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KG
11366
v.617

Fundamental Stars
Observations and Reductions
From Mar. 30 1885 to Oct. 10 1885
B.2

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$i = -4^\circ\ 56'\ 02''$ From Mar. 30 1885 to Sept 30 1885 Applied to Circle Readings.

$\log i = 8.93614_m$

$\log 15 \tan i = 0.11223_m$ " " " " " "

$i = 4^\circ\ 55'\ 6''$ From Oct 1 1885 to Dec — 1885

$\log i = 8.93599$

$\log 15 \tan i\ 0.11208$

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Mar. 30 1885

	β Gem		γ Gr. 1374		χ Gem		δ Cancri	
cos δ / sec δ / sin z	+54	+24	+3.53	−.53	+.53	+.25	+34	+.40
h m s	7 38 20	+64	7 46 32		7 56 31		8 38 12	
n / c	+28 18 / +14 5	+00	+74 13 / −31 50		+28 7 / +14 16		+18 34 / +23 49	

Transits (wires):

38 21.0	12.0	38 26.2	44 58.2	26.7	4	56 21.7	22.7	56 36.8	38 22.7	6.4	38 19.4
23.4	14.5	28.5	3.2	34.0		24.8	25.2	39.4	24.3	8.3	21.6
25.3	16.8	30.7	7.2	41.7		26.9	27.4	41.5	26.2	10.7	23.8
27.3	19.0	33.0	15.7	49.5		28.9	29.9	43.8	27.5	12.8	25.9
28.9	21.3 1672	35.5	20.3	57.1 +180		30.8	32.0 2744	46.1	29.0	15.0 1064	28.1
		37.8				32.4		48.6			30.3
	49.5	40.2		47 27.9			0.3	50.8		41.0	32.4
	51.9	42.7		35.7			2.4	53.0		43.2	34.6
	54.2	44.8		43.1			4.6	55.5		45.5	36.7
	56.4			50.7			7.0			47.8	
	58.7 5414			58.6 4320			9.4 474			49.9 4548	
1259 / 38 25.18	7086 / 38 35.430	3194 9 / 38 35.488	3446 / 45 8.92	20500 / 46 42.500		56 27.58	9218 / 56 46.090	4155 7 / 56 46.168	1297 / 38 25.94	5612 / 38 28.060	2528 9 / 38 28.088

Mean T: 38 35.460 · 46 42.500 · 56 46.128 · 38 28.074

		β Gem		Gr. 1374		χ Gem		δ Cancri	
T_m	T	38 35.460		46 42.500		56 46.128		38 28.074	
K		−.018		−.055		−.018		−.016	
T_m+K		38 35.44		46 42.44		56 46.11		38 28.06	
RA	Δ T m	38 17.87	−17.91	46 26.79	−17.92	56 28.53	−17.92	38 10.34	−17.93
T−RA		+ 17.57	+ .35	+ 15.65	+2.26	+ 17.58	+ .34	+ 17.72	+ .22
α_0	c sec δ	16.69		24.53		27.26		8.93	
	Red. app. place		− 1.18		−2.26		−1.27		−1.41
	Sum		− 18.74		−17.92		−18.85		−19.12
	α 1885.0		38 16.70		46 24.52		56 27.26		38 8.94

	β Gem		Gr. 1374		χ Gem		δ Cancri
	9.94472		9.43457		9.94546		9.97679
C.R. 47 30.30	+10.28 · 1.01199	53 18.32	+38.58 (9) · 1.97118 / ~~1.52608~~	58 52.50	+18.55 · 1.26834	30 50.10	+2.13 · 0.32838
R_m − 11.72	1.06894n	− ~~11.83~~ 32.96	~~1.07288n~~ 1.51798n	− 21.18	1.32603n	− 2.61	0.41740n
Corr. C.R. 47 18.58		~~53 6.49~~ 52 45.36		58 31.32		30 47.49	

C.R.
R_m
Corr. C.R.

	β Gem	Gr. 1374	χ Gem	δ Cancri
δ'	+28° 35 29.77	+74° ~~29~~ 30 48.6 / 2.93	+28 24 17.03	+18 52 0.86
z	+14 4 44	−31 49 28	+14 16 6	+23 48 4
n+ log =	1.15950	1.55300n	1.16560	1.40470
73+t+r	+ 2675	+ 2685	+ 2706	+ 2777
log R_z	1.18625	1.57985	1.19266	1.43247
R_z	− 15.35	+ 38.01	− 15.58	− 27.07
R_{nd}	− .02	− 1.26 17	− .08	− .00
R_n	+ .00	+ .00	+ .00	+ .00
Sum	− 15.37	+ ~~37.84~~ 36.75	− 15.66	− 27.07
δ	+28 35 14.40	+74 30 ~~9.70~~ 39.68	+28 24 1.37	+18 51 33.79

	β Gem		Gr. 1374		χ Gem		δ Cancri	
Refr. δ − z	− .16	−17 12.24	+ .36	−17 12.24	− .17	−17 12.24	− .27	−17 12.24
δ	35 14.2	− .16	30 20.1 400	+ .36	24 1.2	− .17	51 33.5	− .27
App. δ	18 2.0	+ 8.60	13 28.0	− 5.0	6 47.9	+ 8.90	34 21.9	+ 12.5
Δ	−17 12.2	−17 3.80	~~16 52.1~~ −17 12.0	−17 16.88	13.3	−17 3.51	11.6	−17 0.01
δ_0	18 10.55	18 10.60	13 22.98	13 22.80	6 56.84	6 57.86	34 34.40	34 33.78

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1985phae.proj.1021

Mar. 30 1885

γ Hydrae +11
R.A. +.59
8 49 22
+6 23
+36 0

ι Urs. Maj. +1.13
8 51 24
+48 29
−6 6

χ Urs. Maj. +1.10
8 55 50
+47 37
−5 14

49 188 200 212 227 248 — 1075 — 2150
174 196 216 237 2872160 — 507 527 548 568 589.5478 — 7638 — 38.190
49 299 319 340 360 382 402 423 443 464 — 3432 — 38.133
51 360 392 422 440 452 — 2066 — 4.132
51 263 295 326 358 388 420 450 482 512 — 3494 — 38.822
55 236 259 282 300 323 — 1400 — 28.00
846 375 410 436 468 4070.0 +24475 56 5.175

49 38.162

51 38.822

56 5.175

49 38.162 − .016 49 38.14 49 20.33 + 17.81 1887 −17.94 + .07 − 1.46 −19.33 49 18.81

51 38.822 − .023 51 3880 51 2151 + 17.29 1986 −17.94 + .72 − 1.65 −18.87 51 19.93

56 5.175 − .023 52 3.15 55 4.794 + 17.21 46.27 −17.94 + .70 − 1.67 −18.91 55 4.624

9.99730

9.82141

9.82872

4 52 3.175 − 21.44 52 10.31 +16.66 1.22167 1.33120 36 11.57 + .215 36 13.72 −2.50 0.39794 0.33158 29 40.52 − 32.45 29 8.07 +3.718 1.57081 1.51126n

+6 40 38.04 +35 59 46 1.62120 + .2798 1.64918 − .4458 − .02 + .00 − .4460 +6 39 53.44

+48 46 34.63 −6 6 34 0.78990 + .2803 0.81793 + 6.57 − .00 + .00 + 6.57 +48 46 41.20

+47 53 40.28 −5 13 6 0.72090 + .2808 0.74898 + .561 − .087 + .000 + .524 +47 53 45.52

Mar 30
Reg − 17 12.2 12.0 13.3 11.6 12.2 12.4 12.0 − 17 12.24

	− .40	−17 12.24		+ .07	−17 12.24		+ .06	−17 12.24	
39	53.0	− .40		46 40.3	+ .07		53 45.6	+ .06	
22	40.8	+ 5.22		29 28.9	+ 3.48	8.77	36 33.6	+ 3.70	
	122	−16 [illegible]		[illegible] 24	−17 11.83		17 12.0	−17 8.08	
22	57.03	22 33.00		29 32.31	29 29.37		36 37.33	36 33.04	
		57.00			32.43				

Red to Light Place
Sum
S1885.0

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Apr. 1 1885

68 Aurigae +.82

λ Gem +.30

19 Lyncis +1.45

Gr. 1808 +2.56

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Apr. 1, 1885

β Can. +15 Min

h m s +.56
7 20 58
+8 31
+33 52

α Can. +19 Min +.60

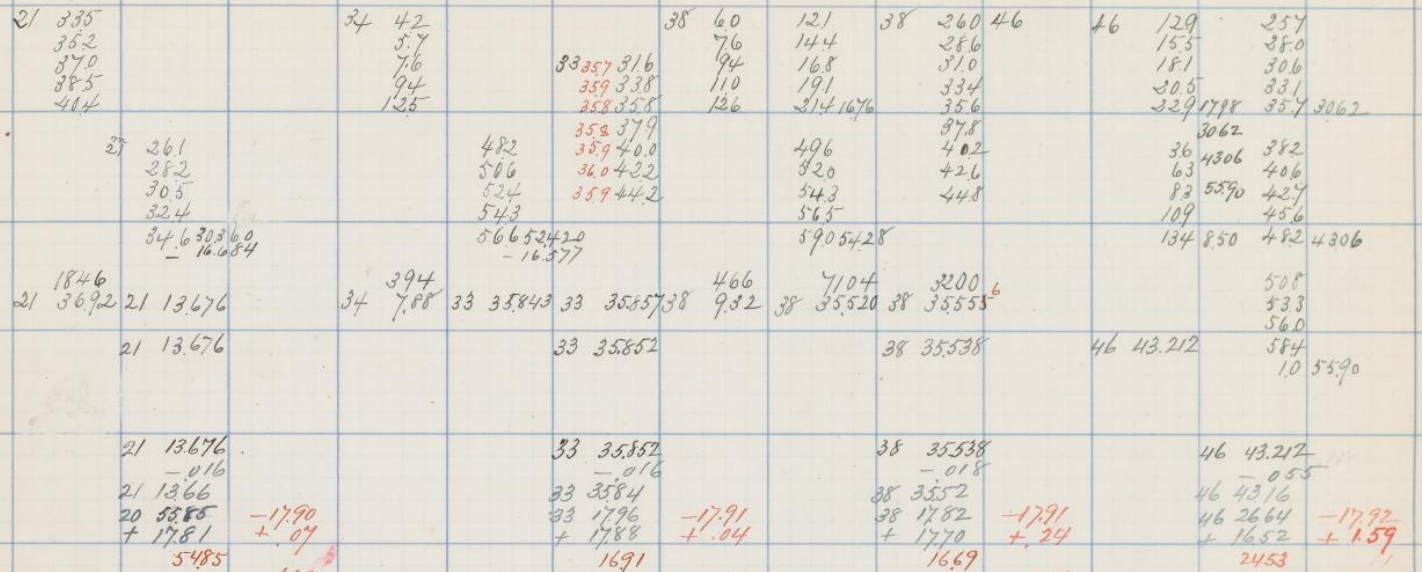
7 33 20
+5 31
+36 52

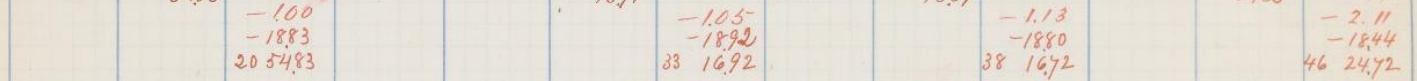
β Gem +54 +.24

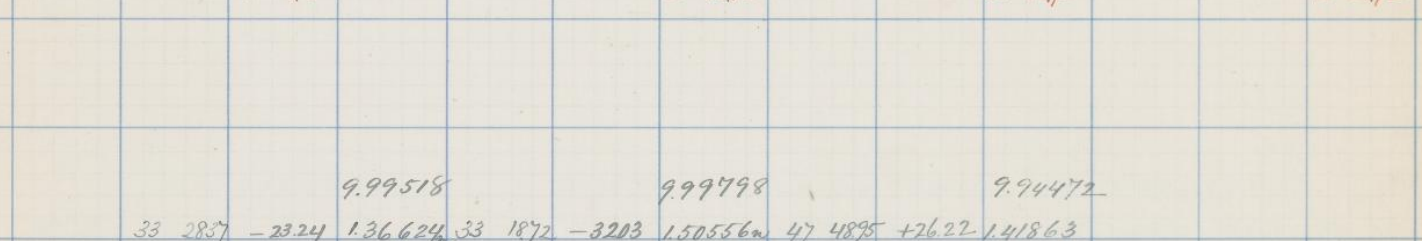
7 38 20
+28 18
+14 5

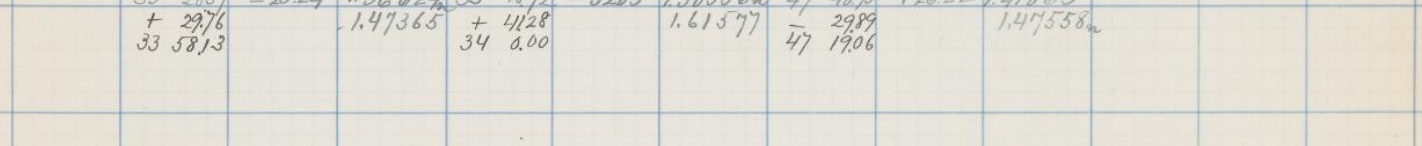
Cx. 13.74 +3.53 −.53

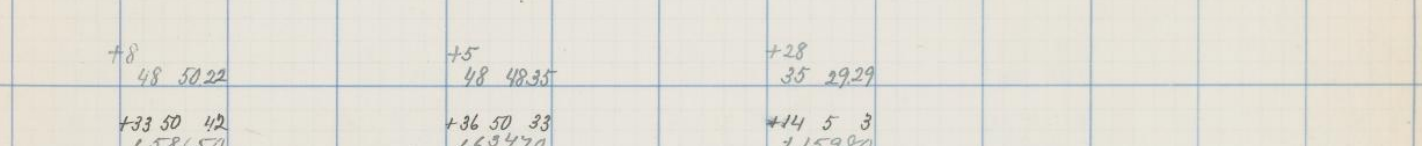
7 46 32
+74 13
−31 50



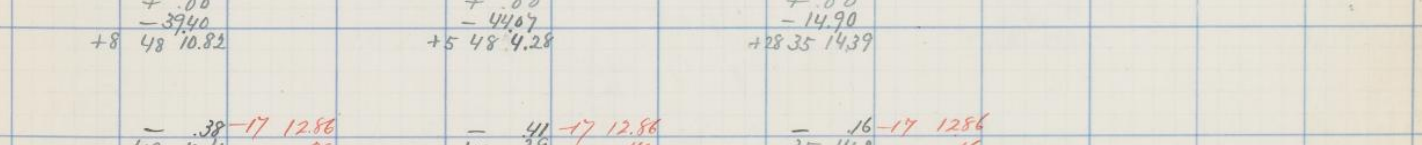


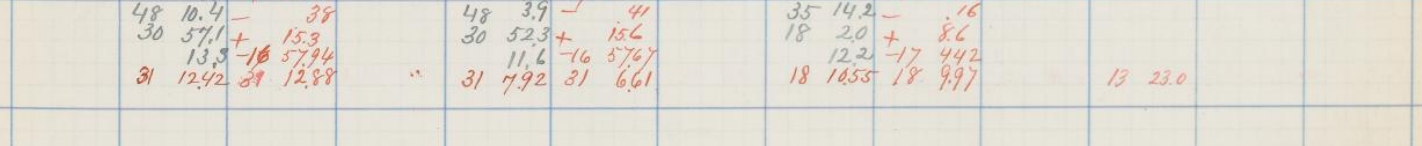


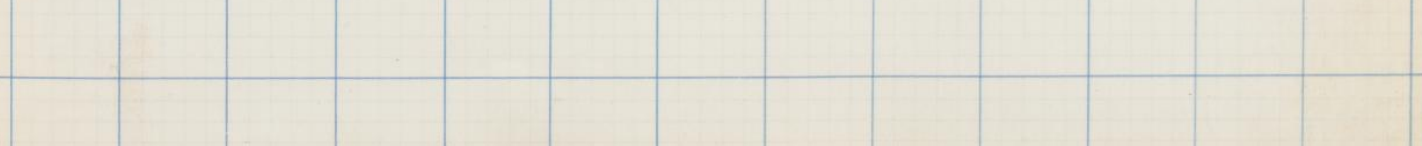












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Apr 1, 1885

δ Cancri +34

h m s +.40
8 38 12
+18 04
+23 49

i Cancri +56

8 39 48 +.23
+39 11
+13 12

38 21 65 38 194 39 340 398 39 538
38 86 216 350 421 563
55 107 238 365 444 584
67 130 259 377 467 11
88 150 1076 280 400 492 4444 33
+17406 303 56
325 175 80
346 199 104
366 222 127
245
27.12224

269 2527 1832 12668 5699
38 5.38 38 28.166 38 28078 39 3664 40 3340 40 3.322
38 28.107 40 3.331

38 28.107 40 3.331
− 016 − 018
38 2809 40 331
38 1031 −17.93 39 4565 −17.93
+ 1778 + .15 + 1766 + .25
8.93 44.24
− 1.38 − 1.41
−19.16 −19.09
38 8.93 39 44.22

9.97679 9.94105

31 1482 +22.73 1.35660 55 1395 +26.69 1.42635
− 2790 1.44562n − 3017 1.44963n
30 46.92 54 43.78

+18°
52 1.43

+29
28 4.57

+23 48 29
1.40490
+ 1110
1.41600

+13 12 28
1.13080
+ 1129
1.14209

−2606
− .08
+ .00
−2614

−13.87
− .14
+ .00
−14.04

+18 51 35.29 +29 27 50.53

Apr 1
Reg − 1ʸ 13,4
12.8
13.5
13.7
13.3
11.6
12.2
13.0
12.2
−17 12.86

− .27 −17 12.86 − .16 −17 12.86
51 35.0 − .27 27 50.4 − .16
34 22.0 + 12.4 10 38.2 + 9.0
−17 13.0 −17 0.73 12.2 −17 4.02
34 34.40 24 34.56 10 47.21 10 46.51

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Apr. 6 1885

η Cancri	δ Cancri	i Cancri	ζ Hydrae
+38	+34	+56	+11
h m s +.37	h m s +.40	+.23	+.59
8 26 6	8 38 12	8 39 48	8 49 22
+20 49 +.33	+18 34	+29 10	+6 22
+21 34 +.00	+23 49	+13 13	+36 1

26 205		26 143	38 57	70	38 200	39 350	404	39 545	49 114	18.0	49 30.6	
222		166	76	92	221	367	427	570	125	20.2	32.6	
237	55 5.5	188	87	114	242	380	450	592	138	22.1	34.7	
250	5.3 7.5	210	102	135	265	398	474	17	152	24.3	36.7	
275	5.6 100 5.467	232	120	156 1134	288	412	498 4506	40	167	264 2220	38.8	
		254		+17406	310			63			40.9	
	363	278			330		182	87		51.3	43.0	
	386	298			352		205	11.0		53.3	45.0	
	408	322			375		227	134		55.4	47.2	
	430						252			57.5		
	452 4078						276 2284			59.5 5540		
1189		2091	442		2583	1907	12790	5758	696	7760	3495	
26 23.78	26 23.124	26 23.233	38 8.84	38 28.746	38 28.700	39 38.14	40 3.950	40 3.978	49 13.92	49 38.800	49 38.833	
		26 23.178			38 28.715			40 3.964			49 38.816	
		26 23.178			38 28.715			40 3.964			49 38.816	
		− 016			− 016			− 018			− 016	
		26 23.16			38 28.70			40 3.95			49 38.80	
		26 47.3	−18.60		38 10.23	−18.60		39 45.56	−18.60		49 20.22	−18.61
		+ 18.43	+ .13		+ 18.47	+ .11		+ 18.39	+ .18		+ 18.58	+ .04
		3.480			8.933			4.4236			18.873	
			− 1.25			− 1.30			− 1.32			− 1.35
			− 19.72			− 19.79			− 19.74			− 19.92
			26 3.44			38 8.91			39 44.21			49 18.88
		9.97068			9.97679			9.94112			9.99731	
15 30.80	−0.60	9.77815n	31 12.10	+19.88	1.29842	55 12.22	+25.82	1.41196	42 43.65	+24.90	1.39620	
+ 0.73		9.86106	− 24.40		1.38744n	− 29.20		1.46531n	− 32.04		1.50574n	
15 31.53			30 47.70			54 43.02			42 11.61			

η Cancri	δ Cancri	i Cancri	ζ Hydrae
+21	+18	+29	+6
7 16.82	52 0.65	28 5.33	40 36.74
+21 32 45	+23 48 26	+13 12 26	+35 59 58
1.35660	1.40490	1.13070	1.62130
+ 1299	+ 1335	+ 1353	+ 1370
1.36959	1.41825	1.14423	1.63500
−23.42	−26.20	−13.94	−43.15
− .00	− .07	− .16	− 04
+ .00	+ .00	+ .00	+ 00
−23.42	−26.27	−14.10	−43.19
+21 6 53.40	+18 51 34.38	+29 27 51.23	+6 39 53.55

η Cancri		δ Cancri		i Cancri		ζ Hydrae	
− .25	−17 12.43	− .27	−17 12.43	− .15	−17 12.43	− 40	−17 12.43
6 53.2	− 25	51 34.1	− .27	27 51.1	− .15	39 53.1	− .40
49 40.3	+ 12.3	34 22.2	+ 12.2	10 38.6	+ 8.6	22 40.9	+ 16.1
−17 12.9	−17 13.8	11.9	−17 0.50	12.5	−17 3.98	12.2	−16 56.73
49 51.57	49 52.02	34 34.40	34 33.88	10 47.21	10 47.25	22 57.03	22 56.82

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Apr. 6 1885

α Cancri	10 Ursæ Majoris	κ Ursæ Majoris	δ² Ursæ Majoris
h m s +50	+00		
8 52 13	8 58 14	8 55 50	9 0 21
+12 18	+42 14	+47 36	+67 36
+30 5	+0 9	ch. f	ch. f

52 0.9 106 52 233 54 34
3.2 126 25.4 5.0
4.7 149 27.6 6.8
6.5 170 29.5 8.7
8.3 191 1484 31.7 10.1
+ 16.885 33.9
35.9
38.1
40.4

53 474
496
522
550
5485240
−22285

236 2861 340
52 4.72 52 31.728 52 31.789 54 6.80 53 30.115

52 31.769 53 30.115

52 31.769
−.016
52 31.753
52 13.18 −18.61
+ 18.57 + .07
11815
−1.36
−19.90
52 11.85

53 30.115
−.021
53 30.09
53 11.76 −18.61
+ 1833 + .320
10332
−1.43
−19.74
53 10.35

9.98991 9.86947

47 43.02 +2705 1.43217 50 49.42 −36.68 1.56443
−34.22 1.53431 + 35.17 1.54613
47 8.80 51 24.59

+12°
35 39.55

+42
31 23.76

+30 4 57
1.52310
+ 1388
1.53698

+0 8 3
9.13200
+ 1388
9.14588

−34.43
− .08
+ .00
−34.51

− 0.14
− 36
+ .00
− 0.50

+12 35 5.04 +42 31 23.26

Apr 6
Reg − 17

12.9
11.9
12.5
12.2
11.7
14.0
−17 12.43

− 34 −17 12.43 − 00 −17 12.43
35 4.7 − .34 31 23.3 − .00
17 53.6 + 14.2 14 9.3 + 4.60
11.1 −16 58.57 14.0 −17 7.83
18 7.79 18 6.47 14 13.86 14 15.43

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1885phae.proj.1621

Apr. 6 1885

1 H Draco +6.97

h m s
9 20 45
+81 50

19	58.9		28.0	
	40		28.0	
	90		32.5	
	132		38.3	
	174	850	42.8	3292
	36.1	3292	47.2	
	39.8	5696	52.4	
	45.6	21.04	57.2	
	50.6		1.6	
	54.7	45.36	6.4	5696
			11.4	
			16.0	
20			21.2	
19	56.956		25.6	
			31.0	2104

20 56.956
− 108
20 5685 62
20 4035 −18.7
+ 1650 + 2.30
−21
+16.29 − 3.97
36.375 − 20.67 29
20 36.21
56

1885phae.proj.1621.

Apr. 9 1885

Br. 1147 +4.04
h m s −.55
8 3 12
+76 6 +.40
−33 43 +.00

β Cancri
8 10 20
+9 32
chf.

γ Cancri +.38
8 26 7 +.37
+20 50
+21 33

κ Hydrae −.14
9 21 59 +.77
−8 10
+50 33

5 45.4 52.1 59.5 4.2 12.2

5 5.8 8.9 11.7 14.5 17.7 20.5 23.1 26.0 29.3 32.0 34.7 37.6 40.4 40.5 40.4 40.4

5 58.68

5 26.110 23.246

23.246
5 26.110
− .063
8 5 26.052 23.18
5 5.83 −18.94
+ 30.22 +1.62
+ 17.35
4.027 −1.82
−19.14
5 4.04

9.38062
59 38.10 −35.43 1.54937
+ 11.02 1.04222
59 49.12

26 11.2 12.5 14.2 15.9 17.8

26 1.432

1.5 3.6 5.8 8.1 10.1 5.82 36.6 39.0 41.2 43.2 45.6 41.12

4.694

26 23.470

26 14.7 17.0 19.1 21.2 23.3 25.7 28.0 30.1 32.2

2.113

26 23.478

26 23.474

26 23.474
− .017
26 23.46
26 4.64 −18.95
+ 18.82 +.15
3.480

9.97063
15 42.82 +9.15 0.96142
− 11.07 1.04428
15 31.75

21 53.7 53.2 57.0 58.4 59.8

21 56.82

14 47.00 +19.89
− 25.49
14 21.51

−1.16
−18.96
26 3.50

56.2 58.1 0.2 2.2 4.2 0.18 29.1 31.3 33.2 35.4 37.5 33.30

3.348

22 16.740

22 8.4 10.3 12.5 14.6 16.6 18.8 20.9 23.0 25.1

1.502

22 16.689

22 16.714

22 16.714
− .016
22 16.70
21 57.69 −18.97
+ 19.01 −.06
56.174

9.99557
1.29863
1.40643

−1.52
−20.53
21 56.15

+76°
22 59.23

−33 43 8
1.58440
+ 1979
1.60419

+40.19
− .16
+ .05
+ 4628
+76 23 39.31

+21
7 16.60

+21 32 57
1.35670
+ 2012
1.37682

−23.81
− .02
+ .01
− 23.82
+21 6 52.78

−7
51 33.16

+50 32 1
1.84400
+ 2123
1.86523

−73.32
+ .03
+ .05
− 73.24
−7 52 46.40

Apr 9
Reg − 17 12.7
12.0
11.6
−17 12.10

+ 36 −17 12.10
23 39.7 + .36
6 21.0 − .58
−17 12.7 −17 17.54
6 21.25 6 21.77

24 −17 12.10
6 52.5 − .24
49 40.5 + 11.1
12.0 −17 1.24
49 51.57 49 51.54

− 51 −17 12.10
52 46.9 − .51
9 58.5 + 20.0
11.6 −16.52.61
9 38.49 9 39.01

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ι Urs. Maj. +1.13
h m s −.11
8 51 24
+48 29 +.46
− 6 6 +.00

42 Leonis +61.
+.19
10 39 31
+31 17
+11 6

ζ Urs. Maj. +.91
−.34
10 56 41
+63 21
−19 58

γ Urs. Maj. +1.00
−.05
11 3 15
+45 7
− 2 44

51 98 124 142 159 186 — 92 122 155 185 215 1538 +24892

89 482 503 514 534 552 — 2585 — 89 51.70

250 275 299 325 347 2992 37 60 85 110 — 9842 — 39 49.210

39 396 420 447 470 494 517 540 568 590 — 4443 — 39 49.355

56 384 415 439 471 512 — 2221 — 56 44.42

133 182 228 274 317 2268 252 296 338 383 — 11662 — 56 58.310

56 406 450 495 538 582 26 72 115 159 — 5243 — 56 58.255

3 570 02 24 43 60 — 3109 — 3 2.18

35 63 93 123 152 932 503 531 560 588 — 6530 — 8 32.650

8 210 240 268 297 327 356 385 414 444 — 2941 — 3 32.678

709 — 51 14.18

51 40.272

39 49.282

56 58.282

3 32.664

51 40.272 −.023 = 51 40.25
51 21.13
+ 19.12
19860

−1.964 +.52
−1.27
−20.39
57 19.86

39 49.282 −.018 = 39 49.27
39 29.77
+ 19.50
28.117

−19.68 +.28
−1.65
−21.05
39 28.22

56 58.282 −.033 = 56 58.25
56 39.44
+ 18.81
37.436

−1.969 +.88
−2.00
−20.81
56 37.44

3 32.664 −.022 = 3 32.64
3 13.51
+ 19.13
11.741

−1.969 +.46
−1.77
−2.00
3 11.64

9.82141 — 3 — 56 32.42 +26.09 — 1.41647 — 1.35011/2 — 22.39 — 33 6 10.03

9.93177 — 48 13.50 −2.42 — 0.38382 — 0.42782 — 48 16.18

9.66658 — 43 47.30 +13.86 — 1.14176 — 0.92057 — 43 38.97

9.84860 +30.48 — 1.48287 — 1.44370

+48 46 38.32 — −6 6 14 — 0.78940 — +10.57 — 0.79997 — +6.31 −.18 +.01 +6.14 — +48 46 44.46

+31 34 32.17 — +11 5 28 — 1.05280 — +14.53 — 1.06733 — −11.68 −.50 +.03 −11.65 — +31 34 20.52

+62 39 9.38 — −19 58 59 — 1.32090 — +14.94 — 1.33584 — +21.67 −.04 +.04 +21.67 — +62 39 31.05

Apr 14
Reg −17 14.0 12.0 13.5 — −17 13.17

+.07 −17 13.17 — 46 44.5 +.07 — 29 30.5 +1.8 — −17 14.0 −17 11.30 — 29 33.31 — 29 33.16

−.12 −17 13.17 — 34 20.4 −.12 — 17 8.4 +7.7 — 12.0 −17 5.59 — 17 16.06 — 17 14.94

+.22 −17 13.17 — 39 31.9 +.22 — 22 17.8 +0.0 — 13.5 −17 12.95 — 22 17.85 — 22 18.10

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E Cancri

h m s
8 38 12
+18 34

ch. f

3 Hydrae +11

+59

8 49 22
+6 23 +30
+36 0 +00

49	284	188		49	314	59	577	416		0	146	8	200	284		8	365		
	304	213			336		29	475			200		218	253			377		
	328	230			360		57	526			255		238	274			397		
	347	251			398		113	583			310		257	294			418		
	363	274	2312		398		150	38	5276		363		276	315	2740		437		
					419						415						460		
		522			440			86			470			562			480		
		542			458			141			526			582			500		
		562			480			192			578			02			520		
		582						246						33					
		04	5624					300	1930					44	026				
	1626		7936		3588		3326		19206		3263		1189		8766		3944		
49	32.52	49	39.680	49	39.811	0	6.52	0	36.030	0	36.258	8	23.78	8	43.830	8	43.822		
				49	39.746					0	36.143					8	43.826		

				49	39.746					0	36.143					8	43.826		
					−.016						−.038						−.015		
				8	49 3973					0	3611					8	43.81		
					49 2006		−19.68			0	1723		−1969			8	24.15	−1969	
					+ 1967		+ .03			+	1888		+ .73			+	1966	+ .01	
					18.873						15.758						22.852		
							− 1.19						− 1.47					−1.30	
							−20.84						−20.43					−20.98	
							49 18.89					0	1568					8	22.83

					9.99730						9.58101						9.99948		
							29						3418						
42	2030	+7.23	0.85914		38	1425	+2962	147159		17	3498	+20.05	130211						
−	930		0.96867		−	1462		1.16483		−	2573		1.41382						
42	11.00				38	5963				17	4.65								
					29						8.55								

+6°				+67						+3	39.80								
40	3735			52	48.72					5	3730								
+35	59	34		−25	13	32				+39	34	51							
1.62	120			1.43	380					1.67	730								
+	855			+	910					+	937								
1.62	975			1.44	240					1.68	667								
−	4263			+	27.70					−	48.60								
−	.00			−	.17					−	.01								
+	.02			+	.04					+	.03								
−	4261			+	27.57					−	48.58								
+6	39	54.74		+67	53	16.29				+3	4	48.72							
												50.22							

−	.38	−17	12.07	+	.28	−17	12.07			−	.42	−17	12.07						
39	54.4	−	38	53	16.5	+	28			4	48.9	48	.42						
22	41.3	+	15.7	36	4.6	−	37			47	386	+	17.0						
−17	13.1	−16	56.75		11.9	−17	15.49				7.78		5549						
22	57.03	22	57.99	36	0.93	36	0.80			47	11.2	47	54.73						
											55.58								

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40 Lyncis +.70
h m s +.13
9 14 6
+34 58
+7 30

1 Draco +6.97
9 20 46
+81 50

η Ursæ Maj. +2.01
9 22 32
+63 34
−21 11

γ Cancri +.38
8 26 7
+20 50
+21 33

13	494		586		14	136		20	427	21	591		17	22	295	26	328		
	514		09			160			474		24		62		340		343		
	535		35			186			524		66		106		385		360		
	552		60			210			572		95		154		432		381		
	571		85	350		235			17		130		203	1084	480		393		
						360			66						525				
			386			285			117				160		572				
			412			310							204		17				
			436			336							348		61				
			462										294						
			486	4364									340	2492					

																		26	242 220
																			240 240
																	373		241 263
																	396		241 285
																	416		242 308
																	440		
																	460	470	
																		17654	

	2666		4714		2118			3997		3306		9576		4307		1805			
13	5332	14	23570	14	23533	20	57100	22	6.12	22	47880	22	47855	26	3610	26	24.046	26	24.120
				14	23.552	20	57.100					22	47.868					26	24083

			14	23.552		20	57.100			22	47868					26	24083		
				019			108				034						017		
			14	23.533		20	5699			22	4783					26	2407		
			14	4.02	−19.69	20	39.16	−19.70		22	2867	−19.70				26	455	−19.66	
			+	1951	+ .21	+	17.83	+ 2.09		+	19.16	+ .60				+	1952	+ .11	
				2.826			− .21				27.129						3.480		
					−1.19		+ 17.62	− 2.78				− 1.54						−1.07	
					−2067		36.375	−2039				−2064						−2062	
					14 2.86			20 36.60				22 27.19						26 3.45	

				9.91398							9.64851						9.97063		
13	2595	+3023		1.48044			32 2062	+4175		1.62066		15	17.18 468	−12.02		1.07990		
	− 32.11			1.50665			− 2407			1.38140		+	1455			1.16276		
12	53.84					32	6.55					15	3423						
													31.73						

+34						+63						+21	16.62						
9	5451					50	4180					7	14.12						
+7	30 40					−21	10 16					+21	32 34						
	6.88040						1.34830						1.35660						
	+ 964						+ 1019						+ 747						
	0.89004						1.35849						1.36407						
	−7.76						+22.83						−23.12						
	− .23						− .38						− .03						
	+ .03						+ .02						+ .00						
	−7.96						+22.47						−23.15						
+34	9 46.35					+63	51 4.27					+21	6 50.97						
													53.47						

Apr. 16
Reg − 17 13.1
11.9
11.2
11.3
12.5
12.4
− 17 12.07

	.08	−17	12.07			+	.23	−17	12.07			−	.24	−17	12.07				
9	46.4	−	68			51	14.5	+	.23			6	50.753.2	−	24				
52	35.1	+	6.0			33	5.20	−	2.4			49	40.8	+	108				
	11.3	−17	6.13				12.5	−17	14.24				99	−17	1.51				
52	41.07	52	40.40			33	49.64	33	5.003				12.4						
												49	51.37	49	51.96				

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μ Urs. Maj. +90 +.04
h m s
10 15 32
+42 4 +.13
+0 19 +.00

36 Urs. Maj. +1.52 −.25
10 23 20
+56 38
−14 10

9 N Draco +4.10 −.56
10 25 23
+76 18
−33 55

β Urs. Maj. +1.54 −.25
10 54 57
+56 59
−14 36

15 40.1 19.0 15 36.3 23 1.0 57.3 23 19.3 25 53.3 25 28.1 54 26.8 54 26 57.5
42.0 22.0 38.9 3.6 1.3 23.2 57.2 30.6 29.0 12.6 1.3
44.7 24.9 41.6 5.0 4.7 27.1 2.5 33.1 31.5 12.6 5.0
46.6 27.8 44.4 7.3 8.3 30.6 8.2 36.5 34.7 12.8 9.0
48.2 30.4 248.2 47.6 9.8 12.0 47.2 34.3 16.7 39.2 40.3 12.6 12.6
50.2 37.9 42.0 + 30282 12.9 16.7
3.7 52.8 57.0 41.7 44.9
6.4 55.6 0.5 45.6
9.4 58.3 4.6 49.4 12.9 28.0
12.1 8.2
15.2 93.6 12.3 45.2

2216 9418 4257 267 6924 3091 3179 2544 1623
15 4432 15 47.090 15 47.300 23 5.34 23 34.620 23 34.344 26 3.58 25 36.343 54 32.46 55 12.382 55 12.794

15 47.195 23 34.482 25 36.343 55 12.581

15 47.195 23 34.482 25 36.343 55 12.581 714
−.021 −.027 −.065 −.028
10 15 47.17 23 34.46 25 36.28 55 12.569
15 29.94 −17.44 23 17.15 −17.44 25 19.36 −17.44 54 55.42 −17.45
+ 17.23 +.13 + 17.31 +.20 + 16.92 +.53 + 17.27 +.20
28.540 15.685 17.430 53.793
−1.40 −1.47 −1.93 −1.63
−18.71 −18.71 −18.84 −18.88
15 28.46 23 15.75 25 17.44 54 53.81

9.87062 9.74132 9.37445 9.73630
1 4.08 +2.88 0.45939 31 56.90 +29.14 1.46449 47 43.20 −27.24 1.43521n 6 20.60 +40.25 1.60477
− 2.77 0.44224n − 20.80 1.31804n + 8.35 0.92189 − 28.40 1.45330n
1 1.31 31 36.10 47 51.55 5 52.20

+42°
21 47.04 +56 +76 +57
51 12.25 34 56.80 16 56.15
+0 18 18 −14 10 49 −33 55 3 −14 36 25
9.48600 1.16280n 1.58770n 1.17630n
+ 384 + 407 + 407 + 484
9.48984 1.16687 1.59177 1.18114
0.31 +14.68 +39.06 +15.18
− .00 − .21 − .09 − .40
+ .02 + .04 + .05 + .03
− 0.29 +14.51 +39.02 +14.81
+42 21 46.75 +56 51 26.76 +76 35 35.82 +57 17 10.96

− .07 + .16 −17 14.45 + .36 −17 14.45 + .16 −17 14.45
21 46.7 51 26.9 + .16 35 36.2 + .36 17 11.1 + .16
4 35.7 34 12.5 − 1.1 18 21.1 − 3.8 59 56.1 − 1.0
−17 11.0 24 14.4 −17 15.39 15.1 −17 17.89 15.0 −17 15.29
34 11.40 34 11.37 18 17.35 18 17.93 59 55.10 59 55.67

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+1.97

Chr. Klag

Tu m a -1.34

10 56 41

+62 22

-19 59

56 31.8
35.3
37.8
41.4
45.3

56 39.0
43.4
47.5
52.6
56.8
1.0
5.3
9.8
14.4

19.6
56 38.32

5.098
56 56.644

56 56644

56 56.644
-.033
56 56.61
56 39.12 -1.745
+ 17.49 + .25
37.436
-1.68
-1.888
56 [37.73]

9.66634

43 47.45 +18.32 1.26293
1.04150
- 11.00
43 36.45

+62
39 11.90

-19 58 59
1.32090m
+ 484
1.32574

+21.17
- .07
+ .08
+21.18
+62 39 33.08

+ .22 -17 14.45
39 33.3 + .22
22 20.0 - .22
13.3 -17 16.43
22 17.85 22 16.65

Apr 25
Reg -17 14.4
15.1
15.0
13.3
-17 14.45

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120. Ephemeris.

Br. 1608

δ Leo

ε Corvus

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no Ephemeris
Apr. 27 1885

Gr. 1852
h m s
11 59 23
+77 33

Double
2 #;
+4.82
4 η Draco
12 6 48
+78 15

no Ephemeris
Br. 6
12 9 43
133 42
76 18

0 262 290 320 357 394 | 59 10.9 45 | 203 234 265 297 | 1090 329 2656
80 108 140 174 202 1408 | 365 394 424 456 490 4258
0 1623 3246 | 516 550 582
59 42.464 | 1.3 4.9 5820

4 05 47 77 110 141 760 | 173 206 236 268 305 2376
23.76 73 4064 107 5738 136 1380 169 205 | 339 373 406 440 474 4064
510 540 576
4 40.636 | 07 3.6 5738

6 22 56 90 120 155 886 | 6 189 225 260 290 323 2574 | 8 190 235 295 366 457 3086
88 2574 122 4236 155 5888 188 230 1566 | 357 386 420 462 493 4236 | 11 285 333 387 446 517 3936
524 556 589 | 8 3086 11 3936
6 42.300 | 2.0 5.5 5888

9 270 300 328 356 382 3272 | 416 444 476 504 530 4740
248 4740 278 170 310 1606 336 365 3074 | 558 590 18 45 74 170
99 132 163
10 1.724 | 187 222 1606

59 42.464
−.071
59 42.39 −17.61

4 40636
−.076
4 40.56
6 50.93 −17.61
−2 10.37 Gf

6 42300
−.076
6 4222
6 50.93
− 8.71 Gf

10 1.724
+.065
10 1.66 −17.61

9.33362
32 50.80 −50.00 1.69897n

25 29.75 | +9086 | 1.95837
+27.86 | −9764 | 1.98963 n
1.44505
1.47631
9.37445n

26 27.72
− 29.94

1885phae.proj.1621

Ephemeris
Apr. 30 1885

9.30398

Br. 1508
h m s
10 50 43
+78° 23' 9"

κ Urs. Maj.

λ Leonis

γ Cephei

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1885phae.proj.1621..

Apr. 30 1885

No Ephemeris.

No Ephemeris.

β Leo +.27

Gr. 1852

4 N Draco +4.82

Br 6

+.46

11 43 11 | 11 59 33 | 12 6 48 −.59 | 12 9 43

+15 12 | +77 33 | +78 15 | +103 41

+27 11 | −35 52 | 76 19

43 134 153 174 190 205 | 99 120 140 163 183 | 43 225 247 269 292 312 332 | 0 255

438 460 482 503 | 43 354 374 396 | 1 240 253 265 279

524 | 4814 | 295

59 50 82 115 143 174 | 206 240 270 299 334 | 1128 | 2698 | 4 290 365 430 542 | 15

85 117 152 182 | 364 396 430 460 | 212 | 1496 | 496 | 4292

6 267 304 338 375 406 | 442 477 510 540 550 | 3380 | 5710 | 8 303 384 460 | 5080 17

344 377 412 444 | 07 41 75 109 | 482 | 4118 | 139 | 742

8 349 438 522 12 | 9 272 303 330 358 | 42.0 44.2 47.4 50.4

10.05242 | 386 | 3298 | 53.0 37/60

10 547 32 117 207 | 2.53 2.80 31.0 3.38 | 4740 1.84 16.28 | 563 588 18 47

29.0 | 1186 | 365 | 8092 | 76 184

.856 | 6224 | 2801

43 17.12 | 43 31120 | 43 31122 | 0 25.50 + 26.64

43 31.121

59 43052

530 560 589 | 2242 | 4 4484

2.3 54 | 5912

7 7.464

172 206 242 | 2314 | 8 46.28

276 310 | 2412

10 6428 | 10 2.140

10 1.884

104 135 161

192 222 | 16.28

43 31.121 −.016 43 31.10 43 13.34 + 17.76 | −17.92 + .08 | 11.596

59 43.052 −.071 59 42.98

−17.93

7 7.464 −.076 7 739 6 58.74 + 1665 | −17.94 + 1.35 | 47.983

−17.94

10 1.884 + 065 10 1.95

− 1.74 − 19.58 43 11.52

− 2.76 − 19.35 6 4804

43 45.78

9.98453

9.33362

9.30887

9.37393n

52 12 41.60 − 17.49 12 52 24.11 | +1460

1.14613 1.14289n | 33 440

1.62788 2.01532 | −4245 −103.59

51 2995 − 37.61 50 52.34

2.15418 1.57528 | 25 2390 | +7560

187852

+15 30 25.24

+279 56 1.47050 − 372 1.46678

−29.29 − .03 + .05 − 29.27

+15 29 55.98

+78 31 5601

−35 51 16 1.61900 − 267 1.61633

+41.34 − 2.21 + .03 + 39.16

+78 32 35.17

− 30 −17 10.94

29 55.7 − 30

12 44.1 + 9.4

11.6 −17 1.84

12 53.54 12 54.14

+ .38 −17 10.94

32 35.5 + .38

15 24.7 − .52

10.8 −17 1.576

15 19.49 15 19.41

Apr 30

Reg −17

11.6 11.1 9.6 11.6 10.8

−17 10.94

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May 2 1885

δ Leo +.38

h m s +.36

11 7 59

+21 9 +.40

+21 14 +.00

κ Urs Maj +.67

11 12 16 +1.15

+33 43

+ 8 40

γ Cephei −4.33

11 34 38 − .87

+103 1

76 59

−60 38

β Leo. +.27

11 43 12 +.46

+15 13

+27 10

8 03 572 8 104 12 45 107 12 25.6 33 65 84 215 365 43 98 102 43 23.0

20 594 126 63 132 28.2 46 245 394 115 124 25.2

34 1.7 148 84 15.6 30.4 19.3 276 42.7 134 145 27.3

60 37 170 102 18.3 33.0 26.6 30.5 45.8 147 166 29.4

70 6.0 160 193 206 1568 35.6 35.3 1986 33.7 2756 48.7 4262 16.0 187 1448 31.5

21.5 38.1 33.6

325 236 504 40.5 36 30.3 222 57.8 444 35.7

347 25.7 530 43.0 34.4 250 55.0 464 38.0

368 28.0 554 45.5 42.6 284 58.0 486 40.0

392 57.8 49.2 316 1.0 507

41.33690 0.3 5538 56.0 4250 34.3 2830 40 5796 53.0 4862

177 3850 1729 411 7106 3202 70 654 6310 2837

8 3.54 8 19.250 8 19.211 12 8.22 12 35.530 12 35.578 33 19.86 36 42.50 98 43 13.08 43 31.550 43 31.522

127

8 19.230 12 35.554 34 57.896 163 43 31.536

194 13.04

8 19.230 12 35.554 34 57.896 43 31.536

− .017 − .019 + .069 − .016

11 8 19.21 12 35.54 34 57.96 43 31.52

8 1.07 −18.30 12 17.59 −.07 −18.30 34 37.96 −18.31 43 13.32 −18.31

+ 18.14 + .15 + 7.55 + 27 + 19.87 − 1.73 + 18.20 + .11

59.510 18.04 18.60 38.098 11.596

− 1.56 − 1.53 +0.04 14 − 1.72

−19.71 −19.56 −2.00 19.90 −19.92

7 39.50 12 16.98 34 37.93 43 11.60

9.96971 9.92002 9.35263n 9.98450

St. 30.00 +15.69 1.19562 22 44.38 +27.33 1.43664 6 10.78 +98.04 1.99140 52 45.90 +18.46 1.26623

− 18.95 1.27756n − 29.44 1.46889n + 28.59 −104.60 2.01953n − 23.07 1.36296n

56 11.05 22 14.94 6 39.37 1.95626 52 22.83

1.48439n

7

52 10.28

− 30.51

6 39.77

+21° +34 +103 +15

26 37.30 0 33.41 16 8.98 16 8.58 30 25.52

+21 13 44 +8 39 58 −60 36 35 −60 35 36 +27 10 0

1.34960 0.94340 2.00804n 2.00775n 1.47050

+ 333 + 350 + 418 + 435

1.35293 0.94690 2.01222 2.01193 1.47485

− 22.54 − 8.85 +102.85 +102.79 − 29.84

− .05 − .19 + 1.15 + 1.31 − .04

+ .03 + .05 + .02 + .04 + .05

− 22.56 − 8.99 +104.02 +104.14 − 29.83

+21 26 14.74 +34 0 24.42 +103 17 53.00 17 52.72 +15 29 55.69

+103 17 52.86

− .24 −17 10.56 − .16 −17 10.56 + .57 −17 10.56 − .30 −17 10.56

26 14.5 − .24 0 24.3 − .16 17 53.4 + .57 29 55.4 − .30

9 4.9 + 8.2 43 13.7 + 4.3 0 43.2 − 8.7 12 44.4 + 9.1

−17 9.6 −17 26.0 10.6 −17 6.42 10.2 −17 + .29 1869 11.0 −17 1.76

9 1.312 9 12.14 43 17.96 43 18.00 34.51 0 54.57 12 53.54 12 53.93

0 39.17

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1885phae.proj.1621

Non. Fundamental
May 2 1885 8.819444

No. Ephemeris.

Gr. 1850
h m s
11 58 57
+86 13

4 N Draco +4.82
12 6 48 −.59
+78 15
−35 52

Bs. 6
12 9 43
103 41
76 19

43 N Cephei 13.11
12 53 11 −.79
+94 21
85 38 16
−51 58

1 250
59 160 160 4 289
158 262 387
15.7365 15.833472
59 15.833 475 560
572 40
71 7.500
172 52.096
15.404 285
388
488
594 59.280
9.2 104.190
15.090 20.2 2348
4 46.96
1 2500

6 265 434 8 314
300 465 35.7
333 50.1 42.8
365 534 51.9
403 3332 56.8 5004 59.3 4422
50.04
343 0.2 11 41.0
375 6.98 35 47.1
408 24.04 7.1 52.5
440 104 00
476 40.84 13.7 698 6.35 338
17.3
206 8 4422
240 11 5338
274
309 24.04

9 284 425 49 442
310 456 50 25
340 482 25.6
370 514 49.2
398 3404 540 4834 2.54
263 4834 572
294 2.94 00
322 1762 29
350 59
380 3218 8.7 294
11.7 4469
315.12 146 50 2.938
177
206
235 1762

51 442 290
523 374
0.7 468
90 567
195 114 54 4706
437 47.06 14.1
534 2.29
20 31.94 32.0
119 16.76 41.0
20.7 2.34 49.7 31.94
25.24 5.87
8.0
17.2
26.3
33.6 16.76

59 15.442
−.232
59 15.21
−18.32

7 7.044
−.076
7 6.97
6 50.60 −18.33
+ 16.37 + 1.93
47.983
−.262
−19.02
6 47.95

10 3.024
+.065
10 3.08
−18.33

53 31.848
+.202
53 2.205
53 7.98 −18.35
+ 24.07 − 5.24
12.188
+4.21
−19.38
53 12.67

8.81944
9.30887
9.37393n
8.88116n

52 49.45 − 12.56 2.112477m 3.005 +140.08 2.14638 25 3.452 +78.80 1.89653 44 52.12 57.68 +18.247 2.26119
− 36.94 −1.10.36 2.04281m + 17.97 1.25458
50 53.11 45 12.59 10.09

26 33.45

+78
31 55.24

−35 51 16
1.61902
+ .503
1.62403

+42.08
− 2.13
+ .03
+ 39.98
+78 32 35.22

+ .39 −17 10.56
32 35.6 + .39
15 25.1 − 5.6
10.5 −17 15.77
32 19.49 15 19.45

+94 38.26
37 55.76

−51 58 57.49
1.86640
+ .636
1.87276

+ 74.60
+ 1.38
+ .10
+ 76.08
+94 38 57.34

+ .52 −17 10.56
38 52.45 49 + .52
21 44.0 − 6.5
10.98.4 −17 16.54
21 37.47 21 37.50
38 22.20
− .45
21.75

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1885phae.proj.1621.

May 2 1885

Polaris

h m s
13 16 36
+91 18
88 41 38
−48 55

8.35782 n
− 4386
− .75

2	19.4	10	45.8	50.7	56.5	10.	5100	16	5292
		11	16.2	20.4	26.4	11	21.00		52.76
4	0.4		46.5	52.4	57.5	11	~~5128~~52.13		53.73
5	32.8	12	14.3	20.0	27.4	12	2057		53.01
			46.2	53.2	57.6	12	52.33		53.61
6	45.7	13	17.7	21.4	28.4	13	2250		53.62
			48.7	53.7	0.4	13	5427		55.23
		14	17.4	23.4	28.5	14	2310		53.90
8	21.2		45.8	50.3	57.0	14	5103		51.67
		15	17.8	22.5	28.3	15	2287		53.35
			47.3	52.0	57.2	15	5283		53.15
		16	18.3	23.6	29.6	16	2383		53.99
			48.5	54.2	0.0	16	5423		54.23

16 53398
+ 670
16 5407
16 18.29 − 18.35
+ 35.08 − 1.754
36441

+18.15 ~~17~~
~~+.95~~ 17.74
16 ~~52.12~~ 3633

8.35782 n

48 6.85	+874.00	2.94151	1.41156	
+ 25.80	+773.80	2.88818	1.35823	
48 32.65	+680.60	2.83289	1.30294	
	+607.70	2.78369	1.25374	
48 6.82	+512.20	2.70944	1.17949	
+2282				
48 29.65				

~~+98°~~

48 8.52	34 15.70	34 18.70	34 19.74	34 20.29	34 22.05
+ 20.09					
48 28.61	−48 54 39	−48 54 39	−48 54 38	−48 54 36	−48 54 35
	1.81910				
	+ 703				
48 10.12	1.82613				
+ 19.94					
48 28.06	+67.01	+67.01	+67.01	+67.01	+67.01
	+ 9.49	+ 7.43	+ 5.75	+ 4.59	+ 3.26
	+ .06	+ .06	+ .06	+ .06	+ .06
48 11.18	+76.56	+74.50	+72.82	+71.66	+70.33
+15.12	+91 35 32.26	(35 33.20)	(35 32.56)	35 31.95	35 32.38
48 26.30	+91 35 32.32				

+ .50	−17 10.56	
35 32.8	+ .50	
18 21.7	− 5.5	
11.1	−17 15.56	
18 16.19	18 16.76	
	41 43.24	
	~~83~~	
	42.41	

May 2
Reg −17 "
9.6
10.6
10.2
11.0
10.5
10.9
11.1
−17 10.56

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May. 3 1885

β Crateris

h m s +.90
11 5 57
−22 12 +.32
+64 35 +.00

S Leonis +.38 +.36

11 7 56
+21 9
+21 14

9.91993

V Ursæ Maj. +.67 4.15

11 12 13
+33 44
+8 39

S Crateris −.25 +.83

11 13 32
−14 9
+56 32

5	58.6	6	11.9	7	55.0		57.3	8	10.5	12	29.5			12	25.9	14	22.0		34.6	13	47.3
	0.7		14.1		56.6		59.5		12.7		31.4				28.4		24.0		36.7		49.6
	3.0		16.3		58.3		1.7		14.9		32.8	15.9	15.9		31.0		26.0		38.7		51.8
	5.3		18.5		59.8		4.0		17.2		34.8	15.8	18.3		33.2		27.7		41.0		54.0
	7.4	30.0	20.7		2.0		6.1	17.2	19.2		37.0	15.8	20.8	15.833	35.8		29.1		43.1	38.2	56.0
			23.0						21.5						38.2						58.2
	34.0		25.4				32.6		23.6				50.6		40.7				8.6		0.3
	36.3		27.4				34.9		26.0				53.1		43.3				10.8		2.3
	38.5		29.6				37.0		28.2				55.6		45.7				13.0		4.4
	40.8						39.3						58.0						15.3		
	43.0	38.52					41.4	37.04					0.6	55.58					17.3	13.00	

	41.52		18.69		29.17		38.76		17.88		16.55			32.22		12.88		11.82		50.39
6	20.760	6	20.767	7	58.34	8	19.380	8	19.311	12	33.10	12	35.706	12	35.800	14	25.76	13	55.910	13	55.989

6 20.764
− 017
6 20.75
6 2.06 + 12 18.444
+ 18.69 − .13
58
0.124 −1.94
−20.57
6 0.24

8 19.346
− 017
8 19.33
8 1.06 −18.444
+ 18.27 + .12
59.512 − 1.55
−19.87
7 59.46

12 35.753
− 019
12 35.63
12 17.58 − 09 −18.444
+ 18.05 + .21
14
16.060 − 1.52
−19.75
12 15.88

13 55.950
− 016
13 55.93
13 37.34 −18.444
+ 18.59 − 08
35.462 − 1.88
−20.40
13 35.53

9.96971 9.91993 9.98662

58 6 34.52 +21.01 1.32243 AR +2.63 14 16.45 −2.981 1.47436
− 25.37 + 37.43 1.57321
58 9.15 14 11.88

+21
26 39.20

+21 13 49
1.34960
+ 1086
1.36046

−22.93
− .08
+ .03
−22.98
+21 26 16.22

− .24 −17 10.13
26 16.0 − .24
9 50 + 8.1
−17 11.0 −17 22.7
9 13.12 9 13.95

−13
51 59.53

+56 31 24
1.93876
+ 1103
1.94979

− 8.908
+ 12
+ 08
− 8.888
−13 53 2.841

− .55
9 41.5

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May 3 1885

γ Leo Sup +4.33

h m s −.87
11 34 38
+103 1
76 59
−60 38

X Urs Maj +1.13 −1.10

11 39 55
+48 25
−6 2

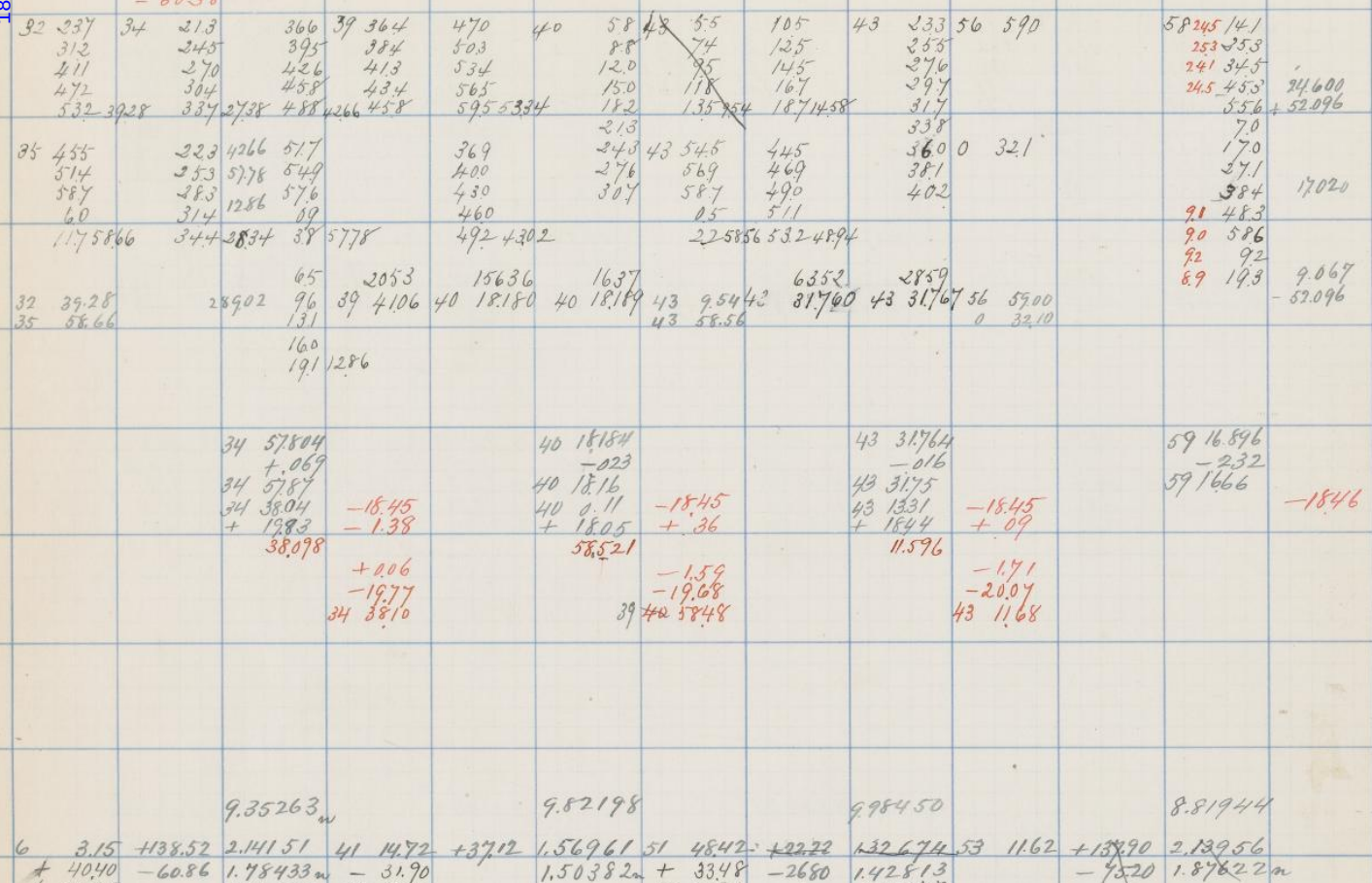
B Leo +.27 +.46

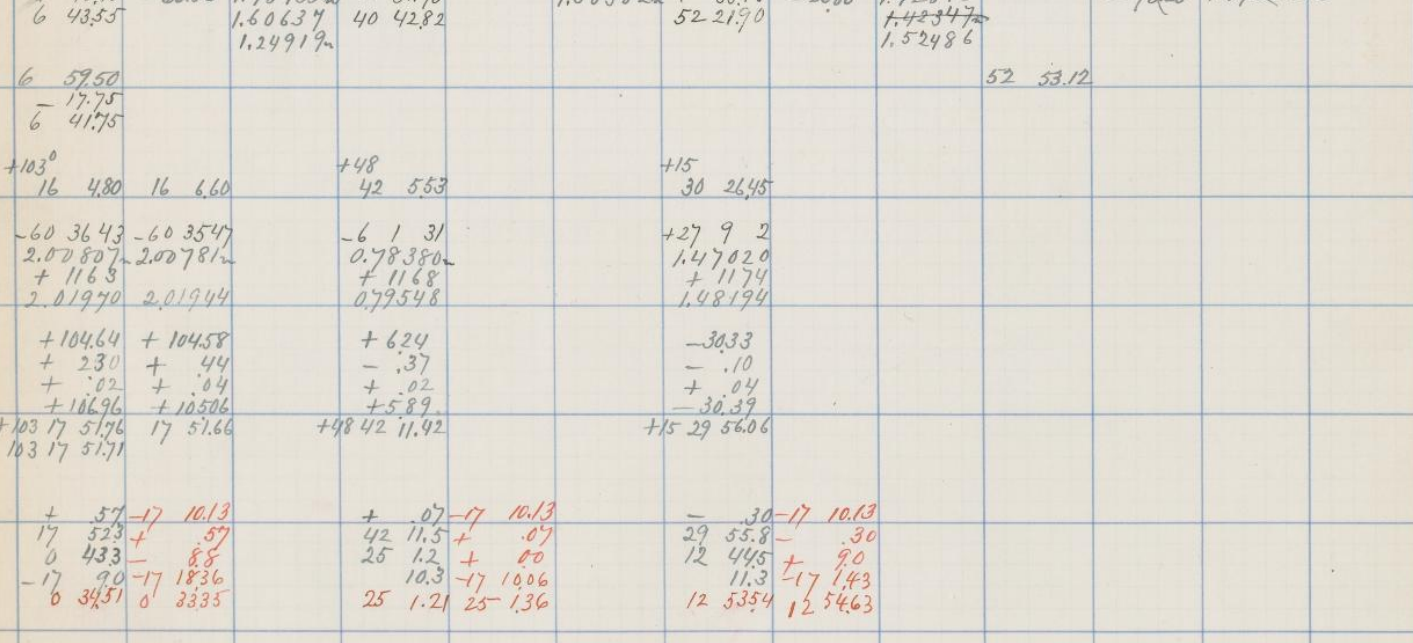
11 43 8
+15 13
+27 10

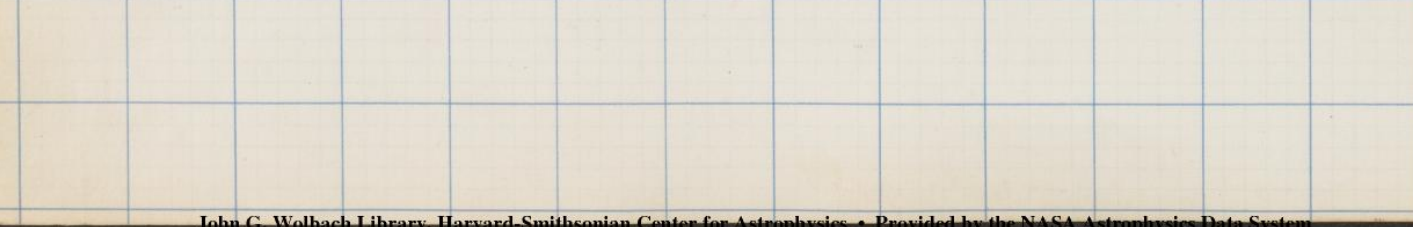
Non-fundamental. 8.81944

Gr. 1850

11 58 57
+86 13







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1885phae.proj.1621...

May 3 1885

No Ephemeris.

4 N Draco. +4.82

h m s − .59
12 6 48
+78 15
−35 52

Br 6

12 9 43
+103 41
−76 19
−61 18

43 N Cephei −13.11

−.79
12 53 11
+94 21
85 38 16
−51 58

4 33.0 / 43.3 / 47.7 / 59.5 / 73 50.16

6 27.0 / 30.8 / 34.4 / 37.4 / 40.8 3408

43.6 / 47.6 / 51.0 / 54.0 / 57.7 5078

8 49.7 / 56.0 / 2.6 / 9.3 / 17.0

~~8 21.6~~

5078 34.6 / 38.4 / 41.8 / 7448 44.7 / 47.8 41.30

10 / 7.80 / 4.6 / 7.8 / 11.3 / 14.3 7.80

38.44 18.0 / 21.3 / 24.4 / 27.5 / 31.2 24.48

3146 9 292

~~4 30.16~~ ← 21.60

9 28.2 / 31.2 / 34.1 / 36.8 / 39.7 3400

42.4 / 45.4 / 48.3 / 51.2 / 54.0 4826

49 12 / 7.6 / 14.3 / 18.8 / 24.4

26.0 48.26 / 28.5 2.46 / 31.5 17.02 / 34.4 / 37.1 31.50

56.9 / 59.6 / 2.2 / 5.6 / 8.0 24.6

55 38.4

13.24 11.2 / 14.0 / 17.0 / 20.0 / 23.9 17.02

663 49 13.26 55 28.40

51 42.8 / 50.7 / 0.9 / 9.0 / 18.6 0.40

26.1 / 36.6 / 45.4 / 56.5 / 37.4 5546

43.0 / 52.2 / 1.6 / 10.4 / 19.6 13.6

45.46 13.2 / 30.50 21.5 / 16.72 31.8 / 38.6 / 47.4 30.50

15.44 44 58.9 / 8.2 / 16.2 / 25.4 / 34.9 16.72

7 7.688 − .076 = 7.61

6 30.54 − 18.46 + 1.54 = 47.983

− 2.56 − 19.48 = 6 48.13

10 26.48 + .065 = 10 2.71 − 18.46

53 30.888 + .202 = 53 31.09

53 8.15 − 18.46 − 4.20 = 12.188

+4.04 − 18.62 = 53 12.47

9.30587

9.37393 ~~9.37393~~

8.88116

51 30.80 +137.53 / − 36.17 −~~3.91~~ / 50 54.63

2.13726 25 4280 +~~58.73~~ / ~~1.86870~~ / 1.55836 / 1.28980

1.77619 44 4800 +25763 / + 25.37 −117.51 / 45 13.37

2.41100 / 2.07007 / 1.40439 / 1.06346

45 22.52 / −11.57 / 45 10.95

+78 / 31 53.72

−35 51 15 / 1.61900 / + 12.17 / 1.63117

+4277 / − 2.05 / + .03 / + 40.75 / +78 32 34.47

+94 / 37 34.98 37 37.40

−51 57 58 −51 57 24 / 1.86620 1.86600 / + 12.69 / 1.87889 1.87869

+75.66 +75.63 / + 1.73 + .57 / + .10 + .01 / + 77.49 + 76.21

+94 38 52.47 38 53.61 / +94 38 33.04

+ .39 −17 10.13 / 32 34.8 + .29 / 15 25.3 − 5.8 / 9.5 −17 15.54 / 15 19.49 15 18.93

+ .52 −17 10.13 / 38 53.6 + .52 / 21 44.2 − 6.7 / 9.4 −17 16.31 / 21 37.47 21 36.73 / 38 53.27 / − 45 / 8.282

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1885phae..proj.1621

May 3 1885 8.35782

~~4386~~ − 4386

Polaris − − 75

h m s
13 16 36
+91 18
88 41 38
~~48 55~~

5 26.3	10	41.2	47.5	53.2	10	47.30	16	49.22
(7 13.8)	11	14.3	21.6	29.8	11	21.90		53.66
8 36.2		46.8	51.0	0.2	11	~~45.27~~ 52.67		54.27
	12	13.0	18.2	24.3	12	18.50		49.94

16 51.772
+.670
16 52.44
16 18.78 ~~− 18.47~~
+ 33.66 ~~−14.04~~
36.441

+17.66
~~+14.04~~
−14.85
16 36.92

48 8.68	+68.547	2.83599	1.30604	
+ 20.23	+57.797	2.76190	1.23195	
48 28.91	+49.557	2.69510	1.16515	
48 10.70				
+ 17.06				
48 27.76				
10.12		+91 34 19.44	34 20.59	34 20.50
		−48 54 37	−48 54 35	−48 54 33
		1.81910		
		+ 12.76		
48 13.22		1.83186		
+ 14.63				
48 27.85		+ 67.90	+ 67.90	+ 67.90
		+ .584	+ .415	+ .305
		+ .06	+ .06	+ .06
		+ 72.80	+ 72.11	+ 71.01
		+91 35 32.24	(35 32.70)	35 31.51
		+91 35 31.87		

May 3 − 17 11.0
9.0
10.3
11.3
9.5
9.4
10.4
−17 10.13

+ .50	−17	10.13
35 32.4	+	.50
18 22.0	−	.55
10.4	−17	15.43
18 16.19	18	16.44
	41	43.50
	−	.83
		42.73

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1885phae.proj.1621.

May 9 1885

γ Cephei 4.33 −.87
h m s
11 84 38
+103 1 +.18
76 59 +.00
−60 38

χ Urs. Maj. +6.13. −10
11 39 58
+48 25
− 6 2

β Leo. +27 +.46
11 43 12
+15 12
+27 11

γ Urs. Maj. +.39 −.21
11 47 42
+54 20
−11 57

32 299	34 222	373	39 390	480	40 69	43 35	112	43 242	47 450	323	47 534
332	252	402	409	511	100	50	133	262	479	355	568
382	280	431	440	542	129	69	155	283	512	392	02
461	312	462	460	573	160	84	177	305	536	425	37
584 4116	341 2814	493 4322	483	065424	190	100	198 1550	326	555	461 3912	73
					222			348			110
35 422	233	4322 524		377	253		456	370		287	143
472	263	5878 556		408	284		477	391		320	180
542	288	14.14 589		440	315		497	412		356	215
06	323	22		470			518			392	
535390	355 2924	48 5878		5004390			5404976			427 3564	

29 352 82 218.2 15814 1722 338 6526 2939 2532 13476 6062
32 41.16 110 39 43.64 40 19.070 40 19.133 43 6.76 43 32.630 43 32.655 47 50.64 48 7.380 48 7.355
35 53.90 140
172
203 14.14

34 58.704 | 40 19.101 | 43 32.642 | 48 7.368
+ 069 | − 023 | − 016 | − 026
34 58.77 | 40 19.08 | 43 32.62 | 48 7.34
34 38.56 −19.34 | 40 0.01 −19.34 | 43 13.25 −19.35 | 47 48.24 −19.35
+ 20.21 − .78 | + 19.07 + .20 | + 19.37 + .05 | + 19.10 + 25
38.098 | 58.521 | 11.596 | 46.689
− 0.46 | − 1.49 | − 1.65 | − 1.55
− 20.58 | − 20.63 | − 20.95 | − 20.65
34 38.19 | 39 58.45 | 43 11.67 | 47 46.69

9.35263n | 9.82198 | 9.98453 | 9.76572
5 58.90 +13754 2.138434 41 9.28 +3546 1.54974 52 53.88 +25.88 1.41296 45 54.25 +16.73 1.22350
+ 40.11 −55.20 1.74194n − 30.47 1.48395n − 32.34 1.50972n − 12.63 1.10145n
6 39.01 1.60329 40 38.81 52 21.54 45 41.62
1.20680n

6 53.75
− 16.10
6 37.65

+103 | +48 | +15 | +54
16 9.34 16 10.70 | 42 9.54 | 30 26.81 | 37 6.79

−60 36 47 −60 35 52 | −6 1 37 | +27 10 8 | −11 56 52
2.00810n 2.00784n | 0.78390n | 1.47050 | 1.08580n
+ 90 | + 100 | + 100 | + 110
2.00900 2.00874 | 0.78490 | 1.47150 | 1.08690

+102.09 +102.03 | + 6.09 | − 29.61 | + 12.22
+ 2.26 + .36 | − .34 | − .09 | − .07
+ .03 + .06 | + .04 | + .09 | + .03
+104.38 +102.45 | + 5.79 | − 29.61 | + 12.18
+103 17 53.72 17 53.15 | +48 42 15.33 | +15 29 57.20 | +54 37 18.91
+103 17 53.44

+ 57 −17 12.07 | + 07 −17 12.07 | − 30 −17 12.07 | + 14 −17 12.07
17 54.0 + .57 | 42 15.4 + .07 | 29 56.9 − .30 | 37 19.0 + .14
0 44.2 − 9.7 | 25 2.3 − 1.1 | 12 45.1 + 84 | 20 5.5 − 27
−17 9.8 21.20 | 13.1 −17 13.10 | 11.8 −17 3.97 | 13.5 −17 14.63
0 34.51 0 32.24 | 25 1.21 25 2.23 | 12 53.54 12 53.23 | 20 2.82 20 4.28

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1885phae.proj.1621

Ephemerides
May 9 1885

Gr. 1852
h m s
11 5 9 23
+77 33

4 Ursae Majoris
-.59

12 6 48
+78 15
-35 52

8 Corvi

12 23 52
-15 52
clouds

43 Ursae Majoris
-.79

12 53 11
+94 21
65 38 14
-51 58

8.88122n

0 31.0 59 5.3 217 4 31.7 6 288 449
37.0 9.4 25.0 39.2 32.0 48.3
43.5 12.0 28.5 44.9 35.0 51.8
52.2 15.3 31.2 57.0 38.2 55.3
56.5 44.04 18.0 12.00 34.2 28.12 60 47.76 41.0 35.00 58.3 51.72

55 24.0 54 43.0
25.4 50.8
26.6 1.0
9.2
18.1 04.20
-90.376

2 26.8 9.6 28.12 376 7 8.60 35.5 51.72 2.0
27.8 12.7 43.92 40.6 12 38.8 8.46 4.7
28.8 16.2 59.76 44.0 6.4 42.0 25.76 8.4
29.5 19.0 59.76 47.0 15.8 46.1 11.6
30.8 28.80 22.3 15.96 50.4 43.92 22.3 8.34 49.0 42.28 15.6 8.46

21.9.76 53.3 43.22 19.0
56.5 4 47.76 22.3
0.0 8 6.34 25.5
2.8 29.3
62 59.76 32.7 25.76

U 44.04
2 28.80

55 25.33

59 43.952
-.071
59 43.88
-19.36

7 8.644
-.076
7 8.57
6 50.12 -19.36
+ 8.45 + .87
47.983
- 2.154
- 2.063
6 47.95.4

53 30.044
+.201
53 30.24
53 9.08 -19.38
+ 21.16 - 2.36
12.188
+3.11
-18.63
53 11.61

9.33362

9.30887

8.88122n

32 58.75 -6.09 1.77880n 51 28.48 +14.088 2.14885
-16.485 2.21789n - 37.15 -59.70 1.77397n
50 51.33 1.56995
1.19707

45 17.08 -115.29 2.06179n
- 11.36 1.05524n
45 5.72

26.38

50 36.32
+ 15.74
50 52.06

+78°
31 57.02 31 56.29

+94
37 42.63

-35 51 18 -35 52 10
1.61900n 1.61920n
+ 141
1.62041 1.62061

-51 57 29
1.86600n
+ 247
1.86847

+41.73 +41.75
- 2.16 - .39
+ .04 + .02
+ 39.61 +41.38

+ 73.87
+ .55
+ .01
+ 74.43

+78 32 36.63 32 37.67
+78 32 37.15

+94 38 59.06

+ 39 -17 12.07
32 37.5 + .39
15 26.5 - .70
11.0 -17 18.68
15 19.49 15 18.47

+ 52 -17 12.07
38 57.6 + .52
21 45.6 - .51
12.0 -17 18.65
21 37.47 21 37.41
38 22.59
45
22.14

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May 9 1885

Polaris

h m s

13 16 36
+91 18
88 41 36
−48 55

8.35800
−4384
− .75

(11 230)	14	94	17	120	14	16.58	16	47.32
		139		140	14	47.90		49.49
12 483		200		332	15	17.23		47.67
		230		455	15	50.37		51.67
19 577		413		500	16	17.83		47.28
		488		562	16	48.83		48.83
		536	18	107	17	17.40		47.25
	15	114		175	17	50.57		50.27
		171		247	18	17.63		47.19
		232		416	18	48.50		47.91
		452		485	19	19.43		48.69
		500		554	19	46.57		47.68
		559	19	130				
	16	86		193				
		168		260				
		260		406				
		410		462				
		500 x		529				
		556						

16 48.437
+.679
16 49.11
16 21.40 −19.39
+ 24.71 − 4.89
36.441

+15084
−12284
16 36.837

8.35800

48 12.90	+325.44	2.51247		0.98270
+ 9.61	+240.14	2.38046		0.85069
48 22.51	−189.26	2.27606		0.74629

48 13.28
+ 7.09
48 20.37

48 28.10
− 5.58
48 22.52

+91

34 25.84	34 27.98	34 25.83
−48 54 33	−48 54 33	−48 54 18
1.81910		
+ 316		
1.82226		
+66.41	+66.41	+66.41
+ 1.31	+ .72	+ .44
+ .10	+ .10	+ .10
+ 67.82	+ 67.23	+ 66.95
(+91 35 33.66)	35 33.21	35 32.78
+91 35 34.00		

+	50	−17	12.07
35	34.5	+	.50
18	23.5	−	7.3
	11.0	−17	18.87
18	16.19	18	15.13
		41	44.87
		18	16.83
			44.04

May 9
Reg − 17 13.1
11.8
13.5
11.0
12.0
11.0
−17 12.07

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May 10 1885

9.93177

33 Leit −.02

h m. s +.69

10 35 30

−1 8 +16

+43 31 +00

42 Leonis +61

+.19

10 39 25

+31 17

+11 6

α Leonis +20

+.52

10 43 9

+11 98

+31 14

B. Crateris −41

+.90

11 5 57

−22 12

+64 35

35 322 338 35 461 39 378 39 394 43 190 132 43 256 5 596 6 152

335 358 482 390 418 269 150 276 18 175

349 378 502 413 298 443 225 170 296 40 196

362 400 524 434 322 466 240 192 314 62 220

380 420 544 447 347 490 259 213 339 85 402 241

565 515 360 362

67 585 37 540 464 380 353 285

88 05 60 563 485 402 375 308

109 26 83 588 507 423 397

130 107 528 418

150 1088 132 838 548 5064 440 3966

1748 10870 4894 2062 98.21 4417 1123 6778 3058 4368 1968

35 3496 35 54380 35 54378 39 4124 39 4810539 49078 43 2246 43 33890 43 33889 6 21840 6 21867

35 54.379 39 49.091 43 33.890 6 21.854

−.015 −.018 −.016 −.017

35 54.36 39 4907 43 3287 6 21.84

35 34.76 −19.71 39 29.39 −19.71 43 14.14 −19.71 6 1.97 +11 −19.71

+ 19.60 − .00 + 19.68 + .10 + 19.73 + .03 + 19.87 − .07

33.071 28.117 12.739 0.124

− 1.69 − 1.27 − 1.40 − 1.85

− 21.40 − 20.88 − 21.08 − 21.63

35 32.96 39 28.19 43 12.79 6 0.21

9.99992 9.93177 9.99172

13 36.95 +19.42 1.288 25 47 22.32 +7.85 0.89487 56 13.38 +11.43 1.05805

− 25.14 1.400 40 − 8.69 − 14.52 1.162 00

13 11.81 47 13.63 55 58.86

48

− 0°

50 23.46

+31 +11

34 34.72 26 49.49

+43 30 51 +11 5 86 +31 13 27

1.73730 1.05270 1.54270

− 80 − 56 − 56

1.73650 1.05214 1.54214

− 5451 − 11.27 − 3484

+ .00 − .01 − .01

+ .11 + .10 + .04

− 54.40 = 11.78 − 34.81

− 0 51 17.86 +31 34 23.54 +11 26 14.68

− 46 −17 12.35 − .13 −17 12.35 − .35 −17 12.35

51 13.3 − 46 34.7 23.4 − .13 26 14.3 − .35

8 30.7 + 16.3 17 11.6 + 4.5 9 0.9 + 11.3

−17 12.4 −16 5651 −17 11.8 −17 7.98 13.4 −17 1.40

8 14.42 8 14.31 17 16.06 −16 15.54 9 12.16 9 13.28

17

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May 10 1885

δ Sco. +38
h m s +.36
11 7 56
+21 10
+21 13

κ Urs. May +67
+.15
11 12 13
+33 44
+8 39

γ Cephei −4.33
−.87
11 34 38
+103 1
76 59
−60 38

β Sco. +27
+.46
11 43 12
+15 12
+27 11

8 34.2 / 36.0 / 37.8 / 39.3 / 40.7

8 118 / 140 / 162 / 184 / 206 / 228 / 250 / 273 / 295
12 84 / 108 / 118 / 152 / 162

122 / 150 / 170 / 197 / 221 17.20 / 518 / 543 / 567 / 592 / 1.7 5674
12 270 / 295 / 320 / 345 / 368 / 394 / 419 / 444 / 469
35 438 / 479 / 560 / 605 / 69
35 542 Q / 30 × / 12.7 − / 21.5 / 31.0 1248 / − 73.257
43 34 / 44 / 57 / 68 / 80
115 / 137 / 160 / 180 / 203 15.90 / 460 / 480 / 502 / 523 / 543 5016
43 245 / 266 / 287 / 309 / 331 / 352 / 372 / 393 / 416

8 1880 / 37.60
8 1856 / 20622
12 624 / 1248
12 7394 / 36.970
12 3324 / 36.933
35 2751 / 5502
34 59.223
43 283 / 566
43 6606 / 38030
48 2971 / 33011

8 20.622 / −.017 / 8 2060 / 8 0.99 / + 1963 / 59.510 / −19.71 / + .06 / − 1.46 / −2.11 / 7 59.49
12 36.952 / −.019 / 12 36.93 / 12 1747 −19 / + 1946 / 16.060 / −19.71 / + .11 / − 1.41 / −2.101 / 12 15.92
34 59.223 / + .069 / 34 59.29 / 34 38.65 / + 20.64 / 38.098 / −19.71 / − .69 / − 0.55 / −2.95 / 34 38.34
43 33.020 / −.016 / 43 33.00 / 43 13.24 / + 1976 / 11.576 / −19.71 / + .04 / − 1.64 / −2.131 / 43 11.69

9.96766
55 46.75 −16.98 / + 20.50 / 56 7.25 / 1.22994 / 1.31083
9.91993
22 3900 +24.47 / − 25.75 / 22 13.25 / 1.38863 / 1.41079
9.35263
6 5245 −5.580 / − 16.27 / 6 36.18 / 1.74663 / 1.21149
9.98453
52 5458 +27.36 / − 34.19 / 52 20.39 / 1.43712 / 1.53388

+21 / 26 41.10
+34 / 0 35.10
+103 / 16 12.17
+15 / 30 27.96

+21 13 1 / 1.34930 / + 42 / 1.34972
+8 39 53 / 0.94330 / + 66 / 0.94396
−60 35 54 / 2.50784 / + 160 / 2.00944
+27 10 9 / 1.47060 / + 182 / 1.47242

−22.37 / − .05 / + .02 / − 22.40 / +21 26 18.70
−8.79 / − .15 / + .08 / −8.86 / +34 0 26.24
+102.20 / + .38 / + .06 / +102.64 / +103 17 54.81
−29.68 / − .10 / + .09 / − 29.70 / +15 29 58.26

− .24 −17 12.35 / 26 18.5 − .24 / 9 5.8 + 7.3 / 12.7 −17 5.29 / 9 13.12 / 9 13.41
− .10 −17 12.35 / 0 26.1 − .10 / 43 14.7 + 32.30 / 11.4 −17 9[illegible].15 / 43 17.96 / 17.09
+ .58 −17 12.35 / 17 55.4 + .58 / 0 49.3 − .98 / 11.1 −17 21.57 / 0 34.57 / 0 33.24
− .31 −17 12.35 / 29 57.9 − .31 / 12 45.2 + 8.3 / 12.7 −17 4.36 / 12 53.54 / 12 53.90

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May. 10 1885

No Ephemeris

γ Ursæ Maj. +1.39 L.21

h m s
11 47 42
+54 30
−11 57

Gr. 1852

11 59 33
+77 33

4 Ν Draconis +4.82 −.59

12 6 48
+78 15
−35 52

43 Ν Cephei Comet −13.11 −.79

12 53 11
+94 21
85 38 14
−51 58

8.88172n

Q − 1

47 231 322 47 535 0 390 59 69 227 4 356 6 292 458 57 82 55 125
257 358 570 107 358 420 823 493 140 388
284 394 06 138 292 502 867 523 310 56 58
306 430 42 165 326 564 396 556 450 57 24 6640
325 464 3936 78 196 1350 358 2922 3704 956 426 3608 592 5244 64 −216900
112 52 29740
288 1481 211 1186 29.22 390 F 19 366 5244 25
324 186 260 142 4544 420 93 396 930 56
360 220 350 174 456 152 429 94
397 413 203 136 490 224 462 2596 130
4313600 4673402 225 1708 516 4544 3181612 495 4296 160 930
54 18392 8
195 195 = 18900
− 45188
53 33712

1403 13536 6097 556 84 674 190 1646
47 2806 48 7680 48 7744 0 29.00 583 4 49.56 225 57 32.92
1 34.02 09 8 16.12 260
45 295
75 136 325
2596

48 7.712 59 45320 7 9.348 53 33.712 8
−.026 −.071 −.076 + 201
48 769 59 4525 7 9.27 53 23.91
47 48.20 −19.71 −19.71 6 50.04 −19.71 53 9.24 −19.71
+ 1.949 + .22 + 1923 + .77 + 2.467 −2.10
46689 47.983 12.188
−1.51 −2.06 +2.95
−2.100 −2.100 −18.86
47 4669 6 4827 53 15.05

9.76572 9.33362 9.30887 8.88122n

46 10.48 +3.965 1.59824 33 0.95 −43.68 1.64828n 51 26.15 +139.79 2.14548 45 38.75 −239.21 2.37878n
− 29.91 1.47619n −108.80 2.03023n − 36.86 −66.77 1.82458n − 23.56 1.37223n
45 40.54 50 49.29 1.56658n 45 15.19
1.24568

32 41.62 50 32.10
+ 17.61
50 49.71

+54 +78 +94
37 7.81 31 59.06 31 58.41 37 33.16

−11 56 36 −35 51 20 −35 52 14 −51 57 7
1.08570n 1.61900n 1.61920n 1.86590n
+ 2.04 + 268 + 406
1.08774 1.62168 1.62188 1.86996

+12.24 +41.85 +41.87 +74.12
− 41 − 2.12 − 48 + 2.36
+ 04 + 04 + 02 + 02
+11.87 +39.77 +41.41 +76.50

+54 37 19.68 +78 32 38.83 32 40.05 +94 38 49.66
+78 32 39.44

+ 14 −17 12.35 + 40 −17 12.35 + 53
37 19.8 + 14 32 39.8 + 40 38 50.2
20 5.6 − 2.8 15 26.7 − 72 21 45.8
−17 14.2 −17 15.01 13.1 −17 19.15 4.2 cx
20 28.2 20 4.67 15 19.49 15 20.29

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1885phae.proj.1621

May 10 1885 8.35800

Polaris −.4384

h m s −.75

13 16 36

+91 18

88 41 36

−48 55

10 46.8	14 9.4	14.0 21.3	14	14.90 +2 30.74	16 45.64		
	40.3	47.7 53.6	14	47.20 +2 0.59	47.79		
(2 24)	15 10.8	18.6 24.0	15	17.80 +13.44	48.24		
	35.6	39.7 46.0	15	40.43 +1 0.30	[40.73]		
17 33.3	16 12.0	15.8 23.0	16	16.83 +30.15	46.98		
	42.0	47.3 54.4	16	47.90	47.90		
	17 12.1	17.0 22.6	17	17.23 −30.15	47.08		

16 47.272
+ .670
16 47.94
16 21.94 −19.71
+ 26.00 − 7.01
36.44
+14.50
−12.22
16 35.72

8.35800

48 12.70	+360.47	2.35687	1.02710	
+10.64	+274.87	2.43913	0.90936	
48 23.34	−46.03	1.66304	0.13327	

48 15.32
8.12
48 23.44

+91

48 21.90	34 25.01	34 24.91	34 27.81
−1.36			
48 20.54	−48 54 33	−48 54 31	−48 54 24
	1.81910		
	+473		
	1.82383		

+66.65	+66.65	+66.65
+1.62	+.94	+.03
+.10	+.10	+.10
+68.37	+67.69	+66.78
+91 35 33.38	(35 32.60)	35 34.59
+91 35 33.98		

+ .50	−17 12.35	
35 34.5	+ .50	
18 23.8	− .76	
10.7	−17 19.45	
18 16.19	18 14.53	
	41 45.47	
	− 8.3	
	44.64	

May 10

Reg	− 17
	12.4
	11.8
	13.4
	12.7
	11.4
	11.1
	12.7
	14.2
	13.1
	10.7
	−17 12.35

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1885phae.proj.1621

May 11 1885

β

h m s
11 5 5.7
−22 12

clouds

δ Leo

11 7 56
+21 10

clouds

ν & Urs.

11 12 13
+33 44
+8 39

+47 May

+.15
+.14
+.80

9.91993

12 566
590
03
18
41

12 275 86 1.8
300 8.3
323 102
349 138
373 202
398 266
422
448
472

522
546
572
596
2.2 5716
19840

3018
13 0.36 12 37326 12 37.333 36 1297

9.35263 n

Cephei −.433
−.87

11 34 38
+103 1
76 59
−60 38

35 234
27.0
29.9
32.9
36.1 2986
−36.524

34 59336

35 542
35
12.7
22.4
31.8 1282
− 73.257
34 59.563

35 144 17.4
145 20.6
14.450
− 15.262
59.188

12 37.331
−.019
12 3731
12 17.45 −.09 −20.04
+ 19.86 +.09
16.060

−1.39
−21.34
12 15.97

34 59.362
+.069
34 59.43
34 38.74 −20.05
+ 20.69 −.61
38.098

−0.64
−21.30
34 38.13

9.91993

21 47.55 −23.03 1.36229 n
+ 24.80 1.39445
22 12.35

9.35263 n

γ 0.15 −73.61 1.86694 n
− 21.47 1.33180 n
6 38.68

+34°
0 36.00

+8 39 2
0.94250
+ 598
0.94848

−8.88
− .13
+ .05
− 8.96
+34 0 27.04

+103
16 9.67

−60 35 46
2.00781 n
+ 694
2.01455

+103.41
+ .65
+ .06
+104.12
+103 17 53.79

− .10 −17 11.00
0 26.9 − .10
43 14.8 + 3.2
−17 12.1 −17 7.90
43 17.96 43 19.14

+ .58 −17 11.00
17 54.4 + .58
0 44.4 − .99
15.0 −17 20.32
0 34.51 0 33.47

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May 11 1885

X Urs. +1.13
h m s −.10
11 39 58
+48 25
−6 2

39 449 490 40 7.7
479 520 10.7
502 550 13.8
527 582 16.8
554 12 55 08 19.9
23.0
385 26.2
415 29.4
446 32.2
478
51.0 44.68

2511 15976 1797
39 50.22 40 19.880 40 19.967

40 19.924
−.023
40 19.90
39 59.96 −.2005
+ 19.94 +.16
58.521

−1.44
−2.133
39 58.54

α Leo
11 43 9
+11 10
ch. f

γ Urs. +4.39
May −.20
11 47 42
+54 10
−11 47

47 215 326 47 540 4 482
245 862 574 539
282 39.7 1.0 16
31.0 43.1 44 9.3
34.0 46.9 39.70 8.0 17.3
11.5
29.3 15.1
32.9 18.6
36.6 22.2
39.7
43.5 36.40

1392 13610 6122 3103
47 27.84 48 8.050 48 8.022 5 2.06

48 8.036
−.026
48 8.01
47 48.18 −20.06
+ 19.83 +.19
46.689

−1.49
−21.36
47 46.65

4 N Draco +4.82
−.59
12 6 48
+78 15
−35 52

6 28.7 460
32.4 490
36.5 530
39.0 562
42 7.3586 595 5.274
5.274
36.2 2.7
39.6 9.34 6.0
42.8 9.2
46.0 26.16 12.8
50.1 42.94 16.0 9.34

347.04 19.6
32.6
26.2
29.4
33.0 2.616

7 9.408
−.076
7 9.33
6 50.00 −.2007
+ 19.33 +.67
47.983

−.202
−2.142
6 47.91

9.82198

41 5.68 +29.70 1.47276
−25.52 1.40697m
40 40.66

9.76747

+40.20 1.60423 51 24.70 +27.35
1.48393m −33.58
50 51.12

9.30887

2.10500
1.52610m

+48
42 7.69

−6 1 40
0.78400m
+693
079093

+6.18
−.24
+.03
+5.97
+48 42 13.66

+ .07 −17 11.00
42 13.7 + .07
25 26 − 1.4
11.1 −17 1.283
25 1.21 25 1.33

+78
31 57.23

−35 51 21
1.61900m
+768
1.62668

+42.33
−1.76
+.04
+40.61
+78 32.37.84

+ .40 −17 11.00
32 38.2 + .40
15 26.9 − 7.4
11.3 −17 18.00
15 19.49 15 19.84

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New Ephemeris.
May 11 1885

8.88122n

8.35800n

-13.11

-43.84

Br. 6

43 H. Cephei

Polaris

h m s
12 9 43
+103 41
76 19
-61 18

12 53 11
+94 21
85 38 14
-51 58
-.79

13 16 36
+91 18
88 41 36
cl. f.

10 522 9 299 440 54 507
580 324 466 343
53 358 502 428
104 384 530 515
157 432 413 3556 557 4990 554

52 448 357
468 468
461 552
455 36 4580

1 340
4 400
11 470

12 00 277 4990 587
42 305 436 15
74 335 40
114 362 1884 73
184 728 390 3338 103 436

109
224
302
388
497 3040

32204 132
159 54 42.94
187
217
247 1884

10 432
12 728

597
67
182
252
343 1672

10 4408
+.065
10 4471
-2007

53 30.973
+.201
53 31.17
53 9.47
+ 21.70
12.188

-20.09
-1.84
+2.72
-19.21
53 11.96

9.37393n
8.88122n

26 16.30 +0.09 8.95424 45 14.65 -7.97 1.85715n
-122.87 2.08945n - 7.09 0.85060n
45 7.56

26 37.90

+94°
37 40.79

-51 57 31
1.86660n
+ 912
1.87512

+75.01
+ .21
+ .01
+75.23
+94 38 56.02

May 11

Reg -17 12.1
10.0
11.1
11.3
10.5
-17 11.00

+ .53 -17 11.00
38 56.6 + .53
21 46.1 - 8.6
-17 10.5 -17 19.07
21 37.47 21 - 36.95
38 23.05
- 45
22.60

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1885phae.proj.1621..

May 16 1885 .982198 .998450

No. Ephemeris

X Urs Maj. +1.13 B Leo. +.27 γ Urs Maj. +1.39 Gr. 1852

h m s −.10 +.46 −.21

11 39 58 11 48 12 11 47 47 11 59 23

+48 25 +.04 +15 13 +54 20 +77 33

−6 2 +.00 +27 10 −11 57

40 30 40 88 43 211 43 259 47 205 338 47 552 57 336 59 77 235

6.5 120 237 283 242 373 584 428 100 267

.82 562 562 153 262 173 173 303 284 409 24 814 132 295

93 560 592 182 278 174 195 222 304 445 59 16 178 334

125 790 22.56 033 214 296 175 218 17.40 344 322 480 4090 94 94 5176 209 1392 36.3 2988

559 240 366 132

4X 238 394 473 387 303 162 0 312 11.0 29.88 397

274 429 494 410 340 196 382 137 45.90 427

29.6 460 518 431 372 230 457 17.4 1.44 45.6

492 537 537 20.5 490

524 45.98 557 57.58 407 446 3736 599 45.74 24.0 17.32 52.5 45.90

1908 1284 3105 1357 13826 6233 22 8.46 555

40 7.90 40 21.006 40 21.200 43 25.68 43 34.490 43 34.500 47 27.14 48 9.130 48 9.253 57 51.76 585

41 26.93 45.74 13

44

7.5 144

40 21.103 43 34.495 48 9.192 57 45.92

−.023 −.016 −.026 −.071

40 21.08 43 34.48 48 9.17 57 45.62 −2129

39 59.86 −21.26 43 13.18 −21.27 47 48.06 −21.28

+ 21.22 + .05 + 21.30 + .01 + 21.11 + .06

58.521 11.596 46.89

−1.34 −1.58 −1.37

−22.55 −22.84 −22.59

39 58.53 43 11.64 47 46.58

9.82198 9.98450 9.76572 9.33862

40 53.55 +13.20 1.12057 52 33.12 +8.82 0.94547 46 15.90 +42.05 1.62377 33 47.27 +6.07 0.78319

− 11.34 −6.583 1.81843 − 11.02 1.04220 − 31.75 1.50172 −180.05 2.25539

40 42.21 1.05478 52 22.10 45 44.15

1.75263

33 59.82

+48 +15 +54

42 6.14 30 26.25 37 4.20

−6 1 52 +27 9 47 −11 56 30

0.78430 1.47040 1.08560

+ 746 + 746 + 769

0.79176 1.47786 1.09329

+6.19 −30.05 +12.40

− .05 − .01 − .46

+ .03 + .08 + .04

+6.17 −29.98 +11.98

+48 42 12.31 +15 29 56.25 +54 37 16.18

+ .07 −17 9.45 − .31 −17 9.45 + .14 −17 9.45

42 13.6 + .07 29 55.9 − .31 37 16.3 + .14

25 3.4 − 2.2 12 45.8 + .77 20 6.7 − .39

−17 9.6 −17 11.58 10.1 −17 2.66 9.6 −17 1.321

25 6.21 25 0.73 12 53.54 12 54.19 20 2.82 20 2.97

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May. 16 1885

No. Ephemeris.

8.35810 n

−43.83

4 No. Draco.

h m s −.59
12 6 48
1 +78 15
−35 52

+4.82

Er 6

12 9 43
+103 41
76 19

Polaris

h m s −.75
13 16 36
+91 18
88 41 35
−48 55

4 415 — 513 — 03 — 100 — 166

6 295 320 353 389 425 3564 595 5254 180
364 3254 28
396 958 61
435 100
469 2650 130
502 4332 160 958

8 510 558 597 640 680
456 490 526 560 3564

9 317 341 370 396 430 3708 576 5178
295 322 350 380 408 3510 122 644
460 486 517 550
5178 06
644 34
20.58 64
96

18 32.6
20 3.0
(21 27.2)

15 18.3
48.0
16 17.2
48.3
17 19.8
50.2
18 21.3

4 2997 — 5994

347.58 200 230 267 297 331 2650
3125 9 2.50

33 0.98 147 176 205 235 266 205.8

759.1
16 48.443

7 9.516 — .076 — 7 9.44 — 6 49.61 + 19.837 — 6 47.98

−21.30 + .19 — 1.63 — 22.74 — 6 46.70

10 6.196 + .065 — 10 6.26

— 21.31

16 48.443 + .670 — 16 49.11 — 16 26.09 + 23.02 — 36.41

−21.39 — 1.75 +10.35 — 1.279 — 16 36.32

9.30887 — 211254 — 2.08028 — 1.50138 n — 1.53364 n

9.37393 n

8.35810 n

57 33.12 +129.58 — 31.73417 — 57 1.29 — 0 58.95

25 41.42 +63.70 — 26 39.65

1.80414

48 25.8 −104.16 — 3.08 −194.56 — 48 22.74 −278.76

2.01770 n 0.48803 n
2.28905 n 0.75938 n
2.44523 n 0.91556 n

29.65 — 5.75 — 48 23.90

32.95 — 8.23 — 48 24.72

+78 49.40 — 31 46.96 — −35 57 13 — 1.61900 n — + 841 — 1.62741

+91 34 25.61 34 24.45 34 23.63

−48 54 20 — 1.81910 n — + 1164 — 1.83074

−48 54 16 −48 52 13

+1240 — 157 — + 05 — +1088

+67.72 + .13 + .10 +67.95
+67.72 + .47 + .10 +68.29
+67.72 + .97 + .10 +68.79

+78 32 — 27.84 — 30.28

+91 35 33.56 — +91 35 33.15

35 32.74 (35 32.42)

+ 40 — 32 29.2 30.7 — 15 27.8 — −17 02.94 — 2.9

+ 50 −17 9.45 — 35 33.7 + .50 — 18 25.2 − 9.0 — 8.5 −17 17.95 — 18 16.19 18 15.20 — 41 48.0 − 83 — 4397

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ζ Virginis

h m s
13 28 49 +.67
−0 1
+42 24

28 5 30 29 54
550 76
570 96
593 118
12 57 10 139
158
26.0 180
28.0 198
30.0 219
32.2
34 2 8008

14718 1238
29 13590 29 13755

29 13.672
−015
29 1366
28 5219 −2.141
+2147 − .00
49993

−2.20
−28.61
28 50.05

May 16
Reg −17 9.6
10.1
9.6
8.5
−17 9.45

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1885phae..proj.1621..

May 17 1885

29 Comae +.39

h m s +.36

12 23 56 +.16

+21 32 +.80

+20 51

23 5'56 5'74 5'96 15 26

5'7 0.1 2.2 44 66 220

332 354 376 397

420 37'58

24 11'2 13'4 15'4 17'7 19'8 22.0 24'4 26'6 28'8

2967 23 5'934

3978 24 19'890

1793 24 19'922

β Coma -.42 +.91

12 28 21 −22 46 +65 9

m

38 225 249 27.1 293 315 3706

584 06 29 52

74 290

28 36.0 38.2 40.5 42.7 45.0 47.2 49.4 51.7 53.8

8996 38 44.980

4045 28 44.944

Polaris 8.35810m −43.83 −.75

13 16 36 +91 18 88 41 35 −48 55

19 47.7

[21 15.2 22 31.8]

23 46.4

[25 05]

14 22.7 45.3 15 19.6 48.6 16 20.5 49.6 17 14.9 50.6 18 26.0 47.5 19 19.4

24.3 25.9 49.0 53.0 23.6 25.9 53.0 4.3 25.2 30.3 54.4 1.7 21.5 30.6 58.5 3.6 28.0 30.8 54.2 59.7 20.4 33.2

14 24.30 4977 15 23.03 55.97 16 25.33 55.23 17 22.33 57.57 18 28.27 53.80 19 26.43

60.203

24 19.906 −.017 24 19.889 23 58.37 +2.152 56648

−21.75 +.06 −1.72 −23.41 23 [56.48]

28 44.962 −.017 28 44.994 28 23.08 +21.86 20.778

−21.75 −.07 −2.30 −24.12 28 20.82

−21.78

16 54.730 +.670 16 55.40 16 26.77 +28.63 36.441

9.96858

33 48.90 +20.57 1.31323

1.39404n

− 24.78 33 24.12

48 22.25 −172.97 2.23797n 0.70830n

− 5.11 48 22.14 −260.47 2.41546n 0.88609n

−337.07 2.52742n 0.99805

−411.67 2.61455n 1.08488

−485.77 2.68643n 1.15676

29.75 − 7.69 48 22.06

+21°

49 24.23

+20 51 3 1.34100 +.592 1.34692

−22.23 −.07 +.11 −22.19

+21 49 2.04

+91

33.15 34 26.21 34 26.29 34 25.16 34 24.86

− 9.96 48 23.19 −48 54 19 1.81910n +.592 35.85 1.82502 − 12.16 48 23.69

−48 54 16 −48 54 13 1.87980n 1.82492

+66.84 +.37 +.10 +67.31 +66.82 +.84 +.10 +67.76 +66.82 +1.41 +.11 +68.34 +66.82 +2.11 +.11 +69.04

3882

14.35 +91 35 33.52 − 48 24.47 +91 35 33.61

(35 34.07) (35 33.50) 35 33.70

− 24 49 1.8 31 54.4 −17 7.4 31 58.97

−17 7.83 − .24 + 4.6 −17 3.47 31 58.57

+ .50 35 34.1 18 25.3 8.8 18 16.19

−17 7.83 + .50 − 9.1 −17 16.43 18 17.18 41 4.382 − .83 41.99

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May 17 1885

9.89791

γ Virginis −.00

13 28 47 +.67
−0 1
+42 24

17 Com. Vens +.78

13 29 37 +.08
+37 46
+4 37

2 28 535 29 5.7 30 28.5
555 8.0 30.7
575 10.0 32.9
596 12.1 34.6
17 5756 14.3 36.6
16.2
266 18.2 188 30 3.359
28.6 20.3 21.4 3.284
30.6 22.4 24.0 3.110
32.8 26.7 3.313
34.7 8066 29.3 24040
−20872

14823 1272 1633
29 14110 29 14133 30 3266 30 3168 30 3250

29 14.122
− 015
29 1411
28 52.18 −21.79
+ 21.93 − .00
49.993

30 3209
− 020
30 3.19
29 4153 −21.79
+ 2166 + .12
39641

−21.78
−7.01
+9.67
−19.12
16 8628

− 2.19
−23.98
28 5013

− 1.89
−23.56
29 39.63

9.89791

18 4680 −2945 1.46908n
+ 30.15 1.47922
19 16.95

+38
3 3140

34.2388

48547

+4 36 1
0.66590
+ 592
0.67182

+6682
+293
+.11
+6986
(35 33.74)

−~~4697~~ 4.70
− .23
+ .11
−~~4709~~ 4.82
+38 2 ~~4421~~
3 26.58

May 17
Reg − 17 7.4
8.8
7.3
−17 7.83

− .05 −17 7.83
32 ~~44.3~~ 26.5 − .05
46 19.2 − 0.7
7.3 −17 8.58
46 18.53 46 18.00

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1885phae.proj.1621..

May 21 1885

γ Urs. Maj. +1.39

h m s −1.21
11 47 47
+54 26 +.10
−11 57 +.00

47 29.7
32.8
35.2
37.4
39.9

36.1
39.6
43.0
46.8
50.3 43.16

32.9
36.2
40.0
43.5
47.0 39.92

47 57.5
0.9
4.3
8.0
11.5
15.0
18.5
22.0
25.6

59 23.9
27.2
29.6
31.3
32.4

1750
35.00

14308
48 11.540

6433
48 11.478

1464
59 29.28

o Virginis +16

11 59 21 +.54
+9 22
+33 1

25.6
27.8
30.0
32.0
34.1 29.90

5.92
1.3
3.3
5.3
7.6 3.34

59 38.3
40.3
42.5
44.5
46.6
48.6
50.8
52.9
55.0

9324
59 46.20

4195
59 46.11

8 Cam

12 28 17
+41 59

N.f.

Polaris

48 11.509
−.026
48 11.48
47 47.94 −23.88
+23.54 +.14
46.89

−1.25
−24.99
47 46.49

59 46.616
−.016
59 46.60
59 22.74 −23.88
+23.86 +.02
21.069

−1.67
−25.53
59 21.07

9.76572

46 10.27 +3651 1.562 41
−27.56 1.440 36
45 42.71

43 12.80 +1734 1.239 05
−22.15 1.345 45
42 50.65

9.99417

+54°
37 56.4

+9
39 57.70

−11 56 36
1.08570
+ 238
1.08808

+33 0 27
1.54270
+ 260
1.57530

+12.25
− .35
+ .05
+11.95

−37.61
− .02
+ .13
−37.50

+54 37 17.59

+9 39 20.20

18
+ .14 −17 9.76
37 17.7 + .14
20 7.3 − 4.5
−17 10.4 −17 1472 13.54
20 28.2 20 327
405

18
− .36 −17 9.76
39 19.8 − .36
22 9.6 + 8.6
10.2 −17 172 0.94
22 18.15 22 1848
19.26

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1885phae..proj.1621

May 21 1885 8.35879m

-43.82

Polaris — .75

h m s
13 16 36
+91 18
88 41 34
− 48 55

P Bootis
13 41 48
+48 1

γ Ursæ Maj.
13 42 09
+49 52

Bootis
13 49
+49 38

5 235
7 38

15	530	535	0.8	15	5643	+ 1	0.26	16	5669
16	228	266	32.4	16	27.387	+	30.13		57.50
	49.3	568	22		56.10				5610
17	207	280	340	17	2757	−	30.13		57.34
	51.8	89.3	44		58.50	− 1	0.26		58.24
18	20.9	23.6	31.2	18	2590	− 1	30.39		55.51

5 23.50
7 3.80

16 56897
+ .679
16 57.57
16 2919 −23.87
+ 28.38 − 4.38
36.44
+7.25
−2.00
16 36.57

48 1.18 +693.40 2.84098 1.31140
+2048 +593.10 2.77313 1.24355
48 21.66

48 3.88
+ 17.52
48 21.40

48 5.12

+91
34 26.72 34 26.95

48 54 45 − 48 54.42
1.81910
+ 401
1.82311

+66.54 +66.54
+ 5.98 + 4.38
+ .12 + .12
+72.64 +71.04
+91 35 39.36 35 39.99
+91 35 38.67

+ .50 −17 9.96
35 39.2 + .50
18 26.1 − 9.9
13.1 −17 10.36
18 16.19 18 1.31

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1885phae.proj.1621.

May. 21 1885

17 H Cam
h m s
13 39 39
+37 46

no obs.

T Boötis +.32 +.41

13 41 48
+18 1
+24 22

41 520 42 49 44 18
541 71 86
562 94 50
585 115 65
0.6 5628 137 79
160
268 182
290 200
310 225
332
356 3112

14740 12.33 248
42 13700 42 13700 44 496

η Ursæ Maj. +1.19 −.13

13 42 59
+49 52
−7 29

453
486
518
548
584 51780
−25.598

43 236
268 264
264 294
262 324
260 356
262 390

43 26182 43 26.267

49 31.5
334
350
363
378

1740
49 34.80

η Boötis +.34 +.40

13 49 12
+18 58
+23 25

m
49 165
187
209
233
251 2090

5.16
5.37
5.60
5.81
0.2 5592

7682
49 38410

49 29.7
32.0
34.0
36.3
384
406
428
451
471

3460
49 38444

42 13700
−.016
42 13.68
41 49.86 −.2387
+ 23.82 +.03
47.848

−2.01
−25.85
41. 47.83

43 26224
−.024
43 2620
43 2.41 −.2387
+ 23.79 +.12
0.546

−1.86
−25.61
43 0.59

49 38.427
−.016
49 3841
49 14.58 −.2387
+ 23.83 +.03
12.549

−2.03
−25.87
49 12.54

9.80927

11 36.50 −.3874 1.58816m
+ 32.33 1.50966
12 28.83

6 52.72 +3.63
− 4.44
6 48.28

9.97576

0.55991
0.64499m

+50°
10 1952

−7 30 50
0.88050m
+ 439
0.88487

+ 767
− .40
+ .08
+7.35
+50 10 26.87

+19
16 0.07

+23 24 7
1.39650
+ 449
1.40099

−25.18
− .01
+ .08
−25.11
+19 15 34.96

May 21
Reg −17 10.4
10.2
[illegible]
7.4
8.4
−17 9.96
9.18

18
+ .09 −17 9.96
10 27.0 + .09
53 19.3 − 4.1
−17 7.7 −17 13.87 19
53 15.17 53 +2.90
13.68

18
− .27 −17 9.96
15 34.7 − .27
58 26.3 + 2.4
8.4 −17 7.83 705
58 2868 58 27.13
27.91

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1885phae.proj.1621

May 26 1885 9.89071

12 Cam. Ven. +81

h m s +.06

12 50 20 +.01

+38 58 +.00

+3 25

50 56.0 50 56.8

58.8 59.3

12 .20

3.3 4.8

4.5 7.2

10.0

23.1 12.5

25.7 15.3

28.5 18.0

31.2

33.7 28.44

27.22

30.38 60.59

51 0.76 51 7.219 57 7.22

51 7.288

−.020

51 7.27

50 40.44 −26.79

+ 2.683 + .01

38.853

−1.59

−28.37

50 38.90

9.89071

9 13.60 +6.53 0.81491

− 6.57 0.81785

9 7.03

+39

13 41.32

+3 26 28

0.53940

− 1311

0.52629

− 3.36

− .01

+ .17

− 3.20

+39 13 38.12

− .04 −17 12.00

13 38.1 − .04

56 25.1 − 2.3

−17 13.0 −17 143.4

56 22.80 56 23.78

8.35828n

Polaris −43.81

− .75

13 16 36

+91 18

88 41 33

−48 55

5 25.4

7 17.0

(8 42.3)

14 57.7 59.0 0.3 14 59.00 16 59.52

15 22.3 28.9 37.5 15 29.57 59.96

53.3 0.6 8.3 16 0.73 6.99

16 26.0 30.5 33.0 14 29.83 59.96

33.5 59.5 4.4 16 59.80 59.80

17 18.3 23.6 31.6 17 29.50 54.37

56.0 3.9 7.8 18 2.37 62.11

53.8 57.5 4.7 18 58.67 58.15

16 59.358

+ .670

17 0.03

16 32.86 −26.81

+ 27.17 − .44

36.441 +3.58

−23.67

16 36.36

47 59.55 +693.96 2.84133 1.31184

+ 20.50 +582.36 2.76586 1.23637

48 20.05 +497.06 2.69641 1.16692

48 0.95

1723

48 18.18

48 1.70

+ 14.69

48 16.39

+91

34 28.30 34 30.17 34 31.96

−48 54 47 −48 54 45 −48 54 44

1.81920 1.81910n 1.81910n

−1265

1.80655 1.80645 1.80645

+6405 +6404 +6404

+ 5.99 + 4.23 + 3.07

+ .12 + .12 + .12

+ 7.16 +68.39 +67.23

+91 35 38.46 35 38.56 (35 39.19)

+91 35 38.51

+ .50 −17 12.00

35 39.0 + .50

18 27.1 − 10.9

11.9 −17 22.40

18 16.19 18 16.11

41 43.89

− .83

43.06

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May 26 1885

η Urs Maj +1.19

h m s −.13
13 43 1
+49 58
− 7 30

η Bootis +.24

13 49 13 +.40
+18 59
+23 24

11 Bootis

13 55 58
+27 37
clouds

α Draco +2.14

− .38
14 1 16
+64 56
−22 33

42 532 572 43 16.3 49 221 196 49 327 / 172 571 / 260
557 03 195 235 218 349 212 14 309
576 35 227 255 240 371 241 65 354
05 67 258 272 262 393 284 114 402
22 100 354 293 286 283 3398 414 305 163 654 456
322 437 501
485 356 545 488 145 550
515 386 567 480 194 07
547 420 588 503 242 48
578 10 292
1.2 5474 3.2 5884 340 2426

2892 5828 2620 1269 8282 3732 1214 9080 4087
42 5784 43 29140 43 29.111 49 2538 49 41410 49 41467 / 2428 / 45400 / 45411

43 29.126 49 41.438 / 45.406
−.024 −.016 −.036
43 29.10 49 4142 / 45.37
43 234 −26.83 49 14.56 −26.84 / 18.54 −26.85
+ 2676 + .01 + 26.86 + .00 + 2683 + .02
0.546 12.549 16.559

−1.79 −.201 −.198
−28.61 −28.85 −28.81
43 0.49 49.1257 / 1656

9.80912 9.97571 9.62703

52 48.12 +31.29 1.49540 γ 6.08 +1.606 1.20575 10 31.32 +21.13 1.32490
− 26.11 1.41675 − 19.66 1.29369 − 11.59 1.06416
52 22.01 6 46.42 10 19.73

+50° +19 +65
10 2634 16 1.93 12 2862

−7 29 58 +23 24 20 −22 32 15
0.87970 1.39660 1.37830
− 1229 − 1220 − 1201
0.86741 1.38440 1.36629

+7.37 −24.23 +23.24
− .27 − .04 − .09
+ .11 + .08 + .02
+7.21 −24.19 +23.17
+50 10 33.55 +19 15 37.44 +65 12 51.79

May 26
Reg −17 13.0
11.9
13.2
10.4
11.5
−17 12.00

+ .09 −17 1200 − .27 −17 1200 + .25 −17 1200
10 33.6 + .09 15 37.5 − .27 12 52.0 + .25
53 20.4 − 5.2 58 27.1 + 1.6 55 40.5 − 7.8
−17 13.2 −17 1711 10.4 −17 1067 11.5 −17 1955
53 15.17 53 16.44 58 28.68 58 2707 55 32.75 55 32.24

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1885phae.proj.1621

May 28 1885

+.54

43 Comae

h m s +.24

18 6 30

+28 27 +.03

+13 56 +.00

8.35828

−4381

Polaris

13 16 36

+91 18

88 41 33

6	326	367	6	509	12	568	18	561	40	126	18	4.23
	342	390		530	14	54	19	20.6	31.0	380	19	2987
	359	414		555				46.2	45.6	40	19	5527
	374	436		578			20	12.6	22.2	29.5	20	2143
	397	460	4134	02					384			
				26								
		142		49								
		164		73								
		189		94								
		212										
		236	1886									

	1801	12020		5416
6	3602	7 0.100	7	0.178

7 0.139

−018

7 012 28.04

6 32.12 ~~−28.81~~

+ 28.00 + 02

30406

−1.71

~~−28.50~~ 29.73

6 ~~31.62~~

30.39

9.94458

38 995 +24.12 1.38238

− 2749 1.43919

37 4246

+28

45 589

+13 55 24

1.15460

+ 335

1.15795

−14.39

− .13

+ .13

−14.39

+28 44 51.50

− .16 −17 10.70

44 51.3 − .16

27 41.2 − 0.5

10.1 −17 11.36

27 40.74 27 40.14

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1885phae..proj.1621..

May 28 1885

13 T Bootis

h m s +.41

13 41 48

+18 2

+24 21

+32

η Urs. Maj.

13 43 0

+49 53

− 7 30

9.80912

+1.19

13

η Bootis

13 49 12

+18 58

+23 25

+34

+.40

11 Bootis

13 55 57

+27 56

+1 4 29

9.94620

+.53

+.25

563	42	92	43	260		43	175	49	327	210	49	340	56	457		56	184
584		115		283			206		343	230		362		477			210
06		135		306			240		365	252		384		498			230
28		159		326			272		380	273		405		514			254
50 062		180		357			302		398	296 2522		427		534			277
		201					335					449					300
309		222			494		366			558		470			418		322
330		244			528		399			579		493			440		346
352		267			558		430			00		514			463		370
374					588					23					486		
396 3532					23 55820					44 0086					510 46340		
					−25607										− 18.696		
3584		1615		1532			2725		1813	8530		3844		2480			2493
42 17920	42	17944	43	30643	43	30213	43	30278	49	36263	49	42650	49	42644	56	49600	56	27664	56 27700

42 17.932

− 016

42 17.92

41 4982 −28.07

+2810 + .01

47.848

43 30.256

− 024

43 3023

43 232 −2807

+ 2791 + .04

0.546

49 42.680

− 016

49 42.66

49 14.55 −2807

+ 26.11 + .01

12.549

56 27.688

− 018

56 27.67

55 3957 −28.08

+ 2810 + .02

57.623

−1.97

−3003

41 4789

−1.77

−2980

43 0.43

−2.00

−3006

49 12.60

−1.95

−3001

55 5766

9.80912

9.97576

9.94620

12 23.15 −0.38 9.57978m 6 52.68 +6.42 0.80754 8 22.98 −22.91 1.36003m

+ 0.32 9.50113 − 7.86 0.89553m + 26.21 1.41846

12 23.47 6 44.82 8 49.19

+50°

10 2488

+19

16 3.53

+28

13 59.16

−7 30 23

0.88010m

+ 432

0.88442

+23 24 7

1.39650

+ 447

1.40097

+14 25 37

1.17070

+ 463

1.17533

+ 7.66

− .00

+ .10

+ 7.76

−25.17

− .01

+ .08

−25.10

−14.97

− .12

+ .14

−14.95

+50 10 32.64

+19 15 38.43

+28 13 44.21

May 28

Reg − 17 10.1

11.9

10.9

9.9

−17 10.70

+	.09	−17	10.70		−	.27	−17	10.70		−	.17	−17	10.70						
10	32.7	+	.09		15	38.2	−	.27		13	44.0	−	.17						
53	20.8	−	5.6		58	27.3	+	1.4		56	34.1	−	1.2						
−17	11.9	−17	16.21			10.9	−17	9.57			29.9	−17	12.07						
53	15.17	53	16.43		58	28.68	58	28.86		56	32.95	56	32.14						

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June 1 1885

24 Comae Seq.
h m s
+19 01

43 Comae +54
+.24
13 6 30
+28 27 +.07
+13 56 +.00

6	316	394	6	536
	334	417		560
	351	440		582
	365	463		05
	383	490	4412	32
				54
		169		77
		192		100
		215		122
		240		
		262	2156	
	1749	12568		5668
6	34.98	7	2.840	7	2.978

7 2.909
−.018
7 2.89
6 32.08 −.2804 30.90
+ 30.81 + .04
30.906

−1.67
−2.967 32.53
6 3322
30.36

9.94410

38 1460 +27.93 1.44607
− 31.80 1.50240
37 4280

+28
45 555

+13 55 29
1.15460
− 435
1.15025

−14.13
− .18
+ .13
−14.18
+28 44 51.37

− .16 −17 10.50
44 51.2 − .16
27 41.8 − 1.1
9.4 −17 11.76
27 40.4 27 39.61

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1885phae.proj.1621

June 1 1885 8.35837m
−4380
Polaris − .75
h m s
13 16 36
+91 18
88 41 32
−48 55

~~10 39.7~~

14	38.0	39.0	40.0	14	39.00	17	9.61
10 54.7	15	4.3	11.1	18.0	15	11.18	11.62
		34.2	40.7	47.4	15	40.77	11.14
12 23.7	16	2.8	7.5	13.8	16	8.08	8.52
		33.2	42.0	46.4	16	40.53	11.14
	17	0.5	7.4	16.4	17	7.93	7.93
		37.1	47.0	57.3	17	45.13	15.01
	18	8.2	12.6	15.6	18	12.13	11.88
		43.1	46.6	51.3	18	47.00	16.63
	19	7.0	10.4	14.7	19	10.70	10.21

17 11.369
+ 670
17 12.04
16 37.84 −30.90 −3.07
+ 34.20
36.441
− 1.40
−35.37
16 36.67

~~48 6.48 +39147 2.59270 1.46330~~
+ 11.13 + 37.67 2.57596 1.04656
48 17.61 +287.67 2.45889 0.92949

48 7.45
+ 8.50
48 15.95

+91°
34 30.74 34 32.40

−48 54 40 −48 54 39
1.81910
− 405
1.81505

+65.32 +65.32
+ 1.77 + 1.03
+ .12 + .12
+67.21 +66.47
+91 35 37.95 35 38.87
+91 35 38.41

+ .51 −17 10.50
35 38.9 + .51
18 28.0 − 1.18
−17 10.9 −17 21.79
18 16.9 18 16.62
41 43.8
− 8.3
42.55

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1885phae.proj.1621.

June 1 1885

ζ Virginis

h m s
13 28 50
−0 0

ch f

α Bootis +1.48

14 5 9 +.29
+25 38
+16 45

9.31430

4 Urs Min +4.74

14 9 19 −.58
+48 6
−35 43

9.83688

λ Bootis +1.06

14 12 1 −.07
+46 37
−4 14

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1885phae.proj.1621..

June 1 1885

+1.30

Q Rootis

lu mn a — 17

14 21 17

+52 33

−10 0

21	46	15.7	21	363	
	78	19.2		39.7	
	98	22.5		42.1	
	123	25.9		46.2	
	148	29.3	2252	49.8	
				53.3	
		10.4		56.8	
		13.5		0.1	
		16.7		3.4	
		20.2			
		2357686			
	493		9938	4483	
21	986	21	49690	21	49811

21 49.750

−.025

21 4972

21 1882 −30.96

+ 3090 + .09

16907

−191

−3278

21 1694

9.78560

43 15.72 +3989 1.60086

− 31.53 1.49869

42 4419

+52°

40 4.16

−9 59 30

1.08620

− 214

1.00406

+1029

− 42

+ 13

+9.80

+52 40 13.96

June 1.

Reg −17 9.4

10.9

11.2

10.9

11.0

9.6

−17 10.50

+	.12	−17	10.50
40	14.1	+	.12
23	4.5	−	6.9
−17	9.6	−17	17.28
22	57.56	22	56.68

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1885phae.proj.1621..

June 2 1885 8.35837n

−43.80

−.75

Polaris

h m s

13 16 36

+91 18

88 41 32

−48 55

22 33.0	16	11.2	15.9	21.6	16	16.23	+1	0.25	17	16.48
		40.4	45.6	51.6	16	45.87	+	30.12		15.99
24 15.8	17	1.0	17.2	24.2	17	17.13				17.13
		43.7	47.2	51.7	17	47.53	−	30.12		17.41
	18	10.0	17.7	22.8	18	16.83	−1	0.25		16.58
		43.5	47.3	52.5	18	47.77	−1	30.37		17.40
	19	10.3	17.0	23.9	19	17.07	−2	0.49		16.58
		43.8	49.6	54.3	19	49.13	−2	30.62		18.51
	20	12.3	19.6	26.3	20	19.07	−3	0.74		18.33
		41.5	47.5	53.0	20	48.00	−3	30.86		17.14
	21	12.5	17.2	23.2	21	17.63	−4	0.98		16.65
		41.7	49.4	53.3	21	48.87	−4	31.11		17.76
	22	12.8	18.2	24.9	22	18.63	−5	1.23		17.40

Rejected no other obs

17 16.412
+ 670
17 1708
16 38.56
+ 38.52

48 28.20 − 31659 2.50050 ~ 0.97110n
− 9.36 − 419.39 2.62262 ~ 1.09322n
48 18.84

48 32.82
− 12.39
48 20.43

+91
34 29.57 34 27.91

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1885phae.proj.1621

June 2 1885 ccc obs.

ζ Bootis	λ Bootis	Θ Bootis
h m s		
14 5 9	14 12 1	14 21 17
+25 38	+46 37	+52 23

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1885phae.proj.1621

June 3, 1885

Polaris

h m s

13 16 36

+91 18

88 41 32

−48 55

8.35837m

−43.80

− .75

+ .14

+ .00

20	11.5					
	14	43.5	47.5	57.5	14	47.50
22	12.3	15	12.4	17.5	23.1	15	17.67
			37.0	44.4	52.3	15	44.57
		16	8.2	14.0	24.5	16	15.53
			38.4	43.5	52.5	16	44.80
		17	9.1	14.5	21.5	17	15.03
			43.0	48.1	54.9	17	48.67
		18	8.6	14.8	20.7	18	14.70
			39.1	44.0	57.2	18	44.77
		19	11.3	16.9	23.3	19	17.16
			40.7	47.5	53.4	19	47.20

17 16.140
+ .670
17 16.91
16 34.28 −32.17
+ 2.63 − 6.13
36.441
− 2.84
−41.14
16 35.77

48 21.52 − 175.36 2.24393m 0.71453m
− 5.18 − 296.16 2.47153m 0.94213m
48 16.34

48 25.45
− 8.75
48 16.70

+91
34 32.01 34 31.65

−48 54 25 −4854 21
1.81910
− 201
1.81709

+6563	+6563
+ 38	+ 109
+ 14	+ 14
+6615	+6686
+91 35 38.16	35 38.51
+91 35 38.34	

+ 51	−17 11.92
35 38.8	+ .51
18 28.2	− 12.0
−17 10.6	−17 23.41
18 16.19	18 14.93
	41 45.07
	− .83
	44.24

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1885phae..proj.1621

June 3 1885 9.95500

d Bootis +.48
14 5 9 +.29
+25 38
+16 45

4 Urs. Min +.74
14 9 18 −.58
+78 6
−35 43

λ Bootis +1.06
14 12 1 −.07
+46 37
−4 14

O Bootis +1.30
14 21 17 −.17
+52 23
−10 0

6 9.5 122 138 153 168
5 38.9 43.5 41.0 43.3 43.3 43.3 45.5 43.4 48.0 43.2 50.1 43.3 52.5
5 72 595 1.7 4.0 6.4 1.760 − 18.301
10 38.7
9 12.0 160 188 224 25.9 1902 193 35.74 456 22.4 52.38 49.3 25.7 918 52.3 29.0 55.7 822 35.72 59.0 52.38
290 325 35.7 39.2 42.3 3574 13 124 154 179 196 219
50 77 106 136 16.7 1072 526 556 585 18 47 5864
12 228 25.4 28.6 31.6 34.6 3745 40.7 43.7 46.6
21 54 72 10.0 13.0 16.0
17.0 20.4 23.9 27.2 30.6 2382 112 14.5 18.0 21.3 246 1792
21 37.5 40.8 44.1 47.6 50.6 54.0 57.7 1.0 4.4
676 6 13.52
22 5 43.461
5 43.314
10 38.70
22 62 9.3 12.5 15.7 918 872 13 1744
6936 12 34.680
3118 12 34.644
516 21 10.32
10174 21 50.870
4577 21 50.856

5 43.403 −.017 5 43.39 5 11.23 + 32.16 9.258
−32.21 +.07 −1.97 −34.11 5 9.28
9 52408 −.074 9 52.33 9 2081 + 31.52 18.654
−32.22 +.66 −2.16 −33.72 9 18.61
12 34.662 −.022 12 34.64 12 2.55 + 32.09 0.694
−32.22 +.15 −1.86 −33.93 12 0.71
21 50.863 −.025 21 50.84 21 18.80 + 32.04 16.907
−32.22 +.18 −1.89 −33.93 21 16.91

9.95500
26 29.35 3.85 −30.12
1.47885
+ 35.16 27 4.51
1.54608
+ 22.02 −46.29
9.31430
1.66549
27 55.75 −42.78
+ 38.05 28 33.80
1.09202
9.83688
1.63124
43 12.98 −32.04 42 40.94
+40.54
9.78560
1.60788
1.50571

0 37.98 + 12.36 0 50.34
+25 43.84 55 41.34
+16 43 46 1.2 38.20 − 73 1.23747
−17.28 − .19 + .06 − 17.41
+25 55 23.93 26.43
+78 21 58.01
−35 41 56 1.61650 − 65 1.61585
+41.29 − .23 + .02 +41.08
+78 22 39.09
+46 54 14.55
−4 14 50 0.63110 − 57 0.63053
+4.27 − .50 + .12 +3.89
+46 54 18.44
+52 48 7.41
−9 59 33 1.00630 − 41 1.00589
+10.14 − .43 + .13 +9.84
+52 40 17.25

− .20 −17 11.92 55 23.7 62 − .20 38 14.4 − 1.9 −17 9.3 ⇔ 14.02 38 11.8 38 12.47 38 12.41
+ .39 −17 11.92 22 39.5 + .39 5 27.7 − 11.1 11.8 −17 22.63 5 16.60 5 16.46
+ .05 −17 11.92 54 18.5 + .05 37 6.7 − 6.5 11.8 −17 18.37 37 0.17 37 0.07
+ .12 −17 11.92 40 17.4 + .12 23 5.0 − .74 12.4 −17 16.20 22 57.56 22 58.05

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1885phae.proj.1621...

June 3. 1885
9.93367

+60

Q Bootis
h m s +.20
14 26 52
+30 52
+11 31

27 26.8 24 27 170
28.6 50 19.5
30.7 7.5 21.8
32.3 98 24.1
34.4 120 734
36.7 29.1
41.0 31.5
43.3 33.7
45.7 36.8
48.1
50 64574

1895 5308 2130
27 31.58 27 26540 27 26625

27 26.588
−.018
27 26.57
26 5445 −.3223
+3212 +.08
52.436
−.201
−34.16
26 52.41

9.93367
12 38.35 −499 0.69810
+ 5.55 0.74400
12 43.90

+31
10 4.45

+11 29 52
1.06840
− 25
1.06815

−11.70
− .01
+ .10
−11.61
+31 9 52.84

June 3
Reg −17 10.6
11.8
11.8
11.8
12.4
13.1
−17 11.92

− .14 −17 11.92
9 52.7 − .14
52 39.6 − 3.6
13.1 15.66
52 35.96 52 37.18

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1885phae..proj..1621.

June 8 1885 888133

43 McCaffrey

h m s
12 53 11
+94 21
85 38 10

O Booth

h m s
14 21 17
+52 24
−10 1

June 8

Assumed Req = −17 11.00

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1885phae.proj.1621

June 9 1885 8.35847 m

−4379

Polaris
h m s
13 16 36
+91 18
88 41 31
−48 55

−.75
+.05
+.00

9	5 90	14	20.7	21.7	22.6	14	21.67	+3	0.70	17	22.37
			47.3	53.2	59.1	14	53.20	+2	3058		23.78
18	6.2	15	16.6	20.6	24.8	15	21.67	+2	0.47		22.14
			49.4	56.0	7.3	15	55.5	+1	30.35		25.85
		16	14.2	21.5	30.7	16	22.13	+1	0.23		22.36
			46.1	53.2	1.0	16	53.43	+	3012		23.55
		17	22.2	25.3	29.7	17	25.73				25.73

17 23.93
+.70
17 24.36
16 44.39 −35.85
+40.02 −2.19
36.41
−7.90
−45.94
16 38.42

48 2.08 +44469 2.64886 1.11876
13.14 − 42.51 1.62849 −0.09919
48 15.22

48 5.00

+91
48 16.28 34 33.13 34 39.32
− 1.25
48 15.03 −48 54 44 −48 54 30
1.81910
− 101
1.81809

+65.78	+65.78
+ 2.46	+ .02
+ .15	+ .16
+68.39	+65.96

+91 35 41.52 35 39.28
+91 35 40.40

+ 57	−17 10.63
35 40.9	+ .52
18 29.1	− 12.9
11.8	−17 23.01
18 16.19	18 17.39
	41 4.261
	− 83
	41.78

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1885phae.proj.1621.

June 9 1885

	d Bootis		4 Urs. Min.		Gr. 2164		β Bootis	
Header	+48 / h m s +.29 / 14 5 8 / +26 38 / +16 45		+4.74 / −.58 / 14 9 19 / +78 5 / −35 42		+1.72 / −.30 / 14 48 29 / +59 46 / −17 23		+.86 / +.03 / 14 57 36 / +40 51 / +1 32	
Readings	5 28.4, 30.2, 32.8, 34.6, 35.3 / 24.2, 26.4, 28.7, 31.0, 33.2 2870 / 06, 30, 53, 75, 97.5 22	5 38.0, 40.0, 42.5, 44.8, 47.0, 49.2, 51.6, 53.9, 56.2 / 10 48.5, 55.8, 36, 92, 15.4	9 16.2, 19.7, 23.3, 26.3, 29.9 2308 / 22.6, 25.7, 29.3, 32.8, 36.0 2928	32.7, 35.9, 40.6, 43.0, 46.2 3968 / 3968 49.6, 5624 53.0, 1286 56.2, 59.6, 2.8 5624	48 16.6, 19.7, 24.6, 27.3, 30.2 / 28.2, 32.4, 36.4, 40.4, 44.4 3636 / 33.6, 37.7, 41.8, 45.7, 50.0 4176	48 52.9, 56.8, 10, 5.3, 9.0, 13.0, 17.5, 21.2, 25.3	57 42.8, 44.6, 46.4, 48.2, 51.0	47.8, 50.6, 52.9, 55.9, 58.5 5314 / 31.3, 34.0, 36.7, 39.4, 42.0 3668	58 4.1, 6.7, 9.3, 12.0, 15.0, 17.7, 20.4, 23.1, 25.7
Means	1608 / 5 32.16 / −9392 / 5 46.960	4232 / 5 47.022 / 3125 / 11 2.50		61, 96, 13.1, 16.1, 19.4 1286 / 1184 / 48 23.68	13812 / 49 9.060	6220 / 49 9.111 / 2330 / 57 46.60	14982 / 58 14.910	1340 / 58 14.889
Reduction		5 46.991 / −.017 / 5 46.97 / 5 11.18 / +35.79 / 9.258 / −35.90 / +.02 / −1.92 / −37.80 / 5 9.17	9 56.228 / −.074 / 9 56.15 / 9 20.31 / +35.84 / 18.654	−35.90 / +.24 / −1.66 / −37.32 / 9 18.83	49 9.085 / −.031 / 49 9.05 / 48 33.23 / +35.82 / 31.277	−35.93 / +.09 / −1.95 / −37.79 / 48 31.26		58 14.900 / −.020 / 58 14.88 / 57 38.90 / +35.98 / 36.61 / −35.94 / +.04 / −2.04 / −37.94 / 57 36.94
Logs	27 23.20 / −17.31 / 27 5.89 / +14.83	9.95500 / 1.17114 / 1.238 37 / 0 32.10 / +17.72 / 0 49.82 / −66.27	9.31490 / 1.82132 / 1.24845	20 32.98 / −29.53 / 20 3.45 / +45.40	9.70202 / 1.65706 / 1.470 31	15 16.02 / −27.72 / 14 48.30 / +28.30	9.87877 / 1.45179 / 1.44279	
Declination	+25° / 55 42.46 / +16 44 37 / 1.23860 / +14 / 1.23874 / −17.33 / −.05 / +.12 / −17.26 / +25 55 25.20	+78 / 21 58.53 / −35 42 14 / 1.61660 / +28 / 1.61688 / +41.39 / −.49 / +.02 / +40.92 / +78 22 39.45		+60 / 2 44.90 / −17 22 13 / 1.25560 / +113 / 1.25673 / +18.06 / −.49 / +.02 / +17.59 / +60 3 2.49		+41 / 8 0.05 / +1 32 30 / 0.19020 / +143 / 0.19163 / −1.55 / −.22 / +.01 / −1.76 / +41 7 58.29		
Final	−.20 / 55 25.0 / 38 15.3 / −17 9.7 / 38 12.47	−17 10.63 / −.20 / −2.8 / −17 13.63 / 38 11.57	+.40 / 22 39.8 / 5 28.9 / 10.9 / 5 16.60	−17 10.63 / +.40 / −12.3 / −17 22.53 / 5 16.92	+.21 / 3 2.7 / 45 52.5 / 10.2 / 45 42.30	−17 10.63 / +.21 / −10.2 / −17 20.62 / 45 41.87	−.02 / 7 58.3 / 50 47.9 / 10.4 / 50 40.66	−17 10.63 / −.02 / −7.2 / −17 17.85 / 50 40.44

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June 9 1885 9.94839

+.52

ν Bootis

h m s +.26

14 59 30

+27 23

+16 0

0 235
25.7
28.1
29.6
31.5

232
25.5
27.8
30.0
325 2780
−18.582

0 93 70
92 92
92 115
90 136
90 160
91 184

1384 8
1 2768 0 9218 0 9.133

0 9.175
−.017
0 9.16
59 23.21 −3594
1 35.95 +.03
31.074
−2.14
−38.05
59 31.11

9.94839
41 8.38 −18.50 1.267717n
+ 21.27 1,32779
41 29.65

+27
41 1870

+14 58 22
1.18750
+ 143
1.18893

−15.45
− .07
+ .06
−15.46
+27 41 3.24

June 9
Reg − 17 11.8
9.7
10.9
10.2
10.4
10.8
−17 10.63

− .18 −17 1063
41 3.1 − .18
23 52.3 − 4.8
10.8 −17 1561
23 4752 23 4743

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June 10 1885

43 Comae +.54
h m s +.24
13 6 30
+28 28 +.00
+13 55 +.00

8.35847m
Polaris -4379
-.75
13 16 36
+91 18
88 41 31
-48 55

6	398	448	6	586	10	55.7	12	44.2	483	38.7	12	30.40	+4	3105	17	21.45
	415	471		12	(12	25.5)	13	16.6	22.0	26.2	13	22.27	+4	0.94		23.21
	431	495		35	17	40.3		46.6	62.9	58.3	13	52.60	+3	3082		23.42
	450	518		58			14	16.5	22.5	29.0	14	22.67	+3	6.70		23.37
	474	540 +944		81				48.0	63.6	69.7	14	53.47	+2	3058		23.25
				104			15	16.2	22.2	28.7	15	22.37	+2	047		22.84
		22.1		128				46.5	57.5	63.1	15	52.34	+1	3035		22.72
		24.4		152			16	18.3	25.1	30.4	16	23.64	+1	0.23		23.90
		26.8		175				43.0	57.0	59.8	16	51.24	+	30.12		21.39
		29.2					17	18.3	23.3	31.2	17	24.27				24.27
		316 2682														
	2168	13626		6131												
6	4336	7 8130	7	8122												

7 8.126
-.015
7 8.11
6 31.96 -3622
+ 36.15 +.00
30.406
-1.55
-3777
6 30.34

17 23.092
+ 670
17 23.76
16 45.32 -3622
+ 38.44 .00
36.441
-8.88
-45.10
16 38.66

9.94404

38	8.18	+2477	1.39.393	48	2.08	+38739	2.58815	1.05885			
	-28.20		1.45020m		+ 11.45	+297.59	2.47362	0.94432			
37	3998			48	13.53	- 17.21	1.23578	9.70648m			
				48	3.32						
					+ 8.80						
				48	12.12						
+28							+91				
	45 8.37			48	12.25		34 34.82	34 36.23	34 36.61		
					- .51						
+13	55 22			48	11.74		-48 54 44	-48 54 43	-48 54 34		
	1.15460						1.81910m				
	-692						- 640				
	1.14768						1.81270				
	-14.05						+64.97	+64.97	+64.97		
	- .14						+ 1.87	+ 1.10	+ .00		
	+ .16						+ .15	+ .15	+ .16		
	-14.13						+66.99	+66.22	+65.13		
+28	44 5424						+91 35 41.81	(35 42.45)	35 41.74		
							+91 35 41.74				
	- .17	-17 11.87					+ .52	-17 11.87			
	44 54.1	- .14					35 42.3	+ .52			
	27 43.0	- 2.3					18 29.2	- 13.0			
-17	11.1	-17 14.34					13.1	-17 24.35			
	27 40.74	27 39.90					18 16.19	18 17.42			
								41 42.58			
								- .83			
								41.75			

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d Ol Boots +48
h m s +.29
14 5 9
+25 38
+16 45

4 Urs. Min. +4.74
14 9 19 −.58
+48 5
−35 42

λ Boötis +1.06
14 11 59 −.07
+46 37
−4 14

Θ Boötis
14 21 15
+52 23
no obs.

5	182	246	5	384	7	462	9	165	8	331	12	31		86	12	267			
	200	270		406		546		202		370		58		116		297			
	217	292		430		17		237		403		77		148		327			
	232	314		452		122		264		433		91		175		357			
	248	338	2920	474		175		297	2330	466	4006	110		206	1462	387			
				498					4006							417			
		11		522				232	5708	504				368		446			
		33		544				266	5708	537				397		477			
		57		566				296	1330	574				26		507			
		80						334		02				55					
		1035	568					368	2992	37	5708			87	2366				
										66		367			7728		3482		
5	1079	9488		4276		3122				101	12	7.34	12	38640		12	38689		
5	21.58	5	47.440	5	47.511	8	2.44			133									
										167									
										198	1330								

			5	47.475			9	56.732							12	38.664			
				−.017				−.074								−.022			
			5	47.46			9	56.66							12	38.64			
			5	11.17		−36.26	9	20.23		−36.26					12	2.44		−36.26	
			+	36.29		+.00	+	36.43		.00					+	36.20		+.00	
				9.258				18.654								0.694			
						−1.91				−1.58								−1.75	
						−38.17				−37.84								−38.01	
					5	9.29			9	18.82							12	0.63	

			9.95500					9.31490							9.83688				
27	35.52	+2590	1.41330	1	1878	+11429	2.05801	29	0.25	+3132	1.49582	43	828						
	−30.24		1.48053$_n$		−3056		1.48514$_n$		−27.86		1.44493$_n$								
27	5.28			0	48.22			28	3239										

+25				+78	0.13			+46											
	55	43.07			22	57.63			54	15.96									
	+16	44 50			−35	41 25			−4	13 46									
	1.23870				1.61640$_n$				0.62940$_n$										
	−434				−421				−408										
	1.23436				1.61219				0.62532										
	−17.15				+40.94				+4.22										
	−.15				−1.45				−.27										
	+.13				+.07				+.20										
	−17.17				+39.56				+4.15										
+25	55 25.90			+78	22 37.19			+46	54 20.11										
					37.19														

	−.20	−17	11.87		+.40	−17	11.87		+.05	−17	11.87								
−	55 25.7	−	.20		22 37.6	(40)	+.40		54 20.2	+	.05								
	38 15.5	−	3.0		5 29.1	−	1.25		37 8.2	−	8.0								
	10.2	−17	15.04		8.5	−17	23.97		12.0	−17	19.82								
	38 12.47	38	10.83		11.0	5	15.72		37 0.17	37	6.29								
				5	1660														

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1885phae.proj.1621

June 10, 1885 9.93367 9.98083

Q Boötis +.60 +.20

h m s
14 26 52
+30 52
+11 31

TT Boötis +.30 +.43

14 35 19
+16 54
+25 29

28 29
50
68
86
104

36 250
26.7
28.9
30.2
31.6

37 106
128
150
172

37 5.00 5.80
52.8 49.9
64.8 58.0

19.3 14980
−17.244

49.967
−19.223

337

1424

28 6.74 27 30.744 36 28.48 35 57.736

27 30.744
−.018
27 30.726
26 54.39 −36.27
+36.34 +.00
52.436

35 57.736
−.016
35 57.72
35 21.42 −36.28
+36.30 +.00
19.285

−1.95
−38.22
26 52.57

−2.14
−38.42
35 19.30

9.93367 9.98083

12 3.02 −36.00 1.55630n 89 45.60 −30.74 1.48770n
+48.01 1.60220 +38.09 1.58076
12 48.03 90 23.69

+31°
10 5.32

+17
12 24.66

+11 29 17
1.06830
−.355
1.06475

+25 27 0
1.43770
−.301
1.43469

−11.61
−.31
+.10
−11.82

−27.21
−.15
+.24
−27.12

+31 9 53.50 +17 11 57.54

June 10
Reg = −17 11.1
13.1
10.2
11.0
12.0
12.4
13.3
−17 11.87

−.14 −17 11.87
9 53.4 −.14
52 41.0 −5.0
−17 12.4 −17 17.01
52 35.96 52 36.49

−.30 −17 11.87
11 57.2 −.30
54 43.9 −1.9
13.3 −17 14.04
54 41.96 54 43.47

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1885phae.proj.1621

June 11 1885

+.54

43 Comae

h m s +24

13 6 30

+28 27 +04

+13 56 +60

8.358417 n

−4379

Polaris

−.475

13 16 36

+91 18

88 41 31

−48 55

6	536	450	6	590	10	140	14	19.5	225	28.7	14	28.57
	553	472		15				52.6	59.0	5.9	14	59.14
	570	496		37	(11 | 450)	15	20.0	25.0	31.7	15	25.57
	586	520		61				53.0	59.2	7.2	15	59.80
	04	545 4966		84	12	540	16	22.8	28.6	33.5	16	28.30
				10.8				57.2	55.5	58.2	16	53.97
		224		13.1	13	32	17	20.6	28.2	33.3	17	27.34
		248		155				52.1	58.0	22	17	57.43
		272		17.8			18	18.2	25.6	32.6	18	25.37
		295						52.8	58.6	5.3	18	59.23
		21.82714					19	19.5	27.1	33.0	19	26.53
								53.8	57.3	2.5	19	56.87
	2852	13680		6159			20	20.6	26.0	33.4	20	26.67
6	57.04	7 8.400	7	8.433								

7 8.416

−.018

7 8.40

6 31.95 −36.51

+ 3645 + .02

30.406

−1.574

−38.03

6 30.37

17 23.835

+.670

17 24.50

16 46.30 −36.57

+ 38.20 − 1.75

36.441

− 986

−48.12

16 36.38

9.94410

37 51.92 +11.38 1.05614

− 12.96 1.11247n

37 38.96

48 1.98 +129.83 2.63330 1.10400

+ 12.71 +338.84 2.52999 1.00069

48 14.69 +269.83 2.43109 0.90179

+260.64 2.41604 0.88674

48 3.48

+ 10.02

48 13.50

48 5.28

+ 7.97

48 13.25

+28

45 9.39

+13 55 6

1.15440

− 939

1.14501

−13.96

− .03

+ .14

−13.85

+28 44 5554

+91

34 33.66 34 34.85 34 35.10

−48 54 44 −48 54 43 −48 54 41

1.81910n

− 824

1.81086

+6469 +6469 +6469

+2.30 +1.43 + .91

+ .15 + .15 + .15

+6.74 +6.27 +6.75

+91 35 40.80 (34 41.72) 35 40.85

+91 35 40.82

− .17 −17 12.43

44 55.4 − .17

27 43.2 − 3.5

−17 12.2 −17 15.10

27 40.74 27 40.44

+ .52 −17 12.43

35 41.3 + .52

18 29.2 − 13.0

12.1 −17 24.91

18 16.19 18 15.91

41 44.09

− 83

43.26

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69 H Urs. Maj. +1.77 −.31	17 H Can. Ven. +.78 +.08	d Q Bootis +48 +.29	Gr. 2164 +1.72 −.30
h m s 13 24 12 +60 32 −18 9	13 29 39 +37 46 +4 37	14 5 9 +25 38 +16 45	14 48 29 +59 46 −17 23

25 131	24 348	29 512	516	30 74	5 264	249	5 386	48 268	286	48 534	
154	386	536	544	10.0	29.6	27.1	409	289	327	574	
180	429	557	570	12.6	31.9	29.4	432	330	36.5	14	
213	475	573	597	15.3	33.2	31.7	454	36.0	410	54	
242	514	594	22 5698	17.8	34.3	34.0 2942	477	399	450 3676	95	
	55.7			20.3			50.0			13.7	
	59.7		335	23.2		14	52.2		342	17.8	
	4.1		360	25.7		37	544		383	220	
	8.3		386	28.2		60	56.7		423	260	
			412			82			465		
			439 3864			10.6 5.98			505 4236		
920	4630	2772	1556.2	1605	1554	9540	4291	1646	1391.2	6266	
25 1840	24 51.444	29 55.44	30 17.810	30 17.833	5 3108	5 47.700	5 47.678	48 32.92	49 9.560	49 9.622	

24 51.444		30 17.821		5 47.689		49 9.591	
−031		−020		−017		−031	
24 51.41		30 17.80		5 47.67		49 9.56	
24 15.08	−08 −36.51	29 41.24	−36.51	5 11.16	−36.30	48 33.19	−36.49
+ 36.33	+ .07	+ 36.56	+ .03	+ 36.51	~~+ .02~~	+ 36.37	+ .07
13.831		39.641		9.258		31.277	
	− 1.25		− 1.60		− 1.90		− 1.91
	−37.69		−38.08		−38.38		−38.33
	24 13.72		29 39.72		5 9.29		48 31.23

		9.69189			9.89791			9.95500		9.70202
33 2.32	−26.96	1.43072n	19 30.10	+22.38	1.34986	27 22.50	+16.61	1.22037	20 23.40 +36.67	1.56431
+ 17.17		1.23484	− 22.91		1.36000n	− 19.39		1.28760n	+ 23.91	1.37856n
33 19.49			19 7.19			27 3.11			19 59.49	

+60°	+38	+25	+60
49 28.86	3 41.16	55 45.24	2 48.86
−18 9 44	+4 36 44	+16 44 36	+17 22 23
1.27620n	0.66700	1.23860	1.25570
− 767	− 710	− 569	− 400
1.26853	0.65990	1.23291	1.25170
+18.56	− 4.57	− 17.10	+17.85
− .17	− .13	− .06	− .32
+ .15	+ .22	+ .12	+ .02
+18.54	− 4.48	− 17.04	+17.55
+60 49 47.40	+38 3 36.68	+25 55 28.20	+60 3 6.41

+ .22	−17 12.43	− .06	−17 12.43	− .20	−17 12.43	+ .21	−17 12.43
49 47.6	+ .22	3 36.6	− .06	55 28.0	20	3 6.6	+ .21
32 33.8	− 10.2	46 23.8	− 5.3	38 15.7	− 3.2	45 53.0	− 10.7
−17 13.8	−17 22.41	12.8	−17 17.79	12.3	−17 15.83	13.6	−17 22.92
32 23.61	32 24.99	46 18.53	46 18.89	38 12.47	38 12.43	45 42.30	45 43.49

.37

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June 11 1885

B Books +86

h m s +.03
14 57 36
+40 51
+1 32

57 430	481	58	4.5
450	509		7.2
470	535		100
492	562		128
512	590	5354	154
			180
	318		209
	343		235
	371		263
	400		
	42737	18	
2354	15072		1386
57 4708	58 15360	58	15400

58 15380
— 020
58 15360
57 3889 −36.49
+ 3649 +.03
38861

−2.03
−38.49
57 36.87

9.87877

15 1408 +28.30 1.45179
— 2772 1.44279
14 4636

+41
8 1.99

+1 32 28
0.19020
— 350
0.18670

— 1.54
— 27
+ .04
— 172
+41 8 0.27

— 0.2 −17 12.43
8 0.2 — .02
50 484 — 77
11.6 −17 28.15
50 40.66 50 40.12

June 11
Reg − 17 12.2
12.1
12.8
12.3
13.6
11.6
−17 12.43

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1885phae.proj.16211

June 13 1885 8.35847m

−4379

Polaris

h m s

13 16 36

+91 18

88 41 31

−48 55

− .75

+ .05

+ .00

13	88		14	20.9	265 31.6	14 26.33
				5.00	53.8 0.5	14 55.43
20	41.7		15	22.5	26.8 31.2	15 26.83
				52.0	57.6 1.7	15 57.10
			16	20.4	27.0 32.0	16 26.57
				50.6	53.7 57.7	16 53.33
			17	20.0	27.5 32.4	17 26.63
				51.4	57.2 4.3	17 57.63
			18	22.2	27.0 31.6	18 26.93
				49.7	55.6 2.2	18 55.83
			19	20.8	26.5 35.3	19 27.53
				52.9	58.0 3.7	19 58.20
			20	28.5	27.5 32.9	20 27.97

17 26.792

+ 6.40

17 27.46

16 48.22 −37.29

+ 39.24 − 2.19

36.441

− 11.78

−51.26

16 86.20

48 2.50 +257.99 2.41160 0.88230

−194.91 2.28983m 0.76053m

48 37.5

+ 7.63

48 11.38

+91°

48 17.90 34 36.97 34 36.21

− 5.76

48 12.14 −48 54 42 −48 54.28

1.81910m

− 1413

1.80497

+6382 +6382

+ .83 + .47

+ .15 + .16

+6480 +6445

+91 35 41.77 35 40.66

+91 35 41.22

+ .52 −17 12.18

35 41.7 + .52

18 29.4 − 13.2

−17 12.3 −17 24.86

18 16.9 18 16.36

41 43.64

− .83

42.81

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1885phae.proj.1621

June 13 1885 9.69189

69 Ursae Majoris +1.77

h m s
13 24 12
+60 82
−18 9

−.31

17 Can. Ven. +.78

13 29 39
+5446
+4 37

+.08

α Bootis

14 5 9
+35 38

no obs

π Bootis pr +.39

14 35 19
+16 55
+25 28

+.43

S 25 17.2
20.7
23.5
26.4
29.1

24 35.5
39.5
43.8
48.0
52.0
56.3

29 45.3
47.4
49.2
51.1
52.7

52.5
55.0
57.8
0.3
38 57.8

30 8.1
10.8
13.3
15.9
18.6
21.2

35 57.0
58.3
0.0
1.3
2.6

37.3
39.4
41.5
43.6
45.8 41.52

35 50.0
52.3
54.4
56.7
58.9
1.0

17.2
20.7
23.5
26.4
29.1 23.38

4.7
8.9

34.1
36.7
39.3
41.9
44.5 39.30

23.7
26.3
28.9

11.7
13.8
16.0
18.0
20.2 15.94

3.2
5.3
7.3

46.92 2457 15698 1668
25 23.38 24 52.133 29 49.14 30 18.490 30 18.533

29.92 11746 5291
35 59.84 35 58.730 35 58.789

24 52.133
− .031
24 52.10
24 15.02 −08 −37.28
+ 37.08 + .09
16
13.831

30 18.511
− .020
30 18.49
29 41.21 −37.28
+ 37.28 + .04
39.641

35 58.759
− .016
35 58.74
35 21.40 −37.25
+ 37.34 + .01
19.285

−1.19
−38.38
24 13.72

−1.57
−38.81
29 39.68

−2.12
−39.36
35 19.38

9.69189

32 58.75 −31.25
+ 19.91
33 18.66

1.49485
1.29897

19 37.30 +29.37
− 30.06
19 7.24

9.89791

1.46790
1.47804

9.98079

10 22.60 −1.08 0.03342
+ 1.34 0.12644
10 23.94

+60
49 29.69

−18 9 47
1.27620
− 1391
1.26229

+18.29
− .22
+ .15
+18.22
+60 49 47.91

+38
3 41.11

+4 36 51
0.66720
− 1371
0.65349

−4.50
− .23
+ 23
−4.50
+38 3 36.61

+17
12 24.41

+25 27 37
1.43790
− 1470
1.42620

−.2668
− .02
+ .02
−.2666
+17 11 57.75

+ .22 −17 12.18
49 48.1 + .22
32 34.1 −10.5
140 − 22.46
32 23.61 32 25.45

− .06 −17 12.18
3 36.6 − .06
46 24.1 − 56
12.5 −17 17.84
46 18.53 46 18.77

− .30 −17 12.18
11 57.4 − .30
54 44.4 − 2.4
13.0 −17 14.88
54 41.86 54 42.87

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Gr. 2164 +1.72

h m s −.30
14 48 29
+59 46
−17 23

B Booths 9.87877 +.86 +.03

14 57 36
+40 67
+1 32

48 Tc Cephei −41.444 −.87

15 5 46
102 41
77 19
−60 18

Z Booths +.87 +.02

15 26 46
+41 13
+1 10

48 244 27.5 31.2 34.3 36.8
295 33.6 37.5 41.6 45.7 3758
48 539 58 499
580 522
20 540
62 55.6
10.3 57.7
14.4 18.6 22.7 26.7
349 39.0 42.9 47.0
51.34302

58 404 37.7
434 37.9
58 37.800
−21.813

3 435 492 02 6.3 16.15906
5 464 494 524 550 585 5234
7 50 70 10.1 165 245 26.7
485 516 547 58.1 11 5480
18 48 8.0 11.0 143798
26 570 58.7 04 30 45
798 23.72 39.18
175 205 237 269 30.0 2372
330 363 392 422 45.2 3918
3036 0.72

0.0 2.7 5.4 8.2 11.0 546
27 163 19.2 21.8 24.6 27.2 30.0 32.8 35.5 38.4
437 464 492 520 547 4920
5466 27 27330
2458 27 27311

1542 48 3084
14060 49 10300
6328 49 10311
2694 58 5388
58 15987 3 5906 7 14.97

49 10.305 −.031 49 10.27 48 33.15 + 3.12 31.277
−37.24 +.09 −1.87 −39.02 48 3.125

58 15.987 −.020 58 15.97 57 38.87 + 37.10 36.861
−37.23 +.04 −2.01 −39.20 57 36.77

5 23.604 +.070 56 23.67 5 46.13 + 37.54 45.727
−37.23 −.22 −0.40 −37.85 5 45.82

27 27.311 −.020 27 27.29 26 60.09 + 37.20 47.942
−37.22 +.04 −2.15 −39.33 26 47.96

9.70202 20 27.30 −.23 20 1.57 +39.46 1.59616 1.41041
14 8.15 + 37.11 14 45.26 −37.89 1.57852

9.87877 1.56952

9.34156 25 34 2.20 + 24.04 25 26.24 −111.37 1.92706 2.04677 1.38085 1.50056
52 20.80 − 25.90 51 54.90 +26.57 1.42472 1.41330

9.87635

25 52.75 − 31.66 25 21.09

+50° 2 46.78 −17 22 19 1.25560 −11.50 1.24410
+41 8 3.09 +1 31 22 0.18510 −11.28 0.17382
+102 57 22.11 −60 17 44 2.00251 −11.00 1.99151
57 17.26 −60 16 53 2.00228 1.99128
+41 30 53.45 +1 9 35 0.06670 −10.18 0.05652

+17.54 −.37 +.02 +17.19 +50 3 3.97
−1.49 −.39 +.20 −1.68 +41 8 1.41
+9806 +.83 +.00 +98.89 +102.59 1.00 58 56.76
+9801 +.45 +0.04 +99.50 58 56.76
−1.14 −.20 +.11 −1.23 +41 30 52.22

+.21 3 4.2 45 53.4 −17 12.18 +.21 −1.11 −17 23.07 45 42.30 45 40.90
−.02 8 1.4 50 48.8 126 −17 12.18 −.02 −8.1 −17 20.30 50 40.66 50 41.11
+.61 58 57.4 41 38.8 44 [224]
−.01 30 52.2 13 40.3 11.9 13 31.81 −17 12.18 −.01 −8.5 −17 20.69 13 31.53

June 13
Reg −17 12.3
12.5
13.0
10.8
12.6
11.9
−17 12.18

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June 14 1885 8.35847

−43.79

Polaris

h m s

13 16 36

+91 18

88 41 31

−48 55

− .75

+.06 .04

+.00

9	12.6	14	20.6	27.2	32.7	14	26.83
			53.0	58.2	5.5	14	58.90
(11	49.2)	15	20.6	27.4	33.2	15	27.07
			57.4	58.0	4.0	15	57.80
12	57.4	16	21.4	28.0	33.8	16	27.83
			53.0	57.3	2.4	16	57.57
(20	55.0)	17	24.2	29.2	34.7	17	29.37
			52.5	57.3	5.4	17	59.07
		18	22.6	27.0	34.0	18	27.84
			57.8	57.0	35	18	57.43
		19	28.3	27.6	34.8	19	28.57
			52.5	57.5	4.0	19	56.80
		20	20.7	26.2	34.9	20	26.93

17 27.88
+ .70
17 28.46
16 49.10 −37685
+ 39.36 − ~~2.63~~ 1.75
36.441
− 1266
− 52.95 .06
16 ~~35.51~~
36.40

47	57.60	+ 495.19	2.69477	1.16547
+	14.64	+ 338.59	2.52967	1.00067
48	12.24	+ 270.39	2.43199	0.90269
		− 207.21	2.31641	0.78711

48 1.30
+ 10.01
48 11.31

+91

48	2.18	34	36.11	34	37.04	34	38.18	34	38.87
+	7.99								
48	10.17	−48	54 48	−48	54 45	−48	54 44	−48	54 30
		1.81920		1.81920		1.81910		1.81910	
		− 2239							
48	15.60	1.79681		1.79681		1.79671		1.79671	
−	6.12								
48	9.48	+ 6263		+ 6263		+ 6262		+ 6262	
		+ 3.05		+ 1.43		+ .91		+ .53	
		+ .15		+ .15		+ .15		+ .16	
		+ 6583		+ 6421		+ 6368		+ 6331	
		+91 35 41.94		(35 41.25)		35 41.86		(35 42.18)	
		+91 35 41.90							

+ 52	17 12.78
35 42.4	+ 52
18 29.4	− 132
13.0	17 25.46
18 16.9	18.1644
	42.56
	− 83
	42.73

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69 Urs. Maj. +1.77

h m s
13 24 12
+60 32
−18 9

−.31

25 154
191
214
240
282

1081
25 2162

17 76 Cam. Nhu. +5.78

13 29 39
+37 46
+4 37

+.08

24 358
394
440
484
525
567
08
52
92

47.25
24 52500

29 517
534
556
582
598

2787
29 55.74

528
553
580
06
32.5798
346
370
397
422
450 39.970

15768
30 18.840

30 85
110
137
163
189
214
241
267
293

1699
30 18.878

43 40
57
92
111
130

430
43 8.60

y Urs Maj. +1.19

13 42 59
+49 53
−7 30

−.13

76
109
140
173
205 1406
588
18
54
82
118 520

7926
43 39.630

43 269
300
332
365
396
430
461
492
525

3570
43 39.667

49 242
259
276
290
8

1293
49 25.86

226

m Bootis +.34

13 49 12
+18 58
+23 23

+.40

30.2
324
347
368
390 3462
51
73
95
118
139 952

7414
49 52.070

49 43.3
455
476
499
520
541
564
586
08

4682
49 52.022

24 52500
−031
24 5247
24 1449
+3748
13831

−37685
+.007
−1.16
−38.7×4
24 13.7×3

30 18.859
−020
30 1884
29 4120
+3764
39.641

−37685
+.053
−1.56
−39.1×8
29 39.6×6

43 39.648
−023
43 3962
43 202
+3760
0.546

−376×6
+.045
−1.47
−39.0×8
43 0.53×4

49 52.046
−016
49 5203
49 1442
+3761
12.547

−376×6
+.021
−1.87
−39.52
49 12.57

9.69189

32 5960 −2912
+18.55
33 18.15

1.46419n
1.26831

19 3020 +23.12
−23.87
19 6.53

9.89791

1.36399
1.37413n

12 4390 +31.05
−2591
12 17.99

9.80912

1.49206
1.41341n

7 1550 +26.19
−3207
6 43.43

9.97576

1.41814
1.50613n

+60°
49 3020
−18 9 46
1.27620n
−2206
1.25414
+1795
−.20
+.15
+17.90
+60 49 48.10

+38
3 41.82
+4 36 44
0.66700
−2174
0.64526
−442
−.14
+.22
−4.34
+38 3 37.48

+50
10 3036
−7 30 2
0.87970n
−2112
0.85858
+7.22
−.26
+.14
+7.10
+50 10 37.46

+19
16 4.92
+23 24 29
1.39660
−2081
1.37579
−23.76
−.11
+.12
−23.75
+19 15 41.17

+.22 −17 12.78
49 48.3 +.22
32 34.2 −10.6
−17 14.1 −17 23.16
32 23.6 32 24.94

−.06 −17 12.78
3 37.4 −.06
46 24.2 −5.7
13.2 −17 18.54
46 18.53 46 18.94

+.09 −17 12.78
10 37.6 +.09
53 24.0 −8.8
13.6 −17 21.49
53 15.17 53 15.97

−.28 −17 12.78
15 40.9 −.28
58 29.8 −1.1
11.1 −14.16
58 28.68 58 27.01

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47 Ursae Minoris

h m s −.85
14 50 57
+101 2
−78 58
−58 39

9.89781 +.78

μ Boötis +.08

15 20 11
+37 47
+4 36

9.70718 +1.69

i Draconis −.29

15 22 24
+59 22
−16 59

D Boötis +.87 +.50

16 26 47
+41 14
+1 9

49 41.5 46.9 55.7 14 11.7 13.0

50 45.3 49.2 52.5 66.0 59.1 5242

31 21 21.9 70 23.5 108 25.7 140 27.3 175 1048 29.3

23 468 499 531 561 591

26 516 530 548 564 580

03 30 59 8.7 113 584

27 16.8 19.4 22.2 26.0 27.7 30.5 33.2 35.9 38.6

52 202 280 343 411 515 3502

57.0 8.3 42 75 12.0 4.20 10.48 28.54 46.16 354 2854

21.5 24.6 29.0 32.2

31 42 6.9 9.4 12.0 146 942.0 −20.877

264 305 345 384 425 34460 −32.382

23 2.1 2.1 2.0 2.1 2.1 2.1 60 102 142 183

442 468 495 523 552 4960

49 58.37
52 35.02
52 35.02

390 424 460 497 537 46.16 1277 21 25.54

2650 23 53.00

20 48.543

23 2.078 23 2.080 4

2738 26 54.76

5844 27 27.720

2493 27 27.700

51 28.360 +.080 51 28.440 50 51.27 +37.17 50579

20 48.543 −.020 20 48.852 20 10.85 +37.67 8.729

23 2.079 −.030 23 2.049 22 24.42 +37.63 22.300

27 27.719 −.020 27 27.699 26 50.08 +37.61 47.942

−37.68 −.21 0 −.87 −38.67 50 48.77 49.09

−37.69 −2.12 −39.78 20 8.784

−37.70 −2.12 −39.78 22 22.331

−37.70 +.07

−37.70 +.03

−2.14 −39.80 26 47.89

9.28190n

4 51.58 −16.52 −6.66 4 38.06

+8999 −6666 −66.66

+95419 1.82387n 1.34832 1.21800n 1.21800n

9.89781

1.56820n 1.57824

17 5365 −37.00 +37.86 18 31.51

9.70718

1.70689n 1.52630

42 57.45 −50.92 +33.60 43 31.05

52 26.58 −32.09 51 54.49

+32.95

9.87624

1.51786 1.50633

+101 18 10.29 −58 38 52 1.97417 −1807 1.95610 +9039 +45 +24 +9108 +101 19 41.37

+38 4 16.84 +4 35 8 0.66450 −1705 0.64745 −4.44 −.36 +.14 −4.66 +38 4 12.18

+59 39 17.30 −16 59 49 1.24550 −1689 1.22861 +16.93 −.63 +.15 +16.45 +59 39 33.75

+41 30 53.86 +1 9 41 0.06730 −1689 0.05041 −1.12 −.30 +.12 −1.30 +41 30 52.56

June 14
Reg − 17 13.0 13.2 13.6 11.1 13.7 12.7 13.3 11.6
−17 12.78

+ .60 −17 12.78 19 42.0 + .60 2 28.3 − 13.5 25.2 + 25.68 13.7 2 14.80 2 15.69

− .06 −17 12.78 4 12.1 − .06 46 59.4 − 8.2 12.7 −17 21.04 46 51.18 46 51.14

+ .20 −17 12.78 39 34.0 + .20 22 20.7 − 11.3 13.3 23.88 22 9.44 22 9.87

− .35 −17 12.78 30 52.2 − .35 13 40.6 − 8.8 11.6 21.93 13 31.81 13 30.63

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+1.30

α Bootis

h m s −.17 −06

14 21 14 −06 +04

+52 33 −10 0 +00

47 76 Cephei 512

−.85

14 50 57

+101 2

78 58

−58 39

48 76 Cephei 444

−.87

15 5 46

102 41

77 19

−60 18

21 194 217 242 266 296

240 370 306 340 374 3060

21 440 475 507 541 576 10

179 212 245 278 31 3245 4

49 160 220 280 362 452

42 78 112

50 47.0 506 538 576 15 5416

11.82 585 29.86 1.6 47.80 5.7 9.6 127 562

51 45 78 120 156 192 1182

7 90 18.0 263 323 400

227 263 300 335 368 2986

5 479 50.7 540 565 595 5372

9.20 495 25.12 531 40.66 561 592 23 5604

27 60 94 125 154 920

189 22.1 252 282 31.2 25.12

1215 2430

11514 21 57570

5181 21 57567

1474 49 2948

404 442 481 513 550 4780

1256 7 25.12

342 377 407 438 469 4066

21 57.569 −025 21 57.54 21 18.47 + 39.07 16.907

39.12 −39.99 38.99 −.08 +.05 −156 −156 −4063 21 1691

51 29.840 +.080 51 29.92 50 51.87 + 38.05 50.599

−39.00 + .31 −127 −39.96 50 [49.96]

Stet

6 24.948 +.070 6 25.02 5 46.72 + 39.30 45.727

−39.01 + .27 −.99 −39.73 5 45.29

9.78560

9.28190n

9.34156n

43 0.20 −26.30 42 33.90

+33.27

1.52205 1.41988n

4 8.32 + 29.83 4 38.15

+120.36

2.08048 1.44461

25 53.12 − 17.11 25 36.01

−60.17

1.77938n 1.23317n

+52°

40 14.45

−9 59 46 1.00650n −1513 0.99137

+9.80 −.30 +.15 +9.65

+52 40 24.10

+101

18 10.20

−58 38 38 1.97408n −1352 1.96056

+91.32 +1.48 +.20 +93.00

+101 19 43.20

+102

57 12.34

−60 16 53 2.00228n −1256 1.98972

+97.66 −.42 +.04 +97.28

+102 58 19.62

June 20

Reg −17 15.8 14.6 13.4

−17 14.60

+ .12 −17 14.60

40 24.2 + .12

23 8.4 − 10.8

−17 15.8 −17 25.28

22 57.56 22 58.82

+ .62 −17 14.60

19 43.8 + .62

2 29.2 − 14.4

14.6 −17 28.38

2 14.80 2 14.82

+ .64 −17 14.60

58 50.3 + .64

41 36.9 − 14.3

13.4 −17 28.26

41 22.59 41 21.36

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June 21 1885 8.35856 m

Polaris −43.78

− .75

+.00

+.00

13 16 36

+91 18

88 41 30

−48 55

23 48.7	26	294	▽	26	35.10 + 3	0.66	29	35.76
		343	−	28	6.57 + 1	30.33		36.90
[29 47.7	28	411	○	29	35.70			35.70
[31 24.5]		1.0						
		54					29	36.120
		128					−12	2.637
32 48.3	29	314					17	33.483
		340						
		417						

17 33483
+ .670
17 34.15
16 55.12 −38.94
+ 39.03 .00
36.44

−1868
−5762
16 36.53

48 21.45	−375.22	2.57429	−1.04508m	
− 11.09	− 734.22	2.86583	−1.33662m	
48 10.36	− 831.02	2.91961	−1.39040m	
	− 914.82	2.96134	−1.43213m	

48 10.05

48 37.15	34 37.99	34 32.91	34 30.92	34 29.30	
− 21.71					
48 15.44	−48 54 25	−48 54 9	−48 54 4	−48 54 0	
	1.81910	1.81900m			
	−1446				
48 42.00	1.80464	1.80454	1.80454	1.80454	
− 24.57					
48 17.43	+63.77	+63.76	+63.76	+63.76	
	+1.75	+ 6.71	+ 8.60	+ 10.42	
	+17	+ .18	+ .18	+ .19	
	+65.09	+70.65	+72.54	+74.37	
48 46.10	+91 35 43.68	(35 43.56)	(35 43.46)	35 43.67	
− 27.05					
48 19.05	+91 35 43.68				

\+ 56 −17 15.50
35 44.24 + .56
18 29.8 − 1.36
14.4 −17 28.54
18 16.19 18 15.14
41 43.86
− .83
43.03

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June 21 1885

T Booth +32
h m s +41
13 41 45
+18 2
+24 21

42 17	77	42 20.0	
34	94	220	
48	111	243	
62	134	260	
90	157 1146	286	
108		307	
	415	329	
	437	350	
	459	372	
	480		
	502 4586		
359	5732	2572	
42 5.98	42 28.660	42 28.578	

γ Booth +34
+40
18 49 10
+18 59
+23 24

315	49 446	
337	467	
359	490	
380	512	
402 3586	533	
	555	
63	576	
85	598	
107	20	
128		
151 1068		
10654	4797	
49 53270	49 53300	

42 28.619
−.016
42 2860
4 4961 −38.95
+ 38.99 + .00
47.848
76
−1.86
−40.87 71
41 47.79 89

49 53285
−016
49 5327
49 14.35 −38.96
+ 38.92 + .00
12.549
−1.80
−40.76
49 12.51

9.97812

3 4360 +2264 1.35488
− 2788 1.44523
3 1572

+18°
19 32.63

+24 20 58
1.41590
− 1446
1.40144

−25.20
− .08
+ .18
−25.10
+18 19 7.53

June 21
Reg − 17 14.4
16.6
−17 15.58

− .30 −17 15.50
19 7.2 − .30
1 50.6 − 1.6
−17 16.6 −17 17.40
1 49.05 1 50.13

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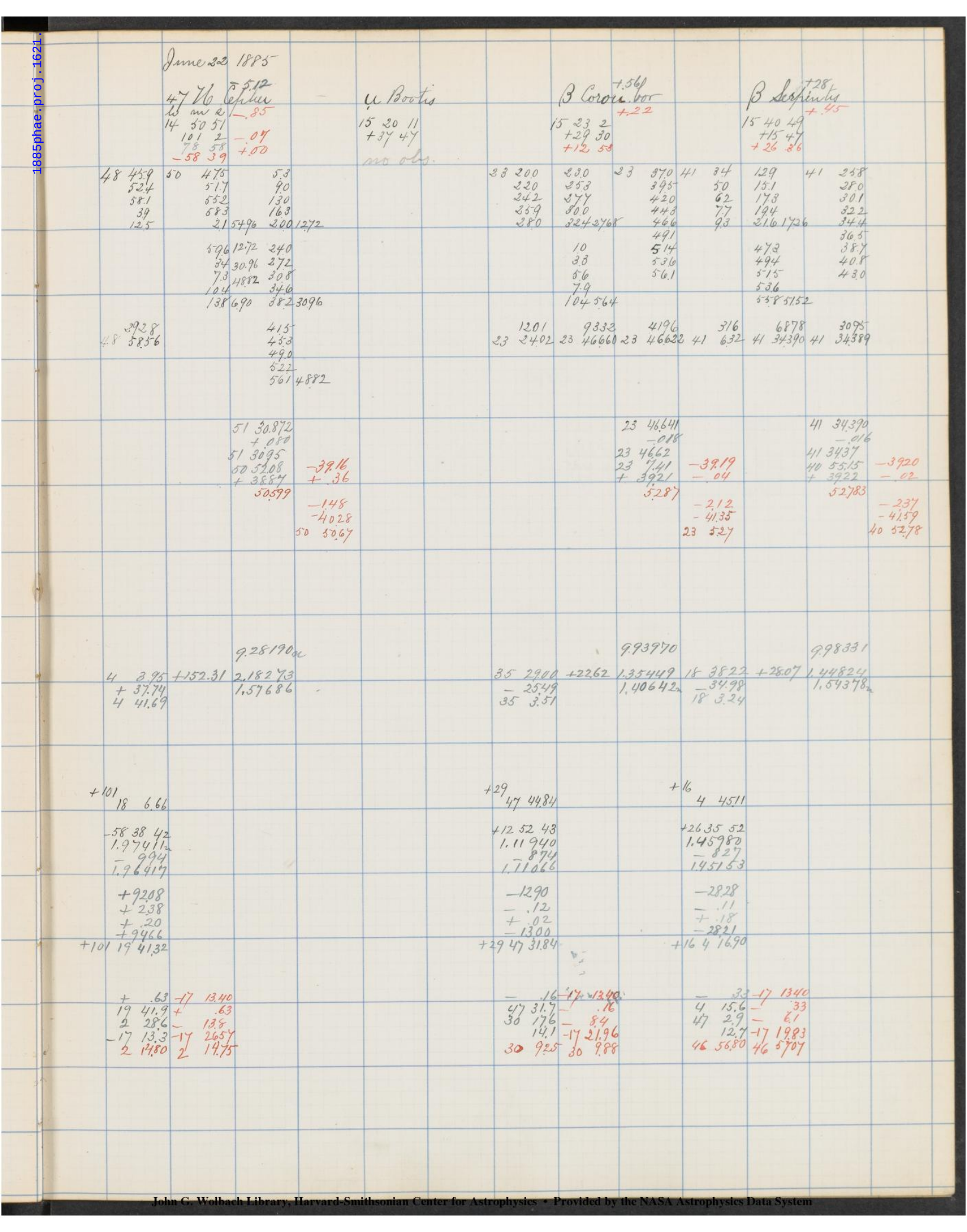
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47 Ν Cephei +5.12

ω Bootis

β Coronæ bor +.56 +.22

β Scorpii +.28 +.45



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June 22 1885

+.33

K Serpentis

h m s +.40

15 43 31

+18 30

+23 53

43 46.8 53.7 44 6.7

48.5 55.8 58.0 9.0

50.1 57.5 0.3 11.1

51.5 59 2.3 58.2 13.3

15.4

17.6

28.3 19.9

30.6 22.0

32.8 24.0

35.0

37.2 32.78

2498 1508.0 139.0

43 49.96 44 15.400 44 15.444

44 15.422

−.016

44 15.40

43 36.16 −39.20

+ 39.24 − .02

33.817

−2.34

−41.56

43 33.84

9.31250

+4.74

Z Ursæ Minoris

15 48 11

+78 9

A 20 to 80

20.0

48 23.4

26.5

30.4

33.5 26.76

9.9 37.5

13.2 39.8

16.3 43.3

20.0 46.8

23.8 49.7 43.42

53.0

56.6

59.8

67 5.982

48 43.291

−.045

48 43.246

9.31250

+4.74

Z Ursæ Minoris

−.58

15 48 11

+78 9

−35 46

A 20 to 80

48 — 48 30.4

— 33.5

— 37.5

20.0 23.4 39.8

19.8 26.5 19.900 43.3 36.90

+33.479

26.7 20.0 53.379 46.8

27.2 23.8 49.7

— 53.0

— 56.6

— 26.950 59.8 53.18

−33.479

52.471 3.0

1/4 wt. 48 53.425 6.7

9.9

13.2

16.3 9.82

48 53.300

48 53.325

−.075

48 53.25

48 13.67 −39.21

+ 39.58 − .33

10.986

−2.68

−42.22

48 11.03

997696

35 43.32 +25.46 1.40 586

− 31.26 1.49 052

35 12.06

+18

47 36.29

+23 52 57

1.40 640

827

1.39 813

−25.01

− .10

+ .04

−25.07

+18 47 11.22

June 22

−17 ' " 13.3

14.1

12.7

13.5

−17 13.40

− 30 −17 13.40

47 10.9 − .30

29 57.4 − 6.7

−17 13.5 −17 20.40

29 50.6 29 50.82

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1885phae.proj.1621.

June 23 1885 8.35856m

−43.78

Polaris

h m s

13 16 36

+91 18

88 41 30

−48 55

−.75

−.01

+.00

23 53.3	19	9.7	10.3	11.0	19	10.33	−1	30.33	17	40.00
		31.2	37.0	43.8	19	37.33	−2	0.44		36.89
(27 11.7)		59.4	6.0	11.9	20	5.77	−2	30.55		35.22
28 30.3	20	31.3	37.4	43.0	20	37.23	−3	0.66		36.57
	21	2.5	6.6	10.8	21	6.63	−3	30.77		35.86
		33.0	37.3	40.8	21	37.03	−4	0.88		36.15
	22	1.3	9.2	14.0	22	8.17	−4	30.99		37.18
		30.4	36.0	44.0	22	36.80	−5	1.10		35.70
	23	3.2	7.6	13.0	23	7.93	−5	31.21		36.72
		33.8	40.4	44.3	23	39.40	−6	1.32		38.08

17 36.837
+.670
17 37.51
16 57.16 −39.49
+ 40.35 + .44
36.441

−20.72
−59.77
16 37.74

48 22.85 − 376.46 2.57572n 1.04651n
− 11.13 − 574.86 2.75956n 1.23035n
48 11.72 − 653.46 2.81522n 1.28601n

48 30.28
− 17.00
48 13.28

48 34.75
− 19.32
48 15.43

	34 36.63	34 35.07	34 32.92
	−48 54 23	−48 54 16	−48 54 12
	1.81910n	1.81910n	1.81900n
	−1155		
	1.80755	1.80755	1.80745
	+64.20	+64.20	+64.19
	+1.76	+4.11	+5.32
	+.17	+.17	+.18
	+66.13	+68.48	+69.69
	+91 35 42.76	(35 43.55)	35 42.61
	+91 35 42.68		

+ .56 −17 14.19
35 43.2 + .56
18 29.9 − 13.7
13.3 −17 27.33
18 16.19 18 15.35
41 44.65
− 83
43.82

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June 23 1885

d Bootis +.48

h m s +.29
14 5 6
+25 38
+16 45

4 Urs Min +4.74 −.58

14 9 14
+48 5
−35 42

O Bootis +1.30 −.17

14 21 14
+52 21
−9 58

Gr. 2164

14 48 28
+59 46

5	200		278	5	418	10	474	9	186		354	21	211		245	21	445		
	218		300		436		492		225		391		235		277		480		
	235		323		460		515		258		421		255		302		513		
	253		346		483		536		293		460		273		344		543		
	278		368	3230	506		552		336	2576	490	4232	305		380	3096	578		
					529												15		
			43		552				357	4232	523				183		49		
			66		574				289	5896	560				215		81		
			88		597				320	1548	592				250		118		
			110						357		19				286				
			135	884					394	3234	54	5896			318	3504			
	1184		10114		4550	6	2569				90		1279		11600		5222		
5	23.68	5	50.570	5	50.555	10	51.38				11.9	21	25.58	21	58.000	21	58.022		
											154								
											186								
											225	1548							

				5	50.563					9	58.972						21	58.011	
					−.017						−.074							−.025	
			14	5	50.55					9	58.90						21	57.99	
				5	11.04		−39.63			9	19.17		−39.54				21	18.41	−39.54
				+	39.51		−.00			+	39.73		−.05				+	39.58	−.01
					9.258						18.654							16.907	
							−1.78						−0.52						−1.50
							−41.31						−40.11						−41.06
						5	9.24					9	18.79						21 16.94

					9.95500						9.31490							9.78592	
27	33.20	+26.88			1.42943	1	~~2.22~~	−52.41			1.71941n	42	58.80	+32.43				1.51095	
	31.38				1.49666n	+	14.01				1.14654		25.65					1.40910n	
27	1.82					1	26.23					42	33.15						
						0	28.75												
						+	14.01												
						0	42.76												
+25°						+78						+52							
55	46.53					22	55.59					40	15.20						
+26	41 47					−35	41 34					−9	59 47						
	1.23870						1.61640n						1.00650n						
	− 990						− 970						− 930						
	1.22880						1.60670						0.99720						
	−16.94						+40.43						+ 9.94						
	− .16						− .30						− .28						
	+ .13						+ .06						+ .15						
	−16.97						+40.19						+9.81						
+25	55 29.56					+78	22 45.78					+52	40 25.01						
	− .22	−17	1419				+ .43	−17	1419				+ .13	−17	1419				
55	29.3	−	.22			22	46.2	+	.43			40	25.1	+	.13				
38	17.4	−	49			5	31.2	−	146			23	8.9	−	11.3				
−17	11.9	−17	1931				15.0	−17	2836				16.2	−17	2536				
38	12.47	38	10.25			5	1660	5	17.42			22	57.56	22	59.65				

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June 23 1885 9.70718

i Draco +1.69

h m s −.29
15 22 19
+59 32
−16 59

ζ Serpentis +.12

15 38 32 +.58
+6 47
+35 36

κ Serpentis +.33

15 43 80 +.40
+18 30
+23 53

22	47.2			22	47.6	38	57.0	39	10.0	43	51.0	44	7.0		
	50.3				52.0		58.7		12.0		52.1		9.2		
	55.0				56.0		0.6		14.2		53.2		11.5		
	57.3				0.1		2.0		16.2		54.3		13.6		
	59.5				4.0		3.1		18.2		55.6		15.7		
					8.0				20.4				17.8		
		28.2			12.1				22.4				20.0		
		32.3			16.1				24.5				22.2		
		36.3			20.1				26.5				24.3		
		40.2													
		44	36.280												
			−.382												
	2693				5760		3014		3648		1644		2662		1413
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				23	3.966			39	18.253			44	15.705		
					−.030				−.016				−.016		
				23	3.94			39	18.24			44	15.69		
				22	24.23		−39.59	38	38.67		−39.60	43	36.15		−39.60
					+39.71		−.02		+39.57		−.00		+39.54		−.00
					22.300				36.213				33.817		
							−1.93				−2.46				−2.33
							−41.54				−42.06				−41.93
							22 22.40				38 36.18				43 33.76

				9.70718				9.99695				9.97696			
43	34.78	+10.11		1.00475	17	54.70	+17.97	1.25455	35	39.60	+22.46	1.35141			
	−6.67			0.82416		−23.11		1.36373		−27.58		1.44060			
43	28.11				17	31.59			35	12.02					

+59				+7				+18							
39	20.24			5	16.76			47	36.33						
−16	59.11			+35	35.9			+23	52.54						
1.	24530			1.	61470			1.	40640						
	−717				675				654						
1.	23813			1.	60795			1.	39986						
	+17.30				−40.55				−25.11						
	−.02				−.02				−.08						
	+.18				+.14				+.03						
	+17.46				−40.43				−25.16						
+59	39 37.70			+7	4 36.33			+18	47 11.17						

+	22	−17	14.19	−	43	−17	14.19	−	.30	−17	14.19				
39	37.9	+	22	41	35.9	−	43	47	10.9	−	.30				
22	22.8	−	13.4	47	21.4	−	43	29	57.6	−	6.9				
	15.1	−17	27.37		14.5	−17	18.92		13.3	−17	21.39				
22	9.44	22	10.33	47	17.09	47	17.41	29	50.67	29	49.78				

June 28

Reg	−17	13.3
		11.9
		15.0
		16.2
		15.1
		14.5
		13.3
	−17	14.19

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© Boötis +1.30
h m s −.17
14 21 14
+52 23 −.11
−10 0 +.00

π Boötis +.30
14 35 16 +.43
+16 55
+25 28

47 Herculis 5.12
14 50 51 −.85
101 2
78 58
−58 39

48 Herculis 4.44
15 5 46 −.87
102 41
77 19
−60 18

22 3847 21 4488 35 5455 35 5266 52 2333 50 4847 6 7 3588 5 4911 45
4174 4806 5644 6488 2933 5207 1015 522 78
4511 5166 5866 5700 2937 5540 1370 5566 1057
4794 5477 07 5906 3744 5911 1602 5833 139
4955 5800 22 4504388 4505 22 5542 2051364 2781634 20 5544 17.0 1074
15 33
1855 484 140 5613.64 24.0 7 13.0 516 10.74 20.2
2174 883 1624 3631.46 27.9 17.2 5477 26.58 234
2522 1177 1834 72 49.26 31.7 23.5 5822 42.12 268
2855 2057 108 35.2 30.6 1.0 29.8
3202518.0 2281836 14.3 7.12 385 3146 357 2400 435 7.96 327 26.58
−27.032
2226 5234 2924 12224 5508 1881 421 4 357
22 4452 21 58.148 21 5815 35 5848 36 1.120 36 1.200 52 3762 45.7 3 1534 39.2
4.96 7 24.00 421
529 453
56.0 49.26 48.3 42.12

21 58.153 36 1.160 51 31.380 6 26.568
−.025 −.016 +.088 +.070
21 5813 67 26 1.14 69 51 3146 71 6 26.64 73
21 1838 −39.75 35 21.34 −39.79 50 5220 −39.51 5 47.08 −39.65
+39.75 +39.80 +39.16 +39.56 +.49
−.14 −.03 +.56
16.967 19.285 50.599 45.727
−1.47 −2.06 −1.70 −1.35
−41.36 28 −41.88 78 −40.95 85 −40.159
21 1677 35 1926 50 5861 5 4594
1685 19.36 5061 4.605

9.78560 9.98079 9.28190n 9.34156n

41 5602 5572 −.4637 1.66624n 10 2278 +2.68 0.42813 4 5320 −.6624 1.82112n 24 5802 1774 +1.3123 2.118 03
+36.45 1.56407 −3.32 0.52115n −16.42 1.21525n +37.31 −.5743 1.759144n
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32.67 1.21293n
25 50.88
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25 34.55

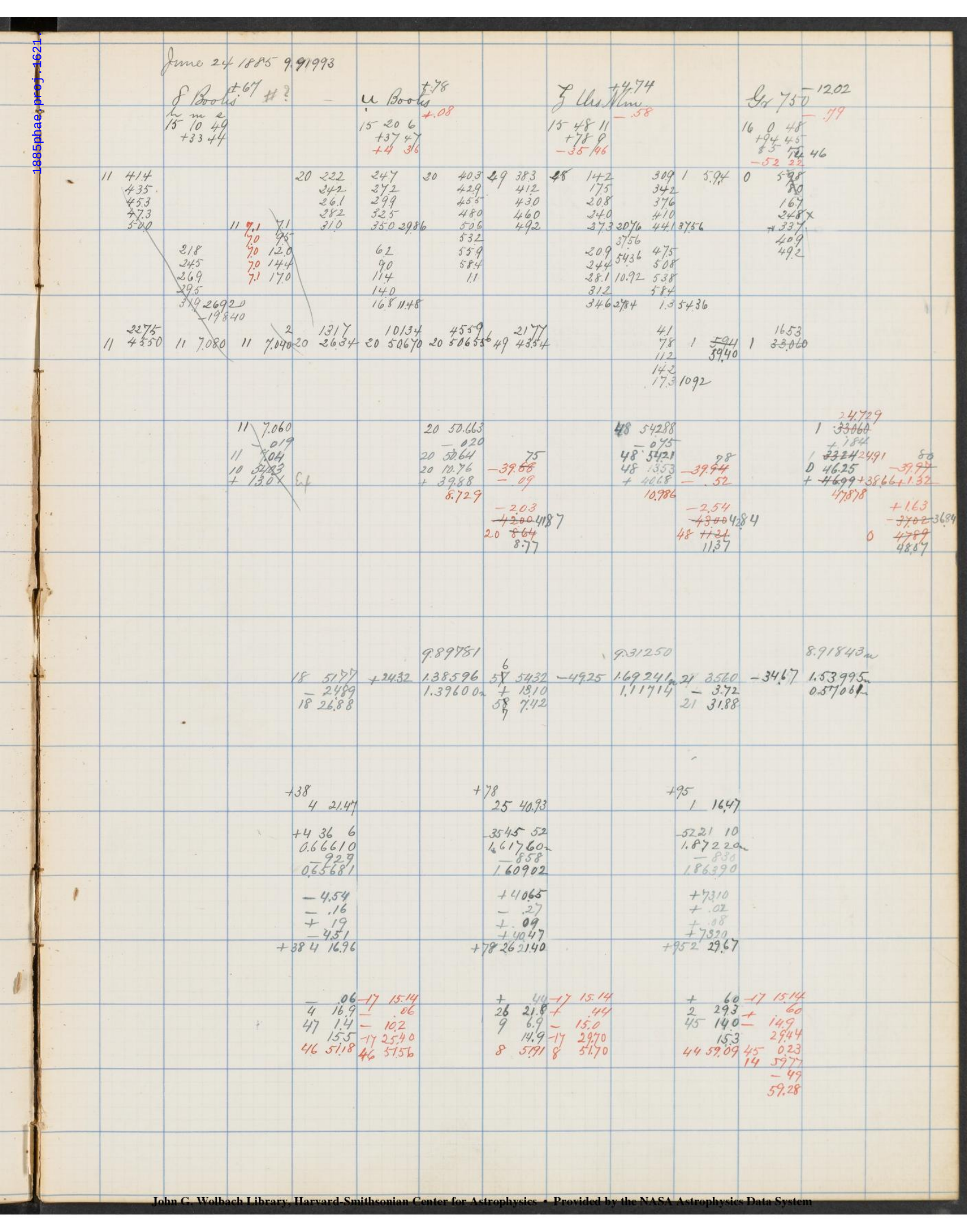
+52° +17 +101 +102
40 3648 15.68 12 28.89 18 11.57 57 916 13.02 57 1380
−10 40 11.50
1.00750n +25 27 37 −58 37 53 −60 17 44 −60 16 55
−.1096 1.43790 1.97388n 2.00251n 2.00228n
0.99654 −.1050 −.1012 −.0958
2 1.42740 1.96376 1.99293 1.99270
+9.921 −26.75 +91.99 +9838 +98.33
−.57 −.00 −.45 +.12 +.41
+.089 +.02 +.24 +.25 +.04
+9.43 −26.73 +91.78 +98.75 +98.78
+5240 4591 25.11 +17 12 2.16 +101 19 43.35 +102 58 51.77 58 52.58
+102 58 52.17

+ .13 −17 15.14 − .33 −17 15.14 + .65 −17 15.14 + .66 −17 15.14
40 252 + .13 12 1.8 − .33 19 44.0 + .65 58 528 + .66
23 90 − 114 54 45.9 − .39 2 29.7 − 149 41 375 − 14.9
17 162 −17 2641 15.9 −17 1937 14.3 −17 2939 15.3 −17 2938
22 57.56 22 5870 54 41.96 54 42.79 2 1480 2 1396 41 2259 41 2279

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June 24 1885 9.91993



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June 24 1885 9.86647

σ Herculis +92
h m s −.01
16 30 20
+42 40
− 0 17

31 203
220
240
264
287

229
257
285
312

31 6.1 89
6.1 117
6.1 145
6.1 173

341 28480
22.440

1214
31 2428

31 6.040

31 6.100

39 114
137
154
177
199

781
39 1562

130
157
183
212
237 1838

556
582
08
34
62 084

792.2
39 39610

290
318
342
369
396
423
448
474
501

3561
39 39567

31 6070
− 020
31 605 −39.84
30 ~~25.75~~ 2613 ~~−1003~~
~~+ 4032~~ 39.12 − .10
23.757

− 237
~~− 177~~
~~− 42.72~~ 41221
30 ~~2393~~
23.84

39 39.589
− 020
39 39.54 −39.84
38 ~~39.56~~67 ~~−40.04~~
+ ~~4022~~ 3990 − .09
57.244

− 2.41 43
~~− 42.24~~ 4236
38 ~~57.33~~
57.21

9.86647
24 3648 −18.21
+ 17.34
24 5382

1.26031n
1.23901

57 1368 +23.97
− 24.08
56 4960

9.88968
1.37967
1.38158n

+42°
57 5453
− 0 18 9
9.48400n
− 759
9.47641

+0.30
− .09
+ 23
+ 044
+42 57 54.97

+39
25 5875
+3 14 28
0.51340
− 745
0.50595

− 3.21
− .15
+ .11
− 325
+39 25 55.50

+ .01 −17 15.14
57 55.0 + .01
40 40.5 − 11.9
−17 14.5 −17 27.03
46 28.1 40 27.94

− .05 −17 15.14
25 55.4 − 0.5
8 41.0 − 11.4
14.4 −17 26.58
8 29.59 8 28.91

June 24
Reg −17 16.2
15.9
14.3
15.3
15.5
14.9
15.3
14.5
14.4
−17 15.14

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June 25 1885

48 Ho Cephei — 9.34156

h m s
15 5 46
+102 41
−60 18

−4.44
−.87
−.09
+.00

α Serpentis — 9.99693

15 38 32
+6 48
+35 35

+12
+.58

χ Serpentis

15 43 33
+18 30
+23 53

+33
+.40

ζ Cas. Nme. — 9.31250

15 48 6
+78 9
−35 46

+4.44
−.58

4 5.5 10.2 14.2 26.0 32.6

5 5.8 — 5 55.1 55.3 58.2 1.6 55.20

49 39 41.8 83 45.7 11.6 47.2 14.5 48.7 17.7 1140 50.2 11.40 27.00 42.56 30.1 209 236 272 332 2700

39 10.3 12.4 14.5 16.4 18.5 20.7 22.8 24.8 26.8 31.0 33.1 35.2 37.3 43 55.9 57.5 58.9 0.4 2.0 39435200 −16.617

544 56.5 58.7 0.8 32 58.72 290 812 33.4 36.5 878 3838

44 7.4 9.5 11.7 13.9 16.1 18.2 20.3 22.6 24.8

30.3 33.6 37.4 40.7 48 20.6 23.9 25.0 26.7 20.30 37.20 44.0 37.20 212 243 276 305 34.3 53.92 10.76 47.2 50.5 53.8 57.3 2758 08 5392

4 8.85 17.70

362 394 42.3 45.7 49.2 2836 4256

39 46.72

39 18.583

39 16.72 18.578

43 39.47 58.94

44 15.210 16.050

44 14.45 16.055

40 70 10.7 14.3 17.8 10.76

6 26.864 −.070 6 26.79 5 47.17 + 39.62 45.727

−39.87 +.40 −1.44 −40.91 5 45.88

39 18.580 −.016 39 18.56 38 38.66 +39.90 36.213

−39.89 −.01 −2.45 −42.35 38 36.21

44 16.052 −.016 44 16.03 43 36.14 + 39.89 33.817

−39.90 −.03 −2.32 −42.25 43 33.78

48 53.952 −.075 48 53.88 48 13.46 + 40.42 10.796

−39.90 −.41 −2.47 −42.78 48 11.10

9.34156 m — 9.99693 — 9.97696

24 59.82 + 36.72 25 36.54

+129.16 2.11113 1.56492

16 55.08 + 36.18 17 31.26

−28.14 1.44932 m 1.55848

35 32.78 − 21.01 35 11.77

+17.11 1.23325 1.32244

+102 57 11.81

−60 17 46 2.00254 m −1.410 1.98844

+97.37 + 1.95 + .25 +.99557

+102 58 31.38

+7 5 17.09

+35 34 9 1.61450 − 1.315 1.60135

−39.93 − .05 + .10 − 39.88

+7 4 37.21

+18 47 36.68

+23 52 47 1.40630 −1.296 1.39334

−24.74 − .05 + .02 − 24.77

+18 47 11.81

8 51.91

+ .67 −17 14.24 58 52.0 + .67 41 37.6 − 1.50 −17 14.4 −17 28.87 41 22.57 41 22.81

− .45 −17 14.24 4 36.8 − .45 47 21.6 − 4.5 15.2 −17 19.19 47 17.09 47 18.02

− .31 −17 14.24 47 11.5 − .31 29 57.9 − .72 13.6 −17 21.75 29 50.67 29 50.06

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June 25 1885

f Ophiuchi 06

h m s +.72
16 8 16
−3 24
+45 47

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	395	453		578		344	402		527
	413	473		596		357	424		549
	425	494 4522		18		377	444 4128		570
				38					590
		142		59			93		10
		162		80			114		30
		183		100			134		50
		204					155		
		225 1832					175 1342		

	1977	12354	5562	1723		11370	5120
8	39.54	9 1.770	9 1.800	12 3446	12	56850	12 56889

ε Ophiuchi 08

+.73
16 12 11
−4 24
+46 47

9 1.785
−.015
9 1.77
8 21.85 −39.91
+39.92 +.01
19.142

−2.71
−42.61
8 19.16

12 56.869
−.015
12 56.85
12 16.93 −39.91
+39.92 +.01
14.191

−2.74
−42.64
12 14.21

9.99923

28 52.38 +22.24 1.34713
−28.75 1.45859m
28 23.63

9.99872

29 39.98 +22.41 1.35044
−28.93 1.46139m
29 11.05

−3°
5 35.28

+45 46 6
1.77140
−1219
1.75921

−57.44
+.01
+.20
−57.23
−36 32.51

−4
6 22.70

+46 46 54
1.78680
−12.00
1.77480

−59.54
+.02
+.23
−59.29
−47 21.99

June 25
Reg −17 14.4
15.2
13.6
13.4
14.6
−17 14.24

−	55	−17 14.24	−	56	−17 14.24
6	33.1	− 55	7	22.5	− 56
23	46.5	− 4.1	24	37.1	− 4.2
−17	13.4	−17 18.89		14.6	−17 19.06
23	50.2	23 51.40	24	41.27	24 40.98

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48 Hc Ephem +4.44
h m s −.87
15 5 46
+102 41 −.12
77 19 +.00
−60 18

B Coronis Ber +56
+.22
15 23 2
+29 30
+12 53

Z Ursæ Min +4.74
−.58
15 48 1
+78 9
−35 46

G 750

16 0 48
+94 45

no wire.

7 19.5 26.5 34.7 42.7 49.2

7 23.7 33.2 42.2 51.5 1.3 +2380 −75.148

23 17.1 19.1 21.0 22.7 24.4

23 24.1 26.5 28.8 31.1 33.5 −2880 20 45 67 92 117.682

23 38.3 40.7 43.0 45.5 47.8 50.2 52.6 55.0 57.4

49 39.7 42.0 45.7 48.5 51.8

48 14.3 17.6 21.0 24.6 27.6 21.1 24.6 28.1 31.3 34.3

30.8 34.2 37.4 40.6 43.8 37.36 54.28 11.14 27.88

2 13.2 14.4 15.6 16.9 18.5 47.8 51.0 54.5 57.4 07.5428

1726 7 34.52

6 27.232

28 10.43 28 20.86

23 9.562 23 47.810

23 43.05 23 47.833

49 22.77 49 45.54

41 78 112 146 180 1114

2 7.86 2 15.72

6 27.232 +.070 6 27.302 5 47.35 +39.75 45.727

−40.30 +.53 −1.62 −41.39 5 45.91

23 47.821 −.018 23 47.784 23 47.738 +.046 5.287

−.031 −.07 −2.09 −42.47 23 5.37

48 54.336 −.075 48 54.261 48 13.32 +40.94 10.986

−40.33 −.57 −2.33 −43.23 48 1.103

9.34156n

25 54.10 −19.13 25 34.97

−67.29

1.82795n 1.28174n

35 31.80 −30.38 35 1.42

9.93970

+26.96

1.43072 1.48265n

56 52.42 +1.361 57 6.03

−51.20

9.31250

1.70927n 1.13400

+102 57 13.38

−60 16 52 20.0228n −14.63 1.98765

+97.20 +.53 +.04 +97.77

+102 58 51.15

+29 47 46.93

+12 52 46 1.11950 −14.13 1.10537

−12.75 −.17 +.02 −12.90

+29 47 34.03

+78 25 42.32

−35 45 54 1.61760n −13.50 1.60410

+40.19 −.29 +.10 +40.00

+78 26 22.32

+.18 −17 14.61 58 51.8 41 37.8 −17 14.0 41 22.59

+.68 −1.52 −17 29.13 41 22.02

−.17 −17 14.61 47 33.9 30 18.6 15.3 −17 24.18 30 9.25

−.17 −9.4 −17 24.18 30 9.85

+.45 −17 14.61 26 22.8 9 7.5 15.3 −17 29.76 8 51.91

+.45 −1.56 −17 29.76 8 52.56

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ε Ophiuchi −08		τ Herculis +1.06		α Scorpii −49		σ Herculis +.92	
h m s +.73		−.07		+.93		−.01	
16 12 11		16 16 14		16 22 0		16 30 20	
− 4 24		+46 35		−26 10		+42 41	
+46 47		− 4 12		+68 33		− 0 18	

12 295	365	12 490	16 215	297	16 479	23 309	418	22 561	30 330	386	30 554
314	386	511	239	328	508	326	442	58.0	348	412	582
328	407	531	265	358	538	343	465	05	372	441	1.0
346	427	553	288	387	568	366	488	26	389	468	38
360	452 4074	574	304	417 3574	598	374	51.0 4646	5.0	407	497 4408	67
		593			27			72			95
	98	16		178	56		187	96		234	122
	11.7	35		208	87		21.1	118		260	151
	137	55		237	11.8		233	14.1		290	178
	158			267			256			317	
	179 1378			298 2376			279 2332			345 2892	
1643	11452	5158	1311	11950	5379	1718	12978	5849	1846	13300	5997
12 3286	12 57260	12 57311	16 2622	16 59750	16 59767	23 3436	23 4890	23 4989	30 3692	31 6500	31 6633

12 57285	16 59758	23 4940	31 6566
−015	−022	−017	−021
12 5727	16 5974	23 492	31 654
12 1693	16 1926	22 2466	30 2611
+ 4034	+4048	+ 4026	+ 4043
14.191	16.989	21.402	23.757
−40.35	−40.35	−40.36	−40.36
+ .01	− .13	+ .06	− .11
−2.74	−2.27	−3.26	−2.35
−43.08	−42.75	−43.56	−42.82
12 14.19	16 16.99	22 21.36	30 23.72

		9.99872			9.83715			9.95304		9.86635
29 4267	+24.42	1.38775	30 39.32	+33.54	1.52556	13 10.72	−29.42	1.46864	25 2062 +29.65	1.47202
−3153		1.49870n	−2985		1.47494n	+ 34.19		1.53391n	−2822	1.45060n
29 11.14			30 9.47			13 44.91			24 5240	

− 4	+46	−25	+42
6 2279	52 3888	50 5656	57 5595
+46 46 57	−4 12 7	+68 30 25	−0 17 25
1.78680	0.62640n	2.16186	9.46400n
−1287	−1271	−1255	−1240
1.77393	0.61369	2.14931	9.45160
−59.42	+ 4.11	−141.03	+ 0.28
+ .02	− .31	+ .18	− .24
+ .23	+ .03	+ .16	+ .02
−59.17	+ 3.83	−140.69	+ 0.06
−4 7 21.96	+46 52 4271	−25 53 1725	+42 57 56.01

− .57	−17 1461	+ .05	−17 1461	− .73	−17 14.61	+ .01	−17 1461
7 225	− .57	52 428	+ .05	53 18.0	− .73	57 56.0	+ .01
24 369	− 44	35 286	− 13.0	10 323	− 1.1	40 412	− 12.6
−17 14.4	−17 1958	14.2	−17 2756	14.3	16.44	14.8	−17 2720
24 4127	24 41.54	35 1555	35 1575	10 3338	10 33.69	40 2861	40 2881

June 27

Reg. −17 14.0
15.3
15.3
14.4
14.2
14.3
14.8

−17 14.61

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9.93970

48 H Cephei — δ Bootis +67 +.15 — γ Urs. Min. +3.12 −50 — β Cor. Bor. +56 +.22

h m s
15 5 46
102 41
no wires

15 10 49
+33 45 −.11
+8 38 +.00

15 20 51
+72 15
−28 52
no other star

15 23 2
+29 30
+12 53

3	55.3	11	462	452	11	00	18	390	17	290	400 23 410	23 406
	59.4		494	474		23		452		312	420 425	429
	10.4		516	50.0		48		494		332	446 445	454
	17.3		533	524		72		535		355	467 464	477
	23.2		547	550 5000		96		570		376 3330	493 4452 482	500
						125						524
				249		148				141 4452	515	43 548
				275		172				158 55.76	535	66 572
				300		198				183 7.34	558	89 598
				321						207	578	113
				348 2986						228 1834	02 55.76	137 8960 −18957

3456 — 2552 — 13986 — 882 — 2441 — 29 2226 — 4508
4 9.12 — 11 5.104 — 11 9.930 — 11 9.800 — 18 48.82 — 50 23 44.52 — 23 50.003 — 23 50.089
75
95
118 7.34

11 9.865
−.019
11 985
10 53.94 — −42.62
+ 15.91 — E − .07

18 55.852
−.050
18 55.80
20 56.68 — −42.62
−2 0.88 — E − .34

23 50.061
−.018
23 50.04
23 7.33 — −42.62
+ 42.71 — −.06
5.287
−2.04
−44.72
23 5.32

9.91985 — 9.48411 — 9.93970

8 14.60 — 51 0.12 — 35 6.50 +5.54 0.74351
6.24 — 0.79544
35 0.26

+ 29
47 48.09
+12.52 20
1.11920
−1233
1.10687

−12.79
− .01
+ .00
− 12.80
+29 47 35.29

− .18 — 17 15.10
47 35.1 — .18
30 19.4 — 10.2
−17 15.7 — 25.48
30 9.25 — 30 9.81

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4 Cor. Bor. +51 +.26

h m s
15 29 46
+27 6
+15 17

3 Urs. Min +4.74 −.58

15 48 6
+78 9
−35 46

30	3.7	108	30	246		4.8	163		32.6		
	5.3	130		271			190		36.2		
	6.8	15.5		294			230		39.3		
	8.6	17.7		317			26.3		43.0		
	10.2	20.0	15.40	34.0			29.5	22.82	46.5	39.52	
				36.4				39.52			
		47.6		38.7			23.0	56.40	49.8		
		50.0		41.0			26.3		53.2		
		52.2		43.3			29.6	12.98	56.6		
		54.6					32.7		59.7		
		57.0	52.28				35.3	29.38	2.7	56.40	
	34.6	67.68		306.2					6.5		
30	6.92	30 33.840	30	34.022					9.6		
									12.9		
									16.3		
									19.6	12.98	

30	33.931		48	56.220	
	−.017			−.075	
30	33.91		48	56.15	
29	51.26	−42.63	48	12.96	−42.64
+	4265	−.06	+	4319	−.52
	49.143			10.986	
		−2.12			−1.97
		−44.81			−45.13
		29 49.10			48 11.02

9.94949

59 31.55 +27.01 1.43152
− 31.13 1.49324
59 0.42

+27°
23 47.92

+15 16 46
1.19680
− 12.18
1.18462

− 15.30
− .16
+ .22
− 15.24
+27 23 32.68

July 2
Reg −17 15.7
14.5
−17 15.10

− .21 −17 15.10
23 32.5 − .21
6 18.0 − .98
−17 14.5 −17 25.11
6 8.24 6 7.57

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July 4 1885

ζ Urs Min +4.74
h m s −.58
15 48 7 −.08
+78 9 +.00
−35 46

δ Ophiuchi −.06
16 8 16 +.72
−3 23
+45 46

χ Ophiuchi +.17
16 52 10 +.54
+9 33
+32 50

ε Herculis +.60
16 55 50 +.20
+31 6
+11 17

46	46.5	48	16.6		33.4	9	6.4		44.7	8	57.0	52	40.2		38.7	52	51.4	56	14.6		15.3	56	29.8
	51.4		20.0		36.6		8.4		46.6		59.2		42.2		40.8		53.6		16.7		17.8		32.2
	55.1		23.4		39.9		10.0		49.0		61.3		44.0		43.0		55.5		19.3		20.1		34.5
	57.7		26.7		43.1		11.2		51.0		63.4		45.5		45.1		57.6		20.8		22.5		37.0
	00		29.9	23.32	46.6	39	92 14.0		53.0	48	86		47.5		47.2	42.96	59.6		22.2		25.0	20.16	39.3
											78						1.8						41.7
49	42.7		23.7	39.92	50.2				18.0		9.4				12.2		3.8				53.9		44.2
	45.3		26.8	56.82	53.7				19.7		11.6				14.2		5.9				56.3		46.7
	47.4		29.6	13.42	56.6				21.4		13.6				16.3		8.0				58.6		49.0
	49.4		33.4		.01				23.7						18.4						1.0		
	52.4		36.9	30.08	35	56	82		25.8	21.72					20.5	16.32					34	58.64	
					65		500		10.58		485		194		11928		872		936	56	78 80		3544
46	54.14				102	9	1000	9	52.90	9	53.89	52	43.88	52	59.640	52	54.689	56	18.72	54	39.440	56	39.378
49	47.44				136																370		
					166																		
					202	13.22																	

				48	56716			9	5.339					52	59.664			56	39.384
					−.075				−.015						−.016				−.018
				48	5664			9	5.32					52	59.65			52	39.37
				48	1280		−4346	8	2182		−4347			52	16.11		−4351	55	55.86	−4351
				+	4384		−.38	+	4350		+ .00			+	4354		−.01	+	4351	−.05
					10.986		−1.81		19.142						13.481				53.390	
							−43.7365				−268						−263			−247
						48	1089				−46.15						−46.15			−4603
							10.99			8	19.17					52	13.50			53	53.34

				9.31250				9.99924						9.99394				9.93261	
57	36.58	+122.58	2.08842	23	8	15.05	−466	0.66839	31	50.70	+15.78	1.19811	59	44.62	+20.66	1.31513			
	−32.60	−50.72	1.70518		+	6.02		0.77986		−20.15		1.30428		−22.91		1.35994			
57	3.98		1.51915	23	8	21.07			31	30.55			59	21.71					
			1.12991																
56	50.85																		
	+ 13.49																		
57	4.34																		
+78					−3				+9				+31						
25	44.37	25	44.01		5	32.72			51	17.80				23	26.64				
−35	45 9	−35	45 68		+45	45 29			+32	49 5				+11	16 59				
	1.61740		1.61760			1.77120				1.56960					1.06030				
	−1228					−1207				−1149					−1149				
	1.60512		1.60532			1.75913				1.55811					1.04881				
	+4028		+4030			−57.43				−36.15					−11.19				
	−164		−29			+ .00				−02					−11				
	+ 13		+ 09			+ .16				+ 09					+ .23				
	+38.77		+40.10			−57.27				−36.08					−11.07				
+78	26 23.14		26 24.11		−3	6 29.99			+9	50 41.72				+31	23 15.57				
+78	26 23.62																		
	+ 49	−17	15.18		− 61	−17	15.18		− 46	−17	15.18			− .17	−17	15.18			
	26 24.1		+ .49		6 30.6		− .61		50 41.3		− .46			23 15.4		− .17			
	9 8.9		− 1.70		23 45.8		− .48		33 26.5		− 9.8			5 59.1		− 13.2			
−17	15.2	−17	31.69		15.2	−17	20.59		14.8	−17	25.44			15.5	−17	28.55			
	8 51.91	8	51.93		23 50.62	23	50.58		33 16.70	33	16.28			5 46.74	5	47.02			

July 4
Reg −17 15.2
15.2
14.8
15.5
−17 15.18

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July 6 1885

48 Ye Ophiuchi

δ Bootis

ζ Bootis

α Serpentis

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July 6 1885

β Serpentis	κ Serpentis	3 Urs Min	ε Ophiuchi
h m s			
15 40 49	15 43 34	15 48 11	16 12 11
+15 47	−3 4	+78 9	−4 24
chf	chf	chf	+46 47

+.73

13 283 300 317 330 350

40.2 422 443 465 484 44.32

12 0.8 56.7 0.9 58.8 1.0 1.0 0.6 2.7 0.9 5.0 0.9 7.1 0.9 9.2

132 154 175 196 216 17.46

80 13 31.60

178 13 0.890

26.0 13 0.857

13 0.880
−.015
13 0.87
12 16.90
+ 43.97
14.191

−43.95
+ .00
−2.71
−46.66
12 14.21

9.99872
1.48742
1.59837

28 2865 −3072
+3966
29 8.31

−4 6 19.96

+46 45 43
1.78640
− 763
1.77877

−6009
+ .64
+ .17
−59.88
−4 7 19.84

July 6
Reg −17 15.2
15.7
−17 15.45

64 −17 5.45
7 20.5 − .64
24 36.2 − 5.1
−17 15.7 −17 51.19
24 41.27 24 41.03

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ξ Bootis +.67

h m s +.15

15 10 48

+33 45 −.20

+8 38 +.00

μ Bootis +.78

15 20 6 +.08

+37 47

+4 36

ζ Bootis +.87

15 26 45 +.02

+41 14

+1 9

ζ Urs Min +.74

15 48 11 −.58

+78 9

−35 46

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July 8 1885

49 Herculis +27
hr m s +.46
16 46 47
+15 10
+27 13

E Herculis +60
16 55 50 +.20
+31 5
+11 18

ζ Draco. +2.23
17 8 23 −.40
+65 51
−23 28

δ Herculis
17 10 15
+24 59
chf

47	21.1		165	47	29.4	56	45.7		16.4	56	30.8	8	5.7		24.6	8	55.0		
	22.3		18.5		31.6		47.8		18.8		33.3		9.5		39.4		59.9		
	23.3		20.9		33.7		49.0		21.0		35.7		13.3		34.6		4.6		
	24.8		22.9		35.9		50.6		23.5		38.1		16.8		39.6	58	10.2		
	26.4		25.0	20.76	38.0		52.0		25.0	21.12	40.6		20.2		44.7	34.64	15.2		
					40.1						43.1						20.0		
			50.8		42.1				55.0		45.4				45.3		25.1		
			52.8		44.3				57.5		47.5				50.5		30.0		
			55.0		46.4				59.7		50.2				55.4		35.1		
			57.2						2.0						0.1				
			59.2	55.00					46	59.76					55	55.36			
	17.9		75.76		34.15		45.1		8.088		36.47		6.55		29.94		13.51		
47	23.58	47	37.880	47	37.944	56	49.02	56	40.440	56	40.522	8	13.10	9	15.000	9	15.011		
															14.970				

				47	37.912					56	40.481					9	14.990		
					−.016						−.018						−.037		
				47	37.90					56	40.46					9	14.95		
				46	53.28		−.4448			55	55.84		−.4448			8	3.000		−.4449
				+	44.62		−.05			+	44.62		−.12			+	44.95		−.45
					50.729						53.390						27.329		
							−2.55						−2.445						−2.67
							−.4708						−.4705						−.4761
							46 50.82						55 53.41						8 24.84

					9.98460						9.93269						9.61186		
55	6.75	+14.33			1.15625	59	11.57	−8.54			0.93146	14	48.88	+61.89			1.79162		
	−17.91				1.25308		+ 9.47				0.97638		−32.79				1.81571		
54	48.84					59	21.04					14	16.09						

+15				+31						+66									
	27 59.57				23 27.31						8 32.26								
+27	12 21			+11	16 26					−23	27 57								
	1.47120				1.05990						1.39780								
	−.1802				−.1780						−.1732								
	1.45318				1.04210						1.38048								
	−.2839				−11.02						+24.01								
	−.03				−.01						−.78								
	+.00				+.21						+.24								
	−28.42				−10.82						+23.47								
+15	27 31.09			+31	23 16.49					+66	8 55.73								
	−.41	−17	15.83		−.18	−17	15.83				+.36	−17	15.83						
27	30.6	−	.41	23	16.3	−	.18			8	56.1	+	.36						
10	15.8	−	11.2	6	0.7	−	14.0			57	39.8	−	17.0						
	14.8	−17	27.44		15.6	−17	29.01	30.01			16.3	−17	32.47						
10	4.57	10	3.65	5	46.74	5	47.49			51	22.84	51	23.26						
							46.48												

July 8
Reg − 17
15.4
15.8
16.1
16.8
14.8
15.6
16.3
−17 15.83

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July 11 1885 9.99923

ζ Ophiuchi −.06
h m s +.72
16 8 16
−3 27 −.11
+45 44 +.00

T Hercules +1.06
16 16 13 −.07
+46 35
−4 12

η Draco +1.86
16 22 23 −.33
+61 47
−19 24

No Ephemeris
G 2373
16 35 36
+77 40

9 361 375 390 408 430
9 7.0 29 6.9 48 6.8 89 6.9 90 7.1 112 6.9 13.1 6.8 15.1
194 210 233 254
374 23.30 − 16.529
1964
9 39.28
9 6.771
9 6.929
485

17 427 447 470 497 522
284 283 285
17 28.4 31.3 34.5
17 28.400 −24007
363
17 47.268
17 4.393

22 314 245 266 292 326
343
22 26.86

299 340 385 430 477 3862 397 440 484 525
570 4832
22 561 04 48 93 134 17.8 22.0 26.6 30.8
26.94
23 13.470
1212
23 13.467

35 45.0 48.9 57.6 54.8 58.1 5168 493 52.3 56.2 59.4 30
7.72 23.96 39.90
16 43 7.4 11.0 14.3 7.72 17.8 21.0 23.7 27.1 30.2 23.96
56.04
335 366 30.5 433 466 39.90

9 6.854 −.015 9 6.84
8 21.78 −45.12 +45.06 +.01 19.142
−2.64 −47.75 8 19.09

17 4.393 −.022 17 4.37
16 19.06 −45.13 + 43.31 −.12 16.989
−2.07 −47.32 16 17.05

23 13.469 −.033 23 13.347
22 28.35 −45.14 + 45.12 −.20 + .19 + 45.31 −2.04 26.310 −47.38 22 26.09

36 23.960 −.072 36 23.89
−45.15

9.99923
27 37.05 −32.43 + 41.92 28 18.97
1.510952 1.62241
29 25.65 −42.87 + 38.15 30 3.80

9.83715
1.63215
1.58153

?
+4661

9.67468
1.66848
1.45539

−3°
5 30.62
+45 44 51
1.77110
−.1209
1.75901
−57.41 + .03 + .13 −57.25
−3 6 27.87

+46
52 44.55
−4 13 20
0.62850
−.1166
0.61684
+4.14 −.50 +.22 +3.86
+46 52 48.41

−.66 −17 16.83
6 28.5 −.66
23 45.2 −5.4
−17 16.7 −17 22.89
23 51.62 23 50.76

+.06 −17 16.83
52 48.5 +.06
35 31.7 −.161
16.8 −17 32.87
35 15.55 35 15.34

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July 11 1885

ε Urs. Min.

+7.33 −.64

h m s
16 54 47
+8 2 13
−3 9 50

ω Draconis

+2.58 −.41

17 37 34
+6 8 48
−2 6 25

μ Herculis

+.53 +.25

17 41 54
+27 47
+14 36

γ Draconis

+3.12 −.50

17 43 33
+7 2 12
−2 9 49

59 42.1 5.35 7.3 15.5 23.6

57 34.5 40.8 45.7 51.0 55.0 4540 11.14 176 36.96 222 1.98 283 330 376 27.74

07 58 11.3 16.3 21.6 11.14 37.4 32.2 36.6 42.0 46.6 36.96 6.7

36 58.0 1.8 5.4 10.9 14.2 38 54.0 55.8 59.6 2.0 6.7

518 572 18 68 123 1.98

387 6.06 38 59.62

38 35 54 74 90 110 726 16.58 26.20 35.78 413 432 449 468 490 4504

129 148 165 184 203 16.58 22.3 24.4 26.0 28.1 30.2 26.20

42 115 133 147 162 183.3

322 340 35.9 375 39.3 35.78

740 42 1480

220 247 268 292 8.15 26.84 596 18 40 64 8.7 4.10

90.94 42 45.470

42 36.2 38.5 40.8 43.0 45.5 47.8 50.0 52.3 54.8

42 45.433

45 17.0 18.3 19.5 21.7 23.7 46 9.9 11.3 12.5 13.7 14.7

40.89 46 12.42

45 20.04

44 21.0 23.2 25.7 27.6 30.0 2550 36.86 60 78 103 12.7 15.0 10.36

32.3 34.6 36.7 39.4 41.3 36.86 43.6 46.0 48.0 50.4 52.9 48.18

55.2 57.5 59.4 1.5 3.7 59.46

5.29

0 4.40

58 36644 −.113 58 36.53 57 50.74 + 45.79 47144 −45.16 −.81 −3.60 −49.57 57 46.96

38 26.172 −.040 38 26.13 37 40.60 + 45.53 37536 −45.20 −.28 −3.06 −48.54 37 37.59

42 45.452 −.018 42 45.43 42 0.14 + 45.29 57.502 −45.20 −.06 −2.64 −47.90 41 57.53

44 48.072 −.049 44 48.02 44 2.41 + 45.61 59.056 −45.20 −.34 −3.35 −48.89 43 59.13

9.13095

9.55826

9.94680

9.48529

52 14.78 + 15.36 52 30.14 −8.776

1.94330 1.18648

17 39.28 − 37.51 17 1.77 +6.011 −3.345

1.90369 1.52440 1.57418 1.19489

18 19.50 − 35.11 17 44.39 +30.65

1.48643 1.54546

53 16.50 + 12.65 53 29.15 −31.97 −84.35

1.50474 1.92609 1.10226 1.52361

16 46.50 + 15.66 17 2.16

52 56.00 + 33.39 53 29.39

+82 30 18.21

+69 5 46.58 5 46.19

+28 5 3.96

+72 29 19.20 29 18.96

−39 50 31 1.68130 −1016 1.67114

−26 25 7 1.45630 −888 1.44742

+14 35 33 1.17590 −866 1.16724

−29 49 30 1.51850 −866 1.50984

−29 49 50 1.51860 1.50994

+46.90 − .57 + 11 +46.44

+2802 − 1.17 + .13 +26.98

+2802 − .20 + 09 +2791

−14.70 − .21 + 16 −14.75

+3235 − .16 + .16 +32.35

+3236 −1.14 + 14 +31.36

+82 31 46.5

+69 6 13.56 +69 6 13.83

6 14.10

+28 4 49.21

+72 29 51.55 +72 29 50.94

29 50.32

July 11

Reg −17 16.7 16.8 17.8 17.4 17.8 16.5 −17 16.83

+ .59 −17 16.83 31 52 + .57 13 47.9 − 15.6 17.8 −17 34.24 13 29.35 −13 30.41

+ .40 −17 16.83 6 14.2 + .40 48 56.8 − 17.45 17.4 −17 33.83 48 39.34 −48 40.00 39.90

− .23 −17 16.83 4 49.0 − .23 47 33.2 − 14.5 15.8 −17 31.56 47 18.68 −47 17.65

+ .46 −17 16.83 27 51.4 + .46 12 34.9 − 17.0 16.5 −17 33.37 12 17.90 −12 17.57

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1885phae..proj.1621..

July 12 1885 9.83701

T Herculis			η Draco			ο Herculis			G. 2373		
	+1.06			+1.86			+.92			No Ephemeris	
h m s	−.07			−.33			−.01				
16 16 47	−.01		16 22 22	+.00		16 30 20	+.00		16 35 36		
+46 36			+61 47			+42 41			+77 40		
−4 13			−19 24			−0 18					
17 10.4		16	30.2	22 56.6	30 35.2	43.7	31 04	37 10.7	35 45.2	17	
130			34.7	0.9	377	46.3	31	122	49.2	42	
162		46 58.6	39.0	5.4	39.4	49.0	61	134	52.3	92	
187		48 1.8	43.5	9.3	41.5	52.0	89	146	55.6	120	
208		48 48	47.5	38.98 13.7	43.0	54.7	49.14 116	165	58.5	52.16 14.7	8.36
		48 78		18.3			144			8.36	
	227	47 10.7	40.0	22.5		38.5	173		50.0	17.9	
	256	46 13.6	44.3	26.8		31.2	200		53.1	24.30 21.0	
	285	46 16.6	48.7	31.5		34.1	228		56.0	40.92 24.2	
	314		53.1			37.0			59.5	27.4	
	346 26.560		57.6	48.74		39.6	34.08		29.5	63.0	81.0 24.30
	−24.007										
791		49	2772	12.50	1968	23.22	10.46	674		35.0	
17 15.82	17 4.553	17 4700	23 13.860	23 13.889	30 39.36	23 11.610	31 11.622	37 13.48		37.9	
										40.5	
										44.0	
										47.2	40.92
		17 4.628		23 13.874			31 11.616			36 24.408	
		−.022		−.033			−.021			−.072	
		17 4.61		23 13.84			31 11.60			36 24.34	
		16 19.06	−45.60	22 28.32	−45.61		30 25.95	−45.61			−45.62
		+46.55	−.01	+45.52	−.02		+45.65	−.01			
		16.989		+.19			23.759				
			−2.07	+45.71	−2.01			−2.19			
			−47.68	26.310	−47.64			−47.81			
			16 16.93		22 26.20			30 23.79			
		9.83701					9.86635			9.32960	
29 52.90	−11.19	1.04883n			25 18.20	+32.26	1.50866	25 10.88	−48.07	1.69082n	
+9.96		0.99807			−30.71		1.48424n				
30 2.86					25 47.49						
					4						
+46°				+42							
52 45.49				57.8 0.86							
−4 12 53				−0 17 28							
0.62780n				9.46600n							
−.879				−.847							
0.61901				9.45783							
+4.16				+0.29							
−.03				−.28							
+.14				+.02							
+4.27				+0.23							
+46 52 49.76				+42 57.8 0.89							
+.07	−17 16.60			+.01	−17 16.60						
52 49.83	+.07			57.8 0.9	+.01						
35 31.9	−16.3			40 44.8	−16.2						
−17 17.9	−17 32.83			16.1	−17 32.79						
35 15.55	35 16.93			40 28.61	39 28.10						
					40						

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1885phae.proj.1621.

July 12 1885 9.13095

E Urs Min +7.33

α 16 57 47 −.64
δ +82 13 49
−39 50

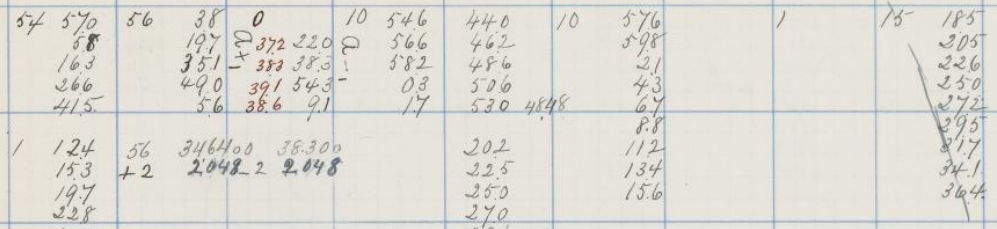
S Herculis +.47

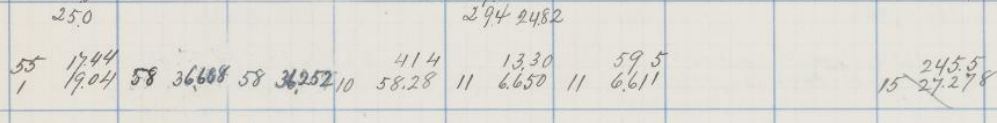
17 10 15 +.30
+24 58
+17 25

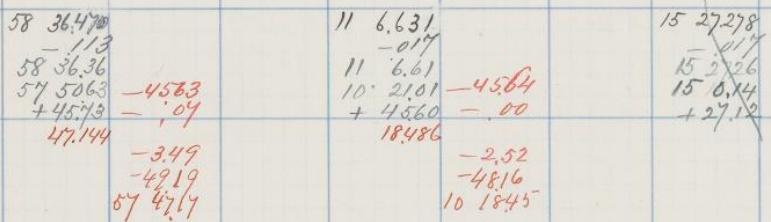
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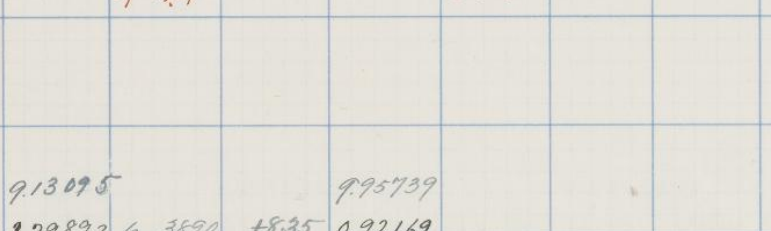
θ Ophiuchi −.46

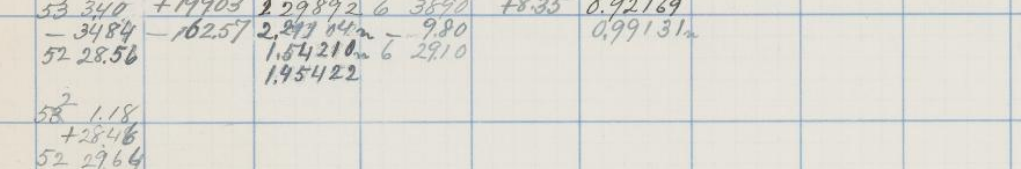
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−24 52

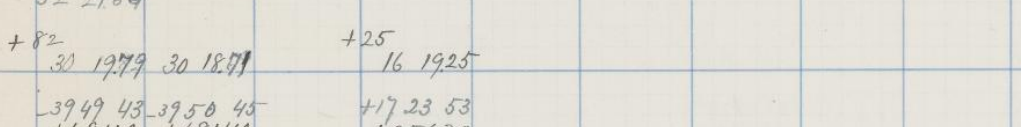


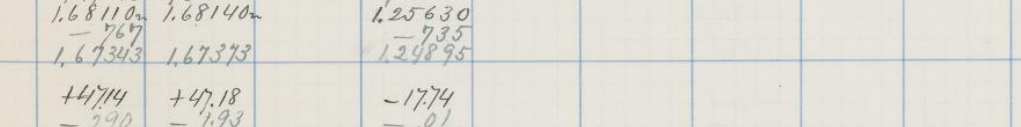


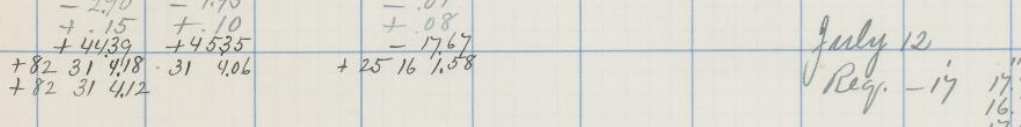


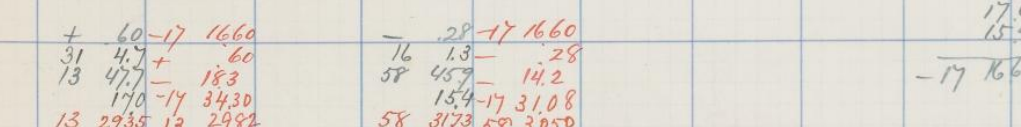


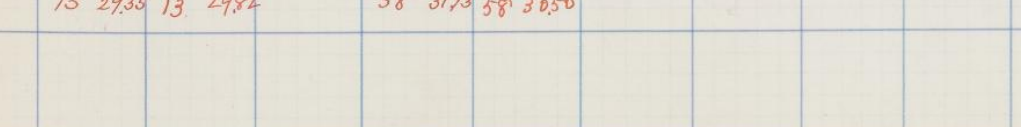


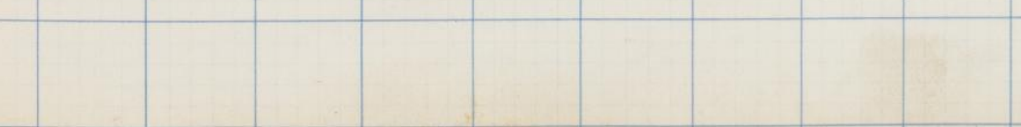












July 12
Reg. −17 17.9
16.1
17.0
15.4
−17 16.60

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July 15

θ Draco +1.66		δ Ophiuchi −.06		ε Ophiuchi −.08		τ Hercules +1.06
h m s −.28		+.72		+.73		−.07
15 59 41		16 8 16		16 12 11		16 16 14
+58 52 −.03		−3 24		−4 24		+46 35
−16 29 +.80		+45 47		+46 47		−4 12

1 212, 243, 272, 301, 341 | 0 166, 204, 246, 286, 325, 364, 406, 444, 480 | 8 484, 495, 514, 533, 550 | 477, 498, 517, 538, 559 5178 | 9 0.0, 2.0, 4.1, 6.3, 8.4, 10.5, 12.4, 14.4, 16.4 | 376 12 390, 413, 430, 438 | 427, 447, 468, 488, 509 4678 | 12 55.0, 57.3, 59.1, 1.3, 3.2, 5.3, 7.2, 9.5, 11.5 | 16 26.5, 29.0, 31.3, 33.6, 35.8 | 356, 385, 416, 447, 476 41.60 | 16 53.6, 56.6, 59.6, 2.6, 5.6, 8.6, 11.6, 14.6, 17.6

56.3, 01, 40, 81, 122 4140, −31.912 | 207, 228, 247, 267, 289 24.76 | 158, 179, 20.0, 21.9, 24.2 19.96 | 235, 265, 294, 325, 356 29.50

1369 | 2921 | 76 | 1654 | 74.5 | 2047 | 6.74 | 29.4 | 62 | 11.10 | 50.4

1 27.380 | 0 32.228 | 0 32.456 | 8 51.52 | 9 8.270 | 9 8.278 | 12 40.94 | 13 3.370 | 13 3.267 | 16 31.24 | 17 5.550 | 17 5.600

0 32.380, −030, 0 32.35, 59 45.89, +46.46, +.09, +46.55, 44.209 | −46.49, −.05, 1.68, −2.25, −48.79 4822, 59 43.56, 44.13

9 8.274, −.015, 9 8.26, 8 21.75, +46.51, 19.142 | −46.49, +.00, −2.61, −49.10, 8 19.16

13 3.319, −.015, 13 3.30, 12 16.85, +46.45, 14.191 | −46.50, +.00, −266, 49.16, 12 14.14

17 5.575, −.022, 17 5.55, 16 18.99, +46.56, 16.989 | −46.50, −.03, −2.00, −48.53, 16 17.02

9.71352 | 9.99923 | 9.99872 | 9.83716

22 ~~17~~ 31.18, + 36.82, ~~18~~ 23 8.00 | −55.00 | 1.74036, 1.56611 | 28 42.28, −21.65, 28 20.63 | +16.75 | 1.22401, 1.33547 | 29 38.28, −28.89, 29 9.39 | +22.38 | 1.34986, 1.46081 | 30 34.52, −30.56, 30 3.96 | +34.34 | 1.53580, 1.48518

+59 9 ~~4~~ 40.35 | −3 5 32.28 | −4 6 21.04 | +46 52 44.39

−16 25 0 15, 1.22740, −15.80, 1.21160 | +45 45 56, 1.77140, −1569, 1.75571 | +46 46 52, 1.78680, −1558, 1.77122 | −4 12 12, 0.62660, −1547, 0.61113

+16.28, −.73, +.12, +15.67, +59 9 56.02 | −56.98, +.01, +.18, −56.89, −3 6 29.17 | −59.05, +.02, +.23, −58.80, −4 7 17.84 | +4.08, −.32, +.03, +3.79, +46 52 48.18

+ .27, 9 56.0, 52 40.0, −17 16.3, 52 21.61 | −17 16.27, +.27, −18.4, −17 34.40, 52 21.62

−.69, 6 29.9, 23 44.9, 15.0, 23 50.62 | −17 16.27, −.69, −5.7, −17 22.66, 23 51.83

−.70, 7 18.5, 24 35.4, 16.9, 24 41.27 | −17 16.27, −.70, −5.9, −17 22.87, 24 40.71

+ .07, 52 48.2, 35 32.5, 15.7, 35 15.55 | −17 16.27, +.07, −16.5, −17 33.10, 35 15.08

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1885phae.proj.1621

July 15 1885

No Ephemeris

G 2373

h m R

16 35 36

+77 40

9.13095

ε Urs. Min. +7.33 −.64

16 57 47

+82 13 49

−39 50

α Herculis +.26 +.47

17 9 21

+14 31

+27 52

37 91 134 157 170 187

35 462 492 526 560 593

23 54 94 129 160

59 443 463 490 514 534 557

9.20 24.72 41.00

509 570 568 0.0 36

18.7 21.5 24.6 27.6 31.2

5266 5706 2472

178 235 282 323 383

58 370 370 37.2 424 36.3 465

28.020 50853 37.167

10 413 430 441 453 471

36.870 522 544 563 585 0.6 5640

205 584 27

10 50 70 90 112 134 155 177 199 219

261 282 303 324 346 3032

2672 10 13.360

1204 10 13378

739 37 14.78

343 374 406 448 479 36 24.928

2998 59 49.97 41.00

58 38243

85 129 2.940 25427 37.813

36 24.928 −.072 36 24.856

−46.52

58 37.151 −.113 58 3704 57 6028 + 46.76 47.144

−46.53 − .22 − 3.14 − 49.89 57 47.15

10 13.369 −.016 10 13.35 9 26.84 + 46.51 24.225

−46.54 − .01 − 2.62 − 49.17 9 24.18

9.32960

9.13095

9.98591

25 9.30 −47.85

52 16.72 + 12.75 52 29.47

−7282

1.86225 1.10543

32 50.98 + 38.60 33 29.58

−30.79

1.48841 1.58655

+82 30 18.88

−3950 29 1.68130 −1525 1.66605

+46.35 − .39 + .12 +46.08

+82 31 4.96

+14 49 18.77

+2750 5 1.48280 −1523 1.46757

−29.35 − .12 + .14 − 29.33

+1448 49.41

+ 61 31 56 13 48.3 17.3 13 29.35

−17 16.27 + .61 − 189 −17 34.56 13 30.40

− 45 48 49.0 31 32.6 16.4 31 19.51

−17 16.27 − .45 − 13.1 −17 29.82 31 19.62

July 15

Reg − 17 16.3 15.0 16.9 15.7 17.3 16.4

−17 16.27

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1885phae.proj.1621.

July 16 1885

δ Ophiuchi −.06 | ε Ophiuchi −.08 | τ Herculis +1.06 | η Draco +1.86

h m s +.72 | +.73 | −.07 | −.33

1 16 8 16 | 16 12 11 | 16 16 14 | 16 22 23

−3 23 −.04 | −4 24 | +46 35 | +61 46

+45 46 +.00 | +46 47 | −4 12 | −19 23

8 402	478	9 02	12 400	427	12 553	16 342	360	16 540	22 165	310	22 577
419	500	23	416	447	573	365	390	570	212	354	20
434	520	43	435	470	595	385	419	599	240	400	64
450	540	63	453	490	16	406	450	29	280	443	106
468	560 5198	83	463	512 4692	36	439	481 42.00	60	313	490 39.940	148
		106			57			90		+ 34879	192
	210	126		160	78		240	120			237
	230	147		180	98		269	150			280
	250	167		201	119		297	180			326
	271			222			328				
	292 2506			242 2010			358 2984				

173	1702	760	167	702	325	437	1184	538	210		1350
8 43.46	9 8.520 10	9 8.444	12 43.340	13 3.510	13 3.611	16 38.74	17 5.920	17 5.978	22 24.20	23 14.819	23 15.000

9 8.477 | 13 3.560 | 17 5.949 | 23 14.940
− .015 | − .014 | − .022 | − .033
9 8.46 | 13 3.55 | 17 5.93 | 23 14.91
8 21.74 −46.78 | 12 16.84 −46.79 | 16 18.97 −46.79 | 22 28.20 −46.80
+ 46.72 + .00 | + 46.71 + .00 | + 46.96 − .04 | + 46.71 − .07
19.142 | 14.191 | 16.989 | + .19
−2.60 | −2.65 | −1.98 | +46.90 −1.89
−49.38 | −49.44 | −48.81 | 26.310 −48.76
8 19.08 | 12 14.11 | 16 17.12 | 22 26.15

9.99924 | 9.99872 | 9.83715 | 9.67492

28 52.62 +25.02 1.39829 | 29 33.32 +20.22 1.30578 | 30 26.68 +27.21 1.43473 | 19 33.88 +50.74 1.70535
− 32.34 1.50976n | − 26.11 1.41673n | − 24.22 1.38411n | − 31.08 1.49250n
28 20.28 | 29 7.21 | 30 2.46 | 19 2.80

−3° | −4 | +46 | +62
5 31.93 | 6 18.86 | 52 45.89 | 3 45.55
+45 46 7 | +46 46 47 | −4 12 19 | −19 23 12
1.77140 | 1.78670 | 0.62670n | 1.30670n
− 1372 | − 1359 | − 1346 | − 1332
1.75768 | 1.77311 | 0.61324 | 1.29338
−57.23 | −59.31 | +4.10 | +19.65
+ .02 | + .02 | − .20 | − .58
+ .20 | + .23 | + .02 | + .23
−57.01 | −59.06 | +3.90 | +19.30
−3 6 28.94 | −4 7 17.92 | +46 52 49.79 | +62 4 4.85

− .70 −17 16.15 | − .71 −17 16.15 | + .07 −17 16.15 | + .32 −17 16.15
6 29.6 − .70 | 7 18.6 − .71 | 52 49.9 + .07 | 4 5.2 + 32
23 44.9 − 57 | 24 35.5 − 58 | 35 32.7 − 17.1 | 46 47.4 − 18.8
−17 15.3 −17 22.55 | 16.9 −17 22.66 | 17.2 −17 33.18 | 17.8 −17 34.63
23 50.62 23 51.49 | 24 41.27 24 40.58 | 35 15.55 35 16.61 | 46 28.62 46 30.22

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July 16 1885 9.13095

ε Ursae Minoris +7.33

h m s — .64

16 57 47

+82 13 49

−39 50

36 Draconis +4.32 −.57

17 54 32

+76 59

−34 36

o Herculis +.55 +1.23

18 2 59

+28 45

+13 38

δ Ursae Minoris +16.91 −.70

18 9 25

+86 37 35

−44 14

8.77115

59 41.8 436 462 487 505

18.3 23.1 28.3 33.1 38.2 28.200 −50.853 58 37.347

59 30.8 46.16 58 38.900

56 8.3 13.3 20.2 27.5 33.4

54 49.8 53.5 56.5 59.4 22

57.4 54.2 57.2 05 33

10.27 56 20.54

53.3 56.8 2.9 7.7 12.8 2.700 −25.407 58 37.273

55 51 8.1 11.3 14.6 17.7 5628 1136 20.8 24.0 26.86 42.08 27.0 29.7 5732 32.8 36.0 39.0 42.2 45.2 48.0 4208

3 25.3 27.0 28.9 31.2 33.5 11.36 26.86 14.59 3 29.18 4208

58 37.355 10 −.113 58 37.242 57 50.16 −46.83 +47.084 −.29 47.144 −3.02 −50.14 57 47.06

55 26.780 −.069 55 26.711 54 39.78 −46.88 +46.93 −.17 35.900 −3.88 −50.93 54 35.78

3 29.5 3 18 3 40 3 86.7 39.0 34.20 7.0 9.5 11.8 14.2 1.65 11.80 10600 3 53.000

3 43.6 46.0 48.5 50.6 53.0 53.3 57.7 02 2.4 4773 3 53.033

3 53.016 −.018 3 53.00 3 6.12 −46.90 +46.88 −.02 3.407 −2.71 −49.63 3 33.7

10 57.5 12 48.8 57.4 3.3 25.8 40.5 53.3 56.2

10 51.50 13 31.33 22.76

11 0.8 12.2 23.2 33.0 46.1 5.75 −58.222 12 9.7 19.7 33.0 43.4 10 24.727 −.259 10 24.47 9 35.86 −46.90 +48.61 −.68 24.896 −10.96 −58.54 9 25.93

6.469 23.460 25.238 20.660 116.444 24.276

9.13095

52 2088 −6882 + 12.05 52 32.93

1.83771 1.08089

6 58.58 −53.76 +15.68 7 14.26

9.35263

1.73046 1.19532

20 39.15 +23.84 −27.06 20 12.09

9.94286

1.37731 1.43240

29 17.60 −26.77 −17.803 + 13.61 29 31.41

8.77115

+.42765 2.25047 6.31103 1.13387

+82 30 15.42 −39.50 25 1.68130 −12.55 1.66875 +.4664 −.35 +.12 +.4641 +82 31 1.83

+77 15 34.09 −34 35.47 1.59870 −.1130 1.58740 +.3867 −.35 +.10 +.3842 +77 16 12.51

+29 2 36.26 +13 37.53 1.14590 −.1116 1.13384 −13.61 −.13 +.04 −13.70 +29 2 22.56

+86 53 16.94 −44 13.28 1.74800 −.1090 1.73710 +54.59 −1.02 +.22 +53.79 +86 54 10.73

+.62 −17 16.15 31 2.5 + .62 13 48.5 − 19.1 14.0 −34.63 13 29.35 13 27.20

+.55 −17 16.15 16 13.1 + .55 58 56.2 −17.3 183 16.9 −17 33.45 90 58 39.89 58 39.06 38.61

−.22 −17 16.15 2 22.3 − .22 45 6.6 − 16.3 15.7 −17 32.67 44 50.26 44 49.89

+.68 −17 16.15 54 11.4 + .68 36 55.1 − 17.3 163 −17 32.77 36 37.76 36 37.96

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July 16-1885

+1.64

ζ Draconis

h m s −.28

18 22 11

+58 44

−16 21

22 15.1 24.3 22 48.0
19.1 28.0 52.0
22.3 32.0 56.2
24.7 36.0 02
28.4 40.0 3206 42
44.2
27.9 11.9
31.8 15.9
35.8 19.8
39.7
43.7 3578

1096 784 364
22 21.92 23 3.920 23 4044

920
23 3.982
− 029
23 3.953
22 16.89 −46.91
+ 4700 − .07
13837
− 3.05
−50.03
22 13.82

9.71519

21 56.20 +4200 1.62325
− 28.23 1.45067
21 27.97

+59°
1 20.38

−16 20 50
1.22760
−1066
1.21694

+16.48
− .92
+ .10
+16.16
+59 1 36.54

July 16
Reg −17 15.3
16.9
17.2
17.8
14.0
15.7
16.3
16.0
−17 16.15

+ .27 −17 16.15
1 36.8 + .27
44 20.8 − 17.6
−17 16.0 −17 33.48
44 3.16 44 3.06

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1885phae.proj.1621...

July 18-1885

9.13095

No Ephemeris

Gr. 2373

h m s
16 25 36
+77° 40

E Ursæ Minoris

+7.33

h m s −.64
16 57 47
+82° 13 49 −.14
−39 50 +.00

α Herculis

+26

h m s +.47
17 9 21
+14° 31
+27 52

O Ophiuchi

−.16

h m s +.92
17 14 52
−24 53
+67 16

37 14.0 19.6 24.8 35.6 42.2

35 47.6 50.8 53.6 56.8 04 5384 164 9.78

36 32 66 9.7 13.0

9.78 514 549 57.7 1.0 42.

26.00 42.16 5784 196 226 259 295 324 2600

355 388 422 456 487 42.16

10 6.0 6.7 8.5 9.6 11.3 4.21

10 8.42

5.29 5.30 5.72 5.97 1.4 5724 27.0 29.0 31.1 38.2 35.4 3114

10 14190

10 5.8 7.9 10.0 12.0 14.3 16.5 18.5 20.4 22.8

10 14278

15 23.9 25.7 27.4 29.4 31.0

15 27.48

24.9 24 29.2 31.4 33.7 2926 10 8.2 5.4 7.7 10.2 5.50

15 47.380

15 38.3 40.6 43.0 45.2 47.4 49.8 51.8 54.3 56.5 669

15 47.433

1392
37 27.84

29.040
− 57.858
58 138.189

2838
10 14.190

12.85
10 14.278

374
15 27.48

9476

58 39.920 59.878
41 14.3 3900
− 25427
58 38473

58 38.311
− 113
58 38.20
57 49.91 −47.28
+ 48.29 − 1.03
47.144

10 14.234
− 016
10 14.22
9 2682 −47.29
+ 47.40 − 04
24.225

15 47.406
− 007
15 47.39
15 0.12 −47.29
+ 47.27 + 06
36.817

36 25924
− 072
36 25.85 −47.26

−2.77
−51.08
57 47.12

−2.60
−49.93
9 24.29

−3.30
−50.53
14 56.86

9.32960

9.98591

9.95769

25 7.22 −61.92 1.79183

35.80
33 35.80 +5.81
− 7.28
33 26.52
28.52

0.76418
0.86232

56 36.60 +19.93
− 2.341
56 13.19

1.29951
1.36943

+14 1983
49 22.33

−24
33 24.84

+27 50 47
1.48307
−14 56
1.46844

+67 13 51
2.13454
−1424
2.12030

−2941
− .00
+ .14
−29.27
+14 48 53.06
50.56

−13.92
+ .08
+ .06
−13.78
−24 35 36.62

− 46 −17 16.82
48 52.6 50.1 − .46
31 33.1 − 13.6
−17 19.5 −17 3.88
1.10
31 19.51 31 19.68

− 90 −17 16.82
35 37.5 − .90
52 56.2 − 5.5
18.7 −17 23.22
53 1.74 52 59.84

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1885phae.proj.1621

July 18 - 1885 9.84125

i Herculis +1.04 −.06

h m s
17 36 10
+46° 4'
− 3 41

β Oph. +.08 +.61

h m s
17 37 44
+4° 37'
+37 46

α Herculis +.53 +.25

h m s
17 41 54
+25° 48'
+14 35

36	34.8	36	33.3	36	51.4	38	30.2	17.2		38	29.4	42	15.6	24.2	42	38.0
	38.0		36.3	3.9	54.2		32.0	19.0			31.5		18.4	26.4		40.4
	40.1		39.4	3.1	57.1		34.0	21.0			33.4		20.4	28.9		42.8
	41.8		42.4	3.1	0.1		35.2	23.2			33.4		22.2	31.1		45.0
	43.8		45.3	3.1	3.1		36.5	25.0	2108		33.7		23.4	33.4	2880	47.4
			39.340								39.8					49.8
			23.781					50.0			41.9			1.4		52.0
								52.0			43.9			8.7		54.4
								54.2			46.0			6.0		57.0
								56.2						8.5		
								58.2	5412					10.8	6.08	
	485				179		75.20				696		06	94.88		66.8
36	39.70	37	3.121	37	3.140	38	33.58	38	37.600	38	37.733	42	20.12	42	47.440	42	47.422

37 3.13.1
− 022
37 3.11
36 15.70 −47.31
+ 4.741 − .15
13.162
−2.54
−50.00
36 13.11

38 37.666
−015
38 37.65
37 50.29 −47.31
+ 47.36 − .01
47.479
−2.81
−50.13
37 47.52

42 47.431
−018
42 47.41
42 0.11 −47.32
+ 47.36 − .07
57.502
−2.61
−50.00
41 57.41

9.84125 9.99859 9.94674

1	33.45	+23.43	1.36977	27	42.30	+4.09	0.61172	18	15.25	+27.31	1.43632				
	−21.01		1.32325		− 5.28		0.72254		− 31.28		1.49529				
1	12.44			27	37.02			17	43.97						

+46°
21 3591

−3 41 13
0.56940
− 1385
0.55605

+3.60
− .15
+ .06
+3.51
+46 21 39.42

+4
55 11.33

+37 44 56
1.44890
1335
1.63585

−43.21
− .00
+ .11
−4332
+4 54 28.01

+28
5 4.38

+14 35 29
1.17570
− 1308
1.16262

−1454
− .17
+ .13
−14.58
+28 4 49.80

July 18.
Reg − 17 17.0
18.7
16.7
14.9
−17 16.82

+ .06 −17 16.82
21 39.5 + .06
4 22.8 − 18.3
−17 16.7 −17 35.06
4 4.54 4 4.36

− .60
54 27.4
48 58.8
5 28.6

− 24 −17 16.82
4 49.6 − 24
47 34.7 − 16.0
14.9 −17 33.06
47 18.68 47 16.74

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July 19 – 1885

ι Herculis +1.04
h m s −.06
17 36 10
+46° 4′ −.11
− 3 41 +.00

36 22.1 | 33.6 | 36 57.2
24.8 | 36.4 | 54.3
26.7 | 39.7 | 57.3
28.8 | 42.3 | 0.3
31.1 | 45.3 3946 | 3.3
6.2
21.1 | 9.2
24.0 | 12.2
27.0 | 15.2
30.0
33.0 27.02

33.5 648 292
36 26.70 37 3.240 37 3.244

37 3.242
− 022
37 3.22
36 15.69 −47.50
+ 47.63 − .11
13.16
−2.53
−50.14
36 13.08

9.84125
1 45.40 +36.54 1.56277 18
− 32.90 1.51725n
1 12.50

+46
21 35.85
−3 41 1
0.56900n
−1448
0.55452
+3.58
− .36
+ .07
+3.29
+46 21 39.14

+ .06 −17 17.12
21 39.2 + .06
4 23.1 − 18.6
−17 16.1 −17 35.66
4 4.5 4 3.48

υ ζ Herculis +.53
h m s +.25
17 41 5?
+24 44
+14 36

42 17.6 | 24.3 | 38.4
19.0 | 26.7 | 40.7
20.9 | 29.0 | 43.0
22.3 | 31.3 | 45.4
23.6 | 33.7 29.00 | 47.7
50.1
1.7 | 52.2
4.0 | 54.6
6.2 | 57.0
8.6 30
11.0 6.70

1034 95.70 (30) 4291
42 20.68 42 47.850 (.650) 42 47.678

42 47.664
− 018
42 47.65
42 0.11 −47.50
+ 47.54 − .06
57.50
− 2.61
−50.17
41 57.48

9.94680
1248
9.98 +26.98 1.43104
− 30.91 1.49007n
17 39.07
41.57

+28 6.78
5 9.28
+14 35 24
1.17580
− 1449
1.16131
−14.50
− .16
+ .13
−14.53
+28 4 54.45
52.25

− .25 −17 17.12
4 54.5 520 .25
47 34.9 − 16.2
19.6 54 −17 33.57
17.1
47 18.7 47 18.68

γ Draconis +3.12
h m s −.50
17 43 53
+72° 12′
−29 49

45 33.6 | 44 23.0 | 34.3
38.9 | 25.3 | 36.6
43.3 | 27.4 | 38.8
48.6 | 29.7 | 40.9
53.4 | 32.0 2748 | 43.5 3882
7.7 3882 | 45.6
9.9 50.24 | 47.8
12.3 1.22 | 50.2
14.7 | 52.4
16.8 1228 | 54.9 5024

2178 | 56.9
45 43.56 | 59.0
1.3
3.3
5.6 1.22

44 50.008
− 049
44 49.96
44 2.12 −47.50
+ 47.84 − .34
59.06
−3.06
−50.90
4x 59.06 (3)

53 498 −53.55 9.48529
+ 21.20 1.72876
53 26.18 1.32628

+72
29 22.17
−29 49 41
1.51860n
− 1449
1.50411
+31.92
− .46
+ .12
+32.26
+72 29 54.43

+ .50 −17 17.12
29 54.9 + .50
12 37.2 − 19.3
17.7 −17 35.92
12 17.9 12 18.57

ξ Draco +1.53
h m s −.25
17 57 30
+56° 53′
−14 30

51 55.1 | 45.1 | 52 7.8
57.0 | 48.8 | 11.3
0.8 | 52.8 | 15.3
3.5 | 56.6 | 19.0
6.0 | 0.4 5274 | 23.0
26.6
45.3 | 30.6
49.0 | 34.2
52.7 | 38.0
56.8
0.6 5288

24 4562 2058
52 0.480 52 22.810 52 22.867

52 22.838
− 028
52 22.81
51 35.32 −47.51
+ 47.49 − .17
32.59
−2.73
−50.41
51 32.40

1 9.73747
12 14.80 +22.36 1.34947
− 15.82 1.19917n
+2 8.98
11 58.98

+57
10 49.37
−14 30 21 (3)
1.17320n
−1450
1.15870
+14.41
− .13
+ .10
+14.38
+57 10 53.75

+ .25 −17 17.12
11 4.0 + 54 .25
53 46.4 − 17.10
17.6 −17 35.97
53 27.3 53 27.78
27.78

July 19
Reg −17 16.1
17.1
17.7
17.6
−17 17.12

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July 21 – 1885

Gr. 2377 +1.54

h m s −.25
16 43 5
+56° 5′ 9 −.15
−14 36 +.00

9.13095

Eltes. Min. +7.33

h m s −.64
16 57 47
+82° 13′ 49
−39 50

i Herculis +1.04

h m s −.06
17 36 11
+46 4
−3 41

9.35263

35 Draconis +4.32

h m s −.57
17 54 26
+76° 59′
−34 36

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July 21 - 1885

Illes. Min +16.91
h m s -.70
18 9 25.
+86° 3' 6 57
-44 14

α Lyrae +.80
h m s +.06
18 33 1
+38° 41
+3 42

G. 2653
h m s
18 35 18.
+77° 27'

9.97178
110 Herculis +.37
h m s +.37
18 40 42.
+20° 26
+21 57

12 55.1 / 57.2 / 1.2 / 6.7 / 15.2 / 19.0

8 62 / 17.9 / 28.4 / 41.6 / 52.3 2928

9 3.3 / 16.6 / 28.4 / 38.8 / 52.2 2786 / 27.86 / 26 / 26.30 / 14.3 / 25.38 / 26.4 / 38.6 / 49.6 26.30

33 35.6 / 37.1 / 38.6 / 40.6 / 42.7

276 / 30.0 / 32.8 / 35.4 / 38.2 3280 / 9.7 / 12.3 / 15.0 / 17.7 / 20.3 1500

33 43.1 / 46.0 / 48.6 / 51.2 / 53.9 / 56.6 / 59.3 / 1.9 / 4.7

42 8.6 / 5.0 / 6.2 / 8.0 / 10.3

25.0 / 27.2 / 29.5 / 31.7 / 33.8 / 47.0 / 49.2 / 51.4 / 53.6 / 55.7 51.380 / -17.608

41 25.0 / 27.2 / 29.5 / 31.7 / 33.7 / 36.0 / 38.2 / 40.3 / 42.6

13 5.732 344

11 1.0 / 13.7 / 24.8 / 38.7 / 48.7 25.38

19478 / 33 38.97½

10780 / 33 53.900

353 / 33 53.922

331 / 42 6.628

41 33.772

342 / 41 33.800

10 26.336 / -.259 / 10 26.08 / 9 34.87 -48.06 / +51.21 -2.54 / 2490 / -9.97 / -60.57 / 18 25.81 / 9

33 53.911 / -.020 / 33 53.89 / 33 5.55 -48.10 / +48.34 -.12 / 2.70 / -2.85 / -51.07 / 33 2.82

41 33.791 / -.016 / 41 33.78 / 40 45.62 -48.11 / +48.16 -.06 / 42.75 / -2.87 / -51.04 / 40 42.74

8.77108

29 14.12 -15.39 / +12.18 / 29 26.30

2.20246n / 1.08577

?

+14.99

9.89244

1.17580 / 1.18047n

9.97178

37 58.98 -32.83 / +39.84 / 38 38.82

1.51627n / 1.60028

+86 / 53 22.05 / -44 13 32 / 1.74800n / -.2255 / 1.72545 / +53.14 / -.82 / +.13 / +52.45 / +86 54 14.50

+20 / 44 9.53 / +21 53 13 / 1.36490 / -.2216 / 1.34274 / -.2202 / -.19 / +.09 / -.2192 / +20 43 47.61

+.70 -17 18.43 / 54 15.2 +.70 / 36 56.6 -.18.8 / 18.6 -17 36.53 / 36 37.8 36 37.97

-.37 -17 18.43 / 43 47.2 -.37 / 26 29.7 -17.6 / 17.5 -17 35.80 / 26 12.7 26 11.81

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July 21 – 1885

β Lyrae +.65

h m s +.16
18 45 49
+33 13
+9 10

δ Draco +1.68

h m s −.29
18 49 28
+59 15
−16 52

θ Lyrae +.78

h m s +.08
19 12 21
+37 56
+4 27

2	46	15.6	16.5	46	31.2	49	39.0	41.7	50	8.7	12	47.2	48.0	13	3.6				
		17.7	19.0		33.8		44.2	45.7		9.8		49.3	50.6		6.0				
		19.4	21.4		36.2		47.2	49.8		14.0		51.5	53.0		8.7				
		20.9	23.9		38.5		50.0	53.3		17.9		53.4	55.7	12	11.2				
		21.2	26.3	2142	41.0		52.8	57.8	4966	21.8		55.0	58.3	53.29	13.9				
					43.7					25.9					16.3				
			56.0		46.0			46.3		29.9			29.5		19.2				
			58.3		48.2			50.0		33.9			32.1		21.7				
			0.7		50.9			54.0		38.1			34.9		24.1				
			3.4					58.1					37.2						
			5.7	0.82				2.0	5408				40.0	34.74					
													2786						
		948	8224		95		332	2374		1970		664	2814		1247				
	46	18.96	46	41.120	46	41.056	49	46.64	50	21.870	50	21.889	12	51.33	28	13	13.930	13	13.856

				46	41.088				50	21.879						13	13.893			
					−.019					−.030							−.020			
				46	41.07				50	21.85						13	13.87			
				45	52.93		−48.11		49	33.50		−48.13				12	25.56		−48.16	
					+48.14		−.10			+48.35		−.25					+48.31		−.12	
					50.06					30.24							22.55			
							−2.87					−3.26							−3.01	
							−51.08					−51.64							−51.29	
						45	49.99				49	30.21						12	22.58

					9.92252					9.70867							9.89693		
51	41.05	+22.13		1.34498		50	58.68	+35.24	1.54704		9	45.68	+22.61		1.35430				
−	23.97			1.37973		−	23.33		1.36794		−	23.09			1.36346				
51	17.08					50	35.35				9	22.59							

+33°				+59					+38										
31	31.27			32	13.07				13	25.76									
+9	8 55			−16	51 47				+4	27 0									
	0.96720				1.24190					0.65140									
	− 2208				− 2208					− 2178									
	0.94512				1.21982					0.62962									
	− 8.81				+ 16.59					− 4.26									
	− .12				− .30					− .14									
	+ .05				+ .03					+ .14									
	− 8.88				+ 16.32					− 4.26									
+33	31 22.39			+59	32 29.32				+38	13 21.50									

	− .16	−17	18.43		+ .29	−17	18.43			− .08	−17	18.43							
31	22.2	−	.16	32	29.6	+	.29		13	21.4	−	.08							
14	5.4	−	18.1	15	11.1	−	18.3		56	3.3	−	17.8							
−17	16.8	−17	36.69		18.5	−17	36.44			18.1	−17	36.31							
13	47.3	13	45.70	14	52.8	14	52.88		55	45.5	55	45.19							

July 21

Reg − 17	18.9
	19.0
	18.4
	18.6
	17.5
	18.5
	18.1
− 17	18.43

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July 22 - 1885 9.67492

N Draconis +1.86

h m s −.33
16 22 23
+61 46 −.13
−19 23 +.00

G. 2377 +1.54

h m s −.25
16 43 4
+56 59
−14 56

49 Herculis +.27

h m s +.46
16 46 50
+15 10
+27 13

E Herculi +.60

h m s +.20
16 53 52
+31 6
+11 17

24 16 5.1 8.1 11.2 14.9

43 27.8 30.0 27.2 34.0 27.0 37.9 27.2 31.0 40.6 27.1 34.7

43 42.2 46.0 48.9 53.6 57.3 2.12 10 6.0 8.7 12.5

47 20.7 22.6 24.6 26.0 27.7

47 33.0 35.0 37.2 39.3 41.6 43.4 45.7 47.8 50.0

56 28 13.6 15.7 17.6 19.3 21.2 17.48

56 34.3 36.9 39.2 41.6 44.0 46.4 49.0 51.5 53.6

23 42.4 46.7 50.8 55.3 1.7 57380 34879

20.0 23.8 27.6 31.2 36.2 27.56

20.0 22.3 24.3 26.4 28.7 24.34 57.3 56.4 58.6 0.6 28 58.54

20.0 22.3 24.9 27.2 29.6 24.80 8.1 3.30

409 24 8.180

23 16.501

203 43 34.06

11468 43 57.40

5152 43 57.244

216 47 24.32

82.88 47 41.440

132 47 41.467

56 17.48

8810 56 44.050

365 56 44.056

23 16.501 −.033 23 16.47 22 28.04 −4.824 +48.43 −.24 +.19 +48.62 −1.73 26.31 −5.021 22 26.26

43 57.292 −.028 43 57.26 43 9.05 −4.825 +48.21 −.20 +.09 +48.30 −1.98 7.07 −5.043 43 6.83

47 41.453 −.016 47 41.44 46 53.18 −48.25 +48.26 −.04 50.73 −2.45 −50.74 46 50.70

56 44.053 −.018 56 44.04 55 55.70 −48.26 +48.34 −.08 53.39 −2.31 −50.65 55 53.89

9.67492

18 28.08 −51.68 +31.66 18 59.74

1.71332 1.50047

6 25.78 +23.23 − 16.39 6 9.39

9.73630

1.36605 1.21458

55 6.68 +17.13 − 21.41 54 45.27

9.98460

1.23376 1.33059

59 46.25 +26.57 −29.46 59 16.79

9.93261

1.42439 1.46923

+62 3 48.61

−19 24 18 1.30710 −15.69 1.29141

+19.56 −.60 +.10 +19.06

+62.4 7.67

+57 38.96 16 44.96

−14 36 20 1.17630 −15.10 1.16120

+14.49 −.13 +.04 +14.40

+57 16 56.36

+15 28 3.08

+27 12 21 1.47120 −14.90 1.45630

−28.60 −.04 +.50 −28.64

+15 27 34.44

+31 23 31.56

+11 17 0 1.06030 −14.70 1.04560

−11.11 −.17 +.14 −11.14

+31 23 20.42

+ .33 −17 17.08 4 8.0 + .33 46 48.6 − .20 −17 19.4 −17 36.75 46 28.6 46 30.92

+ .25 −17 17.08 16 56.6 536 + .25 59 35.3 − 19.9 27.3 27 36.73 59 18.8 15.4 59 16.63

− .46 −17 17.08 27 34.0 − .46 18 17.8 − 13.2 16.2 −17 30.74 10 4.6 10 3.70

− .20 −17 17.08 23 20.2 − .20 6 3.5 − 16.8 16.7 −17 34.08 5 46.7 5 46.34

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July 22 - 1885 9.13095 8.77108

ε Urs. Min. +7.33 — h m s 16 57 48, +82° 13 49, −39 50, −.64

δ Urs. Min. +16.91 — h m s 18 9 25, +86 36 57, −44 14, −.70

α Lyrae +.80 — h m s 18 33 1, +38 40, +3 43, +.06

110 Herculis +.37 — h m s 18 40 41, +20 26, +21 57, +.37

59 44.8
46.1
47.1
48.2
49.0

5 45.1

8 7.9
17.4
27.9
40.7
52.2
29.220
+116.464
10 25.684

9 4.2
16.3
27.2
37.9
50.8
27.280
+58.232
25.512

33 27.2
29.2
31.2
32.6
34.9

27.9
30.2
32.9
35.6
38.1 32.94

33 43.5
46.1
48.9
51.4
54.1
56.6
59.3
1.9
4.4

41 5.8
7.5
9.6
10.7
13.7

12.0
14.2
16.3
18.6
21.0 16.42

41 25.3
27.5
29.7
31.9
34.1
36.1
38.3
40.6
42.7

19.0
24.7
30.6
33.9
38.7

58 37.6 37.6
38.6 43.7
29.380 48.1
−50.853
38.527 53.1
57.9
4.1
9.1
14.1

38.033

10 25.0 1.7
25.3 13.6
25.4 25.4 25.233

9.7
12.3
14.8
17.7
20.2 14.98

47.1
49.1
57.6
53.6
55.9 51.46

35.2
59 47.04

5 45.10

15.5.1
33 31.02

107.8
33 53.940

36.2
33 54.022

48.3
41 9.66

67.88
41 33.940

30.6.2
41 34.022

58 39324

3.660
25.427
38.233

58 38.332
−.113
58 38.220
57 49.39
+48.83
47.14

−48.26
−.95
−2.25
−57.46
57 46.74

10 25.476
−.258
10 25.12
9 34.61
+50.51
24.90

−48.31
−2.20
−9.71
−60.22
9 24.90

33 53.981
−.020
33 53.96
33 5.54
+48.42
2.70

−48.32
−.10
−2.84
−51.26
33 2.70

41 33.981
−.016
41 33.96
40 45.61
+48.35
42.75

−48.33
−.05
−2.86
−51.24
40 42.72

9.13095 8.77108 9.89254 9.97178

52 15.58
+12.03
52 27.61

−68.73

1.83715
1.08033

29 43.90
−21.43
29 22.47

+280.38

2.44775
1.33106

24 53.42
−23.21
24 30.21

+22.96

1.36097
1.36574

39 8.48
−29.51
38 38.97

+24.32

1.38596
1.46997

+82
30 20.74
−39 50 30
1.68130
−1450
1.66680
+46.43
−.34
+.07
+46.16
+82 31 6.90

+86
53 25.88
−44 13 2
1.74790
−1196
1.73594
+54.44
−2.53
+.14
+52.05
+86 54 17.93

+38
58 18.14
+3 42 7
0.57120
−1108
0.56012
−3.63
−.14
+.15
−3.62
+38 58 14.52

+20
44 9.38
+21 56 22
1.36540
−1086
1.35454
−22.62
−.10
+.12
−22.60
+20 43 46.78

+ .65
31 7.6
13 49.7
−17 17.9
13 29.4

−17 17.08
+ .65
− 20.3
−17 36.73
13 30.17

+ .71
54 18.6
36 56.9
21.1 ap

− .06
58 14.5
40 56.5
18.0
40 38.0

−17 17.08
− .06
− 18.5
−17 35.64
40 38.88

− .37
43 46.4
26 29.9
16.5
26 12.7

−17 17.08
− .37
− 17.2
−17 34.65
26 12.13

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July 22 - 1885

8.68588

β Lyrae +.65
h m s +.16
18 40 49.
+33° 14'
+9 9

δ7 H Cephei −20.59
h m s −.77
18 46 14.
+92° 47'
87 13 9
−50 24

α Lyrae +.78
h m s +.08
19 12 21.
+37° 56'
+4 27

χ Cygni +1.33
h m s −.19
19 14 25.
+53° 9'
−10 46

46 ~~10.8~~		46 31.6		49 19.6				12 46.4		48.0		13 3.7		14 44.5		44.2		15 4.9	
11.6		34.0		28.1				48.2		50.7		6.2		47.8		47.6		8.1	
13.7		36.5		39.3				50.0		53.3		8.9		51.1		51.1		11.6	
15.8		38.9		47.6				52.5		56.0	32	11.6		53.3		54.2		15.1	
17.1		41.3		56.0				54.6		58.6	53.12	14.1		56.4		57.8	50.98	18.3	
18.8		43.7										16.8						22.0	
		46.3								29.8		19.2				39.2		25.3	
		48.9								32.2		22.0				42.4		29.0	
		51.2								34.9		24.5				45.8		32.1	
										37.6						49.3			
										40.1	3492					52.7	4588		
270	8266	124	49 38.12					2804	1270		31		3686		1664				
46 15.40	46 41.30	46 41.378	51 15.10					12 50.34	13 14.020	13 14.111	14 50.62		15 18.430		15 18.489				

A-1

51	1.0	28	5.2	3.00	
51	44.6	46.3	47.3	46.07	
52	25.2	28.6	33.6	29.13	
53	10.0	13.7	17.0	13.57	
53	51.5	54.5	58.6	54.87	
			52	29.28	
			−5	40.095	1.7

		46 41.354				46 49.233					13 14.116						15 18.459		
		−.019				+ .315					−.020						−.025		
		46 41.34				46 49.55					13 14.10						15 18.43		
		45 52.93	−48.33			46 4.96	−48.33				12 25.55	−48.35					14 29.97	−48.35	
		+ 48.41	− .08			+ 4.59	+ 2.68				+ 48.55	− .10					+ 48.46	− .14	
		50.06				16.92					22.55						26.71		
			−2.87				+ 11.96					− 3.00						− 3.26	
			−51.28				~~−39.05~~ −33.69					− 51.45						−52.78	
			45 50.06				46 ~~10.50~~ 15.86					12 22.65						14 ~~25.44~~ 26.65	

		9.92244				8.68588m					9.89693						9.77795		
51 46.28	+25.95	1.41414	20 7.68	~~−16.89~~		2.22760	47 ~~52~~ 48	+23.78		1.37621	56 22.82	+2.84				1.44467			
− 28.11		1.44881m	− 16.70	~~−2.65.87~~		2.42467m	− 24.29			1.38537m	− 21.62					1.03485m			
51 18.17			19 50.98			4.02541m	9 ~~28~~ 23.19				56 1.20								
						1.22278m													

+33			+93				+38	25.76				+53							
31 30.18			2 57.37				13 28.16					26 47.15							
+9 9 0			−50 22 38				+4 27 6					−10 46 23							
0.96730			1.84160m				0.65160					1.03970m							
− 1074			− 1063				− 972					− 961							
0.95656			1.83097				0.64188					1.03009							
−9.05			+6.776				− 4.38					+10.72							
− .17			+ 1.89				− .15					− .21							
+ .05			+ .01				+ .15					+ .04							
−9.17			+6.964				− 4.38					+10.55							
+33 31 21.01			+93 4 7.01				+38 13 15.78					+53 26 57.70							
							2078												

− .16	−17	1708	+ .78	−17	1708		− .08	−17	1708			+ .19	−17	1708					
31 20.8	=	.16	4 7.9	+	.78		13 28.7	−	.08			26 57.9	+	.19					
14 56	=	18.3	46 51.3	−	17.3		56 36	−	18.1			9 41.5	−	17.9					
15.2	<	35.54	16.6	−17	3360		42.1	−17	3526			16.4	−17	3479					
13 47.3	13	45.47	46 34.0	46	3341		17.1	17				9 23.6	9	2291					
				13	26.59		55 45.5	55	4582										
				−	50														
					26.09														

July 22
Reg 17

18.3	
16.2	
16.7	
17.9	
18.0	
16.5	
16.6	
17.1	
16.4	
− 17	1708

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9.13 095

49 Herculis +.27
h m s +.46
16 46 50
+15° 20 −.17
+27 10 13 +.00

ε Herculis +.60
h m s +.20
16 55 52
+31° 5
+11 18

ε Urs. Min. +7.33
h m s −.64
16 57.47
+82 13 49
−39 50

ε Serpentis −.27
h m s +.85
17 30 59
−15° 20
+67 43

47 53.4
55.6
57.3
58.8
0.0

47 33.1
35.4
37.5
39.5
41.7
43.7
45.9
48.0
50.2

56 15.9
17.8
19.6
21.4
23.5

20.0
22.7
25.0
27.4
29.8 24.98
58.7
1.1
3.4
5.9
8.3 3.48

56 34.6
37.2
39.5
41.9
44.2
46.7
49.1
51.5
54.0

59 54.9
56.0
57.0
58.1
59.2
0.2

20.0
25.1
29.9
34.7
39.8 29.90
−50.853

58 2.3
8.2
12.9
18.8
22.8 13.000
+25427
28.6
32.4
40.0
44.7
48.6 38.86
53.8
59.3
4.2
9.8
16.0 46.20
−25427

32 19.5
20.9
22.7
24.0
26.4
32 22.90 / 70

30.2
32.4
34.5
36.7
38.9 34.54
4.5
6.7
8.8
10.9
13.0 8.78

31
51.7 47.4
51.6 49.5
51.8 51.8
51.7 52.8
51.5 55.8
51.6 58.0
51.6 0.2

351
47 57.02

3750
47 41.667

982
56 19.64

8846
56 44.230

387
56 44.300

59 57.58

1.45
32 22.90

10332
31 51.660

4.5
31 51.6423

47 41.667
−.016
47 41.65
46 53.17 −48.46
+48.48 −.05
50.73
−2.44
−50.95
46 50.70

56 44.265
−.018
56 44.25
55 55.69 −48.46
+48.56 −.11
53.39
−2.30
−50.87
55 53.88

38882
58 39.140
−.113
58 39.03 38.77
57 49.26 −48.46
+49.77 −1.25
51 47.14
−2.12
−51.83
57 46.94

31 51.654
−.016
31 51.64
31 3.19 −48.46
+48.45 +.05
0.10
−3.09
−51.50
31 0.14

54 26.10 −15.35
+19.17
54 45.27

9.98426
1.18611
1.28260

59 43.18 +24.62
−27.30
59 15.88

9.93269
1.39129
1.43621

52 29.10 (14.55) −78.69
+ 13.78
52 42.88
28.33

9.93095
1.89592
1.13910

22 54.28 −21.05
+26.29
23 23.57

9.98426
1.32325
1.41974

+15°
28 3.08
+27 11 40
1.47100
−1145
1.45955
−28.81
−.03
+.13
−28.71
+15 27 34.37

+31
23 32.47
+11 16 57
1.06030
−1140
1.04890
−11.19
−.15
+.14
−11.20
+31 23 21.27

+82 20.02
30 6.47
−39 50 17 / 31
1.68130
−1125
1.67005
+46.78
−.44
+.07
+46.41
+82 30 51.88
31 6.14

−15 3
0 25.22 / 20
+57 40 1
1.95766
−1855
1.94611
−88.33
+.06
+.08
−88.19
−15 23.41
2

45
−.47 −17 17.09
27 33.9 − .47
10 18.0 − 13.4
−17 15.9 −17 30.76 31.32
10 4.6 10 34.1
30.5

45
−.20 −17 17.09
23 21.1 − 20
6 3.7 − 17.0
17.4 −17 34.29 65
5 46.7 5 46.48
.62

45
+.65 −17 17.09
31 7.1 + .65
13 49.9 − 20.6
17.2 −17 37.44 40
13 29.3 13 29.40
.04

45
−.87 −17 17.09
19 24.3 − .87
19 21.4 − 9.6
27.1 − 37.96 27.32
19 30.4 19 23.7
30.37 30.73

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35 Decemis +4.32

h m s −.57
17 54 26.
+76° 59
−34 36

56 16.4 / 23.4 / 28.4 / 33.5 / 39.4
84 52.0 / 55.0 / 58.0 / 0.9 / 4.3 / 5.2
55 7.2 / 10.2 / 13.9 / 17.0 / 18.5 / 19.9 / 21.9 / 25.8 / 28.8 / 31.9 / 36.0
4 26.0 / 27.3 / 28.5 / 29.6 / 30.6 / 28.6
5804 13.56 28.68 43.82 59.04
1413
56 28.26
34.5 / 40.8 / 43.7 / 47.1 / 50.0
420
4 28.40
43.82

55 28.628 − .069 = 55 28.56
54 39.39 − 48.46 = 54 35.88
+ 49.17 − .73 = 35.90
− 3.49
− 52.68

9.35263
6 53.25 − 59.63
+ 17.39
7 10.64
1.77546
1.24032
19 35.88 − 33.74
+ 38.30
20 14.18

9.35263
+77
15 37.71
−34 35 53
1.59880
− 1009
1.58871
+38.79
− .43
+ .06
+38.42
+77 16 16.13
+ .58 −17 17.09 45
16 16.7 + .58
58 58.1 − 20.2
18.6 −17 36.7 + 37.07
58 37.9 −58 34.42
39.06

+29
2 34.17
+13.36 50
1.14440
− 987
1.13453
+13.63
− .26
+ .14
− 13.75
+29 2 20.42
− .23
2 20.2
45 8.2 84

Not Fundamental

24 Ursæ Min. +.55

h m s +.23
18 8 2.
+28° 45'
+13 38

3 45.2 / 47.7 / 50.0 / 52.4 / 54.6 / 56.9 / 59.3 / 1.7 / 4.0
88 / 11.7 / 13.3 / 15.7
18.0 13.500 − 18.820
3 54.680
418
3 54.644

16 28.2 / 28.4 / 30.6 / 31.6 / 32.5
23
4 16 30.46

12 24.2 / 37.5 / 53.3 / 13 8.4 / 17.9
13 30.2 / 44.4 / 56.8 / 14 10.2 / 22.7
15 1.3 / 16.3
5166 29.6
8.7 42.6 / 9.9 56.8 / 16.76 7.6 / 8.6 21.7
28 13.4 / 18.9 / 27.0 / 33.3 / 39.7
5692 1323
28 26.46
8.70

23 H Camel −5.50

h m s −.85
18 26 35.
+100° 19'
79 41
−57 56

35.9 / 39.5 / 43.1 / 46.8 / 50.6
26 54.4 / 58.0 / 2.0 / 6.0 / 10.2
43.18
212
522 / 560 / 59.5 / 31
2.12 / 21.46 / 40.38
136 / 176 / 21.5 / 25.4 / 29.2
2146
7.0 59.56
32.8 / 36.7 / 40.8 / 43.8 / 47.8
4038

27 21.340 − .085 = 27 21.26
26 33.98 − 48.46 = 26 33.98 − 48.46
+ 47.28 + .94 = 35.34
+ 1.36
48.88 4616
33.38
26 35.10

9.94286
3 54.656 − .018 = 3 54.638
3 54.64 − 48.46 = 3 6.08 − 48.46
+ 48.56 − .09 = 3.41
− 2.67
− 51.22
3 3.42

9.94286
1.52815
1.58324
1 34.32

9.25307a
48 8.10 − 65.12 = 1.81871a
− 15.10
47 53.00
1.17901a

+100
35 10.35
4 35.33
−57 54.53
1.96178
− 957
1.95221
+ 89.58
+ .40
+ .09
+ 90.07
+100 36 40.42
25.42
+ .87 −17 17.09 45
36 26.3 + .87
19 10.6 − 18.1
15.7 −17 34.32 68
18 52.5 18 50.74

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α Lyrae +.80 +.06
h m s
18 33 1
+38° 41
+3 42

110 Herculis +.37 +.37
h m s
18 40 42
+20° 28
+21 55

No Ephemeris
24 H Camel
h m s
18 43 17
102° 53
77 7

O Lyrae +.78 +.08
h m s
19 12 21
+37° 56
+4 27

33 25.4 27.0 29.4 30.7 33.4 | 27.9 30.4 33.1 36.0 38.4 33.16 | 33 43.7 46.3 48.9 51.5 54.0 56.7 59.3 2.0 4.5 | 41 19.6 21.4 23.4 24.9 26.3 | 12.2 14.5 16.6 18.8 21.0 16.62 | 41 25.4 27.6 29.8 32.0 34.2 36.3 38.5 40.7 42.8 | 44 46.7 48.2 51.0 54.0 58.0 | 25.9 29.0 32.3 35.5 38.7 32.28 | 43 41.8 44.7 48.0 50.9 54.0 47.88 | 12 59.2 1.3 3.5 5.6 7.1 | 48.1 50.6 53.3 56.0 58.4 53.28 | 13 4.0 6.6 8.9 11.7 14.2 16.8 19.4 22.0 24.8

10.0 12.5 15.1 17.8 20.4 15.16 | 47.2 49.4 51.6 53.8 56.1 51.62 | 27.9 47.88 31.0 3.46 34.2 18.52 37.2 40.4 34.14 | 57.3 0.5 3.6 6.6 9.3 3.46 | 29.8 32.5 35.2 37.8 40.5 35.16

459 | 10832 | 369 | 156 | 6824 | 373 | 79 | 121 15.3 18.8 21.6 24.8 18.52 | 167 | 28.44 | 1284
33 29.18 | 33 54.160 | 33 54.100 | 41 23.12 | 41 34.120 | 41 34.144 | 44 51.58 | 13 3.348 | 13 14.220 | 13 14.267

33 54.130
−.020
33 54.11
33 5.53 −48.46
+48.58 −.14
2.70
−2.83
−51.43
32 33 2.68

41 34.132
−.016
41 34.12
40 45.61 −48.46
+48.51 −.06
42.75
−2.86
−51.38
40 42.74

44 3.256
+.069
44 3.32
−48.46

13 14.243
−.020
13 14.22
12 25.55 −48.46
+48.67 −.13
22.55
−3.00
−51.59
12 22.63

9.89244 | 9.97168 | 9.34824n | 9.89693

24 55.05 +24.95 1.39707 38 51.10 +11.01 1.04179 14 24.42 ~~−48.32~~ 9 33.10 +10.90 1.03743
−25.22 1.40174n − 13.36 1.12570n − 11.13 1.04659n
24 29.83 38 37.74 9 21.97

+38°
58 18.52
+3 42 9
0.57140
−939
0.56201
−3.65
−.17
+.15
−3.67
+38 58 14.85

+20
44 10.61
+21 56 5
1.36520
−931
1.35589
−22.69
−.02
+.12
−22.59
+20 43 48.02

+38
13 26.38
+4 26 47
0.65110
−896
0.64214
−4.39
−.03
+.14
−4.28
+38 13 22.10

− .06 −17 17.09 45
58 14.8 − .06
40 57.0 − 19.0
−17 17.8 −17 36.15 51
40 38.0 40 ~~38.70~~ 39.0
38.34

− .38 −17 17.09 45
43 47.6 − .38
26 30.1 − 17.4
17.5 −17 ~~34.87~~ 35.23
26 12.7 26 ~~13.15~~
12.79

− .08 −17 17.09 45
13 22.0 − .08
56 3.9 − 18.4
18.1 −17 35.57 93
55 45.5 55 ~~46.03~~
46.17

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July 23 – 1885

χ Cygni +1.33

α m s −.19
19 14 25
+53° 9
−10 46

13 5.0
8.2
12.0
15.1
18.4
22.0
25.4
28.9
32.5

3.94
4.28
4.61
4.95
5 30 46 160
−27 512

16 75
15 18648 15 18611

15 18.623
−.025
15 1860
14 2996 −.4846
+.4864 −.23
2671

−3.25
−51.94
14 2666

July 23
Reg – 17

15.6
15.9
17.4
17.2
17.1
15.7
17.8
17.5
18.1

– 17 ~~17.89~~
19.45

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July 25 - 1885

+37

110 Herculis

h m s +.37
18 40 46.
+20° 26 −.14
+21 57 +.00

−20.58

57 H Ophii

h m s −.77
18 46 17.
+92° 46'
87 13 7
−50 24

O Serpentis

h m s
18 50 34.
+4° 3'

No Obs.

+96

χ Lyrae

h m s −.02
18 57 54
+43° 48'
−1 25

5.0 41 125 49 525 43 55.0 45 12.2 53 15.2 135 52 307
6.1 169 19.3 59.0 44 14.5 26.7 17.6 16.4 33.4
7.0 175 17.5 4.3 31.0 41.9 20.3 19.3 36.3
8.0 100 44.5 56.2 22.2 22.0 39.0
8.7 171 215 17.25 13.3 58.7 46 9.2 41.24 25.0 25.0 19.24 41.9
28.74
44.9
478 48 46.0 41.24 23.3 47.6
50.1 59.5 51.48 37.0 50.5
52.0 49 120 52.2 63.4
374.5 268 2.42 6.5 7.8
56.5 52.180 41.3 18.4 5.148 10.5 4.86
−17.608 13.12
32.0
34.8 69.43 19.1 49.2 0.3 8410 377.7
42 6.96 41 34.745 50 3.82 48 3.3 53 20.06 53 42.050 52 41.967
34.572 16.9
30.7 2.42

572

41 34.745 46 51.400 52 42.009
− 016 + 315 − 021
41 34.729 56 46 51.72 52 41.99
40 4561 −48.8 x 2 46 585 −488 x 3 51 53.08 −488 x 3
4880 + 4587 + 2.88 + 48.91
4707 16.92 − .06 5015
4275
−2.86 +11.07 −293
−51.784 −34.878 −5188
40 42.97 46 16.852 51 50.140
.82

9.97178 8.68597 n 9.85839

37 59.15 −32.24 1.50840 n 19 58.60 −192.42 2.28425 n 16 54.15 −38.05 1.58035 n
+ 39.12 1.59241 − 12.09 1.08245 n + 35.56 1.55097
38 38.27 19 46.51 17 29.71

+20°
44 10.08

+21 55 13
1.36490
− 2044
1.34446

−2210
− .18
+ 09
− 2219
+20434789

+93
3 1.84

−50 22 47
1.84160 n
−2044
1.82116

+6624
+ .98
+ .15
+6737
+92 4 9.21

+44
5 18.64

−1 25 52
0.15810 n
− 2044
0.13766

+ 1.37
− .39
+ .06
+ 1.04
+44 5 19.68

− .38 −17 17.70
43 47.5 − .38
26 30.5 − 1.75
− 17 17.0 −17 35.88
26 12.7 26 12.01

+ .79 −17 17.70
4 10.0 + .79
46 52.1 − 1.81
17.9 −17 35.01
46 34.0 46 34.20
13 25.80
− 50
25.30

+ .02 −17 17.70
5 19.7 + .02
48 1.4 − 1.94
18.3 −17 37.08
47 42.0 47 42.60

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July 25 – 1885 – 9.92587

γ Leyrea +.64
h m s +.17
18 54 42.
+82° 32'
+9 51

γ Aquilae +.24
h m s +.48
19 0 11.
+13°41'
+28 42

O Leyrea +.78
h m s +.08
19 12 21.
+87°56'
+4 27

53	59.1			55		0	41.6		38.0	0	50.9	13	21.0		48.4	13	4.0
	1.0						43.3		40.4		53.0		23.7		57.0		6.7
	8.0						44.8		42.7		55.0		25.6		53.8		9.4
	5.0						46.9		44.6		57.0		27.5		56.2		12.0
	6.5				30.2 30.2		48.5		46.7 4248		59.2		29.4		58.8 5364		14.5
					30.6 38.0						1.5						17.2
		45.0			30.3 85.2				12.0		3.6				30.0		20.0
		47.5			30.3 87.6				14.0		5.6				32.7		22.4
		49.9			30.3 40.0				16.2		7.7				35.4		25.2
		52.1							18.3						38.2		
		546	49820						205 1620						407 3540		
			19571														
	6 146				17		251		18.68		8.35		27.2		29.04		13.14
55	29.2	55	30249	55	30.340	0	45.02	0	54340	0	59.278	13	25.44	13	14.520	13	14.600
									59								

				55	30.294					0	59.309					13	14.560
					– .019						– .016						– .020
				55	30.27					0	59.29					13	14.54
				54	41.39		–4888.3			0	10.39		–4888.4			12	25.55	–4888.5
					+ 48.88		– .09				+ 48.90		– .03				+ 48.99	– .11
					38.49						7.45						22.55
							–2.90						–2.94				– 3.00
							–51.82					0	–51.82				–51.956
						54	38.46	5				59	7.498			12	22.588

				9.92587					9.98750						9.89693		
		–3263		1.51362							9						
32	29.72	+27.37		1.43727	23	2500	+14.29		1.15503	59	10.68	–10.88			1.03663		
+ 3562	2.88			1.44534	–	17.98			1.25476		+ 11.11				1.04579		
31	56.84			1.55172	23	7.02				59	21.79						
33	5.34									9							

+32	4301			+13				+38									
60	48.57			59	41.33			13	26.56								
49																	
+9	49 44			+2840	39			+4	26 25								
	0.99900				1.49810				0.65040								
	– 2044				– 2044				– 2044								
	0.97856				1.47766				0.62996								
	– 9.52				– 3004				– 426								
	– .19				– .03				– .03								
	+ .07				+ .10				+ .13								
	– 9.64				– 2997				– 4.16								
+32	38.87			+13	59 11.36			+38	13 22.40								
49	33.37																

	– .17	–17	17.70		– .49	–17	17.70		– .08	–17	17.70						
49	33.2		– .17	59	10.9		– .49	13	22.3		– .08						
32	15.7		– 19.0	41	53.3		– 17.7	56	44		– 18.9						
18	29.0		3687		17.6	–17	35.89		17.9	–17	3668						
	17.5			41	35.6	41	35.47	55	45.5	55	45.72						
31	56.7	81	56.50														

July 25

Reg	–17
	17.0
	17.9
	18.3
	17.5
	17.6
	17.9
	–17 17.70

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July 27 – 1885

η Herculis +81	ε Serpentis −27	ι Herculis +1.04	υ Herculis +.53
h m s +.06	h m s +.85	h m s −.06	h m s +.25
16 38 59	17 31 5	17 36 14	17 42 0
+39° 8′ −.17	−15 20	+46 4	+27 44
+3 15 +.00	+57 43	−3 41	+14 31

39 14.7	22.0	39 37.8	31 24.5	31.0	31 43.8	36 24.3	35.0	36 52.8	42 21.8	25.8	42 39.8
18.0	24.5	40.3	25.8	33.0	45.9	26.2	37.8	55.7	23.1	28.0	42.2
20.3	27.2	43.2	27.9	35.4	48.0	28.8	41.1	58.8	24.9	30.4	44.6
22.2	29.9	45.8	29.5	37.4	50.2	31.5	43.9	1.5	26.0	32.8	46.8
23.5	32.3 27.24 18	48.5	31.1	39.4 35.24	52.4	33.2	47.0 40.96	4.7	27.3	35.1 30.42	49.1
		51.0			54.4			7.4			57.4
	4.2	53.8		5.0	56.7		22.5	10.6		3.0	53.8
	6.8	56.4		7.2	58.8		25.5	13.4		5.5	56.0
	9.6	59.0		9.2	0.8		28.1	16.6		7.7	58.4
	12.3			11.6			31.2			10.1	
	15.0 9.58			13.5 9.30			34.2 28.30			12.6 7.78	
48.7	96.82 76	75.8	38.8	104.54	21.0	43.7	92.6	42.4	23.1	98.20	8.21
39 19.74	39 48.410 380	39 48.422	31 27.76	31 52.270	31 52.333	36 28.74	37 4.630	37 4.678	42 24.62	42 49.100	42 49.122

39 48.401	31 52.301	37 4.654	42 49.111
−.020	−.016	−.022	−.018
39 48.38	31 52.28	37 4.63	42 49.09
38 59.29 −48.98	31 3.17 −49.05	36 15.57 −49.06	42 0.04 −49.06
+49.09 −.14	+49.11 +.05	+49.06 −.18	+49.05 −.09
57.24	0.10	13.16	41 57.50
−2.05	−3.07	−2.41	−2.54
−51.17	52.07	51.68	−51.69
38 57.21	31 0.21	36 12.98	41 57.40

		9.88968			9.98426		9.84125			9.94680
57 7.02	+28.66	1.45728	23 53.38	+24.54	1.38987	1 41.23	+35.91 1.55522	18 8.22	+24.49	1.38899
−28.79		1.45919n	−30.64		1.48636n	−32.26	1.50870n	−28.06		1.44802n
56 38.23			23 22.74			1 8.97		17 40.16		

+39°	−15	+46	+28
26 10.12	0 34.39	21 39.38	5 8.19
+3 14 21	+57 41 7	−3 41 5	+14 35 22
0.51320	1.95797	0.56920	1.17580
−978	−828	−813	−798
0.50342	1.94969	0.56107	1.16782
−3.19	−89.06	+3.64	−14.72
−.22	+.08	−.35	−.13
+.06	+.12	+.05	+.09
−3.35	−88.86	+3.34	−14.76
+39 26 6.77	−15 2 3.25	+46 21 42.72	+28 4 53.43

−.06	−17 17.00	−.88	−17 17.00	+.06	−17 17.00	−.26	−17 17.00
26 6.7	−.06	2 4.1	−.88	21 42.8	+.06	4 53.2	−.26
8 41.7	−18.1	19 21.3	−9.1	4 24.9	−20.4	47 36.5	−17.8
−17 19.0	35.16	17.2	−17 26.98	17.9	−17 37.34	16.7	−17 35.06
8 29.6	8 31.61	19 30.4	19 30.23	4 4.5	4 5.38	47 18.7	47 18.37

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July 27 - 1885

35 Draconis +4.32

h m s
17 54 26.
+76° 59'
Ex

52 18.7 266 84.7 483 544 35.94
85 90 118 136 157 176 12.54
52 35.94
55 13.54

54 14.9 18.7 21.0 24.7 27.3 30.0 15.70 33.0 36.5 39.2 41.8 44.5 47.1 51.2 55.0
54 33.069 − .069 54 33.000 54 39.13 − 6.13

23 57.15 53.3 57.5 53.5 57.85
23 57.26 46
23 3.73

b Draco +1.64

h m s −.28
18 22 12
+58 44
−16 21

30.6 34.1 37.8 41.9
45.8 38040 − 31.791
23 6.249

22 5.8 5.9 6.2 6.2 6.2 6.2 10.2 6.3 14.2 6.1 18.0 6.3 22.2
23 6.210 − .029 23 6.18 22 16.72 + 49.46 13.84
23 6.171

23 H Camel −5.50

h m s −.85
18 26 85
+100 19
79 41
−5 7 56

26 8.4 8.4 13.8 18.2 21.0
26 1.296

37.4 41.2 44.8 48.0 52.3 44.74
53.2 57.2 1.2 5.0 9.2 1.16
43.1

26 56.2 0.3 4.6 7.2 11.6
3.98 15.2 19.0 22.3 26.1 29.5
34.0 38.6 42.7 45.9 49.8 42.20

40 52.8 54.8 57.2 59.3 2.2
3.98 22.42 42.20
2242
36.3 40 57.26
4220

27 22.900 + .085 27 22.98 26 34.34 + 48.64 35.34
− 49.13 − .28 − 2.88 − 52.29 22 13.89
− 49.13 + .94 + 1.00 − 47.19 26 [35.79]

51 H Ceplei −20.58

h m s −.77
18 46 17.
+92° 47' 13.7
−5 0 24

43 53.4 44 12.4 28.2 42.1 53.4 26.70 46.3 58.7 50.54 14.3 29.0 1.80 40.5
48 11.0 22.3 39.9 53.8 4.7 38.34 38.34 22.4 36.2 50.2 3.6 12.96 2.03 50.54
48 3.5 14.2 27.4 18.0
46 50.068 + .315 46 50.38 46 6.43 + 43.95 16.92
− 49.14 + 3.50 + 10.49 − 42.15 − 35.15 46 8.23 46 15.23

9.71519
20 4855 − 51.25 + 3444 21 2299
1.70969n 1.53711

9.25307n
47 3782 + 6994 49 57.04
1.84473 1.21003

8.68597n
19 3056 + 35281 + 22.17 19 52.72
2.54784 1.34574

+59 1 25.36 − 16 21 58 1.22820n − 697 1.22123 + 16.64 − .63 + .02 + 16.03 +59 1 41.39
+100 34 54.31 − 67 55 8 1.96787n − 990 1.91797 + 90.15 − .47 + .09 + 89.76 +100 36 24.07
+93 2 55.63 − 50 23 15 1.84170n − 6.38 1.83532 + 68.44 + 3.29 + .18 + 71.86 +93 4 7.49

+ .29 1 41.7 44 2.40 17.7 44 3.2
−17 17.00 + .29 − 2.98 −17 3.751 44 3.88
+ .88 36 24.9 19 11.4 13.3
+ .79 4 8.3 46 5.26 15.7 46 3.40
−17 17.00 + .79 − 1.86 −17 3.481 46 3.268 13 2.732 − .52 2.682

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July 27 – 1885

	ζ Leporis +.64				α Aquilae +.24				ω Aquilae +.20			
	h m s +.17				h m s +.48				h m s +.51			
	18 54 41				19 0 11				19 12 29			
	+32° 31'				+13° 41'				+11° 23'			
	+9 52				+28 42				+31 0			
53	16.7	61	53	20.9	0 53.7	38.5	0	57.2	12 52.4	56.3	13	8.9
	19.1	8.6		23.3	54.0	40.6		53.2	54.3	58.4		11.2
	21.2	11.2		25.8	59.0	42.8		53.3	53.8	0.5		13.2
	23.0	13.6		28.3	12	44.9		57.6	57.5	2.6		15.2
	25.2	16.2 11.14		30.7	2.8	47.0 42.6		54.7	55.0	4.8 0.52		17.2
				33.1				1.9				19.5
		45.3		35.8		12.3		4.0		29.9		21.4
		47.7		38.0		14.5		6.1		32.0		23.7
		50.0		40.4		16.7		8.2		34.2		25.8
		52.6				18.7				36.2		
		33.0 5012				20.8 1660				38.2 3397 34.10		
	52	6126		63	487	10936		874		3444		661
55	2.04	65 30.630	55	30.700	0 59.14	0 59.680	0	59.711	12 55.80	13 17.220 .310	13	17.324

		55 30.665				0 59.695				13 17.327		
		– .019				– .016				– .016		
		55 30.65				0 59.68				13 17.31		
		54 41.38		–49.17		0 10.39		–49.18		12 28.10		–49.19
		+ 49.27		– .11		+ 49.29		– .04		+ 49.21		– .03
		38.49				7.45				25.11		
				–2.89				–2.94				–2.99
				–52.17				–52.16				–52.21
				54 38.48				0 7.52				12 23.10

		9.92595				9.98750				9.99137		
33	15.72	+9.62	0.98318	23	7.82	+0.56	9.74819	41	47.50	+21.53	1.33304	
	– 10.50		1.02136		– 0.70		9.84792		– 27.33		1.43664	
33	5.22			23	7.12			41	20.17			

+32°				+13				+11				
49	43.13			59	41.23			41	28.18			
+9	50 30			+28	40 22			+30	59 1			
	0.99950				1.49880				1.53860			
	– 6.23				– .608				– .578			
	0.99327				1.49192				1.53282			
	– 9.85				–31.04				–34.11			
	– .02				– .00				– .05			
	+ .10				+ .09				+ .05			
	– 9.77				–30.95				–34.11			
+32	49 33.36			+13	59 10.28			+11	40 54.07			
	– .18	–17	17.00		– .49	–17	17.00		– .52	–17	17.00	
49	33.2	–	.18	59	9.8	–	.49	40	53.5	–	.52	
32	16.2	–	19.5	41	53.7	–	18.1	23	37.8	–	18.3	
–17	17.0	–17	36.68		16.1	–17	35.59		15.7	–17	35.82	
31	56.7	31	36.68	41	35.6	41	34.69	23	19.5	23	18.25	

July 27

Reg	–17 19.0"
	17.2
	17.9
	16.7
	17.7
	15.7
	17.0
	16.1
	15.7
	–17 17.50

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July 28 - 1885

rej 1d 8

η Draconis +1.86

h m s −.33
16 22 25
+61° 46′ −.16
−19 23 +.00

22	22.6		33.3		22 59.7																		
	26.1		37.8		4.0																		
	29.5		42.2		8.2																		
	32.1		46.5		12.6																		
	35.4		50.9	42.14	17.0																		
					21.4																		
			43.2		25.8																		
			47.3		30.1																		
			51.9		34.5																		
			56.3																				
			0.5	51.60																			
				96																			
	457		337.4		1533		379		1646		736		142		3028		1356		106		9770		4392
22	29.14	23	16870		23 17033	26	47.58	26	8230	26	8178	30	42.84	31	15.140	31	15067	39	22.12	39	48.850	39	48.800
			.980																				

β Herculis +.40

h m s +.35
16 28 20
+21° 44′
+20 39

26	43.4		46.1		25 59.3																		
	45.7		48.3		1.6																		
	47.8		50.6		3.7																		
	49.3		52.8		6.0																		
	51.7		54.9	50.54	8.2																		
					10.4																		
			—		12.6																		
		25.8	23.6		14.8																		
		25.9	25.9		17.0																		
		26.1	28.3																				
		25.9	30.3	25.92																			
							379		1646		736		142		3028		1356		106		9770		4392
						26	47.58	26	8230	26	8178	30	42.84	31	15.140	31	15067	39	22.12	39	48.850	39	48.800

δ Herculis +.92

h m s −.01
16 30 26
+42° 40′
− 0 17

30	39.2		47.0		31 8.9																		
	41.1		49.4		6.6																		
	42.9		52.8		9.3																		
	44.6		53.3		12.3																		
	46.4		58.3	52.66	15.1																		
					18.0																		
			32.0		20.7																		
			34.8		23.5																		
			37.7		26.2																		
			40.4																				
			43.2	37.62																			
							142		3028		1356		106		9770		4392						
						30	42.84	31	15.140	31	15067	39	22.12	39	48.850	39	48.800						

ε Herculis +.81

h m s +.16
16 38 59
+39° 8′
+3 15

			22.4		39 38.2																		
			25.0		40.8																		
			27.6		43.5																		
			30.3		46.0																		
			32.9	27.64	48.8																		
					51.4																		
			4.8		54.2																		
			7.4		56.8																		
			10.1		59.5																		
			12.7																				
			15.3	10.06																			
							106		9770		4392												
						39	22.12	39	48.850	39	48.800												

23 17006
−.033
23 16.97
22 27.78 −49.35
+49.19 −.30
+.19
+49.38 −1.47
26.31 −57.12
22 25.85

26 8.204
−.017
26 8.19
25 18.73 −49.35
+49.46 −.06
16.56 −2.17
−57.58
25 16.61

31 15.104
−.021
31 15.08
30 26.87 −49.35
+48.98 −.15
44.41
23.76 −1.91
−57.41
30 23.67

39 48.825
−.020
39 48.80
38 59.27 −49.36
+49.53 −.13
57.24 −2.03
−57.52
38 57.28

9.67492 9.96798 9.86647 9.88968

19 29.58 +47.87 1.68006 19 43.92 +.3738 1.59528 25 13.72 +.3226 1.50866 57 8.88 +26.70 1.42651
−29.32 1.46721 +47.37 −30.72 1.67549 −26.82 1.42842
19 0.26 18 56.55 24 43.00 56 42.06
20 31.29

+62 3 48.09
−19 23 16
1.30670
−1530
1.29140
+19.56
−.52
+.13
+19.17
+62 4 7.26

+22 3 17.06
3 51.80
+20 36 58
1.33570
−1530
1.32040
−20.91
−.28
+.14
−21.05
+22 3 30.75
1 55.01
56

+42 58 5.35
−0 17 32
9.46600
−1513
9.95087
+0.28
−.29
+.01
+0.00
+42 58 5.35

+39 26 6.29
+3 14 23
0.51320
−1496
0.49824
−3.15
−.19
+.06
−3.28
+39 26 3.01

+.34 −17 16.21
4 7.6 +.34
46 49.6 −21.0
−17 18.0 −17 36.87
46 28.6 46 30.39

−.36 −17 16.21
13 30.4 −.36
44 41.5 −14.6
−18 48.9 −17 31.17
44 26.9 44 23.84
24.84

+.01 −17 16.21
58 5.4 +.01
40 47.6 −19.0
17.8 −17 35.20
40 28.6 40 30.15

−.06 −17 16.21
26 30.0 −.06
8 48.2 −18.6
14.8 −17 34.87
8 29.6 8 28.14

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35 Draco +4.32

h m s −.57
17 54 24
+76° 59'
−34 36

γ Sagittarii −.59

h m s +.96
17 58 31
−30° 25'
+72 48

51 H Cephei −20.58

h m s −.77
18 46 17
+82° 47'
87 13 7
−50 24

Lyrae +.96

h m s −.02
18 57 57
+43° 48'
−1 25

53 12.0 13.9 16.3 19.2 21.5 | 52 6.6 53.5 68.5 1.9 47 58.64 | 53 8.0 10.9 13.3 16.4 19.6 13.64 | 58 53.8 57.6 58.8 0.5 1.8 | 54 2.2 8.6 9.1 1.6 4.0 59.10 | 59 8.6 11.0 13.3 15.7 18.0 20.6 | 50 0.2 | 43 58.9 44 11.0 30.0 43.0 58.9 | 45 13.1 23.6 40.2 54.2 6.8 | 52 5.8 7.8 10.1 12.0 13.7 | 14.0 17.0 19.7 22.5 25.7 19.78 | 52 3.13 34.0 36.9 40.0 42.6 45.3

56 12.2 14.2 16.2 18.4 20.7 | 53 8.8 56.7 28.82 57.8 2.8 44.34 6.3 59.72 | 22.5 26.6 28.5 32.0 35.6 28.82 | 32.4 34.8 37.0 39.5 41.9 37.12 | 42.5 49 1.3 14.0 30.0 | 39.58 50.86 2.78 47 | 22.0 37.0 50.2 5.8 19.3 50.86 | 59.6 2.7 5.3 8.2 11.2 5.40 | 48.3 51.2 54.2

53 16.58 56 16.40 | 37.7 41.4 44.2 47.6 60.8 44.34 | 44.5 58 58.90 | 36.22 59 18.110 | 16.29 59 18.100 | 50 0.20 | 34.0 47.5 48 3.4 16.6 32.4 2.78 | 49.4 52 9.88 | 85.18 42.590 | 24.0 52 42.667

55 29.032 −.069 55 28.96 54 37.07 +49.89 35.90 −49.42 −.69 −3.17 −53.28 54 35.68

59 18.105 −.018 59 18.09 58 28.77 +49.32 25.25 −49.41 +.09 −3.52 −53.84 58 25.25

46 51.160 +.315 46 51.48 46 6.70 +44.78 1692 −49.45 +3.29 +10.22 −35.94 46 15.34

52 42.628 −.021 52 42.61 51 53.06 +48.55 50.15 −49.46 −.15 −2.91 −52.52 51 50.09

9.35263

7 46.55 −38.63 7 7.92 | +13.245 −47.37 | 2.12205 1.67550 1.58691 1.14036 | 28 12.55 − 21.44 27 51.11 | +19.20

6 56.60 + 13.82 7 10.42

9.93569

1.28330 1.33122 | 20 0.35 − 18.16 19 42.19 48.47 | −189.04 11.88

8.68597n 2.27655n 2.46096n 1.25916n 1.07475n | 18 0.85 3.35 − 30.61 17 32.74 30.24 | +3.275

9.85839

1.51521 1.48583n

+77° 15 40.43 | 15 37.93

−34 34 59 1.59860n − 1268 1.58592 | −34 35 49 1.59880n 1.58612

+3854 − 2.10 + .08 +36.52 | +3856 − .27 + .06 +38.35

+77 16 16.95 +77 16 16.62 | 16 16.28

− 30 5 2.76

+72.45 26 2.26331 − 1251 2.25080

−178.16 + .08 + .10 −177.98

− 30 8 0.74

+93 2 59.88 3 6.76

−50 22 46 1.84160n − 1111 1.83049

+6768 + 2.21 + .00 +6989

+934 16.05 9.77

+44 5 15.61 18.11

−1 24 43 0.15200n − 1102 0.14098

+1.38 − .29 + .09 +1.18

+445 16.79 19.29

+ 59 −17 16.21 | 16 17.2 + .59 | 58 59.4 − 2.15 | 17 17.8 −17 37.12 | 58 39.9 58 39.50

− 99 −17 16.21 | 8 0.8 − .59 | 25 20.2 − 1.7 | 19.4 −17 24.90 | 25 27.9 25 25.64

+ 79 −17 16.21 | 4 16.8 10.8 + .79 | 46 52.9 − 18.9 | 34.0 −17 34.32 | 17.9 46 34.0 | 46 35.45 13 24.55 − 50 24.05

+ .02 −17 16.21 | 5 16.8 193 + .02 | 48 2.3 − 2.03 | 14.5 −17 36.49 | 17.0 47 42.0 | 47 42.80

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γ Lyrae +.64
h m s +.17
18 54 41.
+32° 32
+9 51

ζ Aquilae +.24
h m s +.48
19 0 11.
+13° 42'
+28 41

ω Aquilae +.20
h m s +.51
19 12 30.
+11° 24'
+30 59

53 4.3	6.7	53 21.3	0 34.8	38.8	0 57.4	13 28.6	56.5	13 9.2
5.7	9.0	23.7	36.7	40.9	53.5	30.5	58.8	11.3
7.0	11.5	26.1	38.5	43.0	53.6	31.5	0.8	13.3
8.2	14.0	28.5	40.1	45.2	57.8	32.6	2.8	15.6
10.6	16.3 11.50	31.0	42.0	47.4 4306	59.8	33.9	0.0 0.78	17.6
		33.5			20			19.6
	45.5	35.9		12.6	4.3		30.2	21.9
	48.2	38.2		14.7	6.4		32.4	24.0
	50.4	40.8		16.7	8.5		34.5	25.9
	53.0			18.8			36.5	
	55.4 50.50			21.0 16.76			38.5 34.42	
35.8	62.00	9.0	42.1	10982	89.3	71	35.20	68.4
55 7.16	55 31.000	55 31.000	0 38.42	0 59.910	0 59.922	13 31.42	13 17.600	13 17.600

55 31.000
− .019
55 30.98
54 41.37 −49.46
+49.61 − .10
38.49
−2.88
−52.44
54 38.54

0 59.916
− .016
0 59.90
0 10.39 −49.46
+49.51 − .04
7.45
−2.94
−52.44
0 7.46

13 17.600
−.016
13 17.58
12 28.10 −49.47
+49.48 −.03
25.11
+2.99
−52.49
12 25.09

9.92587
33 32.15 +23.84 1.37731
− 26.03 1.41541m
33 6.12

9.98746
23 34.40 +21.50 1.33244
− 27.05 1.43213m
23 7.35

9.99135
41 3.85 −13.82 1.14051m
+ 17.54 1.24409
41 21.39

+32
49 42.23
+9 50 46
0.99980
−1094
0.98886
−9.75
− .14
+ .10
− 9.79
+32 49 32.44

+13
59 41.00
+28 40 48
1.49810
−1076
1.48734
−30.71
− .06
+ .11
−30.66
+13 59 10.34

+11
41 26.96
+30 58 18
1.53840
−1042
1.52798
−33.73
− .02
+ .03
−33.72
+11 40 53.24

− .18 −17 16.21
49 32.3 − .18
32 16.4 − 19.7
15.9 −17 36.09
31 56.7 31 56.35

− .49 −17 16.21
59 9.8 − .49
41 53.9 − 18.3
15.9 −17 35.00
41 35.6 41 35.34

− .53 −17 16.21
40 52.7 − .53
23 38.0 − 18.5
14.7 −17 35.24
23 19.5 23 18.00

July 28
Reg −17 18.0
14.1
17.8
14.8
17.7
17.0
15.9
15.9
14.7
−17 16.21

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July 30 - 1885

S Mrs. Minn +16.91
h m s −.70
18 9 25.
+86° 8′ 59
−44 14

δ Draconis +1.64
h m s −.28
18 22 12.
+58° 44′
−16 21

110 Herculis
h m s
18 40 46.
+20° 26′
No obs.

12	57.6	8	5.0	9	4.0	23	10.0			22	57.2
	52.6		17.8		15.3		13.0				55.2
	83.5		29.4		26.9		16.0				59.2
			41.2		38.6		18.5				3.2
			51.2	2892	57.3	2722	22.3				7.2
				2722							11.2
		11	57.5	10	1.8						15.2
		12	9.5	25.28	13.5						19.0
			21.1	23.78	24.8						23.1
			33.0		37.1						
			45.3	2128	49.2	25.28					

	7.7			11	0.8		298				645
12	52.57				11.7	23	~~59.60~~			23	7.167
					24.7		15.96				
					34.4						
					47.3	23.78					

				10	25.296					23	7.167
					−.259						−.029
				10	2504					23	7.14
				9	3254					22	1.67
					+5250						+5047
					2490						1384

Reject this date in June obs

8.77100 9.71519

29	15.58	−147.27	2.16811	21	21.42	−8.79	0.94399				
	+11.25		1.05134		+5.91		0.77141				
29	26.83			21	27.33						

+86° +59

53	21.52	1	21.02
−44	13 30	−16	21 25
	1.74830		1.22790
	−1195		−1195
	1.73635		1.21595
	+5449		+1644
	−.70		−.02
	+.08		+.02
	+5387		+16.44
+86	54 15.89	+59	1 37.46
	+72		+29
54	16.1	1	37.8
36	58.4	44	24.8
−17	[17.4] Rej		[13.0] Rej

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Aug. 4 - 1885

α Ophiuchi	ι Herculis	u Herc.	35 Draco.
+.22	+1.04	+.53	+4.32
h m s +.50	h m s -.06	h m s -.25	h m s -.57
17 29.40,	17 36 14,	17 4 2 0,	17 54 25,
+12° 38' -.09	+46° 4'	+27° 47'	+76° 59'
+29 45 +.00	- 3 41	+14 36	-34 36

9.35263

10.0
13.0
16.4 16.14

30 58.0	9.4	30 22.3	36 33.4	38.3	36 56.0	42 23.5	28.9	42 43.0	53 34.8	55 3.7	55 19.0	
0.7	11.6	24.9	36.8	41.1	58.8	25.2	31.2	45.2	38.9	0.7 6.7	22.3	
2.5	13.7	26.5	39.0	44.0	1.8	27.2	33.5	47.5	41.8	0.6 ~~10.0~~	25.3	
4.2	15.8	28.6	40.8	46.9	4.8	29.1	35.9	49.8	44.3	~~13.0~~	28.4	
5.6	18.1 13.72	30.7	43.0	49.9 44.04	7.8	30.6	38.3 33.56	52.2	47.2 41.40	~~16.4~~ 0.65	31.0	31.18
		32.7			10.6			54.5				
	43.2	35.0		25.5	13.5		6.2	56.8	56 6.3	20 55.9	34.0	
	45.3	37.1		28.5	16.6		8.5	59.2	8.1	1.6 58.6	37.2	
	47.4	39.1		31.2	19.4		10.8	1.4	11.0		40.4	
	49.7 48			34.2			13.2		12.8		43.7	
	51.8 47.~~50~~			37.4 31.36			15.4 10.82		14.4 10.52		1.80 46.7	46.70

11.0	61.28	69	43.0	15.40	69.6	35.6	104.38	469.6	53 41.40		49.6
31 2.20	30 30.6~~10~~	30 30.767	36 ~~86.00~~ 38.60	37 7.700	37 7.733	42 27.12	42 52.190	42 52.178	56 10.52	55 31.225	53.1

~~53.9~~
~~58.6~~

55 31.340

30 30.683	37 7.716	42 52.184	55 ~~40.476~~ 31.311
-.016	-.022	-.018	-.069
30 30.67	37 7.69	42 52.17	55 ~~40.41~~ 31.24
29 38.34 -52.26	36 15.52 43 52.26	41 59.94 -52.27	54 38.55 -52.28
+52.33 -.02	+52.17 -.09	+52.23 -.05	+52.69 -.39
35.77	13.16	57.50	35.90
-2.57	-2.27	-2.44	-2.65
-54.85	-54.62	-54.76	-55.32
29 35.82	36 13.07	41 57.41	54 35.92

	9.98936	9.84125	9.94680
25 23.45 -31.52	1.49859n	1 33.42 +29.12 1.46419	18 8.78 +25.06 1.39898
+ 39.83	1.60018	- 26.16 1.41767n	- 28.71 1.45801n
26 3.28		1 7.26	17 40.07

9.35263
7 38.62 +119.91 2.07886
- 34.97 -39.21 1.59340n
7 3.65 1.54372n
1.05826

6 54.88
+ 11.44
7 ~~5.52~~ 6.02

+12 56 45.07	+46 21 41.09	+28 5 8.28	+77 15 44.70 15 42.83
+29 42 37	-3 41 13	+14 35 23	-34 35 7 -34 35 52
1.51650	0.56940n	1.17580	1.59860n 1.59880n
- 1930	- 1919	- 1908	- 1885
1.49720	0.55021	1.15672	1.57975 1.57995
-31.42	+3.55	-14.35	+38.00 +38.01
- .11	- .23	- .14	- 1.60 - .18
+ .00	+ .02	+ .03	+ .03 + .02
-31.53	+3.34	-14.46	+36.43 +37.85
+12 56 13.54	+46 21 44.43	+28 4 53.82	+77 16 21.13 16 20.68
			+77 16 20.98

- .51 -17 17.06	+ .06 -17 17.06	+ .26 -17 17.06	+ .59 -17 17.06
56 13.0 - .51	21 44.5 + .06	4 54.1 + .26	16 21.2 + .59
38 56.3 - 16.0	4 26.5 - 22.0	47 38.0 - 19.3	59 1.1 - 23.2
-17 16.7 -17 33.57	18.0 -17 39.00	16.1 -17 36.10	20.1 -17 39.67
38 40.3 38 39.97	4 4.5 4 5.43	47 18.7 47 17.72	58 37.9 58 40.98

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Aug. 4 - 1885

α Lyrae +80

h m s +.06
18 33 5
+38°41'
+3 42

110 Herculis +37

h m s +.37
18 40 46
+20° 26'
+21 57

β Lyrae +65

h m s +.16
18 48 32
+33° 13'
+9 10

33 45.0 313 33 46.9 41 11.6 160 41 29.0 47 13.2 20.7 46 35.4
46.0 33.7 50.0 13.5 18.0 31.3 14.9 23.0 38.0
50.4 36.4 52.8 13.0 20.3 33.4 16.6 23.3 40.3
53.4 39.5 53.3 16.4 22.5 35.8 19.0 28.0 42.8
56.0 42.0 3658 57.7 17.6 24.6 2032 38.0 22.1 30.5 2555 45.2
58.3 0.6 40.2 47.8
13.8 3.2 51.1 42.2 0.1 50.3
16.2 5.8 53.2 44.5 2.9 52.4
19.0 8.5 55.4 46.6 6.0 53.4
21.5 57.7 7.6
24.5 19.00 59.9 55.46 10.2 5.14

9.1 11558 521.0 241 7578 71.0 358 9068 479
33 51.52 33 57.790 33 57.889 41 14.82 41 37.870 41 37.889 47 17.16 46 45.346 46 45.322

33 57839 41 37890 46 45.331
−.020 −.016 −.019
33 57.82 41 37.87 46 45.31
33 5.43 −52.31 40 45.55 −52.32 45 52.85 −52.32
+52.39 −.07 +52.32 −.03 +52.46 −.06
2.70 42.75 50.06
−2.73 −2.80 −2.79
−53.11 −53.15 −53.17
33 2.71 40 42.72 45 50.14

9.89244 9.97178 9.92252

24 32.23 +6.32 0.80072 39 5.68 +23.09 1.36342 50 4030 −31.83 1.50284
−6.39 0.80539 −2802 +3448 1.53759
24 25.84 38 37.66 51 1478

+38° +20 +33
58 22.51 44 10.69 31 33.57

+3 41 46 +21 56 20 +9 7 54
0.57070 1.36530 0.96640
−1829 −1824 −1819
0.55241 1.34706 0.94821

−3.57 −22.24 −8.88
−.01 −.09 −.26
+.04 +.04 +.01
−3.54 −22.29 −9.13

+38 58 18.97 +20 43 48.40 +33 31 24.44

Aug 4
Aug − 17 16.7
18.0
16.1
18.9
15.6
−17 17.06

−.06 −17 17.06 −.38 −17 17.06 −.16 −17 17.06
58 18.9 −.06 43 48.0 −.38 31 24.3 −.16
41 0.0 −22.0 26 32.4 −19.7 14 8.7 −2.14
−17 18.9 −17 39.12 15.6 −17 37.14 13.6 −17 38.62
40 38.0 40 39.85 26 12.7 26 11.26 13 47.3 13 45.82

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Aug. 6 – 1885

9.92244

γ Draco. +1.26

h m s −.16
17 53 55
+51° 30' −.19
−9 7 +.60

η Serpentis −.05

h m s
18 15 23
−2° 56'

α Lyrae +.80

18 33 3 +.06
+38°41'
+3 42

β Lyrae +

h m s
18 43 57
+33°14'
+9 9

54 10.7 13.0 16.0 19.0 20.1
186 220 253 286 318 25.26
54 386 41.7 45.3 48.7 52.0 53.4 58.5 1.6 6.0
16 10.9 12.7 14.7 16.0 17.0
13 39.2 11 1.1 12 3.3 13 5.4 1.22
16 9.5 11.8 13.7 15.7 17.7 19.9 22.0 24.0 26.0
33 31.2 34.0 36.6 39.1 41.0
820 34.7 37.5 401 428 37.42
83 480 50.7 53.4 56.0 58.6 1.4 4.0 6.5 9.2
46 10.9 12.2 13.6 15.0 16.2
45 36.0 38.3 40.5 43.0 45.7 48.1 50.6 53.0 55.2
45 36.0 38.3 40.5
116 18.1 18.2 21.9 25.0 18.36
30.2 32.2 34.3 36.3 38.33.26
144 17.0 19.6 22.2 24.9 19.62

288 54 15.76
10362 54 51.810
466.8 54 51.867
213 16 14.26 16 17.770
35.48 16 17.811
70.3 16 17.811
319 33 36.38
11704 23 58.520
538 2 58.644
179 46 13.38
41.021 45

54 51.838
− 021
54 51.817
53 58.49 −52.95
+ 53.32 − 24
56.15
− 2.34
−53.33
53 56.28

16 17.775
− 015
16 17.76
15 24.44
+ 53.32

33 58.582
− 020
33 58.56
33 5.40 −52.98
+ 53.16 − 15
2.70
−2.70
−53.83
32 2.73
33

9.79415
9.99943
9.89244

35 35.42 +36.08
− 29.08
35 6.34
1.55727 0
1.46365
23.55 +3.52
24 47.85 +22.20
− 22.44
24 25.41
1.34635
1.35102

+51
47 42.01
−9 7 11
0.96590
− 788
0.95802
+9.08
− .35
+ .01
+8.74
+51 47 50.75

+38
58 22.84
+3 42 2
0.57100
− 642
0.56458
−3.67
− .13
+ .05
−3.75
+38 58 19.09

+ .16 −17 18.22
47 50.9 + .16
30 32.8 − 23.1
−17 18.1 −17 41.16
30 9.7 30 9.59

− .06 −17 18.22
58 19.0 − .06
41 0.4 − 22.4
18.6 −17 40.68
40 38.0 40 38.41

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Aug. 6 1885 9.94707

P Cygni +.52 +.25

h m s
(19) 78 26 6
+24 43
+14 40

E Draco. +2.74 −.46

h m s
19 48 30
+69 59
−27 36

27	26.8			26	57.8	48	40.0		30.9	49	7.5
	28.4				53.9		45.7		36.8		13.7
	29.3				56.0		50.9		42.8		19.2
	30.8				58.6		52.8		49.5		25.6
	32.7				1.0		57.4		54.6	42.92	31.4
					3.5		3.3				37.8
		27	15.0		5.8			50	7.6		43.7
			17.4		8.0				13.5		49.8
			19.7		10.0				19.7		55.8
			22.0						25.5		
			24.2	19.660					31.3	19.52	
				−18.638							
	48.2				8.6		10.1		67.44		28.45
27	29.64	27	1.022	27	0.956	48	51.68	49	30.220	49	31.611

27 0.978
−.018
27 0.96
26 7.99 −53.03
+52.97 −.10
.582

49 31.416
−.041
49 31.38
48 37.81 −53.06
+53.57 −.52
33.46

−2.97
−36.10
26 48.6

−4.35
−57.93
48 33.45

9.94707 9.53440

21 14.85 −28.66 1.45728 7 25.90 +39.74 1.59923
+32.85 1.51658 −17.61 1.24586
21 47.70 7 8.29

+28°
1 0.65

+14 38 29
1.17730
512
1.17218

−1487
−.19
+.01
−1505
+28 0 45.60

+70
15 40.06

−27 35 20
1.47830
477
1.47353

+2975
−.28
+.02
+2949
+70 16 9.55

− 26 −17 18.22
0 45.3 −.26
43 28.6 −21.5
−17 16.7 −17 39.98
43 7.1 43 5.62

+ .47 −17 18.22
16 10.0 + .47
58 55.5 − 20.6
19.5 −17 38.35
58 29.9 58 31.20

Aug 6
Reg −17 18.1
18.6
16.7
19.5
−17 18.22

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A 40 de 9.48529

9.79415

+1.53

+1.26

+.53

+3.12

+.25

−.50

−.25

−.12

+.00

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Aug. 8 - 1885

ζ Leonis +.80
h m s +.06
18 33 3
+38° 41'
+3 42

57 H Ophiuchi −.77
h m s
18 46 17
+92° 47'
87° 13' 4"
−50 24

χ Cygni +1.33
h m s −.19
19 14 26
+53° 10'
−10 47

χ Cygni +1.28
h m s −.17
19 52 39
+52° 8'
−9 45

33 36.4 335 33 49.2 47 55.5 44 8.0 45 18.9 14 43.2 49.8 15 10.6 52 59.0 8.6 53 23.5
37.8 36.0 57.8 56.1 23.0 33.3 45.9 53.2 13.9 1.8 6.7 27.0
39.2 38.7 54.2 57.0 42.3 51.6 49.0 56.8 17.2 8.9 10.2 30.4
40.3 41.3 57.0 56.5 46 5.8 52.4 0.0 20.5 6.0 13.4 33.6
42.4 43 38.64 59.7 45 9.8 39920 16.0 49320 56.0 3.5 5666 24.0 9.1 16.8 1014 37.1
2.4 161.654 70.817 27.2 40.3
155 5.0 40 41.5 31.6 5.3 44.8 30.8 57.3 43.7
18.2 7.6 44.0 43.2 34.2 48.1 34.2 0.5 47.2
20.9 10.2 46.5 59.6 37.7 57.5 3.7 50.4
23.4 47 14.4 54.7 7.1
26.2 2084 29.3 002 58.3 5148 10.6 3384
465

461 18948 5361 47 56.20 48.14 36.1 198 7.398 333.2
33 39.22 33 54.74033 59.367 44 44.01 14 49.30 15 24.070 15 24.011 53 3.96 53 36.990 53 37.022
59.

4 59.31

33 39.653 47 0.570 15 24.041 53 37.086
−.020 +.315 −.025 −.025
33 39.63 47 0.88 15 24.02 53 36.98
33 5.38 −54.03 46 10.19 −54.04 14 29.79 −54.05 52 42.74 −54.08
+54.25 −.10 +5.069 +2.47 +54.23 −.16 +54.21 −.15
27.0 16.92 26.71 39.40
−2.68 +6.73 −3.08 −3.37
−56.81 −44.84 −57.29 −57.60
32 2.82 46 16.04 14 26.73 52 39.38
30

9.89244 8.68610n 9.77778 9.78805

24 48.28 +20.44 1.31048 19 48.25 −55.63 1.74531n 56 21.82 +34.74 1.54083 57 42.35 +33.05 1.51917
−20.66 1.31515n −3.50 −163.43 2.21333n −26.97 1.43084n −26.27 1.41945n
24 27.62 19 44.75 0.54364n 55.5485 57 16.08
1.01166n

19 45.90
−10.27
19 35.63

+38° +93 +53 +52
58 20.73 3 36.0 3 12.72 26 53.50 25 32.27

+3 42 2 −50 22.58 −50 23.0 −10 46 24 −9 45 4
0.57160 1.84170n 1.84170n 1.03970n 0.99850n
−536 −524 −498 −461
0.56564 1.83646 1.83646 1.03972 0.99089

−3.68 +6862 +6862 +1083 +9.79
−.11 +.08 +.71 −.31 −.29
+.00 +.00 +.00 +.00 +.00
−3.79 +68.70 +69.33 +10.52 +9.50

+38 58 16.94 +93 4 12.30 4 22.05 +53 27 4.02 +52 25 41.77

Aug 8
Reg −17 18.5
17.2
18.2
16.1
17.3
17.5
18.1
−17 17.56

−.06 −17 17.56 +.49 −17 17.56 +.20 −17 17.56 +.18 −17 17.56
58 16.9 −.06 4 13.1 +.79 27 4.2 +.20 25 41.9 +.18
41 0.8 −22.8 46 55.8 −21.8 9 46.4 −23.1 8 23.8 −21.9
−17 16.1 −17 4042 173 −17 3857 17.5 −17 4046 18.1 −17 3928
40 38.0 40 34.52 46 34.0 46 33.73 9 23.6 9 23.56 8 1.9 8 2.49
13 26.27
−.52
25.77

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Aug. 9 1885

δ 8, to 9, δ 9.53440

α Lyrae +.80	110 Herculis +.37	β Lyrae +.65	ε Draco +2.74
h m s +.06	h m s +.37	h m s +.16	h m s −.46
18 33 3	18 40 44	18 45 51	19 48 30
+38° 41′ −.16	+20° 26	+33° 14	+69° 59′
+3 42 +.00	+21 57	+9 9	−27 36

33	34.3	33.8	33	49.8	41	24.4	18.0	41	31.4	46	23.8	22.8	46	37.4	50	21.3		49	48.8
	56.0	36.2		52.3		26.4	20.3		33.4		25.9	25.6		40.0		24.8			50.6
	57.6	38.9		54.8		28.3	22.8		35.7		28.9	27.7		42.3		30.0			52.8
	59.1	41.5		57.3		29.8	24.9		38.0		30.5	30.2		44.9		33.0			54.8
	1.2	44.2 38.92		0.0		31.0	27.0 22.60		40.0		32.2	32.6 27.78		47.4		36.8			56.9 52.800
				2.4					42.3					50.0					− 20.085
		16.0		5.2			53.3		44.5			22		52.5	50	8.7			
		18.4		7.5			55.4		46.7			4.8		54.9		14.8			
		20.8		10.4			57.6		48.9			7.1		57.4		20.9			
		23.4					59.8					9.5				27.1			
		26.5 21.02					2.05 7.62					11.8 7.08				33.6 ~~20.620~~ 21.000 −48.203			

382	119.94	53.97		80.22	0.9		94.86	42.68	14.59	695
33 57.84 (64)	33 59.970	33 59.967	41 27.98	41 40.110	41 40.114 (60)	46 28.26	46 47.430	46 47.422	50 29.180	49 32.417 (817)	49 32.715

α Lyrae	110 Herculis	β Lyrae	ε Draco
33 59.969	41 40.105	46 47.426	49 32.756
− .020	− .016	− .019	− .041
33 59.95	41 40.09	46 47.41	49 32.72
33 5.37 −54.48	40 45.52 −54.49	45 52.80 −54.49	48 37.74 −54.55
+ 54.58 − .13	+ 54.57 − .06	+ 54.61 − .10	+ 54.98 − .44
2.70	42.75	50.06	33.46
−2.67	−2.77	−2.74	−4.28
−57.28	−57.32	−57.33	−59.27
33 2.67	40 42.77	45 50.08	48 33.45

9.89244		9.97178		9.92244		9.53440		
24 28.88	+2.33	0.36736	38 50.58	+12.12	1.08350	51 33.88	+19.17	1.28262	6 43.82	−56.42	1.75143n
− 2.36		0.37203n	− 14.71		1.16751n	− 20.76		1.31729n	+ 25.01		1.39806
24 26.52			38 35.87			51 13.12			7 8.83		

α Lyrae	110 Herculis	β Lyrae	ε Draco
+38 58 21.83	+20 44 12.48	+33 31 35.23	+70 15 39.52
+3 41 43	+21 56 5	+9 8 48	−27 36 2
0.57040	1.36520	0.96710	1.47850n
681	− 676	− 670	− 614
0.56359	1.35844	0.96040	1.47236
− 3.66	− 22.83	− 9.13	+ 29.67
− .00	− .02	− .09	− .56
+ .00	+ .00	+ .00	+ .00
− 3.66	− 22.85	− 9.22	+ 29.11
+38 58 18.17	+20 43 49.63	+33 31 26.01	+70 16 8.63

α Lyrae		110 Herculis		β Lyrae		ε Draco	
− .06	−17 16.60	− .38	−17 16.60	− .16	−17 16.60	+ .47	−17 16.60
58 18.1	− .06	43 49.3	− .38	31 25.8	− .16	16 9.1	+ .47
41 1.0	− 23.0	26 33.3	− 20.6	14 9.7	− 22.4	58 51.5	− 21.6
17.1	−17 39.66	16.0	−17 37.58	16.1	−17 39.16	17.6	−17 37.73
40 38.0	40 38.51	26 12.7	26 12.05	13 47.3	13 46.85	58 29.9	58 30.90

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Aug. 9 - 1885

+1.28

γ Cygni
h hm s
19 52 39 −.17
+52° 8'
−9 45

52	53.6	4.0	53	24.1
	56.6	7.2		27.5
	59.2	10.6		30.9
	1.5	14.0		34.1
	4.2	17.5	10.66	37.4
				40.6
		57.7		44.2
		1.0		47.9
		4.4		51.1
		7.9		
		11.2	4.44	
		7.510		3.378
52	59.02	53 37.550		53 37.533

53 37.542
−.025
53 37.52
52 42.76 −54.56
+54.76 −.20
39.40
−3.36
−58.12
52 39.40

9.78805

57 48.68 +38.52 1.58569
−30.82 1.48597
57 18.06

+52°
25 30.29

−9 44 57
0.99540
−.609
0.98931

+9.76
−.39
+.00
+9.37
+52 25 39.66

Aug 9
Reg −17 17.1
16.9
17.6
15.7
−17 16.60

+ .18 −17 16.60
25 39.8 + .18
8 24.1 − 22.2
−17 15.7 −17 38.62
8 1.9 8 1.04

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Aug 11 - 1885 8.77093
A-1 495
+16.92
S Urs. Min
h m s
18 9 25, -.70
+86° 37' 1 -.07
-44 14 +.00

23 H Camelop. 5.50
h m s
18 26 35 -.85
+100° 19'
79 41
-57 56

No Ephemeris
G 2655
h m s
18 35 18,
+77 24

No Ephemeris
24 H Camelop - L.C.
h m s
18 43 17
102 53
77 7

16 0.4 15 40.3 16 15.2 15 54
1.4 16 14.0 14.0 41
2.5

24 42.5 26 44.8 27 42 37 57.4
44.0 49.0 8.0 58.8
45.3 52.0 11.8 0.0
46.5 55.6 15.7
47.7 0.5 52.38 19.5 11.84

35 38.4 35 54.8 42 12.2
42.0 58.0 13.6
45.2 1.0 14.7
48.0 4.2
51.8 45.08 7.6 1.12

43 35.0 43 50.6
38.2 53.2
41.0 56.6
44.4 59.7
47.4 41.20 2.6 56.54

15 47.6 14.600
-4 39.608

28 19.6 1.4 11.84 23.5
20.5 5.5 30.84 27.1
21.4 9.5 49.74 30.7
12.6 34.6
16.6 9.12 38.3 30.84

42.1 1.12 11.0
45.3 16.96 13.7
48.4 32.74 17.0
51.8 19.9
54.8 48.48 23.2 16.96

36.7 6.0
40.0 8.7
43.0 12.2
45.8 15.3
48.9 42.88 17.8 12.00

16 1.43
11 34.992 24 45.20
10 25.142 28 20.50

41.8
2 45.7 37 58.73
49.8
53.7
57.7 49.74

26.2
29.5 42 13.50
33.0
36.0
39.0 32.74

20.9
24.2
27.2
30.5
33.4 27.24

10 25.142
11 34.992
-.259
10 34.733 24.88
9 28.82 -55.23
+2 5.91 -1.18
+5 6.06
24.90 -3.92
-60.33
9 24.55

27 30.784
+.085
27 30.87
26 35.84 -55.25
+55.03 + .38
35.34
-0.50
-55.37
26 35.50

36 16.876
-.070
36 16.81
-55.26

8.77093 9.25307n 9.33704 9.34824n

28 54.58 -336.29 2.52671n 47 10.02 56.40 +165.58 2.21901 38 49.02 -101.85 21 30.55
+ 25.70 1.40987 + 38.40 -49.72 1.69653n
29 20.28 47 48.42 1.58431
1.06183n

47 56.40
- 11.53
47 44.87

+86 +100
53 28.07 34 59.93 35 34.8

-44 13 51 -57 55 36 -57 54 50
1.74810n 1.96205n 1.96178
-1543 -1528
1.73267 1.94677 1.94650

+54.03 +88.46 +88.41
-3.63 +2.63 +.24
+.00 +.00 +.00
+50.40 +91.09 +88.65
+86 54 18.41 +100 36 31.02 36 37.13
+100 36 31.57

+ 72 -17 16.81 + 88 -17 16.81
54 19.2 + 72 36 32.21 + .88
37 1.4 -2.36 19 14.9 -.224
-17 17.8 -17 39.69 17.5 -17 38.33
36 37.8 36 38.78 18 52.5 18 53.24

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1885phae.proj.1621

Aug. 11 – 1885 – 8.68610n

51 H Cephei

h m s
18 46 17
+92° 44'
87 13.4
−50 24

−2.958
−.77

δ Lyrae

h m s
19 12 23
+37° 53'
+4 28

+.78
+.08

γ Cygni

h m s
19 14 26
+53° 10'
−10 47

9.77778
+1.33
−.19

β Aquilae

h m s
19 49 41
+6
+36 16

9.99752
+.11
+.59

50 23.5
3.8
4.7

13 161
17.9
196
226
250

54.8
57.3
00
2.7
54 0.04

13 106
134
138
179
193
20.8
235
262
288
315

16 19.3
21.3
23.6
25.3
28.0

575 575
574 08
577 45 57.533

15 11.5
14.9
18.3
21.7
25.0
28.6
32.0
35.4
38.9

50 25.1?
26.9
28.4
30.8
32.6

17.7
19.6
21.8
23.8
26.0

57 32.0
38.2 34.0
38.1
38.3 36.2
38.2 38.2
38.3 40.4
+14.94
38.374

48 56.3
49 11.8
23.8
40.0
54.6

25.30.0
−141.634

366
38.9
41.8
44.4
47.0 41.74

45.6
49.1
52.5
56.2
59.752620

38.2 46.5

54.9 59.0 54.90
−16.94
38.06

47 43.2
59.6
48 14.5
27.8
42.9 13.60.0
−70.817

41.78

50.153
226.3

50 3.67

13 20.74 82
13 20.890
13 21.022 20.944
16 23.50
15 25.076
15 25.144
50 28.76
50 38.362
50 38.217

19

47 3.724
+.315
47 4.04
46 11.31
−55.27
+1.44
+5.61
−48.22
46 15.82
16.92

13 20.950
−.020
13 20.940
12 25.44
−55.29
+53.50
−.05
46
22.55
−2.89
−58.23
12 22.67

15 25.110
−.025
15 25.08
14 29.73
−55.29
+55.35
−.09
26.71
−3.02
−58.40
14 26.68

50 38.290
−.016
50 38.27
49 42.93
−55.32
+55.34
−.01
39.84
−3.09
−58.42
49 39.83

8.68610n
9.89702
9.77778
9.99752

14 54.10 −179.95 2.25515n 9 18.30 22.30 +0.10 9.00000 55 8.45 −58.39 1.76634n 57 29.90 +9.53 0.97909n
−11.31 1.05348n −0.10 9.00925n +45.33 1.65635 −12.27 1.08884n
19 42.79 9 22.20 55 53.78 57 17.63
18.20

+93°
3 5.56

+38
30.15
13 25.15

+53
26 54.57

+6
25 30.72

−50 22 52
1.84170n
−1500
1.82670

+4 26 39.2
0.65080
−1490
0.63590
380

−10 47 38
1.04050n
−1470
1.02580

+36 14 44
1.62520
−1427
1.61093

+67.10
+.86
+.00
+67.96

−4.332
−.00
+.00
−4.332

+10.61
−.89
+.00
+9.72

−40.83
−.01
+.00
−40.84

+93 4 13.52

+38 13 20.82
25.83

+53 27 4.29

+6 24 49.88

+.79 −17 16.81
4 14.3 +.79
46 57.6 −23.6
−17 16.7 −17 39.62
46 34.0 46 33.90
13 26.10
−.52
25.60

−.08 −17 16.81
13 20.7 25.7 −.08
56 8.8 −23.3
11.9 −17 40.19
16.9
55 45.5 35 45.64

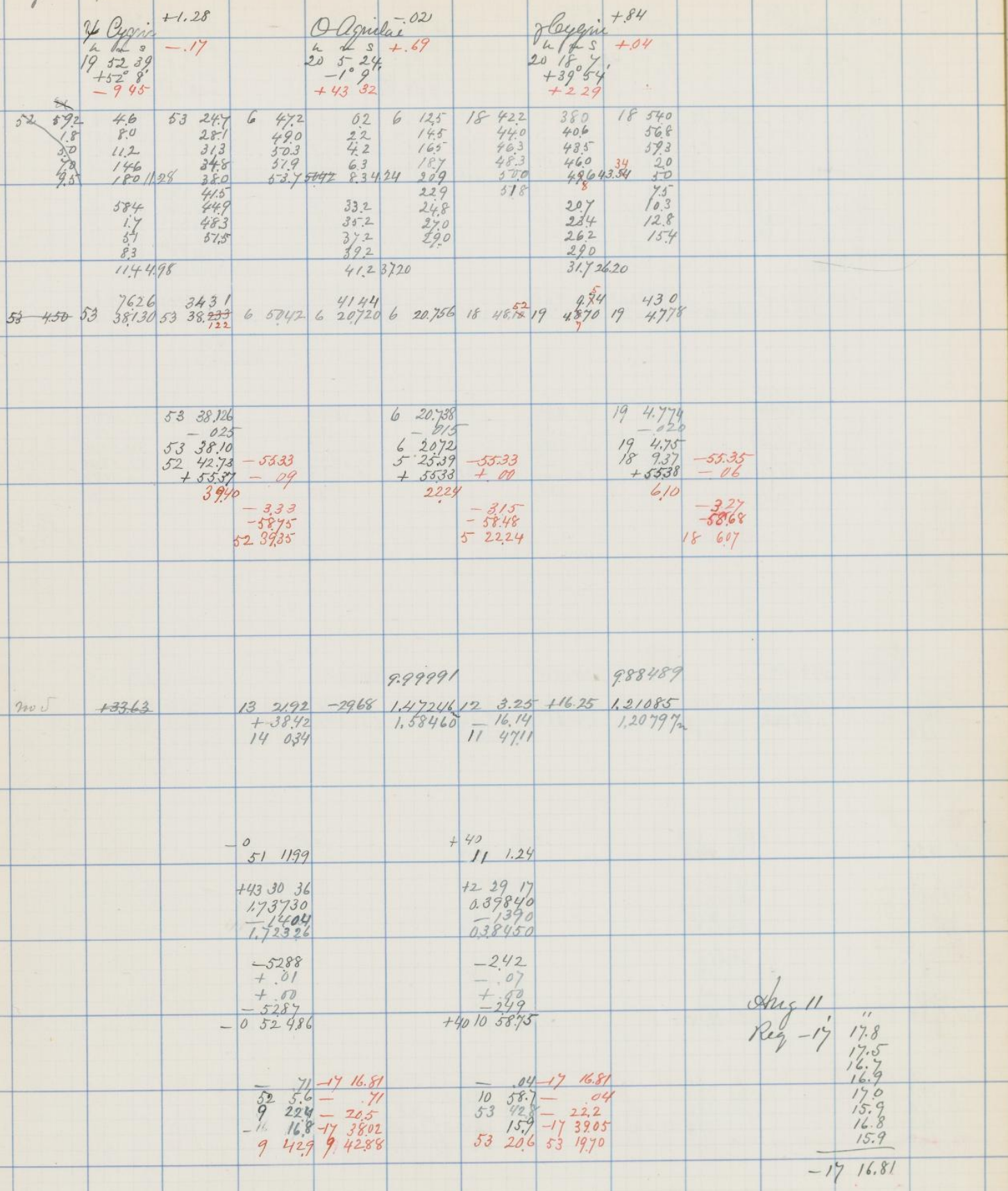
+.20 −17 16.81
27 4.5 +.20
9 17.5 −23.9
17.0 −17 40.51
9 23.6 9 23.78

−.61 −17 16.81
24 49.2 −.61
7 33.3 −20.5
15.9 −17 37.92
7 12.8 7 11.96

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Aug. 11 - 1885



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Aug. 15 – 1885

β Draconis +1.30
h m s − .17
17 27 57.
+52° 23′ − .22
− 10 0 +.00

ι Herculis +1.04
h m s −.06
17 36 15.
+46° 4′
− 3 41

u Herculis +.53
h m s +.25
17 42. 0
+27° 44′
+14 36

γ Draco. +1.26
h m s −.16
17 53. 57.
+51° 30′
−9 7

27 58.3	14.8	28 35.2	36 38.1	42.3	37 0.0	42 25.0	33.1	42 47.1	54 13.3	22.0	54 41.7
2.2	18.0	38.4	40.2	45.7	3.0	27.3	35.4	49.5	15.4	25.3	45.0
6.3	21.2	42.0	42.7	48.4	5.7	28.6	37.8	51.9	18.8	28.3	48.5
8.8	24.7	45.2	44.3	37.3	8.9	30.0	40.2	54.0	21.4	31.9	51.8
10.8	28.0 24.34	48.5	47.0	54.1 48.36	11.8	31.5	42.5 37.80	56.6	23.8	35.0 28.50	55.0
		52.0			14.8			58.9			58.7
	9.0	55.2		29.7	17.7		10.4	1.0		15.0	1.8
	12.2	58.8		32.6	20.5		12.7	3.4		18.2	5.0
	15.5	2.2		35.4	23.6		14.9	5.7		21.7	8.3
	18.8			38.3			17.3			25.2	
	22.3 15.56			41.3 35.46			19.7 15.00			28.2 21.66	
	96.90	43.75		23.82	106.0		112.80	508.1 6		110.16	49.58
28 5.28	28 48.450	28 48.611	36 42.46	37 11.910	37 11.778	42 28.48	42 56.400	42 56.455	54 18.54	54 55.080	54 55.089

611							
28 48.530		37 11.844		42 56.428		54 55.084	
− 025		− 022		− .018		− 024	
28 48.509		37 11.82		42 56.41		54 55.06	
27 51.92	− 56.42	36 15.18	− 56.43	41 59.77	− 56.44	53 58.27	− 56.46
+ 56.58	− .29	+ 56.64	− .23	+ 56.63	− .12	+ 56.79	− .28
67							
56.09		13.16		57.50		56.15	
	− 1.83		− 2.02		− 2.27		− 2.12
	− 58.54		− 58.68		− 58.83		− 58.86
	27 50.05		36 13.14		41 57.58		53 56.20

		9.78560			9.84125			9.94680			9.79415
42 36.05	+43.33	1.63679	1 30.25	+29.38	1.46805	18 6.80	+27.95	1.44638	35 32.12	+36.54	1.56277
− 34.25		1.53462n	− 26.40		1.42853n	− 32.02		1.50541n	− 29.45		1.46915n
42 1.80			1 3.85			17 34.78			35 2.67		

+52°	+46	+28	+51
40 46.55	21 44.50	5 13.57	47 45.68
−10 0 10	−3 41 16	+14 35 21	−9 7 14
1.00680n	0.56960n	1.17580	0.96590n
− 800	− 780	− 760	− 718
0.99880	0.56180	1.16820	0.95872
+ 9.97	+ 3.65	− 14.73	+ 9.09
− .50	− .24	− .18	− .36
− .03	− .01	− .03	− .01
+ 9.44	+ 3.40	− 14.94	+ 8.72
+52 40 55.99	+46 21 47.90	+28 4 58.63	+51 47 54.40

+ .18	−17 18.48	+ .06	−17 18.48	− .26	−17 18.48	+ .16	−17 18.48
40 56.2	+ .18	21 48.0	+ .06	4 58.4	− .26	47 54.6	+ .16
23 37.0	− 24.3	4 28.6	− 24.1	47 39.6	− 20.9	30 34.5	− 24.8
−17 19.2	−17 42.60	19.4	−17 42.52	18.8	−17 39.64	20.1	−17 43.12
23 12.7	23 13.39	4 4.5	4 5.38	47 18.7	47 18.99	30 9.7	30 11.28

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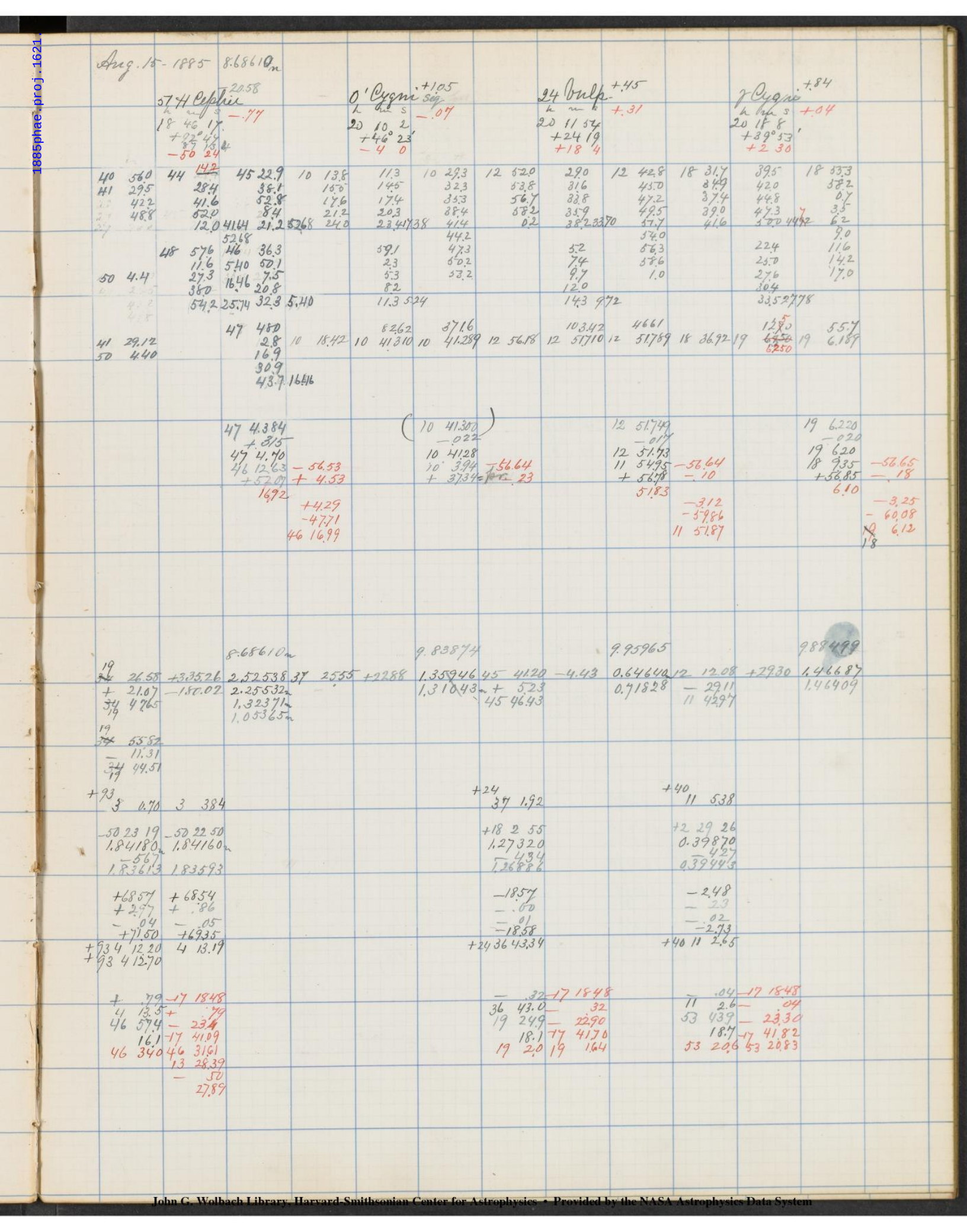
Aug. 15 - 1885 8.68610m

57 H Cephei +20.58

O' Cygni +1.05 sig

24 Vulp. +.45

γ Cygni +.84



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Aug. 15 - 1885

Q Cephei +1.93

h m s − .35
20 24 40.
+62° 36'
−20 13

73 Draco +3.63

h m s −.53
20 33 0
+74° 34'
−32 11

Cygni

h m s
20 34 32.
+44° 53'

Ch. J.

27	39.0		33.2	28	22.0	32	34.4	33	33.3	33	45.7		
	43.4		39.6		26.5		35.5		35.8		48.0		
	46.4		41		31.0		36.6		38.0		50.3		
	49.3		88		33.4		37.7		40.2		53.3		
	52.4		13.14.16		40.0		39.0	36.64	42.4	37.94	56.0	50.70	
					44.3					50.70			
			6.7		49.4	34	43.7		24.2	4.20	58.5		
			11.4		53.7		47.9		26.9	17.08	1.3		
			15.4		58.0		52.0		29.8		4.1		
			20.7				54.0		32.3		7.0		
			24.8	15.80			53.8	36.68	35.0	29.64	9.9	4.20	
			79.96		36.03						12.2		
27	46.10	28	37.980	28	40.033	32	36.64				14.4		
						34	30.68				17.0		
											19.8		
											22.0	17.08	

28 40.006
− .033
28 39.97
27 43.10 −12 56.66
+56.87 − .42
97
39.64 −4.06
−61.14
~~28~~ 38.83
27

34 3.912
− 057
34 3.86
33 6.48 −56.66
+ 57.38 − .80
0.85
−5.63
−63.09
~~34~~ 0.77
33

9.66295

9.42507

29	32.25	+53.91	1.73167	32	39.40	+87.27	1.94086	
−	32.12		1.50685	−	30.07	−46.77	1.66997	
29	0.13			32	9.33		1.47816	
							1.20727	
				32	52.50			
				+	16.12			
				32	8.62			
+62°				+74				
53	48.22			50	39.02	50	39.73	
−20	13	14		−32	10	7	−32 10 54	
	1.32650			1.55870			1.55900	
	− 413				406			
	1.32237			1.55464			1.55494	
	+ 2101				+3586		+3589	
	− .65				− 1.08		− .31	
	− .04				− .03		− .02	
	+ 20.32				+34.75		+35.56	
+62	54	8.54		+74	51	13.77	51 15.29	
				+74	51	14.53		

	+	.36	−17	1848		+	.55	−17	1848
54	8.9	+	.36		51	15.1	+	.55	
36	499	−	224		33	582	−	212	
−17	19.0	−17	40.52			169	−17	3913	
36	27.5	36	28.02		33	37.0	33	35.40	

Aug 15
Reg −17 19.2"
19.4
18.8
20.1
16.1
18.1
18.7
19.0
16.9
−17 18.48

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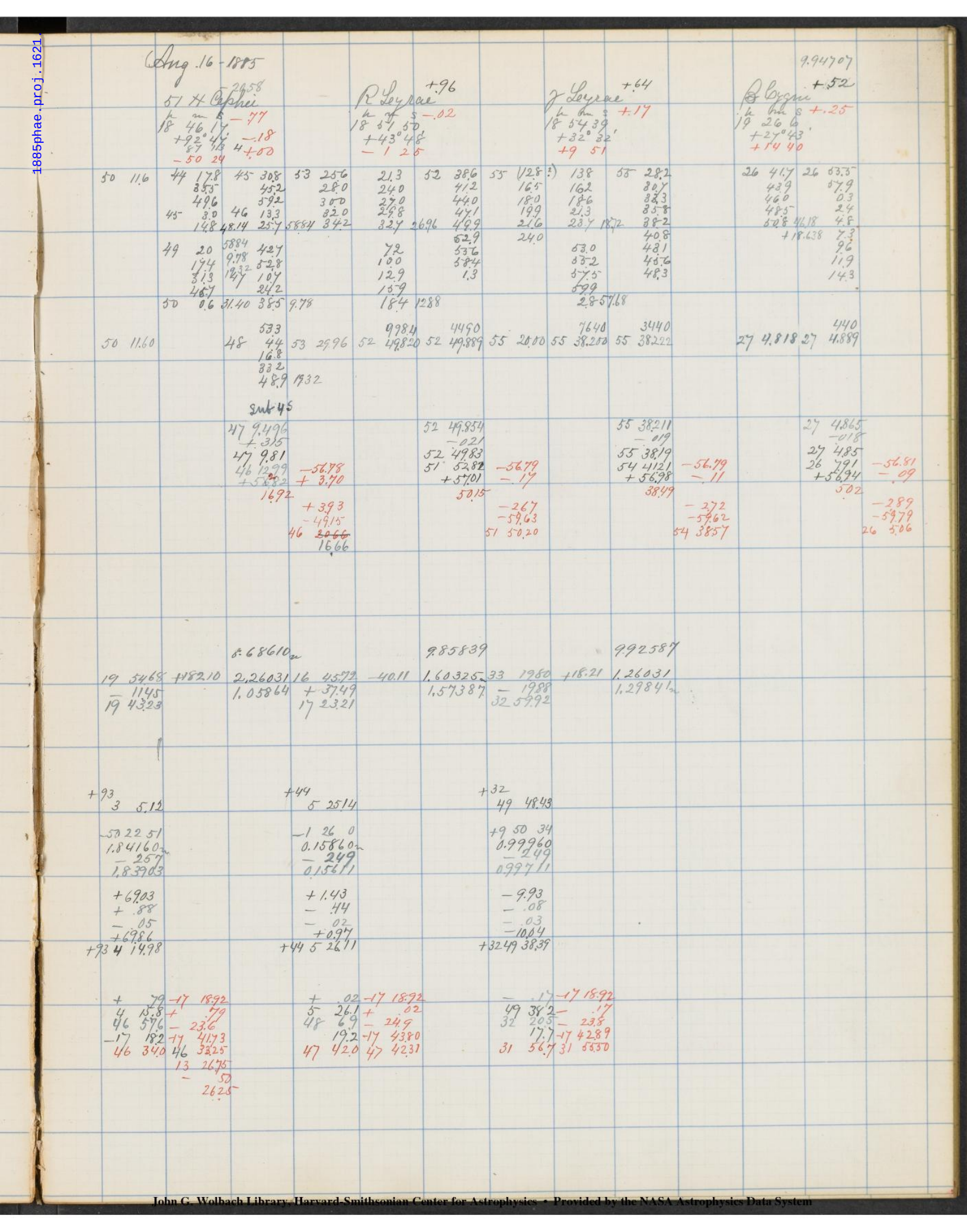
Aug. 16 - 1885

57 H Cephei

R Leyrac

J Leyrac

R Cygni



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Aug. 16 1885 9.79415

i Cygni +1.26
h m s −.16
19 26 48,
+51° 30′
−9 7

27 44.2, 47.3, 50.0, 52.2, 54.2
28 8.3, 11.8, 15.0, 18.2, 21.5 14.960 −26.505
27 35.1, 38.4, 42.0, 45.4, 48.6, 51.6, 55.0, 58.2, 1.5 4358
2479
27 49.58 27 48.455 27 48.422

27 48.433
− 024
27 4841
26 5145 −56.81
+ 5696 − 23
4842 − 3.03
−60.07
~~27~~ 26 48.34

36 5.92 −1.15
+ 0.93
36 6.85

9.79415
0.06070ₙ
9.96708

7 58.38 +7.06
− 5.90
7 52.48

+51°
46 41.50
−9 6 40
0.96550ₙ
− 206
0.96344
+9.19
− .00
− .01
+ 9.18
+51 46 50.68

+ .16 −17 18.92
46 50.8 + .16
29 31.2 − 25.0
−17 19.6 −17 43.76
29 6.2 29 6.92

9.80837

θ Cygni +1.19
h m s −.11
19 33 21,
+49° 58′
−7 35

34 8.2, 11.3, 15.5, 17.4, 20.5
34 40.8, 43.9, 47.4, 50.4, 53.7 47.240 −25651
34 9.0, 12.1, 15.1, 18.4, 21.7, 25.0, 28.0, 31.3, 34.4
1950
34 14.58 34 21.589 34 21.667

34 21.641
− 024
34 2162
33 2452 −56.82
+ 5410 − .21
21.46 − 3.06
−60.09
~~34~~ 33 21.53

9.80987
0.84880 57 21.82 +10.47
0.77090ₙ − 834
57 13.48

+50
14 55.87
−7 34 48
0.88440ₙ
− 189
0.88251
+ 7.63
− .01
− .03
+ 7.59
+50 15 3.46

+ .11 −17 18.92
15 3.6 + .11
57 43.5 − 25.0
20.1 −17 43.81
57 18.5 57 19.65

ψ Cygni +1.28
h m s −.17
19 52 39
+52° 28′
−9 45

53 24.3, 26.8, 28.9, 31.6, 34.1
6.0, 9.3, 12.6, 16.2, 19.5 12.72
59.5, 3.0, 6.4, 9.8, 13.2 638
53 26.2, 29.7, 33.0, 36.3, 39.7, 43.0, 46.5, 49.7, 52.9
7910 3570
53 29.14 53 39.550 53 39.667

53 39.608
− 025
53 3958
52 4266 −56.84
+ 5692 − .23
3940 −3.26
−60.83
~~53~~ 52 39.25

9.78902
1.01995 36 41.28 −27.37
0.92120ₙ

+52
25 34.87
−9 45 24
0.99570ₙ
− 164
0.99406
+ 9.86
− .03
− .02
+ 9.81
+52 25 44.68

+ .17 −17 18.92
25 44.8 + .17
8 26.1 − 24.2
18.7 −17 42.95
8 1.9 8 1.73

o¹ Cygni +1.05
9.83861
h m s −.07
20 10 1
+46° 24′
−4 1

11 4.2, 6.9, 9.0, 11.0, 13.5
10 59.5, 2.5, 5.4, 8.5, 11.5 5.480 23.926
11 8.92 10 41.554

10 41.554
− 022
10 41.53
10 3.94 −56.85
(+ 37.59) = −56.19

9.83861
1.43727ₙ

Aug 16
Req −17′

18.2″
19.2
17.7
19.6
20.1
18.7
−17 18.92

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Aug. 18 - 1885 8.25807n 9.99752 9.78805 9.83874

+55.19 +.11 +1.28 +1.05

λ Urs. Min. β Aquilae ψ Cygni o^1 Cygni seq.

λ Urs. Min.	β Aquilae	ψ Cygni	o^1 Cygni
h m s −.73	h m s +.59	h m s −.17	h m s −.07
19 37 52	19 49 43	19 52 41	20 10 3
+88° 54' 43 −.14 −.12	+6° 7'	+52° 8'	+46° 23'
−46 35 +.00	+36 16	−9 45	−4 0
A40 to 60			

				mean										
37 38.8	38 35.0	38.3 44.2	39.167	57	13.9	237 19.6	50 32.0	54 31.8	6.3	53 26.8		10 30.2
42 38.6	39 11.0	16.1 25.6	17.567		15.5	237 21.6	34.2	33.0	9.7	30.1		422 33.3
	39 50.7	56.7 0.5	55.967		17.2		36.2	34.2	13.0	33.3		423 36.0
	40 27.8	32.0 42.2	34.000		19.2	236 25.7	38.2	35.3	16.5	36.8		424
	41 6.9	12.4 18.6	12.300		21.2	238 27.9 23.70	40.4	36.2	19.9 13.08	40.0		
	41 40.1	47.0 53.6	47.567				42.4			43.5		
	42 22.1	27.4 33.7	27.733			52.8	44.4		0.5	46.9	11 —	
			40 33.472			54.9	46.5		3.6	50.2	60 3.0	
						57.0	48.6		7.1	53.5	59 6.9	
						59.0			10.5		60 9.0	
						1.0 56.94			13.8 7.10		59 11.9 5.950	
											−23926	

37 38.80 / 42 38.60 5 51 17.40 50 40.320 (8064) 50 40.322 (29) 54 34.10 53 40.090 (8018) 53 40.122 (3611) 10 42.024 10 42.167 (5)

λ Urs. Min.		β Aquilae		ψ Cygni		o^1 Cygni
40 33.472		50 40.321		53 40.106		10 42.096
−.844		−.016		−.025		−.022
40 32.63	41	50 40.30	42	53 40.08	43	10 42.07
39 31.22	−57.32	49 42.91	−57.33	52 42.64	−57.34	10 3.92
+1 1.41	−7.73 6.62	+57.39	−.01	+57.44	−.185	fore (+38.15)
38 55.71		39.84		39.40		
	−35.51		−3.07		−3.24	
	+40.56 = 13954		−60.4150		−60.7682	
	40 52.07		50 39.870		53 39.32	
	38 [53.09]		49		52 26	

8.25807n 9.99752 9.78805

8 40.88	+74.67	2.24221	56 31.82	−37.08	1.56914n	56 29.85	−53.99	1.73231n
+ 4.10	−125.13	2.09736n	+ 47.74		1.67889	+ 42.91		1.63259
8 44.98		0.61251	57 19.56			57 12.76		
		0.46766n						

λ Urs. Min.	β Aquilae	ψ Cygni
+89	+6	+52
14 3.37	25 28.79	25 35.59
−46 34 5	+36 13 46	−9 46 16
1.78350n	1.62500	0.99640n
−1652	−1652	−1652
1.76698	1.60848	0.97988
+58.48	−40.60	+9.55
−.30	−.08	−.77
−.04	−.01	−.01
+58.14	−40.69	+8.77
+89 15 1.51	+6 24 48.10	+52 25 44.36

λ Urs. Min.		β Aquilae	ψ Cygni	
+ .74	−17 18.10	− .60	+ .17	−17 18.10
15 2.2	+ .74	24 48.7	25 44.5	+ .17
57 42.6	− 23.1	7 34.1	8 26.7	− 24.8
−17 19.6	−17 40.46	[14.6]	17.8	−17 42.73
57 19.5	57 21.05		8 1.9	8 1.63

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Aug. 18 - 1885

9.85049

γ Cygni +.84 +.04 — δ Cephei +1.93 — 73 Draco +3.63 — ζ Cygni +1.05

γ Cygni: h m s 20 18 8 — +39°54′ — +2 29 — +.04

δ Cephei: h m s 20 27 40 — +62 36 — −20 13 — −.35

73 Draco: h m s 20 33 0 — +74 34 — −32 11 — −.53

ζ Cygni: h m s 20 37 32 — +44°52′ — −2 29 — −.04

18 55.2 57.1 58.5 0.3 3.2 — 40.0 42.6 45.3 48.0 50.8 45.34 23.0 25.6 28.3 30.9 33.7 28.30 — 18 56.2 59.0 1.6 4.2 6.9 9.5 12.1 15.0 17.6 — 27 43.7 46.4 50.6 52.9 56.8 58.5 — 560 04 4.8 9.2 13.8 4.84 7.8 12.0 16.4 21.0 25.4 16.52 — 28 22.9 27.2 31.8 36.2 40.6 45.0 49.5 54.0 58.6 — 32 26.2 28.7 34.0 36.2 39.0 34 16.4 18.8 21.0 23.0 25.0 — 33 56.8 59.3 1.9 4.4 7.0 9.7 — 38 9.2 10.9 13.5 16.1 18.2 — 2.8 5.7 8.7 11.5 14.4 8.620 +23.285 543 485 544 87.5 5 — 38 20.3 23.2 25.9 28.9 31.8 33.0 37.7 40.6 43.2

1364 — 621 — 8136 — 3658 — 125 — 2866

18 58.86 — 19 6.820 — 19 6.900 — 27 51.48 — 28 40.680 — 28 40.644 — 32 32.82 — 34 20.84 — 38 13.58 — 38 34.905 — 38 31.844

19 6.860 −.020 19 6.84 18 9.33 +57.51 6.10 — 45 −57.36 −.72 10 −3.23 −6.07 X8 18 6.13 06 — 28 40.662 −.033 28 40.63 27 4306 +57.57 39.04 — 46 −10 57.57 −.64 2.83 −4.02 −2.66 71 27 38.972 — 34 4.514 −.057 34 4.446 33 6.40 +58.06 0.85 — 46 −57.37 −.54 44 −5.55 −63.485 34 1.031 33 — 38 31.863 −.021 38 31.84 37 34.16 +5.68 30.72 — 47 −12 57.38 −.14 2 −3.44 −60.76 6.103 38 30.858 37

9.88489 — 9.66295 — 9.42507 — 9.85049

11 51.78 +8.00 — 0.90309 — 29 29.02 +49.18 — 1.69179 — 32 36.30 +91.69 — 1.96232 — 13 15.35 +18.28 — 1.26198

7.94 — 0.90021n — −29.31 — 1.46697n — −31.60 — −16.33 — 1.21299n — −16.78 — 1.22470n

11 43.84 — 38 57.71 — 32 4.70 — 1.49962n — 12 58.57

0.85029

32 0.38 +7.08 32 7.46

+40° — +62 — +74 — +45

10 45.1 — 53 48.64 — 50 43.65 50 40.89 — 9 49.78

+2 29 6 — −20 13 17 — −32 10 10 — −32 10 46 — −2 29 31

0.39780 — 1.32650n — 1.55880n — 1.55890n — 0.39890n

−.1652 — −.1652 — −.1652 — −.1652

0.38128 — 1.30998 — 1.54228 — 1.54238 — 0.38238

−2.41 — +20.42 — +34.86 — +34.86 — +2.41

−.02 — −.55 — −1.17 — −.03 — −.09

−.02 — −.04 — −.03 — −.02 — −.03

−.245 — +19.83 — +33.66 — +34.81 — +2.29

+40 11 2.06 — +62 54 8.47 — +74 51 17.31 — 51 15.70 — +45 9 52.07

+74 51 16.50

Aug 18

Reg −17 19.6

17.8

17.3

18.2

18.1

17.6

−17 18.10

−.04 −17 18.10 — +.36 −17 18.10 — +.54 −17 18.10 — +.04 −17 18.10

11 2.0 −.04 — 54 8.8 +.36 — 51 17.0 +.54 — 9 52.1 +.04

53 44.7 −2.41 — 36 30.6 −2.31 — 33 58.9 −2.19 — 52 34.5 −2.34

−17 17.3 −17 42.24 — 18.2 −17 40.84 — 18.1 −17 39.46 — 17.6 −17 41.46

53 20.6 53 19.82 — 36 27.5 36 27.63 — 33 37.0 33 37.04 — 52 11.1 52 10.61

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Aug. 19-1885

78 Draconis +3.63

h m s
20 33 0
+ 74 33
− 32 10

− .53
− .14
+ .00
Dahlfue

33	33.9	33	46.7	37	38.7		30	38	20.4	50	10.7		17.7	50	31.5	53	19.3		27.5	53	43.7
	36.3		49.2		0.7		5.8		23.5		13.2		19.8		33.7		22.0		30.0		46.4
	38.6		51.6		2.4		8.8		26.2		15.3		22.2		36.0		24.2		32.8		49.3
	41.3		54.6		4.7		11.7		29.2		16.8		24.4		38.3		26.4		35.5		52.0
	43.9	38.80	57.5	51.92	7.0		14.7	880	32.1		18.9		27.0	22.22	40.6		28.8		38.2	32.80	54.5
		51.92							83.1						43.0						57.2
	25.6		59.9	38	34.0		49.6		38.0	50	57.5		54.8		45.4	54	31.8		10.9		0.0
	28.0	4.56	2.1		36.0		52.4		40.8		59.7		57.2		48.0		34.0		13.4		2.8
	30.4	17.44	4.6		38.3		55.2		43.8		1.4		59.4		50.0		36.6		16.3		5.4
	32.9		6.8		40.0		58.3				3.0		2.0				38.5		19.0		
	35.5	30.48	9.4	4.56	42.4		1.2	55.34			4.7		4.1	59.50			40.3		21.7	16.26	

		12.2	38	27.0		6.4	14		28.9	1	50	14.92		8.1	72		36.6	5	53	24.14		10.9	06		49.1	3
		15.2	38	38.14	38	32.6	70	38	32.1	22	51	1.26	50	40.8	60	50	40.7	22	54	36.24	53	54.5	30	53	54.5	89
		17.5																							
		20.0																							
		22.3	17.44																						

		34	4.640					38	32.096					50	40.791								53	54.560	
			− 057						− 022						− 017									− 020	
		34	4.58					38	32.07					50	40.77								53	54.54	
		33	6.37		−57.8	3		37	34.15		−57.8	3		49	42.82		−57.85	34					52	56.62	−57.8	5
			+ 58.21		− .57				+ 57.92		− .14				+ 57.95		− .07							+ 57.92	− .12
			0.85						59.78	04					39.56									53.18	
					− 552				30.72		− 343						− 326								− 344
					−638	76					−61.4	10					−61.187								−61.42	1
					0.4	2					30.6	87					39.56								53.123
					33						37						49 60								52

							9.85049						9.94740										9.87964		
		13	25.82	+29.40		1.46835		28	8.75	+25.87		1.41280		22	5.88	+30.42		1.48316	
			− 26.98	− 6.04		0.78104n			− 29.68	− 20.47		1.31112n			− 29.86	− 41.68		1.61993n	
		12	58.84			1.43107n		27	39.07			1.47243n		21	36.02			1.47503n	
						0.74376						1.37075						1.61180	
		12																							
		~~22~~	52.48					27	14.15					20	55.30										
			+ 5.54						+ 23.48						+ 40.91										
		12	58.02					27	37.63					21	36.21										
		+45						+27						+41											
			9 49.51	9 50.33					55 9.28	55 10.72					1 12.33	1 12.14									
			−2 29 20	−2 29 54					+14 45 23	+1444 28					+1 39 20	+1 38 9									
			0.39840	0.40010					1.18090	1.18050					0.22110	0.21580									
			− 1556						− 1556						− 1556										
			0.38284	0.38454					1.16534	1.16494					0.20554	0.20024									
			+ 2.41	+ 2.42					− 14.63	− 14.62					− 1.60	− 1.58									
			− .24	− .01					− .15	− .09					− .25	− .47									
			− .03	− .03					− .03	− .02					− .02	− .01									
			+ 2.14	+ 2.38					− 14.87	− 14.73					− 1.87	− 2.06									
		+45	9 51.65	9 52.71				+27	54 54.47	54 55.99				+41	1 10.46	1 10.08									
		+45	9 52.18					+27	54 55.23					+41	1 10.27										
			+ .04	−17 17.15					− .27	−17 17.15					− .03	−17 17.15									
			9 52.2	+ .04					54 55.0	− .27					1 10.2	− .03									
			52 34.8	− 23.7					37 37.6	− 23.3					48 52.4	− 23.1									
			−17 17.4	−17 4081					17.4	−17 4072					178	−17 4028									
			52 14.1	52 11.37					37 14.3	37 14.91					43 29.3	43 29.99									

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Aug. 19 - 1885

61 Cygni	Br. 2777	ζ Cygni
+.79 / +.07	9.32960 / +4.55 / −.58	9.93855 / +.57 / +.22
h m s 21 1 46	h m s 21 7 43	h m s 21 8 2
+38° 11′	+77° 40′	+29° 46′
+4 12	−35 17	+12 37

2 17.0 19.4 21.5 23.0 25.0 | 20.0 22.7 25.4 28.0 30.5 25.32 | 2 35.7 38.3 41.2 43.7 46.3 49.0 51.5 54.0 56.6 | 7 5.6 17.0 22.7 32.2 38.5 45.9 54.7 | 8 14.0 17.2 21.2 23.6 27.1 30.5 33.5 36.8 | 8 30.5 33.5 36.8 / 36.9 36.7 36.8 | 20620 32186 52806 | 36800 16093 52893 | 9 18.7 21.0 23.3 26.0 28.9 | 18.1 20.5 22.9 25.0 27.7 22.840 −19008 | 9 4.0 1.6 3.8 3.8 3.8 6.2 3.6 8.4 3.9 11.0 3.8 13.3

3 17.4 20.0 21.9 23.7 26.0 | 1.8 4.6 7.1 9.8 12.4 7.14

2 21.18 | 9246 | 4163
3 21.80 | 2 46.230 | 2 46256 | 7 30.94 | 9 23.58 | 9 3.832 | 9 3.817 49

2 46.243 | 8 52.881 35 | 9 3.824
− 020 | −.072 | −.018
2 4622 | 8 52.796 | 9 381
1 48.13 +15 57.876 | 7 54.08 −57.876 | 8 5.85 −57.876
+58.09 −.11 | +58.71 −.64 | +57.96 −.08
+57.94 | 46.82 68 | 2.51
44.47 −3.66 | −7.26 | −3.34
−61.643 | −65.776 | −61.298
2, 44.589 | 8, 46.99 7 47.00 | 8 2.583

9.89544 | 9.32960 | 9.93855

54 22.75 +25.06 1.39898 | 26 39.48 +81.90 1.91328 | 19 14.12 −19.76 1.29579n
− 25.51 −35.56 1.55096n | − 22.65 1.3551 n | + 22.21 1.34657
53 57.24 1.40665n | 26 16.83 | 19 36.33
1.55863

53 22.32
+ 36.19
53 58.51

+38° 28 51.11 | 28 49.84 | +77 56 31.52 | +27 3 12.02

+4 11 37 | +4 10 36 | −35 16 7 | +12 36 28
0.62550 | 0.62380 | 1.60960n | 1.10990
−1556 | | −1556 | −1556
0.60994 | 0.60724 | 1.59404 | 1.09434

−4.07 | −4.05 | +39.27 | −12.43
−.17 | −.33 | −.76 | −.09
−.04 | −.03 | −.02 | −.04
−4.28 | −4.41 | +38.49 | −12.56
+38 28 46.83 | 28 45.43 | +77 57 10.01 | +27 2 59.46
+38 28 46.13

−.07 −17 17.15 | +.59 −17 17.15 | −.22 −17 17.15
28 46.1 − .07 | 57 10.6 + .59 | 2 59.2 − .22
11 28.2 − 24.8 | 39 54.6 − 1.96 | 45 42.8 − 2.28
−17 17.9 −17 42.02 | 16.0 −17 36.16 | 16.4 −17 40.17
11 34 11 4.11 | 39 35.0 39 33.85 | 45 20.0 45 19.29

Aug 19
Rey −17 17.4
17.4
17.8
17.9
16.0
16.4
−17 17.15

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Aug. 20 - 1888 8.68610

57 H Cephei. −20.58

18 46 17 −.77
+32 47 −.15
87 13 4 +.00
−50 24 90 [illegible]

44 17.0 ~~45~~ 29.4
32.2 ~~50~~ 47.0
47.4
45 1.2
167 46.90
141.234
47 8.534

0 Draco. +1.68

h m s −.29
18 49 28
+59 15
−16 52

50 14.5 50.9 50 15.3
17.7 55.0 19.4
20.6 59.2 23.4
22.9 3.0 27.3
25.3 7.1 59.04 31.3
33.4
50 49.5 53.4 39.3
51.3 57.4 43.2
53.2 3.5 47.3
55.7 7.4
58.0 11.6 3.46

50 20.24 62.50 28.19
50 53.54 50 31.250 50 31.322

9.70867

R Lyrae +.96

h m s −.02
18 57 49
+43° 47'
−1 24

52 15.6 22.7 52 39.8
18.0 25.3 42.5
20.7 28.5 45.6
23.0 31.4 48.4
25.0 34.0 28.38 57.3
37.4
53 22.8 8.3 56.9 59.88
25.2 11.2
27.7 14.0 2.8
29.9 16.9
31.5 20.0 14.08

52 20.46 10.246 46.82
52 27.42 52 51.230 52 51.256
244

9.85851

γ Lyrae +.64

h m s +.17
18 64 37
+32° 32'
+9 51

83 4.3 15.0 55 29.8
6.9 17.6 32.3
8.0 20.0 34.9
9.7 22.6 37.2
11.3 25.0 20.04 29.6
42.1
66 3.3 37.3 44.4
4.6 56.8 47.0
6.2 39.2 49.4
8.2 17
9.8 4.3 39.26

55 7.84 79.30 39.67
56 6.42 55 39.650 55 39.633

9.92587

47 8.534
+3.15
47 8.85
46 14.69 −58.23
+54.16 +3.09
16.92 +2.23
−52.91
46 15.94

50 31.286
−.030
50 31.26
49 32.85 −58.23
+58.41 −2.5
30.24
−2.61
−61.09
50 30.17
49

237
52 51.[illegible]
−.021
52 51.2[illegible]
51 52.74 −58.24
+58.[illegible] −.14
48
50.15
−2.59
−60.97
50.25
51

55 39.642
−.019
55 39.62
54 41.14 −58.24
+58.48 −.10
38.49
−2.64
−60.99
38.63
54

9.82090

50 34.45 +11.05
15 7.32 −22.25
15 27.13
50

50 14.15
+ 14.73
50 28.88

+59
32 21.22 32 19.47

−16 52 12 −16 52 32
1.24210 1.24220
− 601
1.23609 1.23619

+17.22 +17.23
− .03 − .12
− .01 − .00
+17.18 +17.18
+59 32 38.40 32 36.58
+59 32 37.49

+ .30 −17 1880
32 37.8 + .30
15 19.3 − 26.5
−17 18.5 −17 45.00
14 52.8 14 52.49

9.97074

1.48827 33 32.72 +31.80
1.55847 − 34.72 −26.80
1.45901 32 58.00
1.52921

16 49.22
+ 33.82
17 23.04

+44
5 25.58 5 25.31

−1 24.54 −1 25.57
0.15350 0.15860
− 579
0.14721 0.15281

+ 1.40 + 1.42
− .26 − .35
− .06 − .04
+ 1.08 + 1.03
+44 5 26.66 5 26.34
+44 5 26.50

+ .02 −17 1880
5 26.5 + .02
48 7.7 − 25.7
18.8 −17 44.48
47 42.0 47 42.02

1.04336 17 51.55 +30.78
1.34733 − 28.78 −36.18
0.86426 17 22.77
1.16823

32 30.10
+ 29.26
32 59.36

+32
49 50.35 49 48.99

+9 50 47 +9 49 44
0.99980 0.99900
− 579
0.99401 0.99321

− 9.86 − 9.84
− .25 − .18
− .07 − .05
−10.18 −10.07
+32 49 40.17 49 38.92
+32 49 39.54

− .17 −17 1880
49 39.4 − .17
32 21.3 − 24.6
18.1 −17 43.57
31 56.7 31 55.97

0.03810

1.50243
1.42813
1.54053
1.46623

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Aug. 20 - 1885

δ Draco. +2.40 (+2.40) 9.58375 — .42
h m s
19 12 29
+67° 24'
−25 14

χ Cygni 9.77795 +1.33 — .19
h m s
19 14 25
+53° 9'
−10 46

β Cygni 9.94707 +.52 +.25
h m s
19 26 4
+27° 43'
+14 40

ι Cygni 9.79431 +1.26 —.16
h m s
19 26 47
+51° 29'
−9 6

12 19.2	39.4	13 11.9	15 18.0	53.6	15 14.3	26 30.4	43.1	26 57.0	28 3.2		27 36.7
21.3	44.6	17.0	21.0	57.0	17.8	32.7	45.3	59.3	5.5		40.0
24.4	49.9	22.2	23.7	0.4	21.4	34.6	47.7	1.6	8.0		43.4
26.6	53.4	28.0	26.8	4.0	24.9	36.2	50.0	4.0	10.6		46.3
30.0	0.8 50.02	33.4	29.0	7.1 0.42	28.1	38.0	52.2 47.660	6.3	13.5		49.7
		39.1			31.6		+18.638	8.6			53.0
13 43.2	5.8	44.4	16 5.1	48.8	34.8			10.9	28 29.8	28 9.8	56.3
47.4	11.1	49.2	7.0	52.2	38.2			13.1	31.7	13.2	59.6
49.5	16.4	54.9	9.0	55.7	41.7			15.4	34.5	16.3	2.9
52.5	21.7		11.3	59.0					36.4	19.6	
57.0	27.4 1648		13.6	2.5 55.64					40.3	23.0 16.380	
										−26.495	
12 24.30	6650	3001	15 23.70	5606	2528			562	28 8.16		4479
13 50.32	13 33.250	13 33.344	16 9.20	15 28.030	15 28.089	26 34.38	27 6.298	27 6.244	28 34.54	27 49.885	27 49.767

13 33.297
−.038
13 33.26
12 34.73 −58.26
+58.53 −.36
31.57
−3.16
−61.78
~~13~~ 12 31.48

15 28.059
−.025
15 28.03
14 29.57 −58.26
+58.46 −.20
26.71
−2.86
−61.32
~~15~~ 14 26.71

27 6.271
−.018
27 6.25
26 7.87 −58.27
+58.38 −.08
5.02
−2.85
−61.20
~~27~~ 26 5.05

27 49.804
−.024
27 49.78
26 51.37 −58.27
+58.41 −.19
48.42
−2.95
−61.41
~~27~~ 26 48.37

9.69598n
38 31.42 +69.00 1.83885 55 53.60 +14.36
−34.26 −17.02 1.23096n − 3.39 −41.14
37 57.16 1.53483n 55 50.21
0.92693

37 48.80
+ 8.45
37 57.25

55 18.00
+ 31.95
55 49.95

9.89018n
0.63949 22 19.30 +31.89
1.61426n − 36.55
0.52967n 21 42.75
1.50444

0.05930n
1.50365 35 51.02 −18.36
1.56295n + 14.80 −44.74
36 5.82

35 29.10
+ 36.08
36 5.18

9.90654n
1.26387n
1.65070n
1.17041
1.55724n

+67°
44 51.19 44 51.10
−25 4 15 −25 4 57
1.43030n 1.43050n
−516
1.42514 1.42534
+26.62 +26.63
− .91 − .06
− .07 − .06
+25.64 +26.51
+67 45 16.83 45 17.61
+67 45 17.22

+53
26 58.14 26 58.40
−10 46 52 −10 47 28
1.04000n 1.04040n
−516
1.03484 1.03524
+10.84 +10.85
− .01 − .44
− .02 − .01
+10.81 +10.40
+53 27 8.95 27 8.80
+53 27 8.88

+28
1 5.60
+14 39 33
1.17790
−476
1.17314
−14.90
− .23
− .05
−15.18
+28 0 50.42

+51
46 42.53 46 43.17
−9 6 55 −9 7 17
0.96560n 0.96590n
−476
0.96084 0.96114
+9.14 +9.14
− .09 − .53
− .02 − .01
+9.03 +8.60
+51 46 51.56 46 51.77
+51 46 51.66

+ .43 −17 18.80
45 17.6 + .43
27 59.4 − 2.62
−17 18.2 −17 44.57
27 33.2 27 32.65

+ .19 −17 18.80
27 9.1 + .19
9 49.8 − 2.62
19.3 −17 44.81
9 23.6 9 24.07

− .25 −17 18.80
0 50.2 − .25
43 31.5 − 2.44
18.7 −17 43.45
43 7.1 43 6.97

+ .16 −17 18.80
46 51.8 + .16
29 32.1 − 2.59
19.7 −17 44.54
29 6.2 29 7.12

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Vacation -

Aug. 20 - 1885 — 980837

O Cygni +1.19

h m s −.13
19 33° 20'
+49° 58'
−7 35

994747 +52

32 Vulpeculae

h m s +.26
20 49 42
+27° 37'
+14 46

987964 +.86

V Cygni

h m s +.03
20 52 56
+40° 43'
+1 40

33	40.8		50.8	34	10.1	50	29.9	18.0	50	32.0	53	32.9	28.0	53	44.4
	44.0		53.7		13.2		31.4	20.2		34.2		33.0	31.0		47.3
	46.5		57.0		16.4		33.7	22.5		36.6		36.5	34.0		49.7
	48.4		0.7		19.6		35.5	25.1		39.0		38.5	36.2		52.3
	51.1		3.8	57.20	22.7		38.0	27.3	2262	41.4		41.6	39.0	3364	55.7
					26.0					43.7					58.0
35	12.2		42.0		29.5	51	14.7	55.0		46.0	54	33.0	11.2		0.8
	14.0		46.3		32.6		16.3	57.5		48.4		35.4	13.8		3.2
	16.5		48.5		35.8		18.6	0.0		50.5		37.4	16.8		5.6
	18.8		51.6				20.0	2.2				39.0	19.3		
	21.8		54.8	48.44			21.6	4.5	3984			40.0	22.2	1666	
33	46.16		4564		2059	50	33.70	8246		3718	53	36.90	10930		464
35	16.66	34	22.820	34	22878	51	18.12	50	41.230	50	41.311	54	36.96	53	54.965	53	55.156

34 22.849
− 024
34 22.825
33 24.45 −58.28
+58.37 − 16
21.46
−2.99
−61.45
34 21.37
33

50 41.270
− 018
50 41.25
49 42.81 −58.36
+58.44 − .08
39.56
−3.25
−61.69
50 39.56
49

53 55.060
− 020
53 55.04
52 56.61 −58.36
+58.43 − .13
53.18
−3.43
−61.92
53 53.12
52

			9.92060				0.05970				9.99187		
8	22.42	+3669	1.56455	27	46.32	+7.57	0.87910	21	54.25	+8.16	1.25912		
	−30.56	−53.81	1.73086		− 8.68	−.36.85	1.56644		− 17.82	−4.90	1.62221		
7	51.86		1.48515	27	37.64		0.93880	21	36.43		1.25099		
			1.65146				1.62614				1.61408		
87	5.45			27	2.65			20	52.08				
	+44.82				+ 9.28				+ 41.12				
87	49.27			27	11.93			21	33.20				
+50				+27				+41					
	14 56.49	14 59.08			55 10.71	55 3.42			1 11.92	1 15.15			
	−7 34 24	−7 35 41			+14 45 0	+14 44 17			+1 39 8	+1 38 6			
	0.88400	0.88530			1.18070	1.18040			0.22020	0.21580			
	436	− 436			− 208				−189				
	0.87964	0.88094			1.17862	1.17832			0.21831	0.21391			
	+ 7.58	+7.60			− 15.09	−15.08			− 1.65	− 1.64			
	− .36	− .77			− .02	− .31			− .18	− .48			
	− .07	− .04			− .06	− .04			− .04	− .02			
	+ 7.15	+6.79			− 15.17	−15.43			− 1.87	− 2.14			
+50	15 3.64	15 5.87		+27	54 55.54	54 47.99		+41	1 10.05	1 13.01			
+50	15 4.76			+27				+41	1 11.53				
	+ .13	−17 1880			− .27	−17 1880			− .03	−17 1880			
15	4.9	4 .13		54	55.2	− 27		1	11.5	− 03			
57	44.4	− 25.9		37	37.8	− 23.5		43	52.1	− 23.4			
	205	−17 4457			174	−17 4257			18.8	−17 4223			
57	18.5	57 20.19		37	14.3	37 12.97		43	29.3	43 29.30			

Aug 20
Reg −17 18.5
18.8
18.1
18.2
19.3
18.7
19.7
20.5
17.4
18.8
−17 18.80

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Return.
from
location

Sept. 30 - 1885 9.58345 | 9.79415 | 9.80837 | 9.78805

ρ Draconis +2.40	ι Cygni +1.26	θ Cygni +1.19	ψ Cygni +1.28
h m s 19 12 29, +67° 28' −2 5 5	h m s 19 26 48, +51° 30' −9 7	h m s 19 33 21, +49° 58' −7 35	h m s 19 52 39, +52° 8' −9 45
−.42 −.16 +.00	−.16	−.13	−.17

13 28	59.8	13 32.3	27 37.0	37.8	27 57.8	34 7.4	12.3	34 34.3	53 45.0	28.8	53 49.0
4.6	5.1	37.9	39.9	41.4	1.3	11.0	15.7	34.5	47.4	32.2	52.0
9.3	11.0	42.8	41.7	45.0	4.6	14.0	18.8	37.9	51.7	35.6	56.0
14.7	16.4	49.3	43.8	48.1	7.9	17.4	21.8	41.1	54.7	39.0	59.4
18.0	21.1 10.88	53.6	47.3	51.4 4474	11.2	19.8	25.2 1676	44.1	56.8	42.6 3564	3.0
		59.1			14.2			47.3			6.2
	26.8	4.8		31.0	17.8		3.1	50.0		22.5	9.3
	31.6	9.8		34.2	21.0		6.3	53.5		26.0	12.7
	36.4	15.7		37.4	24.4		10.0	56.8		29.5	15.8
	42.0			40.9			13.1			32.9	
	47.6 3694			44.2 3754			16.3 9.76			36.1 2940	

13 1008	10782 13 53.910	4853 13 53.922	27 41.94	2228 28 11.140	100.2 28 11.133	34 13.92	8852 34 44.260	396.5 34 44.0565	53 5112	5.04 54 2.520	5640 54 2.889

ρ Draconis		ι Cygni		θ Cygni		ψ Cygni	
13 53.916		28 11.136		.260 34 44.158		52 54 2.704	
−.038		−.024		−.024		−.025	
13 53.88		28 11.11		34 44.134		54 2.68	
12 32.57	−80.74	26 50.21	−80.75	33 23.36	−80.76	52 41.52	−80.78
+1 21.31	−.38	+1 20.90	−.20	+1 20.77 88	−.19	+1 21.16 20.98	−.20
31.57	−1.00	48.42	−1.79	21.46	−1.90	39.40	−2.12
	−82.12		−82.74		−82.85		−83.10
	13 12 31.76		26 48.37		33 21.39		52 39.40

	9.69568n	9.90638n	9.92060n	9.90028n
38 28 11.68 −21.75 38 49.43 37	+4384 1.64187 1.33755n	36 23.30 −23.54 35 59.76	+2920 1.46538 1.37176n	8 11.23 −25.27 7 45.96
+3034 1.48202 1.40262n	57 14.42 −9.06 57 5.36	+11.40 1.05690 0.95718n		

ρ Draconis	ι Cygni	θ Cygni	ψ Cygni
+67° 44 58.42	+51 46 48.59	+50 15 2.39	+52 25 42.99
−25 4 34	−9 6 23	−7 34 35	−9 45 32
1.43040n	0.96520n	0.88420n	0.99580n
−117	−53	−13	+44
1.42923	0.96467	0.88407	0.99624
+26.87	+9.22	+7.66	+9.91
−.37	−.22	−.25	−.03
−.03	−.01	−.03	−.02
+26.47	+8.99	+7.38	+9.86
+67 45 24.89	+51 46 57.58	+50 15 9.77	+52 25 52.85

ρ Draconis		ι Cygni		θ Cygni		ψ Cygni	
+ .27	−17 18.10	+ .10	−17 18.10	+ .08	−17 18.10	+ .11	−17 18.10
45 25.2	+ .27	46 57.7	+ .10	15 9.8	+ .08	25 53.0	+ .11
28 6.2	− 33.0	29 39.0	− 32.8	57 51.5	− 33.0	8 35.2	− 33.3
−17 19.0	−17 50.83	18.7	−17 50.80	18.3	−17 51.02	17.8	−17 51.29
27 33.2	27 34.06	29 6.2	29 6.78	57 18.5	57 18.75	8 1.9	8 1.56

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1885phae.proj.1621

9.88489
+84
+.04

γ Cygni
h m s
20 18 7.
+39° 54'
+2 29

20 06 19 —
30 —
46 29.8 24.4
66 29.8 24.1
92 29.8 29.8
29.8 32.5
48.7 29.6 35.0
48.5 29.4 37.5
57.2 29.8 40.6
64.0

56.45 1160
−21.507
50

20 480 19 29.6 5319 29.713

19 29.693
— 020
19 29.67
18 8.61 −.5081
+1 21.06 — .13
6.10
−.251
83.45
18 6.22

9.99712

21 0.92 −35.11 1.54543
+34.88 1.54255
21 35.80

+40
11 12.55

+2 28 15
0.39550
+126
0.39676

−.249
−.33
−.01
−.283
+40 11 9.72

Sept 30
Reg −17 19.0
18.7
18.3
17.8
16.4
−17 18.10

— .03 −17 18.10
11 9.7 — .03
53 53.0 — 32.4
16.7 −17 50.53
53 20.6 53 19.19

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Oct. 1 1885 9.26605

ζ 2900
h m s
19 28 38
+79° 22

8.25703
+55.32
λ Ursæ Min.
h m s −.73
19 38 56
+88° 54′ 52 −.11
−46 35 +.00

9.83861
+.05
O Cygni
h m s −.07
20 10 1
+46.24
−4 1

9.88489
+.84
γ Cygni
h m s +.04
20 18 7
+39° 54′
+2 29

28 5.2 — 29 15.8
15.0 30.5 19.3 26.8
19.5 31.0 31.0 38.1
27.4 38.0 42.2 49.4
37.1 30.6 53.0 30078 0.5
−89420 11.2
0.198 23.4
34.0
44.8

544.0
28 20.84 30 0.198 30 0.1444

38 13.5 11 31.2 20 1.6 3.5 19 18.9
49.7 33.6 6.0 6.2 22.2
38 28.2 36.2 8.0 8.9 25.0
40 7.6 38.3 9.8 11.5 27.8
47.3 40.5 13.5 14.2 8.66 30.1
41 26.5 33.2
42 6.0 46.5 35.7
49.1 38.5
51.6 41.1
54.2
57.0 5168

58.8
40 8.400 11 35.96 20 4.78 19 30.170 19 30.278

40 8.400
−.848
40 7.55
38 4197
11 25.58
38 35.71

11 23.233
−.022
10 23.21
10 301
11 21.20

11 5.294 11 5.300
11 5.297
−.022
11 5.28
10 301
11 2.27

19 30.224
−.020
19 30.20
18 8.55
11 21.65
6.10

9.99697

42 35.32 7 3.20 36 57.48 −30.66 1.48657 11 45.02 −37.56 1.57473m
−37.30 1.54170m
11 7.72

+40°
11 40.63

+2 29 29
0.39890
+223
0.40113

−.252
−.38
−.02
−.292
+40 11 37.71

−.03 −17 44460
11 37.7 −.03
53 53.1 −325
−17 44.6 −18 17.13
53 20.6 53 20.58

1885phae.proj.1621

Oct-1- 1885 9.66295 — O Cephei +1.93 — 9.89544 — Cl, Cygni +.79 — 9.93855 — γ Cygni +.57 — 9.53266 — β Cephei +.275

O Cephei
h m s −.35
20 27 38
+62° 36'
−20 13

Cl, Cygni
h m s +.07
21 1 46
+38° 11'
+4 12

γ Cygni
h m s +.22
21 8 4
+29° 46'
+12 37

β Cephei
h m s −.46
21 27 10
+70° 4'
−27 41

28 1.7 4.8 6.3 10.5 12.9 — 18.5 23.4 27.8 32.2 36.5 — 30.6 34.6 39.3 43.8 — 48.2 39.30 — 28 48.4 49.8 54.5 59.0 3.7 7.8 12.4 17.0 21.1 — 2 55.9 57.8 59.7 1.2 3.8 — 2 59.5 1.6 4.3 6.9 9.5 12.0 14.7 17.4 20.0 — 9 1.8 3.1 5.0 7.4 10.1 — 9 3.5 5.9 8.3 10.9 13.2 — 17.8 20.0 22.6 24.9 27.3 29.6 32.0 34.2 36.8 — 29 10.5 16.2 19.3 22.0 27.3 — 13.3 15.6 17.2 19.0 21.0 — 28 22.6 24.8 26.8 28.6 30.4 — 26.64 32.6 34.4 36.8 38.8 41.0 — 36.72

6.98 — 30.7 — 1900 — 859 — 5450 — 18482

28 7.24 — 29 3.490 — 29 3.411 — 2 59.68 — 3 9.500 — 3 9.549 — 548 — 9 27.250 — 9 27.245 — 29 19.06

43.0 45.0 47.0 49.0 51.1 4702

793

29 3.450 −.033 29 3.42 — 27 4167 — 41 21.75 — 39.04

3 9.522 −.020 3 9.50 — 1 47.96 — 41 21.54 — 44.48

9 27.248 −.018 9 27.23 — 8 5.43 — 41 2180 — 2.51

28 36.964 −.041 28 36.923 — 17 1472 — 41 22.003 — 10.42

61 — 10 8.156 — 8.21 — 85 — 2.63 — 8.450 45 — 2738.98 — 7

8.516×6 — 15 — 12.08 — 3.16 — 8.489 90 — 1 49.61 — 60

8.168 6 — 8.906 — 2.92 — 84.6×4 — 8 2.62 — 59

8.389 — 44.30 — 4.30 — 86.37 29 — 27 10.65 — 46

9.47503 — 0.00752 — 0.05063 — 9.64474

27 49.08 −.5621 — 1.74981 — 53 50.10 +9.84 — 0.99300 — 18 34.75 +21.77 — 1.33786 — 1.62428n

− .3348 — 27 15.60 — 1.52484n — + 10.21 — 53 20.11 — 1.00052 — + 24.46 — 18 59.21 — 1.38849 — 1 5950 −4710 — − 1858 — 4192 — 1.26902n

+62 — 55 32.75 — −20 14 27 — 1.32700n — + 259 — 1.329.59 — +21.36 — − .70 — − .03 — +20.63 — +62 55 53.38

+38 — 29 28.24 — +4 10 54 — 0.62430 — + 347 — 0.62777 — − 4.24 — − .03 — − .03 — − 4.30 — +38 29 23.94

+30 — 3 49.14 — +12 36 19 — 1.10980 — + 364 — 1.11344 — − 12.98 — − .11 — − .04 — − 13.13 — +30 3 36.01

+70 — 21 6.43 — −27 40 17 — 1.47980n — + 434 — 1.48414 — +30.49 — − .31 — − .02 — +30.16 — +70 21 36.59

+ .23 −17 4460 — 55 53.6 + .23 — 37 53.1 − 356 — −18 50.5 −18 19.97 — 36 27.5 — 37 33.41

− .05 −17 4460 — 29 23.9 − .05 — 11 38.2 − 348 — 45.7 −18 19.45 — 11 3.4 — 11 4.49

− .14 −17 4460 — 3 35.9 − .14 — 45 50.7 − 30.6 — 45.2 −18 15.34 — 45 20.1 — 45 20.67

+ .30 −17 4460 — 21 36.9 + .30 — 3 54.3 − 331 — 42.4 −18 17.40 — 3 21.1 — 3 19.19

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Oct-1 - 1885 9.88489 9.81882

+.84 +1.14

74 Cygni 11 Cygni

h m s +.04 h m s −.11

21 32 22 21 42 34

+39° 54′ +48° 47′

+2 29 −6 24

33	44.5	18.8	33	34.7	44	34.2	26.9	43	45.4
	46.8	21.3		37.3		37.0	29.7		48.6
	49.0	24.0		40.0		39.6	33.0		51.8
	50.9	26.6		42.8		41.6	36.0		54.8
	54.2	29.3	24.00	45.7		43.7	39.2	32.96	58.2
				48.0					1.2
		1.5		51.2			17.0		4.3
		4.2		53.6			20.0		7.3
		6.8		56.1			23.0		10.5
		9.5					26.0		
		12.2	6.84				29.2	23.04	
		9084		4094			11600		5721
33	4908	33	45.420	33	45.487	44	39.22	43	58.000	43	58.011

33 45.454 43 58.006

−.020 −.023

33 45.43 43 5798 70

32 23.62 −81.69 42 3623 −81.64

1 21.81 −.79 1 21.75 −.78 13

20.40 32.73

−3.22 −3.50

−8498 8502 −8532 3

32 20.45 42 32.66

1 5

9.99697 9.93090

10 4390 −363 0.55991 18 33.22 −41.21 1.61500n

−3.60 0.55688n −35.15 1.54590n

10 40.30 17 58.07

+40° +49

12 8.05 4 50.28

+2 28 28 −6 23 43

0.39605 0.80990n

+434 +470

0.40034 0.81460

−2.51 +6.52

−.01 −.46

−.01 −.04

−2.53 +6.02

+40 12 55.2 +49 4 56.30

Oct-1

Reg −17 44.6

45.7

45.2

42.4

44.6

45.1

−17 44.60

−	.03	−17	44.60	+	.07	−17	44.60
12	55	−	.03	4	56.4	+	.07
54	20.9	−	31.5	47	11.3	−	31.7
−17	44.6	−18	16.13		45.1	−18	16.23
53	49.4	53	49.39	46	39.6	46	40.07

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1885phae.proj.1621.

Oct. 5 – 1885 8.25703 | 9.78837 | 9.83861 | 989544

λ Urs. Min. +55.32 — h m s 19 38 56, +88° 57' 52 — –.73, –.08; –46 35 +.00

χ Cygni +1.29 — h m s 19 52 39, +52° 18' — –.17; –9 45

O₁ Cygni +1.05 — h m s 20 10 1, +46° 24' — –.07; –4 1

61 Cygni +.79 — h m s 21 1 46, +38° 11' — +.07; +4 12

40 54	8.0	11.6	8.33	54 46.8	32.5	53 52.7	12 8.3		11 15.6	2 44.7	46.4	3 2.0
40 43.0	46.2	48.0	45.73	38.04 49.4	36.0	56.2	11.0		18.5	46.7	48.9	4.5
41 22.0	23.9	26.5	24.13	76.08 51.7	39.0	59.5	13.5	3.8 3.8	21.4	48.2	51.6	7.2
41 55.6	1.4	4.2	1.73	114.12 54.0	42.4	2.8	15.6	3.7 6.7	24.7	50.5	54.1	9.6
				57.2	45.7 39.12	6.2	18.0	3.8 9.8 3.77	27.6	53.1	56.6 51.52	12.2
						9.4			30.5			15.0
		40	8.33		26.4	12.7		45.3	33.4		28.0	17.6
			7.69		29.5	16.3		48.0	36.4		30.8	20.4
			8.05		32.9	19.6		51.0	39.4		33.2	23.0
			7.61		36.2			54.5			35.8	
					39.7 32.94			57.2 51.20			38.6 33.28	

40 8.420 7.920 | 54 51.82 | 54 6.030 (7206) | 54 6.156 (554) | 12 13.28 | 11 27.485 (5497) | 11 27.500 (2475) | 2 48.64 | 3 12.400 (2480) | 3 12.389 (1115)

7.920			
40 8.420	54 6.093	11 27.492	3 12.394
– .848	– .025	– .022	– .020
40 7.580 7	54 6.07	11 27.47	3 12.37
38 36.60 –84.52	52 41.36 –84.55	10 2.90 –84.57	1 47.56 +.15 –84.64
+1 30.98 –4.42	+1 24.71 –.10	+1 24.57 –.08	+1 24.81 –.06
38 55.74 (144)	39.40	0.64	44.47 (66)
+19.17	–1.96	–2.26	–3.09
–69.83	–86.61	–86.91	–87.79
38 57.24	52 39.46	10 0.56	1 44.58

8 18.52 | 57 14.12 – 36.36 = 56 37.76 | –45.73 | 9.90045, 1.66020n, 1.56065n | 41 41.22 – 40.88 = 41 0.34 | –45.79 | 9.95069, 1.66077n, 1.61146n | 52 56.48 + 24.16 = 53 20.64 (3) | +23.75 | 0.00752, 1.37566, 1.38318

+52	+46	+38
26 10.59	41 48.01	29 27.71
–9 45 2	–4 0 35	+4 10 40
0.99540n	0.60610n	0.62400
+ 425	+ 441	+ 570
0.99965	0.61051	0.62970
+9.99	+4.08	–4.26
– .55	– .57	– .15
– .02	– .02	– .03
+9.42	+3.49	–4.44
+52 26 19.01	+46 41 51.50	+38 29 23.27

+ .11	–17 44.64	+ .04	–17 44.64	– .04	–17 44.64
26 19.1	+ .11	41 51.5	+ .04	29 23.2	– .04
8 35.7	– 3.38	24 8.0	– 3.36	11 38.5	– 3.51
–17 43.4	–18 18.33	43.5	–18 18.20	44.7	–18 19.78
8 1.9	8 0.68	23 34.4	23 33.30	11 3.4	11 3.49

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Oct. 5 – 1885

α Cephei +1.89
h m s –.34
21 15 50,
+62° 6'
– 19 43

9.67018

β Cephei +2.75
h m s –.46
21 27 10,
+70° 4'
– 27 41

9.53266

74 Cygni +.84
h m s +.04
21 32 22,
+39° 54'
+ 2 29

9.88489 9.88489

π² Cygni +1.14
h m s –.11
21 42 54,
+48° 47'
– 6 24

9.81882

16 17.4 / 21.9 / 25.8 / 28.1 / 32.3
34.2 / 38.5 / 42.9 / 47.6 / 51.9 43.02
44.7 / 49.0 / 53.8 / 57.9
2.35374
17 0.5 / 6.7 / 9.5 / 13.7 / 18.0 / 22.7 / 27.0 / 31.5 / 36.0
27 15.5 / 19.0 / 22.6 / 26.8 / 31.4
38.8 / 45.2 / 57.2 / 57.4 / 3.15414
15.6 / 21.5 / 28.0 / 33.6
39.82770
28 15.4 / 21.4 / 27.0 / 33.5 / 39.4 / 45.2 / 51.8 / 57.4 / 3.1
33 14.1 / 17.3 / 19.0 / 20.5 / 23.0
21.5 / 24.0 / 26.4 / 29.5 / 32.2 26.98
4.5 / 7.0 / 10.0 / 12.5
15.09780
33 37.8 / 40.4 / 42.8 / 45.6 / 48.2 / 51.1 / 53.8 / 56.3 / 59.0
43 20.0 / 22.3 / 24.0 / 25.8 / 28.6
29.8 / 32.8 / 35.9 / 38.0 / 42.03590
19.8 / 22.6 / 25.7 / 29.1
32.0.2584
43 48.3 / 51.7 / 54.7 / 57.9 / 1.0 / 4.0 / 7.2 / 10.4 / 13.5

16 25.10 3676 17 18.380
17 16.40 17 18.222
27 22.86 7884 28 39.420
28 35.48 28 39.422
33 18.78 9678 33 48.390
43 51.1 48.346
43 24.14
44 1.74 0.870
44 8.8 0.978

17 18.301 – .033 = 17 18.27
15 53.46 –8466 – .15
+1 24.81 50.07
–3.39 / –88.20 / 15 50.07

28 39.421 – .041 = 28 39.38
27 14.52 –8468 – .22
+1 24.86 10.42
–4.10 / –89.00 / 27 10.38

33 48.368 – .020 = 33 48.35
32 23.55 –8468 – .07
+1 24.80 20.40
–3.15 / –87.90 / 32 20.45

44 0.924 – .023 = 44 0.90
42 36.14 –8470 – .09
+1 24.76 32.73
–3.41 / –88.20 / 42 32.70

58 24.88 +53.20 / + 32.22 / 58 57.10

9.78226 / 1.72591 / 1.50817
1 4.65 +76.56 / + 33.79 / 1 38.44

9.64474 / 1.88400 / 1.52874
10 7.75 +29.59 / +29.38 / 10 37.13

9.99697 / 1.47114 / 1.46811
17 25.42 +36.78 / + 31.37 / 17 56.79

9.93090 / 1.56561 / 1.49651

+62° / 23 51.25 / –19 43 51 / 1.31490 / + 618 / 1.32108 / +2094 / – .64 / – .03 / +20.27 / +62 24 11.52

+70 / 21 9.91 / –27 41 11 / 1.48020 / + 635 / 1.48655 / +3066 / – 1.03 / – .01 / +2962 / +70 21 39.53

+40 / 12 11.22 / +2 27 52 / 0.39430 / + 651 / 0.39981 / – 2.51 / – .24 / – .00 / – 2.75 / +40 12 8.47

+49 / 41 51.56 / – 6 24 51 / 0.81110 / + 683 / 0.81793 / + 6.57 / – .37 / – .02 / + 6.18 / +49 41 57.74

+ 21.11.7 / 24 6 28.2 / –17 43.5 / 5 54.3
–17 44.64 / + .21 / – 3.39 / –18 18.33 / 5 53.19

+ 29.8 / 21 39.8 / 3 54.8 / 4.5.0 / 3 21.4
–17 44.64 / + .29 / – 33.4 / –18 17.75 / 3 21.78

– .02 / 12 8.4 / 54 21.6 / 46.8 / 53 49.4
–17 44.64 / – .02 / – 32.2 / –18 16.86 / 53 51.61

+ .07 / 4 57.8 / 47 12.2 / 45.6 / 46 34.5
–17 44.64 / + .07 / – 32.7 / –18 17.27 / 46 40.47

Oct-5
Reg –17 43.4
43.5
44.7
43.5
45.0
46.8
45.6
–17 44.64

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Oct. 10 - 1885

9.83861
+1.05

9.34043
+445

λ Urs. Min
h m s
19 38 56
+88° 57'

δ Cygni
h m s
20 10 0
+46° 24' —

κ Cephei
h m s — .57
20 12 43
+77° 12' — .04
22 +.00
— 34 59 0.3 57.0

γ Cephei
h m s
20 18 7
+39° 54'

No Observation

11 43.4
46.0
48.0
50.0
52.7

11 17.5
20.5
23.5
26.5
29.6
32.4
35.3
38.3
41.4

3540
−23926

11 4802 11 29444
11 11.476 11 11.500

13 53.4
0.2
6.3
12.0
19.4

13 18.0 149
20.9 146 1475
24.0
27.0
30.0

33.3 30.160
36.5 − 15.697
39.5 458
42.9 460
45.7 457 45.830
− 31.374

14 6.26

11 29.444 11 11.487
− .022 − .022
11 2942 11 1146
10 2.77 10 2.77
1 2665 +1 869

14 14.350
− .070
14 1448
12 4598 — 88.38'
+1 2843 — .18
44.56
− 1.42
− 8993'
12 44.55

37 1.78 + 36.53

9.97069
1.56265.36 2942 + 8.29

9.45251
0.91855
0.37106

+ 2.35
36 31.77

+77 46 16.58
5 47
+ 192
01
− .02
+ .35
22 27.2

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1885phae.proj.1621.

Oct. 10 - 1885 | 9.66270 | 9.85037 | 9.87953 | 9.89534

θ Cephei +1.93 (corrected from 1.93) — +1.93, −.35
h m s
20 27 38
+62° 34'
− 20 14

α Cygni +.100, −.04
h m s
20 37 31
+44° 53'
− 2 30

V Cygni +86, +.03
h m s
20 52 54
+40° 44'
+1 39

61, Cygni +79, +.07
h m s
21 1 46
+38° 12'
+4 11

28 36.0	24.8	28 51.8	38 28.4	32.4	38 49.9	54 58.6	—	54 13.0	3 12.4	49.8	3 5.5
39.6	29.0	56.1	30.1	35.1	52.9	0.6	—	16.0	14.4	52.2	8.0
43.3	33.8	1.0	32.6	38.1	55.8	3.0	26 2.6	18.7	16.4	55.0	11.0
46.2	38.2	5.3	34.7	41.2	58.8	4.7	23 5.0	21.5	18.2	57.7	13.4
47.0	43.0 33.76	9.7	37.0	44.0 38.16	1.4	7.7	23 7.7 2.400	24.0	20.5	0.2 5498	16.1
		14.2			4.2		+21.774	27.0			18.8
	36.8	18.9		18.8	7.3		40.3 24.174	29.6		31.9	21.3
	41.1	23.1		21.8	10.1		43.4	32.1		34.3	24.0
	45.6	27.5		24.5	13.2		46.2	34.8		36.8	26.7
	50.2			27.3			48.6			39.4	
	54.6 45.66			30.6 24.60			51.4 45.980 − 21.774 24.206			42.0 36.88	

28 42.82 | 29 1942 9.710 | 29 876 9.733 | 38 32.56 | 39 276 1.380 | 39 13.6 1.511 | 55 2.92 | 54 24190 | 54 36.7 24078 | 3 16.38 | 2 31.86 15.930 | 3 144.8 16089

29 9.722 −033
20 29 9.690
27 41.28 −10 88.38 2
+1 28.44 50 − .08
39.04
−2.25
−90685
27 39.08 4

39 1.445 −.022
39 1.420 −07
37 33.18 2.42 −88.38 2
+1 28.230 35 − .04
30.72
−2.41 7
−908 43
37 30.58 59

54 24134 −.020
54 2411
52 55.81 −88.38 2
+1 28.30 − .03
53.18
−2.63
−90998
52 53.12 13

3 16.010 −.020
3 1599
1 4.47 +.15 88.33
+1 28.59 39 − .03
44.48
−2.99
−91.35
1 44.64

9.77478 | 9.96245 | 9.99161 | 0.00742

28 6.18 +26.90 1.42975 11 55.22 +28.88 1.46060 21 36.80 −38.79 1.58872n 58 21.78 −0.37 9.56820n
+16.02 1.20453 +26.49 1.42305 −38.05 1.58033n −038 9.57562n
27 22.20 12 21.71 20 58.75 58 21.40

+62° | +44 | +41 | +38
54 26.15 | 10 26.64 | 1 49.60 | 29 26.95
−20 14 10 | −2 30 21 | +1 39 31 | +4 11 6
1.32680n | 0.40130n | 0.22200 | 0.62470
+230 | +243 | +282 | +295
1.32910 | 0.40373 | 0.22482 | 0.62765
+21.34 | +2.53 | −16.78 1.68 | −4.24
−.16 | −.23 | −.41 | −.00
+.00 | +.00 | +.00 | +.00
+21.18 | +2.30 | −17.19 2.09 | −4.24
+62 54 47.33 | +44 10 28.94 | +41 1 32.41 47.51 | +38 29 22.71

+ .21 −17 44.37 | + .02 −17 44.37 | − .02 −17 44.37 | − .04 −17 44.37
54 47.5 + .21 | 10 29.0 + .02 | 1 47.4 − .02 | 29 22.7 − .04
37 3.8 − 36.3 | 52 45.2 − 34.1 | 44 2.8 − 33.5 | 11 39.0 − 35.6
−17 43.7 −17 80.46 | 43.8 −17 78.45 | 44.9 −17 77.89 | 43.7 −17 80.01
36 27.5 36 26.87 | 52 11.1 52 10.49 | 43 29.3 43 29.62 | 11 3.4 11 2.70

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1995phacat.proj.41021

Oct-10-1885 9.93855 9.88489

+.64

γ Cygni +.57

γ Cygni +.04

21 8 4 +.22

21 32 22

+2.9°46'

+12 37

+89°54'

+2 29

9	5.9	10.2	9	24.0	34	12.9	25.2	33	41.1		
	8.0	12.5		26.2		15.0	27.7		43.9		
	10.5	14.8		28.8		16.4	30.4		46.4		
	12.8	17.0		31.3		19.0	33.2		49.2		
	15.0	19.3	14.76	33.6		21.3	35.8	30.46	52.0		
				36.0					54.6		
		47.6		38.3			7.9		57.1		
		50.1		40.7			10.7		59.7		
		52.6		43.0			13.4		2.4		
		55.0					16.0				
		57.3	57.52				18.7	12.34			
		6.728		31.9			18.380		164		
9	10.46	9 33640	9	33544	34	16.92	33 57.900	33	57822		

9 33.592

−.018

9 33.57

8 5.27 −88.33

+1 28.0 −.02

2.51

−2.76

−9111

8 2.46

33 57.861

−.020

33 57.84

32 23.44 −88.384

+1 28.40 −.03

20.40

−3.04

−91.48

32 20.48

3

0.05063 9.99697

18 32.82 +23.13 1.36418 11 2.72 −25.06 1.39898

+25.99 1.41481 −24.89

18 58.81 10 37.83 1.39595

+30

3 49.54

+12.36 17

1.10980

+.308

1.11288

−12.97

−.13

+.00

−13.10

+30 3 36.44

+40

12 10.52

+2 28 47

0.39690

+.359

0.40049

−2.52

−.17

+.00

−2.69

+40 12 7.83

Oct-10

Reg −17 43.7

43.8

44.9

43.7

44.7

45.4

−17 44.37

− .13 −17 44.37

3 36.3 − .13

45 51.6 − 31.6

44.7 −17 76.10

45 20.0 45 20.34

− .02 −17 44.37

12 7.8 − .02

54 22.4 − 33.0

45.4 −17 77.39

53 49.4 53 50.44

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AND DEALERS IN BLANK MUSIC PAPER.
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☞ Passenger Elevator at 21 MILK STREET. Freight Elevator on ARCH STREET.

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