

2008

Sun and Planets

Date	SUN					Mercury						Venus													
	GHA	d	Dec	d		vis	mag	GHA	d	dd	Dec	d	dd	vis	mag	GHA	d	Dec	d						
Jan	1	179	14.0	-7.1	-23	4.1	4.7	SS	-0.9	169	55.3	-46.8	-0.1	-24	18.6	13.2	-0.8	SR	-4.1	220	12.2	-15.7	-18	28.2	-15.9
	2	179	6.9	-7.0	-22	59.4	5.3	SS	-0.9	169	8.5	-46.5	-0.1	-24	5.4	14.7	-0.8	SR	-4.1	219	56.5	-16.0	-18	44.1	-15.5
	3	178	59.8	-7.0	-22	54.1	5.7	SS	-0.9	168	22.0	-46.1	-0.2	-23	50.7	16.3	-0.8	SR	-4.1	219	40.5	-16.3	-18	59.6	-15.0
	4	178	52.9	-6.9	-22	48.4	6.2	SS	-0.9	167	35.8	-45.7	-0.2	-23	34.4	17.9	-0.8	SR	-4.1	219	24.2	-16.6	-19	14.6	-14.6
	5	178	46.0	-6.8	-22	42.2	6.6	SS	-0.9	166	50.2	-45.1	-0.3	-23	16.5	19.3	-0.7	SR	-4.1	219	7.7	-16.8	-19	29.2	-14.0
	6	178	39.2	-6.7	-22	35.6	7.0	SS	-0.9	166	5.1	-44.4	-0.4	-22	57.2	21.0	-0.9	SR	-4.1	218	50.9	-17.1	-19	43.2	-13.5
	7	178	32.6	-6.5	-22	28.6	7.5	SS	-0.9	165	20.7	-43.5	-0.4	-22	36.2	22.4	-0.7	SR	-4.1	218	33.7	-17.4	-19	56.7	-13.0
	8	178	26.0	-6.4	-22	21.1	8.0	SS	-0.9	164	37.2	-42.5	-0.5	-22	13.8	23.9	-0.7	SR	-4.1	218	16.4	-17.6	-20	9.7	-12.4
	9	178	19.6	-6.3	-22	13.1	8.3	SS	-0.9	163	54.7	-41.4	-0.6	-21	49.9	25.3	-0.7	SR	-4.1	217	58.7	-17.9	-20	22.1	-11.9
	10	178	13.3	-6.1	-22	4.8	8.9	SS	-0.9	163	13.3	-40.0	-0.7	-21	24.6	26.8	-0.8	SR	-4.1	217	40.8	-18.1	-20	34.0	-11.4
	11	178	7.2	-6.0	-21	55.9	9.2	SS	-0.9	162	33.3	-38.4	-0.8	-20	57.8	28.0	-0.6	SR	-4.0	217	22.7	-18.4	-20	45.4	-10.8
	12	178	1.2	-5.9	-21	46.7	9.7	SS	-0.9	161	55.0	-36.5	-0.9	-20	29.8	29.3	-0.6	SR	-4.0	217	4.3	-18.6	-20	56.2	-10.2
	13	177	55.3	-5.7	-21	37.0	10.0	SS	-0.9	161	18.4	-34.4	-1.1	-20	0.5	30.5	-0.6	SR	-4.0	216	45.7	-18.8	-21	6.4	-9.6
	14	177	49.6	-5.5	-21	27.0	10.5	SS	-0.9	160	44.1	-31.9	-1.2	-19	30.0	31.5	-0.5	SR	-4.0	216	26.9	-19.0	-21	16.0	-9.1
	15	177	44.1	-5.4	-21	16.5	10.9	SS	-0.8	160	12.2	-29.0	-1.4	-18	58.5	32.3	-0.4	SR	-4.0	216	7.9	-19.2	-21	25.1	-8.4
	16	177	38.7	-5.2	-21	5.6	11.3	SS	-0.8	159	43.2	-25.7	-1.6	-18	26.2	33.2	-0.5	SR	-4.0	215	48.6	-19.4	-21	33.5	-7.8
	17	177	33.5	-5.0	-20	54.3	11.7	SS	-0.8	159	17.5	-22.0	-1.9	-17	53.0	33.6	-0.2	SR	-4.0	215	29.2	-19.6	-21	41.3	-7.2
	18	177	28.5	-4.8	-20	42.6	12.1	SS	-0.8	158	55.5	-17.7	-2.1	-17	19.4	34.0	-0.2	SR	-4.0	215	9.7	-19.8	-21	48.5	-6.7
	19	177	23.7	-4.6	-20	30.5	12.5	SS	-0.8	158	37.8	-12.9	-2.4	-16	45.4	34.1	0.0	SR	-4.0	214	49.9	-19.9	-21	55.2	-5.9
	20	177	19.1	-4.5	-20	18.0	12.9	SS	-0.7	158	24.9	-7.4	-2.7	-16	11.3	33.8	0.2	SR	-4.0	214	30.0	-20.1	-22	1.1	-5.4
	21	177	14.6	-4.3	-20	5.1	13.2	SS	-0.7	158	17.5	-1.2	-3.1	-15	37.5	33.2	0.3	SR	-4.0	214	9.9	-20.2	-22	6.5	-4.7
	22	177	10.3	-4.1	-19	51.9	13.6	SS	-0.6	158	16.3	5.6	-3.4	-15	4.3	32.3	0.5	SR	-4.0	213	49.7	-20.3	-22	11.2	-4.0
	23	177	6.3	-3.9	-19	38.3	14.0	SS	-0.5	158	21.9	13.2	-3.8	-14	32.0	31.0	0.6	SR	-4.0	213	29.4	-20.4	-22	15.2	-3.5
	24	177	2.4	-3.7	-19	24.3	14.3	SS	-0.4	158	35.1	21.6	-4.2	-14	1.0	29.3	0.9	SR	-4.0	213	9.0	-20.5	-22	18.7	-2.7
	25	176	58.7	-3.5	-19	10.0	14.7	SS	-0.2	158	56.7	30.6	-4.5	-13	31.7	27.1	1.1	SR	-4.0	212	48.5	-20.6	-22	21.4	-2.1
	26	176	55.2	-3.3	-18	55.3	15.0	SS	-0.1	159	27.3	40.3	-4.9	-13	4.6	24.5	1.3	SR	-4.0	212	27.9	-20.7	-22	23.5	-1.5
	27	176	51.9	-3.1	-18	40.3	15.4	SS	0.1	160	7.7	50.6	-5.1	-12	40.1	21.5	1.5	SR	-4.0	212	7.3	-20.7	-22	25.0	-0.8
	28	176	48.8	-2.9	-18	24.9	15.7	SS	0.4	160	58.3	61.3	-5.3	-12	18.6	18.0	1.8	SR	-4.0	211	46.6	-20.8	-22	25.8	-0.1
	29	176	45.9	-2.7	-18	9.2	16.0	SS	0.7	161	59.5	72.1	-5.4	-12	0.6	14.2	1.9	SR	-4.0	211	25.8	-20.8	-22	25.9	0.6
	30	176	43.2	-2.5	-17	53.2	16.3	SS	0.9	163	11.6	82.9	-5.4	-11	46.4	10.2	2.0	SR	-4.0	211	5.0	-20.8	-22	25.3	1.2
Jan 31	176	40.7	-2.3	-17	36.9	16.7	SS	1.2	164	34.5	93.4	-5.2	-11	36.2	6.0	2.1	SR	-4.0	210	44.2	-20.8	-22	24.1	1.9	
Feb	1	176	38.4	-2.1	-17	20.2	17.0	SS	1.5	166	7.9	103.1	-4.9	-11	30.2	1.7	2.1	SR	-4.0	210	23.5	-20.8	-22	22.2	2.5
	2	176	36.3	-1.9	-17	3.2	17.3	SS	1.8	167	51.0	111.9	-4.4	-11	28.5	-2.4	2.0	SR	-4.0	210	2.7	-20.7	-22	19.7	3.2
	3	176	34.4	-1.7	-16	45.9	17.5	2.1	169	42.9	119.3	-3.7	-11	30.9	-6.5	2.1	SR	-4.0	209	42.0	-20.7	-22	16.5	3.9	
	4	176	32.7	-1.5	-16	28.4	17.9	2.3	171	42.1	125.0	-2.9	-11	37.4	-10.1	1.8	SR	-4.0	209	21.3	-20.6	-22	12.6	4.6	
	5	176	31.2	-1.3	-16	10.5	18.1	2.6	173	47.2	128.9	-2.0	-11	47.5	-13.4	1.6	SR	-4.0	209	0.6	-20.6	-22	8.0	5.2	
	6	176	29.8	-1.1	-15	52.4	18.4	2.7	175	56.1	130.9	-1.0	-12	0.9	-16.0	1.3	SR	-4.0	208	40.1	-20.5	-22	2.8	5.8	
	7	176	28.7	-0.9	-15	34.0	18.7	2.5	178	7.0	130.9	0.0	-12	16.9	-18.2	1.1	SR	-4.0	208	19.6	-20.4	-21	57.0	6.6	
	8	176	27.8	-0.7	-15	15.3	18.9	2.4	180	17.9	129.0	0.9	-12	35.1	-19.6	0.7	SR	-4.0	207	59.2	-20.3	-21	50.4	7.1	
	9	176	27.1	-0.5	-14	56.4	19.2	2.2	182	26.9	125.4	1.8	-12	54.7	-20.6	0.5	SR	-4.0	207	39.0	-20.1	-21	43.3	7.9	
	10	176	26.6	-0.3	-14	37.2	19.5	SR	2.1	184	32.4	120.4	2.5	-13	15.3	-21.0	0.2	SR	-4.0	207	18.9	-20.0	-21	35.4	8.4
	11	176	26.3	-0.1	-14	17.7	19.6	SR	2.0	186	32.8	114.2	3.1	-13	36.3	-21.0	0.0	SR	-4.0	206	58.9	-19.8	-21	27.0	9.1
	12	176	26.2	0.1	-13	58.1	19.9	SR	1.8	188	27.0	107.2	3.5	-13	57.3	-20.6	-0.2	SR	-4.0	206	39.1	-19.7	-21	17.9	9.8
	13	176	26.3	0.3	-13	38.2	20.1	SR	1.7	190	14.2	99.5	3.8	-14	17.9	-19.7	-0.4	SR	-4.0	206	19.4	-19.5	-21	8.1	10.3
	14	176	26.6	0.5	-13	18.1	20.4	SR	1.5	191	53.7	91.6	4.0	-14	37.6	-18.8	-0.5	SR	-4.0	205	59.9	-19.3	-20	57.8	11.0
	15	176	27.1	0.7	-12	57.7	20.5	SR	1.4	193	25.3	83.5	4.0	-14	56.4	-17.5	-0.6	SR	-4.0	205	40.6	-19.1	-20	46.8	11.6
	16	176	27.8	0.8	-12	37.2	20.8	SR	1.3	194	48.8	75.5	4.0	-15	13.9	-16.2	-0.6	SR	-4.0	205	21.4	-18.9	-20	35.2	12.2
	17	176	28.6	1.0	-12	16.4	20.9	SR	1.1	196	4.3	67.7	3.9	-15	30.1	-14.7	-0.8	SR	-4.0	205	2.5	-18.7	-20	23.0	12.8
	18	176	29.6	1.2	-11	55.5	21.1	SR	1.0	197	12.1	60.3	3.7	-15	44.8	-13.2	-0.8	SR	-4.0	204	43.8	-18.5	-20	10.2	13.4
	19	176	30.8	1.4	-11	34.4	21.3	SR	0.8	198	12.3	53.2	3.6	-15	58.0	-11.6	-0.8	SR	-3.9	204	25.3	-18.3	-19	56.8	14.0
	20	176	32.2	1.5	-11	13.1	21.5	SR	0.7	199	5.5	46.5	3.4	-16	9.6	-10.0	-0.8	SR	-3.9	204	7.0	-18.1	-19	42.8	14.5
	21	176	33.8	1.7	-10	51.6	21.6	SR	0.6	199	51.9	40.2	3.1	-16	19.6	-8.4	-0.8	SR	-3.9	203					

2008

Sun and Planets

Date	Mars							Jupiter							Saturn									
	GHA		d	Dec		d		GHA		d	Dec		d		GHA		d	Dec		d				
	vis	mag		O	O			O	O		O	O			O	O		O	O			O	O	O
Jan 1	y	-1.5	10	10.1	83.3	26	56.5	0.7	y	-1.8	186	45.0	44.2	-23	14.2	0.2	y	0.9	299	20.0	60.4	9	58.3	0.7
2	y	-1.5	11	33.4	82.7	26	57.2	0.7	y	-1.8	187	29.2	44.2	-23	14.0	0.3	y	0.9	300	20.4	60.5	9	59.0	0.8
3	y	-1.5	12	56.1	82.2	26	57.9	0.4	y	-1.8	188	13.5	44.2	-23	13.7	0.3	y	0.9	301	20.8	60.6	9	59.8	0.8
4	y	-1.4	14	18.3	81.6	26	58.3	0.4	y	-1.8	188	57.7	44.2	-23	13.4	0.3	y	0.9	302	21.4	60.7	10	0.6	0.9
5	y	-1.4	15	39.9	81.0	26	58.7	0.2	y	-1.8	189	41.9	44.3	-23	13.1	0.3	y	0.9	303	22.1	60.8	10	1.5	0.9
6	y	-1.4	17	0.9	80.3	26	58.9	0.1	y	-1.8	190	26.2	44.3	-23	12.8	0.4	y	0.9	304	22.9	60.9	10	2.4	1.0
7	y	-1.3	18	21.1	79.6	26	59.0	-0.1	y	-1.8	191	10.5	44.3	-23	12.4	0.3	y	0.9	305	23.8	61.0	10	3.4	0.9
8	y	-1.3	19	40.7	78.8	26	58.9	-0.1	y	-1.8	191	54.8	44.3	-23	12.1	0.4	y	0.8	306	24.7	61.1	10	4.3	1.1
9	y	-1.3	20	59.5	78.0	26	58.8	-0.3	y	-1.8	192	39.1	44.4	-23	11.7	0.4	y	0.8	307	25.8	61.2	10	5.4	1.0
10	y	-1.3	22	17.6	77.2	26	58.5	-0.3	y	-1.8	193	23.5	44.4	-23	11.3	0.5	y	0.8	308	27.0	61.3	10	6.4	1.1
11	y	-1.2	23	34.8	76.4	26	58.2	-0.5	y	-1.8	194	7.9	44.4	-23	10.8	0.4	y	0.8	309	28.2	61.4	10	7.5	1.1
12	y	-1.2	24	51.2	75.6	26	57.7	-0.5	y	-1.8	194	52.3	44.4	-23	10.4	0.5	y	0.8	310	29.6	61.5	10	8.6	1.2
13	y	-1.2	26	6.8	74.7	26	57.2	-0.6	y	-1.8	195	36.7	44.5	-23	9.9	0.5	y	0.8	311	31.0	61.5	10	9.8	1.2
14	y	-1.1	27	21.5	73.8	26	56.6	-0.6	y	-1.8	196	21.2	44.5	-23	9.4	0.6	y	0.8	312	32.6	61.6	10	11.0	1.2
15	y	-1.1	28	35.3	72.9	26	56.0	-0.8	y	-1.8	197	5.7	44.5	-23	8.8	0.5	y	0.8	313	34.2	61.7	10	12.2	1.3
16	y	-1.1	29	48.2	72.0	26	55.2	-0.7	y	-1.8	197	50.2	44.6	-23	8.3	0.6	y	0.8	314	35.9	61.8	10	13.5	1.3
17	y	-1.1	31	0.2	71.1	26	54.5	-0.9	y	-1.8	198	34.8	44.6	-23	7.7	0.6	y	0.8	315	37.7	61.9	10	14.8	1.3
18	y	-1.0	32	11.3	70.2	26	53.6	-0.8	y	-1.8	199	19.4	44.6	-23	7.1	0.6	y	0.8	316	39.6	62.0	10	16.1	1.4
19	y	-1.0	33	21.5	69.3	26	52.8	-0.9	y	-1.8	200	4.1	44.7	-23	6.5	0.6	y	0.8	317	41.6	62.1	10	17.5	1.3
20	y	-1.0	34	30.8	68.4	26	51.9	-1.0	y	-1.8	200	48.8	44.7	-23	5.9	0.7	y	0.8	318	43.7	62.1	10	18.8	1.5
21	y	-0.9	35	39.2	67.4	26	50.9	-0.9	y	-1.8	201	33.5	44.8	-23	5.2	0.7	y	0.8	319	45.8	62.2	10	20.3	1.4
22	y	-0.9	36	46.6	66.5	26	50.0	-1.0	y	-1.9	202	18.3	44.8	-23	4.5	0.7	y	0.8	320	48.0	62.3	10	21.7	1.5
23	y	-0.9	37	53.1	65.6	26	49.0	-0.9	y	-1.9	203	3.1	44.9	-23	3.8	0.7	y	0.7	321	50.3	62.4	10	23.2	1.5
24	y	-0.8	38	58.8	64.7	26	48.1	-1.0	y	-1.9	203	48.0	44.9	-23	3.1	0.7	y	0.7	322	52.7	62.4	10	24.7	1.5
25	y	-0.8	40	3.5	63.8	26	47.1	-1.0	y	-1.9	204	32.9	45.0	-23	2.4	0.8	y	0.7	323	55.1	62.5	10	26.2	1.5
26	y	-0.8	41	7.3	62.9	26	46.1	-1.0	y	-1.9	205	17.8	45.0	-23	1.6	0.7	y	0.7	324	57.6	62.6	10	27.7	1.6
27	y	-0.8	42	10.3	62.1	26	45.1	-1.0	y	-1.9	206	2.9	45.1	-23	0.9	0.8	y	0.7	326	0.2	62.7	10	29.3	1.6
28	y	-0.7	43	12.3	61.2	26	44.1	-1.0	y	-1.9	206	47.9	45.1	-23	0.1	0.8	y	0.7	327	2.9	62.7	10	30.9	1.6
29	y	-0.7	44	13.5	60.3	26	43.1	-0.9	y	-1.9	207	33.1	45.2	-22	59.3	0.8	y	0.7	328	5.6	62.8	10	32.5	1.6
30	y	-0.7	45	13.8	59.5	26	42.2	-1.0	y	-1.9	208	18.2	45.2	-22	58.5	0.9	y	0.7	329	8.4	62.9	10	34.1	1.7
Jan 31	y	-0.6	46	13.3	58.6	26	41.2	-1.0	y	-1.9	209	3.5	45.3	-22	57.6	0.8	y	0.7	330	11.2	62.9	10	35.8	1.7
Feb 1	y	-0.6	47	11.9	57.8	26	40.2	-0.9	y	-1.9	209	48.8	45.4	-22	56.8	0.9	y	0.7	331	14.1	63.0	10	37.5	1.7
2	y	-0.6	48	9.7	57.0	26	39.3	-0.9	y	-1.9	210	34.1	45.4	-22	55.9	0.9	y	0.7	332	17.1	63.0	10	39.2	1.7
3	y	-0.5	49	6.7	56.1	26	38.4	-0.9	y	-1.9	211	19.5	45.5	-22	55.0	0.9	y	0.7	333	20.2	63.1	10	40.9	1.7
4	y	-0.5	50	2.8	55.3	26	37.5	-0.9	y	-1.9	212	5.0	45.5	-22	54.1	0.9	y	0.7	334	23.2	63.1	10	42.6	1.8
5	y	-0.5	50	58.1	54.5	26	36.6	-0.9	y	-1.9	212	50.5	45.6	-22	53.2	0.9	y	0.7	335	26.4	63.2	10	44.4	1.7
6	y	-0.5	51	52.7	53.8	26	35.7	-0.9	y	-1.9	213	36.1	45.7	-22	52.3	1.0	y	0.7	336	29.6	63.2	10	46.1	1.8
7	y	-0.4	52	46.4	53.0	26	34.8	-0.8	y	-1.9	214	21.8	45.8	-22	51.3	0.9	y	0.7	337	32.8	63.3	10	47.9	1.8
8	y	-0.4	53	39.4	52.2	26	34.0	-0.9	y	-1.9	215	7.6	45.8	-22	50.4	1.0	y	0.6	338	36.1	63.3	10	49.7	1.8
9	y	-0.4	54	31.6	51.5	26	33.1	-0.8	y	-1.9	215	53.4	45.9	-22	49.4	1.0	y	0.6	339	39.4	63.4	10	51.5	1.8
10	y	-0.3	55	23.1	50.8	26	32.3	-0.8	y	-1.9	216	39.3	46.0	-22	48.4	1.0	y	0.6	340	42.8	63.4	10	53.3	1.8
11	y	-0.3	56	13.9	50.1	26	31.5	-0.8	y	-1.9	217	25.3	46.1	-22	47.4	1.0	y	0.6	341	46.2	63.5	10	55.1	1.9
12	y	-0.3	57	4.0	49.4	26	30.7	-0.8	y	-1.9	218	11.4	46.1	-22	46.4	1.0	y	0.6	342	49.7	63.5	10	57.0	1.8
13	y	-0.3	57	53.3	48.7	26	29.9	-0.8	y	-1.9	218	57.5	46.2	-22	45.4	1.0	y	0.6	343	53.2	63.5	10	58.8	1.8
14	y	-0.2	58	42.0	48.0	26	29.1	-0.8	y	-1.9	219	43.7	46.3	-22	44.4	1.1	y	0.6	344	56.7	63.5	11	0.6	1.9
15	y	-0.2	59	30.0	47.4	26	28.3	-0.8	y	-1.9	220	30.0	46.4	-22	43.3	1.0	y	0.6	346	0.2	63.6	11	2.5	1.9
16	y	-0.2	60	17.3	46.7	26	27.5	-0.8	y	-1.9	221	16.4	46.5	-22	42.3	1.1	y	0.6	347	3.8	63.6	11	4.4	1.8
17	y	-0.1	61	4.1	46.1	26	26.7	-0.8	y	-1.9	222	2.9	46.6	-22	41.2	1.1	y	0.6	348	7.4	63.6	11	6.2	1.9
18	y	-0.1	61	50.2	45.5	26	25.9	-0.7	y	-1.9	222	49.4	46.6	-22	40.1	1.0	y	0.6	349	11.0	63.6	11	8.1	1.8
19	y	-0.1	62	35.7	44.9	26	25.2	-0.8	y	-1.9	223	36.1	46.7	-22	39.1	1.1	y	0.6	350	14.6	63.6	11	9.9	1.9
20	y	-0.1	63	20.6	44.3	26	24.4	-0.8	y	-1.9	224	22.8	46.8	-22	38.0	1.1	y	0.6	351	18.3	63.7	11	11.8	1.9
21	y	0.0	64	4.9	43.8	26	23.6	-0.8	y	-1.9	225	9.6	46.9	-22	36.9	1.1	y	0.6	352	21.9	63.7	11	13.7	1.8
22	y	0.0	64	48.7	43.2	26	22.8	-0.8	y	-1.9	225	56.5	47.0	-22	35.8	1.1	y	0.6	353	25.6	63.7	11	15.5	1.9
23	y	0.0	65	31.9	42.7	26	22.0	-0.9	y	-1.9	226	43.6	47.1	-22	34.7	1.1	y	0.6	354	29.3	63.7	11	17.4	1.9
24	y	0.0	66	14.6	42.2	26	21.1	-0.8	y	-2.0	227	30.7	47.2	-22	33.6	1.1	y	0.6	355	33.0	63.7	11	19.3	1.8
25	y	0.1	66	56.7	41.7	26	20.3	-0.9	y	-2.0	228	17.9	47.3	-22	32.5	1.1	y	0.6	356	36.7	63.7	11	21.1	1.9
26	y	0.1	67	38.4	41.1	26	19.4	-0.9	y	-2.0	229	5.2	47.4	-22	31.4	1.2	y	0.6	357	40.4	63.7	11	23.0	1.8
27	y	0.1	68	19.5	40.7	26	18.5	-0.9	y	-2.0	229	52.6	47.5	-22	30.2	1.1	y	0.6	358	44.1	63.7	11	24.8	1.8
28	y	0.1	69	0.2	40.2	26	17.6	-0.9	y	-2.0	230	40.1	47.6	-22	29.1	1.1	y	0.6	359	47.7	63.7	11	26.6	1.9
Feb 29	y	0.2	69	40.4	39.7	26	16.7	-1.0	y	-2.0	231	27.8	47.7	-22	28.0	1.1	y	0.6	0	51.4	63.7	11	28.5	1.8
Mar 1	y	0.2	70																					

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Sun and Planets

Date	SUN					Mercury					Venus													
	GHA	d	Dec	d		vis	GHA	d	dd	Dec	d	dd	vis	GHA	d	Dec	d							
	o		o				o			o				o		o								
Mar 6	177	10.5	3.5	-5	36.1	23.3	sr	0.1	202	38.3	-10.4	1.0	-15	54.4	13.0	-0.8	sr	-3.9	200	2.4	-14.2	-15	9.3	22.0
7	177	14.1	3.6	-5	12.8	23.4	sr	0.1	202	27.9	-12.2	0.9	-15	41.4	14.4	-0.7	sr	-3.9	199	48.1	-14.0	-14	47.3	22.4
8	177	17.7	3.7	-4	49.4	23.4	sr	0.1	202	15.7	-13.9	0.8	-15	27.0	15.7	-0.7	sr	-3.9	199	34.2	-13.7	-14	24.9	22.9
9	177	21.4	3.8	-4	26.0	23.5	sr	0.1	202	1.8	-15.4	0.8	-15	11.3	17.1	-0.7	sr	-3.9	199	20.5	-13.5	-14	2.0	23.2
10	177	25.2	3.9	-4	2.5	23.6	sr	0.1	201	46.4	-16.9	0.7	-14	54.2	18.5	-0.7	sr	-3.9	199	7.0	-13.2	-13	38.8	23.6
11	177	29.1	4.0	-3	38.9	23.6	sr	0.0	201	29.6	-18.2	0.7	-14	35.7	19.8	-0.7	sr	-3.9	198	53.8	-13.0	-13	15.2	23.9
12	177	33.1	4.0	-3	15.3	23.6	sr	0.0	201	11.4	-19.4	0.6	-14	15.9	21.2	-0.7	sr	-3.9	198	40.9	-12.7	-12	51.3	24.3
13	177	37.1	4.1	-2	51.7	23.7	sr	0.0	200	51.9	-20.6	0.6	-13	54.7	22.4	-0.6	sr	-3.9	198	28.2	-12.5	-12	27.0	24.7
14	177	41.2	4.2	-2	28.0	23.7	sr	0.0	200	31.3	-21.7	0.6	-13	32.3	23.8	-0.7	sr	-3.9	198	15.7	-12.2	-12	2.3	24.9
15	177	45.4	4.2	-2	4.3	23.7	sr	0.0	200	9.6	-22.8	0.5	-13	8.5	25.0	-0.6	sr	-3.9	198	3.5	-12.0	-11	37.4	25.3
16	177	49.7	4.3	-1	40.6	23.7	sr	-0.1	199	46.8	-23.8	0.5	-12	43.5	26.4	-0.7	sr	-3.9	197	51.5	-11.8	-11	12.1	25.6
17	177	54.0	4.4	-1	16.9	23.7	sr	-0.1	199	23.0	-24.7	0.5	-12	17.1	27.5	-0.6	sr	-3.9	197	39.7	-11.6	-10	46.5	25.9
18	177	58.3	4.4	-0	53.2	23.8	sr	-0.1	198	58.3	-25.6	0.5	-11	49.6	28.9	-0.7	sr	-3.9	197	28.1	-11.3	-10	20.6	26.1
19	178	2.7	4.4	-0	29.4	23.7	sr	-0.1	198	32.7	-26.5	0.4	-11	20.7	30.1	-0.6	sr	-3.9	197	16.8	-11.1	-9	54.5	26.5
20	178	7.2	4.5	-0	5.7	23.7	sr	-0.1	198	6.2	-27.4	0.4	-10	50.6	31.3	-0.6	sr	-3.9	197	5.6	-10.9	-9	28.0	26.6
21	178	11.6	4.5	0	18.0	23.6	sr	-0.2	197	38.8	-28.2	0.4	-10	19.3	32.5	-0.6	sr	-3.9	196	54.7	-10.8	-9	1.4	27.0
22	178	16.1	4.5	0	41.6	23.7	sr	-0.2	197	10.6	-29.1	0.4	-9	46.8	33.7	-0.6	sr	-3.9	196	44.0	-10.6	-8	34.4	27.1
23	178	20.7	4.5	1	5.3	23.6	sr	-0.2	196	41.5	-29.9	0.4	-9	13.1	34.9	-0.6	sr	-3.9	196	33.4	-10.4	-8	7.3	27.4
24	178	25.2	4.6	1	28.9	23.6	sr	-0.3	196	11.7	-30.7	0.4	-8	38.2	36.1	-0.6	sr	-3.9	196	23.0	-10.2	-7	39.9	27.6
25	178	29.8	4.6	1	52.5	23.6	sr	-0.3	195	41.0	-31.6	0.4	-8	2.1	37.3	-0.6	sr	-3.9	196	12.7	-10.1	-7	12.3	27.8
26	178	34.3	4.6	2	16.1	23.5	sr	-0.3	195	9.4	-32.4	0.4	-7	24.8	38.4	-0.6	sr	-3.9	196	2.6	-9.9	-6	44.5	28.0
27	178	38.9	4.5	2	39.6	23.4	sr	-0.4	194	37.0	-33.3	0.4	-6	46.4	39.6	-0.6	sr	-3.9	195	52.7	-9.8	-6	16.5	28.1
28	178	43.4	4.5	3	3.0	23.4	sr	-0.4	194	3.8	-34.1	0.4	-6	6.8	40.7	-0.6	sr	-3.9	195	42.9	-9.7	-5	48.4	28.3
29	178	48.0	4.5	3	26.4	23.4	sr	-0.5	193	29.6	-35.0	0.4	-5	26.1	41.8	-0.6	sr	-3.9	195	33.2	-9.6	-5	20.1	28.5
30	178	52.5	4.5	3	49.8	23.2	sr	-0.5	192	54.6	-36.0	0.5	-4	44.3	42.9	-0.6	sr	-3.9	195	23.7	-9.4	-4	51.6	28.6
Mar 31	178	57.0	4.5	4	13.0	23.2	sr	-0.6	192	18.6	-36.9	0.5	-4	1.4	43.9	-0.5	sr	-3.9	195	14.2	-9.3	-4	23.0	28.7
Apr 1	179	1.4	4.4	4	36.2	23.1	sr	-0.6	191	41.7	-37.9	0.5	-3	17.5	45.0	-0.6	sr	-3.9	195	4.9	-9.2	-3	54.3	28.9
2	179	5.9	4.4	4	59.3	23.0	sr	-0.7	191	3.8	-39.0	0.5	-2	32.5	46.1	-0.6	sr	-3.9	194	55.7	-9.2	-3	25.4	28.9
3	179	10.3	4.4	5	22.3	23.0	sr	-0.8	190	24.8	-40.0	0.5	-1	46.4	47.0	-0.5	sr	-3.9	194	46.5	-9.1	-2	56.5	29.1
4	179	14.6	4.3	5	45.3	22.8	sr	-0.8	189	44.8	-41.1	0.6	0	59.4	48.0	-0.5	sr	-3.9	194	37.4	-9.0	-2	27.4	29.1
5	179	19.0	4.3	6	8.1	22.7	sr	-0.9	189	3.6	-42.3	0.6	0	11.4	48.9	-0.5	sr	-3.9	194	28.4	-9.0	-1	58.3	29.2
6	179	23.2	4.2	6	30.8	22.6	sr	-1.0	188	21.3	-43.5	0.6	0	37.5	49.8	-0.4	sr	-3.9	194	19.5	-8.9	-1	29.1	29.2
7	179	27.4	4.2	6	53.4	22.5	sr	-1.1	187	37.8	-44.7	0.6	1	27.3	50.6	-0.4	sr	-3.9	194	10.5	-8.9	-0	59.9	29.3
8	179	31.6	4.1	7	15.9	22.4	sr	-1.2	186	53.1	-46.0	0.6	2	17.9	51.5	-0.4	sr	-3.9	194	1.7	-8.8	-0	30.6	29.3
9	179	35.7	4.0	7	38.3	22.2	sr	-1.3	186	7.0	-47.4	0.7	3	9.4	52.1	-0.3	sr	-3.9	193	52.8	-8.8	-0	1.3	29.4
10	179	39.7	4.0	8	0.5	22.1	sr	-1.4	185	19.7	-48.7	0.7	4	1.5	52.8	-0.4	sr	-3.9	193	44.0	-8.8	0	28.1	29.3
11	179	43.7	3.9	8	22.6	22.0	sr	-1.5	184	31.0	-50.1	0.7	4	54.3	53.4	-0.3	sr	-3.9	193	35.2	-8.8	0	57.4	29.4
12	179	47.6	3.8	8	44.6	21.8	sr	-1.6	183	40.9	-51.5	0.7	5	47.7	53.8	-0.2	sr	-3.9	193	26.4	-8.8	1	26.8	29.3
13	179	51.5	3.8	9	6.4	21.7	sr	-1.7	182	49.5	-52.8	0.7	6	41.5	54.2	-0.2	sr	-3.9	193	17.5	-8.8	1	56.1	29.3
14	179	55.2	3.7	9	28.1	21.5	sr	-1.8	181	56.6	-54.2	0.7	7	35.7	54.4	-0.1	sr	-3.9	193	8.7	-8.9	2	25.4	29.2
15	179	58.9	3.6	9	49.6	21.3	sr	-2.0	181	2.4	-55.5	0.7	8	30.1	54.6	-0.1	sr	-3.9	192	59.8	-8.9	2	54.6	29.3
16	180	2.5	3.5	10	10.9	21.1	sr	-2.1	180	6.9	-56.8	0.6	9	24.7	54.5	0.0	sr	-3.9	192	50.9	-9.0	3	23.9	29.1
17	180	6.0	3.4	10	32.0	21.0	sr	-2.2	179	10.0	-58.0	0.6	10	19.2	54.3	0.1	sr	-3.9	192	41.9	-9.0	3	53.0	29.1
18	180	9.4	3.3	10	53.0	20.8	sr	-2.1	178	12.0	-59.1	0.5	11	13.5	53.9	0.2	sr	-3.9	192	32.9	-9.1	4	22.1	29.0
19	180	12.7	3.2	11	13.8	20.7	sr	-2.0	177	12.9	-60.0	0.5	12	7.4	53.3	0.3	sr	-3.9	192	23.8	-9.2	4	51.1	28.9
20	180	16.0	3.1	11	34.5	20.4	sr	-1.9	176	12.9	-60.8	0.4	13	0.7	52.5	0.4	sr	-3.9	192	14.6	-9.3	5	20.0	28.8
21	180	19.1	3.0	11	54.9	20.2	sr	-1.8	175	12.1	-61.4	0.3	13	53.2	51.6	0.5	sr	-3.9	192	5.3	-9.4	5	48.8	28.6
22	180	22.1	2.9	12	15.1	20.1	sr	-1.7	174	10.8	-61.7	0.2	14	44.8	50.4	0.6	sr	-3.9	191	55.9	-9.5	6	17.4	28.6
23	180	25.0	2.8	12	35.2	19.8	sr	-1.6	173	9.1	-61.8	0.0	15	35.2	48.9	0.8	sr	-3.9	191	46.4	-9.6	6	46.0	28.4
24	180	27.7	2.6	12	55.0	19.6	ss	-1.5	172	7.3	-61.5	-0.1	16	24.1	47.4	0.8	sr	-3.9	191	36.8	-9.7	7	14.4	28.2
25	180	30.4	2.5	13	14.6	19.4	ss	-1.4	171	5.8	-61.0	-0.3	17	11.5	45.5	1.0	sr	-3.9	191	27.1	-9.9	7	42.6	28.1
26	180	32.9	2.4	13	34.0	19.2	ss	-1.4	170	4.7	-60.2	-0.4	17	57.0	43.6	1.0	sr	-3.9	191	17.2	-10.0	8	10.7	27.9
27	180	35.3	2.3	13	53.2	19.0	ss	-1.3	169	4.5	-59.1	-0.6	18	40.6	41.5	1.0	sr	-3.9	191	7.2	-10.2	8	38.6	27.7
28	180	37.5	2.1	14	12.2	18.7	ss	-1.2	168	5.4	-57.7	-0.7	19	22.1	39.2	1.2	sr	-3.9	190	57.0	-10.4	9	6.3	27.5
29	180	39.7	2.0	14	30.9	18.5	ss	-1.1	167	7.7	-55.9	-0.9	20	1.3	36.9	1.1	sr	-3.9	190	46.6	-10.5	9	33.8	27.3
Apr 30	180	41.7	1.9	14	49.4	18.2	ss	-1.0	166	11.8	-53.9	-1.0	20	38.2	34.5	1.2	sr	-3.9	190	36.1	-10.7	10	1.1	27.1
May 1	180	43.5	1.7	15	7.6	18.0	ss	-0.9	165	17.9	-51.6	-1.2	21	12.7	31.9	1.3	sr	-3.9	190	25.3	-10.9	10	28.2	26.8
2	180	45.3	1.6	15	25.6	17.7	ss	-0.8	164	26.3	-49.0	-1.3	21	44.6	29.5	1.2	sr	-3.9	190	14.4	-11.1	10	55.0	26.6
3	180	46.8	1.4	15	43.3	17.5	ss	-0.7	163	37.3	-46.2	-1.4	22	14.1										

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Sun and Planets

Date	Mars					Jupiter					Saturn							
	vis	GHA		d	Dec	vis	GHA		d	Dec	vis	GHA		d	Dec			
	mag	O		'	O		O		'	O		O		'	O			
Mar 6	y 0.3	73	32.0	37.1	26 10.4	-1.2	y -2.0	236	15.8	48.4	-22 21.2	1.1	y 0.6	7	13.2	63.6	11 39.2	1.7
7	y 0.3	74	9.1	36.7	26 9.2	-1.3	y -2.0	237	4.2	48.5	-22 20.1	1.2	y 0.6	8	16.8	63.5	11 40.9	1.8
8	y 0.4	74	45.8	36.3	26 7.9	-1.3	y -2.0	237	52.7	48.6	-22 18.9	1.1	y 0.6	9	20.4	63.5	11 42.7	1.7
9	y 0.4	75	22.2	36.0	26 6.6	-1.3	y -2.0	238	41.3	48.8	-22 17.8	1.1	y 0.6	10	23.9	63.5	11 44.4	1.7
10	y 0.4	75	58.1	35.6	26 5.3	-1.5	y -2.0	239	30.1	48.9	-22 16.7	1.1	y 0.6	11	27.3	63.4	11 46.1	1.6
11	y 0.4	76	33.7	35.2	26 3.8	-1.4	y -2.0	240	19.0	49.0	-22 15.6	1.1	y 0.6	12	30.8	63.4	11 47.7	1.7
12	y 0.4	77	8.9	34.9	26 2.4	-1.6	y -2.0	241	8.0	49.1	-22 14.5	1.2	y 0.7	13	34.2	63.4	11 49.4	1.6
13	y 0.5	77	43.8	34.5	26 0.8	-1.6	y -2.0	241	57.2	49.3	-22 13.3	1.1	y 0.7	14	37.6	63.3	11 51.0	1.6
14	y 0.5	78	18.3	34.2	25 59.2	-1.6	y -2.0	242	46.5	49.4	-22 12.2	1.1	y 0.7	15	40.9	63.3	11 52.6	1.6
15	y 0.5	78	52.5	33.9	25 57.6	-1.7	y -2.1	243	35.9	49.5	-22 11.1	1.0	y 0.7	16	44.2	63.2	11 54.2	1.6
16	y 0.5	79	26.4	33.6	25 55.9	-1.8	y -2.1	244	25.4	49.7	-22 10.1	1.1	y 0.7	17	47.4	63.2	11 55.8	1.5
17	y 0.5	79	60.0	33.3	25 54.1	-1.9	y -2.1	245	15.1	49.8	-22 9.0	1.1	y 0.7	18	50.6	63.1	11 57.3	1.5
18	y 0.6	80	33.3	33.0	25 52.2	-1.9	y -2.1	246	4.9	50.0	-22 7.9	1.1	y 0.7	19	53.7	63.1	11 58.8	1.5
19	y 0.6	81	6.3	32.7	25 50.3	-2.1	y -2.1	246	54.9	50.1	-22 6.8	1.0	y 0.7	20	56.8	63.0	12 0.3	1.5
20	y 0.6	81	39.0	32.4	25 48.2	-2.1	y -2.1	247	45.0	50.2	-22 5.8	1.1	y 0.7	21	59.8	63.0	12 1.8	1.4
21	y 0.6	82	11.4	32.2	25 46.1	-2.1	y -2.1	248	35.2	50.4	-22 4.7	1.0	y 0.7	23	2.8	62.9	12 3.2	1.4
22	y 0.6	82	43.6	31.9	25 44.0	-2.3	y -2.1	249	25.6	50.5	-22 3.7	1.0	y 0.7	24	5.7	62.9	12 4.6	1.4
23	y 0.7	83	15.5	31.7	25 41.7	-2.3	y -2.1	250	16.1	50.7	-22 2.7	1.0	y 0.7	25	8.6	62.8	12 6.0	1.3
24	y 0.7	83	47.1	31.4	25 39.4	-2.5	y -2.1	251	6.7	50.8	-22 1.7	1.0	y 0.7	26	11.3	62.7	12 7.3	1.4
25	y 0.7	84	18.5	31.2	25 36.9	-2.5	y -2.1	251	57.5	51.0	-22 0.7	1.0	y 0.7	27	14.1	62.7	12 8.7	1.3
26	y 0.7	84	49.7	30.9	25 34.4	-2.6	y -2.1	252	48.5	51.1	-21 59.7	1.0	y 0.7	28	16.7	62.6	12 10.0	1.2
27	y 0.7	85	20.6	30.7	25 31.8	-2.7	y -2.1	253	39.6	51.3	-21 58.7	1.0	y 0.7	29	19.3	62.5	12 11.2	1.3
28	y 0.7	85	51.3	30.5	25 29.1	-2.8	y -2.1	254	30.9	51.4	-21 57.7	0.9	y 0.8	30	21.8	62.4	12 12.5	1.2
29	y 0.8	86	21.8	30.3	25 26.3	-2.9	y -2.1	255	22.3	51.6	-21 56.8	0.9	y 0.8	31	24.3	62.4	12 13.7	1.1
30	y 0.8	86	52.1	30.1	25 23.4	-2.9	y -2.1	256	13.8	51.7	-21 55.9	0.9	y 0.8	32	26.7	62.3	12 14.8	1.2
Mar 31	y 0.8	87	22.1	29.9	25 20.5	-3.1	y -2.1	257	5.6	51.9	-21 55.0	0.9	y 0.8	33	29.0	62.2	12 16.0	1.1
Apr 1	y 0.8	87	52.0	29.7	25 17.4	-3.2	y -2.2	257	57.4	52.0	-21 54.1	0.9	y 0.8	34	31.2	62.1	12 17.1	1.1
2	y 0.8	88	21.6	29.5	25 14.2	-3.3	y -2.2	258	49.5	52.2	-21 53.2	0.9	y 0.8	35	33.3	62.1	12 18.2	1.0
3	y 0.8	88	51.1	29.3	25 10.9	-3.3	y -2.2	259	41.7	52.4	-21 52.3	0.8	y 0.8	36	35.4	62.0	12 19.2	1.0
4	y 0.9	89	20.4	29.1	25 7.6	-3.5	y -2.2	260	34.1	52.5	-21 51.5	0.8	y 0.8	37	37.4	61.9	12 20.2	1.0
5	y 0.9	89	49.5	28.9	25 4.1	-3.6	y -2.2	261	26.6	52.7	-21 50.7	0.8	y 0.8	38	39.3	61.8	12 21.2	0.9
6	y 0.9	90	18.4	28.7	25 0.5	-3.7	y -2.2	262	19.3	52.9	-21 49.9	0.8	y 0.8	39	41.1	61.7	12 22.1	0.9
7	y 0.9	90	47.1	28.6	24 56.8	-3.8	y -2.2	263	12.2	53.0	-21 49.1	0.8	y 0.8	40	42.9	61.7	12 23.0	0.9
8	y 0.9	91	15.7	28.4	24 53.0	-3.9	y -2.2	264	5.2	53.2	-21 48.3	0.7	y 0.8	41	44.5	61.6	12 23.9	0.8
9	y 0.9	91	44.1	28.2	24 49.1	-4.1	y -2.2	264	58.4	53.4	-21 47.6	0.7	y 0.8	42	46.1	61.5	12 24.7	0.8
10	y 0.9	92	12.3	28.1	24 45.0	-4.1	y -2.2	265	51.8	53.6	-21 46.9	0.7	y 0.8	43	47.6	61.4	12 25.5	0.8
11	y 1.0	92	40.4	28.0	24 40.9	-4.2	y -2.2	266	45.4	53.7	-21 46.2	0.7	y 0.8	44	49.0	61.3	12 26.3	0.7
12	y 1.0	93	8.4	27.8	24 36.7	-4.4	y -2.2	267	39.1	53.9	-21 45.5	0.6	y 0.9	45	50.2	61.2	12 27.0	0.7
13	y 1.0	93	36.2	27.7	24 32.3	-4.5	y -2.2	268	33.1	54.1	-21 44.9	0.7	y 0.9	46	51.4	61.1	12 27.7	0.6
14	y 1.0	94	3.9	27.6	24 27.8	-4.5	y -2.2	269	27.2	54.3	-21 44.2	0.6	y 0.9	47	52.6	61.0	12 28.3	0.6
15	y 1.0	94	31.4	27.4	24 23.3	-4.7	y -2.3	270	21.4	54.5	-21 43.6	0.5	y 0.9	48	53.6	60.9	12 28.9	0.6
16	y 1.0	94	58.9	27.3	24 18.6	-4.9	y -2.3	271	15.9	54.6	-21 43.1	0.6	y 0.9	49	54.5	60.8	12 29.5	0.5
17	y 1.0	95	26.2	27.2	24 13.7	-4.9	y -2.3	272	10.5	54.8	-21 42.5	0.5	y 0.9	50	55.3	60.7	12 30.0	0.5
18	y 1.1	95	53.4	27.1	24 8.8	-5.0	y -2.3	273	5.4	55.0	-21 42.0	0.5	y 0.9	51	56.1	60.6	12 30.5	0.4
19	y 1.1	96	20.5	27.0	24 3.8	-5.2	y -2.3	274	0.4	55.2	-21 41.5	0.5	y 0.9	52	56.7	60.5	12 30.9	0.5
20	y 1.1	96	47.5	26.9	23 58.6	-5.3	y -2.3	274	55.6	55.4	-21 41.0	0.4	y 0.9	53	57.2	60.4	12 31.4	0.3
21	y 1.1	97	14.3	26.8	23 53.3	-5.4	y -2.3	275	51.0	55.6	-21 40.6	0.4	y 0.9	54	57.7	60.3	12 31.7	0.4
22	y 1.1	97	41.1	26.7	23 47.9	-5.5	y -2.3	276	46.5	55.8	-21 40.2	0.4	y 0.9	55	58.0	60.2	12 32.1	0.3
23	y 1.1	98	7.8	26.6	23 42.4	-5.6	y -2.3	277	42.3	55.9	-21 39.8	0.4	y 0.9	56	58.3	60.1	12 32.4	0.2
24	y 1.1	98	34.4	26.5	23 36.8	-5.8	y -2.3	278	38.2	56.1	-21 39.4	0.3	y 0.9	57	58.4	60.0	12 32.6	0.3
25	y 1.1	99	1.0	26.4	23 31.0	-5.9	y -2.3	279	34.4	56.3	-21 39.1	0.3	y 0.9	58	58.5	59.9	12 32.9	0.2
26	y 1.2	99	27.4	26.3	23 25.1	-6.0	y -2.3	280	30.7	56.5	-21 38.8	0.3	y 0.9	59	58.4	59.8	12 33.1	0.1
27	y 1.2	99	53.7	26.3	23 19.1	-6.1	y -2.3	281	27.2	56.7	-21 38.5	0.2	y 0.9	60	58.2	59.7	12 33.2	0.1
28	y 1.2	100	20.0	26.2	23 13.0	-6.2	y -2.3	282	23.9	56.9	-21 38.3	0.2	y 1.0	61	58.0	59.6	12 33.3	0.1
29	y 1.2	100	46.2	26.1	23 6.8	-6.4	y -2.4	283	20.8	57.1	-21 38.1	0.2	y 1.0	62	57.6	59.5	12 33.4	0.0
Apr 30	y 1.2	101	12.3	26.1	23 0.4	-6.5	y -2.4	284	18.0	57.3	-21 37.9	0.1	y 1.0	63	57.2	59.4	12 33.4	0.0
May 1	y 1.2	101	38.4	26.0	22 53.9	-6.6	y -2.4	285	15.3	57.5	-21 37.8	0.2	y 1.0	64	56.6	59.3	12 33.4	-0.1
2	y 1.2	102	4.4	25.9	22 47.3	-6.7	y -2.4	286	12.8	57.7	-21 37.6	0.0	y 1.0	65	56.0	59.2	12 33.3	0.0
3	y 1.2	102	30.3	25.9	22 40.6	-6.8	y -2.4	287	10.5	57.9	-21 37.6	0.1	y 1.0	66	55.2	59.1	12 33.3	-0.2
4	y 1.3	102	56.2	25.8	22 33.8	-7.0	y -2.4	288	8.4	58.1	-21 37.5	0.0	y 1.0	67	54.4	59.0	12 33.1	-0.1
5	y 1.3	103	22.0	25.7	22 26.8	-7.1	y -2.4	289	6.5	58.3	-21 37.5	0.0	y 1.0	68	53.4	58.9	12 33.0	-0.2
6	y 1.3	103	47.7	25.7	22 19.7	-7.2	y -2.4	290	4.8	58.5	-21 37.5	0.0	y 1.0	69	52.4	58.8	12 32.8	-0.3
7	y 1.3	104	13.4	25.6	22 12.5	-7.3	y -2.4	291	3.3	58.7	-21 37.5	-0.1	y 1.0	70	51.2	58.7	12 32.5	-0.3
8	y 1.3	104	39.0	25.6	22 5.2	-7.5	y -2.4	292	2.0	58.9	-21 37.6	-0.1	y 1.0	71	49.9	58.6	12 32.2	-0.3
May 9	y 1.3	105	4.6	25.5	21 57.7	-7.6	y -2.4	293	1.0	59.1	-21 37.7	-0.1	y 1.0	72	48.6	58.5	12 31.9	-0.3

2008

Sun and Planets

Date	SUN					Mercury					Venus														
	GHA	d	Dec	d		vis	GHA	d	dd	Dec	d	dd	vis	GHA	d	Dec	d								
	o	'	o	'		mag	o	'	'	o	'	'	mag	o	'	o	'								
May 10	180	54.0	0.5	17	39.9	15.5	ss	0.0	159	24.0	-21.1	-2.0	24	31.9	10.4	1.2	sr	-3.9	188	39.3	-12.9	14	19.5	24.2	
11	180	54.4	0.3	17	55.4	15.2	ss	0.1	159	2.9	-16.9	-2.1	24	42.3	8.3	1.0	sr	-3.9	188	26.4	-13.2	14	43.7	23.7	
12	180	54.7	0.2	18	10.6	14.9	ss	0.2	158	45.9	-12.6	-2.2	24	50.6	6.3	1.0		-3.9	188	13.2	-13.5	15	7.4	23.4	
13	180	54.9	0.0	18	25.5	14.6	ss	0.3	158	33.4	-8.1	-2.2	24	56.9	4.4	1.0		-3.9	187	59.7	-13.7	15	30.8	23.0	
14	180	55.0	-0.1	18	40.1	14.3	ss	0.4	158	25.2	-3.5	-2.3	25	1.3	2.4	1.0		-3.9	187	46.0	-14.0	15	53.8	22.6	
15	180	54.9	-0.2	18	54.4	13.9	ss	0.6	158	21.7	1.2	-2.4	25	3.7	0.7	0.9		-3.9	187	32.0	-14.2	16	16.4	22.2	
16	180	54.6	-0.4	19	8.3	13.6	ss	0.7	158	22.9	6.0	-2.4	25	4.4	-1.2	1.0		-3.9	187	17.8	-14.5	16	38.6	21.8	
17	180	54.3	-0.5	19	21.9	13.3	ss	0.8	158	29.0	10.9	-2.5	25	3.2	-2.7	0.8		-3.9	187	3.3	-14.8	17	0.4	21.3	
18	180	53.8	-0.6	19	35.2	13.0	ss	0.9	158	39.9	16.0	-2.5	25	0.5	-4.4	0.8		-3.9	186	48.5	-15.1	17	21.7	20.9	
19	180	53.1	-0.8	19	48.2	12.6	ss	1.1	158	55.9	21.1	-2.5	24	56.1	-5.9	0.8		-3.9	186	33.4	-15.4	17	42.6	20.5	
20	180	52.4	-0.9	20	0.8	12.3	ss	1.2	159	16.9	26.2	-2.6	24	50.2	-7.4	0.8		-3.9	186	18.0	-15.6	18	3.1	19.9	
21	180	51.4	-1.0	20	13.1	11.9	ss	1.4	159	43.1	31.4	-2.6	24	42.8	-8.8	0.7		-3.9	186	2.4	-15.9	18	23.0	19.5	
22	180	50.4	-1.2	20	25.0	11.6	ss	1.5	160	14.6	36.6	-2.6	24	34.0	-10.2	0.7		-3.9	185	46.5	-16.2	18	42.5	19.0	
23	180	49.2	-1.3	20	36.6	11.3	ss	1.7	160	51.2	41.9	-2.6	24	23.8	-11.4	0.6		-3.9	185	30.3	-16.5	19	1.5	18.5	
24	180	47.9	-1.4	20	47.9	10.8	ss	1.8	161	33.1	47.1	-2.6	24	12.4	-12.6	0.6		-3.9	185	13.8	-16.8	19	20.0	18.0	
25	180	46.5	-1.6	20	58.7	10.6	ss	2.0	162	20.2	52.2	-2.6	23	59.8	-13.7	0.5		-3.9	184	57.1	-17.0	19	38.0	17.5	
26	180	44.9	-1.7	21	9.3	10.1	ss	2.1	163	12.4	57.3	-2.5	23	46.1	-14.8	0.5		-3.9	184	40.0	-17.3	19	55.5	16.9	
27	180	43.2	-1.8	21	19.4	9.8	ss	2.3	164	9.7	62.2	-2.5	23	31.3	-15.8	0.5		-3.9	184	22.7	-17.6	20	12.4	16.3	
28	180	41.4	-1.9	21	29.2	9.4	ss	2.4	165	11.9	66.9	-2.4	23	15.5	-16.7	0.5		-3.9	184	5.1	-17.8	20	28.7	15.9	
29	180	39.5	-2.0	21	38.6	9.1	ss	2.6	166	18.9	71.4	-2.2	22	58.8	-17.4	0.3		-3.9	183	47.3	-18.1	20	44.6	15.2	
30	180	37.5	-2.2	21	47.7	8.6	ss	2.7	167	30.3	75.6	-2.1	22	41.4	-18.1	0.4		-3.9	183	29.2	-18.4	20	59.8	14.7	
May 31	180	35.3	-2.3	21	56.3	8.3	ss	2.9	168	45.9	79.5	-1.9	22	23.3	-18.7	0.3		-3.9	183	10.8	-18.6	21	14.5	14.1	
Jun 1	180	33.0	-2.4	22	4.6	7.9	ss	3.0	170	5.4	82.9	-1.7	22	4.6	-19.1	0.2		-3.9	182	52.2	-18.9	21	28.6	13.4	
2	180	30.7	-2.5	22	12.5	7.5	ss	3.2	171	28.4	86.0	-1.5	21	45.5	-19.3	0.1		-3.9	182	33.3	-19.1	21	42.0	12.9	
3	180	28.2	-2.6	22	20.0	7.1	ss	3.3	172	54.3	88.5	-1.3	21	26.2	-19.5	0.1		-3.9	182	14.2	-19.3	21	54.9	12.3	
4	180	25.6	-2.6	22	27.1	6.7		3.5	174	22.8	90.5	-1.0	21	6.7	-19.3	-0.1		-3.9	181	54.9	-19.6	22	7.2	11.6	
5	180	23.0	-2.7	22	33.8	6.4		3.6	175	53.4	92.0	-0.7	20	47.4	-19.1	-0.1		-3.9	181	35.3	-19.8	22	18.8	11.0	
6	180	20.3	-2.8	22	40.2	5.9		3.8	177	25.3	92.9	-0.4	20	28.3	-18.7	-0.2		-3.9	181	15.6	-20.0	22	29.8	10.4	
7	180	17.5	-2.9	22	46.1	5.5		3.9	178	58.2	93.2	-0.1	20	9.6	-18.1	-0.3		-3.9	180	55.6	-20.2	22	40.2	9.7	
8	180	14.6	-2.9	22	51.6	5.2		3.7	180	31.4	92.9	0.1	19	51.5	-17.2	-0.4		-3.9	180	35.5	-20.3	22	49.9	9.1	
9	180	11.7	-3.0	22	56.8	4.7		3.6	182	4.2	92.0	0.4	19	34.3	-16.2	-0.5		-3.9	180	15.1	-20.5	22	59.0	8.3	
10	180	8.7	-3.0	23	1.5	4.3		3.5	183	36.2	90.6	0.7	19	18.1	-15.1	-0.6		-3.9	179	54.6	-20.7	23	7.3	7.8	
11	180	5.7	-3.1	23	5.8	3.9		3.3	185	6.8	88.6	1.0	19	3.0	-13.8	-0.7		-3.9	179	34.0	-20.8	23	15.1	7.0	
12	180	2.6	-3.1	23	9.7	3.5		3.2	186	35.5	86.2	1.2	18	49.2	-12.3	-0.8		-3.9	179	13.2	-20.9	23	22.1	6.4	
13	179	59.5	-3.1	23	13.2	3.1	sr	3.0	188	1.7	83.4	1.4	18	36.9	-10.7	-0.8		-3.9	178	52.2	-21.1	23	28.5	5.7	
14	179	56.4	-3.2	23	16.3	2.7	sr	2.9	189	25.0	80.1	1.6	18	26.2	-9.0	-0.9		-3.9	178	31.2	-21.2	23	34.2	5.0	
15	179	53.2	-3.2	23	19.0	2.2	sr	2.8	190	45.1	76.5	1.8	18	17.2	-7.3	-0.9		-3.9	178	10.0	-21.3	23	39.2	4.3	
16	179	50.0	-3.2	23	21.2	1.9	sr	2.6	192	1.6	72.6	1.9	18	9.9	-5.5	-0.9		-3.9	177	48.8	-21.3	23	43.5	3.6	
17	179	46.8	-3.2	23	23.1	1.4	sr	2.5	193	14.2	68.5	2.1	18	4.4	-3.7	-0.9		-3.9	177	27.4	-21.4	23	47.1	2.9	
18	179	43.6	-3.2	23	24.5	1.1	sr	2.3	194	27.7	64.1	2.2	18	0.7	-1.9	-0.9		-3.9	177	6.0	-21.5	23	50.0	2.2	
19	179	40.3	-3.2	23	25.6	0.6	sr	2.2	195	26.8	59.6	2.2	17	58.8	-0.1	-0.9		-3.9	176	44.6	-21.5	23	52.2	1.5	
20	179	37.1	-3.2	23	26.2	0.2	sr	2.1	196	26.4	55.0	2.3	17	58.7	1.7	-0.9		-3.9	176	23.1	-21.5	23	53.7	0.7	
21	179	33.8	-3.2	23	26.4	-0.2	sr	1.9	197	21.5	50.3	2.4	18	0.4	3.4	-0.8		-3.9	176	1.6	-21.5	23	54.4	0.1	
22	179	30.6	-3.2	23	26.2	-0.6	sr	1.8	198	11.8	45.5	2.4	18	3.8	5.1	-0.9		-3.9	175	40.0	-21.5	23	54.5	-0.6	
23	179	27.4	-3.2	23	25.6	-1.1	sr	1.6	198	57.3	40.7	2.4	18	8.9	6.6	-0.8		-3.9	175	18.5	-21.5	23	53.9	-1.4	
24	179	24.2	-3.2	23	24.5	-1.4	sr	1.5	199	38.0	35.9	2.4	18	15.5	8.1	-0.8		-3.9	174	57.0	-21.5	23	52.5	-2.0	
25	179	21.0	-3.2	23	23.1	-1.8	sr	1.4	200	14.0	31.1	2.4	18	23.6	9.4	-0.7		-3.9	174	35.5	-21.4	23	50.5	-2.8	
26	179	17.8	-3.1	23	21.3	-2.3	sr	1.2	200	45.0	26.2	2.4	18	33.0	10.8	-0.7		-3.9	174	14.1	-21.4	23	47.7	-3.4	
27	179	14.7	-3.1	23	19.0	-2.7	sr	1.1	201	11.3	21.4	2.4	18	43.8	11.8	-0.5		-3.9	173	52.8	-21.3	23	44.3	-4.2	
28	179	11.6	-3.0	23	16.3	-3.1	sr	1.0	201	32.7	16.6	2.4	18	55.6	12.9	-0.6		-3.9	173	31.5	-21.2	23	40.1	-4.9	
29	179	8.5	-3.0	23	13.2	-3.5	sr	0.8	201	49.3	11.8	2.4	19	8.5	13.8	-0.4		-3.9	173	10.3	-21.1	23	35.2	-5.6	
Jun 30	179	5.5	-2.9	23	9.7	-3.9	sr	0.7	202	1.2	7.1	2.4	19	22.3	14.5	-0.4		-3.9	172	49.2	-21.0	23	29.6	-6.2	
1	179	2.6	-2.9	23	5.8	-4.3	sr	0.6	202	8.2	2.3	2.4	19	36.8	15.1	-0.3		-3.9	172	28.2	-20.8	23	23.4	-7.0	
2	178	59.7	-2.8	23	1.5	-4.7	sr	0.5	202	10.5	-2.4	2.4	19	51.9	15.7	-0.3		-3.9	172	7.4	-20.7	23	16.4	-7.6	
3	178	56.9	-2.7	22	56.8	-5.1	sr	0.3	202	8.1	-7.1	2.4	20	7.6	15.9	-0.1		-3.9	171	46.7	-20.5	23	8.8	-8.4	
4	178	54.1	-2.7	22	51.7	-5.5	sr	0.2	202	1.0	-11.8	2.3	20	23.5	16.1	-0.1		-3.9	171	26.1	-20.4	23	0.4	-9.0	
5	178	51.5	-2.6	22	46.2	-5.9	sr	0.1	201	49.1	-16.5	2.3	20	39.6	16.1	0.0		ss	-3.9	171	5.8	-20.2	22	51.4	-9.7
6	178	48.9	-2.5	22	40.3	-6.3	sr	0.0	201	32.6	-21.2	2.3	20	55.7	15.9	0.1		ss	-3.9	170	45.6	-20.0	22	41.7	-10.3
7	178	46.4	-2.4	22	34.0	-6.7	sr	-0.1	201	11.5	-25.8	2.3	21	11.6	15.6	0.1		ss	-3.9	170	25.6	-19.8	22	3	

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Date	Mars							Jupiter							Saturn									
	GHA		d	Dec		d		GHA		d	Dec		d		GHA		d	Dec		d				
	vis	mag		O	O			O	O		O	O			O	O		O	O		O	O	O	
May 10	y	1.3	105	30.1	25.5	21	50.1	-7.7	y	-2.4	294	0.1	59.3	-21	37.8	-0.2	y	1.0	73	47.1	58.4	12	31.6	-0.4
11	y	1.3	105	55.6	25.5	21	42.4	-7.8	y	-2.4	294	59.4	59.5	-21	38.0	-0.2	y	1.0	74	45.5	58.3	12	31.2	-0.5
12	y	1.3	106	21.1	25.4	21	34.6	-8.0	y	-2.4	295	58.9	59.7	-21	38.2	-0.2	y	1.0	75	43.9	58.2	12	30.7	-0.4
13	y	1.3	106	46.5	25.4	21	26.6	-8.0	y	-2.5	296	58.6	59.9	-21	38.4	-0.3	y	1.0	76	42.1	58.1	12	30.3	-0.5
14	y	1.3	107	11.9	25.4	21	18.6	-8.2	y	-2.5	297	58.5	60.1	-21	38.7	-0.3	y	1.0	77	40.2	58.0	12	29.8	-0.6
15	y	1.4	107	37.3	25.3	21	10.4	-8.3	y	-2.5	298	58.7	60.3	-21	39.0	-0.3	y	1.0	78	38.3	57.9	12	29.2	-0.6
16	y	1.4	108	2.6	25.3	21	2.1	-8.4	y	-2.5	299	59.0	60.5	-21	39.3	-0.3	y	1.0	79	36.2	57.8	12	28.6	-0.6
17	y	1.4	108	27.9	25.3	20	53.7	-8.6	y	-2.5	300	59.5	60.7	-21	39.6	-0.4	y	1.0	80	34.0	57.7	12	28.0	-0.7
18	y	1.4	108	53.2	25.3	20	45.1	-8.6	y	-2.5	302	0.2	60.9	-21	40.0	-0.4	y	1.1	81	31.8	57.6	12	27.3	-0.6
19	y	1.4	109	18.5	25.2	20	36.5	-8.8	y	-2.5	303	1.1	61.1	-21	40.4	-0.5	y	1.1	82	29.4	57.5	12	26.7	-0.8
20	y	1.4	109	43.7	25.2	20	27.7	-8.9	y	-2.5	304	2.2	61.3	-21	40.9	-0.4	y	1.1	83	27.0	57.4	12	25.9	-0.7
21	y	1.4	110	8.9	25.2	20	18.8	-9.0	y	-2.5	305	3.5	61.5	-21	41.3	-0.5	y	1.1	84	24.4	57.4	12	25.2	-0.8
22	y	1.4	110	34.1	25.2	20	9.8	-9.2	y	-2.5	306	5.0	61.7	-21	41.8	-0.6	y	1.1	85	21.8	57.3	12	24.4	-0.9
23	y	1.4	110	59.3	25.2	20	0.6	-9.2	y	-2.5	307	6.7	61.9	-21	42.4	-0.5	y	1.1	86	19.0	57.2	12	23.5	-0.9
24	y	1.4	111	24.5	25.2	19	51.4	-9.4	y	-2.5	308	8.6	62.1	-21	42.9	-0.6	y	1.1	87	16.2	57.1	12	22.6	-0.9
25	y	1.4	111	49.7	25.1	19	42.0	-9.4	y	-2.5	309	10.7	62.3	-21	43.5	-0.6	y	1.1	88	13.2	57.0	12	21.7	-0.9
26	y	1.5	112	14.8	25.1	19	32.6	-9.6	y	-2.5	310	12.9	62.5	-21	44.1	-0.7	y	1.1	89	10.2	56.9	12	20.8	-1.0
27	y	1.5	112	39.9	25.1	19	23.0	-9.7	y	-2.6	311	15.4	62.6	-21	44.8	-0.7	y	1.1	90	7.1	56.8	12	19.8	-1.0
28	y	1.5	113	5.1	25.1	19	13.3	-9.8	y	-2.6	312	18.0	62.8	-21	45.5	-0.7	y	1.1	91	3.9	56.7	12	18.8	-1.0
29	y	1.5	113	30.2	25.1	19	3.5	-10.0	y	-2.6	313	20.9	63.0	-21	46.2	-0.7	y	1.1	92	0.6	56.6	12	17.8	-1.1
30	y	1.5	113	55.3	25.1	18	53.5	-10.0	y	-2.6	314	23.9	63.2	-21	46.9	-0.7	y	1.1	92	57.2	56.5	12	16.7	-1.1
May 31	y	1.5	114	20.4	25.1	18	43.5	-10.2	y	-2.6	315	27.1	63.4	-21	47.6	-0.8	y	1.1	93	53.7	56.4	12	15.6	-1.2
Jun 1	y	1.5	114	45.5	25.1	18	33.3	-10.2	y	-2.6	316	30.4	63.6	-21	48.4	-0.8	y	1.1	94	50.1	56.3	12	14.4	-1.2
2	y	1.5	115	10.5	25.1	18	23.1	-10.4	y	-2.6	317	34.0	63.7	-21	49.2	-0.8	y	1.1	95	46.5	56.2	12	13.2	-1.2
3	y	1.5	115	35.6	25.1	18	12.7	-10.5	y	-2.6	318	37.7	63.9	-21	50.0	-0.9	y	1.1	96	42.7	56.2	12	12.0	-1.2
4	y	1.5	116	0.7	25.1	18	2.2	-10.6	y	-2.6	319	41.6	64.1	-21	50.9	-0.9	y	1.1	97	38.9	56.1	12	10.8	-1.3
5	y	1.5	116	25.7	25.1	17	51.6	-10.7	y	-2.6	320	45.7	64.2	-21	51.8	-0.9	y	1.1	98	34.9	56.0	12	9.5	-1.3
6	y	1.5	116	50.8	25.1	17	40.9	-10.8	y	-2.6	321	50.0	64.4	-21	52.7	-0.9	y	1.1	99	30.9	55.9	12	8.2	-1.4
7	y	1.5	117	15.9	25.1	17	30.1	-10.9	y	-2.6	322	54.4	64.6	-21	53.6	-0.9	y	1.1	100	26.8	55.8	12	6.8	-1.4
8	y	1.5	117	40.9	25.1	17	19.2	-11.1	y	-2.6	323	58.9	64.7	-21	54.5	-1.0	y	1.1	101	22.6	55.7	12	5.4	-1.4
9	y	1.5	118	6.0	25.1	17	8.1	-11.1	y	-2.6	325	3.7	64.9	-21	55.5	-1.0	y	1.1	102	18.3	55.6	12	4.0	-1.4
10	y	1.6	118	31.0	25.1	16	57.0	-11.2	y	-2.6	326	8.5	65.0	-21	56.5	-1.0	y	1.1	103	14.0	55.6	12	2.6	-1.5
11	y	1.6	118	56.1	25.1	16	45.8	-11.4	y	-2.6	327	13.6	65.2	-21	57.5	-1.0	y	1.1	104	9.6	55.5	12	1.1	-1.5
12	y	1.6	119	21.2	25.1	16	34.4	-11.4	y	-2.6	328	18.8	65.3	-21	58.5	-1.0	y	1.1	105	5.0	55.4	11	59.6	-1.5
13	y	1.6	119	46.2	25.1	16	23.0	-11.5	y	-2.7	329	24.1	65.5	-21	59.5	-1.0	y	1.1	106	0.4	55.3	11	58.1	-1.6
14	y	1.6	120	11.3	25.1	16	11.5	-11.7	y	-2.7	330	29.5	65.6	-22	0.5	-1.1	y	1.1	106	55.8	55.2	11	56.5	-1.6
15	y	1.6	120	36.4	25.1	15	59.8	-11.7	y	-2.7	331	35.1	65.7	-22	1.6	-1.1	y	1.1	107	51.0	55.2	11	54.9	-1.6
16	y	1.6	121	1.5	25.1	15	48.1	-11.8	y	-2.7	332	40.8	65.8	-22	2.7	-1.1	y	1.1	108	46.2	55.1	11	53.3	-1.7
17	y	1.6	121	26.6	25.1	15	36.3	-11.9	y	-2.7	333	46.7	66.0	-22	3.8	-1.1	y	1.1	109	41.3	55.0	11	51.6	-1.7
18	y	1.6	121	51.7	25.1	15	24.4	-12.1	y	-2.7	334	52.7	66.1	-22	4.9	-1.1	y	1.2	110	36.3	54.9	11	49.9	-1.7
19	y	1.6	122	16.8	25.1	15	12.3	-12.1	y	-2.7	335	58.8	66.2	-22	6.0	-1.1	y	1.2	111	31.2	54.9	11	48.2	-1.7
20	y	1.6	122	41.9	25.1	15	0.2	-12.2	y	-2.7	337	5.0	66.3	-22	7.1	-1.1	y	1.2	112	26.1	54.8	11	46.5	-1.8
21	y	1.6	123	7.0	25.1	14	48.0	-12.3	y	-2.7	338	11.3	66.4	-22	8.2	-1.2	y	1.2	113	20.9	54.7	11	44.7	-1.8
22	y	1.6	123	32.2	25.1	14	35.7	-12.4	y	-2.7	339	17.7	66.5	-22	9.4	-1.1	y	1.2	114	15.6	54.6	11	42.9	-1.8
23	y	1.6	123	57.3	25.1	14	23.3	-12.5	y	-2.7	340	24.2	66.6	-22	10.5	-1.2	y	1.2	115	10.2	54.6	11	41.1	-1.8
24	y	1.6	124	22.4	25.1	14	10.8	-12.5	y	-2.7	341	30.8	66.7	-22	11.7	-1.1	y	1.2	116	4.8	54.5	11	39.3	-1.9
25	y	1.6	124	47.6	25.2	13	58.3	-12.7	y	-2.7	342	37.5	66.8	-22	12.8	-1.2	y	1.2	116	59.3	54.4	11	37.4	-1.9
26	y	1.6	125	12.7	25.2	13	45.6	-12.8	y	-2.7	343	44.3	66.9	-22	14.0	-1.1	y	1.2	117	53.8	54.4	11	35.5	-1.9
27	y	1.6	125	37.9	25.2	13	32.8	-12.8	y	-2.7	344	51.2	67.0	-22	15.1	-1.2	y	1.2	118	48.1	54.3	11	33.6	-2.0
28	y	1.6	126	3.1	25.2	13	20.0	-12.9	y	-2.7	345	58.2	67.0	-22	16.3	-1.2	y	1.2	119	42.4	54.2	11	31.6	-1.9
29	y	1.6	126	28.2	25.2	13	7.1	-13.0	y	-2.7	347	5.2	67.1	-22	17.5	-1.2	y	1.2	120	36.7	54.2	11	29.7	-2.0
Jun 30	y	1.6	126	53.4	25.2	12	54.1	-13.1	y	-2.7	348	12.3	67.1	-22	18.7	-1.1	y	1.2	121	30.8	54.1	11	27.7	-2.1
1	y	1.7	127	18.5	25.2	12	41.0	-13.2	y	-2.7	349	19.4	67.2	-22	19.8	-1.2	y	1.2	122	24.9	54.0	11	25.6	-2.0
2	y	1.7	127	43.7	25.2	12	27.8	-13.3	y	-2.7	350	26.6	67.2	-22	21.0	-1.2	y	1.2	123	19.0	54.0	11	23.6	-2.1
3	y	1.7	128	8.9	25.2	12	14.5	-13.3	y	-2.7	351	33.9	67.3	-22	22.2	-1.2	y	1.2	124	13.0	53.9	11	21.5	-2.1
4	y	1.7	128	34.0	25.2	12	1.2	-13.5	y	-2.7	352	41.1	67.3	-22	23.4	-1.1	y	1.2	125	6.9	53.9	11	19.4	-2.1
5	y	1.7	128	59.2	25.2	11	47.7	-13.5	y	-2.7	353	48.5	67.4	-22	24.5	-1.2	y	1.2	126	0.7	53.8	11	17.3	-2.1
6	y	1.7	129	24.4	25.2	11	34.2	-13.6	y	-2.7	354	55.8	67.4	-22	25.7	-1.1	y	1.2	126	54.5	53.7	11	15.2	-2.2
7	y	1.7	129	49.5	25.2	11	20.6	-13.6	y	-2.7	356	3.2	67.4	-22	26.8	-1.2	y	1.2	127	48.3	53.7	11	13.0	-2.2
8	y	1.7	130	14.7	25.2	11	7.0	-13.8	y	-2.7	357	10.6	67.4	-22	28.0	-1.1	y	1.2	128	4				

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Date	SUN					Mercury					Venus											
	GHA	d	Dec	d		vis	GHA	d	dd	Dec	d	dd	vis	GHA	d	Dec	d					
Jul 14	178	32.2	-1.6	21	39.2	-9.3	sr -0.8	196	37.3	-56.0	2.0	22	42.9	7.8	0.9	ss -3.9	168	12.1	-18.1	21	1.0	-15.4
	178	30.6	-1.4	21	29.9	-9.7	sr -0.9	195	41.3	-59.7	1.8	22	50.7	6.0	0.9	ss -3.9	167	54.1	-17.8	20	45.6	-16.0
Jul 15	178	29.2	-1.3	21	20.2	-10.1	sr -1.0	194	41.7	-63.1	1.7	22	56.7	3.9	1.0	ss -3.9	167	36.3	-17.5	20	29.6	-16.5
Jul 16	178	27.9	-1.2	21	10.1	-10.4	sr -1.1	193	38.6	-66.2	1.6	23	0.6	1.6	1.1	ss -3.9	167	18.8	-17.2	20	13.1	-17.2
Jul 17	178	26.7	-1.0	20	59.7	-10.8	sr -1.1	192	32.4	-68.9	1.4	23	2.2	-0.7	1.2	ss -3.9	167	1.5	-16.9	19	55.9	-17.6
Jul 18	178	25.7	-0.9	20	48.9	-11.1	sr -1.2	191	23.5	-71.3	1.2	23	1.5	-3.2	1.3	ss -3.9	166	44.6	-16.6	19	38.3	-18.3
Jul 19	178	24.8	-0.8	20	37.8	-11.4	sr -1.3	190	12.2	-73.2	1.0	22	58.3	-5.8	1.3	ss -3.9	166	27.9	-16.4	19	20.0	-18.8
Jul 20	178	24.0	-0.6	20	26.4	-11.8	sr -1.4	188	59.0	-74.7	0.7	22	52.5	-8.5	1.3	ss -3.9	166	11.6	-16.1	19	1.2	-19.3
Jul 21	178	23.4	-0.5	20	14.6	-12.2	sr -1.5	187	44.3	-75.7	0.5	22	44.0	-11.1	1.3	ss -3.9	165	55.5	-15.8	18	41.9	-19.8
Jul 22	178	22.9	-0.3	20	2.4	-12.5	sr -1.6	186	28.6	-76.3	0.3	22	32.9	-13.9	1.4	ss -3.9	165	39.7	-15.5	18	22.1	-20.4
Jul 23	178	22.6	-0.2	19	49.9	-12.8	-1.7	185	12.3	-76.5	0.1	22	19.0	-16.5	1.3	ss -3.9	165	24.3	-15.2	18	1.7	-20.8
Jul 24	178	22.4	0.0	19	37.1	-13.1	-1.7	183	55.8	-76.2	-0.1	22	2.5	-19.2	1.3	ss -3.9	165	9.1	-14.9	17	40.9	-21.3
Jul 25	178	22.4	0.1	19	24.0	-13.5	-1.8	182	39.6	-75.5	-0.3	21	43.3	-21.6	1.2	ss -3.9	164	54.2	-14.6	17	19.6	-21.8
Jul 26	178	22.4	0.2	19	10.5	-13.8	-1.9	181	24.1	-74.5	-0.5	21	21.7	-24.1	1.3	ss -3.9	164	39.6	-14.3	16	57.8	-22.3
Jul 27	178	22.7	0.4	18	56.7	-14.1	-2.0	180	9.6	-73.2	-0.7	20	57.6	-26.3	1.1	ss -3.9	164	25.3	-14.0	16	35.5	-22.7
Jul 28	178	23.1	0.5	18	42.6	-14.4	-2.0	178	56.5	-71.6	-0.8	20	31.3	-28.5	1.1	ss -3.9	164	11.3	-13.7	16	12.8	-23.2
Jul 29	178	23.6	0.7	18	28.2	-14.7	-2.0	177	44.9	-69.7	-0.9	20	2.8	-30.4	1.0	ss -3.9	163	57.6	-13.4	15	49.6	-23.5
Jul 30	178	24.3	0.8	18	13.5	-15.0	-1.9	176	35.2	-67.7	-1.0	19	32.4	-32.3	1.0	ss -3.9	163	44.2	-13.1	15	26.1	-24.0
Jul 31	178	25.1	1.0	17	58.5	-15.3	-1.8	175	27.5	-65.6	-1.1	19	0.1	-33.9	0.8	ss -3.9	163	31.1	-12.9	15	2.1	-24.4
Aug 1	178	26.1	1.1	17	43.2	-15.6	-1.7	174	21.9	-63.3	-1.1	18	26.2	-35.5	0.8	ss -3.9	163	18.2	-12.6	14	37.7	-24.8
Aug 2	178	27.2	1.3	17	27.6	-15.9	-1.6	173	18.5	-61.0	-1.2	17	50.7	-36.8	0.6	ss -3.9	163	5.6	-12.3	14	12.9	-25.2
Aug 3	178	28.5	1.4	17	11.7	-16.1	-1.5	172	17.5	-58.7	-1.2	17	13.9	-38.1	0.7	ss -3.9	162	53.3	-12.0	13	47.7	-25.5
Aug 4	178	30.0	1.6	16	55.6	-16.4	-1.3	171	18.8	-56.3	-1.2	16	35.8	-39.1	0.5	ss -3.9	162	41.3	-11.8	13	22.2	-25.9
Aug 5	178	31.6	1.8	16	39.2	-16.7	ss -1.2	170	22.4	-54.0	-1.2	15	56.7	-40.1	0.5	ss -3.9	162	29.6	-11.5	12	56.3	-26.3
Aug 6	178	33.3	1.9	16	22.5	-17.0	ss -1.1	169	28.5	-51.7	-1.2	15	16.6	-41.0	0.4	ss -3.9	162	18.1	-11.2	12	30.0	-26.5
Aug 7	178	35.2	2.1	16	5.5	-17.2	ss -1.0	168	36.8	-49.4	-1.1	14	35.6	-41.7	0.4	ss -3.9	162	6.8	-11.0	12	3.5	-26.9
Aug 8	178	37.3	2.2	15	48.3	-17.4	ss -1.0	167	47.4	-47.1	-1.1	13	53.9	-42.3	0.3	ss -3.9	161	55.8	-10.8	11	36.6	-27.2
Aug 9	178	39.5	2.3	15	30.9	-17.7	ss -0.9	167	0.3	-44.9	-1.1	13	11.6	-42.8	0.3	ss -3.9	161	45.1	-10.5	11	9.4	-27.5
Aug 10	178	41.8	2.5	15	13.2	-18.0	ss -0.8	166	15.4	-42.8	-1.1	12	28.8	-43.2	0.2	ss -3.9	161	34.6	-10.3	10	41.9	-27.7
Aug 11	178	44.3	2.6	14	55.2	-18.2	ss -0.7	165	32.7	-40.7	-1.0	11	45.6	-43.6	0.2	ss -3.9	161	24.3	-10.1	10	14.2	-28.0
Aug 12	178	47.0	2.8	14	37.0	-18.4	ss -0.7	164	52.0	-38.7	-1.0	11	2.0	-43.9	0.1	ss -3.9	161	14.2	-9.9	9	46.2	-28.3
Aug 13	178	49.7	2.9	14	18.6	-18.6	ss -0.6	164	13.3	-36.7	-1.0	10	18.1	-44.0	0.1	ss -3.9	161	4.3	-9.7	9	17.9	-28.5
Aug 14	178	52.7	3.0	14	0.0	-18.9	ss -0.5	163	36.7	-34.8	-1.0	9	34.1	-44.2	0.1	ss -3.9	160	54.7	-9.5	8	49.4	-28.8
Aug 15	178	55.7	3.2	13	41.1	-19.1	ss -0.5	163	1.9	-33.0	-0.9	8	49.9	-44.3	0.0	ss -3.9	160	45.2	-9.3	8	20.6	-29.0
Aug 16	178	58.9	3.3	13	22.0	-19.2	ss -0.4	162	28.9	-31.2	-0.9	8	5.6	-44.2	0.0	ss -3.9	160	36.0	-9.1	7	51.6	-29.2
Aug 17	179	2.2	3.4	13	2.8	-19.5	ss -0.4	161	57.7	-29.5	-0.9	7	21.4	-44.3	0.0	ss -3.9	160	26.9	-8.9	7	22.4	-29.3
Aug 18	179	5.6	3.6	12	43.3	-19.7	ss -0.3	161	28.3	-27.8	-0.8	6	37.1	-44.1	-0.1	ss -3.9	160	17.9	-8.8	6	53.1	-29.6
Aug 19	179	9.2	3.7	12	23.6	-19.9	ss -0.3	161	0.5	-26.2	-0.8	5	53.0	-43.9	-0.1	ss -3.9	160	9.2	-8.6	6	23.5	-29.7
Aug 20	179	12.8	3.8	12	3.7	-20.1	ss -0.3	160	34.3	-24.6	-0.8	5	9.1	-43.8	0.0	ss -3.9	160	0.5	-8.5	5	53.8	-29.9
Aug 21	179	16.6	3.9	11	43.6	-20.3	ss -0.2	160	9.7	-23.0	-0.8	4	25.3	-43.6	-0.1	ss -3.9	159	52.1	-8.4	5	23.9	-30.1
Aug 22	179	20.5	4.0	11	23.3	-20.5	ss -0.2	159	46.7	-21.5	-0.8	3	41.7	-43.2	-0.2	ss -3.9	159	43.7	-8.2	4	53.8	-30.2
Aug 23	179	24.5	4.1	11	2.8	-20.6	ss -0.2	159	25.1	-20.1	-0.7	2	58.5	-43.0	-0.1	ss -3.9	159	35.5	-8.1	4	23.6	-30.3
Aug 24	179	28.6	4.2	10	42.2	-20.8	ss -0.1	159	5.1	-18.6	-0.7	2	15.5	-42.6	-0.2	ss -3.9	159	27.3	-8.0	3	53.3	-30.4
Aug 25	179	32.8	4.3	10	21.4	-21.0	ss -0.1	158	46.4	-17.2	-0.7	1	32.9	-42.2	-0.2	ss -3.9	159	19.3	-8.0	3	22.9	-30.6
Aug 26	179	37.0	4.4	10	0.4	-21.1	ss -0.1	158	29.2	-15.8	-0.7	0	50.7	-41.7	-0.3	ss -3.9	159	11.3	-7.9	2	52.3	-30.6
Aug 27	179	41.4	4.5	9	39.3	-21.3	ss -0.1	158	13.5	-14.4	-0.7	0	9.0	-41.3	-0.2	ss -3.9	159	3.5	-7.8	2	21.7	-30.7
Aug 28	179	45.9	4.5	9	18.0	-21.4	ss 0.0	157	59.1	-13.0	-0.7	-0	32.3	-40.7	-0.3	ss -3.9	158	55.6	-7.8	1	51.0	-30.8
Aug 29	179	50.4	4.6	8	56.6	-21.6	ss 0.0	157	46.1	-11.5	-0.7	-1	13.0	-40.2	-0.3	ss -3.9	158	47.9	-7.7	1	20.2	-30.8
Aug 30	179	55.0	4.7	8	35.0	-21.7	ss 0.0	157	34.6	-10.1	-0.7	-1	53.2	-39.5	-0.4	ss -3.9	158	40.2	-7.7	0	49.4	-30.9
Aug 31	179	59.7	4.8	8	13.3	-21.9	ss 0.0	157	24.5	-8.6	-0.7	-2	32.7	-39.0	-0.3	ss -3.9	158	32.5	-7.6	0	18.5	-30.9
Sep 1	180	4.5	4.9	7	51.4	-22.0	ss 0.1	157	15.9	-7.2	-0.7	-3	11.7	-38.2	-0.4	ss -3.9	158	24.9	-7.6	-0	12.4	-30.9
Sep 2	180	9.4	4.9	7	29.4	-22.1	ss 0.1	157	8.7	-5.6	-0.8	-3	49.9	-37.5	-0.4	ss -3.9	158	17.2	-7.6	-0	43.3	-30.9
Sep 3	180	14.3	5.0	7	7.3	-22.2	ss 0.1	157	3.1	-4.0	-0.8	-4	27.4	-36.7	-0.4	ss -3.9	158	9.6	-7.6	-1	14.2	-31.0
Sep 4	180	19.3	5.0	6	45.1	-22.3	ss 0.1	156	59.0	-2.4	-0.8	-5	4.1	-35.8	-0.5	ss -3.9	158	2.0	-7.6	-1	45.2	-30.9
Sep 5	180	24.3	5.1	6	22.8	-22.4	ss 0.1	156	56.6	-0.7	-0.9	-5	39.9	-35.0	-0.4	ss -3.9	157	54.3	-7.7	-2	16.1	-30.8
Sep 6	180	29.4	5.1	6	0.4	-22.5	ss 0.1	156	55.9	1.1	-0.9	-6	14.9	-34.0	-0.5	ss -3.9	157	46.7	-7.7	-2	46.9	-30.9
Sep 7	180	34.6	5.2	5	37.9	-22.6	ss 0.1	156	57.1	3.0	-0.9	-6	48.9	-33.0	-0.5	ss -3.9	157	39.0	-7.7	-3	17.8	-30.8
Sep 8	180	39.8	5.2	5	15.3	-22.7	ss 0.2	157	0.1	5.0	-1.0	-7	21.9	-31.8	-0.6	ss -3.9	157	31.2	-7.8	-3	48.6	-30.7
Sep 9	180	45.0	5.3	4	52.6	-22.8	ss 0.2	157	5.1	7.2	-1.1	-7	53.7	-30.7	-0.6	ss -3.9	157	23.4	-7.9	-4	19.3	-30.6
Sep 10	180	50.3	5.3	4																		

2008

Sun and Planets

Date	Mars					Jupiter					Saturn													
	vis	GHA		d	Dec	d	vis	GHA		d	Dec	d	vis	GHA		d	Dec	d						
		mag	O					'	"					O	'				"	O	'	"		
Jul 14	y	1.7	132	45.8	25.2	9	43.5	-14.2	y	-2.7	3	54.9	67.3	-22	34.7	-1.1	y	1.2	134	2.9	53.3	10	57.2	-2.3
15	y	1.7	133	11.0	25.2	9	29.3	-14.2	y	-2.7	5	2.3	67.3	-22	35.8	-1.1	y	1.2	134	56.3	53.3	10	54.9	-2.3
16	y	1.7	133	36.1	25.2	9	15.1	-14.3	y	-2.7	6	9.6	67.3	-22	36.9	-1.1	y	1.2	135	49.5	53.2	10	52.6	-2.4
17	y	1.7	134	1.3	25.2	9	0.8	-14.3	y	-2.7	7	16.8	67.2	-22	38.0	-1.0	y	1.2	136	42.7	53.2	10	50.2	-2.4
18	y	1.7	134	26.5	25.2	8	46.5	-14.4	y	-2.7	8	24.1	67.2	-22	39.0	-1.0	y	1.2	137	35.9	53.1	10	47.8	-2.4
19	y	1.7	134	51.6	25.2	8	32.1	-14.5	y	-2.7	9	31.3	67.1	-22	40.0	-1.1	y	1.2	138	29.0	53.1	10	45.4	-2.4
20	y	1.7	135	16.8	25.1	8	17.6	-14.5	y	-2.7	10	38.4	67.1	-22	41.1	-1.0	y	1.2	139	22.1	53.0	10	43.0	-2.5
21	y	1.7	135	41.9	25.1	8	3.1	-14.6	y	-2.7	11	45.5	67.0	-22	42.1	-1.0	y	1.2	140	15.2	53.0	10	40.5	-2.4
22	y	1.7	136	7.1	25.1	7	48.5	-14.7	y	-2.7	12	52.5	66.9	-22	43.1	-1.0	y	1.2	141	8.2	53.0	10	38.1	-2.5
23	y	1.7	136	32.2	25.1	7	33.8	-14.7	y	-2.7	13	59.4	66.9	-22	44.1	-0.9	y	1.2	142	1.1	52.9	10	35.6	-2.5
24	y	1.7	136	57.3	25.1	7	19.1	-14.7	y	-2.7	15	6.3	66.8	-22	45.0	-1.0	y	1.2	142	54.0	52.9	10	33.1	-2.5
25	y	1.7	137	22.4	25.1	7	4.4	-14.8	y	-2.7	16	13.1	66.7	-22	46.0	-0.9	y	1.2	143	46.9	52.8	10	30.6	-2.5
26	y	1.7	137	47.5	25.1	6	49.6	-14.9	y	-2.7	17	19.8	66.6	-22	46.9	-0.9	y	1.2	144	39.7	52.8	10	28.1	-2.6
27	y	1.7	138	12.6	25.1	6	34.7	-14.9	y	-2.7	18	26.4	66.5	-22	47.8	-0.9	y	1.2	145	32.5	52.8	10	25.5	-2.5
28	y	1.7	138	37.6	25.0	6	19.8	-15.0	y	-2.7	19	32.9	66.4	-22	48.7	-0.9	y	1.2	146	25.3	52.7	10	23.0	-2.6
29	y	1.7	139	2.7	25.0	6	4.8	-15.0	y	-2.7	20	39.3	66.3	-22	49.6	-0.9	y	1.2	147	18.0	52.7	10	20.4	-2.6
30	y	1.7	139	27.7	25.0	5	49.8	-15.1	y	-2.7	21	45.6	66.2	-22	50.5	-0.8	y	1.2	148	10.6	52.6	10	17.8	-2.6
Jul 31	y	1.7	139	52.7	25.0	5	34.7	-15.1	y	-2.7	22	51.8	66.1	-22	51.3	-0.8	y	1.1	149	3.3	52.6	10	15.2	-2.6
Aug 1	y	1.7	140	17.7	25.0	5	19.6	-15.2	y	-2.7	23	57.9	66.0	-22	52.1	-0.8	y	1.1	149	55.9	52.6	10	12.6	-2.6
2	y	1.7	140	42.6	24.9	5	4.4	-15.2	y	-2.7	25	3.8	65.8	-22	52.9	-0.8	y	1.1	150	48.5	52.5	10	10.0	-2.6
3	y	1.7	141	7.6	24.9	4	49.2	-15.3	y	-2.7	26	9.7	65.7	-22	53.7	-0.8	y	1.1	151	41.0	52.5	10	7.4	-2.7
4	y	1.7	141	32.5	24.9	4	33.9	-15.3	y	-2.7	27	15.4	65.6	-22	54.5	-0.8	y	1.1	152	33.5	52.5	10	4.7	-2.7
5	y	1.7	141	57.4	24.9	4	18.6	-15.3	y	-2.7	28	20.9	65.4	-22	55.3	-0.7	y	1.1	153	26.0	52.5	10	2.0	-2.6
6	y	1.7	142	22.2	24.8	4	3.3	-15.4	y	-2.7	29	26.3	65.3	-22	56.0	-0.7	y	1.1	154	18.5	52.4	9	59.4	-2.7
7	y	1.7	142	47.1	24.8	3	47.9	-15.4	y	-2.7	30	31.6	65.1	-22	56.7	-0.7	y	1.1	155	10.9	52.4	9	56.7	-2.7
8	y	1.7	143	11.9	24.8	3	32.5	-15.4	y	-2.7	31	36.7	65.0	-22	57.4	-0.7	y	1.1	156	3.3	52.4	9	54.0	-2.7
9	y	1.7	143	36.7	24.8	3	17.1	-15.5	y	-2.6	32	41.7	64.8	-22	58.1	-0.6	y	1.1	156	55.7	52.4	9	51.3	-2.7
10	y	1.7	144	1.4	24.7	3	1.6	-15.5	y	-2.6	33	46.5	64.7	-22	58.7	-0.6	y	1.1	157	48.0	52.3	9	48.6	-2.8
11	y	1.7	144	26.1	24.7	2	46.1	-15.6	y	-2.6	34	51.2	64.5	-22	59.3	-0.6	y	1.1	158	40.4	52.3	9	45.8	-2.7
12	y	1.7	144	50.8	24.7	2	30.5	-15.5	y	-2.6	35	55.7	64.3	-22	59.9	-0.6	y	1.1	159	32.7	52.3	9	43.1	-2.7
13	y	1.7	145	15.5	24.6	2	15.0	-15.6	y	-2.6	37	0.0	64.2	-23	0.5	-0.6	y	1.1	160	25.0	52.3	9	40.4	-2.8
14	y	1.7	145	40.1	24.6	1	59.4	-15.7	y	-2.6	38	4.2	64.0	-23	1.1	-0.6	y	1.1	161	17.2	52.2	9	37.6	-2.7
15	y	1.7	146	4.7	24.6	1	43.7	-15.6	y	-2.6	39	8.2	63.8	-23	1.7	-0.5	y	1.1	162	9.5	52.2	9	34.9	-2.8
16	y	1.7	146	29.3	24.5	1	28.1	-15.7	y	-2.6	40	12.0	63.6	-23	2.2	-0.5	y	1.1	163	1.7	52.2	9	32.1	-2.8
17	y	1.7	146	53.8	24.5	1	12.4	-15.7	y	-2.6	41	15.6	63.5	-23	2.7	-0.5	y	1.1	163	53.9	52.2	9	29.3	-2.8
18	y	1.7	147	18.2	24.4	0	56.7	-15.7	y	-2.6	42	19.1	63.3	-23	3.2	-0.5	y	1.1	164	46.1	52.2	9	26.5	-2.8
19	y	1.7	147	42.7	24.4	0	41.0	-15.7	y	-2.6	43	22.3	63.1	-23	3.7	-0.4	y	1.1	165	38.3	52.2	9	23.7	-2.7
20	y	1.7	148	7.1	24.3	0	25.3	-15.8	y	-2.6	44	25.4	62.9	-23	4.1	-0.5	y	1.1	166	30.4	52.1	9	21.0	-2.8
21	y	1.7	148	31.4	24.3	0	9.5	-15.8	y	-2.6	45	28.3	62.7	-23	4.6	-0.4	y	1.1	167	22.6	52.1	9	18.2	-2.9
22	y	1.7	148	55.7	24.2	-0	6.3	-15.7	y	-2.6	46	31.1	62.5	-23	5.0	-0.4	y	1.1	168	14.7	52.1	9	15.3	-2.8
23	y	1.7	149	19.9	24.2	-0	22.0	-15.8	y	-2.6	47	33.6	62.3	-23	5.4	-0.3	y	1.1	169	6.8	52.1	9	12.5	-2.8
24	y	1.7	149	44.1	24.1	-0	37.8	-15.9	y	-2.6	48	35.9	62.1	-23	5.7	-0.4	y	1.1	169	59.0	52.1	9	9.7	-2.8
25	y	1.7	150	8.3	24.1	-0	53.7	-15.8	y	-2.6	49	38.1	61.9	-23	6.1	-0.3	y	1.1	170	51.1	52.1	9	6.9	-2.8
26	y	1.7	150	32.4	24.0	-1	9.5	-15.8	y	-2.6	50	40.0	61.7	-23	6.4	-0.3	y	1.1	171	43.1	52.1	9	4.1	-2.9
27	y	1.7	150	56.4	24.0	-1	25.3	-15.9	y	-2.5	51	41.7	61.5	-23	6.7	-0.3	y	1.1	172	35.2	52.1	9	1.2	-2.8
28	y	1.7	151	20.3	23.9	-1	41.2	-15.8	y	-2.5	52	43.3	61.3	-23	7.0	-0.3	y	1.1	173	27.3	52.1	8	58.4	-2.8
29	y	1.7	151	44.2	23.8	-1	57.0	-15.9	y	-2.5	53	44.6	61.1	-23	7.3	-0.3	y	1.1	174	19.4	52.1	8	55.6	-2.9
30	y	1.7	152	8.1	23.8	-2	12.9	-15.8	y	-2.5	54	45.8	60.9	-23	7.6	-0.2	y	1.1	175	11.4	52.1	8	52.7	-2.8
Aug 31	y	1.7	152	31.9	23.7	-2	28.7	-15.9	y	-2.5	55	46.7	60.7	-23	7.8	-0.2	y	1.1	176	3.5	52.1	8	49.9	-2.8
Sep 1	y	1.7	152	55.6	23.7	-2	44.6	-15.8	y	-2.5	56	47.4	60.5	-23	8.0	-0.2	y	1.1	176	55.5	52.1	8	47.1	-2.9
2	y	1.7	153	19.3	23.6	-3	0.4	-15.9	y	-2.5	57	48.0	60.3	-23	8.2	-0.2	y	1.1	177	47.6	52.0	8	44.2	-2.8
3	y	1.7	153	42.8	23.5	-3	16.3	-15.8	y	-2.5	58	48.3	60.1	-23	8.4	-0.2	y	1.1	178	39.6	52.1	8	41.4	-2.8
4	y	1.7	154	6.4	23.5	-3	32.1	-15.9	y	-2.5	59	48.4	59.9	-23	8.6	-0.1	y	1.1	179	31.7	52.1	8	38.6	-2.9
5	y	1.7	154	29.8	23.4	-3	48.0	-15.8	y	-2.5	60	48.3	59.7	-23	8.7	-0.1	y	1.1	180	23.7	52.1	8	35.7	-2.8
6	y	1.7	154	53.2	23.3	-4	3.8	-15.9	y	-2.5	61	48.0	59.5	-23	8.8	-0.1	y	1.1	181	15.8	52.1	8	32.9	-2.9
7	y	1.7	155	16.5	23.2	-4	19.7	-15.8	y	-2.5	62	47.5	59.3	-23	8.9	-0.1	y	1.1	182	7.8	52.1	8	30.0	-2.8
8	y	1.7	155	39.8	23.2	-4	35.5	-15.8	y	-2.5	63	46.7	59.1	-23	9.0	-0.1	y	1.1	182	59.9	52.1	8	27.2	-2.8
9	y	1.7	156	2.9	23.1	-4	51.3	-15.8	y	-2.5	64	45.8	58.9	-23	9.1	0.0	y	1.1	183	52.0	52.1	8	24.4	-2.9
10	y	1.7	156	26.0	23.0	-5	7.1	-15.7	y	-2.5	65	44.7	58.6	-23	9.1	-0.1	y	1.1	184	44.0	52.1	8	21.5	-2.8
11	y	1.7	156	49.0	22.9	-5	22.8	-15.8	y	-2.4	66	43.3	58.4	-23	9.2	0.0	y	1.1	185	36.1	52.1	8	18.7	-2.8
12	y	1.7	157	12.0	22.9	-5	38.6	-15.7	y	-2.4	67	41.8	58.2	-										

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Date	SUN					Mercury						Venus										
	GHA	d	Dec	d		vis	GHA	d	dd	Dec	d	dd	vis	GHA	d	Dec	d					
Sep 17	181	22.4	5.4	2	11.7	-23.2	SS 0.4	158	49.4	27.2	-1.8	-10	58.6	-19.6	-0.9	SS -3.9	156	26.4	-8.6	-7	51.4	-29.8
18	181	27.7	5.4	1	48.5	-23.2	SS 0.4	159	16.6	31.1	-1.9	-11	18.2	-17.5	-1.0	SS -3.9	156	17.7	-8.8	-8	21.2	-29.6
19	181	33.1	5.3	1	25.3	-23.3	SS 0.4	159	47.7	35.2	-2.1	-11	35.7	-15.2	-1.2	SS -3.9	156	9.0	-8.9	-8	50.8	-29.4
20	181	38.5	5.3	1	2.0	-23.3	SS 0.5	160	22.9	39.6	-2.2	-11	50.9	-12.7	-1.2	SS -3.9	156	0.0	-9.1	-9	20.2	-29.2
21	181	43.8	5.3	0	38.7	-23.4	SS 0.6	161	2.5	44.4	-2.4	-12	3.6	-9.9	-1.4	SS -3.9	155	50.9	-9.3	-9	49.4	-29.0
22	181	49.1	5.3	0	15.3	-23.3	SS 0.7	161	46.9	49.6	-2.6	-12	13.5	-7.1	-1.4	SS -3.9	155	41.6	-9.5	-10	18.4	-28.7
23	181	54.4	5.2	-2	8.0	-23.4	SS 0.7	162	36.5	55.0	-2.7	-12	20.6	-3.8	-1.6	SS -3.9	155	32.2	-9.7	-10	47.1	-28.6
24	181	59.6	5.2	-2	31.4	-23.4	SS 0.9	163	31.5	60.8	-2.9	-12	24.4	-0.5	-1.6	SS -3.9	155	22.5	-9.9	-11	15.7	-28.3
25	182	4.8	5.2	-2	54.8	-23.4	SS 1.0	164	32.3	66.8	-3.0	-12	24.9	3.2	-1.9	SS -3.9	155	12.6	-10.1	-11	44.0	-28.0
26	182	9.9	5.1	-1	18.2	-23.3	SS 1.1	165	39.1	73.1	-3.1	-12	21.7	7.1	-2.0	SS -3.9	155	2.5	-10.3	-12	12.0	-27.8
27	182	15.0	5.0	-1	41.5	-23.4	SS 1.3	166	52.3	79.6	-3.2	-12	14.6	11.3	-2.1	SS -3.9	154	52.2	-10.5	-12	39.8	-27.4
28	182	20.1	5.0	-2	4.9	-23.3	SS 1.5	168	11.8	86.0	-3.2	-12	3.3	15.5	-2.1	SS -3.9	154	41.7	-10.6	-13	7.2	-27.2
29	182	25.1	4.9	-2	28.2	-23.4	SS 1.6	169	37.8	92.4	-3.2	-11	47.8	20.0	-2.3	SS -3.9	154	30.9	-11.0	-13	34.4	-26.9
Sep 30	182	30.0	4.9	-2	51.6	-23.2	SS 1.8	171	10.2	98.5	-3.0	-11	27.8	24.5	-2.3	SS -3.9	154	19.9	-11.3	-14	1.3	-26.5
Oct 1	182	34.9	4.8	-3	14.8	-23.3	SS 1.9	172	48.7	104.1	-2.8	-11	3.3	28.8	-2.1	SS -3.9	154	8.6	-11.5	-14	27.8	-26.2
2	182	39.6	4.7	-3	38.1	-23.2	SS 2.1	174	32.8	109.0	-2.5	-10	34.5	33.0	-2.1	SS -3.9	153	57.1	-11.8	-14	54.0	-25.9
3	182	44.4	4.6	-4	1.3	-23.2	2.3	176	21.8	113.0	-2.0	-10	1.5	36.8	-1.9	SS -3.9	153	45.3	-12.1	-15	19.9	-25.5
4	182	49.0	4.5	-4	24.5	-23.1	2.4	178	14.8	115.8	-1.4	-9	24.7	40.1	-1.7	SS -3.9	153	33.2	-12.3	-15	45.4	-25.1
5	182	53.5	4.5	-4	47.6	-23.0	2.6	180	10.6	117.2	-0.7	-8	44.6	42.5	-1.2	SS -3.9	153	20.9	-12.6	-16	10.5	-24.7
6	182	58.0	4.4	-5	10.6	-23.0	2.7	182	7.8	117.1	0.1	-8	2.1	44.2	-0.9	SS -3.9	153	8.3	-12.9	-16	35.2	-24.4
7	183	2.3	4.3	-5	33.6	-22.9	2.9	184	4.9	115.4	0.9	-7	17.9	44.8	-0.3	SS -4.0	152	55.5	-13.2	-16	59.6	-23.9
8	183	6.6	4.2	-5	56.5	-22.9	3.0	186	0.3	112.0	1.7	-6	33.1	44.3	0.3	SS -4.0	152	42.3	-13.4	-17	23.5	-23.5
9	183	10.7	4.0	-6	19.4	-22.7	2.7	187	52.3	107.1	2.5	-5	48.8	42.7	0.8	SS -4.0	152	28.9	-13.7	-17	47.0	-23.0
10	183	14.8	3.9	-6	42.1	-22.7	2.4	189	39.4	100.7	3.2	-5	6.1	40.0	1.4	SS -4.0	152	15.1	-14.0	-18	10.0	-22.6
11	183	18.7	3.8	-7	4.8	-22.5	Sr 2.1	191	20.1	93.2	3.8	-4	26.1	36.5	1.8	SS -4.0	152	1.1	-14.3	-18	32.6	-22.2
12	183	22.6	3.7	-7	27.3	-22.5	Sr 1.8	192	53.3	84.7	4.3	-3	49.6	32.0	2.3	SS -4.0	151	46.8	-14.6	-18	54.8	-21.6
13	183	26.2	3.6	-7	49.8	-22.3	Sr 1.5	194	17.9	75.5	4.6	-3	17.6	27.1	2.5	SS -4.0	151	32.2	-14.9	-19	16.4	-21.2
14	183	29.8	3.4	-8	12.1	-22.2	Sr 1.3	195	33.4	66.0	4.8	-2	50.5	21.6	2.8	SS -4.0	151	17.4	-15.2	-19	37.6	-20.6
15	183	33.2	3.3	-8	34.3	-22.1	Sr 1.0	196	39.4	56.3	4.8	-2	28.9	16.0	2.8	SS -4.0	151	2.2	-15.5	-19	58.2	-20.2
16	183	36.5	3.1	-8	56.4	-22.0	Sr 0.7	197	35.8	46.9	4.7	-2	12.9	10.2	2.9	SS -4.0	150	46.7	-15.7	-20	18.4	-19.6
17	183	39.7	3.0	-9	18.4	-21.9	Sr 0.4	198	22.6	37.7	4.6	-2	2.7	4.6	2.8	SS -4.0	150	31.0	-16.0	-20	38.0	-19.1
18	183	42.7	2.8	-9	40.3	-21.7	Sr 0.1	199	0.3	29.1	4.3	-1	58.1	-0.9	2.8	SS -4.0	150	15.0	-16.3	-20	57.1	-18.6
19	183	45.5	2.7	-10	2.0	-21.6	Sr -0.1	199	29.4	21.0	4.0	-1	59.0	-6.0	2.6	SS -4.0	149	58.6	-16.6	-21	15.7	-17.9
20	183	48.2	2.5	-10	23.6	-21.4	Sr -0.2	199	50.4	13.7	3.7	-2	5.0	-10.8	2.4	SS -4.0	149	42.0	-16.9	-21	33.6	-17.5
21	183	50.7	2.3	-10	45.0	-21.2	Sr -0.4	200	4.1	7.0	3.3	-2	15.8	-15.2	2.2	SS -4.0	149	25.1	-17.2	-21	51.1	-16.8
22	183	53.0	2.2	-11	6.2	-21.1	Sr -0.5	200	11.1	1.1	3.0	-2	31.0	-19.1	1.9	SS -4.0	149	8.0	-17.4	-22	7.9	-16.2
23	183	55.2	2.0	-11	27.3	-21.0	Sr -0.6	200	12.2	-4.2	2.6	-2	50.1	-22.6	1.8	SS -4.0	148	50.5	-17.7	-22	24.1	-15.7
24	183	57.2	1.8	-11	48.3	-20.7	Sr -0.7	200	8.0	-8.7	2.3	-3	12.7	-25.8	1.6	SS -4.0	148	32.9	-17.9	-22	39.8	-15.0
25	183	59.0	1.6	-12	9.0	-20.6	Sr -0.7	199	59.3	-12.7	2.0	-3	38.5	-28.4	1.3	SS -4.0	148	14.9	-18.2	-22	54.8	-14.4
26	184	0.6	1.4	-12	29.6	-20.3	Sr -0.8	199	46.6	-16.1	1.7	-4	6.9	-30.6	1.1	SS -4.0	147	56.7	-18.4	-23	9.2	-13.7
27	184	2.0	1.2	-12	49.9	-20.2	Sr -0.8	199	30.5	-19.0	1.5	-4	37.5	-32.7	1.1	SS -4.0	147	38.3	-18.7	-23	22.9	-13.2
28	184	3.3	1.1	-13	10.1	-20.0	Sr -0.8	199	11.4	-21.5	1.2	-5	10.2	-34.2	0.8	SS -4.0	147	19.6	-18.9	-23	36.1	-12.4
29	184	4.3	0.9	-13	30.1	-19.7	Sr -0.8	198	49.9	-23.6	1.1	-5	44.4	-35.5	0.6	SS -4.0	147	0.7	-19.1	-23	48.5	-11.8
30	184	5.2	0.7	-13	49.8	-19.6	Sr -0.9	198	26.2	-25.4	0.9	-6	19.9	-36.6	0.6	SS -4.0	146	41.6	-19.3	-24	0.3	-11.2
Oct 31	184	5.9	0.5	-14	9.4	-19.3	Sr -0.9	198	0.8	-26.9	0.8	-6	56.5	-37.3	0.4	SS -4.0	146	22.3	-19.5	-24	11.5	-10.4
Nov 1	184	6.3	0.3	-14	28.7	-19.0	Sr -0.9	197	33.9	-28.2	0.6	-7	33.8	-37.9	0.3	SS -4.0	146	2.9	-19.6	-24	21.9	-9.8
2	184	6.6	0.1	-14	47.7	-18.9	Sr -0.9	197	5.7	-29.3	0.5	-8	11.7	-38.4	0.3	SS -4.0	145	43.2	-19.8	-24	31.7	-9.1
3	184	6.7	-0.1	-15	6.6	-18.5	Sr -0.9	196	36.4	-30.2	0.4	-8	50.1	-38.5	0.0	SS -4.0	145	23.4	-19.9	-24	40.8	-8.3
4	184	6.5	-0.3	-15	25.1	-18.4	Sr -0.9	196	6.3	-30.9	0.4	-9	28.6	-38.7	0.1	SS -4.0	145	3.5	-20.1	-24	49.1	-7.7
5	184	6.2	-0.5	-15	43.5	-18.0	Sr -0.9	195	35.4	-31.6	0.3	-10	7.3	-38.6	0.0	SS -4.0	144	43.4	-20.2	-24	56.8	-7.0
6	184	5.7	-0.7	-16	1.5	-17.8	Sr -0.9	195	3.8	-32.2	0.3	-10	45.9	-38.4	-0.1	SS -4.0	144	23.3	-20.3	-25	3.8	-6.2
7	184	5.0	-0.9	-16	19.3	-17.5	Sr -0.9	194	31.6	-32.7	0.2	-11	24.3	-38.2	-0.1	SS -4.0	144	3.0	-20.3	-25	10.0	-5.5
8	184	4.0	-1.1	-16	36.8	-17.3	Sr -0.9	193	58.9	-33.1	0.2	-12	2.5	-37.8	-0.2	SS -4.0	143	42.7	-20.4	-25	15.5	-4.8
9	184	2.9	-1.4	-16	54.1	-16.9	Sr -0.9	193	25.8	-33.5	0.2	-12	40.3	-37.4	-0.2	SS -4.0	143	22.3	-20.4	-25	20.3	-4.1
10	184	1.5	-1.6	-17	11.0	-16.7	Sr -0.9	192	52.3	-33.9	0.2	-13										

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Date	Mars					Jupiter					Saturn													
	vis	GHA		d	Dec	vis	GHA		d	Dec	vis	GHA		d	Dec									
		mag	o				'	o				o	'			o	'	o	'					
Sep 17	y	1.7	159	5.4	22.4	-6	57.0	-15.6	y	-2.4	72	30.9	57.2	-23	8.9	0.1	y	1.1	190	48.8	52.2	8	1.9	-2.8
18	y	1.7	159	27.8	22.3	-7	12.6	-15.5	y	-2.4	73	28.1	57.0	-23	8.8	0.1	y	1.1	191	40.9	52.2	7	59.1	-2.8
19	y	1.7	159	50.1	22.2	-7	28.1	-15.6	y	-2.4	74	25.1	56.8	-23	8.7	0.2	y	1.1	192	33.1	52.2	7	56.3	-2.8
20	y	1.7	160	12.4	22.1	-7	43.7	-15.5	y	-2.4	75	21.9	56.6	-23	8.5	0.1	y	1.1	193	25.3	52.2	7	53.5	-2.8
21	y	1.7	160	34.5	22.0	-7	59.2	-15.4	y	-2.4	76	18.5	56.4	-23	8.4	0.2	y	1.1	194	17.5	52.2	7	50.7	-2.8
22	y	1.7	160	56.5	21.9	-8	14.6	-15.4	y	-2.4	77	14.9	56.2	-23	8.2	0.2	y	1.1	195	9.7	52.2	7	47.9	-2.7
23	y	1.7	161	18.5	21.8	-8	30.0	-15.4	y	-2.4	78	11.1	56.0	-23	8.0	0.2	y	1.1	196	1.9	52.2	7	45.2	-2.8
24	y	1.7	161	40.3	21.7	-8	45.4	-15.4	y	-2.4	79	7.1	55.8	-23	7.8	0.3	y	1.1	196	54.2	52.3	7	42.4	-2.7
25	y	1.7	162	2.0	21.6	-9	0.8	-15.3	y	-2.4	80	2.9	55.6	-23	7.5	0.2	y	1.1	197	46.4	52.3	7	39.7	-2.7
26	y	1.7	162	23.7	21.5	-9	16.1	-15.2	y	-2.3	80	58.5	55.4	-23	7.3	0.3	y	1.1	198	38.7	52.3	7	37.0	-2.8
27	y	1.7	162	45.2	21.4	-9	31.3	-15.2	y	-2.3	81	53.9	55.2	-23	7.0	0.3	y	1.1	199	31.0	52.3	7	34.2	-2.7
28	y	1.7	163	6.6	21.3	-9	46.5	-15.2	y	-2.3	82	49.1	55.0	-23	6.7	0.3	y	1.1	200	23.4	52.4	7	31.5	-2.7
29	y	1.6	163	27.9	21.2	-10	1.7	-15.0	y	-2.3	83	44.1	54.8	-23	6.4	0.4	y	1.1	201	15.7	52.4	7	28.8	-2.6
Sep 30	y	1.6	163	49.1	21.1	-10	16.7	-15.1	y	-2.3	84	39.0	54.6	-23	6.0	0.3	y	1.1	202	8.1	52.4	7	26.2	-2.7
Oct 1	y	1.6	164	10.2	21.0	-10	31.8	-15.0	y	-2.3	85	33.6	54.4	-23	5.7	0.4	y	1.1	203	0.5	52.4	7	23.5	-2.7
2	y	1.6	164	31.1	20.8	-10	46.8	-14.9	y	-2.3	86	28.0	54.2	-23	5.3	0.4	y	1.1	203	53.0	52.5	7	20.8	-2.6
3	y	1.6	164	52.0	20.7	-11	1.7	-14.8	y	-2.3	87	22.3	54.1	-23	4.9	0.4	y	1.1	204	45.5	52.5	7	18.2	-2.7
4	y	1.6	165	12.7	20.6	-11	16.5	-14.8	y	-2.3	88	16.3	53.9	-23	4.5	0.5	y	1.1	205	37.9	52.5	7	15.5	-2.6
5	y	1.6	165	33.3	20.5	-11	31.3	-14.8	y	-2.3	89	10.2	53.7	-23	4.0	0.4	y	1.1	206	30.5	52.6	7	12.9	-2.6
6	y	1.6	165	53.8	20.4	-11	46.1	-14.6	y	-2.3	90	3.9	53.5	-23	3.6	0.5	y	1.1	207	23.0	52.6	7	10.3	-2.6
7	y	1.6	166	14.2	20.3	-12	0.7	-14.6	y	-2.3	90	57.4	53.3	-23	3.1	0.5	y	1.2	208	15.6	52.6	7	7.7	-2.6
8	y	1.6	166	34.4	20.1	-12	15.3	-14.5	y	-2.3	91	50.7	53.1	-23	2.6	0.6	y	1.2	209	8.3	52.7	7	5.1	-2.5
9	y	1.6	166	54.6	20.0	-12	29.8	-14.4	y	-2.3	92	43.9	53.0	-23	2.0	0.5	y	1.2	210	0.9	52.7	7	2.6	-2.6
10	y	1.6	167	14.6	19.9	-12	44.2	-14.4	y	-2.3	93	36.8	52.8	-23	1.5	0.6	y	1.2	210	53.6	52.7	7	0.0	-2.5
11	y	1.6	167	34.4	19.8	-12	58.6	-14.2	y	-2.2	94	29.6	52.6	-23	0.9	0.6	y	1.2	211	46.4	52.8	6	57.5	-2.5
12	y	1.6	167	54.2	19.6	-13	12.8	-14.2	y	-2.2	95	22.2	52.5	-23	0.3	0.6	y	1.2	212	39.2	52.8	6	55.0	-2.5
13	y	1.6	168	13.8	19.5	-13	27.0	-14.1	y	-2.2	96	14.7	52.3	-22	59.7	0.6	y	1.2	213	32.0	52.9	6	52.5	-2.5
14	y	1.6	168	33.3	19.4	-13	41.1	-14.0	y	-2.2	97	7.0	52.1	-22	59.1	0.7	y	1.2	214	24.8	52.9	6	50.0	-2.4
15	y	1.6	168	52.7	19.2	-13	55.1	-13.9	y	-2.2	97	59.1	51.9	-22	58.4	0.6	y	1.2	215	17.7	52.9	6	47.6	-2.5
16	y	1.6	169	11.9	19.1	-14	9.0	-13.9	y	-2.2	98	51.0	51.8	-22	57.8	0.8	y	1.2	216	10.7	53.0	6	45.1	-2.4
17	y	1.6	169	31.0	19.0	-14	22.9	-13.7	y	-2.2	99	42.8	51.6	-22	57.0	0.7	y	1.2	217	3.7	53.0	6	42.7	-2.4
18	y	1.6	169	50.0	18.8	-14	36.6	-13.6	y	-2.2	100	34.4	51.5	-22	56.3	0.7	y	1.2	217	56.7	53.1	6	40.3	-2.4
19	y	1.6	170	8.8	18.7	-14	50.2	-13.6	y	-2.2	101	25.9	51.3	-22	55.6	0.8	y	1.2	218	49.8	53.1	6	37.9	-2.3
20	y	1.6	170	27.5	18.5	-15	3.8	-13.4	y	-2.2	102	17.2	51.1	-22	54.8	0.8	y	1.2	219	42.9	53.2	6	35.6	-2.4
21	y	1.6	170	46.1	18.4	-15	17.2	-13.3	y	-2.2	103	8.3	51.0	-22	54.0	0.8	y	1.2	220	36.0	53.2	6	33.2	-2.3
22	y	1.6	171	4.5	18.3	-15	30.5	-13.2	y	-2.2	103	59.3	50.8	-22	53.2	0.8	y	1.2	221	29.2	53.3	6	30.9	-2.3
23	y	1.6	171	22.7	18.1	-15	43.7	-13.1	y	-2.2	104	50.1	50.7	-22	52.4	0.9	y	1.2	222	22.5	53.3	6	28.6	-2.3
24	y	1.6	171	40.8	18.0	-15	56.8	-13.0	y	-2.2	105	40.8	50.5	-22	51.5	0.9	y	1.2	223	15.8	53.4	6	26.3	-2.2
25	y	1.5	171	58.8	17.8	-16	9.8	-12.9	y	-2.2	106	31.4	50.4	-22	50.6	0.9	y	1.2	224	9.2	53.4	6	24.1	-2.2
26	y	1.5	172	16.6	17.7	-16	22.7	-12.8	y	-2.2	107	21.7	50.2	-22	49.7	0.9	y	1.2	225	2.6	53.5	6	21.9	-2.2
27	y	1.5	172	34.3	17.5	-16	35.5	-12.6	y	-2.2	108	12.0	50.1	-22	48.8	1.0	y	1.2	225	56.1	53.5	6	19.7	-2.2
28	y	1.5	172	51.8	17.4	-16	48.1	-12.5	y	-2.1	109	2.0	49.9	-22	47.8	1.0	y	1.2	226	49.6	53.6	6	17.5	-2.2
29	y	1.5	173	9.2	17.2	-17	0.6	-12.4	y	-2.1	109	52.0	49.8	-22	46.8	1.0	y	1.2	227	43.2	53.6	6	15.3	-2.1
30	y	1.5	173	26.5	17.1	-17	13.0	-12.3	y	-2.1	110	41.8	49.7	-22	45.8	1.1	y	1.2	228	36.8	53.7	6	13.2	-2.1
Oct 31	y	1.5	173	43.5	16.9	-17	25.3	-12.1	y	-2.1	111	31.4	49.5	-22	44.7	1.0	y	1.2	229	30.5	53.8	6	11.1	-2.1
Nov 1	y	1.5	174	0.5	16.8	-17	37.4	-12.0	y	-2.1	112	21.0	49.4	-22	43.7	1.1	y	1.2	230	24.2	53.8	6	9.0	-2.0
2	y	1.5	174	17.3	16.6	-17	49.4	-11.8	y	-2.1	113	10.3	49.3	-22	42.6	1.1	y	1.2	231	18.1	53.9	6	7.0	-2.0
3	y	1.5	174	33.9	16.5	-18	1.2	-11.8	y	-2.1	113	59.6	49.1	-22	41.5	1.2	y	1.2	232	11.9	53.9	6	5.0	-2.0
4	y	1.5	174	50.4	16.3	-18	13.0	-11.5	y	-2.1	114	48.7	49.0	-22	40.3	1.1	y	1.2	233	5.9	54.0	6	3.0	-2.0
5	y	1.5	175	6.7	16.2	-18	24.5	-11.5	y	-2.1	115	37.7	48.9	-22	39.2	1.2	y	1.2	233	59.9	54.1	6	1.0	-1.9
6	y	1.5	175	22.9	16.0	-18	36.0	-11.2	y	-2.1	116	26.6	48.7	-22	38.0	1.2	y	1.2	234	53.9	54.1	5	59.1	-1.9
7	y	1.5	175	39.0	15.9	-18	47.2	-11.2	y	-2.1	117	15.3	48.6	-22	36.8	1.3	y	1.2	235	48.1	54.2	5	57.2	-1.9
8	y	1.5	175	54.9	15.7	-18	58.4	-10.9	y	-2.1	118	3.9	48.5	-22	35.5	1.3	y	1.2	236	42.3	54.3	5	55.3	-1.8
9	y	1.5	176	10.6	15.6	-19	9.3	-10.9	y	-2.1	118	52.4	48.4	-22	34.2	1.3	y	1.2	237	36.5	54.3	5	53.5	-1.8
10	y	1.5	176	26.2	15.4	-19	20.2	-10.6	y	-2.1	119	40.8	48.3	-22	32.9	1.3	y	1.2	238	30.9	54.4	5	51.7	-1.8
11	y	1.5	176	41.7	15.3	-19	30.8	-10.5	y	-2.1	120	29.1	48.1	-22	31.6	1.3	y	1.2	239	25.3	54.5	5	49.9	-1.7
12	y	1.5	176	57.0	15.1	-19	41.3	-10.3	y	-2.1	121	17.2	48.0	-22	30.3	1.4	y	1.2	240	19.7	54.5	5	48.2	-1.8
13	y	1.5	177	12.1	15.0	-19	51.6	-10.2	y	-2.1	122	5.2	47.9	-22	28.9	1.4	y	1.2	241	14.3	54.6	5	46.4	-1.6
14	y	1.4	177	27.1	14.8	-20	1.8	-10.0	y	-2.1	122	53.2	47.8	-22	27.5	1.5	y	1.2	242	8.9	54.7	5	44.8	-1.7
15	y	1.4	177	42.0	14.7	-20	11.8	-9.8	y	-2.1	123	41.0	47.7	-22	26.0	1.4	y	1.2	243	3.6	54.8	5	43.1	-1.6
16	y	1.4	177	56.7	14.5	-20	21.6	-9.7	y															

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Date	SUN						Mercury						Venus														
	GHA	d	Dec	d	GHA	d	dd	Dec	d	dd	vis mag	GHA	d	Dec	d												
Nov 21	183	32.7	-3.9	-19	56.7	-13.0						-1.1	186	20.7	-37.7	0.2	-19	25.0	-28.4	-0.4	SS -4.1	139	19.4	-19.6	-25	20.8	4.7
22	183	28.8	-4.1	-20	9.7	-12.7						-1.2	185	42.9	-38.1	0.2	-19	53.4	-27.4	-0.5	SS -4.1	138	59.9	-19.4	-25	16.1	5.4
23	183	24.7	-4.3	-20	22.4	-12.2						-1.2	185	4.9	-38.5	0.2	-20	20.8	-26.4	-0.5	SS -4.1	138	40.5	-19.2	-25	10.7	6.2
24	183	20.4	-4.5	-20	34.6	-11.9						-1.2	184	26.4	-38.9	0.2	-20	47.2	-25.3	-0.5	SS -4.1	138	21.3	-19.0	-25	4.5	6.9
25	183	16.0	-4.7	-20	46.5	-11.5						-1.3	183	47.5	-39.3	0.2	-21	12.5	-24.4	-0.4	SS -4.1	138	2.4	-18.7	-24	57.6	7.5
26	183	11.3	-4.9	-20	58.0	-11.1						-1.2	183	8.2	-39.7	0.2	-21	36.9	-23.2	-0.6	SS -4.1	137	43.6	-18.5	-24	50.1	8.3
27	183	6.4	-5.0	-21	9.1	-10.7						-1.2	182	28.5	-40.1	0.2	-22	0.1	-22.2	-0.5	SS -4.1	137	25.2	-18.2	-24	41.8	9.0
28	183	1.4	-5.2	-21	19.8	-10.3						-1.2	181	48.4	-40.5	0.2	-22	22.3	-21.0	-0.6	SS -4.1	137	7.0	-17.9	-24	32.8	9.6
29	182	56.2	-5.4	-21	30.1	-9.9						-1.1	181	7.9	-40.9	0.2	-22	43.3	-19.9	-0.5	SS -4.1	136	49.0	-17.6	-24	23.2	10.3
Nov 30	182	50.8	-5.6	-21	40.0	-9.5						-1.1	180	27.0	-41.3	0.2	-23	3.2	-18.6	-0.5	SS -4.1	136	31.4	-17.3	-24	12.9	11.0
Dec 1	182	45.2	-5.7	-21	49.5	-9.1						-1.0	179	45.7	-41.7	0.2	-23	22.0	-17.5	-0.7	SS -4.1	136	14.1	-17.0	-24	1.9	11.7
2	182	39.5	-5.9	-21	58.6	-8.6						-1.0	179	4.0	-42.1	0.2	-23	39.5	-16.4	-0.5	SS -4.1	135	57.1	-16.6	-23	50.2	12.3
3	182	33.7	-6.0	-22	7.2	-8.2						-1.0	178	21.9	-42.5	0.2	-23	55.9	-15.1	-0.7	SS -4.2	135	40.5	-16.3	-23	37.9	12.9
4	182	27.7	-6.1	-22	15.4	-7.8						-0.9	177	39.4	-42.9	0.2	-24	11.0	-13.8	-0.7	SS -4.2	135	24.2	-15.9	-23	25.0	13.6
5	182	21.5	-6.3	-22	23.2	-7.3						-0.9	176	56.5	-43.2	0.2	-24	24.8	-12.6	-0.6	SS -4.2	135	8.3	-15.5	-23	11.4	14.2
6	182	15.3	-6.4	-22	30.5	-6.9						-0.9	176	13.3	-43.5	0.2	-24	37.4	-11.3	-0.7	SS -4.2	134	52.8	-15.1	-22	57.2	14.8
7	182	8.9	-6.5	-22	37.4	-6.5						-0.9	175	29.8	-43.8	0.2	-24	48.7	-9.9	-0.7	SS -4.2	134	37.7	-14.7	-22	42.4	15.4
8	182	2.3	-6.6	-22	43.9	-6.0						-0.8	174	46.0	-44.1	0.1	-24	58.6	-8.7	-0.6	SS -4.2	134	23.0	-14.3	-22	27.0	16.0
9	181	55.7	-6.7	-22	49.9	-5.6						SS -0.8	174	1.9	-44.3	0.1	-25	7.3	-7.2	-0.8	SS -4.2	134	8.7	-13.9	-22	11.0	16.6
10	181	49.0	-6.8	-22	55.5	-5.1						SS -0.8	173	17.5	-44.6	0.1	-25	14.5	-5.9	-0.7	SS -4.2	133	54.8	-13.4	-21	54.4	17.1
11	181	42.1	-6.9	-23	0.6	-4.6						SS -0.8	172	33.0	-44.7	0.1	-25	20.4	-4.5	-0.7	SS -4.2	133	41.3	-13.0	-21	37.3	17.7
12	181	35.2	-7.0	-23	5.2	-4.2						SS -0.8	171	48.2	-44.8	0.1	-25	24.9	-3.0	-0.8	SS -4.2	133	28.3	-12.6	-21	19.6	18.2
13	181	28.2	-7.1	-23	9.4	-3.8						SS -0.8	171	3.4	-44.9	0.0	-25	27.9	-1.6	-0.7	SS -4.2	133	15.8	-12.1	-21	1.4	18.8
14	181	21.1	-7.2	-23	13.2	-3.3						SS -0.7	170	18.5	-44.9	0.0	-25	29.5	-0.2	-0.7	SS -4.2	133	3.7	-11.6	-20	42.6	19.3
15	181	13.9	-7.2	-23	16.5	-2.8						SS -0.7	169	33.6	-44.8	0.0	-25	29.7	1.4	-0.8	SS -4.2	132	52.1	-11.2	-20	23.3	19.7
16	181	6.7	-7.3	-23	19.3	-2.3						SS -0.7	168	48.8	-44.7	-0.1	-25	28.3	2.8	-0.7	SS -4.2	132	40.9	-10.7	-20	3.6	20.3
17	180	59.4	-7.3	-23	21.6	-1.9						SS -0.7	168	4.1	-44.4	-0.1	-25	25.5	4.3	-0.8	SS -4.2	132	30.2	-10.2	-19	43.3	20.8
18	180	52.0	-7.4	-23	23.5	-1.4						SS -0.7	167	19.7	-44.1	-0.2	-25	21.2	5.8	-0.8	SS -4.2	132	20.0	-9.7	-19	22.5	21.2
19	180	44.6	-7.4	-23	24.9	-1.0						SS -0.7	166	35.6	-43.7	-0.2	-25	15.4	7.4	-0.8	SS -4.2	132	10.2	-9.3	-19	1.3	21.6
20	180	37.2	-7.5	-23	25.9	-0.4						SS -0.7	165	51.9	-43.1	-0.3	-25	8.0	8.8	-0.7	SS -4.3	132	1.0	-8.8	-18	39.7	22.1
21	180	29.8	-7.5	-23	26.3	0.0						SS -0.7	165	8.8	-42.4	-0.3	-24	59.2	10.4	-0.8	SS -4.3	131	52.2	-8.3	-18	17.6	22.6
22	180	22.3	-7.5	-23	26.3	0.4						SS -0.7	164	26.4	-41.5	-0.4	-24	48.8	11.8	-0.7	SS -4.3	131	43.9	-7.8	-17	55.0	22.9
23	180	14.8	-7.5	-23	25.9	1.0						SS -0.7	163	44.9	-40.5	-0.5	-24	37.0	13.4	-0.8	SS -4.3	131	36.1	-7.3	-17	32.1	23.4
24	180	7.3	-7.5	-23	24.9	1.4						SS -0.7	163	4.4	-39.3	-0.6	-24	23.6	14.8	-0.7	SS -4.3	131	28.8	-6.8	-17	8.7	23.7
25	179	59.8	-7.5	-23	23.5	1.9						SS -0.7	162	25.1	-37.8	-0.7	-24	8.8	16.3	-0.8	SS -4.3	131	22.0	-6.3	-16	45.0	24.1
26	179	52.4	-7.4	-23	21.6	2.3						SS -0.7	161	47.2	-36.1	-0.9	-23	52.5	17.6	-0.7	SS -4.3	131	15.7	-5.8	-16	20.9	24.5
27	179	45.0	-7.4	-23	19.3	2.8						SS -0.7	161	11.1	-34.1	-1.0	-23	34.9	19.0	-0.7	SS -4.3	131	9.9	-5.3	-15	56.4	24.8
28	179	37.6	-7.3	-23	16.5	3.3						SS -0.7	160	37.0	-31.8	-1.2	-23	15.9	20.3	-0.7	SS -4.3	131	4.5	-4.8	-15	31.6	25.2
29	179	30.2	-7.3	-23	13.2	3.8						SS -0.7	160	5.2	-29.1	-1.3	-22	55.6	21.5	-0.6	SS -4.3	130	59.7	-4.3	-15	6.4	25.5
30	179	22.9	-7.2	-23	9.4	4.2						SS -0.7	159	36.0	-26.0	-1.5	-22	34.1	22.5	-0.5	SS -4.3	130	55.4	-3.8	-14	40.9	25.7
Dec 31	179	15.7	-7.2	-23	5.2	4.6						SS -0.7	159	10.0	-26.0	-1.5	-22	11.6	23.5	-0.5	SS -4.3	130	51.6	-3.8	-14	15.2	25.9

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Date	Mars					Jupiter					Saturn										
	vis	mag	GHA	d	Dec	vis	mag	GHA	d	Dec	vis	mag	GHA	d	Dec						
Nov 21	1.4	179	7.9	13.8	-21 8.1	-8.7	y	-2.0	128	25.6	47.1	-22 16.8	1.6	y	1.2	248	33.3	55.2	5 33.9	-1.4	
22	1.4	179	21.7	13.7	-21 16.8	-8.6	y	-2.0	129	12.7	47.0	-22 15.2	1.6	y	1.2	249	28.5	55.3	5 32.5	-1.4	
23	1.4	179	35.4	13.5	-21 25.4	-8.3	y	-2.0	129	59.7	46.9	-22 13.6	1.7	y	1.2	250	23.8	55.4	5 31.1	-1.3	
24	1.4	179	48.9	13.4	-21 33.7	-8.2	y	-2.0	130	46.6	46.8	-22 11.9	1.7	y	1.1	251	19.2	55.5	5 29.8	-1.3	
25	1.4	180	2.2	13.2	-21 41.9	-7.9	y	-2.0	131	33.4	46.7	-22 10.2	1.8	y	1.1	252	14.7	55.6	5 28.5	-1.3	
26	1.4	180	15.5	13.1	-21 49.8	-7.8	y	-2.0	132	20.2	46.6	-22 8.4	1.8	y	1.1	253	10.2	55.6	5 27.2	-1.2	
27	1.4	180	28.5	12.9	-21 57.6	-7.6	y	-2.0	133	6.8	46.5	-22 6.6	1.8	y	1.1	254	5.8	55.7	5 26.0	-1.2	
28	1.4	180	41.5	12.8	-22 5.2	-7.3	y	-2.0	133	53.4	46.5	-22 4.8	1.8	y	1.1	255	1.6	55.8	5 24.8	-1.2	
29	1.4	180	54.3	12.7	-22 12.5	-7.1	y	-2.0	134	39.8	46.4	-22 3.0	1.9	y	1.1	255	57.4	55.9	5 23.6	-1.1	
Nov 30	1.4	181	6.9	12.5	-22 19.6	-7.0	y	-2.0	135	26.2	46.3	-22 1.1	1.9	y	1.1	256	53.3	56.0	5 22.5	-1.0	
Dec 1	1.4	181	19.5	12.4	-22 26.6	-6.7	y	-2.0	136	12.5	46.2	-21 59.2	1.9	y	1.1	257	49.2	56.1	5 21.5	-1.1	
2	1.3	181	31.9	12.3	-22 33.3	-6.5	y	-2.0	136	58.7	46.1	-21 57.3	1.9	y	1.1	258	45.3	56.2	5 20.4	-1.0	
3	1.3	181	44.2	12.2	-22 39.8	-6.3	y	-2.0	137	44.9	46.1	-21 55.4	2.0	y	1.1	259	41.5	56.3	5 19.4	-0.9	
4	1.3	181	56.3	12.0	-22 46.1	-6.0	y	-2.0	138	30.9	46.0	-21 53.4	2.0	y	1.1	260	37.7	56.3	5 18.5	-0.9	
5	1.3	182	8.4	11.9	-22 52.1	-5.9	y	-2.0	139	16.9	45.9	-21 51.4	2.0	y	1.1	261	34.1	56.4	5 17.6	-0.9	
6	1.3	182	20.3	11.8	-22 58.0	-5.6	y	-2.0	140	2.9	45.9	-21 49.4	2.1	y	1.1	262	30.5	56.5	5 16.7	-0.8	
7	1.3	182	32.1	11.7	-23 3.6	-5.4	y	-2.0	140	48.7	45.8	-21 47.3	2.1	y	1.1	263	27.0	56.6	5 15.9	-0.8	
8	1.3	182	43.7	11.6	-23 9.0	-5.1	y	-2.0	141	34.5	45.7	-21 45.2	2.1	y	1.1	264	23.7	56.7	5 15.1	-0.8	
9	1.3	182	55.3	11.4	-23 14.1	-5.0	y	-2.0	142	20.3	45.7	-21 43.1	2.2	y	1.1	265	20.4	56.8	5 14.3	-0.7	
10	1.3	183	6.7	11.3	-23 19.1	-4.6	y	-2.0	143	5.9	45.6	-21 40.9	2.1	y	1.1	266	17.2	56.9	5 13.6	-0.6	
11	1.3	183	18.1	11.2	-23 23.7	-4.5	y	-2.0	143	51.5	45.5	-21 38.8	2.2	y	1.1	267	14.1	57.0	5 13.0	-0.7	
12	1.3	183	29.3	11.1	-23 28.2	-4.2	y	-2.0	144	37.1	45.5	-21 36.6	2.3	y	1.1	268	11.1	57.1	5 12.3	-0.6	
13	1.3	183	40.4	11.0	-23 32.4	-4.0	y	-2.0	145	22.6	45.4	-21 34.3	2.2	y	1.1	269	8.2	57.2	5 11.7	-0.5	
14	1.3	183	51.4	10.9	-23 36.4	-3.8	y	-2.0	146	8.0	45.4	-21 32.1	2.3	y	1.1	270	5.4	57.3	5 11.2	-0.5	
15	1.3	184	2.4	10.8	-23 40.2	-3.5	y	-2.0	146	53.4	45.3	-21 29.8	2.3	y	1.1	271	2.7	57.4	5 10.7	-0.4	
16	1.3	184	13.2	10.7	-23 43.7	-3.2	y	-2.0	147	38.7	45.3	-21 27.5	2.4	y	1.1	272	0.0	57.5	5 10.3	-0.5	
17	1.3	184	23.9	10.6	-23 46.9	-3.0	y	-2.0	148	24.0	45.2	-21 25.1	2.4	y	1.1	272	57.5	57.6	5 9.8	-0.3	
18	1.3	184	34.5	10.5	-23 49.9	-2.8	y	-2.0	149	9.2	45.2	-21 22.7	2.4	y	1.1	273	55.1	57.7	5 9.5	-0.4	
19	1.3	184	45.1	10.5	-23 52.7	-2.5	y	-2.0	149	54.4	45.1	-21 20.3	2.4	y	1.1	274	52.8	57.8	5 9.1	-0.2	
20	1.3	184	55.5	10.4	-23 55.2	-2.3	y	-2.0	150	39.5	45.1	-21 17.9	2.5	y	1.1	275	50.6	57.9	5 8.9	-0.3	
21	1.3	185	5.9	10.3	-23 57.5	-2.0	y	-2.0	151	24.6	45.0	-21 15.4	2.4	y	1.1	276	48.5	58.0	5 8.6	-0.2	
22	1.3	185	16.2	10.2	-23 59.5	-1.8	y	-2.0	152	9.6	45.0	-21 13.0	2.6	y	1.1	277	46.4	58.1	5 8.4	-0.1	
23	1.3	185	26.4	10.1	-24 1.3	-1.5	y	-1.9	152	54.6	44.9	-21 10.4	2.5	y	1.1	278	44.5	58.2	5 8.3	-0.1	
24	1.3	185	36.5	10.1	-24 2.8	-1.2	y	-1.9	153	39.5	44.9	-21 7.9	2.6	y	1.0	279	42.7	58.3	5 8.2	-0.1	
25	1.3	185	46.6	10.0	-24 4.0	-1.0	y	-1.9	154	24.4	44.9	-21 5.3	2.6	y	1.0	280	41.0	58.4	5 8.1	0.0	
26	1.3	185	56.6	9.9	-24 5.0	-0.7	y	-1.9	155	9.3	44.8	-21 2.7	2.6	y	1.0	281	39.4	58.5	5 8.1	0.0	
27	1.3	186	6.5	9.9	-24 5.7	-0.5	y	-1.9	155	54.1	44.8	-21 0.1	2.7	y	1.0	282	37.9	58.6	5 8.1	0.1	
28	1.3	186	16.4	9.8	-24 6.2	-0.3	y	-1.9	156	39.0	44.8	-20 57.4	2.6	y	1.0	283	36.5	58.7	5 8.2	0.1	
29	1.3	186	26.2	9.8	-24 6.5	0.1	y	-1.9	157	23.7	44.7	-20 54.8	2.7	y	1.0	284	35.2	58.8	5 8.3	0.1	
30	1.3	186	36.0	9.7	-24 6.4	0.3	y	-1.9	158	8.5	44.7	-20 52.1	2.8	y	1.0	285	34.0	58.9	5 8.4	0.2	
Dec 31	y	1.3	186	45.7	9.7	-24 6.1	0.5	y	-1.9	158	53.2	44.7	-20 49.3	2.9	y	1.0	286	32.9	58.9	5 8.6	0.3