

KG
11366
-739

8

k, k'
 d, d'
3

Reduction for Nov. 15 1870

log A	9.7102	lg	178 40	log (h-s)	0.65495	log C'	A' log B	+0015	T at	-bu
log A	.5131	w	337 30	log m	45445	log R	X log p	+0127	i	-B'D
A-5	4.4869	h	33 59	log r	1.13940	log l'a	log l'	.0142	-2	+B
log (h-s)	.65745	lg+a	156 10	r	-13784	log l'a	log R	.9156	T+C-2	Sum
log m	1.30222	h+a	11 25			log l'a	log l'a	.9288		
log (h-s)	1.95417	log h	1.2962	log gs	.8880	log l'a	log l'a	.9288		
log (h-s)	3.1890	log b	1.0456	log hT	.3344	log l'a	log l'a	.9288		
log (h-s)	7.68			log h	1.1957	log l'a	log l'a	.9288		
log (h-s)	8.36493			log h		log l'a	log l'a	.9288		
log (h-s)	1.78 40			log h		log l'a	log l'a	.9288		
log p	1.95429			log h		log l'a	log l'a	.9288		

a	h+a	h+a	log (h-s)	log (h-s)	log (h-s)	log (h-s)
-22 30	156 10	11 29	9.60646	9.96129	9.29903	9.99122
40						
50						
-23 00	163 40	18 59	9.44905	9.98211	9.51227	9.97571
10						
20						
-30	171 10	26 29	9.18628	9.99482	9.64927	9.95115
40						
50						
-24 00	178 40	33 59	8.36678	9.99988	9.74737	9.91866

log gs'	9.6349
log hT'	8.8662
log h'	9.5654
log l'a'	9.0340
log d'	.2337
log l'	+0142
log l'd'	2479

a	-gs' sin(h+a) - hT' sin(h+a)	Sum	T+C-2	K	AK	-g cos(h+a) - hT' cos(h+a)	Sum	d	ad
22 30	-3.122	-4.30	-3.552			+8.284	-15.38	+66.96	
40									
50									
23 00	2.173	.703	2.876			86.38	14.84	71.54	
10						86.38			
20									
30	1.186	.963	2.149			88.95	14.05	74.90	
40									
50									
0 00	-0.150	1.207	-1.387			89.99	-13.01	76.98	

a	-gs' sin(h+a) - hT' sin(h+a)	Sum	Al	*K'	+l'da	-bu'	-hT' cos(h+a)	d'	ad'
22 30	-1.774	-.009	-.183	+015	-1.68	+1.770	+1.08	-3.59	+1.579
40					1.52				1.523
50					1.36				1.527
23 00	121	-.015	136		121			.347	1.531
10					105				1.536
20					089				1.542
30	.066	.021	087		072		329		1.549
40					056				1.556
50					.039				1.564
0 00	-0.10	-.026	-.036		-.021		.304		1.574

a	$-g \sin(\theta + \alpha) - h \cos(\theta + \alpha)$	Sum	$\tau + \epsilon - z$
$23^h 0^m$	-1.169	-1.163	-1.332
10			
20	$+4.65$	-1.314	-1.849
30			
40	$+1.096$	-1.456	-1.360
50			
1 0	$+1.719$	-1.586	$+1.133$

$23^h 0^m$	-2.049	-6.12	-2.659
10			
20	1.431	784	-2.215
30			
40	$.804$	949	-1.753
50			
0 0	-1.71	1.108	-1.279
10			
20	$+4.63$	1.258	$-.795$
30			
40	$+1.093$	1.399	-1.306
50			
1 0	$+1.712$	1.528	$+1.184$

$2^h 0^m$	$+3.480$	-1.615	$+1.665$
10			
20			
30	4.283	1.936	2.347
40			
50			
3 0	5.011	2.023	2.988
10			
20			
30	5.655	2.076	3.579
40			
50			
4 0	$+6.200$	-2.095	$+4.105$
10			

$23^h 0^m$	-2.034	-2.72	-2.309
10			
20			
30	-1.114	$.543$	1.660
40			
50			
0 0	-1.76	$.805$	$.987$
10			
20			
30	$+1.764$	1.053	-2.86
40			
50			
1 0	$+1.688$	-1.283	$+4.15$
10			
20			
30	$+2.598$	-1.492	$+1.106$

K

 $AK - g \cos(\theta + \alpha) - h \sin(\theta + \alpha)$ Sum

Nov. 16 1870

$+89.93$	-12.87	$+77.06$
$+89.77$	12.10	77.67
$+88.93$	11.23	77.70
$+87.40$	10.27	$+77.13$

Nov. 17 1870

$+86.26$	-14.70	$+71.56$
88.74	14.25	73.89
89.34	13.70	75.64
89.89	13.04	76.83
89.71	12.28	77.43
88.86	11.42	77.44
87.36	10.48	$+76.88$

Nov. 19 1870

$+78.80$	-7.69	$+71.11$
72.49	5.88	66.61
64.96	3.97	60.99
56.31	-1.99	54.32
46.71	$+1.02$	46.73

Nov. 27 1870

$+85.63$	-15.43	$+70.20$
88.17	15.04	73.13
89.23	14.37	74.80
88.74	13.49	75.25
86.74	12.36	74.38
83.28	11.00	$+72.25$

α	$-g \sin \theta + g_1 - h \sin \theta \cos \theta$	Sum	K'	$4K'$	$-h \sin \theta \cos \theta$	ad'	a
Nov. 16 1870							
0 ^h 0 ^m	-0.010	-0.40	-0.050	-0.33	-0.31	+1.89	+1.58
10				-0.17			+0.1
20	+0.28	.045	-0.17	0.00	.29		1.59
30				+0.16			1.60
40	+0.65	.050	+0.15	+0.32	.27		1.61
50				+0.48			1.62
1 0	+1.02	-0.55	+0.47	+0.64	-0.25		1.63
				+0.16			1.64

Nov 17 1870							
23 ^h 0 ^m	-0.121	-0.22	-0.143	-0.121	+1.786	+1.03	+0.35
10				1.06			+1.55
20	.085	.027	1.12	0.90			1.56
30				0.75			1.57
40	.048	.033	.081	0.59		.32	1.58
50				0.48			1.59
0 0	-0.010	.038	.048	-0.26			1.59
10				0.10			1.60
20	+0.27	.043	-0.16	+0.06		.28	1.61
30				0.22			1.62
40	+0.65	.049	+0.16	0.88			1.62
50				0.84			1.63
1 0	+1.02	-0.54	+0.47	+0.69	-0.25		1.64
				+0.16			1.65

Nov. 19 1870							
2 ^h 0 ^m	+0.206	-0.64	+0.23	+1.65	+1.782	+0.98	-0.18
10			+1.42	1.80			+1.70
20				1.94			1.71
30	.254	.068	1.86	2.09			1.73
40				2.22		.14	1.74
50				2.35			1.75
0 0	.297	.072	.236	2.49		.09	1.77
10				2.64			1.79
20				2.73			1.80
30	.335	.073	.262	2.85		-0.47	1.82
40				2.96			1.87
50				3.06			1.86
4 0	+0.368	-0.74	+0.294	+3.17	+0.1	+1.89	+0.2
				+0.11			

Nov. 27 1870							
23 ^h 0 ^m	-0.121	-0.09	+0.17	-0.130	+1.73	+0.7	-0.37
10				0.88			+1.43
20				0.83			1.43
30	-0.66	.019	-0.85	0.68		.36	1.44
40				0.52			1.44
50				0.36			1.45
0 0	-0.010	.028	-0.38	0.31		.34	1.45
10				0.05			1.46
20				+0.10			1.46
30	+0.45	.037	+0.08	0.25		.32	1.47
40				0.40			1.48
50				0.56			1.48
1 0	+1.01	.045	+0.056	0.72		.30	1.50
10				0.87			1.51
20				1.02			1.51
30	+1.54	-0.53	+1.01	+1.18	+0.16	.28	+1.52
							+0.1

α	$-\sin(\alpha) \cos(\delta) \sin(11^\circ)$	Sum	$\tau + \epsilon - 2 \frac{1}{2} \delta$	K	$4K$
0h 30m	+756	-645	+111	+5301	+5417
40					
50					
1 0	1676	906	.780	304	5 6.079
10					
20					
30	2569	1150	1.419	+5306	6 6.733
40					
50					
2 0	3417	1345	2.042	312	6 7.360
10					
20					
30	4208	1577	2.631	+5315	7 8.053
40					
50					
3 0	4925	1752	3.173	5318	7 8.498
10					
20					
30	5560	1897	3.663	+5322	8 8.993
40					
50					
4 0	+6099	-2009	+4090	+5325	8 9.423
10					

Dec 10 1870

$d = -7433''$
 $\frac{1}{8} \delta = -63050''$

+5787	-1499	+7288	-01	+7287	-63050
8589	1425	7164	-02	7162	3175
8244	1325	6919	-03	6916	3421
7760	1204	6556	-03	6553	
7142	1061	6081	-04	6077	
6402	900	5502	-05	5497	
5652	724	4828	-06	4822	
+4608	-536	+4072	-07	4065	

Dec 13 1870

0h 30m	+753	-546	+207
40			
50			
1 0	1672	.811	.861
10			
20			
30	2562	1063	1.499
40			
50			
2 0	3408	1296	2.112
10			
20			
30	4196	1507	2.689
40			
50			
3 0	4912	1692	3.220
10			
20			
30	5544	1849	3.655
40			
50			
4 0	6082	1973	+4.109
10			

+5764	-1428	7241
8567	1458	7109
8223	1367	6856
7740	1253	6487
7124	1119	6005
6386	964	5424
5538	793	4745
4597	607	3988

Dec 18 1870

0h 50m	+1666	-648	+1018
10			
20			
30	2552	908	1.644
40			
50			
2 0	3395	1154	2.341
10			
20			
30	4180	1380	2.800
40			
50			
3 0	4893	1582	3.311
10			
20			
30	5522	1757	3.765
40			
50			
4 0	6058	1902	4.156
10			
20			
30	+6488	-2015	+4.473

+5533	-1504	+4029
5193	1428	6765
7710	1329	6381
7096	1207	5889
6360	1064	5296
5516	903	4613
4579	726	3853
+3561	-537	+3024

a - g'sailbay-h'sailbay sum				K'	4K'	- h'sailbay d' ad' a					
				Dec 10 1870							
				+0.25							
0	h 30	+0.45	-0.033	+0.022	+0.43	+0.15	+1.81	+0.3	-36	+1.48	+0.00
	40				.058	15				1.48	1
	50				.073	15				1.49	1
1	0	.099	.032	.067	.088	15			.34	1.50	0
	10				.103	15				1.50	1
	20				.118	15				1.51	1
	30	.152	.041	.111	.133	14			.32	1.52	1
	40				.147	15				1.53	1
	50				.161	14				1.54	1
2	0	.203	.049	.154	.175	14			.29	1.55	1
	10				.188	13				1.56	1
	20				.201	13				1.57	1
	30	.249	.056	.193	.214	13			.25	1.59	2
	40				.227	13				1.60	1
	50				.239	12				1.61	1
3	0	.292	.062	.230	.251	12			.022	1.62	1
	10				.262	11				1.63	1
	20				.273	11				1.64	1
	30	.330	.067	+0.263	.284	11			.018	1.66	2
	40				.293	9				1.68	1
	50				.302	9				1.69	1
4	0	+0.361	-0.071	+0.290	+0.311	+0.09			.013	1.71	+0.2
	10										

Dec 13 1870

0	30	+0.45	-0.23		+1.77	+0.3	-36	+1.44
	40							1.45
	50							1.45
1	0	.099	.032				-34	1.46
	10							1.46
	20							1.46
	30	.152	.041				-32	1.48
	40							1.49
	50							1.50
	0	.203	.049				-29	1.51
	10							1.52
	20							1.53
	30	.249	.056				-25	1.55
	40							1.56
	50							1.57
	0	.291	.062				-22	1.58
	10							1.59
	20							1.60
	30	.329	-0.07				-18	1.62
	40							1.63
	50							1.65
	0	+0.360	-0.071				-13	+1.67
	10							
	20							
	30							

same as Dec 10.

Dec 15 1870

0	50	+0.99	-0.23	+0.76		-36
1	0					
	10					
	20					
	30	.151	-0.32	.119		-34
	40					
	50					
2	0	.201	.041	.160		32
	10					
	20					
	30	.248	.049	.198		29
	40					
	50					
3	0	.290	.056	.234		25
	10					
	20					
	30	.327	.062	.265		22
	40					
	50					
4	0	.359	.067	.292		18
	10					
	20					
	30	.385	.071	+0.314		-13

μ	$g \cos \theta_{\text{ray}} \sin \theta_{\text{ray}}$	$\text{Sum } r+c-z$	R	qR	$-g \cos \theta_{\text{ray}} \sin \theta_{\text{ray}}$	$\text{Sum } d$	ad	a
0								
10								
20								
30	6.488	-2.057	4.433					
40								
50								
5	6.810	2.922	4.718					
10								
20								
30	7.013	2.135	4.878					

Dec 22 1870

1	0	+1.662	-2.496	1.148				
	10		.514					
	20							
	30	2.545	3.788	1.764				
	40		.751					
	50							
2	0	3.385	4.223	2.308				
	10		1.034					
	20							
	30	4.167	5.787	2.896				
	40		1.271					
	50							
3	0	4.878	6.666	3.393				
	10		1.488					
	20							
	30	5.505	6.823	3.831				
	40		1.674					
	50							
4	0	6.036	7.444	4.202				
	10		1.834					
	20							
	30	6.467	1.964	4.503				
	40							
	50							
5	0	6.786	2.058	4.728				
	10							
	20							
	30	6.989	2.119	4.870				

Dec 31 1870

1	20	+2.246	-1.932	+1.859				
	30		.359					
	40							
	50							
2	0	3.095	.658	2.437				
	10			2.974				
	20			2.774				
	30	3.892	918	2.458				
	40			3.458				
	50							
3	0	4.620	1.162	3.458				
	10			3.887				
	20			3.887				
	30	5.273	1.386	3.887				
	40							
	50							
4	0	5.830	1.587	4.247				
	10			4.247				
	20			4.034				
	30	6.294	1.760	4.534				
	40			4.744				
	50			4.744				
5	0	6.647	1.903	4.744				
	10			4.871				
	20							
	30							
	40	6.885	2.074	4.871				

a - g_h i k t a j - h t s i m i t a j s e e n K' 4 K' - h i e d i t a j d' a d' a

4	30	+385	-071	+314	-13
	40				
	50				
5	0	403	074	329	.08
	10				
	20				
	30	416	-75	+341	-08

DEC 22 1870

0	50				
1	0	+098	-078	+081	-37
	10				
	20				
	30	151	028	.123	35
	40				
	50				
2	0	201	036	165	83
	10				
	20				
	30	247	045	202	20
	40				
	50				
3	0	289	052	.287	27
	10				
	20				
	30	326	059	267	24
	40				
	50				
4	0	358	065	293	19
	10				
	20				
	30	383	069	314	15
	40				
	50				
5	0	402	074	328	08
	10				
	20				
	30	414	075	339	03

DEC 30 1870

1 ^h	20	+134	-074	+120	-37
	30				
	40				
	50	184	023	.161	36
2	0				
	10				
	20	231	.032	199	34
	30				
	40				
	50	274	041	233	32
3	0				
	10				
	20	312	049	263	29
	30				
	40				
	50	346	056	290	25
4	0				
	10				
	20	373	062	311	21
	30	37			
	40				
	50	394	067	327	17
5	0				
	10				
	20	+408	-071	.337	-13
	30				
	40				
	50				

a gssm(tas)-htsm(tas) Sum T+C-2

1 ⁿ	20 ^m	+2,250	-559	+1,691
	30			
	40	2,523	737	2,086
	50			
2	0	3,376	910	2,466
	10			
	20	3,902	1,075	2,827

1 ⁿ	20 ^m	+2,246	-361	+1,885
	30			
	40	2,817	543	2,274
	50			
2	0	3,367	-722	+2,645

1 ⁿ	20 ^m	+2,243	-150	+2,093
	30			
	40			
	50	3,087	426	2,661
2	0			
	10			
	20	3,878	694	3,184
	30			
	40			
	50	4,604	957	3,653
3	0			
	10			
	20	5,250	1,191	4,059
	30			
	40			
	50	5,807	1,411	4,396
4	0			
	10			
	20	6,264	1,607	4,657
	30			
	40			
	50	6,613	1,475	4,838
5	0			
	10			
	20	6,850	-1,913	+4,937
	30			
	40	6		

2	20	+3,872	-592	+3,280
	30			
	40	4,363	767	8,596
	50			
3	0	4,818	937	3,881
	10			
	20	+5,239	1,099	+5,140
	30			

a K -gssm(tas)-htsm(tas) Sum d ad a
Dec 26 1870

		+8,265	-15,22	+6,743
		7,991	14,80	6,511
		7,686	14,27	6,229
		7,263	12,63	+5,900
Jan 1 1871				

		+8,221	-15,57	+6,670
		7,947	15,22	6,425
		7,614	-14,81	+6,133

Jan 1 1871

		+8,178	-15,62	+6,616
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		7,747	15,35	6,212
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		7,181	14,81	5,700
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		6,494	14,01	5,093
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		5,697	12,98	4,399
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		4,800	11,72	3,628
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		3,823	10,27	2,796
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		2,779	8,63	1,916
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		1,687	6,86	+1,001
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Jan 11 1871

		+7,160	-15,00	+5,660
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		6,716	14,57	+5,259
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		6,218	14,02	+4,816
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		+5,678	-13,36	+4,342
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a - $\frac{g \sin \theta}{h} - \frac{h \sin \theta}{g}$ sum $K' \Delta K'$

1	20	+133	~~+019~~	+114
	30			
	40	167	026	141
	50			
2	0	200	.032	168
	10			
2	20	+231	~~+038~~	+193

1	20	+133	-013	+120
	30			
	40	167	019	148
	50			
2	0	200	.025	+175

1	20	+133	-005	+128
	30			
	40			
	50	183	015	+168
2	0			
	10			
	20	230	024	+206
	30	2		
	40			
	50	273	.034	+239
3	0			
	10			
	20	311	042	+269
	30			
	40			
	50	344	050	+294
4	0			
	10			
	20	371	061	+314
	30			
	40			
	50	392	063	+329
5	0			
	10			
	20	406	067	+339
	30			
	40			

2	20	+229	-021	+208
	30			
	40	259	027	230
	50			
3	0	284	033	251
	10			
	20	+309	-039	+270

- $\frac{h \sin \theta}{g} - \frac{g \sin \theta}{h}$ d' $\Delta d'$ a

Dec 26 1870

-36

35

24

Jan 1 1871

-37

36

-35

Jan 7 1871

-38

37

35

38

31

28

25

21

-17

-36

35

38

-32

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a - gcm hcm - hTcm hcm Sum T+1-2 K qK				- gcm hcm - hTcm hcm Sum d qd			
				Jan 17 1871			
h	20	+3.860	-3.47 ✓	+3.553	+7.113	-15.30	+55.83
	30				+7.113		
	40				6.429	14.83	+49.46
	50	4.578	.615	9.963			
	0				5.635	14.12	+42.23
B	10						
	20	5.218	.873	4.345			
	30				4.745	13.15	34.30
	40	5.768	1.116	4.652			
	50				3.773	11.97	25.76
4	0	6.220	1.340	4.880			
	10				2.737	10.58	16.79
	20	6.565	1.540	5.025			
	30				1.654	9.01	+7.53
	40	6.797	1.715	5.082			
5	50	6.797			+5.49	7.29	-1.86
	0	6.924	1.860 ✓	5.064			
	10				-5.78	3.49	-11.22
	20	6.912	1.973	4.939			
	30				1.689	3.49	-20.38
6	40	6.792	2.053	4.739			
	50				-2.759	-1.49	-29.08
	0	+6.556	-2.097	+4.459			
	10						
	20						

n	$-g_{\text{Sultraj}} - h_{\text{TSultraj}}$	Sum	K'	$4 K'$	$-h_{\text{2'or0traj}}$	d'	$4 S$
2	20	+229	-012	+217			
	30						-34
	40						
	50	271	.022	.249			36
3	0	~~271~~					
	10						
	20	309	-031	278			34
	30						
	40						
	50	.342	.039	303			32
4	0						
	10						
	20	369	.047	322			29
	30						
	40						
	50	389	.055	334			25
5	0						
	10						
	20	403	.061	342			22
	30						
	40						
	50	410	.66	344			17
6	0						
	10						
	20	410	.70	340			13
	30						
	40						
	50	402	.73	329			8
7	0						
	10						
	20	+389	.074	+315			-03

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