KG
11366
v.560

ADS Digitized by Harvard College Observatory

Polaris
Observations and Reductions
B.6
From July 17 1881 to Mar. 21. 1883

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

1884phac.proj..1364

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1881phae.proj.1564.

Reduction to the mean of wires for L.C. observations
Pierce observations of Sept. 21 – Nov. 5

	m	s
	+5	58.9
	+5	29.4
	+4	58.9
	+4	29.0
	+3	59.5
	+3	29.0
	+2	59.6
	+2	29.2
	+1	59.2
	+1	28.9
	+0	59.2
	+0	29.4
	−0	0.4

A

	m	s
+1	14	56.7
	13	27.1
	11	57.4
	10	27.7
	8	58.1

A

	−0	29.5
	−0	59.8
	−1	29.9
	−1	59.2
	−2	29.2
	−2	59.3
	−3	29.3
	−3	59.3
	−4	28.9
	−4	58.3
	−5	28.7
	−5	58.6

A−1 same as A+1 with opposite sign.

$358.^{s}4 = 4$ spaces

$1 \text{ space} = 89.^{s}675$

Equatorial interval $= \frac{89.675}{43\,200.0000} \quad \frac{1.9526714}{5.3640545} \quad \frac{3.5886168}{0.3167259}$

$= 2.^{s}0736$

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tesuphae.proj.1964

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1881phae.proj.1564.

Observations of Polaris from July 17 1881 to Mar 21 1883

0.11661
8.36460
8.48121

6.73660
8.36460
5.10120

Identical.

1881 July 17 UC Polaris

h	m	s	m	s	h	m	s							
1	11	34.4			1	3	40.4	+7.9	57.6			B	25′	2″.30
		41.9	11	41.7				+836.9						
		48.9	+5	57.5		6	57.1	10	40.3	39.2	39.0	B	25	3305
	12	1.2	+5	57.3				+6402			35.1			
		7.3	12	57.8		8	32.8	9	4.8			B	25	3805
		44.9	-	29.2				544.5		37.0	34.8			
		55.5	5	27.0		10	1.8	7	35.6	T	35.9	B	25	2748
		48.2	12	424				+4555						
		48.6	+4	575		24	11.2	-6	33.8	39.9	36.6	B	26	625
	13	4.8		10.3	4	57.2		-393.7			34.6			
		10.3	13	12.7		26	5.2	8	27.8			B	26	690
		15.9	-	2.3				-507.9		37.6	37.6			
h	m	s 29.4	4	2.3		27	49.0	10	11.6	T	39.0	B	26	812
1		— 37.2	13	36.4				-611.7						
		— 42.1	+3	57.6		29	40.0	12	2.8	34.0	34.0	B	26	980
			14	0.4	3	57.6			-7227		40.2			
4		9.1		7.2	14	7.2		31	18.0	13	40.2	B	26	1198
13.7		12.7		14.0	-	28.7			-8207	35.9	35.2			
		18.2		29.2	3	28.0		33	44.0	16	3.6	B	26	1035
5		38.4		38.2	14	37.6			-9637					
42.53		42.1		45.3	+2	57.8				35.4	35.9		36.82	
		49.1	15	3.6	2	58.8					38.0		3781	
7		4.4		10.8	15	10.2				37.8	38.7		7463	
		10.2		16.1	-	27.6					39.6	17	37.31	
13.67		16.5		35.7	2	28.5				40.8	38.9			
8		38.0		40.1	15	403					37.3		2218209	
44.2		43.7		45.0	+2	0.5				37.9	37.4			
		51.1	16	0.6	1	58.6						17	37.31	
				8.4	16	8.2				36.1	35.7			
				15.5	+1	29.7								
				28.5	1	29.2				37.1	36.8			
				37.5	16	36.3								
				43.0	+0	59.8				37.0	36.2			
			17	1.2	-0	59.4								
				6.3	17	7.2				48.57	47.98			
				14.2	-	29.9				17 37.36	36.91			
				29.7	0	29.6								
				36.0	17	36.2								
1	26	28.7		42.8	-	0.8								
					-0	0.0								
34.90		35.0												
		41.0												
	28	0.2												
5.17		5.0												
		10.3												
	29	27.5												
31.13		30.7												
		35.2												
	30	55.2												
	31	2.4		1 15	38.47								88 40	24.35
1.77		7.7												
	32	24.3												
29.33		29.7												
		34.0												

a+1					a−1			
	+							
4 13.3	13 24.1	13 21.8	17 35.1		26 34.9	- 8 57.5	- 8 34.7	17 40.2
5 42.5	11 54.9	11 53.4	17 35.9		28 5.2	10 27.8	10 23.8	17 41.4
7 10.4	10 27.0	10 24.2	17 34.6		29 31.1	11 53.7	11 53.1	17 38.0
8 44.3	8 53.1	8 54.7	17 39.8		31 1.8	13 24.4	13 22.2	17 39.6
✓	✓				32 29.3	14 51.9	14 52.0	17 37.3
					✓	✓		

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2

~~H~~ 1881 July 19 (18) UC

0.11661
8.36460
8.48121

6.73660
8.36460
5.10120

	h	m	s	m	s	h	m	s										
	1	11	34.0		0	56	23.9	+21 13.9				B	25	2.85				
			41.7	11	40.9			+1273.9										
			46.9			58	32.4	19 5.4				B	25	8.30				
			59.4					+11454										
		12	8.4	12	7.7	1	0	2.0	17 35.8			B	25	14.32				
			15.4						+1055.8									
			32.2			1	37.0	16 0.8				B	25	19.62				
		12 ~~44.6~~	41.8	12	41.1			+960.8										
		12 40.8	49.2			3	57.3	13 46.5				B	25	26.90				
			13	4.2					+826.5									
			11.5	13	11.0	6	4.0	11 33.8				B	25	32.25				
			17.3					+698.8										
h m s			36.0		1.2	8	57.4	+8404				B	25	39.12				
1 2 38.4			40.6	13	44.6			+620.4										
43.73 42.5			47.1			23	57.0	-6 13.2				B	26	6.18				
50.3			14	1.8				-373.2										
4 11.3			7.1	14	7.6	26	11.7	8 33.9				B	26	7.40				
16.43 15.8			14.5					-513.9										
22.2			30.1			28	20.4	10 42.6				B	26	9.92				
5 36.2			38.3	14	38.1			-6426										
42.40 42.5			46.0															
48.5			15	4.3														
7 15.2	15 8.0		9.3	15	9.7													
14.90 11.0			15.4															
10.5			30.8															
8 35.0			38.1	15	37.4													
41.10 40.3			43.4															
48.0			16	1.3														
			6.3	16	7.0													
			13.3															
			31.0															
			37.2	16	37.5													
			44.2															
			17	5.2														
			10.8	17	10.7													
			16.1															
			31.4															
		17 37.78	36.1	17	37.1													
			48.8															
			18	2.5														
			7.2	18	7.6													
			13.0															
			30.2															
1 26 39.0			35.1	18	36.0				1 15 40.54							88 40 24.44		
38.5			42.0															
34.33 43.5			19	3.2														
27 52.5			8.1	19	8.8													
28 0.3			15.0															
0.27 41.0			29.4															
29 24.2			39.3	19	38.2													
31.50 32.0			46.0															
38.3			20	1.2														
30 53.8	20 7.56		7.0	20	7.9													
59.37 58.3			15.4															
31 5.0			32.4															
32 25.1			38.0	20	37.5													
32.03 31.0			42.0															
40.5			59.0															
			21	5.0	21	5.4			a+1					a−1				
			12.1						2 43.7	+14 54.1	+14 51.5	17 39.2	26 34.3	-8 56.5	-8 54.7	17 39.6		
			21.0															
			35.4	21	35.9				4 16.4	13 21.4	13 21.8	17 38.2	28 0.3	10 22.5	10 23.8	17 36.5		
			41.3															
			59.4						5 42.4	11 55.4	11 53.4	17 35.8	29 31.5	11 53.7	11 53.1	17 38.4		
			22	7.8	22	7.0												
			14.2						7 11.9	10 25.9	10 24.2	17 36.1	30 59.4	13 21.6	13 22.2	17 37.2		
			28.8															
		22 35.14	35.5	22	35.7				8 41.1	8 56.7	8 54.7	17 35.8	32 32.0	14 54.2	14 52.0	17 40.0		
			42.7															
			23	5.0								180.1				191.7		
			23	4.0	23	3.7						17 3602						
			10.0									3834				17 38.34		
			25.9															
			34.3	23	33.4													
			40.1									74.36						
		17.37.77			17.37.77							17 37.18						

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1881phae.proj.1564.

= 1881 July 19 LC

0.11661
8.36460 m
8.48121 m

6.73660
8.36460 m
5.10120 m Identical

h	m	s						
13	21	16.0	−6	10.9	B	46	3828	
	22	33.4	7	28.3	B	46	3618	
	24	32.7	8	33.6	B	46	3512	
	25	6.2	10	1.1	B	46	3318	
	26	50.3	11	45.2	B	46	3202	
	28	18.5	13	13.4	B	46	3078	
	30	10.2	15	5.1	B	46	2950	
	32	5.7	17	0.6	B	46	2862	

1 15 41.06

88 40 24.50

a − 1

23	59.6	−8	54.5	−8	54.7	15	4.9	
25	29.5	10	24.4	10	24.2	15	4.9	
26	59.0	11	53.9	11	53.4	15	5.4	
28	28.7	13	23.6	13	21.8	15	6.9	
29	57.7	14	52.6	14	37.5	15	6.2	

5.22
5.68
10.90
15 5.45

4.57.2

4.12

1881phae.proj.1564

H

– 1881 July 20 LC

h m s h m s

D: 11661
8.36451m
8.48112m

6.73660
8.36451m
5.10111m Flaurhead

good at taps 46.0 A.Z. 1st & 2nd taps A.S.

13 —
38.9 – 13 40.9
42.9 +1 30.5
14 1.9 +1 29.0
9.0 14 8.3
13.9 +0 59.3
29.8 0 59.3
36.2 – 14 33.0
— + 29.7
+0 29.5

11.4 9.9

7.6 7.6

(2.7) (2.5)

~~155~~
~~200~~
190 ~~21 X 9~~
9.50 ~~X 23 10.50~~ 8.75 ✓

1 15 41.11

8F 40 24.64

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1881phae.proj.1564

- 1881 July 21 LC

0.09228
8.36451
8.45679

6.73660
8.36451
5.10111

Checked

Use Harvard Chronometers.

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1881phae.proj.1564

1881 July 25 LC

0.09228
8.36451 m
8.45679 m

6.73660
8.36451 m
5.10111 m

h	m	s		m	s	h	m	s				
			13	9	2.2	13	2	13.0	+13 3.4	B 47	1890	
					9.0	9 8.8			+783.4			
					15.3		4	17.3	10 49.1	B 47	1242	
					34.6				+649.1			
					40.0	9 39.9	6	25.5	8 409 +	B 47	640	
					45.0				+5209			
				10	4.9		7	40.0	+7 264	B 47	282	
			10	9.34	11.1	10 1.1			+4464			
					17.2		21	25.0	−6 186 +	B 46	3705	
					33.9				−378.6			
					38.6	10 38.3	22	43.7	7 373	B 46	3562	
					43.4				−457.3			
h	m	s		11	2.3		24	28.4	9 220	B 46	3338	
13	1	35.4			8.1	11 8.6			−5620			
41.70		41.4			15.3							
		48.3			31.0							
	3	6.4			38.9	11 38.2						
12.40		11.4			44.6							
		19.4		12	2.9							
					8.2	12 8.1						
					13.3							
					32.2							
	6	5.0	12	37.32	38.6	12 37.7						
10.37		9.1			43.3							
		17.0		13	1.2							
					6.5	13 6.6						
					12.0							
						13 36.0						
						14 6.0						
						14 36.5						
				14	59.5							
			15	6.30		15 6.5						
					29.4							
						15 37.2						
					45.0							
				16	0.1							
23		55.2			5.3	16 5.3						
24		4.6			10.6							
2.93		9.0			27.3							
					37.4	16 36.1						
					43.5							
					58.5							
				17	4.3	17 5.4						
					13.5							
					27.1							
			17	34.80	33.3	17 32.8						
					38.1							
					59.8							
				18	6.9	18 5.7						
					10.4							
					26.3							
					34.0	18 34.0						
					41.8				a+1		a−1	
					57.0		1	41.7	+13 24.7 +13 22.0	15 3.7	24 2.9	−8 56.5 −8 54.8 15 8.1
				19	4.6	19 4.1	3	12.4	11 54.0 11 53.5	15 3.9		✓
					10.6							
					27.6							
					33.6	19 33.9						
					40.5		6	10.4	8 56.0 8 54.8	15 5.2		
					57.2					8.1		
			20	4.36	3.0	20 3.1		✓	✓			
					9.0							
					28.5					22.9		
					33.3	20 34.3				15 5.72		
					41.0							
				21	0.9							
					5.6	21 6.4						
					12.6							
			15	6.424		15 6.424						
			15			15						

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1884phae.proj.1564.

1881 Aug 21 LC

0.04228
8.36396m
8.45624n

6.73660
8.36396m
5.10056n

m s	h	m	s	m s	h	m	s					
	13	8	52.9		13	21	21.9	−6	22.3	R	54	2445
		9	1.1	8 59.8								
			5.3			23	18.5	8	18.9	R	54	2250
			26.7									
			34.7	9 33.8		24	53.8	9	54.2	R	54	1992
			39.9									
			53.4	~~9 57.8~~		26	6.0	11	6.4	R	54	1932
10 0.36			59.7	~~10 6.2~~								
	10		0.5	10 0.9		27	22.1	12	2.25	R	54	1858
			22.2									
			30.5	10 26.8								
			37.0									
			54.4									
1		11	0.9	11 0.5								
			6.2									
			26.5									
			31.3	11 31.2								
			35.7									
			49.1									
			58.7	11 57.8								
		12	4.9									
			30.1									
12 30.78			34.1	12 34.4								
			39.1									
			58.0									
		13	0.9	13 1.6								
			7.8									
			23.1									
			29.0	13 28.9								
			34.5									
			51.6									
			57.4	13 59.7								
		14	8.0									
			32.4									
			37.1	14 30.5								
			38.0									
			53.5									
~~14 54.95~~		15	0.2	15 0.1								
15 6.04			4.5									
			20.0									
			28.7	15 28.9								
			37.0									
			55.5									
		16	0.8	16 0.3								
			4.5									
			25.1									
			30.9	16 30.6								
			35.8									
			49.0		1	16	9.50				88	40 31.36
			56.2	16 56.5								
		17	4.3									
			21.3									
17 28.74			30.1	17 29.1								
			35.9									
			49.6									
			56.8	17 57.8								
		18	5.0									
			24.9									
			29.6	18 29.7								
			34.2									
			50.0									
			55.2	18 57.0								
		19	5.8									
			22.9									
			29.2	19 29.2								
			35.4									
			54.0									
~~19 57.42~~			58.7	19 59.0								
19 57.86		20	4.9									
			19.9									
			24.9	20 25.1								
			30.6									
			55.0	9.0								
			58.7	20 ~~58.3~~								
		21	3.2									
14 59.356				14 59.556								

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1881phae.proj.1564.

0.09228
8.36387n
8.45615n

6.73660
8.96387n
9.10047n
5

Identical

1881 Aug 22 LC

h m s m s h m s
13 — 13 11 45.6 +3 15.2 R 54 40.50
+ 195.2
— 13 53.6 + 7.2 R 54 36.98
9 28.3
30.8 9 32.3 15 13.0 −0 12.2 R 54 34.75
37.9 ±5 26.8 59.1 59.8
— 5 27.5 16 17.5 1 16.7 R 54 32.42
— 17 50.0 2 49.2 R 54 29.25
10 53.5
11 2.0 11 1.0 21 24.3 6 23.5 R 54 24.78
7.5 ±3 58.6 59.6 59.1
27.0 3 58.1 22 29.2 7 28.4 R 54 23.12
31.5 11 31.8
37.0 ±3 28.2 24 8.7 9 7.9 0.0 0.0 R 54 21.90
55.1 3 28.2
12 2.4 12 2.1 25 40.0 10 39.2 R 54 20.05
8.7 ±2 59.8 1.9 0.4
— 2 58.3 27 16.5 12 15.7 R 54 18.30

59.83
1.10
0.87
1.45
4) 3.25
15 0.81

13 57.3
14 1.7 14 2.0
6.9 ±0 59.3 1.3 1.4
27.5 0 59.4
31.8 14 32.4
37.9 ±0 29.7 029.6 2.1 2.0
53.6 15 58.8
15 4.1 + 0.2 59.0 58.8
28.0 0 0.0
32.0 15 31.9
35.6 ±0 30.1 1.8 2.2
53.2 −0 29.7
16 3.0 16 0.9
6.5 ±0 59.5 1.4 1.5
23.7 ±0 59.4
31.0 16 30.1
35.6 ±1 30.6 −129.3 59.5 0.8
53.5 16 59.6
17 5.6 ±1 57.4 59.2 0.9
22.2 −1 58.7
28.7 17 29.0
36.1 ±2 28.5 0.5 0.3
53.0 −2 28.7
57.7 17 57.9
18 3.1 ±2 58.3 59.6 59.4 / 16 10.12 88 40 31.65
26.5 −2 58.5
30.0 18 30.8
36.0 ±3 28.7 2.1 2.6
— 3 28.2
—
—
—
—
19 57.4
20 0.3 20 1.0
5.3 ±4 57.1 3.9 3.5
— −4 57.5
—
52.1 8.0
57.8 20 57.9
21 4.0 ±5 58.7
−5 57.7

59.3 0.3
16) 9733 9730
15 0.83 0.81
16) 13.0
0.81

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1881phae.proj.1564.

0.09228
8.36396
8.45624

6.73660
8.36396
5.10056

1881 Aug 22 UC

h	m	s	m	s	h	m	s			R	D	′	″
	1	11	27.4		1	6	35.4	+10 524		B	B	33	5.10
			31.2	11 31.0				+6524					
			34.4			8	40.1	8 47.1		B	B	33	8.78
			38.8					+527.1					
			58.4	11 59.9		23	50.4	−6 226		B	B	33	36.28
		12	7.5					−3826					
			25.1			25	38.0	8 10.2		B	B	33	39.05
			30.0	12 30.6				−490.2					
			36.6			27	48.0	10 20.2		B	B	33	39.65
			54.0					−620.2					
			59.7	12 59.5		30	33.5	13 7.7		B	B	33	41.32
		13	4.8					−787.7					
h	m	s				32	30.5	13 2.7		B	B	33	42.35
			28.3	13 29.8				−902.7					
			36.7			34	46.8	17 19.0		B	B	33	41.88
			53.4					−1039.0					
			58.7	13 59.2		36	48.6	19 20.8		B	B	33	42.48
		14	5.4					−1160.8					
			24.6			38	39.8	21 12.0		B	B	33	42.10
			30.6	14 30.3				−1272.0					
			35.7										
			56.6										
	14	59.04	15	1.0	15 1.3								
			6.2										
			21.1										
			25.4	15 26.9									
			34.1										
			51.3										
			57.3	15 57.5									
		16	4.0										
			24.5										
			29.4	16 29.1									
			33.4										
			50.6										
			57.9	14 57.5									
		17	4.0										
			28.0										
	17	29.42	33.0	17 33.0									
			38.0										
			55.6										
		18	0.1	18 0.0									
			4.2										
			22.7										
			27.0	18 27.5									
			32.7										
			47.1										
			57.3	18 56.9									
		19	6.3										
			20.7					1.16 9.82					
			29.0	19 28.1									
			34.7										
			51.6										
	19	54.96	55.1	19 56.1									
	19	55.56	20	1.5									
			16.3										
			26.3	20 20.0									
			29.4										
			46.0										
			54.3	20 53.7									
		21	0.7										
			14.3										
			21.0	21 20.8									
			27.0										
			46.0										
			54.8	21 56.6									
		22	7.0										
			19.0										
	22	25.08	25.7	22 25.5									
			31.9										
			50.1										
			55.5	22 55.4									
		23	0.5										
			20.7										
			27.3	23 27.1									
			33.2										
	17	27852		17 27.852									

88 40 31.5

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1881phae.proj.1564

1881 Aug 27 LC

0.09228
8.36378
8.45606

6.73660
8.36378
5.10038

h	m	s	h	m	s						
			13	6	17.8	+8 447		B	53	1125	
						+ 524.7					
				8	2.2	7 0.3		B	53	785	
						+ 420.3					
				21	20.9	− 6 184		B	54	2640	
						− 378.4					
				24	6.3	9 3.8		B	54	2368	
						−543.8					
				25	33.5	10 310		B	54	8275	
						−631.0					
				27	16.4	12 139		B	54	2192	
						−733.9					
				29	11.2	14 8.7		B	54	1882	
						−848.7					
				31	7.0	16 4.5		B	54	2038	
						−964.5					
				32	20.3	17 178		B	54	1865	
						−1037.8					
				34	4.8	19 23		B	54	1905	
						−1142.3					
				36	1.5	20 57.0		B	54	1812	
						−1259.0					
				37	30.5	22 28.0		B	54	1800	
						−1348.0					

10 5.68

12 35.00

15 1.64

17 31.60
17 31.40
17 35.00

19 58.06
19 59.02

1 16 13.39

88 40 32.93

15 2.468

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1881phae.proj.1564.

1881 Aug 29 LC

0.09228
8.36378
8.45606

6.73660
8.36378
5.10038

h	m	s	m	s	h	m	s					
13	9	1.3			13	0	35.5	+ 14 266	B	53	1372
		5.6	9	5.7				+ 8666			
		10.1				3	39.8	11 223	B	53	532
		29.4						+ 682.3			
		34.8	9	35.2		7	0.0	8 21	B	54	5532
		41.4						+ 482.1			
		56.5				8	8.4	+ 6 53.7	B	54	4290
~~10 6.82~~	10	4.5	10	3.8				+ 413.7			
10 4.82		10.5				21	33.0	- 6 30.9	B	54	2780
		30.2						- 390.9			
		35.4	10	35.8		24	10.3	9 8.2	B	54	2570
		41.8						- 548.2			
		59.1				25	24.5	10 224	B	54	2445
	11	3.5	11	~~33.6~~				- 622.4			
		8.1				27	48.7	12 466	B	54	2315
		30.5						- 766.6			
		36.0	11	37.8		29	17.3	14 15.2	B	54	2230
		47.0						- 855.2			
		54.0				30	37.9	15 35.8	B	54	2018
								- 935.8			
	12	1.0	12	0.5							
		6.5									
12 32.00			12	31.0							
				13	0.0						
	13	23.2		~~27.3~~							
		31.4	13	30.7							
		37.4									
		57.4									
	14	3.4	14	3.1							
		8.6									
		23.4									
		31.4	14	3~~8~~0							
		38.1									
~~15 2.50~~	15	4.8	15	7.5							
15 3.10		10.2									
		28.8									
		33.9	15	33.6							
		38.5									
		53.3									
		58.7	16	~~1.6~~ 0.3							
	16	9.0									
		31.4	16	34.6							
		37.8									
		50.3						1 16 1492			88 40 33.48
		56.0	16	56.8							
	17	4.0									
		24.3									
17 30.76		30.2	17	30.6							
		37.4									
		54.1									
	18	0.3	18	0.3							
		6.4									
		26.2									
		31.8	18	31.5							
		36.5									
		55.5									
	19	2.2	19	1.6							
		7.1									
		23.4									
		29.9	19	29.0							
		34.2									
		51.9									
19 59.74		59.3	19	59.2							
	20	6.5									
		22.1									
		31.0	20	29.7							
		36.1									
		53.4									
		58.4	20	59.2							
	21	5.7									
15 02.084			15	20.44							

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1881phae.proj.1564.

12

1881 Aug 29 UC

0.09228
8.36378
8.45606

6.73660
8.36378
5.10038

h	m	s	m	s	h	m	s								
		1			1	6	22.1	+11 116			B	33	5'18"		
				11 35.0				+671.6							
						9	5.0	7 28.7			B	33	9'30		
			12	0.5				+448.7							
			8.3		12 4.1	23	58.5	-6 24.8			B	33	36'08		
			8.4					-384.8							
			27.4			25	42.8	8 9.1			B	33	38'05		
	12	35.28	33.5		12 35.1			-489.1							
			44.4			27	14.4	9 40.7			B	33	39'76		
			13	0.7				-580.7							
			6.2		13 6.8	25	34.4	11 0.7			B	33	40'48		
			18.4					-660.7							
h	m	s	29.5			80	13.4	12 39.7			B	33	41'00		
			34.7		13 35.4			-759.7							
			42.0			31	57.0	14 17.3			B	33	40'42		
			14	1.5				-857.3							
			6.5		14 6.4	33	26.0	15 5.23			B	33	41'90		
			11.2					-952.3							
			31.3			35	4.2	17 30.5			B	33	41'58		
			36.2		14 37.5			-1050.5							
			45.0												
			15	1.0											
	15	5.68	5.2		15 5.5										
			10.2												
			27.0												
			32.7		15 33.4										
			40.5												
			59.9												
			16	4.5	16 5.6										
			12.3												
			28.0												
			33.2		16 33.2										
			38.8												
			56.5												
			17	1.0	17 1.4										
			6.7												
			25.1												
	17	33.32	31.4		17 32.7										
			41.5												
			57.3												
			18	4.6	18 4.4										
			11.3												
			28.2												
			34.2		18 34.9										
			42.2												
			19	2.7											
			9.5		19 8.5										
			13.4												
			25.3					1 16 14.54						88 40 33.34	
			31.2		19 31.3										
			37.4												
			41.3												
	20	3.70	20	2.7	20 2.5										
			8.4												
			24.0												
			35.4		20 34.1										
			43.0												
			57.6												
			21	1.3	21 2.1										
			7.4												
			27.7												
			32.3		21 32.7										
			38.2												
			54.4												
			59.4		21 59.7										
			22	5.4											
			25.0												
	22	30.38	28.5		22 28.9										
			33.2												
			57.3												
			57.8		22 59.0										
			23	8.0											
			27.0												
			30.6		23 316										
			37.2												
	17	33672			17.33672										

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1881phae.proj.1564.

1881 Aug 30 LC

0,09228
8.36369 a
8.45597 m

6.73660
8.36369 m
5.10029 a

h	m	s	m	s	h	m	s		R	D	′	″
	18	9	0.0		13	3	30.7	+11 34.7	B	R	53	4.90
								+ 69 4.7				
			7.2	9 6.2								
			11.5			5	28.3	9 42.1	B	R	54	59.10
			29.9					+ 5 82.1				
			36.1	9 35.8		6	15.5	8 49.9	B	R	54	56.90
			41.5					+ 5 29.9				
		10	2.4			7	5.0	8 04	B	R	54	53.85
								+ 480 H				
10	7.06		7.1	10 7.5								
			12.9			7	40.7	+ 7 24.7	B	R	57	53.95
			32.6					+ 444.7				
			39.1	10 39.1		21	22.5	- 6 17.1	B	R	54	26.72
			45.8					- 37.1				
		11	1.0			22	21.5	7 16.1	B	R	54	23.38
			6.8	11 6.7				- 436.1				
			12.4			23	43.4	8 38.0	B	B	54	23.58
			29.6					- 57.8.0				
			36.7	11 36.6		24	49.0	9 43.6	B	B	54	22.80
			43.6					- 58 3.6				
			59.7			25	52.2	10 46.8	B	B	54	21.98
		12	6.0	12 6.1				- 646.8				
			12.5			27	24.5	12 19.1	B	B	54	20.52
			28.5					- 73 9.1				
12	36.72		36.5	12 36.4		28	26.2	13 20.8	B	B	57	20.32
			42.2					- 800.8				
			58.8									
		13	6.3	13 6.0								
			13.0									
			33.4									
			37.0	13 38.5								
			45.1									
		14	4.9									
			9.0	14 9.2								
			13.6									
			31.7									
			37.0	14 36.8								
			41.8									
		15	1.4									
~~15~~	~~6.16~~		6.1	15 5.8								
15	6.22		10.0									
			26.7									
			32.4	15 32.9								
			39.5									
			59.8									
		16	6.8	16 6.4								
			12.7									
			29.5									
			36.0	16 35.2								
			40.0									
			55.2					1 16 15.69				88 40 33.80
		17	5.0	17 4.0								
			11.9									
			28.2									
17	34.16		36.3	17 35.0								
			40.5									
			57.6									
		18	1.4	18 1.7								
			6.0									
			27.1									
			37.0	18 34.9								
			40.5									
			57.2									
		19	4.0	19 3.1								
			8.2									
			24.2									
			33.3	19 31.7								
			37.5									
			58.4									
20	2.98	20	3.5	20 3.2								
			7.7									
			24.5									
			33.8	20 31.9								
			37.5									
		21	6.0									
			5.4	21 5.0								
			9.6									
15	54.28			15 54.28								

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1881phae.proj.1564

14

1881 Aug 31 LC

0.09228
8,36369 m
8455978

6.73660
8,36369 m
5.10029 m

h	m	s	m	s	h	m	s							
	13	9	3.5		13	21	54.0	−6 51.4		B	54	26.38		
			7.3	9 7.4				−411.4						
			11.4			25	1.4	9 58.8		B	54	23.45		
			31.0					−598.8						
			35.6	9 36.3		26	29.1	11 26.5						
			42.3					−686.5						
			57.8			28	19.7	13 17.1		B	54	22.60		
10	5.56							−797.1						
		10	5.0	10 4.7		30	36.6	15 54.0		B	54	19.70		
			11.2					−934.0						
			29.5											
			35.6	10 35.5		32	16.0	17 13.4		B	54	18.78		
			41.4					−1033.4						
			58.5			34	2.4	18 57.8		B	54	18.22		
		11	3.1	11 3.9				−1139.8						
			10.0			36	36.3	21 33.7		B	54	18.30		
			29.6					−1293.7						
			64.2	11 35.0		38	39.0	23 36.4		B	54	20.08		
			41.1					−1416.4						
			58.0			41	13.9	26 11.3		B	54	19.90		
								−1571.3						
		12	5.2	12 4.4										
			10.0											
			26.5											
12	33.92		32.0	12 32.5										
			39.0											
			57.5											
		13	4.0	13 3.6										
			9.2											
			27.4											
			34.0	13 34.1										
			41.0											
			57.7											
		14	4.5	14 3.0										
			9.7											
			25.5											
			34.0	14 32.9										
			39.1											
			55.7											
15	2.22	15	1.2	15 1.3										
			7.1											
			27.4											
			32.2	15 32.4										
			37.7											
			53.1											
		16	1.0	16 1.5										
			10.3											
			26.7											
			33.2	16 32.7										
			38.2											
			53.4					1 16 16.43					88 40 34.13	
		17	2.2	17 1.3										
			8.4											
			26.2											
17	31.46		30.8	17 31.3										
			37.0											
			—											
			—	18 1.0										
			—											
			—											
			—	18 31.0										
			—											
		18	58.3											
		19	0.3	19 0.1										
			6.8											
			26.2											
			31.6	19 31.5										
			36.8											
			52.5											
20	0.06		57.3	19 59.0										
		20	7.8											
			23.2											
			28.0	20 29.2										
			36.3											
			53.2											
			58.2	21 0.5										
		21	9.2	—										
15.	2.644			15 2.644										

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1881phae.proj.1564

1881 Sept 7 LC

Equatorial Mean Data 1 mm

0.09228
8.36351
8.45579

6.73660
8.36351
5.10011

h	m	s	m	s	h	m	s		R/B	D/B	′	″
	13	10	2.0		13	5	12.0	+10 56.7				
			9.0	10 9.2				+65 6.7				
			16.5	–		6	57.8	9 10.9	B	R	54	59.20
			36.1					+550.9				
			41.5	10 41.6		7	57.3	8 114	B	R	54	57.10
			47.3	–				+491.4				
		11	3.8			8	37.5	7 31.2	B	R	54	55.30
	11	10.36	12.0	11 10.7				+45 1.2				
			16.4	–		9	19.3	+6 49.4	B	R	54	53.35
			34.7					+409.4				
			40.8	11 41.1		22	56.3	– 6 47.6	B	B	54	28.32
			47.8	–				– 407.6				
		12	3.9			25	12.0	9 33	B	B	54	26.30
			8.7	12 9.2				– 5433				
			15.1	–		26	42.0	10 33.3	B	B	54	23.90
			34.0					– 6333				
			41.1	12 40.6		28	8.8	12 0.1	B	B	54	23.30
			46.7	–				– 720.1				
		13	6.0			29	28.9	13 12.3	B	B	54	21.62
			10.2	13 10.8				– 799.3				
			18.2	–								
			34.2									
	13	40.60	42.0	13 40.9								
			46.5	–								
		14	4.5									
			11.0	14 10.6								
			16.2	–								
			33.5									
			38.4	14 40.1								
			48.5	–								
		15	2.0									
			9.8	15 8.9								
			15.0	–								
			32.5									
			37.8	15 38.3								
			45.0	–								
		16	2.8									
	16	8.68	8.0	16 7.6								
			12.0	–								
			33.5									
			38.7	16 39.3								
			45.7	–								
		17	3.2									
			8.6	17 9.3								
			15.5	–								
			32.3									
			38.2	17 38.7								
			45.6	–				1 16 20.31				88 40 36.51
		18	2.7									
			7.0	18 7.4								
			12.4	–								
			32.1									
	18	37.42	38.2	18 37.5								
			42.2	–								
		19	0.6									
			7.2	19 6.5								
			11.7	–								
			30.3									
			35.7	19 37.0								
			45.0	–								
			59.7									
		20	7.3	20 6.8								
			13.5	–								
			29.2									
			36.0	20 36.2								
			40.3	–								
		21	0.3									
	21	6.58	8.0	21 7.2								
			13.2	–								
			31.6									
			37.5	21 36.6								
			40.6	–								
		22	0.1									
			6.6	22 6.1								
			11.7	–								
	16	8.728		16 8.728								

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1881phae.proj.1564

36

1881 Sept. 8 2C

0.09228
8.36341
8.45569

6.73660
8.36341
5.10001

h	m	s		h	m	s		°	′	″
			13	21	34.4	−6	27.1	BR	54	31.40
		9	5.5	22	32.3	7	25.0	BR	54	33.18
		9	36.0	23	19.1	8	11.8	BR	54	29.85
				24	13.8	9	6.5	BR	54	29.20
10	6.32	10	6.0	25	10.5	10	8.2	BR	54	27.38
		10	37.0	26	3.1	10	55.8	BR	54	27.88
	11	0.2		27	28.5	12	16.2	BR	54	26.88
	11	6.7	11 7.1							
		14.4		28	47.9	13	40.6	BR	54	25.98
		33.7								
		38.3	19 38.9	30	6.9	14	59.6	BB	54	24.68
		44.6								
	12	3.3		31	4.1	15	56.8	BB	54	24.62
		11.2	12 10.9							
		18.3		33	3.3	17	56.0	BB	54	23.15
		32.2								
12	38.12	38.3	12 38.6	34	37.3	19	30.0	BB	54	23.18
		45.2								
		58.7		36	3.0	20	55.7	BB	54	23.22
	13	4.2	13 6.3							
		16.0		37	35.0	22	27.7			
		27.3								
		36.3	13 35.9							
		44.0								
	14	2.5								
		9.2	14 9.1							
		15.0								
		32.5								
		39.4	14 40.4							
		49.3								
	15	2.5								
15	8.14	7.6	15 8.4							
		15.2								
		31.2								
		38.7	15 38.4							
		45.2								
		57.3								
h	m	s								
23	58.9		16	3.0	16 4.4					
24	2.8			13.0						
3.80	9.7			20.3						
25	29.8			35.5	16 35.7					
3583	35.5			42.2						
	42.2		17	0.9						
27	2.5			6.3	17 7.1					
7.20	7.4			14.2						
	11.7			30.4						
28	33.4	17 36.8		35.4	17 36.4					
3697	37.0			42.5						
	40.5		18	3.0						
29	55.6			8.5	18 8.6					
1.13	1.6			14.4						
30	6.2			30.8						
				37.2	18 36.5					
				41.4						
				38.5	5.3					
			19	6.5	19 5.7					
				11.0						
				29.8						
				35.7	19 35.9					
				42.8						
			20	3.2						
20	7.58			9.0	20 7.8					
20	6.90			14.1						
				31.2						
				39.0	20 38.1					
				44.1						
			21	1.9						
				6.4	21 7.4					
				13.5						
15	7.268			15 7.268						

1 16 20 43

88 40 36.81

a	−1										
24	3.8	−8	56.5	−8	56.2	15	8.6				
25	35.8	10	28.5	10	25.5	15	10.3				
27	7.2	11	59.9	11	55.0	15	12.2				
28	37.0	13	29.7	13	24.4	15	12.6				
30	1.1	14	53.8	14	54.4	15	6.7				
✓		✓									

504
10.08

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– 1881 Sept 8 UC

0.09228
8.36341
8.45569

6.73660
8.36341
5.10001 Identical

h	m	s	m	s	h	m	s							
1	11	32.4		0	59	1.4	+18 37.7				B	32	38.18	
		40.3	11	39.2			+1117.5							
		45.0	+5	57.5	1	1	17.4	16 21.8	36.7	37.7	B	32	46.42	
	12	6.4	+5	58.5				+981.5						
		11.4	12	11.7		2	44.0	14 55.1			B	32	57.65	
		17.2	–	29.2				+894.9	40.9	39.8				
		35.3	5	28.1		4	9.2	13 30.1			B	32	54.20	
		40.2	12	40.3				+809.9						
		45.3	+4	57.5		5	35.0	12 [illegible]	37.8	38.5	B	32	59.68	
	13	5.0	4	58.2				+723.9						
		10.1	13	10.2		7	16.2	10 22.8			B	33	3.62	
		15.4	–	27.3				+622.7	37.5	38.4				
		31.0	4	28.2		8	52.0	8 47.1			B	33	7.28	
		40.0	13	39.5				+526.9						
		47.5	+3	57.6		24	8.8	–6 29.7	37.1	37.9	B	33	33.25	
	14	7.1	3	58.4				–389.7						
		12.1	14	12.1		26	0.0	8 [illegible]			B	33	36.48	
		17.0	–	28.7				–504.1	40.8	40.8				
		35.5	3	28.7		27	28.4	9 49.3			B	33	37.25	
		41.5	14	41.8				–589.5						
		48.3	+2	57.8					39.6	40.7				
	15	2.0	2	58.9									38.06	
		10.3	15	9.6									39.58	
		16.4	–	27.6					37.2	38.6			39.18	
		33.3	2	29.0									116.82	
		38.4	15	39.4								17	38.94	
		46.4	+2	0.5					39.9	38.4				
	16	4.0	1	59.0										
		9.6	16	9.9									584.1	
		16.2	+1	29.7					39.6	39.4		17	38.94	
		34.0	1	29.5						–				
		38.4	16	39.6										
		46.3	+0	59.8					39.4	39.2				
	17	1.0	0	59.6										
		7.4	17	7.9										
		15.4	–	29.9					37.8	37.6				
		30.4	+0	29.7										
		37.2	17	37.4										
		44.5	–	7 6.8					38.2	37.4				
			–	0 0.0										

1 16 20.57

68 40 36.65

23	1.5													
	7.5	23	8.2											
	15.7	–	26.3						41.9	40.0				
	34.3	–5	28.2											
	39.4	23	39.8											
	45.8	–5	57.6						42.2	41.7				
		–5	58.1											

15) 5866 5861
1739.10 39.07

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48

1881 Sept 13 LC

0.09228
8.36332m
8.45560n

6.73660
8.36332m
5.09992n

h	m	s	m	s	h	m	s		R	D	′	″
	13	9	12.4		12	59	0.1	+16 168	B	R	53	2553
			18.5	9 18.7				+ 976.8				
			25.13		13	0	2.4	15 14.5	B	R	53	2170
			42.0					+ 914.5				
			48.6	9 48.0		0	52.4	14 24.5	B	R	53	1930
			53.4					+ 864.5				
		10	12.4			1	31.0	13 459	B	R	53	1748
10	18.74		21.0	10 19.6				+ 825.9				
			25.5			2	20.5	12 564	B	R	53	1532
			44.1					+ 776.4				
			47.5	10 49.2		3	56.8	11 20.1	B	B	53	1012
			55.9					+ 680.1				
		11	10.5			4	54.0	10 229	B	B	53	710
			18.2	11 18.2				+ 622.9				
			26.0			6	3.2	9 13.7	B	B	53	345
			41.6					+ 553.1				
			49.3	11 48.1		6	53.7	8 232	B	B	53	125
			53.3					+ 503.2				
		12	13.8			7	56.5	+7 204	B	B	54	5845
			20.0	12 19.3				+ 440.4				
			24.2			21	39.6	−6 227	B	R	54	3325
			43.3					− 382.7				
12	48.00		47.5	12 48.1		22	34.5	7 176	B	R	54	3175
			50.4					− 437.6				
		13	11.2			23	21.5	8 46	B	R	54	3138
			17.0	13 17.6				− 484.6				
			24.6			24	8.8	8 51.9	B	R	54	3053
			40.2					− 531.9				
			47.8	13 46.9		25	6.2	− 9 493	B	R	54	2978
			52.8					− 589.3				
		14	12.4			26	13.0	10 56.1	B	B	54	2810
			17.4	14 17.6				− 656.1				
			23.0			27	12.1	11 55.2	B	B	54	2765
			40.6					− 715.2				
			48.5	14 48.2		28	9.0	12 521	B	B	54	2675
			55.6					− 772.1				
		15	9.2			29	6.6	13 49.7	B	B	54	2668
15	17.50		18.0	15 16.3				− 829.7				
			21.7			30	2.4	14 455	B	B	54	2552
			41.5					− 885.5				
			47.0	15 47.1								
			52.7									
		16	11.2									
			18.2	16 18.3								
			25.4									
			38.9									
			45.7	16 45.2								
			50.9									
		17	9.0					1 16 23.81				88 40 38.42
			15.1	17 15.0								
			21.0									
			38.8									
17	45.50		47.2	17 45.8								
			52.3									
		18	—									
			15.2	18 15.5								
			—									
			—									
			46.0	18 46.0								
			—									
		19	—									
			15.0	19 14.0								
			—									
			38.5									
			43.7	19 44.6								
			51.6									
		20	9.0									
20	14.58		14.7	20 15.6								
			23.0									
			37.5									
			45.1	20 44.5								
			51.0									
		21	8.5									
			14.0	21 14.2								
			20.0									
15	16.864			15 16.864								

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1881phae.proj.1564.

1881 Sept 14 LC

0.09228
8.36323 m
8.45551 n

6.73660
8.36323 m
5.09983 n

h	m	s	m	s	h	m	s		R	D	′	″
	13	9	14.5	20.1	13	5	48.2	+9 28	8	R	55	678
			19.7	9 19.5								
			26.2			6	48.0	8 29.0	B	R	55	380
			43.7									
			48.4	9 49.0		7	27.2	7 49.8	B	R	55	180
			55.0									
		10	13.5			8	3.0	7 14.0	B	R	54	5830
			19.2	10 19.1								
10 17.80			24.6			8	43.3	+6 33.7	B	R	54	5728
10 18.12			42.5									
			48.1	10 47.9		22	47.7	−7 30.7	B	R	54	3468
			53.1									
		11	13.6			23	53.7	8 6.7	B	R	54	3288
			19.6	11 19.5								
			25.2			24	46	8 47.5	B	R	54	3278
			45.6									
			49.4	11 50.1		24	56.1	9 39.1	B	R	54	3232
			55.3									
		12	12.1			26	18.0	11 1.0	B	R	54	3098
			18.6	12 18.1								
			23.7			29	44.8	14 27.8	B	B	54	2998
			47.0									
12 48.90			50.4	12 50.3		32	12.0	16 55.0	B	B	54	2872
			53.6									
		13	14.7			33	21.5	18 4.5	B	B	54	2740
			18.2	13 18.7								
			23.3			34	37.7	19 20.7	B	B	54	2675
			41.8									
			46.2	13 47.3					B	B	54	2678
			53.9									
		14	10.6									
			15.4	14 15.5								
			20.6									
			48.0	14 46.6								
			52.7									
		15	12.5									
15 16.30			16.2	15 16.4								
			20.5									
			41.4									
			49.0	15 47.5								
			52.1									
		16	10.0									
			15.8	16 15.5								
			20.8									
			40.1									
			45.3	16 45.5								
			51.1									
		17	10.9					1 16 24.38			88	40 38.78
			15.7	17 16.0								
			21.4									
			40.3									
17 46.24			45.6	17 45.7								
			51.3									
		18	13.3									
			17.5	18 17.6								
			22.0									
			41.0									
			46.3	18 46.4								
			51.8									
		19	11.0									
			14.7	19 14.9								
			19.1									
			44.0	19 44.2								
			48.9									
		20	11.5									
20 14.64			14.6	20 15.9								
			38.0									
			43.7	20 43.9								
			50.0									
		21	7.1									
			13.7	21 14.3								
			22.0									
15 17.040				15 17040								

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20

1881 Sept 16 LC

0.09228
8.36323m
84.55 55.4"/m

6.73660
8.36323m
5.09983m

h	m	s	m	s		s						
					12	57	55.7	+15 216	BR	53	2515	
	13	9	12.8		13	1	20.5	13 568	BR	53	2020	
			19.0	9 19.4				+836.8				
			26.4			2	22.6	12 54.7	BR	53	1625	
			43.0					+774.7				
			50.8	9 49.5		3	23.2	11 54.1	BR	53	1612	
			55.5					+714.1				
		10	13.6			4	8.5	11 88	BR	53	1110	
10 19.94			19.5	10 19.6				+668.8				
			25.8			5	22.8	9 545	BB	53	832	
			44.0					+594.5				
			51.2	10 50.8		6	32.7	8 446	BB	53	670	
			57.1					+5246				
		11	15.0			7	18.7	7 586	BB	53	245	
			20.7	11 20.4				+478.6				
			25.4			7	58.9	+7 18.4	BB	53	218	
			41.5					+438.4				
			45.0	11 45.7		21	46.2	-6 28.9	BR	54	3560	
			50.2					-388.9				
		12	10.14			22	45.4	7 28.1	BR	54	3432	
			15.5	12 15.1				-448.1				
			19.4			23	37.4	8 20.1	BR	54	3298	
			38.6					+500.1				
12 46.90			44.1	12 45.9		24	21.0	9 3.7	BR	54	3272	
			55.1					-543.7				
		13	16.1			25	38.2	10 209	BR	54	3162	
			20.2	13 20.5				-620.9				
			25.1			26	40.6	11 23.3	BB	54	3080	
			38.2					-683.3				
			48.1	13 47.3		27	33.8	12 16.5	BB	54	2982	
			55.5					-736.5				
		14	11.5			28	29.4	13 12.1	BB	54	2920	
			18.2	14 18.1				-792.1				
			24.6			29	36.0	14 18.7	BB	54	2918	
			42.7					-858.7				
			46.1	14 47.8								
			52.7									
		15	10.5									
15 17.24			15.0	15 16.2								
			23.0									
			45.4									
			47.7	15 47.9								
			50.7									
		16	9.8									
			16.3	16 16.2								
			22.6									
			37.1									
			40.5	16 45.5								
			52.8									
		17	9.2					1 16 24.84			88 40 39.17	
			16.9	17 15.8								
			21.3									
			38.0									
17 45.96			45.0	17 45.2								
			52.7									
		18	12.1									
			18.0	18 18.2								
			24.6									
			39.7									
			45.4	18 45.1								
			50.3									
		19	10.6									
			16.4	19 16.7								
			23.2									
			40.2									
			43.3	19 47.5								
			51.0									
		20	10.9									
20 16.62			16.1	20 16.0								
			21.0									
			45.8	20 45.8								
		21	13.1									
			17.0	21 17.1								
			21.2									
15.17.332				15,17,332								

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1881 Sept 17 LC

0.09228
8.36314
8.45542

6.73660
8.36314
5.09974

h	m	s	m	s	h	m	s					
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			18.0	9 19.2				+1162.0				
			25.5	-		57	55.0	17 244		B	53	3265
			42.6					+1044.4				
			49.7	9 49.2		59	14.8	16 4.6	R	B	53	2875
			55.9	-				+964.6				
		10	14.2		13	0	44.7	14 34.7		B	53	2308
			22.5	10 25.2				+874.7				
10	20.78		30.0			2	6.4	13 13.0		B	53	1850
10	20.90		34.0	-				+798.0				
			44.8	50.3		3	36.9	11 425.5		B	53	1570
			49.8	10 49.7				+702.5				
			56.4	-		5	4.1	+10 15.3		B	53	1165
		11	13.0					+6 15.3				
			20.3	11 20.6		21	37.3	-6 17.9	R	B	54	4023
			28.4	-				-377.9				
			42.4			23	27.1	8 7.7		B	54	3445
			48.5	11 48.8				-487.5				
			55.5	-		24	44.7	9 25.3		B	54	3272
		12	14.5					-565.3				
			20.8	12 20.3								
			26.2	-								
			48.3									
12	50.50		55.2	12 54.3								
			59.5	-								
		13	12.4									
			19.4	13 19.1								
			25.5	-								
			43.2									
			50.3	13 50.0								
			56.5	-								
		14	17.2									
			22.3	14 22.8								
			28.8	-								
			45.0									
			50.7	14 50.9								
			57.0	-								
		15	12.1									
15	20.14		20.2	15 19.9								
			27.4	-								
			43.4									
			49.6	15 49.9								
			56.7	-								
		16	10.5									
			16.2	16 17.2								
			24.8	-								
			42.0									
			47.5	16 47.6				1 16 25.72				88 40 39.93
			53.3	-								
		17	12.0									
			19.2	17 18.8								
			25.2	-								
17	47.36		39.2									
17	47.42		45.2	17 45.9 b								
			52.3	-								
		18	11.7									
			17.1	18 17.3								
			23.0	-								
			40.3									
			48.2	18 47.8								
			53.0	-								
		19	10.4									
			16.0	19 17.1								
			25.0	-								
			42.8									
			47.7	19 48.6								
			55.2	-								
		20	11.3									
20	17.90		19.7	20 18.7								
			25.0	-								
			41.9									
			46.8	20 48.5								
			55.3	-								
		21	9.2									
			17.4	21 16.6								
			23.3	-								
15	19.36 D			15 19.360								

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22

1881 Ast 18 LC

0.09228
8.36314
8.45542

6.73660
8.36314
5.09974

h	m	s	m	s	h	m	s						
	13	9	23.3		13	4	46.7	+10 35.1		R	53	12.30	
			25.3	9 25.5				+ 685.1					
			27.9			6	46.7	8 35.1	+	R	53	582	
			40.2					+ 515.1					
			50.0	9 49.4		21	37.2	− 6 15.4		R	54	3732	
			58.0					− 375.4					
	10		20.9			23	4.3	7 42.5		R	57	3528	
10 21.3			24.7	10 25.5				− 462.5					
.26			31.0			25	13.8	9 52.0		R	54	3298	
			47.7					− 592.0					
			53.7	10 55.9		26	23.9	11 2.1	+	R	54	3175	
			58.3					− 662.1					
	11		3.9			27	47.0	12 25.2		R	54	3110	
			18.3					− 745.2					
			24.3	11 25.0									
			32.4										
			46.7										
			52.7	11 53.5									
	12		1.0										
			18.8										
			24.6	12 24.1									
			29.0										
			48.7										
12 52.78			52.0	12 51.7									
	8		54.5										
	13		16.2										
			21.7	13 21.9									
			27.7										
			47.5										
			52.6	13 52.7									
			58.1										
	14		18.1										
			22.5	14 23.4									
			29.6										
			46.8										
			52.7	14 54.8									
			58.7										
	15		0.8										
			14.6										
15 22.78			19.6	15 20.9									
			28.6										
			45.6										
			51.6	15 51.6									
			57.5										
	16		18.2										
			23.2	16 23.2									
			28.3										
			44.3										
			50.0	16 49.7				1 16 26.06				88 40 40.29	
			54.7										
	17		17.2										
			20.7	17 21.0									
			25.2										
			43.1										
17 49.62			48.3	17 48.2									
			53.2										
	18		16.2										
			20.6	18 21.1									
			26.4										
			42.3										
			47.7	18 48.1									
			54.2										
	19		14.3										
			19.7	19 20.5									
			27.5										
			44.2										
			50.2	19 50.1									
			56.0										
	20		14.9										
20 19.66			18.6	20 19.3									
			24.5										
			44.1										
			48.8	20 49.7									
			56.3										
	21		12.2										
15 21.820			17.7	21 18.7									
			23.1										
				15.21.820									

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1881phae.proj.1564.

0.09228
8.36305
8.45538

6.73660
8.36305
5.09965

Identical

– 1881 Sept 19 LC

h	m	s	m	s	h	m	s					R	Q	′	″
13	9	15.9			13	3	25.7	+11	55.2			B	R	55	1482
		21.9	9	21.9				+715.2	9						
		27.8	+5	58.2		4	45.0	10	35.8		20.1	20.0	B	R	55	1040
		48.4	+5	58.1				+635.9	9						
		52.3	9	52.7		5	33.0	9	47.8				B	R	55	898
		57.5	–	29.1				+587.9	3		21.8	20.9				
	10	18.3	5	28.2		6	33.6	8	47.2				B	R	55	592
		20.8	10	22.1				+527.3	1							
		39.3	+4	58.3		7	12.8	8	8.8		20.4	20.3	B	R	55	365
		45.8	4	58.2				+488.1	2							
		50.8	10	51.2		8	0.7	7	20.7				B	R	55	202
		56.9	–	28.1				+440.2	8		19.3	19.7				
	11	18.0	4	28.5		8	32.1	6	48.7				B	R	55	072
		22.0	11	22.3				+408.8	1							
		27.0	+3	58.6		24	43.0	–9	22.3		20.9	20.9	B	B	54	3290
		47.3	3	58.6				–562.1								
		53.6	11	52.9												
		57.9	–	28.6							21.7	21.6	146.5			
	12	16.6	3	28.7									146.4			
		23.8	12	21.4									292.9			
		30.7	+2	58.4							22.8	23.1				
		45.7	2	58.7									– 20.93			
		53.2	12	52.9									20.91			
		59.7	–	28.6							21.5	22.0	41.84			
	13	18.0	2	29.1									1520.92			
		22.1	13	22.6												
		27.7	+1	58.8							21.4	21.8				
		46.8	1	59.2												
		52.4	13	51.9												
		56.4	–	29.4							21.3	21.2				
	14	15.5	1	29.3												
		22.0	14	21.6							20.5	21.1				
		27.4	+0	58.9												
		45.2	0	59.5												
		50.1	14	50.1							19.5	20.0				
		56.0	–	29.1												
	15	14.7	+0	29.6												
		20.3	15	19.8							20.0	19.8				
		24.4	–+	0.2												
		45.6	0	0.0												
		50.2	15	50.2							20.1	20.5				
		54.9	=0	30.1												
			–0	29.7												

14) 2913 2929
15 20.80 2092
2929
15 20.92

1 16 26.36

88 40 40.64

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1881phae.proj.1564

1881 Sept 20 LC

h	m	s	m	s	h	m	s	R	D	′	″
13		—			12	53	37.7	B	B	53	46.80
		—									
		—				57	37.0	B	R	55	31.85
	1	47.0									
		52.5	1	52.5		58	30.7	B	R	55	29.80
		57.9									
	3	19.6				59	11.6	B	R	55	27.38
		23.6	3	23.5							
		27.3									
	4	48.5									
		55.0	4	54.8							
	5	1.0									

h m s

— 2341 —

A —

0,092288
8,363055
8,455533

G

6,736660
8,363055
5,099655

1 16 26.67

88 40 40.98

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1881phae.proj.1564.

1881 Sept 20 U.C.

0.08228
8.36305
8.45533

6.73660
8.36305
5.09965

Identical

h	m	s	m	s	h	m	s						
1	11	32.4		0	58	24.0	+19 13.4			B	32	33.15	
		38.5	11	39.1			+1153.4						
		46.5	+5	57.5	1	0	17.1	+17 20.3	36.6 37.6	B	32	38.90	
	12	1.0	+5	58.6				+1040.3					
		8.4	12	7.6		1	58.2	15 44.2		B	32	43.78	
		13.4	-	29.2				+944.2	+36.8 35.7				
		61.0	5	28.1		5	10.4	12 27.0		B	32	53.85	
		37.2	12	37.5				+747.0					
		44.4	+4	5.5		6	38.8	10 68.6	35.0 35.7	B	32	57.33	
	13	3.2	4	58.2				+658.6					
		8.9	13	8.4		8	8.0	9 29.4		B	33	1.05	
		13.4	-	27.3				+569.4	35.7 36.6				
		33.3	4	28.2		9	30.5	+8 6.9		B	33	5.25	
		39.3	13	39.3				+486.9					
		45.3	+3	57.6		23	49.8	-6 12.4	+36.9 37.7	B	33	30.15	
	14	1.5	3	58.4				-3724					
		7.9	111	7.9		28	21.3	10 43.9		B	33	34.72	
		14.3	-	25.7				-643.9	36.6 36.6				
		33.4	3	28.7		29	47.4	12 10.0		B	33	35.08	
		39.3	14	38.6				-730.0					
		44.2	+2	57.8					36.4 37.5				
	15	4.4	2	58.9								36.66	
		8.7	15	9.4								37.22	
		15.1	-	27.6					37.0 38.4			38.68	
		33.1	2	29.0								37.10	
		38.9	15	38.7								149.66	
		44.0	+2	0.5					39.2 37.7		17	37.41	
		59.4	+1	59.0									
	16	6.5	16	6.4									
		13.2	+1	29.7					36.1 35.9			748.3	
		34.3	+1	29.5							17	37.41	
		39.0	16	38.7									
		42.8	+0	59.8					38.5 38.3				
	17	3.9	0	57.6									
		7.7	17	7.8					37.7 37.5				
		11.8	+0	29.9									
			+0	29.7									
X													
								1 16	26.52				88 40 40.81
	20	5.0											
		8.0	20	8.3									
		12.0	-2	29.1					39.2 39.2				
		33.6	-2	29.1									
		38.3	20	38.8									
		44.4	-3	0.1					38.7 40.1				
	21	1.4	-2	58.7									
		7.2	21	7.0									
		12.4	-3	28.0					39.0 38.8				
		32.4	-3	29.7									
		37.2	21	37.3									
		42.2	-	58.6					38.7 38.7				
		58.2	-3	58.6									
	22	5.3	22	5.5									
		12.0	-4	28.0					37.5 37.0				
		31.3	-4	28.6									
		36.0	22	36.2									
		41.4	-	56.9					39.3 38.0				
	23	2.0	-4	58.2									
		6.0	23	5.7									
		9.2	-5	26.3					39.4 37.5				
		27.1	-5	28.2									
		31.1	23	32.4									
		39.1	-5	57.6					348 34.3				
			-5	58.1									

20) 7491 7483
17 37.45 37.41

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1881phae.proj.1564

126

1881 Sept 21 LC

0.09228
8.36305m
8H5333m

6.73660
8.36305m
5.09965m

h	m	s		h	m	s				
13	9	18.5		13	3	33.2	+11 49.1	R	R	55 16 98
		23.2	9 238				+709.1			
		29.8			5	10.1	10 12.2	R	R	55 12 32
		47.6					+612.2			
		53.1	9 537		6	34.7	8 47.6	R	R	55 9 15
		59.7					+527.6			
	10	16.7			7	56.5	7 25.8	B	R	54 4 72
		22.3	10 226				+445.8			
		28.8			9	11.5	6 10.8	B	R	55 0 88
		47.7					+370.8			
		54.3	10 538		21	43.4	−6 21.1	B	R	54 3 285
		59.4					−381.1			
	11	16.0			22	35.4	7 13.1	B	R	54 3 712
		22.0	11 219				−433.1			
		27.8			24	38.2	9 15.9	B	B	54 3 573
		46.0					−553.9			
		54.3	11 532		26	3.5	10 41.2	B	B	54 3 292
		59.2					−641.2			
	12	17.3			27	30.0	12 7.7	B	B	54 3 315
		24.8	12 238				−727.1			
		29.2			28	49.3	13 27.0	B	B	54 3 225
		50.1					−807.0			
		55.0	12 551		30	18.7	14 86.4	B	B	54 3 250
	13	0.4					−896.4			
		17.4								
		25.0	13 243							
		32.6								
		47.2								
		52.9	13 537							
		59.2								
	14	19.8								
		22.5	14 242							
		30.3								
		45.7								
		52.0	14 526							
	15	0.2								
		19.7								
		22.3	15 229							
		26.6								
		43.5								
		50.6	15 508							
		58.4								
	16	16.7								
		24.0	16 229							
		28.0								
		49.8								
		52.7	16 545							
		59.1								
	17	13.2								
		19.2	17 197							
		26.6								
		45.2								
		52.8	17 521							
		58.3								
	18	16.0								
		20.4	18 212							
		27.3								
		42.4								
		51.2	18 504							
		58.7								
	19	14.4								
		19.5	19 197							
		25.3								
		44.8								
		49.8	19 504							
		57.2								
	20	13.8								
		20.2	20 195							
		25.7								
		45.6								
		51.9	20 512							
		58.0								
	21	11.7								
		19.3	21 184							
		25.1								

13 10 23.16
12 54.02
15 22.68
17 51.58
20 19.92
12 22.27

1 16 26.99

88 40 41.30

15.22.276

15.22.776

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1881phae.proj.1564.

- 1881 Sept 22 P.O.

0.09228
8.36296
8.45524

6.73660
8.36296
5.09956 Identical

h	m	s		h	m	s							
13	9	16.1		12	52	52.2	+22 30.8				R Q	'	"
		21.0	9 21.3				+13506				B R	55	5222
		26.9	+5 58.2		54	21.5	21 1.4		20.2	19.5	19.4		
		48.8	+5 58.1				+1261.3				B R	55	4618
		55.2	9 54.8		55	13.0	20 9.9		24.2	23.9	23.0	B R	55 4882
	10	0.5	29.1				+1209.8						
		16.8	5 28.2		56	1.5	19 21.4					B R	55 4090
		21.6	10 22.3				+1161.3		21.2	20.6	20.5		
		28.4	+4 58.3		56	44.2	18 38.7					B R	55 3860
		46.4	4 58.2				+1118.6						
		52.0	10 52.3		57	24.0	17 58.8		21.3	20.4	20.8	B R	55 3548
		58.4	28.1				+1078.3						
	11	17.4	4 28.5		58	3.5	16 45.7					B B	55 3198
		22.9	11 23.9				+1005.3		23.4	22.5	22.5		
		31.4	+3 58.6		59	39.0	15 43.8					B B	55 2875
			3 58.6				+943.8						
				13	0	58.0	14 24.9					B B	55 2588
							+864.9						
					2	1.4	13 21.5					B B	55 2168
							+801.5						
					3	9.6	12 13.3					B B	55 1792
							+733.3						

21.37
24.17
45.54
15 22.77

16	12.4												
	21.0	16 20.2						20.6					
	27.2	-0 59.5					2.4	20.7	19.8				
	47.5	-0 56.6											
	52.6	16 52.3	52.3				22.4	23.2	22.8				
	56.7	-1 29.1											
17	18.9	-1 29.5		1	16	27.34							88 40 41.63
	25.8	17 25.7					26.5	26.9	26.2				
	32.3	-1 58.8											
	45.1	-1 58.80											
	50.6	17 51.1					21.8	22.9	22.1				
	57.7	-2 28.2											
18	14.5	-2 29.0											
	24.0	18 23.3	23.3				24.0	23.9	24.4				
	31.3	-2 59.4											
	47.0	-2 58.9											
	54.3	18 52.3					23.6	24.0	23.6				
	58.5	-3 28.3											
19	20.5	-3 28.7											
	22.3	19 22.3					23.0	24.1	23.9				
	24.0	-3 58.2											
	46.5	-3 58.4											
	51.5	19 52.1					23.2	23.7	23.9				
	58.2	-4 28.4											
20	16.7	-4 28.2											
	22.8	20 22.8					24.5	24.0	24.6				
	29.0	-4 58.8											
		4 58.2					14)	32.03	3183				
							16	22.80	22.86	22.73			
										3188			
										22.77			
										3188			
										22.77			

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28

1881 Sept 23 LC

0,09228
8,36296m
8.45524m

6.73660
8.36296m
5.09956m

Identical

R D

L	m	s		L	m	s								
13	9	18.3		13	2	36.4	+12468				B	R	53	17.00
		23.0	9 233				+766.3	22.2	21.5	21.4				
		28.7	+5 58.2		13	39.8	11 22.8			23.0	B	R	55	1242
		48.9	+5 58.1				+682.9							
		56.7	9 558		5	15.0	10 7.8	25.2	24.9	24.0	B	R	53	8.78
	10	1.9	29.1				+607.7			22.4				
		19.5	5 28.2		6	39.0	8 43.8				B	R	55	6.00
		24.2	10 24.2				+523.7	22.3	22.5	22.4				
		28.8	+4 58.3		7	27.5	7 55.8			22.4	B	R	53	2.82
		49.4	4 58.7				+475.9							
		53.5	10 53.4		8	21.8	7 0.8	22.4	21.8	22.2	B	R	53	0.40
		58.3	28.1				+420.9							
L	m	s												
13	11	18.9	4 28.5		21	15.7	-5 53.8			21.8	B	B	54	3590
		23.3	11 28.2				-353.0	22.7	21.8	22.3				
		27.4	+3 58.6		26	18.0	10 55.8				B	B	54	3035
		50.6	3 58.6				-655.3							
		55.7	11 55.5					24.5	24.3	24.2				
	12	0.1	28.8											22.64
		17.8	3 28.7											22.56
S		21.9												
24.90		27.5												
		31.3												
4		52.2												
55.90		55.7												
		59.8												
b		20.0												
25.67		25.6												
		31.4												
		23.4	12 23.5					23.1	21.9	22.2				22.60
		29.4	+2 58.4											22.92
		46.2	2 58.7											90.72
		51.4	12 51.9					21.1	20.5	21.0			15	22.68
		58.0	28.6											
	13	19.7	2 29.1											
		23.8	13 24.4					23.6	23.2	23.6				453.6
		29.6	+1 58.8										15	22.68
		46.4	1 59.2											
		53.7	13 53.3					22.2	22.7	22.6				
		57.8	29.4											
	14	16.2	1 29.3					22.6	20.8	21.9				
		22.5	14 22.4											
		28.6	+0 58.4											
		48.7	0 59.5											
		54.4	14 54.3					23.7	23.4	23.9				
		59.7	+0 29.1											
	15	16.8	0 29.6											
		20.4	15 21.2					20.8	21.4	21.2				
X		26.3	+0.2											
		51.1	0 0.0 0											
		54.3	15 54.3					26.8	25.9	26.3				
	16	0.5	-0 30.1											
		15.1	-0 29.7											
		21.9	16 22.6					22.8	23.1	23.0				
		30.7	-0 59.5											
		47.4	-0 59.6											
		54.4	16 54.3					23.4	23.2	22.8				
		58.1	-1 29.1											
	17	13.6	-1 29.5							21.3				
		20.4	17 20.3					21.1	21.7	21.3				
		27.0	-1 58.6											
			-1 59.0											

15 22.97 3846 ~~3913~~
17) 22.62 ~~23.02~~
3858
22.70

1 16 27.73

88 40 41.95

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+

3.	26.9	11	55.7	+11	56.1	15	23.0		
4	55.9	10	26.7	10	26.5	15	22.4		
6	25.7	8	56.9	8	56.7	15	22.4		

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1881 Sept 25 LC

0,09228
8,36287 m
8,45515 m

6,73660
8,36287 m
5,09947 m

h	m	s		h	m	s			R	′	″
13	9	15.8		13	5	14.5	+10 68		R R	55	13,90
		25.4	9 23.5				+ 60.68				
		29.3			6	41.9	8 39.4		R R	55	9,22
		46.3					+ 579.4				
		52.4	9 53.2		7	54.3	7 27.0		R R	55	5,38
		58.9					+ 447.0				
	10	19.8			21	41.0	−6 19.7		R R	54	44,38
10 2332		24.4	10 24.8				−378.7				
		30.2			23	2.6	7 41.3		R R	54	35,45
		48.3					−461.3				
		52.0	10 52.6						R R	54	34,48
		57.4									
	11	17.3									
		21.0	11 22.5								
		29.2									
		48.9									
		54.3	11 54.1								
		59.2									
	12	15.2									
		19.5	12 19.8								
		24.6									
		47.3									
12 52.80		53.0	12 53.9								
		58.4									
	13	14.7									
		25.0	13 23.5								
		30.9									
		49.2									
		52.9	13 53.7								
		59.0									
	14	18.8									
		22.5	14 22.5								
		28.2									
		45.2		13	10		23.32				
		50.5	14 50.1		12		52.80				
		54.5			15		1,02				
	15	16.3			17		48,92				
15 21.02		20.5	15 21.5		20		20.28				
		27.1									
		44.0			15		21.27				
		50.4	15 50.8								
		57.5									
	16	14.0									
		19.9	16 20.2								
		26.8									
		45.0									
		52.3	16 51.5								
		57.1									
	17	15.2									
		19.5	17 20.7								
		27.5									
		40.4									
17 48.92		45.8	17 45.7				1 16 28.61				88 40 42.64
		51.0									
	18	9.3									
		16.8	18 16.9								
		24.7									
		46.6									
		49.5	18 49.8								
		53.4									
	19	13.0									
		21.9	19 20.4								
		26.2									
		45.2									
		48.9	19 49.8								
		55.4									
	20	14.0									
20 20.28		21.4	20 20.5								
		26.0									
		46.1									
		49.2	20 50.2								
		55.2									
	21	14.2									
		21.8	21 20.5								
		25.5									
15 21.268			15 21.268								

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1881phae.proj.1564

30

1881 Sept 26 2C

0.109228
5.362877
8.755151

6.736660
5.362877
5.099477

Equatorial

h	m	s	h	m	s							
13			12	53	24.2	+21 53.79			R Ø			
						+1313.9			B R	55	4858	
				54	21.4	20 56.57			B R	55	4453	
						+1256.7						
				55	13.0	20 44.51			B R	55	4165	
						+1205.1						
				56	40.0	18 37.41			B R	55	3600	
						+1118.1						
				57	27.3	17 50.78			B R	55	3388	
						+1070.8						
				58	42.2	16 35.79			B R	55	2985	
						+995.98.1						
			13	1	40.0	13 37.9			B B	55	2083	
						+818.1.1						
				2	37.0	12 40.9			B B	55	1772	
						+761.1						
				21	40.7	-6 22.6			B R	54	3682	
						-382.6						
12				22	48.0	7 29.9			B R	54	3598	

12	14.3			-4499	15	19.1	17.9	18.2		
	19.4	12	19.5							
	24.8	+2	58.4							
	44.1	+2	58.7							
	49.5	12	48.6			18.8	18.2	18.7		18.32
	55.1	+2	28.6							18.20
13	13.8	2	29.1							18.28
	19.0	13	19.4			18.3	18.2	18.6		17.72
	25.4	+1	58.8							72.52
	45.0	1	59.2						15	18.13
	48.4	13	49.6			18.5	19.0	18.9		
	55.5	+1	29.4							
14	12.5	1	29.3							344.9
	17.8	14	17.7			16.8	16.6	17.2	15	18.15
	22.7	+0	58.9							
	42.6	0	59.5							
	49.0	14	48.4			17.8	17.5	18.0		
	53.5	+0	29.1							
15	11.6	0	29.6							
	18.8	15	18.5			18.1	18.7	18.5		
	25.0	+0	0.2							
	42.7	-0	0.0							
	49.1	15	48.3			18.8	18.2	18.6		
	53.0	-0	30.1							
16	12.7	-0	29.7							
	17.7	16	17.9			18.1	18.4	18.3		
	23.4	-0	59.5							
	40.7	-0	59.6							
	46.4	16	47.1			17.2	18.0	17.6		
	54.3	-1	29.1							
17	11.0	-1	29.5						-1 16	29.05
	18.0	17	17.7			18.5	18.9	18.7		
	24.0	-1	58.8							
	41.1	-1	59.0							
	47.2	17	47.0			17.8	18.8	18.0		
	52.7	-2	28.2							
18	10.7	-2	29.0							
	15.5	18	16.0			16.7	16.6	17.1		
	21.9	-2	59.4							
	39.4	-2	58.9							
	47.7	18	47.9			17.7	18.7	18.3		
	53.9	-3	28.3							
19	12.8	-3	28.7							
	17.0	19	17.7			18.4	19.5	19.3		
	23.2	-3	58.2							
	41.7	-3	58.4							
	46.9	19	47.1			18.2	18.7	18.9		
	52.8	-4	28.4							
20	6.7	-4	28.2			17.1	16.6	17.2		
	17.2	20	15.4							
	22.2	-4	58.8							
	39.8	-4	58.2			17.9	18.4	18.5		
	46.0	20	46.6							
	54.0	-5	28.2							
21	9.0	-5	28.1							
	13.0	21	14.8			16.3	16.9	16.3		
	22.5	-5	57.9							
		-5	58.5							

19) 17.9 3438 3449
15 18.09 18.15

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1881phae.proj.1564.

1881 Sept 27 22

0.09228
8.36287
8.45515

6.73660
8.36287
5.09947

Identical

h	m	s	h	m	s					R	D			
13	9	19.9	12	57	12.0	+18 8.2				B	B	53	36.0	
		26.0	9	24		+1088.5	23.0	22.3	22.2					
		27.5	+5	58.2	13	0	53.0	+14 27.2		B	B	53	23.8	
		45.4	+5	58.1				+867.1						
		50.8	9	51.3		2	45.4	12 34.4	20.9	20.4	19.5	B	B	53	18.2	
		57.8		29.1				+754.7								
	10	18.0	5	28.2		3	52.8	11 27.2				B	R	53	14.0	
		20.4	10	20.5				+687.3		19.4	18.8	18.7				
		28.0	+4	58.3		5	2.0	10 18.2				B	R	53	12.5	
		45.4	4	58.2				618.1	22.0							
		51.5	10	51.3		5	55.1	9 ~~21.9~~	20.8	19.4	19.8	B	R	53	8.02	
		56.9		28.1				562.0								
	11	14.0	4	28.5		6	46.2	8 33.8				B	R	53	7.20	
		20.8	11	20.8				513.9		20.3	19.4	19.4				
		27.7	+3	58.6		7	36.0	7 44.2				B	R	53	4.90	
		45.7	3	58.6				464.1								
		50.3	11	51.7		8	26.8	+6 53.2		20.7	20.5	20.4	B	R	53	3.08
		59.2		28.8				+413.3								
	12	12.3	3	28.7												
		17.0	12	17.5						17.1	15.9	16.2				
		23.3	+2	58.4											20.05	
		45.6	2	58.7											18.95	
		51.2	12	50.7						19.9	19.3	19.8			19.90	
		55.2		28.6											21.35	
	13	14.2	2	29.1											80.25	
		21.1	13	20.3						19.5	19.1	19.2		15	20.06	
		25.7	+1	58.8												
		45.0	1	59.2												
		49.3	13	50.4						19.3	14.8	19.7				
		57.0		29.4												
	14	13.2	1	29.3												
		20.0	14	19.5						18.7	18.4	19.0				
		25.3	+0	58.9												
		46.5	+0	59.5												
		52.0	14	57.8						21.2	20.9	21.4				
		58.8		29.1												
	15	19.2	0	29.6												
K		23.9	15	23.8						23.4	24.0	23.8				
		28.4	+	0.2												
		45.0	-0	0.0												
		51.3	15	50.8						21.3	20.7	21.1				
		56.2	-0	30.1												
	16	12.5	-0	29.7												
		17.7	16	19.2						19.4	19.7	19.6				
		27.3		57.5												
		42.7	-0	59.6												
		51.4	16	50.4						20.5	21.3	20.9				
		57.2	-1	29.1						16)	319.9	32.10				
			-1	29.5						15	20.29	19.98	20.06			
													32.10			
													15	20.06		
						1	16	29.58								

88 40 43.39

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1881 Sept 28 LC

h	m	s
12	57	32.3
13	1	42.3

0.09228
8,36278m
8,45506m

R	D	′	″
B	B	53	26.5
B	B	53	20.5

6.73660
8,36278m
5.09938m

h m s
LT

11 46.3
50.6
55.0

11 50.6

15 1880

A 11

1 47.1
5323 51.5
2 0.5

A

1 16 29.86

BE 40 43.78

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1881phae.proj.1564.

1881 Sept 29 LC

0.09228
8.36278
8.45506

6.73660
8.36278
5.09938

h	m	s	R/B	D/R	′	″
12	51	22.0	B	R	55	58.10
	52	32.3	B	R	55	57.12
	53	28.4	B	R	55	52.82
	54	14.4	B	R	55	51.58
	54	58.4	B	R	55	47.32
	55	51.5	B	R	55	44.80

1 16 30.19

88 40 44.20

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1881phae.proj.1564

0.09228
8.36269m
8.45497m

6.73660
8.36269m
5.09999m

1881 Sept 30 QC

h	m	s		h	m	s			′	″
13				13	28	21.0		B B	54	34.50
					31	37.0		B R	54	31.92
					33	35.7		B R	54	31.00
					37	9.5		B R	54	31.35
					39	5.3		B R	54	31.25
					39	51.6		B R	54	32.55

1 16 30.45

88 40 44.62

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1881phae.proj.1564.

- 1881 Sept 30 UC

0.0866l
8.36278
8.44939

6.936.60
8.36278
5.09938 identical

h	m	s				h	m	s								
1	11	43.0	~~+3.8~~	0		54	58.1	+ 22 50.3				B	32	16.02		
		47.4	11	~~48.1~~				+1370.3	17	46.6	45.6	47.3				
		53.0		48.1		56	47.6	21 0.8					B	32	21.45	
	12	12.5	+5	57.5	59.2			+1260.8								
		20.3	12	19.7		58	13.0	19 35.4		48.4	48.9	48.4	B	82	26.62	
		26.2		29.2				+1175.4								
		44.8	5	28.7		59	55.7	17 52.7					B	32	33.15	
		50.0	12	50.2				+1072.7		48.5	47.7	49.0				
		55.9	+4	57.5		1	52.0	15 56.4					B	32	38.12	
	13	15.5	4	58.8				+956.4								
		20.4	13	20.4		3	41.8	14 8.6								
		25.4		27.3				806.6		48.3	47.7	49.1	B	32	43.90	
		41.0	4	28.7		5	6.4	12 42.0								
		47.7	13	47.3				762.0		46.6	44.9	46.2				
		53.3	+3	57.6		6	34.7	11 13.4					B	32	52.50	
	14	10.4	3	58.9				+673.7								
		15.6	14	16.6		24	7.4	19.0		45.9	45.3	45.7	B	33	24.55	
		23.9		28.7				- 379.0								
		43.3	3	29.1		27	12.2	9 23.8					B	33	27.50	
		49.4	14	49.7				-563.8		49.0	47.5	48.9				
		56.3	+2	57.8												
	15	14.8	2	59.2											48.45	
		19.0	15	19.3					17	48.5	46.9	48.6			47.35	
		24.0		27.6											48.77	
		44.9	2	29.3											49.18	
8	42.8															
	52.0	8 50.8														
	57.7															
		49.5	15	49.9					17	49.1	50.4	49.1			193.75	
		55.3	+2	0.5									17		48.44	
	16	14.3	1	59.2												
		19.1	16	19.2					17	49.1	48.9	48.9			7750	
		24.3	+1	29.7											48.44	
		42.3	+1	29.7								47.4				
		48.3	16	47.7					17	47.5	47.5	~~48.8~~				
		52.6	+0	59.8												
			0	59.7												

1 16 30.33

+ 16

88 40 44.42

	21	43.5										49.7				
		48.6	21	48.8					17	49.3	50.2	~~49.7~~ 49.7				
		54.4	-3	58.6												
	22	13.3	-3	59.1												
		15.0	22	18.1					17	49.1	50.1	49.1				
		23.0	-4	28.0												
		42.1	-4	29.0												
		47.2	22	47.5					17	48.6	50.6	48.7				
		53.2	-4	56.9												
	23	13.2	-4	58.8												
		19.7	23	19.4					17	50.0	53.1	50.6				
		25.3	-5	26.3												
		39.4	-5	28.8												
		47.7	23	47.1					17	48.2	49.5	48.3				
		54.3	-5	57.6												
			-6	58.8					16)	17	48.7	49.8	48.42	~~7744~~ 7748	>>50	
														~~48.40~~	48.44	

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36

1881 Oct 1 LC

0.08661
8.36269m
8.44930m

6.73660
8.36269m
5.09929m

h	m	s		h	m	s						
13	9	18.0		12	53	56.9	+21 263		B	55	48.65	
		23.3	9 23.2				+12863					
		28.3			55	26.0	19 57.2		B	55	43.82	
		48.0					+1197.2					
		54.1	9 54.0		56	41.4	18 35.8	+	B	55	38.32	
		59.9					+1165.8					
	10	17.9			58	17.7	17 5.5		B	55	34.28	
		24.0	10 23.7				+1025.5					
10.23.86		29.2			59	39.8	15 43.4		B	55	29.53	
		48.2					+943.4					
		53.2	10 54.0	13	1	10.0	14 13.2		B	55	21.53	
		0.5					+853.2					
	11	18.4			2	26.0	12 57.2		B	55	20.28	
		24.4	11 24.4				+777.2					
		30.4			5	39.5	+ 9 43.4	+	B	55	11.50	
		46.4					+583.4					
		52.8	11 53.5		21	39.2	− 6 16.0		B	54	39.95	
	12	1.3					− 376.0					
		17.0			23	26.5	− 8 3.3		B	54	37.75	
		23.2	12 23.8				−483.3					
		31.1										
		47.4										
		53.4	12 53.8									
12.54.22	13	0.5										
		18.5										
		24.4	13 24.7									
		31.2										
		50.1										
		53.5	13.55.3									
	14	0.2										
		18.5										
		24.5	14 24.7									
		31.2										
		46.1			13	10.	23.72					
		54.4	14 54.3			12	54.22					
	15	0.3				15	23.82					
		18.3				17	52.10					
		24.2	15 24.6			20	22.06					
15.23.82		31.2										
		46.4				15	23.18					
		54.2	15 53.6									
	16	0.2										
		15.4										
		22.2	16 21.9									
		28.2										
		46.0										
		52.0	16 52.0									
		58.0										
	17	16.2					1 16 30.65				88 40 45.03	
		20.3	17 21.6									
		28.4										
		47.4										
		57.4	17 52.3									
17.52.10		58.2										
	18	16.4										
		21.2	18 21.7									
		27.4										
		45.4										
		53.2	18 52.9									
	19	0.2										
		13.3										
		24.2	19 22.5									
		30.2										
		47.4										
		53.5	19 53.6									
	20	0.0										
		15.0										
		22.5	20 21.8									
20.22.08		28.0										
		45.0										
		50.4	20 50.5									
		56.2										
	21	13.5										
		23.0	21 21.9									
		29.8										
15.23.216			15.23.216									

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1881phae.proj.1564.

0.08661
8.36254
8.44920

6.73660
8.36259
5.09919 Identical

- 1881 Oct 4 NC

h	m	s				h	m	s									
1						0	57	31.8	+20 14.8	7		B	32	28.30			
									+1214.7	5							
							59	25.0	18 21.4	7		B	32	34.85			
									+1101.5	5							
						1	1	3.0	16 44.4			B	32	43.08			
									+1004.5	5							
							5	58.0	11 48.4	5		B	32	53.85			
									+708.5								
							23	57.5	- 6 11.0	7		B	33	26.38			
									-371.0								
					13		26	51.0	9 47.5	5		B	33	29.35			
					17.8				-544.5								
					22.0												
h	m	s			44.0												
1	2	37.5			49.4	13	49.3				17 48.6	46.9	48.2				
		44.5	2	45.9	54.5	+ 3	57.6										
		55.6			14 10.0	3	58.9								46.60		
					15.0	14	15.3				17 44.6	44.0	44.4		47.33		
					21.0	- 3	28.7								45.53		
						3	29.1								139.46		
														17	46.49		
															418.4		
														17	46.49		

1 16 31.01

88 40 45.99

					20 41.6												
					45.0	20	46.2				17 46.6	46.1	47.2				
					52.0	- 3	0.1										
					21 9.5	- 2	59.0										
					16.9	21	16.7				17 47.7	48.7	47.6				
					23.6	- 3	28.0										
					41.4	- 3	29.1										
					45.7	21	45.7				17 46.2	47.1	46.6				
					50.0	- 3	3.6										
					22 10.7	- 3	59.1						47				
					16.8	22	16.8				17 47.8	48.8	48.8				
					22.9	- 4	28.0										
					36.9	- 4	29.0										
					42.9	22	43.7				17 44.8	46.8	44.9				
					57.4	- 4	56.9										
					23 10.8	- 4	58.8										
					16.9	23	16.9				17 47.5	50.6	48.1				
					23.0	- 5	26.3										
					36.1	- 5	28.8										
					42.2	23	42.4				17 44.5	44.8	43.6				
					48.4	- 5	57.6										
						- 5	58.8				9) 17 46.3	17 47.09	41.84				
													46.49				

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1881phae.proj.1564

38

1881 Oct 4/5 LC.

0.08661
8,36259m
8,44920m

6,73660
8,36259m
5,09919m

	h	m	s		h	m	s			R	D	′	″		
	13	9	25.1		13	2	37.0	+12 5.25		B	R	55	23.50		
			29.5	9 29.5				+7725							
			34.9			4	4.4	11 25.1		B	R	55	23.33		
			54.5	9				+6851							
			58.5	9 59.8		4	42.4	10 47.1		B	R	55	21.45		
		10	6.5					6471							
			27.2			5	17.5	10 12.0		B	R	55	19.65		
			31.5	10 32.2				6120							
	10 30.40		37.8			6	5.0	9 24.5		B	R	55	18.25		
			52.0					5645							
			59.2	10 59.8		6	54.8	8 34.7		B	R	55	16.20		
		11	6.3					5147							
			23.6			7	38.5	7 51.0	+	B	R	55	13.33		
			30.9	11 30.4				4710							
			36.7			8	21.6	+7 7.9		B	R	55	11.82		
			55.0	0.3				+4279							
			58.2	12 0.3		21	44.8	−6 15.3		B	R	54	45.95		
		12	6.6					−3753							
			24.2			22	44.0	7 14.5	+	B	R	54	44.93		
			30.6	12 30.0				−4345							
			35.1			23	17.0	7 47.5		B	R	54	43.28		
			52.4					−4675							
			59.0	12 58.7		24	38.4	9 8.9		B	B	54	42.05		
	12 59.28	13	4.7					−5489							
			25.0			26	2.4	10 32.9		B	B	54	42.28		
			29.9	13 29.9				−6329							
			34.7			27	32.2	12 2.7		B	B	54	40.40		
			51.3					−7227							
			56.1	13 57.5		29	33.1	13 33.6		B	B	54	39.82		
		14	4.6					−8136							
			24.5			30	28.0	14 58.5		B	B	54	38.52		
			29.2	14 29.1				−8985							
			33.6												
			53.3												
		15	0.0	15 0.1											
			7.1												
			24.2												
			28.7	15 29.3											
	15 29.52		35.1			12	10	32.40							
			55.2				12	59.28							
			59.5	15 59.8			15	29.52							
		16	4.6				17	59.24							
			24.1				20	28.44							
			29.2	16 29.3											
			34.7												
			53.8				15	29.78							
			57.8	16 58.0											
		17	2.4												
			21.8					1 16 31.07						88 40 46.17	
			26.6	17 27.4											
			34.8												
			56.7												
	17 29.36	18	1.3	18 1.4											
	17 29.36		6.2												
			23.5												
			29.0	18 29.4											
			36.7												
			55.9												
			59.0	19 0.0											
		19	5.0												
			24.1												
			28.2	19 28.3											
			32.7												
			54.1												
			57.8	19 58.1											
		20	2.3												
			21.7												
	20 28.70		26.7	20 27.6											
			54.4												
			54.4												
			59.0	20 59.6											
		21	5.3												
			22.5												
			30.9	21 29.9											
			36.2												
	15 29.45			15 29.45											

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1881phae.proj.1564

1881 Oct. 5/6 DC

0.085669
8.362594
8.449 KO

6.736600
8.362594
5.099194

	h	m	s		h	m	s				
	13	9	28.9		12	57	47.0	+17 47.4	R D	.	20
			35.8	9 355					B R	55	4455
			41.8			58	56.4	16 38.0	B R	55	4342
			59.1								
		10	1.8	10 69		59	55.4	15 39.0	B R	55	3690
			13.2								
			28.2		13	0	47.0	14 47.4	B R	55	3568
			34.2	10 344							
			40.8			1	36.0	13 58.4	B R	55	3262
		11	0.8								
			4.8	11 65		2	19.2	13 15.2	B R	55	2995
			10.8								
			27.1			3	48.5	11 45.9	B B	55	2640
10 35.04			32.2	11 329							
			38.9			4	51.2	10 43.2	B B	55	2268
			50.4								
		12	8.0	12 ~~40~~ 4.0		6	10.3	9 24.1	B B	55	1885
			12.6								
			27.9			7	13.2	8 21.2	B B	55	1630
			34.0	12 336							
			38.8			~~21~~	~~39.0~~		B R	54	4698
			51.2								
		13	0.8	13 24		21	51.8	−6 17.4	B R	54	4635
13 03.62			9.2								
			27.4			22	58.5	7 21.1	B R	54	4422
			32.5	13 327							
			38.2			23	43.0	8 8.6	B B	54	4435
			59.9								
		14	5.0	14 53 4		25	10.0	9 35.6	B B	54	4275
			11.2								
			29.5			26	58.0	11 21.6	B B	54	4062
			33.1	14 344							
			40.5								
		15	0.5								
			5.8	15 65							
			13.2								
			31.0								
15.95.64			35.1	15 367							
			43.3			13	10	35.04			
			58.6				13	2.80			
		16	3.2	16 52			15	35.64			
			13.8				18	5.16			
			30.5				20	32.32			
			35.9	16 354 4							
			39.9				15	34.19			
			57.2								
		17	5.2	17 49							
			10.2								
			34.1				1	16 31.23		88	40 46.52
			36.0	17 369							
			43.0								
			59.2								
18 05.16		18	4.0	18 42							
			9.5								
			28.1								
			35.3	18 348							
			40.5								
			59.4								
		19	5.8	19 50							
			9.8								
			27.0								
			32.7	19 330							
			39.2								
			57.6								
		20	2.4	20 24							
			7.8								
			26.0								
20.82.82			30.5	20 309							
			36.3								
			50.2								
		21	3.3	21 39							
			9.2								
			24.6								
			30.0	21 317							
			39.0								
15.34.35.6				15.34.35.6							

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1881phae.proj.1564

1881 Oct 6/7 PC

0.086661
8.36250m
8.44916

6.73660
8.36250m
5.09910m

h	m	s		h	m	s		R	°	′	″
13	9	26.5		12	59	19.0	+16 13.3	BR	55		37.00
		32.1	9 31.9				+973.3				
		37.2		13	0	25.3	15 7.0	BR	55		34.92
		52.0					904.0				
	10	4.4	10 3.0	1		31.0	14 13	BR	55		30.75
		8.6					841.3				
		26.0		2		32.2	13 0.1	BR	55		28.65
		35.0	10 33.8				780.1				
10 33.58		40.4		3		29.0	12 3.3	BR	55		25.30
		55.5					728.3				
	11	4.3	11 3.0	5		15.4	10 16.9 +	BB	55		19.48
		9.3					+616.9				
		25.2		6		18.5	9 13.8	BB	55		18.10
		36.7	11 35.2				+553.8				
		41.7		7		19.7	8 12.6	BB	55		13.90
	12	1.0					+492.6				
		5.2	12 5.7	8		13.7	+7 18.6	BB	55		12.55
		9.8					+438.6				
		27.3		21		45.4	− 6 13.1 +	BR	54		32.28
		34.0	12 33.6				−373.1				
		39.5		22		53.0	7 20.7	BR	54		45.32
		59.0					−440.7				
15 4.48	13	5.2	13 5.1	23		47.0	8 14.7	BR	54		44.42
		11.0					−494.7				
		27.0		24		57.5	9 25.2	BB	54		42.30
		32.1	13 32.2				−565.2				
		37.4		26		34.6	11 2.3	BB	54		41.42
	14	1.5					−662.3				
		6.1	14 6.3	28		2.9	12 30.6	BB	54		39.88
		11.4					−730.6				
		28.2									
		33.1	14 33.7								
		39.7									
		59.0									
	15	5.0	15 5.0								
		10.9									
		29.5									
		33.0	15 33.8								
15 34.18		39.0		13	10	33.38					
	16	0.6			13	4.46					
		6.3	16 6.0		15	34.18					
		11.0			18	0.80					
		28.0			18	25.60					
		32.3	16 32.4								
		37.0			15	32.28					
		55.2									
	17	1.2	17 0.6								
		5.5									
		24.3	29.6				1 16 31.64				
		28.5	17 30.0								
		36.1									
		54.8									
	18	1.2	18 1.3								
18 0.72		7.8									
		25.8									
		30.8	18 30.7								
		35.6									
		55.5									
	19	0.8	19 1.4								
		7.8									
		21.0									
		28.2	19 27.4								
		33.1									
		52.1									
		58.1	19 58.2								
	20	3.7									
		22.5									
		30.0	20 28.9								
20 28.62		34.2									
		52.5									
		58.9	20 59.5								
	21	6.0									
		24.4									
		29.2	21 29.1								
		33.6									
15 32 26.316			15 32 26.316								

88 40 47.22

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1884phae.proj..1564

1881 Oct 8/9 LC

0.08661
8.36241 n
8.44902 a

6.73660
8.36241 n
5.09901 a

differential

h	m	s			h	m	s							
13	9	22.8			13	6	53.048	32.0					R 53′	15.22
		27.8	9	27.4				15	26.3	27.1	26.2			
		31.6	+5	59.7		8	25.0	70.0					R 53′	11.92
		49.4	5	59.8										
		54.0	9	54.8				15	24.2	24.3	23.6			
	10	1.1	-	29.5										
		23.1	5	28.8										25.18
		27.0	10	27.3				15	26.2	26.2	26.1			24.38
		31.7	+4	58.9										49.56
		49.1	4	58.8							23.4		15	24.78
		54.5	10	54.4				15	23.4	23.3	23.6			
		59.5	-	28.9										
	11	19.8	4	29.0										
		28.4	11	27.5				15	27.0	26.7	26.6			
		34.2	+3	59.2										
		50.6	3	59.1										
		54.1	11	55.1				15	24.1	24.0	24.2			
	12	0.7	-	28.9										
		20.6	3	29.1										
		26.5	12	26.3				15	25.9	25.7	25.3			
		31.7	+2	59.4										
		50.6	2	59.0										
		53.7	12	54.8				15	24.0	24.2	24.2			
	13	0.7	-	29.4										
		20.4	2	29.4										
		24.6	13	25.3				15	24.5	25.2	24.7			
		31.0	+1	59.9										
		48.6	1	59.4										
		53.0	13	54.1				15	23.0	23.1	23.5			
	14	0.7	-	29.0				10)		2498	2522			
			1	29.4				15	24.86	25.0	2522			
											24.38			
											24.78			
											247.8			
											15 24.78			

49 to 60

1 16 32.14

88 40 47.93

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1881phae.proj.1564

1881 Oct 9/10 LC

0.08661
8.36241 n
8449022 n

6.73660
8.36241 n
5.09901 n

h	m	s	h	m	s		R	D	′	″
13	9	29.5	12	58	57.0	+18 36.2	B	A	53	51.40
		35.1								
		39.9		58	4.1	17 29.1	B	B	55	45.35
		58.4								
	10	3.3		59	39.1	15 54.1	B	A	53	41.58
		8.8								
		30.1	13	6	56.2	8 37.0	B	R	53	19.05
		33.6								
10.34.14		37.0		7	49.3	7 43.9	B	R	53	16.70
		39.0								
		58.5		8	44.4	6 48.8	B	R	53	14.15
	11	3.5								
		10.1		21	45.5	−6 12.3	B	R	54	46.85
		26.0								
		34.3		23	8.0	7 34.8	B	R	54	45.18
		40.2								
		59.9		23	42.0	8 8.8	R	B	54	44.53
	12	3.0								
		9.9		24	39.6	9 6.4	R	B	54	42.22
		30.0								
		34.1		26	22.7	10 49.5	R	B	54	41.02
		38.9								
		58.4		27	29.4	11 56.2				
13 4.18	13	2.0								
		9.4								
		25.0								
		33.2								
		39.3								
	14	5.0								
		6.5								
		7.0								
		28.3								
		34.1								
		38.1								
		57.0								
	15	3.5								
		10.0								
		25.1								
15.32.88		30.7		13	10	3.408				
		37.7			13	4.18				
		56.7			15	32.82				
	16	1.1			18	2.16				
		9.3			20	32.72				
		28.0								
		34.0			15	33.39				
		39.5								
		57.5								
	17	2.5								
		7.5			1	16 32.40				
		26.6								
		31.5								
		38.6								
		57.8								
18 2.16	18	2.2								
		7.1								
		28.0								
		31.8								
		36.6								
		58.0								
	19	1.2								
		5.7								
		28.9								
		35.0								
		40.1								
		59.0								
	20	3.0								
		9.8								
		25.1								
20.32.72		32.3								
		37.2								
		55.7								
	21	0.5								
		5.0								
		26.3								
		31.2								
		38.8								
15.33.216										

88 40 46.31

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1881phae..proj..1564

- 1881 Oct 10/11 LC

0,0 8661
8,36232
8,44693

6,73660
8,36232
5,09892

Identical

h	m	s		h	m	s								
18		—		12	57	50.0	17 4.53					R O	′	″
		—					+1065.3					B B	53	54.45
		—			59	57.5	15 37.8					B B	53	49.12
		—					+937.8							
		—		13	2	9.4	+13 25.9					B B	53	42.32
		—					+ 805.9							
		—			3	2.2	12 33.1					B R	53	33.15
		—					+753.1							
		—			3	44.2	11 54.1					B R	53	31.05
							+ 714.1							
	10	39.2												
	11	7.1	11 6.2		4	28.0	15	35.2	35.1	35.2		B R	53	29.42
		12.3	+4 28.9				+667.3							
		31.7	+4 29.0		5	13.5	10 21.8					B R	53	22.92
		35.5	11 36.3				+621.8	15	35.8	35.5	35.4			
		41.7	+3 59.2		22	35.4	-7 0.1					B R	54	49.82
	12	2.7	3 59.5				-420.1							
		7.1	12 7.7		23	19.2	15	36.7	36.6	36.8		B R	54	49.80
		13.4	+3 7.7				-463.9							
		29.2	28.9	3	29.1	-4639						B R	54	47.90
					24	25.7	8 50.4							
		34.8	12 35.6				-530.4	15	35.2	35.0	34.6			
		42.7	+2 59.4		25	28.6	9 53.3					B B	54	47.08
		59.0	2 59.0				-593.3							
	13	4.0	13 5.4		27	5.4	11 30.1							
		13.3	+2 29.4				-690.1	15	34.6	34.9	34.8	B B	54	46.38
		29.0	2 29.4		28	48.4	13 13.1					B B	54	45.35
		36.7	13 35.7				-793.1	15	34.9	35.6	35.1			
		41.5	+1 59.9											
		58.4	1 59.4											35.38
	14	7.8	14 6.4					15	35.3	35.4	35.8			35.47
		13.0	+1 29.0											35.14
		30.1	1 29.4											106.04
		33.7	14 34.8					15	33.0	34.2	34.4		15	35.35
		40.5	+0 59.4											
	15	1.3	0 59.6											
		5.7	15 5.8					15	35.2	34.7	35.5			777.5
		10.3	+0 28.9										15	35.34
		31.0	+0 29.7											
X		37.1	15 37.0					15	36.6	36.5	37.0			
		43.0	-0.5											
		57.7	-0 0.9											
	16	4.4	16 4.0					15	34.5	34.2	34.2			
		9.8	-0 29.8											
		28.5	-0 29.8											
		34.0	16 34.0					15	34.2	33.9	34.3			
		39.5	-0 0.1											
		59.5	0 59.7											
	17	7.0	17 6.2					15	36.3	36.7	36.5			
		12.0	-1 29.5											
		30.4	-1 29.7									1	16 32.62	88 40 48.71
		35.2	17 35.6					15	36.4	36.8	36.4			
		41.2	-1 58.6											
		59.5	-1 59.2											
	18	8.3	18 5.2					15	36.0	35.5	35.9			
		12.4	-2 29.7											
		32.2	-2 29.3											
		35.0	18 35.4					15	36.1	35.7	36.2			
		39.0	-2 59.7											
		57.5	-2 59.2											
	19	2.3	19 3.0					15	33.7	33.6	33.9			
		9.1	-3 29.4											
		28.0	-3 29.1											
		31.7	19 32.2					15	32.9	32.8	33.3			
		36.6	-3 57.4											
		57.8	-3 58.9											
	20	3.7	20 3.7					15	34.8	35.3	35.0			
		9.5	-4 28.4											
		27.0	-4 28.7											
		36.0	20 34.3					15	36.0	36.1	35.5			
		40.0	-4 58.2											
	21	0.0	-4 58.8					15	34.2	34.5	34.2			
		2.4	21 2.9											
		6.3	-5 28.4											
		32.4	-5 28.7											
		35.8	21 36.7					15	38.2	38.4	37.5			
		41.9	-5 58.3											
			-5 59.2					22)	15. 85.26	770	7775			
										35.32	35.34			

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1881phae.proj.1564

- 1881, Oct 12/13 LC

0.08661
8.36232m
8.44893n

6.73660
8.36232m
5.09892n identical

h	m	s		h	m	s									
13	9	30.4	(12	57	45.2	+17 50.8	6				B B	55	4335		
		36.0	9 35.9			+10 50.8	15	34.8	35.6	34.7					
		41.3	+5 59.7	59	43.0	15 55.0	28				B B	55	3785		
	10	0.0	+5 58.8			+9 52.8									
		5.0	10 5.3	1	4.8	+8 71.0	0	34.7	34.8	34.1	B B	55	3312		
		11.0	295			14 31.8									
		31.6	5 28.8	2	33.2	13 2.8	6				B B	55	2892		
		36.0	10 36.5			+7 32.0	5	35.4	35.4	35.3					
		41.8	+4 58.9	41	2.8	11 33.2	0				B B	55	2488		
	11	1.1	4 58.8			+6 93.0									
		7.9	11 7.9	5	37.4	9 58.6	3	36.9	36.8	36.9	B R	55	1538		
		14.8	289			+5 98.4									
		32.9	4 29.0	6	19.5	9 16.5	3				B R	55	1715		
		39.4	11 38.9			+5 56.3	4.8	37.4	38.1	38.0					
		44.5	+3 59.2	7	1.0	8 35.0					B R	55	1625		
	12	3.8	3 59.1			+5 14.8									
		9.2	12 9.3	7	39.0	6.8	8	38.3	38.2	38.4	B R	55	1420		
		15.0	289			+4 76.8	7	57.0							
		29.5	3 29.1	8	24.8	4 11.2	0				B R	55	1225		
		35.4	12 35.8			+4 31.0	15	35.4	35.2	34.8					
		42.5	+2 59.4	21	54.6	-6 18.6	8				B R	54	4685		
	13	1.8	2 59.0			-3 78.8									
		7.0	13 7.7	22	5.2	-4 41.4	7	36.9	37.1	37.1	B R	54	4710		
		14.3	294				21.2								
			2 29.4	23	43.7	8 7.9	9				B R	54	4732		
						-4 87.9									
				24	48.4	9 12.4	6				B B	54	4578		
						-5 52.6									
				26	18.4	10 42.4	6				B B	54	4350		
						-6 42.6									
				27	57.0	12 15.8	2				B B	54	4102		
						-7 33.2									

35.80
35.36
36.20
107.36
15 35.79

536.8
15 35.79

1 16 32.89

88 40 49.53

17	58.3														
18	2.0	18 2.1					15	32.9	32.4	32.8					
	6.0	-2 29.7													
		-2 29.3													
	55.9														
19	3.7	19 2.8					15	33.5	33.4	33.7					
	8.8	-3 29.4													
	27.4	-3 29.1													
	34.5	19 34.1					15	34.8	34.7	35.2					
	40.5	59.4													
	59.8	-3 58.9													
20	5.0	20 5.2					15	36.3	36.8	36.5					
	10.7	-4 28.4													
	28.0	-4 28.7					15	35.9	36.0	35.4					
	34.5	20 34.2													
	40.0	58.8													
21	3.2	-4 58.8													
	9.0	21 8.7					15	40.0	40.3	40.0					
	13.9	-5 28.4													
	27.2	-5 28.7													
	32.5	21 33.1					15	35.6	34.8	33.9					
	39.5	58.3													
		-5 59.2					15)			5396	5368				
							15	35.92		35.97	35.79				

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1881phae.proj.1564.

- 1881 Oct 13/14 BC

0.08661
8.36223m
8.4488.1/m

6.73660
8.36223n
5.09883/m

Identical

h	m	s		h	m	s					R	D	′	″
13	9	32.1		12	58	58.0	+16	40.3						
		36.2	9 36.3				15	35.2	36.0	35.0				
		40.5	+5 59.3	13	0	34.0	15	2.3						
		58.1	+5 58.8											
	10	5.6	10 5.3	2	1.7		15	34.7	34.8	34.1				
		12.1	295			+13	34.6							
		34.6	5 28.8	4	32.5	11	3.8							
		38.2	10 38.4				15	37.3	37.3	37.2				
		42.4	+4 58.9	5	36.5	9	59.8							
	11	3.0	4 58.8			9	3.5							
		7.6	11 8.1	6	32.8		15	37.1	37.0	37.1				
		13.8	289											
		30.3	4 29.0	7	34.1	8	2.2							
		35.2	11 36.2				15	35.7	35.4	35.3				
		43.0	+3 59.2	8	24.0	7	12.3							
		59.0	3 59.1											
	12	4.6	12 5.3				15	34.3	34.2	34.4				
		12.2	289	329.1										
		35.0	41.6											
		41.0	12 40.3				15	39.9	41.0	40.6				
		48.8	+ 2 59.4											
	13	2.2	2 59.0											
		6.7	13 8.0				15	37.2	37.4	37.4				
		15.0	294											
		32.7	2 29.4											
		37.7	13 37.5				15	36.7	37.4	36.9				
		42.0	+1 59.9											
	14	0.6	1 59.4											
		7.0	14 7.3				15	36.0	36.3	36.7				
		14.4	290											
		35.8	1 29.4											
		39.1	14 39.5				15	38.7	38.9	39.X				
		43.6	+0 59.4											
		59.4	0 59.6											
	15	5.4	15 6.0				15	35.4	34.9	35.7				
		13.3	289											
		27.4	0 29.7											
X		33.9	15 35.2				15	34.8	34.7	35.2				
		44.2	- 0.5											
	16	2.0	-0 0.0											
		6.6	16 7.1				15	37.6	37.3	37.3				
		12.8	-0 29.8											
		30.0	-0 29.8											
		34.5	16 34.2				15	34.4	34.1	34.5				
		38.1	-1 0.1											
		58.0	-0 59.7											
	17	2.3	17 3.2				15	33.3	33.7	33.5				
		9.2	-1 29.5				16	5804		5806				
			-1 29.7				15	36.14	36.27	36.29				
										5800				
										36.25				
							1	16	32.92	5800				
										15 36.25				

88 40 49.94

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1881phae.proj.1564

16

1881 Oct 15 MC

0.08661
8.36223
8.47884

6.73660
8.36223
5.09883

h	m	s			″	☿	′	″
1	24	20.0	−6	35	1	B B	33	29 38
	27	3.2	9	18	3	B B	33	31 60
	29	28.5	11	43	6	B B	33	33 90
	32	14.2	14	29	3	B B	33	34 50
	34	2.0	16	17	1	B B	33	36 95

h	m	s			
1	26	33.1			
	37.5		26	38	3
	44.4				
28	8.5				
	12.0		28	13	20
	19.1				
29	39.0				
	43.2		29	43	8
	49.3				
31	7.3				
	13.0		31	13	8
	21.2				
32	37.3		~~32~~	~~44~~	
	42.2		32	42	6
	48.4				

			17	40	2
					45.5
			17	44	94

					46.4
					46.7
					45.9

1 16 32.92

88 40 50.14

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1881phae..proj..1564

- 1881 Oct. 15/16 LC

0.08661
8.36214
8.44875

6.73660
8.36214
5.09874

Identical.

h	m	s	h	m	s						
13			13	21	53.0	−6	17.2	R	54	12.8	
				30	4.2	14	28.4	R	53	50.2	
				31	39.0	16	3.2	R	53	57.0	
				33	14.6	17	38.8	R	53	48.5	
				34	32.0	18	56.2	R	53	48.0	

36.06
35.40
36.14
107.60
15 35.87

609.5
15 35.85

13	30.1										
	40.5	13	37.2					15	36.4	37.1	36.6
	41.1	+1	59.9								
14	0.5	+1	59.4								
	5.8	14	6.1					15	35.0	35.1	35.5
	12.0	+1	29.0								
	28.2	1	29.4								
	34.1	14	35.3					15	34.5	34.7	34.9
	43.5	+0	59.4								
15	0.1	0	59.6								
	7.1	15	6.9					15	36.3	35.8	36.6
	13.0	+0	28.9								
	30.1	0	29.7								
X	34.9	15	35.2					15	34.8	34.7	35.2
	40.7		−0.5								
16	1.6	−0	0.0								
	7.4	16	7.4					15	37.9	37.6	37.6
	13.2	−0	29.8								
	28.4	−0	29.8								
	36.2	16	35.4					15	35.6	35.3	35.7
	41.7	−1	0.1								
	58.4	−0	59.7								
17	2.4	17	3.4					15	33.5	33.9	33.7
	9.5	−1	29.5								
1 16 32.84	31.2	−1	29.7								88 40 50.71
	35.0	17	36.0					15	36.8	37.2	36.8
	41.7	−1	58.8								
	59.0	−1	59.2								
18	5.8	18	5.4					15	36.2	35.7	36.1
	16.5	−2	29.7								
	29.7	−2	29.3								
	35.6	18	35.1					15	35.8	35.4	35.9
	40.0	−2	59.7								
	57.7	−2	59.2								
19	2.0	19	3.3					15	34.0	33.9	34.2
	10.3	−3	29.4								
	29.9	−3	29.1								
	33.1	19	34.0					15	34.7	34.6	35.1
	38.5	−0	59.4								
	59.0	−3	58.9								
20	4.1	20	4.7					15	35.8	36.3	36.0
	10.2	−4	28.4								
	31.9	−4	28.7								
	35.2	20	35.6					15	37.3	37.4	36.8
	39.8	−4	58.2								
21	0.2	−4	58.8								
	3.1	21	6.5					15	36.8	37.1	36.8
	12.1	−5	28.4								
	30.0	−5	28.7								
	38.1	21	38.2					15	36.7	36.9	36.0
	41.8	−5	58.3								
		−5	59.2					17)	15	36.77	6087 6095
										35.81	35.85

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48

1881 Oct-18 LC

0.08661
8.36214n
8.44875n

6.73660
8.36214n
5.09874n

Identical

h	m	s				'	"
13	21	58.2	6	18.8	R	54	58.80
	23	50.0	8	10.6	R	54	50.90
	25	47.0	10	7.6	R	54	54.62
	27	16.3	11	36.9	R	54	53.88
	28	47.4	13	8.0	R	54	62.45

39.40
39.22
78.62
15 39.31

432.5
15 31.32

1 16 32.70

88 40 51.44

h m s		
13 24 29.8		
35.0	363	40.5
44.2		
26 2.4		
8.1	77	40.6
12.5		
27 32.2		
35.0	372	39.8
40.8		
29 1.0		
6.1	59	38.2
10.6		
30 30.8		
37.4	872	39.1
43.2		

15 39.64

19	2.4		
	9.6	19	8.7
	14.2	-3	29.4
	32.6	-3	29.1
	38.2	19	38.3
	44.2	-3	59.4
20	0.5	-3	58.9
	7.0	20	7.0
	13.6	-4	28.4
	31.0	-4	28.7
	37.4	20	37.6
	44.5	-4	58.2
21	3.5	-4	58.8
	8.5	21	9.2
	15.5	-5	28.4
	30.0	-5	28.7
	36.5	21	36.8
	44.0	-5	58.3
		-5	59.2

15 39.4	39.3	39.6	38.6
15 39.0	38.9	39.4	40.4
15 38.1	38.6	38.3	40.1
15 39.3	39.4	38.8	39.1
15 40.5	40.8	40.5	40.1
15 38.3	38.5	37.6	
	2355	2342	

6) 15 39.10
15 39.64
54
15 39.37

39.25
39.03

a - 1

24 36.3	-8 57.1	-8 57.7	15	38.6
26 7.7	10 28.5	10 27.3	15	40.4
27 37.2	11 58.0	11 57.1	15	40.1
29 5.9	13 26.7	13 26.8	15	39.1
30 37.2	-14 58.0	14 57.1	15	40.1

✓ ✓

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1881phae..proj..1564.

1881 Oct 20 d C

0,086661
8,362057
8,448664

6,773660
8,362057
5,098653

Identical.

h	m	s	h	m	s						
			13	5	12.8	+10	26.2		R	55	41.02
						+626.2					
				8	3.2	7	35.8		R	53	30.50
						+455.8					
				22	2.0	-6	23.0		R	55	1.12
						-383.0	45.4				
				23	24.4	7	~~18.4~~		R	54	59.62
						-465.4					
				24	24.2	-8	55.2		R	54	57.65
						-535.2					

38.05
39.77
39.21
117.03
39.01

741.4
39.02

12	36.2												
	39.0	12	39.6			~~15~~		~~8.8~~					
	43.6	+2	39.4			15	3	9.2		39.0	38.6		
13	0.4	+2	59.0										
	7.7	13	7.5			~~15~~		~~6.7~~					
	14.4	+2	29.4			15	3	6.5		36.9	36.9		
	32.3	+2	29.4										
	35.8	13	37.3			~~15~~		~~6.2~~					
	43.1	+1	59.7			15	3	6.5		37.2	36.7		
14	5.4	1	59.4										
	8.4	14	9.2			~~15~~		~~8.4~~					
	13.7	+1	29.0			15	3	8.1		38.2	38.6		
	34.1	1	29.4										
	40.6	14	40.3			~~15~~		~~9.7~~					
	45.6	+0	39.4			15	3	7.5		39.7	39.9		
15	2.5	0	59.6										
	7.2	15	7.9			~~15~~		~~8.3~~					
	44.0	+0	28.9			15	3	7.3		36.8	37.6		
	34.2	+0	29.7										
X	39.8	15	39.5			~~15~~		~~10.0~~					
	44.4	-0	0.5			15	3	9.1		39.0	39.5		
16	1.2	-0	0.0										
	10.0	16	9.2			~~15~~		~~9.4~~					
	16.4	-0	29.8			15	3	9.7		39.4	39.4		
	32.2	-0	29.8										
	37.3	16	38.6			~~15~~		~~8.7~~					
	46.3	-1	0.1			15	3	8.8		38.5	38.9		
17	1.4	-0	59.7								1.16	32.64	58.40 52.10
	9.4	17	8.6			~~15~~		~~9.4~~					
	15.0	-1	29.5			15	3	8.7		39.1	38.9		
	38.4	-1	29.7										
	42.0	17	41.8			~~15~~		~~12.6~~					
	45.0	-1	58.8				4	2.6		43.0	42.6		
18	1.9	-1	59.2										
	9.6	18	8.6			~~15~~		~~9.3~~					
	14.3	-2	29.7			15	3	9.4		38.9	39.3		
	33.9	-2	29.3										
	39.3	18	39.5			~~15~~		~~10.2~~					
	45.3	-2	59.7			15	4	0.2		39.8	40.3		
19	4.0	-2	59.2										
	8.8	19	8.4			~~15~~		~~9.1~~					
	12.5	-3	29.4			15	3	9.1		39.0	39.3		
	29.4	-3	29.1										
	37.9	19	37.1			~~15~~		~~8.2~~					
	43.9	-3	59.4			15	3	7.8		37.7	38.2		
20	4.3	-3	58.9										
	9.6	20	9.6			~~15~~		~~11.3~~			40.9		
	44.9	-4	28.4			15	4	0.7		41.2	~~38.4~~		
	34.2	-4	28.7										
	37.6	20	37.6			~~15~~		~~8.9~~					
	44.0	-4	58.2			15	3	9.3		39.4	38.8		
21	0.8	-4	58.4										
	6.7	21	6.1			~~15~~		~~7.6~~					
	10.8	-5	28.4			15	3	7.4		37.7	37.4		
	34.0	-5	28.7										
	38.6	21	38.8			15	4	0.3		40.5	39.6		
	43.8	-5	58.3										
		-5	59.2										

19) 15 38.96 39.00

19) 73.94
~~38.92~~
74.14
39.02

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50

1881 Oct 22/23

0.08661
8.36195
8.44856

6.73660
8.36195
5.09855

Identical

h	m	s		h	m	s									
K3	9	29.2		13	22	1.0	−6	24.8'					R	55	0.30
		38.9	9	37.6			−384.1		15	36.5	37.3	36.4			
		44.6	+5	59.7	24	58.0	9	21.8'	+				R	54	56.85
	10	4.4	+5	58.8			−541.1								
		8.9	10	8.8	26	37.3			15	38.2	38.3	37.6	R	54	53.78
		13.0	+5	29.5			−660.4		11	0.3	4				
		32.1	5	28.8	30	6.5			14	29.5	4		R	54	54.20
		38.5	10	38.4			−867.6		15	37.3	37.3	37.2			
		44.5	+4	58.9	31	23.3			15	46.3	4	+	R	54	53.52
	11	1.8	4	58.8			−946.4								
		5.5	11	5.1	32	29.0			15	34.1	34.0	34.1	R	54	52.38
		8.0	+4	28.9			−1012.1		16	52.8'					
		—	4	29.0	33	40.5			18	3.5	6		R	54	52.40
							−1083.6								

36.50
37.24
36.84
110.58
15 36.86

774.1
15 36.86

	13	35.9													
		38.0	13	38.7				15	37.9	38.6	38.1				
		42.1	+1	59.9											
		59.5	1	59.4											
	14	4.5	14	5.3				15	34.2	34.5	34.9				
		12.6	+1	29.0											
		31.3	1	29.4											
		38.6	14	37.6				15	36.8	37.0	37.2				
		43.0	+0	59.4											
	15	3.2	0	59.6											
		6.7	15	7.5				15	36.9	36.4	37.2				
		12.7	+0	28.9											
		32.3	0	29.7											
		37.3	15	37.2				15	36.8	36.7	37.2				
		42.1	−	0.5											
	16	1.0	0	0.0											
		6.8	16	6.9				15	37.4	37.9	37.1				
		13.0	− 0	29.8											
		40.7	− 0	29.8											
		33.8	16	35.5				15	35.7	35.4	35.8				
		42.1	− 0	0.1											
		58.2	− 0	59.7								1	16	32.71	88 40 52.82
	17	8.3	17	7.3				15	37.4	37.8	37.6				
		14.4	− 1	29.5											
		31.0	− 1	29.7											
		36.2	17	36.5				15	37.3	37.7	37.3				
		42.2	− 1	58.8											
	18	1.4	− 1	59.2											
		8.3	18	7.8				15	38.6	38.1	38.5				
		13.6	− 2	29.7											
		28.6	− 2	29.3											
		37.6	18	35.8				15	36.5	36.1	36.6				
		41.3	− 2	59.1											
	19	0.2	− 2	59.2											
		4.8	19	5.4				15	36.1	36.0	36.3				
		11.1	− 3	29.4											
		30.7	− 3	29.1											
		36.2	19	35.8				15	36.5	36.4	36.9				
		40.5	− 3	59.4											
		38.3	− 3	58.9											
	20	4.1	20	5.2				15	36.3	36.8	36.5				
		12.8	− 4	28.4											
		29.2	− 4	28.7											
		36.0	20	36.0				15	37.7	37.8	37.2				
		42.7	4	58.7											
	21	0.1	− 4	58.8											
		7.1	21	6.8				15	38.1	38.4	38.1				80 41
		13.3	− 5	28.4											38.29
		28.3	− 5	28.7											
		35.3	21	35.5				15	37.0	37.2	36.3				
		42.9	− 5	58.3											
			5	59.2				21) 15	36.86	36.99					

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1881phae.proj.1564

1881 Oct 25 LC

0.08661
8.36186
8.44847

6.73660
8.36186m
5.09846p

h	m	s		h	m	s					
13	9	35.7		13	3	49.4	+11 52.3		R	55	47.08
		42.2	9 42.4				+712.3				
		48.0			6	11.2	9 30.5		R	55	37.58
		55.7					+570.5				
	10	6.0	10 44.1		7	19.5	8 22.2		R	55	38.92
		10.5					+502.2				
		15.2	10.6		8	21.5	7 20.2		R	54	49.5
		37.7					+440.2				
10.43.28		44.5	10 44.6		21	58.8	-6 17.1		R	54	18.2
		51.5					-377.1				
	11	7.3			23	32.3	7 50.6		R	54	0.55
		13.5	11 13.2				-470.6				
		18.8			24	55.5	9 13.8				
		36.3					-553.8				
		42.2	11 42.6								
		49.3									
	12	8.0									
		14.5	12 14.0								
		19.4									
		37.7									
		43.0	12 43.1								
		48.7									
	13	9.2									
13.13.12		14.1	13 13.9								
		18.3									
		35.5									
		43.1	13 42.4								
		48.6									
	14	6.7									
		11.6	14 12.2								
		18.3									
		34.7									
		41.2	14 41.1								
		47.3			13	10	48.8				
	15	3.0				13	13.12				
		11.6	15 10.3			15	41.20				
		16.2				18	10.70				
		38.1				20	39.40				
15.41.20		42.0	15 42.9								
		48.6				15	41.94				
	16	3.3									
		11.5	16 11.8								
		18.7									
		33.7									
		38.1	16 39.9								
		47.2									
	17	4.8									
		12.2	17 11.2								
		16.7				1	16	32.84		88	40 53.97
		33.7									
		39.8	17 40.4								
		47.7									
	18	1.5									
18.10.70		16.0	18 10.1								
		17.7									
		35.0									
		41.0	18 40.9								
		46.6									
	19	5.4									
		11.0	19 10.9								
		16.4									
		35.1									
		40.6	19 41.0								
		47.2									
	20	4.0									
		10.2	20 10.0								
		15.7									
		36.4									
20.40.07		41.0	20 41.3								
		46.3									
	21	4.0									
		8.4	21 9.3								
		15.6									
		~~26.0~~									
		33.0									
		38.3	21 38.5								
		44.2	38.5								
15.4166			15 41.664								

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1881phae.proj.1564.

52

1881 Oct 26 2C

0.08661
8.36186
8.44847

6.73660
8.36186
5.09846

h	m	s		h	m	s				
13	9	38.1		13	5	31.0	+10 13.1	R	55	41.88
		43.0	9 43.4				+613.1			
		49.1			1	0.9	8 43.2	R	55	38.12
	10	7.2					+523.2			
		13.6	10 13.6		8	9.9	9 34.2	R	55	34.08
		20.1					+434.2			
		38.4			22	1.5	-6 17.4	R	54	57.58
		43.0	10 43.4				-372.4			
10 44 36		48.8			23	42.0	7 57.9	R	54	57.02
	11	10.3					-477.9			
		15.5	11 15.9		24	55.4	9 11.3	R	54	48.58
		21.8					-551.3			
		39.0								
		45.2	11 45.5							
		52.3								
	12	10.0								
		14.2	12 15.1							
		21.0								
		37.8								
		44.2	12 44.1							
		50.2								
	13	9.5								
		15.8	13 15.8							
13 14 06		22.2								
		37.3								
		41.9	13 42.5							
		48.2								
	14	7.0								
		12.5	14 12.8							
		18.9								
		38.8								
		45.0	14 45.6							
		52.9								
	15	10.6			10	44.36				
		16.0	15 16.6		13	14.06				
		23.2			15	44.52				
		38.0			18	14.00				
		42.2	15 42.8		20	43.54				
15 44 34		48.1								
	16	6.7			15	44.10				
		12.3	16 12.8							
		19.3								
		39.1								
		44.7	16 44.8							
		50.8								
	17	9.0								
		13.9	17 14.3							
		19.9								
		38.5					1 16 32.79		88	40 54.38
		44.1	17 44.4							
		50.6								
	18	7.7								
		14.6	18 13.8							
18 14 00		19.5								
		39.6								
		44.5	18 44.6							
		49.7								
	19	7.0								
		12.5	19 12.8							
		19.0								
		36.7								
		43.7	19 43.8							
		48.5								
	20	8.0								
		14.0	20 13.7							
		19.0								
		37.9								
		44.7	20 44.5							
20 43 46		50.8								
	21	8.4								
		13.1	21 13.2							
		18.2								
		37.1								
		43.4	21 42.9							
		48.1								
15 44 08			15 44.12							

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1884phae.proj.1564

1881 Oct 27 SC

0.086661
8.36177n
8.44838n

6.73660
8.36177n
5.09837n

h	m	s		h	m	s				
13	9	37.2		13	6	30.2	+9 11.8	R	53	39.18
		42.4	9 42.4				+551.8			
		47.7			9	2.0	+6 40.0	R	53	31.75
	10	6.7					+406.0			
		12.3	10 11.8		21	54.5	−6 12.5	R	53	8.48
		16.5					−372.5			
		36.7			23	42.9	8 0.9	R	53	5.32
		41.3	10 41.9				−480.9			
10 42.26		47.8			25	23.7	9 41.7	R	53	2.78
	11	7.3					−581.7			
		13.1	11 13.3							
		19.0								
		35.2								
		41.7	11 41.9							
		48.7								
	12	8.1								
		12.9	12 13.0							
		18.0								
		36.4								
		42.3	12 42.9							
		50.0								
	13	7.5								
		18.6	13 13.10							
13.12.90		18.2								
		36.8								
		42.4	13 42.9							
		49.6								
	14	7.5								
		12.6	14 12.6							
		17.1								
		37.9								
		43.2	14 43.1							
		48.1								
	15	6.3			10	42.26				
		12.3	15 12.6		13	12.50				
		19.3			15	42.56				
		37.2			18	12.14				
		42.8	15 42.7		20	40.20				
15.42.16		48.2								
	16	5.4			15	42.01				
		11.2	16 11.1							
		16.8								
		39.3								
		43.0	16 43.3							
		47.7								
	17	7.5								
		12.5	17 12.8							
		18.5								
		36.1			1	16	32.68		88	40 54.79
		42.1	17 41.9							
		47.5								
	18	7.4								
		12.3	18 12.2							
18.12.14		16.9								
		37.3								
		42.6	18 43.1							
		49.3								
	19	6.5								
		10.7	19 10.7							
		15.0								
		36.0								
		41.2	19 41.5							
		47.4								
	20	4.6								
		7.4	20 7.8							
		14.5								
		38.1								
		38.4	20 38.7							
20.40.20		42.6								
	21	5.4								
		11.5	21 11.5							
		17.7								
		36.8								
		42.4	21 41.5							
		46.3								
15 42.01			15 42.01							

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1881phae.proj.1564.

54

1881. Mar 5 2C

0.086061
8.36150m
8H4811m

6.73660
8.36150m
5.09810m

h	m	s	h	m	s					
13	9	32.0	13	22	6.4	−6	28	3	R 55	8.20
		38.0 9 37.9								
		43.7	24		32.5	8	54	4	R 55	5.30
	10	3.8								
		9.5 10.82	26		11.0	10	32	9	R 55	2.65
		14.4 10 9.7								
		32.2	27		49.0	12	10	9	R 55	2.35
		38.2 10 38.2 3								
10 38.32		44.6	29		16.4	13	38	3	R 55	0.95
	11	2.0								
		8.9 11 8.5								
		14.7								
		33.5								
		37.0 11 37.7								
		42.7								
	12	0.3								
		6.9 12 7.2								
		14.4								
		31.9								
		38.9 12 38.3								
		44.0								
	18	2.0								
		8.2 13 8.2								
13 8.30		14.4								
		34.1								
		39.0 13 39.2								
		44.4								
	14	3.1								
		7.9 14 8.6								
		14.7								
		32.6								
		38.8 14 38.8								
		44.9								
	15	0.8	13	10	38.24					
		7.0 15 6.9		13	8.30					
		13.0		15	38.46					
		32.3		18	7.20					
		37.2 15 38.8		20	38.20					
15 38.46		44.5								
	16	3.2	13	15	38.08					
		9.8 16 9.4								
		15.3								
		35.0								
		39.0 16 38.2								
		43.5								
	17	3.1								
		6.0 17 6.5								
		10.4								
		31.9	1	16	30.74				88	40 57.99
		38.4 17 37.8								
		43.0								
	18	2.6								
		7.5 18 7.8								
18 7 17.2		11.7								
		31.6								
		36.9 18 37.1								
		42.9								
	19	2.2								
		6.7 19 7.4								
		13.4								
		32.0								
		38.3 19 37.6								
		42.5								
	20	2.9								
		8.3 20 8.5								
		14.4								
		36.5								
20 38.20		38.9 20 39.6								
		43.3								
	21	2.2								
		7.0 21 7.5								
		13.4								
		32.4								
		36.4 21 37.8								
		44.6								
1 38.10		1 38 10.0								

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1881phae.proj.1564

0,08661
8,36141
8,44802

6,73660
8,36141 m
5,09801 m

1881 Nov 9 Lc

h	m	s	m	s	h	m	s						
	13	9	39.5		13	21	55.7	−6	186	R	53	1202
			40.2	9 40.2									
			40.8			24	48.7	9	11.6	R	53	852
		10	1.8										
			7.8	10 7.8		26	2.0	10	24.9	R	53	840
			13.8										
			30.4			28	14.5	12	37.4	R	53	0.88
10	3806		38.0	10 37.4									
			43.9			29	28.7	13	51.6	R	53	435
		11	1.6										
			7.6	11 7.4									
			13.0										
			31.8										
			37.8	11 37.5									
			42.9										
		12	2.4										
			8.2	12 8.0									
			13.3										
			31.8										
			38.1	12 37.8									
			43.6										
		13	1.3										
13	780		7.5	13 7.8									
			14.5										
			31.4										
			37.4	13 37.7									
			44.2										
		14	1.3										
			8.5	14 7.7									
			13.2										
			31.2										
			38.6	14 40.6									
			43.9										
			48.8										
		15	1.1										
			7.3	15 7.2									
			13.3										
			31.3										
15	3744		36.5	15 36.6									
			42.0										
		16	0.8										
			6.0	16 6.6									
			13.0										
			30.5										
			36.0	16 36.2									
			42.0										
		17	0.0										
			6.8	17 6.1									
			11.6			1	16	29.92					
			31.5										
			37.8	17 37.6									
			43.5										
		18	0.7										
18	614		6.8	18 6.0									
			10.5										
			29.4										
			35.3	18 35.4									
			41.5										
		19	0.9										
			5.0	19 5.6									
			10.9										
			30.3										
			36.8	19 36.5									
			42.5										
		20	0.4										
			5.9	20 6.0									
			11.8										
			30.5										
20	3584		37.5	20 36.4									
			41.3										
			58.6										
		21	5.2	21 4.9									
			10.8										
			29.3										
			35.5	21 35.4									
			41.3										

88 40 54,45

37.056
15 ~~36 456~~

37.056
15 ~~36 456~~

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1881phae.proj.1564.

76

1881 Nov 10 LC

0.086661
8.361 31
8.347 92

6.736 60
8.361 31
5.097 91

h	m	s	m	s	h	m	s				
	13	9	30.0		12	59	20.9	+16 16.5	R	56	12.32
			35.6	9 35.5				+976.5			
			40.8		13	1	28.8	14 8.6	R	55	58.70
		10	1.0					+848.6			
			4.0	10 4.9		2	51.5	13 31.9	R	55	56.48
			9.8					+811.9			
			30.0			4	8.5	11 33.9	R	55	54.00
10	36.22		36.1	10 37.7				+693.9			
			46.3			5	11.8	+10 25.6	R	55	50.18
		11	2.0					+625.6			
			5.1	11 6.6		21	59.1	- 6 22.3	R	55	15.72
			12.0					-382.3			
			31.2			23	16.5	7 31.9	R	55	14.15
			36.0	11 36.4				-451.9			
			42.0			24	28.0	8 50.6	R	55	13.88
		12	0.8					-530.6			
			9.0	12 8.1		25	31.1	9 54.3	R	55	11.80
			14.4					-594.3			
			30.8			27	1.9	11 24.5	R	55	11.48
			37.4	12 37.0				-684.5			
			42.8								
		13	2.6								
13	7.46		6.7	13 7.4							
			12.0								
			31.8								
			36.0	13 37.0							
			43.3								
		14	1.3								
			7.7	14 7.8							
			14.5								
			32.0								
			39.3	14 39.0							
			45.7								
		15	2.2								
			8.2	15 8.2							
			14.2								
			30.9								
15	37.94		35.8	15 36.7							
			43.5								
		16	1.0								
			8.4	16 7.9							
			14.2								
			33.5								
			37.7	16 37.9							
			42.4								
		17	3.4								
			9.2	17 9.2							
			15.1								
			32.4					1 16 29.58		88	40 59.83
			36.8	17 38.1							
			45.0								
		18	2.0								
18	8.00		9.4	18 9.0							
			15.6								
			30.5								
			35.5	18 35.8							
			41.5								
		19	3.3								
			7.7	19 7.8							
			12.7								
			30.6								
			35.1	19 36.2							
			42.8								
		20	0.1								
			5.2	20 6.5							
			14.2								
			30.1								
20	37.26		36.7	20 36.2							
			41.7								
		21	2.0								
			7.6	21 7.7							
			13.6								
			34.2								
			39.2	21 39.7							
			45.8								

15 37.376 | 15 37.376

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1881phae.proj.1564.

1881 Nov 12 LC

0.08661
8.36131
8.44792

6.73660
8.36131
5.09791

h	m	s					
13	(30	47.0)	R	55	40.0		
	36	5.3	R	55	3.10		
	37	13.2	R	55	1.95		
	37	22.5	R	55	2.00		
	38	31.0	R	55	2.18		
	39	36.5					

h	m	s
13	28	59.0
	29	5.8
4.20	9.8	
	30	32.0
36.60	37.2	
		40.6

1 16 28.71

88 40 0.53

a

a − 1

29	4.2	−13	18.2	15	46.0	
30	36.6	14	47.5	15	49.1	
					93.1	
					47.55	

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1881phae.proj.1564.

1881 Nov 13 LC

0.08661
8.36122n
8.44783n

6.73660
8.36122n
5.09783n

h	m	s	m	s	h	m	s						
	13	9	29.7		13	22	40	-6	283	R	55	13.45	
			35.6	9	35.2								
			40.2			23	57.8	8	22.1	R	55	10.42	
		10	0.2										
			6.2	10	6.1	25	12.2	9	36.5	R	55	9.88	
			11.8										
			29.2			26	20.3	10	44.6	R	55	8.82	
	10	35.78	35.4	10	35.4								
			41.5			27	31.4	11	55.7	R	55	7.80	
		11	0.3										
			6.2	10	6.3								
			12.5										
			29.8										
			35.0	10	35.9								
			42.8										
		12	0.4										
			5.4	12	6.1								
			12.4										
			30.6										
			35.6	12	35.8								
			41.2										
		13	1.3										
	13	6.10	7.3	13	6.9								
	13	6.16	12.0										
			31.7										
			36.7	13	36.7								
			41.8										
		14	1.2										
			4.7	14	5.8								
			10.0										
			30.8										
			34.9	14	35.6								
			41.0										
		15	0.6										
				15	5.0								
			31.2										
	15	35.92	36.3	15	36.3								
			41.3										
		16	2.5										
			7.0	16	7.4								
			12.7										
			29.8										
			34.8	16	35.3								
			41.4										
			38.6										
		17	4.0	17	5.0								
			12.3										
			31.3			1	16	28.13					
			36.7	17	36.6								
			41.7										
		18	1.3										
	18	5.66	6.1	18	6.3								
			11.6										
			30.4										
			36.1	18	35.6								
			40.2										
			59.2										
		19	4.7	19	4.8								
			10.6										
			29.6										
			36.1	19	35.6								
			41.2										
			59.7										
		20	4.4	20	4.8								
			10.3										
			29.5										
	20	24.68	34.0	20	34.9								
	20	35.08	41.1										
		21	5.0										
			6.4	21	6.7								
			8.7										
			28.7										
			30.5	21	31.4								
			34.7										
			39.8										

15 35-720 15 35-720

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1881phae.proj.1564

1881, Nov 14 UC

0.08061
8.36122
8.44783

6.73660
8.36122
5.09782

	h	m	s			′	″
D	55	12.1		R	32	19.38	
	56	44.6		R	32	25.18	
	58	6.0		R	32	29.50	
	59	26.6		R	32	33.40	
1	0	47.2		R	32	38.65	
	4	9.9		R	32	43.98	

h	m	s
1	1	21.7
		30.2
30,9	3	40.9
	2	38.5
	3	5.4
4,30		9.0
	4	24.8
30,13		30.4
		35.2
	5	55.1
	6	3.1
2.70		9.3
	7	28.3
33,40		33.5
		38.4

1 16 28.99

88 41 1.03

a+1					
1	30.9	+14	38.4	16	29.3
3	4.3	13	28.1		32.4
4	30.1	11	59.0		29.1
6	2.7	10	29.0		31.7
7	33.4	8	58.8		32.2

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1881phae.proj.1564

- 1881 Nov 15 UC

0.086661
8.136122
8.447833

6.736600
8.361225
5.099782

Equatorial

h	m	s	m	s	h	m	s				
1	11	23.1			1	2	39.9				
		29.3	11	29.6							
		35.8				3	51.4				
		54.7	4	6 0.2	3						
		59.3	11	59.7		8	4.2				
	12	5.0									
		23.5	5	29.7		9	50.5				
		30.2	12	29.2							
		33.9				17	51.3				
		56.7	4	59.7							
	13	0.6	13	0.7							
		4.8									
		24.2	4	29.5							
		28.0	13	28.5							
		33.3									
		53.7	3	59.6							
		58.2	13	58.5							
	14	3.6									
		24.4	3	29.7							
		29.8	14	29.4							
		34.0									
		54.4	2	59.8							
		58.9	14	59.7							
	15	5.7									
		21.0	2	29.8							
		25.9	15	29.0							
		33.8									
		35.3	1	59.6							
		52.5									
		57.7	15	58.1							
	16	4.0									
		20.8	1	29.9							
		27.0	16	29.0							
		33.2									
		34.9	0	59.9							
		53.1									
		59.5	16	59.1							
	17	4.6									
		22.0	0	29.9							
		28.2	17	27.7							
		33.0									
			0	0.0							

		R	32	44.02
9		R	32	47.68
29.8		R	32	58.60
29.4		R	33	2.80
		R	33	18.80
28.9				
30.2				29.60
				28.75
				28.44
28.1				86.79
				28.93
28.2				
29.2				
29.5				
28.6				
28.0				
28.9				
29.0				

27.7

13) 375.6

28.89

1 16 27.51

88 41 1.33

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1881phae.proj.1564.

0.08661
8.36122
8.44783

6.73660
8.36122
5.09782

1881 Nov 15 LC

h m s m s h m s
13 9 30.0 13 7 27.5 +8 7.9
35.7 9 35.4 +487.9
40.6 – 8 44.9 7 50.5
51.7 +470.5
10 4.7 10 4.2 28 33.2 –12 57.8
10.2 –777.8
27.3 30 21.5 14 46.1
10 34.82 33.7 10 34.3 –886.1
41.8 – 31 36.8 16 1.4
58.0 –961.4
11 4.2 11 3.7 32 36.7 17 1.3
9.0 – –1021.3
31.4 33 36.8 18 1.4
35.8 11 36.5 –1081.4
42.2 –
58.9
12 5.6 12 6.1
13.8 –
27.5
34.6 12 34.3
40.9 –
13 5.78 13 (2.5 3.7 5.7 12.0) 13 6.0
32.3
37.6 13 37.2
41.8 –
59.9
14 5.2 14 5.3
10.7 –
29.6
35.3 14 35.7
42.2 –
59.4
15 5.7 15 5.9
12.5 –
15 37.16 31.3
15 ~~36.16~~ 36.1 15 36.4
41.7 –
16 1.8
5.7 16 5.8
10.0 –
30.7
37.7 16 37.0
42.6 –
59.3
17 4.7 17 4.9
10.6 – 1 16 27.28 88 41 1.48
32.4
35.7 17 36.1
40.1 –
59.3
18 5.50 18 4.9 18 4.8
10.1 –
29.7
36.6 18 36.4
43.0 –
19 1.0
5.0 19 5.3
9.8 –
28.7
34.3 19 34.4
40.2 –
56.8
20 4.8 20 4.1
10.7 –
30.5
20 34.96 35.1 20 35.8
41.7 –
21 0.3
4.5 21 5.3
11.9 –
30.3
35.0 21 35.2
40.2 –
15 35.64 (444) ~~13~~ 35.64 (444)
15

	′	″
R	55	47.60
		4.62
R	55	11.82
R	55	11.10
R	55	10.12
R	55	9.78
R	55	9.65

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1881phae.proj.1564

162

1881 Nov 16 SC

D: 0 8661
8, 36113,
8, 4 4774,

G: 7 3 6660
8, 36173,
5, 0 9773,

h	m	s	m	s	h	m	s					
	13	9	26.6		12	55	(12.0)	+20 21.8	R	56	2292	
			30.4	9 34.1			(17.5)	20 14.3				
			36.3					+1221.8				
						57	54.8	17 39.0	R	66	1522	
				10 20.0				+1059.0				
						59	23.0	16 10.8	R	56	1005	
								+970.8				
10	32.94			10 32.5		0	28.0	15 5.8	R	56	580	
								+965.8				
						1	31.4	14 2.4	R	56	365	
				11 3.0				+842.4				
						2	40.6	+12 53.2	R	55	5890	
			11	32.1				+773.2				
			35.6	11 36.1		21	43.9	−6 10.1	R	55	1812	
			39.9					−370.1				
		12	0.1			23	6.6	7 32.8	R	55	1615	
			5.5	12 5.8				−452.8				
			11.8			24	11.7	8 37.9	R	55	1570	
			20.0					−517.9				
			34.2	12 34.7		25	18.0	9 44.2	R	55	1305	
			40.0					−584.2				
			57.1			26	32.2	10 58.4	R	55	1198	
13	4.16	13	3.6	13 3.0				−658.4				
			4.1									
			29.6									
			33.3	13 33.3								
			37.1									
			58.7									
		14	3.5	14 4.0								
			9.7									
			29.7									
			34.0	14 35.2								
			41.9									
			58.6									
		15	3.7	15 3.7								
			8.8									
			28.8									
15	34.64		35.3	15 35.6								
			42.6									
			58.8									
		16	0.3	16 5.6								
			11.8									
			28.3									
			32.0	16 33.1								
			39.1									
			50.0									
		17	3.0	17 3.7								
			9.0									
			26.3					1 16 26.86				88 40 1.77
			32.7	17 32.1								
			37.2									
			39.7									
18	4.00	18	6.8	18 5.9								
			11.1									
			28.0									
			33.3	18 33.7								
			39.8									
			58.2									
		19	5.0	19 4.6								
			10.7									
			28.5									
			33.7	19 33.7								
			38.9									
			58.3									
		20	3.7	20 4.3								
			10.0									
			27.6									
20	33.50		33.8	20 33.6								
			39.3									
			53.3									
		21	3.5	21 2.1								
			9.4									
			28.1									
			33.4	21 33.8								
			39.9									

15 33 8.48 | 15 33 8.48

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1881phae.proj.1564

1881 Nov 19 LC

0.086661
8.36104m
8.44765m

6.73660
8.36104m
5.09764m

h	m	s	h	m	s			R	°	′	″
13	9	24.5	13	0	44.4	+14	47.4	R	56	8	9.5
		30.0	9 30.1			+887.4					
		35.7		3	21.0	12	10.8	R	55	58	8.8
		53.2				+730.8					
		59.3	9 59.8	4	39.8	10	52.0	R	55	54	8.5
	10	4.0				+652.0					
		27.1		6	1.2	9	30.6	R	55	51	1.5
10	32.56	34.9	10 32.7			+570.6					
		39.1		7	21.8	8	10.0	R	55	46	9.5
		56.5				+490.6					
		59.8	11 0.8	21	51.0	−6	19.2	R	55	17	2.8
	11	6.0				−379.2					
		24.1		23	11.7	7	39.9	R	55	16	3.8
		29.5	11 29.4			−459.9					
		34.6		24	18.9	−8	47.1	R	55	14	7.8
		54.6				−527.1					
		59.8	12 0.6								
	12	4.3									
		26.5									
		31.8	12 32.1								
		38.0									
		57.0									
13	1.56	13	1.5	13	1.8						
		6.8									
		25.2									
		31.5	13 31.1								
		36.7									
		57.0									
	14	2.3	14 2.2								
		7.3									
		28.0									
		31.7	14 32.2								
		37.0									
		57.8									
	15	2.0	15 2.9								
		8.9									
		26.1									
15	32.02	31.4	15 31.5								
		37.0									
		55.0									
	16	1.7	16 1.2								
		7.0									
		27.4									
		32.6	16 32.3								
		37.0									
		58.0									
	17	1.7	17 2.3								
		7.2									
		24.9				1 16	25.75				
		29.8	17 29.7								
		34.5									
		56.4									
18	1.26	18	1.0	18	1.4						
		6.8									
		27.2									
		30.0	18 31.5								
		37.3									
		56.0									
	19	1.3	19 1.4								
		6.9									
		27.5									
		32.7	19 32.9								
		38.5									
		56.2									
	20	3.0	20 2.7								
		8.8									
		26.2									
20	31.66	30.5	20 31.5								
		37.8									
		54.4									
	21	1.2	21 0.5								
		6.0									
		25.2									
		30.0	21 30.7								
		37.0									
15	31.812		15 31.812								

88 41 2.66

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1881phae.proj.1564

64

- 1881 Nov 20 UC

8.086661
8.26104
8.44765

6.73660
8.26104
5.09764

Identical

h	m	s	m	s	h	m	s						
	1	11	14.5		0	53	49.3	+23 33.4			R	32	1195
			22.0	11	21.9			+1413.4					
			29.1			55	50.2	-21 32.5			R	32	2000
			47.0	+6	0.3			+1292.5	22.2				
			53.2	-11	52.3	57	42.1	19 40.6			R	32	2700
			56.7					+1180.6					
	12	14.8		5	29.7	59	23.0	17 59.7	22.0		R	32	3175
			22.4	12	21.6			+1079.7					
			27.5			0	42.7	16 40.0			R	32	3580
			47.5	4	59.7			+1000.0	21.3				
			56.6	12	54.7	2	1.6	15 21.1			R	32	4025
	13	0.0						+921.1					
			18.0	4	29.5	5	9.7	12 13.0	24.2		R	32	4918
			24.2	-13	24.6			+733.0					
			31.5			8	7.9	9 14.8	24		R	32	5860
			48.0	3	59.6			+554.8					
			53.8	13	53.3	9	51.0	+6 31.7	24.2		R	33	308
			58.2					+391.7					
	14	17.2		3	29.7				23.0				
			23.0	14	23.4								
			29.9										
			41.8	2	59.8				23.2				
			51.8	14	53.2								
	15	0.0											
			17.9	2	29.8				23.0				
			22.3	15	23.1								
			29.0										
			45.8	1	59.6				22.7				
			51.5	15	51.1								
			56.0										
	16	21.1		1	29.9				21.0				
			27.1	16	26.7								
			31.8										
			47.4	0	59.9				26.6				
			52.0	16	52.3								
			57.5										
	17	13.8		+0	29.9				22.2				
			20.9	17	20.0								
			25.4										
				-0	0.0				20.0				

13) 2956
227/4

2955.6
22.74

1 16 25.67

88 41 2.80

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1881phae.proj.1564

1881 Nov 20 LC

0.086661
8.36104
8.44765

6.73660
8.36104
5.09764

h	m	s	h	m	s			
13			13	29	47.0	R	55	13.62
				31	18.0	R	55	11.08

14

14 24.3
28.7
29.87 30.3
56.7
0.20 59.9
15 4.0
27.0
31.87 35.8
37.8
52.9
16 0.5
0.47 8.0
20.0
32.8
33.17 37.7

1 16 25.40

88 41 2.96

a+1					
1	29.8	14	59.0	16	28.8
9	0.2	13	28.5	16	26.7
4	31.9	11	58.7	16	30.6
5	0.5	10	28.6	16	29.1
6	33.2	8	58.9	16	32.1

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1881phae.proj.1564

6.

1881 Vou 21 LC

O.D 86661
8,36104

6,73660 Identical

h	m	s	m	s	h	m	s						
13	9	26.0			13	(8	46.0	+6	44.9			R 55	33.08
		30.8	9	31.1									
		36.4	+5	59.4		13	49.3	1	41.6	+ 30.8	31.0	R 55	27.05
		53.1	+5	59.9									
		59.1	9	59.7		16	6.9	−0	36.0			R 55	14.20
10		6.3	−5	30.9						30.6	29.5		
		25.0	5	29.8		(21	44.4	)6	13.5			R 55	16.50
		30.2	10	30.3									
		35.8	+1	59.9		24	6.0	8	35.1	+ 30.2	29.9	R 55	12.68
		54.0	4	59.6									
		59.1	10	59.8		25	21.0	9	50.1				
11		5.4	−	30.4						30.2	29.6		
		21.2	4	29.8									
		29.8	11	29.9									
		38.7	3	59.4						29.3	29.7		30.80
		54.7	3	59.8									29.87
12		0.3	12	0.1									30.52
		5.4	−	29.2						29.3	29.8		32.55
		23.8	3	29.7									122.94
		30.8	12	30.1								15	30.74
		35.8	−2	59.6						29.7	29.6		
		54.4	2	59.5									
13		0.5	13	0.6									491.8
		6.9	−	29.8						30.4	30.4	15	30.74
		27.3	2	29.8									
		30.9	13	31.1									
		35.0	+1	59.3						30.4	30.9		
			1	59.8									
15		25.0	−										
		29.5	15	29.4									
		33.8	−	0.2						29.2	29.4		
			−0	0.0									
17		26.2	−										
		31.3	17	31.2									
		36.0	−	59.4						31.8	31.6		
			1	59.6									
18		26.0	−										
		29.7	18	30.0									
		34.3	−2	59.6						30.4	30.2		
			−2	59.8									
19		28.3	−										
		32.0	19	32.1									
		36.0	−3	59.7						32.4	32.4		
			−3	59.6									
20		26.1	−										
		30.5	20	30.6									
		35.1	−4	59.7						30.9	30.9		
21		4.4	21	59.7									
		5.2	21	5.1									
		5.8	−5	29.2						35.9	35.4		
		26.7	−5	29.7									
		31.8	21	31.7									
		36.5	−5	59.0						32.7	31.4		
			−6	0.3									

16) 4942 4918
15 30.89 30.74

1 16 25.02 88 41 −

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1881phae.proj.1564.

1881 Nov 22 UC

0.111581
6.36104
8.77685

6.73660
5.36104
5.09764 Dentzal

h	m	s	m	s	h	m	s					
1	18	13.0			1	20	35.0			R	32	25.75
		23.0	?	11 21.7				22.0				
		29.0	46	0.3		22	2.0			R	32	26.48
		48.2										
		54.0	11	53.1		23	15.8	22.8		R	32	29.00
		57.0	− 5	29.7								
	12	18.7										
		23.9	12	23.3				23.0				
		27.3	− 4	59.7								
		47.0										
		51.5	12	52.3				21.8				23.06
		58.4	− 4	29.5								23.85
	13	18.9										21.25
		35.5	13	25.9				25.5				68.16
		33.4	− 3	59.6								22.72
		40.1										
		52.0	13	53.6				23.3				
	14	2.7	− 3	29.7								
		19.1										
		27.9	14	27.6				27.4				
		35.2	− 2	59.8								
		48.8										
		53.3	14	54.4				24.2				
	15	1.2	− 2	29.8								
		19.7						26.2				
		27.7	15	26.6				~~20.6~~				
		32.5	− 1	59.6								
		46.0										
		50.2	− 15	50.7				20.6				
		56.0	− 1	29.9								
	16	15.0										
		22.3	16	21.8				21.7				
		28.0	− 0	59.9								
		48.2						23.0				
		53.8	16	53.1				~~22.9~~				
		57.2	+ 0	29.89								
	17	11.7										
		16.0	17	16.7				(16.7)				
		22.5	− 0	~~27.0~~								
		41.0										
		48.8	17	48.9				19.1				
		57.0	− 0	29.8								
	18	14.2										
		19.2	18	20.0				20.2				
		26.5	− 0	59.8								
		45.7						23.4				
		53.9	18	53.1								
		59.8	− 1	29.7				(1 16 24.82				88 41 3.47
	19	13.9						21.2				
		20.8	19	21.0				~~20.8~~				
		28.3	− 1	59.8								
		45.1						21.7				
		51.0	19	51.5				~~21.3~~				
		58.5	− 2	29.8								
	20	15.7						21.9				
		21.4	20	21.4				~~20.9~~				
		27.0	− 2	59.5				19) ~~40.15~~				
								~~21.18~~				
								40 90				
								21.53				
								409.0				
								22.72				

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66

- 1881 Nov 24 UC

0, 11581
8, 36095
8476.76

6, 73660
8, 36095
5, 09758

identical

h	m	s	m	s	h	m	s						
	1	11	10.4		0	52	39.2	+24 37.5					
			16.0	11	15.8			+1477.5	16.1				
			21.0	+6	0.3	57	56.0	19 20.7			R	32	6.16
			42.2					+1160.7			R	32	2590
			47.3	11	47.9	59	37.9	17 38.8	17.6				
			54.2	-5	29.7			+1058.8			R	32	3138
	12		11.0			1	0.8	16 15.9			R	32	3592
			17.8	12	17.5			+975.9	17.2				
			23.7	-4	59.7	3	23.4	13 43.3			R	32	4365
			40.3					+823.3					
			45.5	12	45.5	6	20.5	10 56.2	15.0		R	32	5690
			50.8	-4	29.5			+656.2					
h	m	s											
1	2	6.8	13	14.8		9	28.0	+7 48.7			R	32	5895
14.37		14.5	19.4	13	18.7			+468.7	16.3				
		21.8	21.9	-3	59.6								
	3	38.3	40.0										
43.67		43.1	43.0	13	46.6				16.3			16.47	
		49.6	56.8	-3	29.7							17.07	
	5	11.0	14	12.9								33.54	
17.00		17.0	16.2	14	16.8				16.6			16.77	
	6	23.0	21.3	-2	59.8								
		35.3							7)171				
43.13		42.1							16.43				
	8	52.0											
		11.7							117.1				
17.83		17.4							16.73				
		24.4											

1 16 23.85

88 41 4.15

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1881 Dec 7 LC

0.11581
8.36058m
8.47639

6.73660
8.36058m
5.09718m

h	m	s	m	s	h	m	s								
	13	9	—		13	1	51.0	+ 13 228			B	56	7.42		
			13.0	9	15.8			+ 802.8							
			18.6	—		3	33.3	11 40.5			B	56	3.35		
			37.3					+ 100.5							
			41.7	9	42.5	4	57.4	10 16.4			B	55	57.75		
			48.5	—				+ 616.4							
		10	8.0			6	15.2	8 58.6			B	55	53.95		
	10	1402	13.8	10	13.5			+ 538.6							
			18.8	—		21	35.0	− 6 21.2	+		B	55	24.08		
			37.7					− 381.2							
			42.6	10	43.4	23	52.7	8 38.9	+		B	53	20.85		
			49.9					− 518.9							
		11	7.8			25	25.9	10 12.1			B	55	20.32		
			15.8	11	14.9			− 612.1							
			21.2	—		28	32.8	13 19.0			B	55	18.00		
			39.5					− 799.0							
			44.4	11	45.1	30	18.9	15 5.1			B	55	15.70		
			51.5	—				− 905.1							
		12	6.2			31	50.4	− 16 36.6			B	55	15.68		
			14.5	12	13.6			− 996.6							
			20.1	—											
			38.2	—											
	12	4404	42.2	12	42.6										
			47.5	—											
		13	4.5												
			14.1	13	13.9										
			20.0	—											
			38.0												
			45.5	13	45.0										
			51.4	—											
		14	11.0												
			14.2	14	14.9										
			19.6	—											
			37.0												
			43.2	14	43.4										
			50.0	—											
		15	6.3												
	15	1374	14.4	15	13.4										
			19.5	—											
			—												
			—	15	43.0										
			—												
			—												
			—	16	14.0										
			—												
		16	40.2	—											
			44.5	16	44.7										
			49.5	—											
		17	6.2	—				1 16 15.75						88 41 7.85	
			12.7	17	12.5										
			18.6	—											
			37.4												
	17	4370	41.8	17	42.7										
	17	43.34	48.9	—											
		18	5.9												
			9.5	18	12.5										
			23.0	—											
			37.2												
			44.2	18	44.8										
			51.4	—											
		19	9.4												
			14.4	19	15.2										
			21.8	—											
			36.1												
			42.5	19	43.1										
			50.8	—											
		20	4.9												
	20	1386	13.7	20	12.3										
			18.2	—											
			36.0												
			43.0	20	44.2										
			53.7	—											
		21	8.5												
			13.7	21	11.5										
			21.2	—											
	15	13.80			15 13.80										

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- 1881 Dec 8 UC

0.11581
8.36058
8.47639

6.73660
8.36058
5.09718 Identical

h	m	s	m	s	h	m	s			B	′	″		
1	10	55.8		0	50	46.9	+27 11.3			B	31	57.22		
		58.6	10	59.2			+1631.3	59.5						
	11	3.3	+6	0.3	53	18.9	24 39.3			B	32	5.80		
		19.9					+1479.3							
		23.5	11	25.5	54	38.0	23 20.2	55.2		B	32	10.98		
		33.1	−5	29.7			+1400.2							
		54.2			56	15.3	21 42.9			B	32	17.12		
		58.0	11	59.2			+1302.9	58.9						
	12	5.4	−4	59.7	57	38.3	20 19.9			B	32	22.28		
		25.3					+1219.9							
		29.9	12	30.8	1	49.9	16 8.3	0.3		B	32	35.38		
		37.0	−4	29.5			+968.3							
		50.3			3	24.9	+14 33.3			B	32	40.08		
		58.4	12	57.5			+833.3	57.1						
	13	3.8	−3	59.6	23	12.1	− 5 13.9			B	33	21.72		
		23.2					−313.9							
		29.3	13	29.4	26	31.3	8 32.1	59.1		B	33	25.60		
		35.8	−3	29.7			−513.1							
		54.8			27	58.3	−10 0.1	0.3		B	33	26.95		
	14	0.3	14	0.5			−600.1	~~0.7~~						
		6.5	−2	59.8										
		21.7										58.47		
		26.9	14	27.5				57.3				58.45		
		34.0	−2	29.8								57.92		
		53.4										~~57.85~~		
		58.7	14	59.0				58.6				~~230.8~~		
	15	4.9	−1	59.6								232.69		
		25.0										58.17		
		28.8	15	30.0				59.9						
		36.2	−1	29.9								930.8		
		50.0										58.17		
		56.2	15	56.9				56.8						
	16	4.5	−0	59.9										

1 16 15.38

88 41 7.98

	20	57.5												
		55.7	20	56.2				56.4						
	21	1.4	−3	59.8										
		20.2												
		26.8	21	26.4				56.~~8~~						
		32.1	−4	29.~~8~~										
		51.0												
		56.2	21	57.4				57.8						
	22	5.0	−4	59.6										
		25.0												
		29.5	22	29.9				0.1						
		35.1	−5	29.8										
		51.8												
		55.3	22	56.8				56.9						
	23	3.3	−5	59.9										

16) 871.9 8708
54.49 54.55

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- 1881 Dec 9 UC

0,11581
8.36058
8.47639

6.73660
8.36058
5.09718

Identical

h	m	s	m	s	h	m	s								
	1	10	53.6		0	57	42.0	+26 16.6			B	32	3062		
			56.4	10	58.5			+15766	58.8						
		11	5.4	+6	0.3	54	21.0	23 37.6			B	32	4060		
			20.2					+14176							
			30.8	11	29.4	55	41.0	22 17.6	59.1		B	33	1802		
			37.3	-5	29.7			+13376							
			42.9			56	58.3	21 0.3			B	33	1960		
			58.2	11	58.4			+12603	58.1						
		12	4.2	-4	59.7	58	5.3	19 53.3			B	33	2350		
			24.3					+11933							
			30.1	12	29.9	59	23.0	18 35.6	59.4		B	33	2752		
			35.2	-4	29.5			+11156							
h	m	s	53.4			6	52.0	+11 6.6			B	33	4978		
1	1	51.4	59.3	12	59.3			+6666	58.9						
58.10	57.0		13	5.1	-3	59.6	21	44.4	-3 45.8			B	33	1910	
	2	5.9		20.2					-2258						
	3	22.4		28.1	13	27.8	23	15.4	5 16.8	57.5		B	33	2070	
28.77	26.4			35.2	-3	29.7			-3168						
	37.5			48.4			24	41.2	-6 42.6			B	33	2232	
	4	55.0		55.4	13	56.3			-4026	56.1					
	5	1.0		14	5.2	-2	59.8								
1.67		9.0			21.0										
	6	24.3			27.3	14	27.7			57.5			58.86		
29.17	28.7				34.9	-2	29.8						58.33		
		34.5			54.8								117.19		
	7	57.0		15	0.5	15	30.1			59.7			58.59		
57.24	56.8				5.0	-1	59.6								
	8	4.0			24.1										
					30.0	15	30.4			0.3					
					37.0	-1	29.9								
					53.6										
					59.1	15	59.0			58.9					
				16	4.3	-0	59.9								

11) 6443
58.57
644.3
58.57

1 16 14.61

SF 41 8.25

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1881 Dec 10 UC

9.11581
8.36058
8.47639

6.73660
8.36058
5.09718 identical

h m s | m s h m s

1 10 57.4 0 56 49.0 +21 7.9 | β 32 23.10
11 2.9 11 2.4 +1267.9 (2.7) | β 32 33.28
7.0 +6 0.3 59 29.2 18 27.7
22.8 +1107.7
27.3 11 28.0 0 47.3 17 9.6 57.7 | β 32 36.15
33.8 -5 29.7 +1029.6
54.4 6 37.7 11 19.2 | β 32 53.68
12 0.2 12 1.0 +679.2 0.7
8.3 -4 59.7 7 54.0 +10 2.9 | β 32 57.68
21.2 +602.9
26.4 12 26.2 23 18.5 -5 21.6 55.7 | β 33 26.10
30.9 -4 29.5 -321.6
48.2 25 23.8 7 26.9 | β 33 27.70
53.5 12 54.2 -446.9 53.8
13 1.0 -3 59.6 27 30.8 9 33.9 | β 33 30.05
23.3 -573.9
29.0 13 28.6 30 15.0 12 18.1 58.3 | β 33 30.82
33.6 -3 29.7 -738.1
46.8 32 33.0 -14 36.1 | β 33 32.28
51.4 13 53.4 -876.1 53.2
14 2.0 -2 59.8
20.8
28.3 14 28.0 57.8 | 56.74
35.0 -~~1 59.6~~ 2 29.8 | 57.09
53.0 | 113.82
58.4 14 58.8 58.4 | 56.91
15 4.9 -~~1 29.9~~ 1 59.6
22.1
27.1 15 27.0 56.9 | 796.8
31.8 -~~0 59.9~~ 1 29.9 | 56.91
51.5
56.5 15 57.3 57.2
16 4.0 -~~0 29.9~~ 0 59.9

1 16 13.79 | 88 41 8.49

21 25.5
29.4 21 29.5 59.7
33.6 -4 29.8
57.5
58.3 21 58.0 58.4
22 4.2 -4 59.6
15.0
23.3 22 23.5 53.7
32.3 -5 29.8
50.0
55.0 22 55.2 55.3
23 0.5 -5 59.9

14) 796.8
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8.4763 +n

6.73660
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5097 +07 identical
09

h	m	s	h	m	s				RO		
13	9	6.1	12	56	58.1	+18	14.7	20	RR	56	3595
		10.9	9	10.9		+1094.7					
		15.8	+5	59.7	58	20.7	16 52.1	10.6 10.8	RR	56	3108
		36.9	+5	59.6			+1012.1	7.3			
		41.3	9	42.4	59	52.0	15 20.8		RR	56	2638
		49.8	-	30.9			+920.8	13.6 12.5			
	10	6.9	+5	29.8	0	19.3	14 53.5	12.7	RR	56	2005
		12.4	10	13.1			+893.5				
		19.9	+4	59.9	2	10.5	13 2.3	13.0 12.7	RR	56	1365
		38.0	+4	59.6			+782.3	12.1			
		43.4	10	44.1	5	10.0	10 2.8	-	RR	56	535
		51.0	-	30.4			+602.8	14.5 13.9			
h	m	s	11	7.8	4	29.8		10.0			
13	0	3.2		13.4	11	13.9					66.1
7.33		6.4		20.5	+3	59.4		13.3 13.7			76.8
		12.4		38.0	3	59.8		13.0			77.9
	1	37.9		44.2	11	43.8					72
43.30		44.2		48.7	-	29.2		12.8 13.3			
		47.8	12	6.3	3	29.4					
	3	4.3		13.4	12	13.4					11.35
11.93		13.0		20.4	+2	59.6		13.0 12.9			12.80
		18.5		37.5	2	59.5		-			12.88
	4	32.8		41.6	12	42.3					37.03
39.90		39.5		47.7	-	29.8		12.1 12.1		15	12.34
		47.4	13	10.0	2	29.8					
	6	6.5		15.2	13	15.7					
13.17		13.3		21.8	+1	59.3		15.0 15.5			
		19.7		33.2	1	59.8					
				42.9	13	42.0					
				49.8	-	29.3		11.3 11.7			
			14	6.7	1	29.7					
				11.3	14	11.3					
				16.0	+0	59.2		10.5 11.1			
				30.0	90	59.8					
				42.7	14	43.4					
				48.4	-	30.0		13.4 13.2			
			15	7.5	c	29.8					
						3.7					
				44.1	15	14.6					
				19.4	-	- 02		13.5 13.7			
						- 0 0.0					

13) 1666 1671
15 12.81 12.855
2222
15 1234

1 16 13.38

88 41 8.60

	a		+1					
0	7.3	+15	5.5	+15	0.0	15	7.3	
1	43.3	13	29.5	13	29.4	15	12.7	
3	11.9	12	0.9	12	0.2	15	12.1	
4	39.9	10	32.9	10	30.1	15	10.0	
6	13.2	8	59.6	8	57.8	15	13.0	

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1881 Dec 11 LC

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8.47630

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8.36050 49
5.09710

Nautical

09

h	m	s	m	s	h	m	s					R.A.	Decl.
13	9	2.7			13	1	31.4	+13 40.3			B B	56	17.38
		7.3	9	7.3				+820.3					
		12.0	5	59.7		2	53.4	12 18.3	(7.0)	(7.2)	B B	56	12.72
		35.4	5	59.9				+738.3					
		42.6	9	42.6		4	48.6	10 23.1			B B	56	5.22
		49.8	-	3.09				+623.1	13.5	12.4			
10		9.3	5	29.8		5	42.9	9 28.8			B R	56	3.05
		14.0	10	14.4				+568.8		14.0			
		19.8	4	59.9		6	33.0	8 38.7	10.3	12.0	B R	55	59.98
		39.8	4	59.6				+518.7					
		45.1	10	14.3		8	5.2	+7 6.5			B R	55	56.72
		48.1	-	3.04				+426.5	14.7	14.1			
11		2.6	4	29.8		20	51.5	-6 39.8			R R	55	31.98
		11.7	11	10.4				-339.8					
		17.0	3	59.4		22	30.0	7 18.3	9.8	10.2	R R	55	30.70
		34.8	3	59.8				-438.3					
		41.5	11	4.6		23	47.0	8 35.3			R R	55	28.40
		48.5	-	2.92				-515.3	10.8	11.3			
12		5.6	3	29.7		24	51.0	9 39.3			R R	55	26.32
		11.3	12	1.7				-579.3		2			
		18.2	2	59.6		26	2.0	10 50.3	11.3	11.X	R R	55	26.40
		32.8	2	59.5				-650.3		-			
		38.2	12	38.9									
		45.7	-	2.98					(8.7)	(8.7)			12.20
13		1.3	2	29.8									11.93
		11.5	13	11.0									11.62
		20.3	1	59.3					10.3	10.5			35.75
		35.6	1	59.8									11.91
		43.0	13	42.2									
		48.1	-	2.93					11.5	11.9			
14		3.2	1	29.7									
		11.3	14	11.1									
		18.7	0	59.2					10.3	10.9			
		32.4	0	59.8									
		42.8	14	11.0									
		47.8	-	3.00					11.0	10.8			
15		7.5	0	29.8									
		12.5	15	13.7					13.5	13.7			
		21.0	-	2.96									
		36.3	0	0.0									
		44.0	15	4.34									
		49.9	0	3.03					13.1	13.5			
16		4.5	0	29.9						-			
		13.0	16	1.24									
		19.7	1	0.2					12.2	12.5			
		36.7	0	59.9									
		41.9	16	4.13						4			
		45.4	1	29.6					11.7	11.8			
17		3.7	1	29.9		1	16	13.53					88 41 8.81
		8.3	17	4.7									
		17.2	-	5.94					10.3	10.1			
		37.9	1	59.6									
		44.1	17	4.38									
		49.5	2	29.8					14.0	14.0			
18		2.7	2	29.8									
		11.0	18	9.9									
		16.0	-	5.96					10.3	10.1			
			2	59.8									

17) 21.43 19.86 19.90
15 11.28 11.68 11.70
1.951
11.48
209.9
15 11.91

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0.11581 | 6.73660
8.36050 49 | 8.36050 49 Identical
8.47630 | 5.09710 09

- 1881, Dec 15 UC

h m s m s h m s | R O ' "
1 10 42.5 0 53 47.5 +24 5.1 32
48.5 10 50.3 +1445.1 50.6
59.9 +6 0.3 57 20.7 20 31.9
11 15.2 +1231.9 2
20.5 11 21.5 58 22.0 19 30.6 51.X B R 32 2835
28.7 - 5 29.7 +1170.6
43.9 59 40.0 18 12.6 B R 32 3255
50.7 11 54.3 +1092.6 54.0
12 0.3 - 4 59.7 0 46.3 +17 6.3 B R 32 3560
18.7 +1026.3
27.9 12 26.3 1 34.3 55.8 B R 32 3750
32.2 - 4 29.5
47.3 2 27.0 B R 32 4000
52.3 12 52.4 52.0
57.6 - 3 59.6 3 37.7 – B B 32 4372
13 14.5
23.0 13 22.0 4 46.9 51.7 B B 32 4698
28.6 - 3 29.7
46.4 6 8.8 B B 32 5040
52.0 13 51.5 51.3
56.2 - 2 59.8 7 24.1 B B 32 5385
14 13.3
18.0 14 19.5 8 35.5 49.3 B B 32 5795
27.1 - 2 29.8
43.5 23 31.1 B B 33 2392
49.7 14 49.6 49.2
55.5 - 1 59.6 24 43.5 -6 50.9 B B 33 2528
15 22.2 -410.9
26.9 15 26.7 25 46.1 7 53.5 56.6 B B 33 2620
31.0 - 1 29.9 -473.5 –
49.0 26 57.4 9 4.8 B R 33 2765
53.4 15 53.6 -544.8 53.5
58.4 - 0 59.9 27 59.4 10 6.8 B R 33 2812
16 17.7 -606.8
23.4 16 23.1 29 1.5 -12 8.9 53.0 B R 33 2890
28.2 +0 29.9 -728.9
50.1
53.1 16 54.3 54.3 52.72
58.8 - 0 0.0 51.62
54.28
51.90
210.52
52.63

1052.6
52.63

1 16 9.82 88 41 9.42

19 50.4
54.0 19 54.1 54.6
58.0 - 2 59.5
21.1
26.0 20 25.7 56.0
30.0 - 3 29.7 –
46.9
51.3 20 51.4 51.6
56.0 - 3 59.8
21 14.3
23.0 21 22.6 52.8
30.5 - 4 29.8
48.1
53.2 21 53.3 53.7
58.5 - 4 59.6
22 16.3
20.0 22 20.8 51.0
26.0 - 5 29.8
44.6
49.8 22 50.3 50.4
56.4 - 5 59.9 20) 1052.6
52.63

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1881phae.proj.1564.

156.

– 1881 Dec 15 LC

0.11581
8.36050 m
8.47630 n

6.73660
8.36050 m
5.09710 n

Verticals

h	m	s	h	m	s									
13	9	1.8	12	59	49.4	+15	16.0							
		5.5			5.9									
		10.5			59.7	0	53.3	14	12.1	5.6	5.8	BR	56	2202
		25.2			59.9						59.0			
		32.5		9	33.3	1	47.8	13	17.6			BR	56	1978
		42.3			30.9					4.2	3.1			
		59.5			29.8	2	42.3	12	23.1		5.1	BR	56	1762
	10	4.8		10	5.0									
		10.6			59.9	3	41.3	11	24.1	4.9	4.6	BR	56	1475
		31.5			59.6						2.4			
		37.7		10	38.1	4	52.2	10	13.2		–	BR	56	1015
		45.1			30.4					8.5	7.9			
		58.2			29.8	5	50.9	9	14.5		5.0	BR	56	778
	11	3.7		11	4.9									
		12.8			59.4	6	43.0	8	22.4	4.3	4.7	BR	56	580
		35.0			59.8						2.6			
		38.0		11	39.2	7	37.2	7	28.2			BR	56	440
		44.7			29.2					8.4	8.9			
		58.5			29.7									
	12	4.7		12	5.6									3.33
		12.7			59.6					5.2	5.1			5.70
		28.7			59.5						–			5.07
		37.3		12	36.2									14.10
		42.6			29.8					6.0	6.0		15	4.70
		58.8			29.8									
	13	6.2		13	6.3									
		14.0			59.3					5.6	6.1			
		36.0			59.8									
		39.2		13	39.5									
		43.2			29.3					8.8	9.2			
		58.1			29.7									
	14	1.8		14	2.1									
		6.3			59.2					1.3	1.9			
		25.7			59.8									
		33.0		14	33.0									
		40.3			30.0					3.0	2.8			
		58.0			29.8									
X	15	4.3		15	4.4									
		10.8			0.2					4.2	4.4			
				–	0.0									

13) 700 705
15 5.38 54.2

84.6
15 4.70

1 16 9.47

8 8 41 9.50

						a+1								
						59	58.9	+15	6.5	+15	00.1	14	39.0	
						1	35.5	13	29.9	13	29.6	15	5.1	
						3	2.1	12	3.3	12	00.3	15	2.4	
						4	34.8	10	30.6	10	30.2	15	5.0	
						6	2.7	9	2.7	8	59.9	15	2.6	

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0, 11581
8, 36040
8.47621

6.73660
8. 36040
5.09700 duplicate

- 1881 Dec 16 UC

h	m	s	m	s	h	m	s						
1	10	38.2		0	53	20.0	+24 21.3	45.1		B	32	12.10	
		44.7	10	44.8			+1461.3						
		51.6	+ 6	0.3	58	22.7	19 18.6			B	32	29.85	
11		8.9					+1158.6						
		13.1	11	13.1	0	35.3	+47 6.0	42.8		B	32	34.95	
		17.3	- 5	29.7			+1026.0						
		34.3			1	53.2				B	32	40.45	
		38.9	11	39.0									
		43.8	- 4	39.7	3	18.7		38.7		B	32	45.40	
12		7.8											
		12.3	12	12.7	4	51.3		1		B	32	49.70	
		18.0	- 4	29.5				42.2					
		38.0			6	13.5		4		B	32	52.58	
		42.7	12	42.5				42.2					
		47.6	- 3	59.6	22	59.0	- 5 17.7			B	33	24.92	
13		2.0					-317.7	-					
		6.3	13	7.1	24	22.1	6 30.8	36.8		B	33	24.78	
		13.0	- 3	29.7			-410.8						
		34.8			28	7.8	-10 26.5			B	33	31.40	
		40.4	13	41.3			-626.5	41.1					
		48.7	- 2	57.8								42.24	
14		4.7										39.54	
		10.0	14	10.5				40.3				42.16	
		16.9	- 2	29.8								123.94	
		35.2										41.31	
		39.5	14	41.1				40.7					
		48.7	- 1	59.6									
15		5.1										619.7	
		9.2	15	8.9				38.8				41.31	
		12.4	- 1	29.9				-					
		32.4											
		39.2	15	39.8				39.7					
		47.7	- 0	59.9									
21		5.7											
		13.4	21	12.5				42.7					
		18.3	- 4	29.8									
		34.3											
		38.6	21	39.4				39.8					
		45.4	- 4	59.6									
22		10.4											
		14.5	22	14.7				44.9					
		19.3	- 5	29.8									
		35.2											
		44.4	22	43.6				43.7					
		51.2	- 5	59.9									

I 16 9.12

8.8 41 9.59

15) 6192 6197
41.28 41.31

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1881phae.proj.1564.

1564

- 1881 Dec 16 SC

0.11581
8.36040 m
8.47621 n

6.73660
8.36040 n
5.09700 n

Identical

h	m	s	m	s	h	m	s						
13	9	0.1			13	1	39.0	+13	28.7			B 56	11140
		6.3	9	6.5									
		13.0	−5	59.7		3	13.4	11	54.3	6.2	6.8	B 56	1018
		30.7	+6	0.3									
		34.9	9	36.1		4	33.0	10	34.7			B 56	505
		42.7	−	30.9						7.0	5.8		
10		1.4	5	29.7		5	49.8	9	17.9			B 56	265
		5.8	10	7.2									
		14.5	+4	59.9		7	7.2	8	0.5	7.1	6.9	B 55	5470
		31.3	4	59.7									
		36.4	10	37.2		8	24.0	6	43.7			B 55	3182
		44.0	−	30.4						7.6	6.7		
11		0.0	4	29.5		21	22.0	−6	14.3			B 55	2790
		7.2	11	7.5									
		15.3	+3	59.4		23	39.4	8	31.7	6.9	7.1	B 55	2705
		32.3	3	59.6									
		38.4	11	38.3		25	2.0	9	54.3			B 55	2462
		44.2	−	29.2						7.5	8.0		
12		3.3	3	29.7		26	25.0	12	17.3			B 55	2260
		8.0	12	8.2									
		13.3	+2	59.6		27	48.2	12	40.5	7.8	8.0		
		31.3	2	59.8									6.66
		35.5	12	36.5									7.34
		42.7	−	29.8						6.3	6.3		8.86
13		2.1	12	29.8									7.50
		7.2	13	4.3									30.36
		12.5	+1	59.3						6.6	6.9		7.54
		30.7	1	59.6									
		37.7	13	37.6									
		44.4	−	29.3						8.3	7.5		157.8
14		3.2	1	29.9									7.54
		9.8	14	4.7									
		14.2	+0	59.2						9.9	9.0		
		32.7	0	59.9									
		38.3	14	38.2									
		43.6	−	30.0						8.2	8.1		
15		3.5	0	29.9									
		9.4	15	4.8									
		16.4	−	0.2						9.6	9.8		
		32.0	−0	0.0									
		39.0	15	38.9									
		45.6	−0	30.3						8.6	9.1		
16		1.0	−0	29.8									
		8.7	16	8.1									
		14.7	−1	0.2						7.9	8.3		
			−0	59.8									
												1 16	8.78
												88 41	9.69
19		2.0											
		7.3	19	7.5									
		13.2	−3	59.7						7.8	7.7		
		33.0	−3	59.8									
		39.0	19	38.4									
		43.3	−4	29.7						8.7	8.6		
20		0.4	−4	29.8									
		7.0	20	6.8									
		13.1	−4	59.7						7.1	7.2		
		32.4	−4	59.6									
		38.2	20	37.9									
		43.2	−	29.7						8.7	8.1		
21		0.7	−5	29.8									
		4.8	21	5.5									
		11.8	−5	59.0						6.8	5.9		
			−5	59.9									
										29	154.6	151.8	
											7.73	7.59	

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- 1884 Dec 17 UC

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8.36040
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6.73660
8.36040
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h	m	s	m	s	h	m	s		R	Q	′	″
			10	34.8		0	55	11.6		BR	32	7.68
			40.4	10 40.5					40.8			
			46.4	+6 0.3			56	9.0		BR	32	1330
			11	5.2								
			11.0	11 11.9			57	9.7	41.6	BR	32	1740
			18.4	-5 29.7								
			35.2				58	11.8		BB	32	2032
			39.0	11 39.6					39.3			
			44.5	-4 59.7			59	14.9		BB	32	2408
			12	4.8								
			8.8	12 9.1			0	25.4	38.9	BB	32	2750
			14.7	-4 29.5								
h	m	s	36.3				1	29.0		BR	32	3118
1	1	37.4	39.2	12 40.1					40.0			
42.23	41.8		45.7	-3 59.6			2	3.0		BR	32	3685
	47.5		13	7.6								
3	5.7		11.9	13 12.3			2	50.0	42.0	BR	32	3832
10.60	10.4		17.5	-3 29.7								
	15.7		34.8				3	51.4	—	BR	32	4115
4	34.9		40.0	13 41.5					41.3			
41.83	42.3		49.8	-2 59.8			5	4.7		BR	32	4475
	48.3		14	7.4								
6	7.2		11.5	14 11.9			6	27.3	41.7	BR	32	4915
13.3	13.0		16.7	-2 29.8								
	19.7		36.5				23	1.5		BR	33	2060
7	35.9		40.6	14 40.9					40.5			
40.87	39.7		45.6	-1 59.6			24	14.7		BR	33	2258
	47.0		15	3.4								
			9.0	15 8.7			25	10.2	38.6	BR	33	2345
			13.6	-1 29.9								
			32.5				26	23.7		BB	33	2432
			38.9	15 38.9					38.8			
			45.4	-0 59.9			27	37.4		BB	33	2478
			16	6.3								
			11.4	16 12.1			(29	42.5)	42.3	BB	33	2598
			19.5	-0 29.9								
			38.6				(29	48.9)	—			
			41.9	16 42.5					42.5			
			47.1	-0 0.0								

40.43
40.53
44.20
125.16
41.72

751.0
41.72

1 16 8.45

88 41 9.77

			20	40.6								
			46.7	20 45.6					45.8			
			49.5	-3 59.8								
			21	8.8								
			14.0	21 14.4					44.6			
			20.5	-4 29.8								
			38.8									
			45.9	21 46.0					45.4			
			50.2	-4 59.6								
			22	7.5								
			10.7	22 12.5					42.7			
			19.4	-5 29.8								
			39.9									
			43.5	22 44.8					44.2			
			49.0	-5 59.9								

18) 751.0
41.72

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– 1881 Dec 17 ☌ C

0,11581
8,36040 n
8,47621 n

6,73660
8,36040 n
5,09700 n Identical

h m s	h	m	s	m s	h	m	s						′	″
	13	9	0.5		12	59	44.4	+15 24.2				R R	56	19.52
			8.2	– 9 7.3				+924.2						
			13.3	± 5 59.7		3	19.0	11 49.6	7.0	7.2		R	56	7.32
			32.6	+ 5 59.9				+709.6						
			38.1	9 38.7		4	43.6	10 25.0				R	56	3.42
			45.3	– 30.9				+625.0	9.6	8.5				
		10	4.2	– 5 29.8		6	13.7	8 54.9				R	56	0.05
			9.8	10 10.2				+534.9						
			16.6	– 4 59.9		21	30.0	– 6 21.4	10.1	9.8		R R	55	30.62
			32.6	+ 4 59.6				–381.4						
			36.7	10 36.9		23	4.3	7 55.7				R	55	28.02
			41.5	– 30.4				–475.7	7.3	6.7				
h m s		11	4.9	4 29.8		24	21.9	9 13.3				R	55	26.58
12 59 54.3			10.9	11 10.6				–553.3		10.4				
0 4.2			15.9	± 3 59.4		25	31.7	10 23.1	10.0	~~8.9~~		R	55	25.25
2.37 8.6			31.7	3 59.8				–623.1						
1 29.3			36.4	11 37.5										8.30
34.80 34.3			44.4	– 29.2					6.7	7.2				9.11
40.8		12	3.7	3 29.7										8.59
2 59.0			8.8	12 9.6										26.00
3 1.2			16.2	– 2 59.6					9.2	9.1			15	8.66
1.73 5.0			34.0	2 59.5										
4 31.4			39.5	12 39.7										–156.0
36.43 36.5			45.7	– 29.8					9.5	9.5			15	8.66
41.4		13	2.0	2 29.8										
6 0.3			6.6	13 7.0										
5.97 5.2			12.5	± 1 59.3					(6.3)	(6.8)				
12.4			32.1	1 59.8										
			38.2	13 38.5										
			45.2	– 29.3					7.8	8.2				
		14	4.0	1 29.7										
			9.4	14 10.2										
			17.2	± 0 59.2					9.4	10.0				
			35.5	0 59.8									a + 1	
			41.0	14 39.8									0 2.4	+15 6.2
			42.8	– 30.0					9.8	9.6				
		15	2.2	0 29.8									1 34.8	13 33.8
			8.0	15 8.3										
			14.7	– 0.2					8.1	8.3			3 1.7	12 6.9
			33.2	± 0 0.0										
			38.3	15 38.9									4 36.4	10 32.2
			45.3	± 0 30.3					8.6	9.0				
		16	6.0	– 0 29.9									6 6.0	9 2.6
			11.0	16 11.3										
			17.0	± 1 0.2					11.1	11.4			✓	✓
			33.0	– 0 59.9										
			40.0	16 39.8										
			46.4	± 1 29.6					10.2	9.9				
				– 1 29.9		1	16	8.11						
		20	1.2											
			7.8	20 7.4										
			13.2	± 4 59.7					7.7	7.7				
			30.9	– 4 59.7										
			36.1	20 36.5										
			42.5	– 29.2					7.3	6.8				
		21	0.3	5 29.7										
			7.2	21 7.0										
			13.4	± 5 59.0					8.0	6.7				
				– 6 0.3										
								1574	18) 163.7	158.7				
								8.74	15 8.62	8.82				

88 41 9.87

h m
1 1
46.47
3
16.30
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1884phae..proj..1564

0.11581
8.36040
8.47621

6.73660
8.36040
5.09780

1881 Dec 18 UC

h	m	s	m	s	h	m	s			R	W	′	″
	1	10	36.1		0	56	23.1	+21 19.9		R	R	32	1622
			42.5	10	42.6			+1279.9	42.9				
			49.3	+ 6	0.3	58	7.4	19 35.6		R	R	32	2290
	11	7.0						+1175.6					
			13.2	11	12.8	59	42.5	18 0.5	42.5	R	R	32	2650
			18.1	- 5	29.7			+1080.5					
			38.0			1	5.5	16 37.5		R	R	32	3132
			42.4	11	42.6			+999.5	42.3				
			47.3	- 4	59.7	3	6.8	+ 14 36.2 ✓		R	R	32	3772
	12	6.7						+876.2					
			10.3	12	11.2	4	32.1	+13 10.9	40.7	R	R	32	4160
			16.1	- 4	29.5			+790.9					
h	m	s	37.1			22	59.4	- 5 16.4 ✓		R		33	1790
1	1	40.2	43.9	12	43.5			-316.4	43.1				
46.47		46.6	48.5	- 3	59.6	24	19.5	6 36.5	-	R		33	2012
		52.6	18	8.2				-396.5					
	3	11.9	13.2	13	14.0	25	41.8	7 58.8	43.7	R		33	2478
16.30		17.6	20.6	- 3	29.7			-478.8					
		20.0	38.4			26	51.8	9 8.8		R		33	2198
	4	39.6	43.0	13	43.5			-548.8	43.3				
45.0		45.2	49.1	- 2	59.8	28	1.4	10 18.4		R		33	2338
		50.2	14	9.8				-618.4					
	6	10.5	14.4	14	14.5				44.3				
17.10		17.5	19.4	- 2	29.8							42.30	
		23.3	35.0									43.68	
	7	40.5	41.2	14	42.4				42.0			43.02	
45.90		48.7	51.0	- 1	59.6							129.00	
		51.5	15	10.8								43.00	
			14.7	15	15.2				45.1				
			20.0	- 1	29.9				-			645.0	
												43.00	

2 16 7.77

88 41 9.97

	20	37.8											
		41.9	20	43.2					43.0				
		49.8	- 3	59.8									
	21	5.6											
		12.3	21	11.8					41.6				
		17.6	- 4	29.8									
		36.9											
		42.2	21	42.8					42.4				
		49.4	- 4	59.6									
	22	9.3											
		14.2	22	14.7					44.5				
		20.5	- 5	29.8									
		38.9											
		43.0	22	43.7					43.6				
		49.1	- 5	59.9									

15) 6450
43,00

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1881phae.proj.1564

882

- 1881 Dec 18 LC

0,111581
8,360 40m
8,476 21m

6,736 60
8,360 40m
5,097 00m

Identical

h	m	s	m	s				R	O	′	″
13	8	55.1	12	58	28.4	+16 35.0		B	R	56	22.32
	9	3.7	9	2.3		+9950					
		8.0	+5	59.7	59	42.0	15 21.4	2.0	2.2	B	R 56 18.40
		25.8	+5	59.9			+921.4		0.3		
		31.2	9	3.2	0	40.8	14 22.6			B	R 56 15.98
		36.5	-	30.9			+862.6	2.1	1.0		
		58.3	5	29.8	1	52.4	13 11.0		5.2	B	R 56 10.82
	10	1.9	10	3.4			+791.0				
		9.9	+4	5.9.9	2	51.0	12 12.4	3.3	3.0	B	R 56 7.82
		28.1	4	59.6			+732.4		5.2		
		33.2	10	34.0	3	53.0	11 10.4			B	R 56 7.72
		40.7	-	30.4			+670.4	4.4	3.8		
		57.3	4	29.8	4	53.3	10 10.1		4.2	B	R 56 3.75
12	57	53.8	11	1.5	11	3.0					
0,23		58.9		10.0	+3	59.4	6 18.7	8 44.7	2.4	2.8	B R 55 59.00
	0	8.6		27.0		59.8		+524.7		1.8	
	1	29.2		32.2	11	32.4	7 14.1	7 49.3		—	B R 55 56.15
35.60		35.5		38.0	-	29.2		+469.3	1.6	2.1	
		42.1		58.4	3	29.7	7 59.0	9 4.4			B R 55 53.90
	2	59.0	12	2.4	12	2.4		+424.4			
	3	4.5		7.2	+2	5.9.6			2.3	2.2	
4.93		11.3		26.6	2	59.5					
	4	31.5		31.4	12	32.5					2.34
3.397		34.0		39.4	-	29.8			2.3	2.3	3.56
		36.4		58.0	2	29.8					3.12
	5	56.0	13	3.8	13	3.7					5.14
	6	0.2		9.3	+1	5.9.3			3.0	3.5	14.16
1.93		9.6		29.5	1	59.8					15 3.54
				35.3	13	35.8					
				42.6	-	29.3			5.1	5.5	
			14	0.7	1	29.7				—	
				5.5	14	5.5					
				10.3	+0	5.9.2			4.7	5.3	
				30.4	0	59.8					
				34.4	14	35.3					
				41.2	-	30.0			5.3	5.1	
			15	0.3	0	29.8					
				4.5	15	5.0					
				10.3	-	0.2			4.8	5.0	
				30.0	0	0.0					
				34.6	15	35.8					
				42.8	-0	30.3			5.5	5.9	
				57.7	0	29.9					
			16	4.6	16	4.3					
				10.7	-1	0.2			4.1	4.4	
				25.4	-0	59.9					
				30.0	16	30.8					
				37.0	-1	29.6					
					-1	29.9					
									(1.2)	(0.9)	
								15)	54 1		54 1
								15	3.38		
									5.29		3.61
									3.53		
											70.8
											15 3.54

1 16 7.43

88 41 10.07

a+1

0	0.2	+15	3.2	+15	0.1	15	0.3	
1	35.6	13	27.8	13	29.6	15	5.2	
3	4.9	11	58.5	12	00.3	15	5.2	
4	34.0	10	29.4	10	30.2	15	4.2	
6	1.9	9	1.5	8	59.9	15	1.8	

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0.11581
8.36040
8.47621

6.73660
8.36040
5.09700

Identical

1881 Dec 19 UC

h	m	s	m	s	h	m	s			R	O	′	″
					1	10	35.0			B	A	32	3.15
							38.6	10	40.0				
							46.4	+6	0.3	B	B	32	5.35
					11		9.5						
							12.7	11	13.0	B	B	32	13.10
							16.8	−5	29.7				
							34.8			B	B	32	17.90
							39.4	11	38.8				
							42.3	−4	59.7	B	B	32	22.30
					12		3.2						
							8.3	12	10.1	B	R	32	27.12
							18.7	−4	29.5				
							31.4			B	R	32	30.58
1	1	43.6					39.6	12	39.5				
46.87		46.6					47.3	−3	59.6	B	R	32	33.48
		50.4			13		4.9						
	3	9.0					11.6	13	11.0	B	R	32	36.25
14.93		13.3					16.5	−3	29.7				
		22.5					38.2			B	R	32	39.40
	4	42.7					40.3	13	41.2				
48.53		48.2					47.0	−2	59.8	B	R	33	20.85
		54.7			14		5.5						
	6	10.0					9.6	14	10.2	B	R	33	21.62
16.17		17.0					15.4	−2	29.8				
		21.5					33.2			B	R	33	22.95
	7	33.5					39.5	14	39.7				
39.63		39.7					46.3	−1	59.6	B	R	33	23.58
		45.7			15		6.7						
							12.0	15	11.9	B	R	33	25.42
							17.0	−1	29.9				
							35.8			B	B	33	25.65
							41.3	15	41.5				
							47.5	−0	59.9	B	B	33	26.48
					16		8.0						
							12.7	16	12.2	B	B	33	26.28
							15.9	−0	29.9				
							36.2			B	B	33	27.90
							41.0	16	41.2				
							46.2	−0	0.0	B	B	33	28.50

40.15
40.93
40.08
121.16
40.39

1 16 7.07

88 41 10.17

					21		1.7						
							7.1	21	6.8				
							11.5	−4	29.8				
							34.3						
							39.2	21	39.5				
							45.0	−4	59.6				
					22		4.8						
							9.8	22	10.4				
							13.7	−5	29.8				
							36.5						
							40.9	22	41.6				
							47.5	−5	59.9				

37.0
39.9
40.6
41.7

17) 686.9
40.41

6.86.9
40.41

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54

- 1881 Dec 19 LC

0.11581
8.36040 m
8.47621 n

0.73660
8.36040 m
5.09700 n

Identical

h	m	s		m	s	h	m	s							
13	8	52.8				13	0	1.8	14	58.4			B	56	1692
		58.0		8	58.6										
	9	5.0	+	5	59.7		2	3.3	12	56.9	58.3	58.5	B	56	1052
		22.6	+	5	58.9										
		29.4		9	29.2		4	13.9	10	46.3			B	56	455
		35.5	−		30.9						59.1	59.0			
		53.5		5	29.8		5	39.6	9	20.6	+		B	55	5788
	10	1.5		10	1.1										
		8.2	+	4	59.9		21	29.3	−6	29.1	1.0	0.7	B	55	2900
		26.4		4	59.6										
		32.2		10	31.9		23	31.2	8	31.0		.7	B	55	2642
		37.0	−		30.4						2.3	1.7			
		53.2	−	4	29.8		25	40.0	10	39.8	+	−	B	55	2420
	11	1.4		11	0.3										
		6.4	+	3	59.4		27	47.8	12	47.6	59.7	0.1	B	55	2322
		24.0		3	59.8										
		28.4		11	29.3		29	20.4	14	20.2			B	55	2145
		35.5	−		29.2						58.5	59.0			
		55.4		3	29.7		30	56.0	15	55.8			B	55	2090
	12	0.8		12	0.5										
		5.3	+	2	59.6						0.1	0.0			
		25.7		12	59.5										
		31.4		12	31.4										
		37.2	−		29.8						1.2	1.2			
		55.3		2	29.8							−			
	13	1.0		13	0.8										
		6.2	+	1	59.3						0.1	0.6			
		24.8		1	59.8										
		31.5		13	31.1										
		37.0	−		29.3						0.4	0.8			
		55.2	−	1	29.7										
	14	1.1		14	0.5										
		5.8	+	0	59.2						59.9	0.5			
		25.0		0	59.8										
		31.3		14	30.9										
		36.4	−		30.0						0.9	0.7			
		54.4		0	29.8										
	15	1.5		15	1.1										
		7.3	−		0.2						0.9	1.1			
				0	0.0										

13) 78.24
15 0.18

~~78.44~~
~~0.34~~
78.10
0.30

3.9
15 .30

1 16 6.71

88 41 10.27

59.97
.08
0.74
0.79
.33

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1881phae.proj.1564.

1881 Dec 20 UC

0, 11581
8.36040
8.47621

6.73660
8.36040
5.09700

h	m	s					
0	54	10.9	B	32	740		
	56	40.9	B	32	1770		
	58	2.9	B	32	2170		
	7	16.6	B	32	4868		

h	m	s
1	1	39.7
		44.4
	3	3.4
9.40		8.4
		16.4
	4	33.0
40.40		41.4
		46.8
	7	33.4
46.20		39.5
		47.7

a+1 1 16 6.33 88 41 10.37

9	9.4	+13	29.6	16	34.0
4	40.4	12	60.3		40.7
7	40.2	8	56.9		40.1

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1881phae.proj.1564.

56

- 1881 Dec 20 2C

0.11581
8.36040 m
8.47621 p

6.73660
8.36040 m
5.04700 p

Identical

h	m	s	m	s	h	m	s					
13	9	0.5			13	1	55.9	+13 5.7			B	56 1052
		4.4	9	4.3				+785.7				
		8.1	+ 5	59.7		3	24.0	11 37.6	4.0	4.2	B	56 888
		25.5	+ 5	59.9				+697.6				
		34.1	9	32.7		5	14.5	9 47.1			B	56 3.38
		38.5	-	30.9				+587.1	3.6	2.5		
		55.0	5	29.8		6	33.7	8 27.9			B	55 5942
		59.4	9	59.7				+507.9				
	10	4.7	+ 4	59.9		7	47.0	9 14.6	59.6	59.3	B	55 5382
		25.0	4	59.6				+434.6				
		31.4	10	31.5		23	14.0	- 8 12.4			B	55 2812
		38.0	-	30.4				- 492.4	1.9	1.3		
		58.3	4	29.8		24	55.3	9 53.7		-	B	55 2623
	11	3.8	11	3.8				- 593.7				
		9.2	+ 3	59.4		26	26.3	11 24.7	3.2	3.6	B	55 2498
		24.2	- 3	59.8				- 684.7				
		30.9	11	30.5		29	1.8	14 0.2			B	55 2262
		36.3	-	29.2				- 840.2	59.7	0.2		
		57.8	3	29.7		32	4.3	17 2.7			B	55 2138
	12	4.0	12	3.7				- 1022.7				
		9.4	+ 2	59.6					3.3	3.2		
		27.5	- 2	59.5								1.82
		31.9	12	32.7								2.37
		38.6	-	29.8					2.5	2.5		1.04
		54.0	2	29.8								5.23
			13	1.6								1.74
	13	9.2	+ 1	59.3					0.9	1.4		
		24.5	- 1	59.8								
		31.0	13	30.5								
		36.0	-	29.3					59.8	0.2		
		55.0	1	29.7								
	14	1.3	14	1.2								
		7.3	+ 0	59.2					0.4	1.0		
		23.8	- 0	59.8								
		29.1	14	30.4								
		38.2	-	30.0					0.4	0.2		
		57.8	+ 0	29.8								
	15	2.1	15	2.4								
		7.3	-	0.2					2.2	2.4		
			- 0	0.0								

13) 80 15 220
75 1.65 1.69
2 2.0
1.69

1 16 5.94

88 41 10.48

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- 1881 Dec 21 UC

0.11581
8.36040
8.47621

6.73660
8.36040
5.09700

Identical

h	m	s	m	s	h	m	s					
1	10	38.9		0	59	5.5	+18 44.5			B	32	2885
		42.5	10	43.8			+1124.5	44.1				
		50.0	+6	0.3	1	43.0	16 7.0			B	32	3798
	11	2.1					+967.0					
		10.4	11	9.1	3	18.0	17 32.0	38.8		B	32	4130
		14.8	-5	29.7			+872.0					
		38.3			4	46.7	13 3.3			B	32	4788
		44.0	11	43.5			+783.3	43.2				
		48.2	-4	59.7	6	15.5	11 34.5			B	32	4868
	12	5.5					+674.5					
		12.6	12	12.1	7	39.7	10 10.3	41.6		B	32	5382
		18.2	-4	29.5			+610.3					
		38.3			22	52.5	-5 2.5			B	33	2162
		42.3	12	42.8			-302.5	42.4				
		47.8	-3	59.6	26	40.7	8 50.7			B	33	2540
	13	4.3					-530.7					
		8.4	13	9.5	28	5.4	10 15.4	39.2		B	33	2622
		15.8	-3	29.7			-615.4					
		37.8			30	6.9	-12 16.9			B	33	2860
		42.6	13	42.9			-736.9	42.7				
		48.4	-2	59.8								
	14	4.6										
		9.5	14	10.2				40.0				41.92
		16.4	-2	29.8								41.07
		38.2						42.0				40.03
		42.3	14	42.4				~~40.0~~				40.87
		46.8	-1	59.6								203.89
	15	0.0										40.97
		10.3	15	8.7				38.6				
		15.8	-1	29.9								
		34.7										655.6
		41.0	15	40.5				40.4				40.98
		45.8	-0	59.9								
	16	4.2										
		9.4	16	9.2				39.1				
		14.1	+0	29.9								
	21	2.1										
		10.0	21	10.2								
		18.4	-4	29.8				40.4				
		35.3										
		42.5	21	42.3				42.7				
		49.0	-4	59.6								
	22	6.4										
		10.3	22	10.4				40.6				
		14.6	-5	29.8								
		33.2										
		40.7	22	39.7				39.8				
		45.3	-5	59.9								

1 16 5.53

88 41 10.59

16) ~~6536~~ 6556
~~40.85~~ 40.98

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1881phae.proj.1564.

68

-1881 Dec 23 LC

0.11581
8.36030n
8.47611n

6.73660
8.36030n
5.09690n

Identical

h	m	s	m	s	h	m	s							
13	8	50.2			13	5	13.0	+9 44.9			B	56	6.88	
		56.2	8	55.3				+584.9						
		59.6	+5	59.7		6	44.3	8 13.6	55.0	55.2	B	56	2.95	
	9	22.5	+5	59.9				+493.6						
		27.8	9	28.2		22	42.9	-7 45.0			B	53	31.60	
		34.2	-	30.9				-465.0	59.1	58.0				
		54.2	5	29.8		24	28.0	9 30.1			B	55	30.28	
		59.4	9	59.1				-570.1						
	10	5.7	+4	59.9		25	57.8	10 59.9	59.0	58.7	B	55	29.10	
		23.3	4	59.6				-659.9						
		28.4	10	29.0		27	20.3	12 22.4			B	55	28.08	
		35.3	-	30.4				-742.4	59.4	58.8				
		54.5	4	29.8		28	59.2	14 1.3		-	B	55	26.68	
		59.0	10	59.2				-841.3		59.0				
	11	4.2	+3	59.4		30	24.0	15 26.1	58.6	~~58.8~~	B	55	25.60	
		23.5	3	59.8				-926.1						
		29.1	11	29.3		31	56.7	16 58.8			B	55	23.05	
		35.4	-	29.2				-1018.8	58.5	59.0				
		53.4	3	29.7		33	55.1	18 57.2			B	55	23.92	
		58.6	11	58.5				-1137.2						
	12	4.3	+2	59.6					58.4	58.3				
		22.3	2	59.5										
		27.4	12	2.7									57.67	
		33.3	-	2.8					57.5	57.5			58.70	
		51.2	-	2 29.8									57.08	
		54.5	12	55.3									173.45	
	13	0.3	+1	59.3					56.4	55.1			57.81	
		28.5	1	59.8										
		31.3	13	3.3										
		34.2	-	2.9	3				0.6	1.0				
		53.4	1	29.7										
		57.2	13	57.3										
	14	1.4	+0	59.2					56.5	57.1				
		22.3		0 59.8										
		26.0	14	26.5										
		31.2	-	3.0					56.5	56.3				
		50.4	+0	29.8										
		57.4	14	56.9										
	15	3.0	-	0.2					56.4	56.9				
			-0	0.0										
									13) 7522	~~7507~~				
									14 57.86	~~57.75~~				
										7509				
										57.76				
										750.9				
										57.76				
								1 16	3.31					

88 41 11.06

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1881phae.proj.1564.

0.11581
8.36030
8.47611

6.73660
8.36030
5.09690

- 1881 Dec 24 UC

h	m	s	m	s	h	m	s				
1	10	31.2			0	54	29.0			B 32	14.92
		35.4	10	35.7				36.0			
		40.5	- 6	0.3		56	36.7			B 32	22.85
	11	0.3						36.1			
		5.8	11	6.4		58	15.1	~~38.1~~		B 32	28.95
		13.0	- 5	29.7							
		40.0				0	10.4			B 32	35.18
		43.6	11	44.0				(43.7)			
		48.5	- 4	59.7		2	18.6			B 32	42.05
		56.6									
	12	1.5	12	1.9		4	19.0	31.4		B 32	47.45
		7.7	- 4	29.5							
		31.2				(8	44.5)			B 33	27.82
		36.2	- 12	36.9				36.5			
		43.4	- 3	59.6		23	7.0			B 33	26.15
	13	2.3									
		8.6	13	8.1		25	13.6	37.8		B 33	26.22
		13.4	- 3	29.7				—			
		31.0				27	26.6			B 33	28.93
		37.6	13	37.9				37.7			
		45.2	- 2	59.8							
		59.4									
	14	5.4	14	6.1				35.9			
		13.4	- 2	29.8							
		28.5									
		34.1	14	34.4				34.0			
		40.7	- 1	39.6							
		58.3									
	15	5.0	15	4.8				34.7			
		11.0	- 1	29.9							
		31.3									
		36.6	15	37.1				37.0			
		43.4	- 0	59.9				—			
	16	2.3									
		7.3	16	7.4				37.3			
		12.7	- 0	29.9							
		33.8									
		38.2	- 16	38.8				38.8			
		44.3	- 0	0.0							

(1 16 3.83)

88 42 11.14

	21	24.8									
		32.3	21	32.3							
		39.7	- 4	59.6				32.7			
	22	5.1									
		12.0	22	11.5				(41.7)			
		15.4	- 5	29.8							
		34.3									
		40.3	22	40.3							
		46.3	- 5	59.9							

404
14) ~~5013~~ 5063
~~35.81~~ 36.16

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1881phae.proj.1564

20

1881 Dec 25 SC

0.111581
8.360300
8476.11

6.736600
8.360300
509690

h m s	m s h	m s						
13 8 55.5	13	3 22.7	+11 34.7		B	56	8.72	
59.4	8 59.0		+694.7					
9 2.2		5 29.0	9 28.4		B	56	2.58	
20.4			+568.4					
26.3	9 26.0	6 56.0	8 1.4		B	56	0.05	
31.2			+481.4					
54.2		20 46.1	-5 48.7	+	B	55	32.30	
9 58.62 58.5	9 59.3		-348.7					
10 5.3		21 56.8	6 59.4		B	53	30.50	
25.4			-419.4					
30.0	10 30.2	23 50.8	8 53.4		B	53	27.18	
35.3			-533.4					
52.3		24 51.7	9 54.3	+	B	53	26.48	
59.2	10 58.6		-594.3					
11 4.4		26 54.0	11 56.6		B	53	24.58	
24.2			-716.6					
31.0	11 30.5	27 56.4	12 59.0		B	53	24.32	
36.4			-779.0					
50.0		30 24.5	15 27.1		B	53	22.28	
12 0.2	12 0.4		-927.1					
4.9								
22.3								
12 30.18 28.8	12 28.7							
35.0								
55.4								
13 0.2	13 0.6							
6.3								
25.4								
30.3	13 30.7							
36.3								
51.3								
55.3	13 55.5							
14 0.0								
14.3								
20.5	14 22.0							
31.3								
52.5								
14 55.84 57.3	14 57.6							
15 3.0								
19.5								
26.5	15 26.4							
33.3								
53.7								
57.4	15 57.7							
16 2.0								
18.8								
24.7	16 24.9							
31.3								
48.3			1 16 1.41					88 41 11.35
52.5	16 54.4							
17 2.4								
17.3								
17 26.28 26.7	17 25.8							
33.4								
53.2								
59.5	17 59.3							
18 5.3								
	18 27.0							
51.0								
55.4	18 55.9							
19 1.3								
19.7								
28.0	19 27.6							
35.1								
51.3								
19 56.12 58.2	19 57.6							
20 3.2								
20.2								
24.0	20 24.8							
30.3								
50.1								
54.6	20 54.7							
59.3								
14 57.408	14 57.408							

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1881phae.proj.1564.

- 1881 Dec 30 UC

0.11581
8.36021
8.47602

6.73660
8.36021
5.09681

Identical

h	m	s	m	s	h	m	s					
1	10	28.3		0	57	37.8	+19 52.2			B	32′	1″92
		31.4	10	32.0			+1192.2	32.3				
		36.2	1	6 0.3	59	15.4	18 7.6			B	32	2410
		50.0					+1094.6					
	11	55.0	10	55.5	0	42.8	16 47.2	25.2		B	32	2838
	11	1.4	5	29.7			+1007.2					
		25.1			2	1.7	15 28.3			B	32	3235
		31.3	11	30.7			+928.3	30.4				
		35.8	4	59.7	3	28.2	14 1.8			B	32	3685
		53.2					+8418					
	12	1.3	12	0.3	5	21.6	12 8.4	29.8		B	32	4380
		6.3	4	29.5			+728.4					
		19.8			22	58.1	5 28.1			B	33	16.72
		20.9	12	26.7			-328.1	26.3				
		33.4	3	59.6	25	49.0	8 19.0			B	33	2010
		50.2					-499.0					
		55.4	12	55.5	27	8.4	9 38.4	25.2		B	33	2012
	13	0.9	3	29.7			-578.4					
		21.8			28	3.8	10 38.8			B	33	2250
		29.2	13	28.5			-633.8	28.3				
		34.6	2	59.8								
		48.0										28.20
		55.3	13	55.1				24.9				28.13
	14	1.9	2	29.8				?				33.26
		23.9										89.59
		29.7	14	29.1				29.0				29.86
		34.5	1	59.6								
		51.6										
		57.2	14	58.0				27.9				570.8
	15	5.2	1	29.9								30.04
		22.1										
		27.5	15	28.0				27.9				
		34.5	0	59.9								
		54.6										
		58.8	16	0.9				30.8				
	16	9.4	0	29.9								
		29.5										
		33.0	16	33.2				33.2				
		37.0	0	0.0								
		59.0										
	17	2.7	17	3.3				33.1				
		8.3	0	29.8								

1 15 57.59

88 41 11.80

	20	27.3										
		33.1	20	32.8				33.0				
		38.1	3	59.8								
		55.3										
	21	1.1	21	1.6				31.8				
		8.3	4	29.8								
		27.4										
		32.2	21	32.6				33.0				
		38.1	4	59.6								
		57.3										
	22	2.7	22	3.3				33.5				
		10.0	5	29.8								
		30.2										
		34.3	22	35.1				35.2				
		40.7	5	59.9								

19) 5712 5708
30.06 30.04

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- 1881 Dec 30 LC

0.11581
8.36021m
8.47602m

6.73660
8.36021m
5.09681m

Identical

h	m	s	m	s	h	m	s							
13	8	41.3			13	2	1.5	+12	42.3			B	56	1080
		46.2	8	46.3				+7623						
		51.4	5	59.7		3	57.3	10	46.5	46.0	46.2	B	56	325
	9	7.9	75	59.9				+6465						
		13.3	9	12.8		5	23.5	9	20.3			B	56	095
		17.3	-	30.9				+5603		43.7	42.6			
		39.3	5	29.8		7	5.2	7	38.6			B	55	5788
		42.4	9	43.2				+4586		+				
		48.0	+4	59.9		20	57.5	-6	13.7	43.1	42.8	B	55	3030
	10	6.2	- 4	59.6				-373.7		+				
		11.4	10	11.7		24	24.3	9	40.5			B	55	2642
		17.4	-	30.4				-580.5		42.1	41.5			
		33.3	4	29.8		25	52.0	11	8.2			B	53	2520
		39.3	10	38.9				-668.2						
		44.2	+3	59.4		29	4.5	14	20.7	(38.3)	(38.7)	B	53	2158
	11	9.3	3	59.8				-860.7						
		14.4	11	14.3						43.5	44.0			43.42
		19.3	-	29.2							-			43.96
		40.2	3	29.7										44.08
		45.0	11	45.2						44.8	44.7			131.46
		50.3	+2	59.6									14	43.82
	12	5.3	2	59.5										
		12.4	12	12.3						42.1	42.1			
		19.3	-	29.8										657.3
		40.7	2	29.8									14	43.82
		45.5	12	45.5						44.8	45.3			
		50.2	+1	59.3										
	13	8.0	1	59.8										
		13.3	13	13.9						43.2	43.6			
		20.3	-	29.3										
		38.5	2	29.8										
		44.4	13	44.3						43.5	44.1			
		50.0	+0	59.2							-			
	14	9.9	0	59.8										
		16.8	14	16.3						46.3	46.1			
		22.2	=	30.0										
		37.0	0	29.8										
+		44.0	14	43.7						43.5	43.7			
		50.0	=	0.2										
	15	6.4	0	0.0										
		13.4	15	13.1							43.2			
		19.6	=0	30.3						42.8	43.0			
		35.1	0	29.9										
		42.4	15	42.0							42.1			
		48.4	=1	0.2						41.8	41.9			
			0	59.9										

1 15 57.59

88 41 11.80

	20	41.3												
		45.4	20	45.6										
		50.0	-5	59.0						46.6	45.3			
			-6	0.3										

15) ~~6961~~ 6578 ~~6569~~ 6573
14 ~~43.51~~ 43.85 ~~43.79~~ 43.82

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1881phae.proj.1564.

−1881 Dec 31 UC

0.11581 8.36021 8.47602

6.72660 8.36021 5.09681 Identical

h m s	m s	h m s				′	″
1 10 24.0		1 22 37.7	−5 10.9		B	33	17.38
27.0	10 27.8		−310.9	28.1			
32.5	=	24 58.2	−7 31.4		B	33	19.92
47.7	+6 0.3		−451.4				
54.0	10 54.2	26 36.4	9 9.6	23.9	B	33	21.72
11 1.0			−549.6				
23.0	5 29.7	27 53.3	×10 26.5		B	33	21.32
28.1	11 28.3		−626.5	28.0 ✓			
33.9		29 11.8	11 45.0		B	33	23.62
51.4	4 59.7		−705.0				
57.8	11 57.3	30 30.0	13 3.2	26.8	B	33	23.88
12 2.7			−783.2				
21.0	4 29.5	31 52.0	×14 25.2	✓	B	33	24.10
31.4	12 29.3		−865.2	28.9			
35.6		33 13.0	15 46.2		B	33	24.30
52.4	3 59.6		−946.2				
58.0	12 57.9	34 54.2	−17 27.4	27.6	B	33	23.98
13 3.2			−1047.4	—			
21.9	3 29.7	36 9.5	−18 42.7		B	33	24.38
25.8	13 28.0		−1122.7	27.8			
36.4							
54.3	2 59.8						27.22
58.7	13 59.1			28.9			26.56
14 4.4							26.53
22.9	2 29.8						80.31
28.3	14 29.7			29.3			26.77
37.8							
48.4	1 59.6						
52.2	14 53.3			23.2			481.8
59.4							26.77
15 17.3	1 29.9						
24.4	15 23.7			23.~~8~~6			
29.5							
50.5	0 59.9						
56.8	15 56.6			26.5			
16 2.4							
18.5	0 29.9			—			
24.4	16 24.2			24.2			
29.7							
—	0 0.0						

1 15 57.82 — 88 41 11.91

h m s	m s		
20 23.5			
27.8	20 27.6		27.8
31.5			
52.0	−3 59.8		
55.3	20 56.5		26.7
21 2.2	−4 29.8		
18.1			
25.3	21 25.9		26.3
34.2	−4 59.6		
51.4			
56.1	21 57.6		27.8
22 5.3			
19.8	−5 29.8		
26.4	22 26.3		26.4
32.7	−5 59.9	(18)	48~~26~~8
			26.77

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0.11581 6.73660

1882 Jan 2 UC

h m s	m s	h m s					
1 10 16.4		1 7 0.5 +9 15.7			B	32′	54″.18
20.4	10 20.4		16	20.7			
24.4	+6 0.3	8 50.0 +7 26.2			B	32	59.32
44.8							
49.2	10 49.1	22 37.2 -6 21.0		19.8	B	33	22.40
53.2	-5 29.7						
11 8.7		24 5.5 7 49.3			B	33	23.50
15.6	11 15.5			15.2			
22.2	-4 59.7	26 43.0 10 26.8			B	33	26.00
43.0							
47.5	11 47.6	28 1.2 11 45.0		17.1	B	33	25.78
52.2	-4 29.5						
12 8.7		29 35.4 13 19.2			B	33	27.62
14.5	12 14.5			14.1			
20.3	-3 59.6	31 5.8 14 49.6			B	33	29.12
39.2							
45.5	12 45.3	32 33.5 16 17.3		15.0	B	33	28.72
51.1	-3 29.7						
13 10.3		34 5.5 17 49.3			B	33	29.40
14.0	13 14.5			14.3			
19.2	-2 59.8						
37.6							16.98
42.4	13 43.1			12.9			13.37
49.3	-2 29.8						18.80
14 9.3							49.15
15.4	14 15.7			15.3		16	16.35
22.4	-1 59.6						
37.4							
42.3	14 42.7			12.6			276.1
48.5	+1 29.9					16	16.24
15 7.2							
12.4	15 12.3			12.2			
17.4	+0 59.9						
36.3							
43.4	15 43.0			12.9			
49.2	-0 29.9						
16 9.0							
17.0	16 15.8			15.8			
21.3	-0 0.0						

1 15

h m s	m s		
20 40.5			
47.5	20 47.4	17.6	17.6
54.3	-4 29.8		
21 15.4			
21.0	21 20.6	21.0	21.0
25.4	-4 59.6		
39.5	48.0		
48.3	21 ~~37.7~~	18.2	18.2
56.2	-5 29.8		
22 16.2			
20.5	22 21.3	21.4	21.4
27.1	-5 59.9		

17) 27.61

16.24

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0.11581 6.73660 95

1882 Jan 4 UC

h	m	s	m s	h	m	s			B	′	″
1	10	2.5		5	59.8				B	33	22.05
		6.4	10 6.8				16	7.1			
		61.4	− 6 0.3	7	57.3				B	33	25.80
		23.8									
		38.3	10 38.4	22	25.0		8.1		B	33	22.05
		43.2	− 5 29.7								
	11	8.4		24	44.3				B	33	25.75
		12.3	11 12.3				12.0				
		16.3	− 4 59.7	25	56.5				B	33	26.40
		28.4									
		32.7	11 34.2	26	44.4		4.7		B	33	26.88
		41.5	− 4 29.5								
		38.4		28	22.0				B	33	27.98
	13	5.9	12 56.6				5.2				
	12h	12.5	− 3 59.6	29	29.2				B	33	28.42
		25.5									
		32.7	12 31.4	30	21.5		11.1		B	33	29.12
		36.0	− 3 29.7								
	13	0.4		32	7.0				B	33	31.08
		5.4	13 6.3				6.1				
		13.0	− 2 59.8								
		35.4									
		40.2	13 40.8				10.6				
		46.8	− 2 29.8								
	14	5.2									
		9.3	14 11.3				10.9				
		19.4	− 1 59.6								
		35.7									
		41.2	14 42.6				12.5				
		50.4	− 1 29.9								
	15	9.4									
		15.5	15 15.6				15.5				
		22.0	− 0 59.9								
		41.4									
		47.2	15 47.4				17.3				
		53.5	− 0 29.9								
	16	10.4									
		14.3	16 14.9				14.9				
		20.0	− 0 0.0								
	19	40.5									
		45.4	19 45.4				15.7				
		50.4	− 3 29.7								
	20	8.4									
		11.5	20 12.5				12.7				
		17.7	− 3 59.8								
		39.0									
		43.5	20 44.4				14.6				
		49.8	− 4 29.8								
	21	8.3									
		13.3	21 14.0				14.4				
		20.4	− 4 59.6								
		37.8									
		42.2	21 43.4				13.6				
		50.3	− 5 29.8								
	22	2.7									
		9.3	22 9.8				9.9				
		17.5	− 5 59.9								

14)206.9
10.89

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26

0.11581 6.736660

1882 Jan 7 HC

h	m	s	oms	h	m	s					
1	10	3.3	0	52	57.4				B	32′	4.02
		7.3	10 7.9				16	8.2			
		13.2	+ 6 0.3	53	6.0				B	32	1182
		27.2									
		41.3	10 41.6	55	8.0			11.3	B	32	1575
		46.2	− 5 29.7								
11		6.2		56	14.7				B	82	1888
		10.3	11 11.8					11.5			
		18.8	− 4 59.7	57	19.9				B	32	2262
		35.0									
		38.5	11 39.7	58	28.5			9.2	B	32	3985
		45.5	− 4 29.5								
12		6.2		3	59.5				B	82	4468
		12.0	12 11.2					10.8			
		15.3	− 3 59.6	5	40.0				B	82	4752
		38.4									
		43.0	12 43.3	7	2.5			13.0	B	33	1590
		48.4	− 3 29.7								
13		8.3		22	26.4				B	33	1810
		12.5	13 13.3					13.1			
		19.2	− 2 59.8	23	40.8						
		36.2									10.05
		43.0	13 42.8					12.6			12.37
		49.2	− 2 29.8								12.02
14		11.8									12.22
		16.2	14 15.8					13.4			46.66
		19.3	− 1 59.6								11.66
		35.4									
		39.2	14 40.3					10.9			18.67
		46.4	− 1 29.7								11.67
15		6.3									
		12.0	15 12.0					11.9			
		17.8	− 0 59.9								
		34.2									
		40.5	15 40.7					10.6			
		47.3	− 0 29.9								
16		6.4									
		11.5	16 12.3					12.3			
		19.0	= 0 0.0								
21		7.3									
		11.2	21 12.0					12.4			
		17.5	− 4 59.6								
		36.1									
		39.5	21 41.0					11.2			
		47.5	= 5 29.8								
22		7.3									
		11.9	22 12.9					13.0			
		19.6	= 5 59.9								

16) 187
11.67

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0.11581   6.73660

1882 Jan 9 UC

h m s	m s	h m s			' ''
1 10 2.3		0 54 42.0		B	32 908
5.5	10 6.6				
12.0 –		56 22.2		B	32 1552
32.3					
39.2 –	10 38.3	57 39.0	+	B	32 1940
43.4 –					
11 3.3		58 55.2		B	32 2445
9.2 –	11 9.2				
15.0 –		0 8.5			—
32.2 –					
36.5	11 36.7	3 50.6		B	32 3842
41.5 –					
12 2.0		5 33.8		B	32 4342
7.0	12 8.1				
15.3 –		6 55.1	+	B	32 4688
32.5					
38.5	12 39.7	8 6.9	+	B	32 4948
48.1 –					
13 4.3		22 21.9	+	B	33 1448
9.5	13 9.7				
15.2 –					
(24.2)					
32.1	13 (35.1)				
38.2 –					
45.8 –					
14 4.0	14 9.2				
8.3					
15.2 –					
33.3	14 39.4				
38.8					
46.2 –					
15 4.2 –	15'				
9.6	15 10.0				
16.2 –					
34.3					
38.6	15 39.4				
45.4 –					
16 2.3					
8.3	16 8.9				
16.2 –					
21 5.2 –					
21 9.3 –	21 10.0				
15.5 –					
36.4					
41.4	21 41.4				
46.5 –					
22 2.4					
22 9.5	22 8.8				
14.4 –					
14.4					

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498

0,11581 6.736660

1882 Jan 10 UC

h	m	s	oms	h	m	δ			
	1	10	1.3		0	53	49.7	B	32 9.35
			6.3	10	7.2				
			14.1			55	35.2	B	32 15.40
			35.3						
			38.5	10	39.0	56	55.3	B	32 19.68
			43.2						
			11 2.0			58	6.6	B	32 23.95
			6.3	11	7.6				
			14.4			59	41.7	B	32 29.40
			30.4						
			35.7	11	36.4	5	53.0	B	32 47.18
			43.2						
h	m	s	12 2.4			22	12.2	B	33 16.40
1	0	58.0	9.2	12	9.4				
	1	3.3	16.5			23	44.1	B	33 18.20
4.23		11.4	32.4						
			37.5	12	37.6				
			43.0						
			13 0.3						
	3	59.5	6.5	13	7.3				
	4	5.5	15.2						
5.50		11.5	36.7						
			41.4	13	41.5				
			46.4						
			14 5.5						
	7	3.5	9.4	14	10.1				
		7.5	16.2						
10.77		11.3	36.3						
			42.0	14	41.8				
			47.2						
			15 7.2						
			10.4	15	11.1				
			15.7						
			(33.3						
			37.0	15	37.9				
			38.0						
			43.3)						
			16 4.3						
			8.3	16	10.0				
			17.4						

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1883 Feb-8

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100

2 c

1883 ~~Feb 12~~

1879

April 8 - Aug 24 | 14 45.8 | 13 18.0 | 11 47.6 | 10 19.1 | 8 51.8

April 11 - June 19 | 14 54.0 | 13 25.1 | 11 53.8 | 10 25.5 | 8 53.9

A-1

-14	45.8	17.8	48.2	20.4	51.6
	91.7	35.8	96.0	39.5	103.2
14	45.8	17.90	11 47.9	10 19.75	8 51.6

	53.5	22.8	52.6	24.2	54.6
	107.5	47.9	1044	54.7	110.5
14	53.7	13 23.9	11 52.2	10 27.3	8 55.2

June 4 - " 26 | 14 44.4 | 13 15.5 | 11 47.1 | 10 19.6 | 8 49.1

June 21 - July 18 | 53.7 | 23.4 | 54.2 | 25.2 | 55.4

	43.9	17.2	47.9	18.7	50.4
	883	324	950	383	995
14	44.15	13 16.3	11 47.5	10 19.1	8 49.7

	52.0	23.0	53.5	23.8	56.7
	1054	464	1077	490	1121
	52.9	23.2	53.8	24.5	56.0

July 1 - Aug 24 | 14 47.0 | 18 18.1 | 11 47.3 | 10 18.7 | 8 49.9

	44.6	16.5	46.9	18.7	51.2
	915	346	942	374	1011
14	45.7	13 17.3	11 47.1	10 18.7	8 50.5

1880

April 8 - Aug 27 | 55.5 | 20.6 | 52.5 | 21.7 | 53.9

	53.5	21.4	52.0	24.0	53.7
	1070	419	1025	557	1076
	55.5	25.9	51.2	22.8	53.8
		0	53.2		

June 18 - July 9. | 49.5 | 20.4 | 51.1 | 22.0 | 58.3

	48.8	19.0	51.4	23.2	58.8
	986	394	1025	452	1067
	49.3	19.7	51.2	22.6	53.35

Nov. 2

1881

Jan 8 - Feb. 26 | 58.7 | 29.0 | 58.6 | 28.8 | 59.5

	55.7	27.6	59.8	27.0	57.2
	1144	566	1179	558	1167
	57.2	28.3	58.9	27.9	58.35

Jan 7 - [illegible] | 57.5 | 28.7 | 57.8 | 26.8 | 57.7

	57.5	24.8	56.6	26.3	57.2
	1150	536	1140	531	1149
	57.5	26.5	57.03	26.5	57.4

April 2 - " 17 | 55.0 | 26.41 | 57.0 | 28.1 | 57.5

	54.1	24.5	55.7	24.58	56.1
	1091	500	1127	529	1146
	54.5	25.03	56.35	26.34	57.3

April 18 | 56.6 | 28.58 | 58.5 | 27.7 | 57.6

May 4 | 51.1 | 23.0 | 58.7 | 28.5 | 58.7

	1047	498	1122	505	1113
	53.8	24.9	56.1	25.2	55.6
		24.4		5	

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L C.

~~1883 Feb. 13~~

1879.

May 7	14	44.4	13	16.4	11	47.0	10	18.3	8	49.0	July 2	14	32.6	13	23.5	11	53.3	10	24.4	8	55.1
" 31		47.3		16.0		48.5		20.5		50.0	" 25				24.7		57.0				56.8
		917		324		955		388		990					8.2		7.3				11.1
	14	45.8	13	16.2	11	47.7	10	19.4	8	49.5					24.1		53.6				55.5
June 5		44.0		16.2		46.0		17.8		49.9	Dec 10	15	53	18	30.3	12	3.4	10	81.3	9	1.6
" 30		452		16.5		47.7		19.6		51.0	" 18										
		892		317		937		373		1009											
		44.6		15.8		46.8		18.6		50.4											
July 1		46.4		16.0		47.5		19.2		50.6											
Aug 22		~~44.6~~		~~15.0~~		~~47.6~~		~~18.8~~		~~51.7~~											
		~~46.2~~		~~16.5~~		~~47.7~~		~~19.5~~		~~51.0~~											
		~~90.80~~		~~32.60~~		~~95.21~~		~~38.40~~		~~102.23~~											
		~~45.30~~		~~16.2~~		~~47.65~~		~~19.30~~		~~50.85~~ 51.1											
				15.5																	
Sept. 10		48.9		18.7		51.6		19.9		50.5											
Oct 23		46.6				48.1															
		955				997															
		47.7				49.8															

1880

Dec 4	49.0	20.7	50.6	22.8	53.3	
Aug 18	49.8	23.1	54.7	23.7	~~48.8~~	
	8	3.8	5.3	6.50		
	49.4	21.9	52.6	23.0		
Sept 3	58.5	28.2	58.3	27.3	57.1	
1881 Jan 10.	51.5	28.1	57.3	27.2	56.6	
	10.0	3	156	5	13.7	
	55.0	28.4	57.8	27.2	56.8	
Jan 14	56.3	26.3	56.9	26.4	55.6	
April 24	55.1	26.2	56.1	26.5	56.4	
	11.4	12.1	10	9	12.0	
	55.7	26.2	56.5	26.4	56.0	
May 3	52.7	24.1	53.6	22.6	55.4	
" 13	55.2	24.1	55.4	26.1	58.5	
	79	2	9.0	8.7	13.9	
	53.9	24.1	54.5	24.3	56.9	
June 4	52.6	23.6	53.9	24.4	54.8	
" 27	50.7	23.4	58.7	23.5	54.0	
	3.3	10	16	7.9	8	
	51.6	23.5	53.8	23.9	54.4	

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192

~~1883 Feb 18~~

879

	A_{+1}					A_{-1}					
Apr. 15 – May 31	+14 45.9	+13 18.0	+11 47.6	+10 19.1	+8 51.3	−8 51.5	−10 20.4	−11 48.2	−13 17.8	−14 45.8	L.P.
May 7 – ~~May~~ 31	44.4	16.4	47.0	18.3	49.0	50.0	20.5	48.5	18.0	47.3	L.P.
	90.3	34.4	94.6	37.4	100.3	101.5	40.9	96.7	35.8	93.1	
~~88 39 53~~	+14 45.1	+13 17.2	+11 47.3	+10 18.7	+8 50.1	−8 50.7	−10 20.4	−11 48.3	−13 17.9	−14 46.5	
~~8.36911~~	~~885.1~~	~~797.2~~	709.3	618.7	530.1	530.7	620.4	708.3	~~797.8~~	~~886.5~~	
	2.91655	2.90159	2.88680	2.87148	2.85616	2.92485	2.91262	2.90022	2.88784	2.87464	
	1.31440	1.26858	1.22061	1.17535	1.13179						
	20.636	14.598	16.693	14.104	12.353						
June 1 – June 26	+14 44.4	+13 15.6	+11 47.1	+10 20.6	+8 49.9	−8 50.4	−10 18.7	−11 47.9	−13 17.2	−14 43.9	
June 5 – June 30	44.0	15.2	46.0	17.8	49.9	51.0	19.5	47.7	16.5	45.2	
	88.4	30.8	93.1	38.4	99.8	101.4	38.2	95.6	33.7	89.1	
~~88 38 37~~	+14 44.2	+13 15.4	11 46.5	+10 19.2	+8 49.9	−8 50.7	−10 19.1	−11 47.8	−13 16.8	−14 44.5	
8.36795	~~Mc~~	~~795.4~~	707.5	619.2	529.9	530.7	619.1	707.8	796.8	884.5	
July 1 – Aug 24	47.0	17.1	47.3	18.7	49.9	51.2	18.7	46.9	15.5	44.5	
July 1 – Aug 22	45.4	16.0	47.5	19.2	50.6	51.7	18.8	47.6	15.0	44.6	
	92.4	33.1	94.8	37.9	100.5	102.9	37.5	94.5	30.5	89.1	
~~88 38 48~~	46.2	16.5	47.4	18.9	50.2	51.4	18.7	47.2	15.2	44.5	
8.36777	~~Mc~~	~~796.5~~	707.4	618.9	530.2	531.4	618.7	707.2	795.2	884.5	
1880											
April 8 – May 27	52.5	20.5	52.5	21.7	53.9	53.7	24.0	50.0	21.4	52.5	
1879 Dec 4 – Aug 18 1880	49.0	20.7	50.6	22.3	53.3		23.7	54.7	23.1	49.8	
~~88 40 19~~ 80	101.5	41.2	103.1	40	107.2		47.7	104.7	44.5	102.3	
8.36505	50.7	20.6	51.5	22.0	53.6	~~53.7~~	23.8	52.3	22.2	51.1	
	~~Mc~~	~~800.6~~	7115	622.0	533.6	5337	623.8	712.3	802.2	891.1	
June 12 – July 9	49.8	20.4	51.1	22.0	53.3	53.6	23.2	51.4	19.0	48.8	
~~88 40~~ 5	~~Mc~~	~~800.4~~	711.1	622.0	533.3	533.6	623.2	711.4	799.0	888.8	
8.36632											
Nov 2 – Dec 30	57.8	28.3	58.4	29.0	59.6						
Sept 3 – Jan 10 1881	~~Mc~~	28.2	58.3	27.3	57.1	56.6	27.2	57.3	28.1	57.5	
	56.5		116.7	56.3	116.7						
~~88 40 48~~	57.5	28.2	58.3	28.1	58.3			~~71.73~~	-	~~89.15~~	
8.36241	~~Mc~~	~~808.2~~	718.3	628.1	538.3	536.6	627.2	717.3	808.1	8915	
1881 Jan. 2 – Feb. 26	58.7	29.0	58.6	29.8	59.5	57.2	27.0	59.3	27.6	55.7	
~~88 40 55~~	~~Mc~~	~~809.0~~	718.6	628.8	539.5	537.2	627.0	719.3	807.6	895.7	
8.36177											
Mar. 7 – Mar 31	57.5	28.7	57.8	26.8	57.7	57.2	26.3	56.5	24.3	57.3	
Mar. 24 – Apr. 28	56.3	26.3	56.9	26.4	55.6	56.4	26.5	56.1	26.2	55.1	
	113.8	55.0	114.7	53.2	113.3	113.6	52.8	112.6	50.5	112.6	
~~88 40 44~~	56.9	27.5	57.3	26.6	56.6	56.8	26.4	56.3	25.2	56.3	
8.36278	~~Mc~~	~~807.5~~	717.3	626.9	536.6	536.8	626.4	716.3	805.7	896.3	

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1883 Feb. 19

1881

Apr. 2 – Apr. 17	+14 55.0	+13 26.2	+11 57.0	+10 28.1	+8 59.5		-8 55.1	-10 24.8	-11 55.7	-13 24.5	-14 54.1
H 4037	8950	806	717.0	628.1	539.5		535.1	624.8	715.7	804.5	894.1
8.36342											
Apr. 18 – May 4	56.6	25.8	58.5	27.7	57.5		53.7	22.8	53.7	23.0	51.1
May 3 – May 13	52.7	24.1	53.6	22.6	53.4		58.5	26.1	55.4	24.1	55.2
H 4029	1093	499	1111	503	1129		1122	489	1091	471	1063
	54.6	24.9	56.1	25.1	56.4		56.1	24.4	54.5	23.6	53.1
8.36415	8946	8049	7161	6251	536.4		536.1	624.4	714.5	803.5	893.1
May 11 – June 19	54.0	25.1	53.8	25.5	55.9		54.6	24.2	52.6	22.8	53.5
June 4 – June 29	52.6	23.6	53.9	24.4	54.8		54.0	23.4	53.7	23.4	50.7
H 4023	1066	487	1077	499	1107		1086	476	1063	46.2	1042
	53.3	24.3	53.8	24.9	55.3		54.3	23.8	53.1	23.1	52.1
8.36469	8983	8043	713.8	624.9	535.3		534.3	623.8	713.1	803.1	892.1
June 21 – July 18	53.9	23.4	54.2	25.2	55.4		56.7	23.8	53.5	23.0	52.0
July 2 – July 25	52.6	23.5	53.3	24.1	55.1		56.0		54.0	24.7	
H 1023	1065	469	1075	496	1105		1127		1075	477	
	53.2	23.4	53.7	24.8	55.2		56.3	23.8	53.7	23.8	52.0
8.36469	8987	8034	713.7	624.8	535.2		536.3	623.8	713.7	803.8	892.0
Dec. 10 – 18	-.13	3.3	2.4	31.0	5.4		9 0.6	10 31.3	12 2.4	13 30.3	15 5.3
H 4199	9063	8103	722.4	631.0	540.0		540.6	631.3	722.4	810.3	905.3
8.36049											

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1883 Feb 21

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Apr. 15 – May 31

88° 39' 53"

8.36741

+885.1	+ 797.2	+ 707.3	+ 618.7	+ 530.1	−530.7	−620.4	− 708.3	−797.9	− 886.5
2.94699	2.90157	2.84960	2.79148	2.72436	2.72485	2.79267	2.85022	2.90185	2.94768
1.31440	1.26898	1.21701	1.15889	1.09177	1.09226	1.16008	1.21763	1.26936	1.31509
20.626	18.577	16.482	14.418	12.353	12.367	14.457	16.506	18.594	20.658

June 1 – June 30

88° 39' 47"

8.36795

884.2	795.4	707.5	619.2	529.9	530.7	619.1	707.8	796.8	884.5
2.94655	2.90059	2.84973	2.79183	2.72419	2.72485	2.79176	2.84991	2.90135	2.94670
1.31450	1.26854	1.21768	1.15978	1.09214	1.09280	1.15971	1.21786	1.26930	1.31565
20.630	18.558	16.508	14.447	12.363	12.382	14.445	16.514	18.591	20.685

July 1 – Aug 24

88° 39' 49"

8.36777

886.2	796.5	707.4	618.9	530.2	531.4	618.7	707.2	795.2	884.5
2.94753	2.90119	2.84966	2.79162	2.72444	2.72542	2.79148	2.84954	2.90048	2.94670
1.31580	1.26896	1.21743	1.15939	1.09221	1.09319	1.15925	1.21731	1.26825	1.31447
20.668	18.576	16.498	14.434	12.366	12.682	14.430	16.494	18.546	20.629

1878 Dec. 4 – Aug 18 1880

88° 40' 19"

8.36505

890.7	800.6	711.5	622.0	533.6	533.7	623.8	712.3	802.2	891.1
2.94973	2.90342	2.85217	2.79379	2.72722	2.72730	2.79505	2.85266	2.90428	2.94993
1.31478	1.26847	1.21722	1.15886	1.09227	1.09235	1.16010	1.21771	1.26933	1.31498
20.643	18.555	16.490	14.417	12.367	12.370	14.458	16.509	18.592	20.653

June 12 – July 9.

88° 40' 5"

8.36632

889.8	800.4	711.1	622.0	533.3	533.6	623.2	711.4	799.0	888.8
2.94929	2.90331	2.85193	2.79379	2.72697	2.72722	2.79463	2.85211	2.90258	2.94880
1.31561	1.26963	1.21825	1.16011	1.09329	1.09354	1.16095	1.21843	1.26887	1.31512
20.683	18.605	16.491	14.458	12.396	12.403	14.486	16.536	18.573	20.660

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1882 Feb 23

1880 Sept 3 – 1881 Jan 10

88 40 48	897.8	808.2	718.3	628.1	538.3	536.6	627.2	717.3	808.1	891.5
8.36241	2.95318	2.90752	2.85631	2.79803	2.73102	2.72965	2.79741	2.85570	2.90747	2.95012
	1.31559	1.26993	1.21872	1.16044	1.09343	1.09206	1.15982	1.21811	1.26988	1.31253
	20.682	18.618	16.547	14.469	12.400	12.361	14.448	16.524	18.616	20.537 ×

Jan. 2 – Feb. 26

88 40 53	898.7	809.0	718.6	628.8	539.5	537.2	627.0	719.3	807.6	895.7
8.36177	2.95361	2.90795	2.85649	2.79851	2.73199	2.73014	2.79727	2.85691	2.90720	2.95216
	1.31538	1.26972	1.21826	1.16028	1.09376	1.09191	1.15904	1.21868	1.26897	1.31393
	20.672	18.609	16.530	14.464	13.410	12.357	14.423 ×	16.545	18.577	20.603

Mar. 7 – Apr. 28

88 40 44	896.9	807.5	717.3	626.6	536.6	536.8	626.4	716.3	805.2	896.3
8.36278	2.95274	2.90714	2.85570	2.79699	2.72965	2.72981	2.79685	2.85570	2.90590	2.95245
	1.31552	1.26992	1.21848	1.15977	1.09343	1.09259	1.15963	1.21788	1.26868	1.31563
	20.679	1861.7	16 53.8	14.447	12.872	12.405	14.442	16.515	18.564	20.684

Apr. 2 – Apr. 17

88 40 37	895.0	806.2	717.0	628.1	539.5	535.1	624.8	715.7	804.5	894.1
8.36342	2.95182	2.90644	2.85552	2.79803	2.73199	2.72844	2.79574	2.85473	2.90553	2.95139
	1.31524	1.26986	1.21894	1.16145	1.09541	1.09186	1.15916	1.21815	1.26895	1.31481
	20.665	18.615	16.555	14.503	13.457	12.856 ×	14.426	16.525	18.576	20.645

Apr. 18 – May 13

88 40 29	894.6	804.9	716.1	625.1	536.4	536.1	624.4	714.5	803.5	893.1
8.36415	2.95163	2.90574	2.85497	2.79595	2.72949	2.72925	2.79546	2.85400	2.90499	2.95090
	1.31578	1.26989	1.21912	1.16010	1.09364	1.09340	1.15961	1.21815	1.26914	1.31505
	20.691	18.616	16.562	14.458	12.406	12.400	14.442	16.525	18.584	20.656

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~~1883 Feb. 24~~

Wire intervals from observations of Polaris for Group A.

1879

No. of thread	U.C.	Le.C.	Mean
1	+8.263	+8.248	+8.255
2	6.185	6.166	6.175
3	4.133	4.120	4.127
4	2.068	2.065	2.066
5	+0.000	−0.003	−0.001
6	−2.054	−2.051	−2.053
7	−4.132	−4.121	−4.126
8	−6.196	−6.176	−6.186
9	−8.251	−8.253	−8.252

1880

1	+8.285	+8.243	+8.263
2	6.190	6.175	6.183
3	4.124	4.120	4.122
4	2.067	2.063	2.065
5	−0.001	−0.005	−0.003
6	−2.071	−2.056	−2.064
7	−4.136	−4.116	−4.126
8	−6.197	−6.185	−6.191
9	−8.249	−8.256	−8.253

1881

No. of threads	U.C.	Le.C.	Mean.
1	+8.296	+8.236	+8.266
2	6.196	6.181	6.189
3	4.131	4.119	4.125
4	2.056	2.060	2.058
5	−0.008	+0.003	−0.003
6	−2.063	−2.051	−2.057
7	−4.129	−4.111	−4.120
8	−6.194	−6.178	−6.186
9	−8.254	−8.243	−8.249

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Continued from Page 105

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1881

May 11 – June 29

88° 40' 23"	893.3	804.3	713.8	624.9	535.3	534.3	623.8	713.1	803.1	892.1
8.36469	2.95099	2.90542	2.85358	2.79581	2.72860	2.72779	2.79505	2.85315	2.90477	2.95041
	1.31568	1.27011	1.21827	1.16060	1.09329	1.09248	1.15974	1.21784	1.26946	1.31510
	20.686	18.626	16.530	14.474	13.396	13.373	14.446	16.514	18.598	20.658

June 21 – July 25

88° 40' 23"	893.2	803.4	713.7	624.8	535.2	536.3	623.8	713.7	803.8	892.0
8.36469	2.95095	2.90493	2.85352	2.79574	2.72852	2.72941	2.79505	2.85352	2.90515	2.95036
	1.31564	1.26962	1.21821	1.16043	1.09321	1.09410	1.15974	1.21821	1.26986	1.31505
	20.684	18.605	16.528	14.469	13.394	12.420	14.446	16 52.8	18.615	20.656

Dec. 10 – Dec. 18

88° 41' 9"	906.3	810.3	722.4	631.0	540.0	540.6	631.3	722.4	810.3	905.3
8.36049	2.95727	2.90865	2.85878	2.80003	2.73239	2.73288	2.80024	2.85878	2.90865	2.95679
	1.31776	1.26914	1.21927	1.16052	1.09288	1.09337	1.16073	1.21927	1.26914	1.31728
	20.785	18.584	16.568	14.472	13.386	12.899	14.479	16,56.8	18.584	20.763

Distance between separate wires for A+1 and A-1 groups.

Dates	1	2	3	4	5	~~1~~	2	3	4	5
		A+1						A-1		
Apr. 15 – May 3	.049	.095	.064	.065	065-014		.090	.045	.089	.064
June 1 – June 30	72	60	61	84	84-19		63	65	77	94
July 1 – Aug 24	92	78	64	78	78-28		40	64	52	83
	88	65	73	50	-3		88	51	83	61
	78	114	32	62	-4		83	46	37	87
	64	71	78	69	+31		87	76	82	~~26~~
	63	79	66	54	+53		66	122	37	26
	62	79	94	75	-33		37	73	49	20
	50	60	82	47	-97		70	97	51	69
	75	54	104	52	+6		42	83	59	71
	60	96	56	78	+23		73	68	84	79
	79	77	59	75	-26		26	82	87	41

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1883 Feb. 27

Collection of Results for thread intervals from

for 1879

UC

Date interval.	1	2	3	4	5	6	7	8	9	8	9
Feb 16 – Feb 27											

	1	2	3	4	5	6	7	8	9	10	11	12	13
UC	+5 53.62	+5 25.17	+4 56.02	+4 26.24	+3 56.87	+3 27.19	+2 58.02	+2 28.32	+1 58.12	+1 29.39	+0 59.59	+0 29.47	+0.47
BC	353.62	325.17	296.02	266.24	236.87	207.19	178.02	148.32	118.12	89.39	59.59	29.47	
	2.54884	2.51211	2.47132	2.42527	2.37322	2.31637	2.25047	2.17120	2.07232	1.95129	1.77517	1.46938	9.67210
	0.91405	0.87762	0.83683	0.79078	0.73873	0.68188	0.61598	0.53671	0.43783	0.31680	0.14068	9.83489	0.03761
	8.2064	7.544	6.868	6.177	5.496	4.807	4.130	3.441	2.746	2.074	1.383	.68.374	0.1891

Mar 3 – Mar 25

+ 53.82	25.44	55.92	26.82	57.44	27.26	57.88	27.79	58.36	28.52	59.18	29.34	− 0.36
353.82	325.44	295.92	266.82	237.44	207.26	177.88	147.79	118.36	88.52	59.18	29.34	
2.54878	2.51247	2.47117	2.42622	2.37555	2.31652	2.25013	2.16964	2.07320	1.94704	1.77217	1.46746	0.55630
0.91474	0.87843	0.83713	0.79218	0.74157	0.68248	0.61609	0.53560	0.43916	0.31300	0.13813	9.83342	9.22206
8.217	7.558	6.873	6.197	5.515	4.814	4.131	3.432	2.749	2.056	1.374	.68.143	0.0836

Apr. 6 – May 6

55.30	25.25	55.29	25.65	55.76	26.78	57.59	27.44	57.41	28.40	58.85	29.86	+ 0.57
355.30	325.25	295.29	265.65	235.76	206.78	177.59	147.44	117.41	88.40	58.85	29.86	
2.55060	2.51242	2.47025	2.42431	2.37247	2.31551	2.24942	2.16862	2.06971	1.94645	1.76975	1.47509	0.07587
0.91765	0.87927	0.83730	0.79136	0.73952	0.68256	0.61647	0.53567	0.43676	0.31350	0.13680	9.84214	9.12207
8.273	7.573	6.875	6.185	5.489	4.815	4.135	3.433	2.734	2.058	1.370	.69.525	0.1295

June 26 – July 10

53.39	24.14	54.65	25.44	55.69	27.04	57.02	26.87	57.77	28.90	58.94	28.59	+ 0.19
353.39	324.14	294.65	265.44	235.69	207.04	177.02	146.87	117.77	88.90	58.94	28.59	
2.54825	2.51073	2.46931	2.42397	2.37234	2.31605	2.24802	2.16693	2.07103	1.94890	1.77041	1.45621	0.82785
0.91620	0.87868	0.83726	0.79192	0.74029	0.68400	0.61597	0.53488	0.43898	0.31685	0.13836	9.82416	9.64670
8.245	7.563	6.875	6.193	5.499	4.831	4.130	3.427	2.748	2.074	1.375	.66.706	0.0943

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1883 ~~Feb.~~ 28

Observations of Polaris, 27 wires, U. C. & L. C.

	10	11	12	13	14	15	16	17	18	19	20	21	22
													S
	14	15	16	17	18	19	20	21	22	23	24	25	26
47	-0 29.61	-0 58.38	-1 27.78	-1 57.73	-2 28.38	-2 57.98	-3 27.01	-3 56.88	-4 27.68	-4 56.18	-5 26.18	-5 55.51	40° 14' 12"
	29.61	58.38	87.78	117.73	148.38	177.98	207.01	236.88	267.68	296.18	326.18	355.51	88 40 14
													8.36557
7210	1.47144	1.76626	1.94340	2.07089	2.17138	2.25037	2.31599	2.37453	2.42762	2.47156	2.51346	2.55085	
1761	9.83695	0.13177	0.30891	0.43640	0.53689	0.61588	0.68150	0.74004	0.79313	0.83707	0.87897	0.91636	
272													
91	.68.699	1.354	2.037	2.731	3443	4.129	4.803	5.496	6.211	6.872	7.568	8.248	
36	- 2964	5826	2832	5866	2822	5725	2695	5675	2612	5602	2562	5525	88 40 9
	29.64	58.26	88.32	118.66	148.22	177.25	206.95	236.75	266.12	296.02	326.62	355.25	8.36596
5630	1.47188	1.76537	1.94606	2.07430	2.17091	2.24859	2.31587	2.37429	2.42508	2.47132	2.51271	2.55053	
2.2b	9.83784	0.13133	0.31202	0.44026	0.53687	0.61455	0.68183	0.74025	0.79104	0.83728	0.87867	0.91649	
36	.68.840	1.353	2.051	2.756	3.442	4.117	4.807	5.499	6.181	6.875	7.563	8.251	
57	29.01	59.15	88.26	57.66	27.53	57.03	26.72	56.94	26.17	55.46	25.47	53.66	88 39 57
	29.01	59.15	88.26	117.66	147.53	177.03	206.72	236.94	266.17	295.46	325.47	353.66	8.36705
5587	1.46255	1.77195	1.94576	2.07063	2.16894	2.24805	2.31538	2.37464	2.42516	2.47050	2.51251	2.54859	
2.2b7	9.												
1614	9.82960	0.13900	0.31281	0.43768	0.53599	0.61510	0.68243	0.74169	0.79221	0.83755	0.87956	0.91564	
295	.67.546	1.377	2.055	2.740	3.435	4.122	4.813	5.517	6.197	6.879	7.578	8.235	
19	29.96	58.73	27.95	57.75	27.53	56.61	26.31	56.33	24.78	54.98	24.10	53.90	88 39 47
	29.96	58.73	87.95	117.75	147.53	176.61	206.31	236.33	264.78	294.98	324.10	353.90	8.36795
7875	1.47654	1.76886	1.94424	2.07096	2.16888	2.24702	2.31452	2.37352	2.42289	2.46979	2.51068	2.54888	
1670													
540	9.84449	0.13681	0.31219	0.43891	0.53683	0.61497	0.68247	0.74147	0.79084	0.83774	0.87863	0.91683	
943	.69.902	1.370	2.052	2.747	3.442	4.121	4.814	5.514	6.178	6.882	7.562	8.257	

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1879

U. C. Collection of Results for Thread intervals

Aug. 24 – Sept. 29

1	2	3	4	5	6	7	8	9	10	11	12	13
+5 54.88	+5 26.21	+4 54.97	+4 26.33	+3 57.29	+3 27.15	+2 58.69	+2 28.35	+1 58.73	+1 28.71	+0 59.09	+0 29.35	−.029
354.88	326.21	294.97	266.33	237.29	207.15	178.69	148.35	118.73	88.71	59.09	29.35	
2.55002	2.51350	2.46978	2.42542	2.37528	2.31628	2.25210	2.17129	2.07456	1.94794	1.77151	1.46761	9.46240 ~
0.91653	0.88001	0.83629	0.79193	0.74179	0.68279	0.61861	0.53780	0.44107	0.31448	0.13802	9.83412	7.82891 ~
8.251	7.586	6.859	6.193	5.518	4.817	4.155	3.450	2.761	2.063	1.374	68.253	−.007

Oct. 15 – Oct 30

57.73	26.93	56.51	26.85	56.69	26.93	58.57	27.97	58.51	29.71	58.95	29.97	+0.31
357.73	326.93	296.51	266.85	236.69	206.93	178.57	147.97	118.51	89.71	58.95	29.97	
2.55366	2.51445	2.47204	2.42627	2.37411	2.31582	2.25181	2.17017	2.07375	1.95284	1.77048	1.47669	9.84936
0.91879	0.87968	0.83727	0.79150	0.73957	0.68105	0.61701	0.53540	0.43898	0.31807	0.13571	9.84192	7.85659
8.294	7.580	6.875	6.187	5.487	4.798	4.140	3.431	2.748	2.080	1.367	69.490	+.007

Nov 10 – Nov 30

58.00	26.74	56.84	27.24	57.05	27.45	58.10	28.82	58.57	29.02	0.55	29.34	−.024
358.00	326.74	296.84	267.24	237.05	207.45	178.10	148.82	118.57	89.02	60.55	29.34	
2.55388	2.51420	2.47252	2.42690	2.37484	2.31691	2.25066	2.17266	2.07397	1.94949	1.78211	1.46746	9.83802
0.91812	0.87844	0.83676	0.79114	0.73908	0.68115	0.61490	0.53690	0.43821	0.31373	0.14635	9.83170	7.74445 ~
8.282	7.559	6.866	6.182	5.484	4.799	4.120	3.413	2.742	2.059	1.401	67.873	−.005

Dec 1 – Dec 29

58.05	26.92	57.15	26.90	58.13	27.94	58.75	28.86	58.75	29.39	59.25	29.83	−0.16
358.05	326.92	297.15	266.90	238.13	207.94	178.75	148.86	118.75	89.39	59.25	29.83	
2.55394	2.51441	2.47298	2.42635	2.37681	2.31794	2.25225	2.17278	2.07463	1.95129	1.77269	1.47465	9.84204
0.91772	0.87822	0.83676	0.79013	0.74059	0.68172	0.61603	0.53656	0.43841	0.31507	0.13647	9.83843	7.56790 ~
8.274	7.555	6.867	6.168	5.502	4.805	4.131	3.440	2.744	2.066	1.369	68.933	−.004

1880

Jan 1 – Jan 3

59.05	26.70	58.20	27.75	58.04	29.15	58.94	28.94	57.82	28.85	59.52	29.12	+1.05
359.05	326.70	298.20	267.75	238.04	209.15	178.94	148.94	117.82	88.85	59.52	29.12	
2.55515	2.51415	2.47451	2.42773	2.37665	2.32046	2.25271	2.17301	2.07122	1.94866	1.77466	1.46419	0.02119
0.91866	0.87766	0.83802	0.79124	0.74016	0.68397	0.61622	0.53652	0.43473	0.31217	0.13817	9.82770	8.38470
8.292	7.545	6.887	6.184	5.497	4.830	4.133	3.440	2.721	2.052	1.375	67.251	+.024

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From observations of Polaris. 27 wires, U C and L C.

1858 Class 3

14	15	16	17	18	19	20	21	22	23	24	25	26
-0° 28'.83	-0° 0'.39	-1° 28'.57	-1° 58'.07	-2° 28'.41	-2° 57'.79	-3° 25'.97	-3° 56'.47	-4° 25'.79	-4° 56'.45	-5° 25'.15	-5° 54'.47	88° 40' 3"
28.83	60.39	88.57	118.07	148.41	177.79	205.97	236.47	265.79	296.45	325.15	354.47	8.36651
1.459 84	1.780 96	1.947 29	2.072 14	2.171 46	2.249 91	2.313 80	2.373 78	2.424 54	2.471 95	2.512 08	2.549 58	
9.826 35	8.147 47	0.313 80	0.438 65	0.537 97	0.616 42	0.680 31	0.740 29	0.791 05	0.838 46	0.878 59	0.916 09	
67.042	1.404	2.060	2.746	3.451	4.135	4.790	5.499	6.181	6.894	7.561	8.243	
29.91	1 0.23	28.21	59.43	28.67	58.25	27.75	58.33	27.37	56.85	26.73	56.71	88 40 17
29.91	60.23	88.21	119.43	148.67	178.25	207.75	238.33	267.37	296.85	326.73	356.71	8.36523
1.475 82	1.779 81	1.945 52	2.077 11	2.172 22	2.251 03	2.317 54	2.377 18	2.427 11	2.472 54	2.514 19	2.552 32	
9.841 05	0.145 04	0.310 75	0.441 34	0.537 45	0.616 26	0.682 77	0.742 11	0.792 34	0.837 77	0.879 42	0.917 55	
69.351	1.396	2.045	2.769	3.447	4.133	4.817	5.526	6.199	6.883	7.576	8.271	
29.36	59.41	28.86	58.88	29.34	58.24	28.34	58.57	28.80	57.13	26.97	56.46	88 40 28
29.36	59.41	88.86	118.88	149.34	178.24	208.34	238.57	268.80	297.13	326.97	356.46	8.36424
1.467 76	1.773 86	1.948 71	2.075 11	2.174 18	2.251 05	2.318 77	2.377 62	2.429 43	2.472 95	2.514 51	2.552 00	
9.832 00	0.138 10	0.312 95	0.439 35	0.538 42	0.615 24	0.683 01	0.741 86	0.793 67	0.837 19	0.878 75	0.916 24	
67.920	1.374	2.056	2.750	3.455	4.123	4.820	5.519	6.218	6.874	7.564	8.246	
29.85	59.63	29.52	58.86	28.59	59.00	28.50	58.25	28.48	57.13	25.83	57.13	88 40 33
29.85	59.63	89.52	118.86	148.89	179.00	208.50	238.25	268.48	297.13	325.83	357.13	8.36378
1.474 94	1.775 46	1.951 92	2.075 08	2.172 86	2.252 85	2.319 11	2.377 03	2.428 91	2.472 95	2.512 99	2.552 83	
9.838 72	0.139 24	0.315 70	0.438 85	0.536 64	0.616 63	0.682 89	0.740 81	0.792 69	0.836 73	0.876 77	0.916 61	
68.980	1.378	2.069	2.747	3.441	4.137	4.818	5.506	6.204	6.866	7.530	8.253	
29.38	59.51	30.10	59.45	29.26	58.71	28.38	57.98	28.61	58.38	28.68	57.25	88 40 36
29.38	59.51	90.10	119.45	149.26	178.71	208.38	237.98	268.61	298.38	328.68	357.25	8.36351
1.468 05	1.774 59	1.954 72	2.077 19	2.173 94	2.252 15	2.318 86	2.376 54	2.429 12	2.474 77	2.516 77	2.552 97	
9.831 56	0.138 10	0.318 23	0.440 70	0.537 45	0.615 66	0.682 37	0.740 05	0.792 63	0.838 28	0.880 28	0.916 48	
67.852	1.374	2.081	2.759	3.447	4.127	4.812	5.496	6.203	6.891	7.591	8.250	

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Sch. 1–18

W 6. Collection of Results for Thread intervals from Mar. 15 — New set of wires

1	2	3	4	5	6	7	8	9	10	11	12	13
+ 5′ 58″49	+ 5′ 26″04	+ 4′ 56″44	+ 4′ 27″94	+ 3′ 57″14	+ 3′ 27″39	+ 2′ 56″99	+ 2′ 27″89	+ 1′ 58″94	+ 1′ 31″04	+ 0′ 59″24	+ 0′ 31″44	+ 2.14
358.49	326.04	296.44	267.94	237.14	207.39	176.99	147.89	118.94	91.04	59.24	31.44	
2.554448	2.513127	2.471944	2.428014	2.375000	2.316779	2.247955	2.169944	2.075333	1.959223	1.772611	1.497448	0.330441
0.91862	0.877741	0.836008	0.792184	0.739114	0.680934	0.612094	0.534084	0.439477	0.323374	0.136754	9.861624	8.694555
8.291	7.541	6.856	6.197	5.484	4.797	4.093	3.420	2.751	2.106	1.370	72.711	+.049

Apr. 9 – Apr 27

56.33	26.37	56.48	26.67	57.73	27.38	57.25	27.68	57.75	29.13	58.98	30.27	+ 0.17
356.33	326.37	296.48	266.67	237.73	207.38	177.25	147.68	117.75	89.13	58.98	30.27	
2.551851	2.513791	2.471~~99~~200	2.425977	2.376078	2.316777	2.248559	2.169332	2.070960	1.950022	1.770701	1.481011	0.230445
0.91718	0.879041	0.83732~~8~~6	0.79130	0.74141	0.68210	0.61392	0.53465	0.43629	0.31535	0.13603	9.846341	7.59578 ~~8.358837~~
8.264	7.569	6.876	6.184	5.513	4.809	4.111	3.425	2.731	2.067	1.367	70.200	+.004

May 4 – May 31

56.73	26.46	56.55	26.85	57.21	27.03	57.46	28.13	58.22	29.05	59.58	30.03	– 0.63
356.73	326.46	296.55	266.85	237.21	207.03	177.46	148.13	118.22	89.05	59.58	30.03	
2.552341	2.513831	2.472101	2.426271	2.375131	2.316031	2.249101	2.170611	2.072691	1.949631	1.775101	1.477556	0.879934
0.91830	0.879~~888~~	0.83~~806~~715	0.79~~223~~132	0.74~~109~~014	0.68~~099~~008	0.61~~506~~413	0.53~~660~~569	0.43~~865~~774	0.31~~559~~468	0.14~~106~~015	9.84~~385~~288	16530 ~~8.44589~~
8.285	7.582	6.887	6.198	5.509	4.808	4.122	3.440	2.746	2.068	1.384	69.745	–.015

June 2 – June 28

55.71	25.91	56.07	26.47	57.04	26.96	57.48	28.36	58.39	28.66	59.32	29.44	– 0.12
355.71	325.91	296.07	266.47	237.04	206.96	177.48	148.36	118.39	88.66	59.32	29.44	
2.551101	2.513101	2.471391	2.425651	2.374821	2.315891	2.249151	2.171321	2.073311	1.947731	1.773201	1.468911	0.307918
0.91743	0.879043	0.83772	0.79198	0.74115	0.68222	0.61548	0.53765	0.43964	0.31406	0.13953	9.83527	7.44551 ~~8.37425~~
8.269	7.575	6.882	6.194	5.510	4.818	4.125	3.449	2.752	2.061	1.379	68.434	–.003

July 4 – Aug 5

56.37	26.33	57.21	2691	57.29	27.03	57.87	28.33	57.75	28.83	58.99	29.75	– 0.59
356.37	326.33	297.21	266.91	237.29	207.03	177.87	148.33	117.75	88.83	58.99	29.75	
2.551901	2.513661	2.472061	2.426361	2.375281	2.316031	2.250101	2.171231	2.070961	1.948561	1.770781	1.473491	0.877085
0.91813	0.87989	0.83829	0.79259	0.74151	0.68226	0.61633	0.53746	0.43719	0.31479	0.13701	9.83972	8.13708 ~~8.44331~~
8.282	7.584	6.891	6.203	5.514	4.811	4.134	3.447	2.736	2.064	1.371	69.139	–.014

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observations of Polaris. 27 Wires. U band L 6.

14	15	16	17	18	19	20	21	22	23	24	25	26
m s												
-0 27.78	-0 58.68	-1 30.38	-1 59.61	-2 27.86	-2 58.11	-3 30.11	-3 58.11	-4 26.96	-4 55.46	-5 25.96	-5 55.61	88 40 29
27.78	58.68	90.38	119.61	147.86	178.11	210.11	238.11	266.96	295.46	325.96	355.61	8.36414
1.44373	1.76849	1.95607	2.07777	2.16985	2.25069	2.32245	2.37678	2.42645	2.47050	2.51316	2.55097	
9.80784	0.13263	0.32021	0.44191	0.53399	0.61483	0.68659	0.74092	0.79059	0.83464	0.87730	0.91511	
64.250	1.357	2.090	2.746	3.420	4.119	4.859	5.507	6.174	6.834	7.539	8.224	
29.35	59.23	29.13	58.92	28.45	57.67	27.10	57.80	27.15	57.00	25.37	56.25	88 40 16
29.35	59.23	89.13	118.92	148.45	177.67	207.10	237.80	267.15	297.00	325.37	356.25	8.36533
1.46761	1.77254	1.95002	2.07526	2.17158	2.24961	2.31618	2.37621	2.42675	2.47276	2.51238	2.55175	
9.83294	0.13787	0.31535	0.44058	0.53691	0.61494	0.68151	0.74154	0.79208	0.83809	0.87771	0.91708	
68.068	1.374	2.067	2.758	3.443	4.120	4.803	5.575	6.196	6.888	7.546	8.262	
29.34	58.28	28.25	59.23	28.88	57.55	26.74	56.68	26.57	56.50	26.09	54.97	88 40 9
29.34	58.28	88.25	119.23	148.88	177.55	206.74	236.68	266.57	296.50	326.09	354.97	8.36505
1.46746	1.76552	1.94571	2.07638	2.17284	2.24932	2.31542	2.37416	2.42581	2.47202	2.51334	2.55019	
9.83342	0.13148	0.31167	0.44143	0.53790	0.61438	0.68047	0.74012	0.79177	0.83798	0.87930	0.91615	
68.143	1.354	2.050	2.769	3.457	4.124	4.801	5.497	6.191	6.886	7.574	8.244	
29.43	59.39	28.40	57.66	27.88	57.29	27.28	57.19	26.75	56.20	26.16	55.37	88 40 5
29.43	59.39	88.40	117.66	147.88	177.29	207.28	237.19	266.75	296.20	326.16	355.37	8.36633
1.46879	1.77371	1.94645	2.07063	2.16991	2.24868	2.31656	2.37410	2.42610	2.47159	2.51343	2.55068	
9.83512	0.14004	0.31278	0.43696	0.53624	0.61501	0.68289	0.74043	0.79243	0.83792	0.87976	0.91701	
68.410	1.385	2.055	2.735	3.437	4.121	4.818	5.501	6.200	6.885	7.582	8.261	
30.19	59.01	29.43	58.85	27.61	57.69	28.45	57.03	26.93	55.93	26.43	55.23	88 40 6
30.19	59.01	89.43	118.85	147.61	177.69	208.45	237.03	266.93	295.93	326.43	355.23	8.36623
1.47986	1.77092	1.95148	2.07500	2.16912	2.24966	2.31900	2.37480	2.42640	2.47119	2.51379	2.55051	
9.84609	0.13715	0.31771	0.44123	0.53535	0.61589	0.68523	0.74103	0.79263	0.83742	0.88002	0.91674	
70.160	1.371	2.078	2.762	3.430	4.129	4.844	5.509	6.203	6.877	7.586	8.255	

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1880 U.C. **Collection of Results for Thread intervals**

Aug 15 – Sept 28

1	2	3	4	5	6	7	8	9	10	11	12	13
5m 57.92	+5′ 31.07	+4′ 50.87	+4′ 28.57	+3′ 40.07	+3′ 25.30	+2′ 55.47	+2′ 27.50	+1′ 57.07	+1′ 28.50	+0′ 57.32	+0′ 29.82	+ 0.42
357.92	331.07	300.87	268.57	240.07	205.30	175.47	147.50	117.07	88.50	57.32	29.82	
2.55379	2.51992	2.47838	2.42906	2.38031	2.31239	2.24420	2.16879	2.06844	1.94694	1.75831	1.47451	9.62325
0.91884	0.88497	0.84343	0.79411	0.74539	0.67741	0.60925	0.53384	0.43349	0.31199	0.12336	9.83956	8.42737
8.295	7.673	6.973	6.225	5.564	4.758	4.067	3.418	2.713	2.051	1.328	69.113	+.010

Oct 3 – Oct 20

6 0.45	28.35	58.93	27.95	57.25	28.31	59.25	28.92	2 0.13	29.25	59.07	30.20	+ 0.92
360.45	328.35	298.93	267.95	237.25	208.31	179.25	148.92	120.13	89.25	59.07	30.20	
2.55684	2.51634	2.47557	2.42805	2.37521	2.31871	2.25346	2.17295	2.07965	1.95061	1.77137	1.48001	9.86379
0.91080	0.88030	0.83953	0.79201	0.73917	0.68267	0.61742	0.53691	0.44361	0.31457	0.13533	9.83977	8.46634
8.333	7.591	6.911	6.195	5.485	4.816	4.144	3.443	2.772	2.063	1.366	69.818	+.021

Nov 3 – Nov. 29

59.58	28.12	58.52	27.95	58.31	28.92	59.28	28.60	58.87	29.91	59.81	29.93	- 0.33
359.58	328.12	298.52	267.95	238.31	208.92	179.28	148.60	118.87	89.91	59.81	29.93	
2.55577	2.51603	2.47497	2.42805	2.37720	2.31998	2.25353	2.17202	2.07507	1.95381	1.77677	1.47611	9.85185
0.91358	0.87384	0.83278	0.78586	0.73496	0.67774	0.61879	0.52728	0.43033	0.31107	0.13403	9.83337	8.44463
8.290	7.565	6.883	6.178	5.495	4.817	4.133	3.426	2.741	2.073	1.379	69.006	-.008

Dec 7 – Dec 16

6 0.45	30.65	58.58	29.68	59.95	29.38	59.11	29.52	59.41	30.81	59.11	30.55	- 0.66
360.45	330.65	298.58	269.68	239.95	209.38	179.11	149.52	119.41	90.81	59.11	30.55	
2.55684	2.51937	2.47506	2.43085	2.38012	2.32094	2.25312	2.17470	2.07704	1.95813	1.77166	1.48502	9.88195
0.91251	0.87504	0.83073	0.78652	0.73579	0.67661	0.60879	0.53037	0.43271	0.31380	0.12733	9.84086	8.44464
8.298	7.612	6.874	6.209	5.524	4.820	4.123	3.442	2.749	2.091	1.361	70.333	-.015

1881
Jan 15 – Jan 31

59.47	29.01	59.69	29.26	58.61	29.41	59.45	30.67	59.52	29.63	59.40	30.39	- 0.57
359.47	329.01	299.69	269.26	238.61	209.41	179.45	150.67	119.52	89.63	59.40	30.39	
2.55566	2.51721	2.47667	2.43017	2.37769	2.32106	2.25394	2.17803	2.07741	1.95245	1.77379	1.48273	9.87558
0.91744	0.87899	0.83845	0.79195	0.73947	0.68284	0.61572	0.53981	0.43922	0.31423	0.13557	9.84451	8.44697
8.269	7.568	6.894	6.194	5.489	4.818	4.128	3.466	2.749	2.062	1.366	69.905	-.013

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From observations of Polaris. 27 wires. U C and L C.

14	15	16	17	18	19	20	21	22	23	24	25	26
-0m 30.33	-0 ' 0.80	-1 29.03	-1 58.43	-2 28.88	-2 56.18	-3 27.50	-3 57.13	-4 28.33	-4 55.68	-5 27.03	-5 57.20	88 40 19
30.33	60.80	89.03	118.43	148.88	176.18	207.50	237.13	268.33	295.68	327.03	357.20	8.36505
1.48187	1.78390	1.949541	2.073446	2.17284	2.24596	2.31702	2.37499	2.42867	2.47082	2.51159	2.55291	
9.84692	0.14895	0.31459	0.43851	0.53789	0.61101	0.68207	0.74004	0.79372	0.83587	8.87964	0.91796	
70.294	1.409	2.063	2.745	3.451	4.083	4.809	5.496	6.219	6.853	7.579	8.279	
29.55	59.66	29.69	59.42	30.02	58.10	27.46	58.33	27.68	58.10	27.87	56.72	88 40 31
29.55	59.66	89.69	119.42	150.02	178.10	207.46	238.33	267.68	298.10	327.87	356.72	8.36396
1.47056	1.77568	1.952.74	2.07708	2.17615	2.25066	2.31693	2.37718	2.42762	2.47436	2.51570	2.552.33	
9.83452	0.13964	0.31670	0.441104	0.54011	0.61462	0.68089	0.74114	0.79158	0.83832	0.87966	0.91629	
68.316	1.379	2.073	2.761	3.468	4.117	4.796	5.510	6.188	6.892	7.580	8.247	
29.21	59.92	29.64	59.67	29.59	59.21	28.16	59.05	28.69	58.43	27.96	56.90	88 40 48
29.21	59.92	89.64	119.67	149.59	179.21	208.16	239.05	268.69	298.43	327.96	356.90	8.36726
1.46553	1.77757	1.952.50	2.07798	2.17490	2.25336	2.31840	2.37849	2.42925	2.47484	2.51582	2.552.55	
9.82831	0.14035	0.31678	0.44076	0.53268	0.61614	0.67518	0.73527	0.78603	0.83762	0.87860	0.91533	
67.346	1.381	2.067	2.759	3.449	4.132	4.799	5.512	6.195	6.881	7.561	8.229	
30.02	59.85	29.38	59.29	29.45	59.27	31.52	59.89	30.12	59.25	29.52	58.82	88 40 51
30.02	59.85	89.38	119.29	149.45	179.27	211.52	239.89	270.12	299.25	329.52	358.82	8.36214
1.47741	1.77706	1.951241	2.07660	2.17450	2.25351	2.32535	2.38001	2.43156	2.47603	2.51788	2.55488	8.36667
9.83955	0.13920	0.31338	0.43874	0.53664	0.61565	0.68749	0.74215	0.79370	0.83817	0.88002	0.91702	
69.111	1.378	2.058	2.746	3.441	4.127	4.870	5.523	6.218	6.889	7.551	8.261	
31.03	0.40	29.47	59.79	29.54	58.84	29.71	59.68	29.89	58.04	28.71	59.13	88 40 55
31.03	60.40	89.47	119.79	149.54	178.84	209.71	239.68	269.89	298.04	328.71	359.13	8.36178
1.49178	1.78104	1.95168	2.07842	2.17476	2.25246	2.32168	2.37963	2.43119	2.47427	2.51681	2.55525	
9.85356	0.14282	0.31346	0.44020	0.53654	0.61424	0.68346	0.74141	0.79297	0.83605	0.87859	0.91703	
71.377	1.389	2.058	2.755	3.440	4.114	4.825	5.513	6.208	6.856	7.561	8.261	

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1881 U.C. Collection of Results for Thread intervals from
Feb 2 – Mar. 31/Apr. 1.

	1	2	3	4	5	6	7	8	9	10	11	12	13	
	6'1.76	+5' 29.70	+4' 59.27	+4' 28.84	+3' 59.16	+3' 29.09	+2' 58.69	+2' 30.04	+1' 59.26	+1' 29.42	+0' 58.96	+0' 28.94	− 0.73	−0
	361.76	329.70	299.27	268.84	239.16	209.09	178.69	150.04	119.26	89.42	58.96	28.94		
	2.558442	2.51812	2.47606	2.42868	2.37869	2.32033	2.25210	2.17621	2.07649	1.95143	1.77056	1.46150	9.886332	1.4
	0.92065	0.88035	0.83829	0.79091	0.74092	0.68256	0.61433	0.53844	0.43872	0.31366	0.13279	9.82343	8.22555	9.8
	8.330	7.592	6.891	6.179	5.507	4.815	4.115	3.455	2.746	2.059	1.358	66.639	−.017	
Apr 2 – Apr. 30														
	59.24	28.72	58.83	28.49	57.80	28.80	58.81	28.79	59.39	29.35	59.40	29.17	− 0.10	−0
	359.24	328.72	298.83	268.49	237.80	208.80	178.81	148.79	119.39	89.35	59.40	29.17		
	2.555538	2.51683	2.47542	2.42893	2.37621	2.31973	2.25239	2.17257	2.07697	1.95109	1.77379	1.46494	0.00000	1.4
	0.91898	0.88043	0.83902	0.79253	0.73981	0.68333	0.61599	0.53617	0.44057	0.31469	0.13739	9.82854	8.36360	9.8
	8.298	7.593	6.903	6.202	5.493	4.823	4.130	3.437	2.758	2.064	1.372	67.381	+.023	
May 24 – July 12														
	58.83	27.36	57.94	27.31	57.29	28.46	58.84	28.81	59.14	28.49	0.11	29.89	− 0.76	
	358.83	327.36	297.94	267.31	237.29	208.46	178.84	148.81	119.14	88.49	60.11	29.89		
	2.55489	2.51503	2.47413	2.42702	2.37528	2.31902	2.25246	2.17263	2.07606	1.94689	1.77895	1.47553	0.85081	1.4
	0.91958	0.87972	0.83882	0.79170	0.73997	0.68371	0.61715	0.53732	0.44075	0.31158	0.14364	9.84022	8.24550	9.8
	8.310	7.581	6.900	6.191	5.495	4.827	4.141	3.446	2.759	2.049	1.392	69.218	−.018	
July 19 – Aug. 29														
	57.46	29.20	57.50	27.33	57.63	28.70	57.80	27.60	2 0.53	29.73	59.83	29.90	+ 0.82	
	357.46	329.20	297.50	267.33	237.63	208.70	178.80	147.60	120.53	89.73	59.83	29.90		
	2.55323	2.51746	2.47349	2.42705	2.37590	2.31952	2.25237	2.16909	2.08169	1.95294	1.77692	1.47567	9.91381	1.4
	0.91787	0.88170	0.83773	0.79129	0.74054	0.68421	0.61706	0.53378	0.44578	0.31763	0.14161	9.84036	8.27505	9.8
	8.269	7.615	6.882	6.184	5.497	4.828	4.136	3.414	2.788	2.076	1.384	69.169	+.019	7

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Observations of Polaris. 27 Wires. U C and L C.

	14	15	16	17	18	19	20	21	22	23	24	25	26
	-0′ 29″88	-0′ 1′0″40	-1′ 28″87	-1′ 2′0″31	-2′ 29″38	-2′ 59″09	-3′ 29″16	-3′ 59″82	-4′ 28″16	-4′ 58″63	-5′ 29″64	-5′ 58″66	° ′ ″ 88 40 50
	29.88	60.40	88.87	120.31	149.38	179.09	209.16	239.82	268.16	298.63	329.64	358.66	8.36223
	1.47538	1.78104	1.94876	2.08030	2.17429	2.25307	2.32048	2.37988	2.42839	2.47513	2.51804	2.55468	
	9.83761	0.14327	0.31098	0.44253	0.53652	0.61530	0.68271	0.74212	0.79062	0.83736	0.88027	0.91691	
	68.803	1.391	2.046	2.770	3.440	4.124	4.816	5.522	6.175	6.876	7.590	8.259	
	-0 30.69	59.40	29.93	59.10	29.46	59.04	28.65	58.50	28.47	58.35	28.80	57.33	88 40 35
	30.69	59.40	89.93	119.10	149.46	179.04	208.65	238.50	268.47	298.35	328.80	357.33	8.36360
	1.48700	1.77374	1.95390	2.07591	2.17452	2.25295	2.31942	2.37749	2.42890	2.47473	2.51587	2.55307	
	9.85060	0.13739	0.31750	0.43951	0.53812	0.61655	0.68302	0.74109	0.79250	0.83833	0.87947	0.91667	
	70.892	1.372	2.077	2.751	3.452	4.136	4.820	5.509	6.201	6.892	7.577	8.254	
	30.46	59.11	29.43	59.06	28.88	58.99	28.08	58.18	28.04	56.88	28.16	57.33	88 40 23
	30.46	59.11	89.43	119.06	148.88	178.99	208.08	238.18	268.04	296.88	328.16	357.33	8.36469
	1.48373	1.77166	1.95148	2.07577	2.17284	2.25283	2.31825	2.37696	2.42820	2.47258	2.51609	2.55307	
	9.84842	0.13635	0.31617	0.44046	0.53753	0.61752	0.68294	0.74159	0.79289	0.83727	0.88078	0.91776	
	70.537	1.369	2.071	2.757	3.448	4.145	4.819	5.516	6.207	6.875	7.599	8.275	
	30.90	59.70	30.04	59.44	29.07	30.08	28.03	58.58	28.07	56.94	26.27	57.60	88 40 28
	30.90	59.70	90.04	119.44	149.07	180.08	208.03	238.58	268.00	296.94	326.27	357.60	8.36124
	1.48996	1.77597	1.95443	2.07715	2.17339	2.25546	2.31813	2.37763	2.42813	2.47267	2.51358	2.55340	
	9.85420	0.14021	0.31867	0.44139	0.53763	0.61970	0.68237	0.74187	0.79237	0.83691	0.87782	0.91764	
	71.483	1.381	2.083	2.763	3.448	4.166	4.812	5.519	6.200	6.869	7.548	8.273	

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