46.8		46.5		43.1		40.1	
	49.6 35	~~54.4~~	48.9 35	19.6	48.6 35	16.8	45.3 35	55.1	42.3 35	11.9
	51.8	18.4×	51.2		50.8		47.5		44.4	
	4262	18.3	4186		4147		3788		3451	
	38.75	38.745	38.05	38.055	37.70	37.700	34.44	34.436	31.37	31.373

45	3 34.7	4 20.4	3 41.6	3 37.1	4 28.4	3 33.9
	34.2	19.6	38.2	36.9	27.2	29.0
	689	400	798	740	556	629
	34.45	20.00	39.90	37.00	27.80	31.45
	× +20.3		+18.5	+20.9	−20.6	+19.5
	1.30750		1.26717	1.32015	1.31387	1.29043
	1.40867		1.36834	1.42132	1.41504	1.39120
	+25.62		+23.36	+26.38	−26.12	+24.62
	48 34.45		48 37.90	48 37.00	49 27.80	48 31.45
	49 0.07		49 3.26	49 3.38	40 1.79	48 56.07
	26 11.72		26 14.91	26 15.03	26 13.34	26 7.62 (7.72) ✓

06

1871

ε Pegasi

21 37 53

+9 17

5102
5099 +02
51.03 = +0

Sin δ 9.2077
cos δ 9.9943
C 6.7367
5.9387

Cos δ 9.9943
1262
1205

Oct 7	21 37 52.99		+4	+9° 17′ 21.0″		
12	.93	06	+6	21.1	1	
17	86	7	+1	21.2	1	
22	80	6	+6	21.2	0	
27	52.73	7	+1	21.3	1	
Nov 1	66	7	+4	21.3	0	
6	.59	7	−2	21.2	−1	
11	52	7	+6	21.0	−2	
16	52.45	7	+4	20.7	−3	
21			+1	20.4		
26			+5	20.1		
Dec 1			+8	19.7		

Sept 17 = 19.8″
22 20.2
27 20.5
Oct 2 20.8
7 21.0
21.1

+.55 +16

1871	Oct 8 +07 +065	Sept 23 +02 +040	Sept 27 +02 +062	Sept 30 +10 +082	Oct 3 +04 +057	Oct 4 +07 +059
−.016	37 47.4 37 39.8 49.6 41.1 51.6 42.6 55.8 1235 57.9 41.2 0.0 2.1 38 22.0 4.2 23.7 8.3 25.3 10.4 710 12.5 237	38 4.3 37 55.1 6.4 56.6 8.5 58.4 12.7 201 14.8 567 16.9 18.9 38 42.0 21.0 43.3 25.0 44.4 27.2 97 29.3 433 1550	38 46.5 38 21.8 48.6 22.8 50.8 23.8 54.6 68.4 56.9 57.0 1.0 3.1 7.4 9.4 38 22.8 11.6	38 17.8 38 ~~11.9~~ 19.9 ~~12.8~~ 22.0 ~~24.8~~ 26.1 28.1 30.2 32.3 34.4 38.5 40.6 38 12.8 42.8	37 55.0 37 35.6 57.1 36.7 59.3 37.8 1.4 38 20.7 3.4 21.8 296 2 23.0 201 367 55 218	37 46.9 37 34.5 49.0 35.8 51.1 37.3 55.2 176 57.3 359 59.4 1.5 38 18.4 3.6 20.0 7.7 21.4 10.0 598 12.0 199
Sin δ 9.20768	299.8 360 659.8 37 41.2	37 56.6	348.9 300.1 38 22.8 648.9	333.7 38 30.28 38 12.8	37 26.7	353.7 300 653.7 37 35.9
cos δ 9.99427 12669 .12096 12096	59.98 59.982 52.57 6.95 59.97 52.99 −6.98 6.98 5997 ± 1 −1.98	38 16.82 16.818 53.14 24.03 16.80 53.16 2361 23.64 16.80 ± 0 −2.15	38 58.99 58.991 53.09 5.86 5897 53.11 −5.86 5.86 5897 + 0 −2.10	53.06 30.250 3727 30.22 53.06 −3717 3714 30.22 + 2 −2.07	37 59.24 59.240 3.04 8 6.20 59.28 53.06 −6.19 6.12 59.22 ± 1 −2.05	38 59.43 59.427 3.03 6.40 5941 53.05 −6.38 6.36 59.41 1 −2.04
	−6.99 51.02 +.01 −198	−23.63 57.06 +.01 −2.15	−5.90 57.04 +.02 −2.10	−37.13 51.12 +.01 −2.07	616 57.01 +.01 −205	−6.37 51.02 +.01 −2.04
	51.01	51.03	50.99	51.03	51.08	51.01
	03	05	00	05	04	03
	+18.7 −238 +1.2718 1.3766	+203 −264 1.3075 1.4216			+225 −226 1.3522 1.3541	+235 −205 1.3711 1.3118
	5 0 21.2 1 17.3 24.4 21.2 456 385 0 2280 1 1925 24.68 31.41 47.48 47.84	55 0 57.1 1 58.9 0 26.5 2 27.6 2836 4 865 1 4180 2 1325 2680 3485 3860 3840	5 1 52.3 22.3 746 2 37.30	5 0 24.0 23.3 473 0 23.65	0 18.6 1 17.3 25.7 25.7 44.3 43.0 0 2215 1 2150 29.70 2582 51.85 51.68	0 15.1 1 16.4 21.3 22.1 364 385 0 1820 1 1925 3112 2706 50.32 52.19
	+18.87 1.27416 1.39512 ~~+2490~~ +2483 5 22.80 22.80 5 47.78 47.63 1.39512	~~1.30320~~ .30320 1.42946 142416 2688 42656 5 41.80 5 41.80 6 8.68 8.36	−23.8 1.37658 1.49754 ~~−34.52~~ +31.44 5 37.30 37.30 6 5.78 5.86	188 + ~~17.4~~ 1.25768 1.37864 24.80 + ~~23.97~~ ~~+23.00~~ 5 23.65 23.15 5 ~~47.62~~ 46.46	+22.5 1.35218 1.47314 + ~~29.29~~ +29.72 5 22.15 22.15 5 ~~51.74~~ 51.88	+23.5 1.37107 1.49203 + ~~31.12~~ +31.04 5 18.20 18.20 5 ~~49.32~~ 49.24
+ 9°	17′ 0.72 −1 38.92	16 39.99 −37.54	16 42.49 −38.21	~~16 58.79~~ 16 59.90 −39.23 − 39.23	16 56.48 −37.57	16 59.11 −37.88
	16 21.8 17 21.0	16 02.4 17 20.3	16 04.3 17 20.5	~~16 21.6~~ 16 20.67 ~~17 20.7~~ 17 20.9	16 18.9 17 20.8	16 21.2 17 20.9
δ′ = +9	17 0.72 −16.00	16 39.99 −15.30	16 42.49 −15.50	17 0.79 −15.70	16 56.48 −15.80	16 59.11 −15.90
−.51	+0 59.2 58.7	+1 17.9 17.4	+1 16.2 15.7	~~+0 59.1~~ +1 00 +0 59.5	+1 1.9 1.4	+0 59.7 59.1

δ = +9° 17′ 5.0″

Oct 16 +0 17079		Oct 22 +10 +147		Nov 5 +15 +200		Nov 7 +22 +240		Nov 28 +28 +286	
37 48.1	37 39.1	37 48.2	37 38.9	37 49.8	37 38.3	37 49.0	37 42.6	37 42.3	37 39.0
50.2	40.7	50.3	40.0	51.8	39.8	51.1	44.3	44.4	41.0
52.2	42.0	52.4	41.9	53.8	41.6	53.2	45.6	46.6	42.8
56.5	121.8	56.4	120.8	58.0	119.7	57.4	132.5	50.7	122.8
58.5	40.6	58.6	40.3	0.2		59.4		52.8	
0.6		0.6		2.2		1.5		54.9	
2.5	38 18.3	2.7	38 20.4	4.3	24.4	3.5		57.0	
4.7	19.7	4.8	21.8	6.4	25.7	5.7		59.0	
8.8	21.0	9.0	23.0	10.6	27.4	9.8		63.2	
11.0	59.0	11.0	65.2	12.6	37 39.9	12.0	37 44.2	65.3	37 40.9
13.2	19.7	13.1	21.7	14.6		14.0		67.5	
306 3		307 1		2643		3166		603 7	
300	37 40.6	300	37 40.3	240	37 39.9	300	37 44.2		37 40.9
6.3		7.1		24.3		16.6			
38 0.57	0.573	38 0.65	0.645	2.21	22.09	1.51	1.509	54.88	54.882
2.87		52.80		52.60		52.57		52.28	51.00
7.70	0.56	7.85	0.62	9.61	2.19	8.86	1.49		54.86
	52.89		52.82		52.62		52.09		52.80
−7.70	7.67	−7.81	7.80	−9.58	9.57	−8.96	8.90	−2.67	2.56
+ 1	0.56	+ 2	0.62	+ 2	2.19	+ 4	1.49	+ 5	−21 37 54.86
−1.88		−1.81		−1.61		−1.58		−1.29	
	−773		−781		9.60		−897		−288
51.00	+.01	51.05	+.02	51.04	+.03	51.01	+.04	50.97	+.04
	−1.88		−1.80		−1.61		−1.58		−1.29
	50.96		51.03		51.01		50.98		(51.03)
	97		05		03		00		04

+201 −191 +203 −211
1,3032 1,2810 1.3075 1,3243

5 0 20.0	1 12.3	0 22.4	1 17.2	0 22.2	1 22.0	0 30.6	0 35.7
25.8	18.0	27.5	22.5	18.2	19.2	23.3	26.9
458	303	499	398	404	412	539	625
0 22.90	1 15.15	0 24.95	1 19.85	0 20.20	1 20.60	0 26.95	0 31.25
26.53	25.21	26.79	27.85				
49.43	49.94	51.39	52.00				

222

+20.0	+20.3	+22.3	+17.3	+14.8
1.30103	1.30750	1.34830	1.23805	1.14613
1.42299	1.42846	1.46926	1.35901	1.26709
~~26.45~~ +26.43	+ ~~26.88~~ +26.83	~~29.53~~ +29.47	+ ~~22.91~~ +22.86	+ ~~18.54~~ +18.49
5 22.90 22.90	5 24.95 24.85	5 20.20 20.20	5 26.95 26.95	5 31.25 31.25
5 49.38 49.33	5 ~~51.48~~ 51.43 5 51.78	5 49.73 49.67	5 ~~49.86~~ 49.81	5 ~~49.79~~ 49.74
16 59.02 − ~~38.92~~ −38.74	16 56.57 −37.72	16 58.68 −40.04	16 58.54 −39.29	16 58.61 −41.09
16 20.3 17 21.2	16 18.9 17 21.2	16 18.6 17 21.2	16 19.2 17 21.2	16 17.5 17 19.9
16 59.02 −16.20 [+1 0.9 0.4	16 56.57 −16.20 +1 2.3 1.8	16 58.68 −16.20 +1 2.6 2.1	16 58.54 −16.20 +1 2.0 1.5	16 58.61 −14.90 +1 2.4] 1.9

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