



Human Performance Attachment 8 – USNO Sun/Moon Data

Penwell, Texas

HWY15MH004

(15 pages)

U.S. Naval Observatory Astronomical Applications Department

Sun and Moon Data for One Day

Penwell Crash Site (Longitude W102° 33', Latitude N31° 45')

January 14, 2015

Universal Time - 6h

Sun	
Begin civil twilight	07:24
Sunrise	07:51
Sun transit	12:59
Sunset	18:08
End civil twilight	18:34
Moon	
Moonrise	01:55
Moon transit	07:38
Moonset	13:16

Closest Primary Moon Phase: Last Quarter on January 13, 2015 at 03:46

Phase of the Moon on January 14, 2015: Waning Crescent with 37% of the Moon's visible disk illuminated.



[Back to form](#)

Astronomical Applications Dept.
 U.S. Naval Observatory
 Washington, DC 20392-5420
 PENWELL CRASH SITE

° ' ° '
 W102 32, N31 45

Altitude and Azimuth of the Sun
 Jan 14, 2015

Zone: 6h West of Greenwich

	Altitude	Azimuth
		(E of N)
h m	°	°
06:55	-11.8	107.9
06:56	-11.6	108.0
06:57	-11.4	108.1
06:58	-11.2	108.2
06:59	-11.0	108.3
07:00	-10.8	108.5
07:01	-10.6	108.6
07:02	-10.4	108.7
07:03	-10.2	108.8
07:04	-10.0	108.9
07:05	-9.8	109.0
07:06	-9.6	109.2
07:07	-9.4	109.3
07:08	-9.2	109.4
07:09	-9.0	109.5
07:10	-8.8	109.6
07:11	-8.6	109.8
07:12	-8.4	109.9
07:13	-8.2	110.0
07:14	-8.0	110.1
07:15	-7.8	110.3
07:16	-7.6	110.4
07:17	-7.4	110.5
07:18	-7.2	110.6
07:19	-7.0	110.7
07:20	-6.8	110.9
07:21	-6.6	111.0
07:22	-6.4	111.1
07:23	-6.2	111.2
07:24	-6.0	111.4
07:25	-5.8	111.5
07:26	-5.6	111.6
07:27	-5.4	111.7
07:28	-5.2	111.8
07:29	-5.0	112.0
07:30	-4.9	112.1
07:31	-4.7	112.2
07:32	-4.5	112.3
07:33	-4.3	112.5
07:34	-4.1	112.6
07:35	-3.9	112.7
07:36	-3.7	112.8
07:37	-3.5	113.0
07:38	-3.3	113.1
07:39	-3.1	113.2
07:40	-2.9	113.4
07:41	-2.7	113.5
07:42	-2.5	113.6
07:43	-2.3	113.7
07:44	-2.1	113.9

07:45	-1.9	114.0
07:46	-1.7	114.1
07:47	-1.5	114.3
07:48	-1.3	114.4
07:49	-1.1	114.5
07:50	-0.9	114.6
07:51	-0.8	114.8
07:52	0.0	114.9
07:53	0.2	115.0
07:54	0.3	115.2
07:55	0.5	115.3
07:56	0.7	115.4
07:57	0.8	115.6
07:58	1.0	115.7
07:59	1.2	115.8
08:00	1.3	116.0
08:01	1.5	116.1
08:02	1.7	116.2
08:03	1.9	116.4
08:04	2.0	116.5
08:05	2.2	116.6
08:06	2.4	116.8
08:07	2.6	116.9
08:08	2.7	117.0
08:09	2.9	117.2
08:10	3.1	117.3
08:11	3.3	117.4
08:12	3.5	117.6
08:13	3.7	117.7
08:14	3.8	117.8
08:15	4.0	118.0
08:16	4.2	118.1
08:17	4.4	118.3
08:18	4.6	118.4
08:19	4.7	118.5
08:20	4.9	118.7
08:21	5.1	118.8
08:22	5.3	119.0
08:23	5.5	119.1
08:24	5.6	119.2
08:25	5.8	119.4
08:26	6.0	119.5
08:27	6.2	119.7
08:28	6.4	119.8
08:29	6.6	120.0
08:30	6.7	120.1
08:31	6.9	120.2
08:32	7.1	120.4
08:33	7.3	120.5
08:34	7.5	120.7
08:35	7.6	120.8
08:36	7.8	121.0
08:37	8.0	121.1
08:38	8.2	121.3
08:39	8.4	121.4
08:40	8.5	121.6
08:41	8.7	121.7
08:42	8.9	121.9
08:43	9.1	122.0
08:44	9.3	122.2
08:45	9.4	122.3
08:46	9.6	122.5
08:47	9.8	122.6

08:48	10.0	122.8
08:49	10.1	122.9
08:50	10.3	123.1
08:51	10.5	123.2
08:52	10.7	123.4
08:53	10.8	123.5
08:54	11.0	123.7
08:55	11.2	123.8
08:56	11.4	124.0
08:57	11.5	124.1
08:58	11.7	124.3
08:59	11.9	124.4
09:00	12.1	124.6
09:01	12.2	124.8
09:02	12.4	124.9
09:03	12.6	125.1
09:04	12.8	125.2
09:05	12.9	125.4
09:06	13.1	125.6
09:07	13.3	125.7
09:08	13.5	125.9
09:09	13.6	126.0
09:10	13.8	126.2
09:11	14.0	126.4
09:12	14.1	126.5
09:13	14.3	126.7
09:14	14.5	126.9
09:15	14.6	127.0
09:16	14.8	127.2
09:17	15.0	127.3
09:18	15.1	127.5
09:19	15.3	127.7
09:20	15.5	127.8
09:21	15.7	128.0
09:22	15.8	128.2
09:23	16.0	128.4
09:24	16.2	128.5
09:25	16.3	128.7
09:26	16.5	128.9
09:27	16.6	129.0
09:28	16.8	129.2
09:29	17.0	129.4
09:30	17.1	129.6
09:31	17.3	129.7
09:32	17.5	129.9
09:33	17.6	130.1
09:34	17.8	130.2
09:35	18.0	130.4
09:36	18.1	130.6
09:37	18.3	130.8
09:38	18.4	131.0
09:39	18.6	131.1
09:40	18.8	131.3
09:41	18.9	131.5
09:42	19.1	131.7
09:43	19.2	131.8
09:44	19.4	132.0
09:45	19.5	132.2
09:46	19.7	132.4
09:47	19.9	132.6
09:48	20.0	132.8
09:49	20.2	132.9
09:50	20.3	133.1

09:51	20.5	133.3
09:52	20.6	133.5
09:53	20.8	133.7
09:54	20.9	133.9
09:55	21.1	134.1
09:56	21.2	134.3
09:57	21.4	134.4
09:58	21.5	134.6
09:59	21.7	134.8
10:00	21.8	135.0
10:01	22.0	135.2
10:02	22.1	135.4
10:03	22.3	135.6
10:04	22.4	135.8
10:05	22.6	136.0
10:06	22.7	136.2
10:07	22.9	136.4
10:08	23.0	136.6
10:09	23.2	136.8
10:10	23.3	137.0
10:11	23.5	137.2
10:12	23.6	137.4
10:13	23.8	137.6
10:14	23.9	137.8
10:15	24.0	138.0
10:16	24.2	138.2
10:17	24.3	138.4
10:18	24.5	138.6
10:19	24.6	138.8
10:20	24.7	139.0
10:21	24.9	139.2
10:22	25.0	139.4
10:23	25.2	139.6
10:24	25.3	139.8
10:25	25.4	140.0
10:26	25.6	140.2
10:27	25.7	140.4
10:28	25.8	140.6
10:29	26.0	140.9
10:30	26.1	141.1
10:31	26.2	141.3
10:32	26.4	141.5
10:33	26.5	141.7
10:34	26.6	141.9
10:35	26.8	142.1
10:36	26.9	142.4
10:37	27.0	142.6
10:38	27.2	142.8
10:39	27.3	143.0
10:40	27.4	143.2
10:41	27.5	143.4
10:42	27.7	143.7
10:43	27.8	143.9
10:44	27.9	144.1
10:45	28.0	144.3
10:46	28.2	144.6
10:47	28.3	144.8
10:48	28.4	145.0
10:49	28.5	145.2
10:50	28.7	145.5
10:51	28.8	145.7
10:52	28.9	145.9
10:53	29.0	146.1

10:54	29.1	146.4
10:55	29.2	146.6
10:56	29.4	146.8
10:57	29.5	147.1
10:58	29.6	147.3
10:59	29.7	147.5
11:00	29.8	147.8
11:01	29.9	148.0
11:02	30.0	148.2
11:03	30.2	148.5
11:04	30.3	148.7
11:05	30.4	148.9
11:06	30.5	149.2
11:07	30.6	149.4
11:08	30.7	149.7
11:09	30.8	149.9
11:10	30.9	150.1
11:11	31.0	150.4
11:12	31.1	150.6
11:13	31.2	150.9
11:14	31.3	151.1
11:15	31.4	151.4
11:16	31.5	151.6
11:17	31.6	151.9
11:18	31.7	152.1
11:19	31.8	152.4
11:20	31.9	152.6
11:21	32.0	152.9
11:22	32.1	153.1
11:23	32.2	153.4
11:24	32.3	153.6
11:25	32.4	153.9
11:26	32.5	154.1
11:27	32.6	154.4
11:28	32.7	154.6
11:29	32.8	154.9
11:30	32.9	155.1
11:31	33.0	155.4
11:32	33.0	155.6
11:33	33.1	155.9
11:34	33.2	156.2
11:35	33.3	156.4
11:36	33.4	156.7
11:37	33.5	156.9
11:38	33.6	157.2
11:39	33.6	157.5
11:40	33.7	157.7
11:41	33.8	158.0
11:42	33.9	158.2
11:43	34.0	158.5
11:44	34.0	158.8
11:45	34.1	159.0
11:46	34.2	159.3
11:47	34.3	159.6
11:48	34.3	159.8
11:49	34.4	160.1
11:50	34.5	160.4
11:51	34.6	160.6
11:52	34.6	160.9
11:53	34.7	161.2
11:54	34.8	161.5
11:55	34.8	161.7
11:56	34.9	162.0

11:57	35.0	162.3
11:58	35.0	162.5
11:59	35.1	162.8
12:00	35.1	163.1
12:01	35.2	163.4
12:02	35.3	163.6
12:03	35.3	163.9
12:04	35.4	164.2
12:05	35.4	164.5
12:06	35.5	164.8
12:07	35.6	165.0
12:08	35.6	165.3
12:09	35.7	165.6
12:10	35.7	165.9
12:11	35.8	166.1
12:12	35.8	166.4
12:13	35.9	166.7
12:14	35.9	167.0
12:15	36.0	167.3
12:16	36.0	167.6
12:17	36.1	167.8
12:18	36.1	168.1
12:19	36.1	168.4
12:20	36.2	168.7
12:21	36.2	169.0
12:22	36.3	169.3
12:23	36.3	169.5
12:24	36.3	169.8
12:25	36.4	170.1
12:26	36.4	170.4
12:27	36.5	170.7
12:28	36.5	171.0
12:29	36.5	171.3
12:30	36.6	171.5
12:31	36.6	171.8
12:32	36.6	172.1
12:33	36.6	172.4
12:34	36.7	172.7
12:35	36.7	173.0
12:36	36.7	173.3
12:37	36.7	173.6
12:38	36.8	173.8
12:39	36.8	174.1
12:40	36.8	174.4
12:41	36.8	174.7
12:42	36.9	175.0
12:43	36.9	175.3
12:44	36.9	175.6
12:45	36.9	175.9
12:46	36.9	176.2
12:47	36.9	176.5
12:48	36.9	176.7
12:49	37.0	177.0
12:50	37.0	177.3
12:51	37.0	177.6
12:52	37.0	177.9
12:53	37.0	178.2
12:54	37.0	178.5
12:55	37.0	178.8
12:56	37.0	179.1
12:57	37.0	179.4
12:58	37.0	179.7
12:59	37.0	180.0

13:00	37.0	180.2
13:01	37.0	180.5
13:02	37.0	180.8
13:03	37.0	181.1
13:04	37.0	181.4
13:05	37.0	181.7
13:06	37.0	182.0
13:07	37.0	182.3
13:08	37.0	182.6
13:09	37.0	182.9
13:10	37.0	183.2
13:11	36.9	183.5
13:12	36.9	183.7
13:13	36.9	184.0
13:14	36.9	184.3
13:15	36.9	184.6
13:16	36.9	184.9
13:17	36.8	185.2
13:18	36.8	185.5
13:19	36.8	185.8
13:20	36.8	186.1
13:21	36.8	186.4
13:22	36.7	186.6
13:23	36.7	186.9
13:24	36.7	187.2
13:25	36.7	187.5
13:26	36.6	187.8
13:27	36.6	188.1
13:28	36.6	188.4
13:29	36.5	188.7
13:30	36.5	188.9
13:31	36.5	189.2
13:32	36.4	189.5
13:33	36.4	189.8
13:34	36.4	190.1
13:35	36.3	190.4
13:36	36.3	190.7
13:37	36.3	190.9
13:38	36.2	191.2
13:39	36.2	191.5
13:40	36.1	191.8
13:41	36.1	192.1
13:42	36.0	192.4
13:43	36.0	192.6
13:44	35.9	192.9
13:45	35.9	193.2
13:46	35.8	193.5
13:47	35.8	193.8
13:48	35.7	194.1
13:49	35.7	194.3
13:50	35.6	194.6
13:51	35.6	194.9
13:52	35.5	195.2
13:53	35.5	195.4
13:54	35.4	195.7
13:55	35.4	196.0
13:56	35.3	196.3
13:57	35.2	196.5
13:58	35.2	196.8
13:59	35.1	197.1
14:00	35.1	197.4
14:01	35.0	197.6
14:02	34.9	197.9

14:03	34.9	198.2
14:04	34.8	198.5
14:05	34.7	198.7
14:06	34.7	199.0
14:07	34.6	199.3
14:08	34.5	199.5
14:09	34.5	199.8
14:10	34.4	200.1
14:11	34.3	200.4
14:12	34.2	200.6
14:13	34.2	200.9
14:14	34.1	201.1
14:15	34.0	201.4
14:16	33.9	201.7
14:17	33.8	201.9
14:18	33.8	202.2
14:19	33.7	202.5
14:20	33.6	202.7
14:21	33.5	203.0
14:22	33.4	203.3
14:23	33.4	203.5
14:24	33.3	203.8
14:25	33.2	204.0
14:26	33.1	204.3
14:27	33.0	204.5
14:28	32.9	204.8
14:29	32.8	205.1
14:30	32.7	205.3
14:31	32.6	205.6
14:32	32.6	205.8
14:33	32.5	206.1
14:34	32.4	206.3
14:35	32.3	206.6
14:36	32.2	206.8
14:37	32.1	207.1
14:38	32.0	207.3
14:39	31.9	207.6
14:40	31.8	207.8
14:41	31.7	208.1
14:42	31.6	208.3
14:43	31.5	208.6
14:44	31.4	208.8
14:45	31.3	209.1
14:46	31.2	209.3
14:47	31.1	209.5
14:48	31.0	209.8
14:49	30.9	210.0
14:50	30.8	210.3
14:51	30.7	210.5
14:52	30.5	210.8
14:53	30.4	211.0
14:54	30.3	211.2
14:55	30.2	211.5
14:56	30.1	211.7
14:57	30.0	211.9
14:58	29.9	212.2
14:59	29.8	212.4
15:00	29.7	212.6
15:01	29.5	212.9
15:02	29.4	213.1
15:03	29.3	213.3
15:04	29.2	213.6
15:05	29.1	213.8

15:06	29.0	214.0
15:07	28.8	214.3
15:08	28.7	214.5
15:09	28.6	214.7
15:10	28.5	214.9
15:11	28.4	215.2
15:12	28.2	215.4
15:13	28.1	215.6
15:14	28.0	215.8
15:15	27.9	216.1
15:16	27.7	216.3
15:17	27.6	216.5
15:18	27.5	216.7
15:19	27.4	216.9
15:20	27.2	217.2
15:21	27.1	217.4
15:22	27.0	217.6
15:23	26.8	217.8
15:24	26.7	218.0
15:25	26.6	218.2
15:26	26.4	218.5
15:27	26.3	218.7
15:28	26.2	218.9
15:29	26.0	219.1
15:30	25.9	219.3
15:31	25.8	219.5
15:32	25.6	219.7
15:33	25.5	219.9
15:34	25.4	220.2
15:35	25.2	220.4
15:36	25.1	220.6
15:37	25.0	220.8
15:38	24.8	221.0
15:39	24.7	221.2
15:40	24.5	221.4
15:41	24.4	221.6
15:42	24.3	221.8
15:43	24.1	222.0
15:44	24.0	222.2
15:45	23.8	222.4
15:46	23.7	222.6
15:47	23.5	222.8
15:48	23.4	223.0
15:49	23.3	223.2
15:50	23.1	223.4
15:51	23.0	223.6
15:52	22.8	223.8
15:53	22.7	224.0
15:54	22.5	224.2
15:55	22.4	224.4
15:56	22.2	224.6
15:57	22.1	224.8
15:58	21.9	225.0
15:59	21.8	225.1
16:00	21.6	225.3
16:01	21.5	225.5
16:02	21.3	225.7
16:03	21.2	225.9
16:04	21.0	226.1
16:05	20.9	226.3
16:06	20.7	226.5
16:07	20.6	226.7
16:08	20.4	226.8

16:09	20.3	227.0
16:10	20.1	227.2
16:11	19.9	227.4
16:12	19.8	227.6
16:13	19.6	227.8
16:14	19.5	227.9
16:15	19.3	228.1
16:16	19.2	228.3
16:17	19.0	228.5
16:18	18.8	228.7
16:19	18.7	228.8
16:20	18.5	229.0
16:21	18.4	229.2
16:22	18.2	229.4
16:23	18.0	229.6
16:24	17.9	229.7
16:25	17.7	229.9
16:26	17.6	230.1
16:27	17.4	230.3
16:28	17.2	230.4
16:29	17.1	230.6
16:30	16.9	230.8
16:31	16.7	231.0
16:32	16.6	231.1
16:33	16.4	231.3
16:34	16.2	231.5
16:35	16.1	231.6
16:36	15.9	231.8
16:37	15.7	232.0
16:38	15.6	232.1
16:39	15.4	232.3
16:40	15.2	232.5
16:41	15.1	232.6
16:42	14.9	232.8
16:43	14.7	233.0
16:44	14.6	233.1
16:45	14.4	233.3
16:46	14.2	233.5
16:47	14.1	233.6
16:48	13.9	233.8
16:49	13.7	234.0
16:50	13.5	234.1
16:51	13.4	234.3
16:52	13.2	234.4
16:53	13.0	234.6
16:54	12.9	234.8
16:55	12.7	234.9
16:56	12.5	235.1
16:57	12.3	235.2
16:58	12.2	235.4
16:59	12.0	235.5
17:00	11.8	235.7
17:01	11.6	235.9
17:02	11.5	236.0
17:03	11.3	236.2
17:04	11.1	236.3
17:05	10.9	236.5
17:06	10.8	236.6
17:07	10.6	236.8
17:08	10.4	236.9
17:09	10.2	237.1
17:10	10.1	237.2
17:11	9.9	237.4

17:12	9.7	237.5
17:13	9.5	237.7
17:14	9.3	237.9
17:15	9.2	238.0
17:16	9.0	238.1
17:17	8.8	238.3
17:18	8.6	238.4
17:19	8.5	238.6
17:20	8.3	238.7
17:21	8.1	238.9
17:22	7.9	239.0
17:23	7.7	239.2
17:24	7.6	239.3
17:25	7.4	239.5
17:26	7.2	239.6
17:27	7.0	239.8
17:28	6.8	239.9
17:29	6.7	240.1
17:30	6.5	240.2
17:31	6.3	240.3
17:32	6.1	240.5
17:33	5.9	240.6
17:34	5.7	240.8
17:35	5.6	240.9
17:36	5.4	241.0
17:37	5.2	241.2
17:38	5.0	241.3
17:39	4.8	241.5
17:40	4.7	241.6
17:41	4.5	241.8
17:42	4.3	241.9
17:43	4.1	242.0
17:44	3.9	242.2
17:45	3.7	242.3
17:46	3.6	242.4
17:47	3.4	242.6
17:48	3.2	242.7
17:49	3.0	242.9
17:50	2.8	243.0
17:51	2.7	243.1
17:52	2.5	243.3
17:53	2.3	243.4
17:54	2.1	243.5
17:55	2.0	243.7
17:56	1.8	243.8
17:57	1.6	243.9
17:58	1.4	244.1
17:59	1.3	244.2
18:00	1.1	244.3
18:01	0.9	244.5
18:02	0.8	244.6
18:03	0.6	244.7
18:04	0.4	244.9
18:05	0.3	245.0
18:06	0.1	245.1
18:07	-0.1	245.3
18:08	-0.8	245.4
18:09	-1.0	245.5
18:10	-1.2	245.6
18:11	-1.4	245.8
18:12	-1.6	245.9
18:13	-1.8	246.0
18:14	-2.0	246.2

18:15	-2.2	246.3
18:16	-2.4	246.4
18:17	-2.6	246.5
18:18	-2.8	246.7
18:19	-3.0	246.8
18:20	-3.2	246.9
18:21	-3.4	247.1
18:22	-3.6	247.2
18:23	-3.8	247.3
18:24	-4.0	247.4
18:25	-4.2	247.6
18:26	-4.4	247.7
18:27	-4.5	247.8
18:28	-4.7	247.9
18:29	-4.9	248.1
18:30	-5.1	248.2
18:31	-5.3	248.3
18:32	-5.5	248.4
18:33	-5.7	248.6
18:34	-5.9	248.7
18:35	-6.1	248.8
18:36	-6.3	248.9
18:37	-6.5	249.1
18:38	-6.7	249.2
18:39	-6.9	249.3
18:40	-7.1	249.4
18:41	-7.3	249.5
18:42	-7.5	249.7
18:43	-7.7	249.8
18:44	-7.9	249.9
18:45	-8.1	250.0
18:46	-8.3	250.1
18:47	-8.5	250.3
18:48	-8.7	250.4
18:49	-8.9	250.5
18:50	-9.1	250.6
18:51	-9.3	250.8
18:52	-9.5	250.9
18:53	-9.7	251.0
18:54	-9.9	251.1
18:55	-10.1	251.2
18:56	-10.3	251.4
18:57	-10.5	251.5
18:58	-10.7	251.6
18:59	-10.9	251.7
19:00	-11.1	251.8
19:01	-11.3	251.9
19:02	-11.5	252.1
19:03	-11.7	252.2
19:04	-11.9	252.3

[Back to form](#)