

I slightly modified Thorstensen's code to print out the time between evening twilight and morning twilight. For Okie-Tex site (site code = o) near Kenton OK I used same time zone as for Oklahoma City.

W. Romanishin- August 2013 - email: wromanishin at ou.edu - Here is stuff from John T. intro:

***** 2023 Night-time Astronomical Calendar for Kitt Peak *****

By John Thorstensen, Dartmouth College

This calendar is designed to provide information useful for the planning of nighttime observations. The format should minimize confusion; each line gives the phenomena for a single (local!) night, and each line is labeled with both evening and morning (local) day and date. Note that all times given are LOCAL CIVIL (zone) times.

The rise/set times printed are the times at which the center of the object is 50 arcminutes below the geometrical horizon. At the given twilight, the center of the sun is 0.0 degrees below the geometrical horizon.

The moon positions (and rise/set times) are generated by an implementation of the Low-Precision formulae in the Astronomical Almanac. The Almanac states that the error seldom exceeds 0.3 degrees. Topocentric corrections are included. Comparisons with tables for Kitt Peak in the NOAO Newsletter indicate that the rise-set times are good to +/- 2 min or so. The moon's RA, Dec, and illuminated fraction are given for local midnight, regardless of whether the moon is actually up at that time. Note that the moonrise and moonset times are not printed if they occur near mid-day.

The LST at evening and morning twilight are tabulated. This gives an accurate idea of the range of RA's accessible during the night.

The JD is given (severely rounded off) for local midnight. Again, this avoids any ambiguity.

Some credits: The sidereal time and Julian date routines were originally coded in PL/I by Steve Maker of Dartmouth College. The algorithms originated in the old American Ephemeris. The routine to convert JD back to calendar date is adapted from Numerical Recipes in C, by Press et al.

CAUTIONS: I believe that the program which generates these tables is reasonably accurate. However, it has not been exhaustively tested, so you should be sure to run 'sanity checks' on the results. Also, in view of the approximations used, the results should not be used when high precision is needed. Extension to dates far from the present (1990) should be done with great caution. The code has not been tested for the eastern or southern hemispheres. Rise/set times are slightly inaccurate and rather confusing at circumpolar latitudes, where the concept of a 'night' is blurry.

The daylight savings time conventions (if used) are quite specific (to U. S., post-1986) and subject to change. I know that the code has many infelicities; if you should find actual errors, please notify
John.Thorstensen@dartmouth.edu

[This output comes from a (hopefully) portable, completely self-contained program in the c language. It is available from the author and may be used freely for scientific or educational purposes. If you use it for profit, please contact the author to arrange a (modest!) fee.
Source code is copyright John Thorstensen, 1990.]

MOON PHASES FOR 2023, at Kitt Peak

Times and dates are given in local time, zone = 7 hr West.
They are generally better than +/- 2 minutes.

The end of the previous year and the beginning of the next
are included for continuity.

NEW		1ST		FULL		LAST	
Dec 23	3 18	Dec 29	18 23	Jan 06	16 10	Jan 14	19 13
Jan 21	13 56	Jan 28	8 20	Feb 05	11 31	Feb 13	9 03
Feb 20	0 09	Feb 27	1 07	Mar 07	5 43	Mar 14	19 10
Mar 21	10 27	Mar 28	19 33	Apr 05	21 37	Apr 13	2 13
Apr 19	21 16	Apr 27	14 21	May 05	10 37	May 12	7 29
May 19	8 56	May 27	8 24	Jun 03	20 44	Jun 10	12 32
Jun 17	21 39	Jun 26	0 51	Jul 03	4 41	Jul 09	18 49
Jul 17	11 33	Jul 25	15 08	Aug 01	11 33	Aug 08	3 30
Aug 16	2 39	Aug 24	2 58	Aug 30	18 37	Sep 06	15 23
Sep 14	18 40	Sep 22	12 33	Sep 29	2 58	Oct 06	6 49
Oct 14	10 55	Oct 21	20 30	Oct 28	13 24	Nov 05	1 39
Nov 13	2 27	Nov 20	3 51	Nov 27	2 17	Dec 04	22 52
Dec 12	16 32	Dec 19	11 40	Dec 26	17 34	Jan 03	20 33

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 28, latitude (d.m) = 31 57.2
 Rise/set times in Mountain time (7 hr W), for 500 m above surroundings, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2023 JANUARY *****

Date (eve/morn)	LMST midn	----- set	Sun: ----- twi.end twi.beg	rise	LST twilight: eve morn	----- rise	Moon: ----- set %illum	RA	Dec	Twi-Twi hours
Sun Jan 01/Mon Jan 02	6 20	17 37	19 00	6 00 7 23	1 20 12 21	.....	3 49	81	3 06.4 18 06	11.0
Mon Jan 02/Tue Jan 03	6 24	17 38	19 01	6 00 7 24	1 24 12 25	.....	4 49	88	3 56.8 22 08	11.0
Tue Jan 03/Wed Jan 04	6 28	17 39	19 02	6 01 7 24	1 29 12 30	.....	5 48	93	4 49.2 25 06	11.0
Wed Jan 04/Thu Jan 05	6 32	17 39	19 02	6 01 7 24	1 34 12 34	15 38	6 44	97	5 43.1 26 52	11.0
Thu Jan 05/Fri Jan 06	6 36	17 40	19 03	6 01 7 24	1 38 12 38	16 27	7 36	99	6 37.6 27 19	11.0
Fri Jan 06/Sat Jan 07	6 40	17 41	19 04	6 01 7 24	1 43 12 42	17 20	.....	100	7 31.6 26 28	11.0
Sat Jan 07/Sun Jan 08	6 44	17 42	19 05	6 01 7 24	1 48 12 46	18 16	.....	98	8 24.0 24 22	10.9
Sun Jan 08/Mon Jan 09	6 48	17 43	19 05	6 01 7 24	1 52 12 50	19 13	.....	95	9 14.1 21 12	10.9
Mon Jan 09/Tue Jan 10	6 52	17 43	19 06	6 01 7 24	1 57 12 54	20 11	.....	90	10 01.9 17 08	10.9
Tue Jan 10/Wed Jan 11	6 56	17 44	19 07	6 01 7 24	2 02 12 58	21 07	.....	83	10 47.5 12 23	10.9
Wed Jan 11/Thu Jan 12	7 00	17 45	19 08	6 01 7 24	2 06 13 02	22 03	.....	76	11 31.9 7 08	10.9
Thu Jan 12/Fri Jan 13	7 04	17 46	19 08	6 01 7 24	2 11 13 06	22 59	.....	67	12 15.6 1 33	10.9
Fri Jan 13/Sat Jan 14	7 08	17 47	19 09	6 01 7 24	2 16 13 10	23 55	.....	57	13 00.0 - 4 12	10.9
Sat Jan 14/Sun Jan 15	7 11	17 48	19 10	6 01 7 23	2 21 13 14	0 54	.....	47	13 46.0 - 9 54	10.9
Sun Jan 15/Mon Jan 16	7 15	17 49	19 11	6 01 7 23	2 25 13 18	1 57	.....	37	14 34.8 -15 21	10.8
Mon Jan 16/Tue Jan 17	7 19	17 49	19 11	6 01 7 23	2 30 13 22	3 03	.....	27	15 27.8 -20 15	10.8
Tue Jan 17/Wed Jan 18	7 23	17 50	19 12	6 01 7 23	2 35 13 25	4 13	.....	17	16 25.6 -24 11	10.8
Wed Jan 18/Thu Jan 19	7 27	17 51	19 13	6 01 7 23	2 39 13 29	5 24	.....	10	17 28.2 -26 45	10.8
Thu Jan 19/Fri Jan 20	7 31	17 52	19 14	6 01 7 22	2 44 13 33	6 32	.....	4	18 34.3 -27 33	10.8
Fri Jan 20/Sat Jan 21	7 35	17 53	19 15	6 00 7 22	2 49 13 37	7 32	16 36	1	19 41.3 -26 21	10.8
Sat Jan 21/Sun Jan 22	7 39	17 54	19 15	6 00 7 22	2 54 13 40	.....	17 51	0	20 46.3 -23 15	10.7
Sun Jan 22/Mon Jan 23	7 43	17 55	19 16	6 00 7 21	2 58 13 44	.....	19 07	3	21 47.4 -18 36	10.7
Mon Jan 23/Tue Jan 24	7 47	17 56	19 17	6 00 7 21	3 03 13 48	.....	20 20	9	22 44.2 -12 52	10.7
Tue Jan 24/Wed Jan 25	7 51	17 57	19 18	5 59 7 20	3 08 13 51	.....	21 30	16	23 37.1 - 6 34	10.7
Wed Jan 25/Thu Jan 26	7 55	17 58	19 19	5 59 7 20	3 13 13 55	.....	22 36	25	0 27.3 - 0 07	10.7
Thu Jan 26/Fri Jan 27	7 59	17 59	19 19	5 59 7 19	3 17 13 58	.....	23 39	35	1 15.9 6 09	10.7
Fri Jan 27/Sat Jan 28	8 03	17 59	19 20	5 58 7 19	3 22 14 02	.....	0 41	46	2 04.2 11 57	10.6
Sat Jan 28/Sun Jan 29	8 07	18 00	19 21	5 58 7 18	3 27 14 05	.....	1 42	56	2 53.0 17 05	10.6
Sun Jan 29/Mon Jan 30	8 11	18 01	19 22	5 57 7 18	3 32 14 09	.....	2 43	66	3 43.2 21 21	10.6
Mon Jan 30/Tue Jan 31	8 15	18 02	19 23	5 57 7 17	3 36 14 12	.....	3 43	75	4 35.0 24 35	10.6
Tue Jan 31/Wed Feb 01	8 18	18 03	19 23	5 56 7 16	3 41 14 16	.....	4 40	83	5 28.3 26 38	10.6

***** 2023 FEBRUARY *****

Date (eve/morn)	LMST midn	----- set	Sun: ----- twi.end twi.beg	rise	LST twilight: eve morn	----- rise	Moon: ----- set %illum	RA	Dec	Twi-Twi hours
Wed Feb 01/Thu Feb 02	8 22	18 04	19 24	5 56 7 16	3 46 14 19	.....	5 33	89	6 22.4 27 24	10.5
Thu Feb 02/Fri Feb 03	8 26	18 05	19 25	5 55 7 15	3 50 14 23	.....	6 20	94	7 16.4 26 51	10.5
Fri Feb 03/Sat Feb 04	8 30	18 06	19 26	5 55 7 14	3 55 14 26	16 10	7 02	98	8 09.2 25 03	10.5
Sat Feb 04/Sun Feb 05	8 34	18 07	19 26	5 54 7 14	4 00 14 29	17 07	7 39	100	9 00.0 22 06	10.5
Sun Feb 05/Mon Feb 06	8 38	18 08	19 27	5 53 7 13	4 05 14 33	18 05	.....	100	9 48.6 18 12	10.4
Mon Feb 06/Tue Feb 07	8 42	18 09	19 28	5 53 7 12	4 09 14 36	19 02	.....	98	10 35.1 13 32	10.4
Tue Feb 07/Wed Feb 08	8 46	18 09	19 29	5 52 7 11	4 14 14 39	19 58	.....	94	11 19.9 8 19	10.4
Wed Feb 08/Thu Feb 09	8 50	18 10	19 30	5 51 7 11	4 19 14 42	20 54	.....	88	12 03.9 2 44	10.4
Thu Feb 09/Fri Feb 10	8 54	18 11	19 30	5 51 7 10	4 24 14 46	21 50	.....	81	12 48.0 - 3 01	10.3
Fri Feb 10/Sat Feb 11	8 58	18 12	19 31	5 50 7 09	4 28 14 49	22 47	.....	73	13 33.2 - 8 44	10.3
Sat Feb 11/Sun Feb 12	9 02	18 13	19 32	5 49 7 08	4 33 14 52	23 47	.....	64	14 20.5 -14 13	10.3
Sun Feb 12/Mon Feb 13	9 06	18 14	19 33	5 48 7 07	4 38 14 55	0 50	.....	53	15 11.1 -19 12	10.3
Mon Feb 13/Tue Feb 14	9 10	18 15	19 33	5 47 7 06	4 42 14 58	1 56	.....	42	16 05.9 -23 22	10.2
Tue Feb 14/Wed Feb 15	9 14	18 15	19 34	5 47 7 05	4 47 15 01	3 04	.....	32	17 05.1 -26 20	10.2
Wed Feb 15/Thu Feb 16	9 18	18 16	19 35	5 46 7 04	4 52 15 04	4 12	.....	22	18 08.3 -27 44	10.2
Thu Feb 16/Fri Feb 17	9 22	18 17	19 36	5 45 7 03	4 57 15 07	5 14	.....	13	19 13.5 -27 18	10.2
Fri Feb 17/Sat Feb 18	9 25	18 18	19 36	5 44 7 02	5 01 15 10	6 09	.....	6	20 18.4 -24 59	10.1
Sat Feb 18/Sun Feb 19	9 29	18 19	19 37	5 43 7 01	5 06 15 13	6 55	16 37	2	21 20.7 -20 56	10.1
Sun Feb 19/Mon Feb 20	9 33	18 20	19 38	5 42 7 00	5 11 15 16	7 35	17 52	0	22 19.4 -15 34	10.1
Mon Feb 20/Tue Feb 21	9 37	18 20	19 39	5 41 6 59	5 15 15 19	.....	19 05	2	23 14.4 - 9 20	10.0
Tue Feb 21/Wed Feb 22	9 41	18 21	19 39	5 40 6 58	5 20 15 22	.....	20 14	6	0 06.5 - 2 44	10.0
Wed Feb 22/Thu Feb 23	9 45	18 22	19 40	5 39 6 57	5 25 15 25	.....	21 21	12	0 56.9 3 51	10.0
Thu Feb 23/Fri Feb 24	9 49	18 23	19 41	5 38 6 56	5 29 15 28	.....	22 26	20	1 46.4 10 03	10.0
Fri Feb 24/Sat Feb 25	9 53	18 24	19 42	5 37 6 55	5 34 15 31	.....	23 30	29	2 36.3 15 36	9.9
Sat Feb 25/Sun Feb 26	9 57	18 25	19 42	5 36 6 54	5 39 15 34	.....	0 33	39	3 27.0 20 16	9.9
Sun Feb 26/Mon Feb 27	10 01	18 25	19 43	5 35 6 53	5 43 15 37	.....	1 34	49	4 19.2 23 53	9.9
Mon Feb 27/Tue Feb 28	10 05	18 26	19 44	5 34 6 52	5 48 15 40	.....	2 33	59	5 12.6 26 18	9.8
Tue Feb 28/Wed Mar 01	10 09	18 27	19 45	5 33 6 50	5 53 15 42	.....	3 28	68	6 06.7 27 25	9.8

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 28, latitude (d.m) = 31 57.2
 Rise/set times in Mountain time (7 hr W), for 500 m above surroundings, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2023 MARCH *****

Date (eve/morn)	LMST midn	----- Sun: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Wed Mar 01/Thu Mar 02	10 13	18 28 19 45 5 32 6 49	5 57 15 45	..... 4 18 76 7 00.8 27 13	9.8
Thu Mar 02/Fri Mar 03	10 17	18 28 19 46 5 30 6 48	6 02 15 48	..... 5 02 84 7 53.8 25 44	9.7
Fri Mar 03/Sat Mar 04	10 21	18 29 19 47 5 29 6 47	6 07 15 51	..... 5 40 90 8 45.1 23 04	9.7
Sat Mar 04/Sun Mar 05	10 25	18 30 19 48 5 28 6 46	6 12 15 54	..... 6 13 95 9 34.3 19 23	9.7
Sun Mar 05/Mon Mar 06	10 29	18 31 19 48 5 27 6 45	6 16 15 56	16 55 6 43 98 10 21.4 14 52	9.6
Mon Mar 06/Tue Mar 07	10 33	18 31 19 49 5 26 6 43	6 21 15 59	17 52 7 10 100 11 07.0 9 42	9.6
Tue Mar 07/Wed Mar 08	10 36	18 32 19 50 5 24 6 42	6 26 16 02	18 48 99 11 51.6 4 06	9.6
Wed Mar 08/Thu Mar 09	10 40	18 33 19 51 5 23 6 41	6 30 16 05	19 45 97 12 36.0 - 1 45	9.5
Thu Mar 09/Fri Mar 10	10 44	18 34 19 51 5 22 6 40	6 35 16 07	20 42 92 13 21.3 - 7 37	9.5
Fri Mar 10/Sat Mar 11	10 48	18 34 19 52 5 21 6 38	6 40 16 10	21 41 86 14 08.4 -13 16	9.5
Sat Mar 11/Sun Mar 12	10 52	18 35 19 53 5 19 6 37	6 44 16 13	22 43 78 14 58.3 -18 26	9.4
Sun Mar 12/Mon Mar 13	10 56	18 36 19 53 5 18 6 36	6 49 16 15	23 48 69 15 51.9 -22 48	9.4
Mon Mar 13/Tue Mar 14	11 00	18 36 19 54 5 17 6 35	6 54 16 18	0 54 58 16 49.3 -26 04	9.4
Tue Mar 14/Wed Mar 15	11 04	18 37 19 55 5 16 6 33	6 58 16 21	2 00 47 17 50.4 -27 53	9.3
Wed Mar 15/Thu Mar 16	11 08	18 38 19 56 5 14 6 32	7 03 16 23	3 03 36 18 53.6 -27 59	9.3
Thu Mar 16/Fri Mar 17	11 12	18 39 19 56 5 13 6 31	7 08 16 26	3 58 25 19 56.9 -26 17	9.3
Fri Mar 17/Sat Mar 18	11 16	18 39 19 57 5 12 6 30	7 12 16 28	4 47 16 20 58.4 -22 52	9.2
Sat Mar 18/Sun Mar 19	11 20	18 40 19 58 5 10 6 28	7 17 16 31	5 28 8 21 56.9 -18 02	9.2
Sun Mar 19/Mon Mar 20	11 24	18 41 19 59 5 09 6 27	7 22 16 34	6 04 16 40 3 22 52.3 -12 09	9.2
Mon Mar 20/Tue Mar 21	11 28	18 41 20 00 5 08 6 26	7 27 16 36	6 36 17 50 0 23 44.9 - 5 40	9.1
Tue Mar 21/Wed Mar 22	11 32	18 42 20 00 5 06 6 24	7 31 16 39	7 08 18 58 0 0 35.8 1 00	9.1
Wed Mar 22/Thu Mar 23	11 36	18 43 20 01 5 05 6 23	7 36 16 41	..... 20 05 3 1 25.9 7 29	9.1
Thu Mar 23/Fri Mar 24	11 40	18 43 20 02 5 04 6 22	7 41 16 44	..... 21 10 8 2 16.2 13 27	9.0
Fri Mar 24/Sat Mar 25	11 43	18 44 20 03 5 02 6 21	7 45 16 46	..... 22 16 15 3 07.5 18 37	9.0
Sat Mar 25/Sun Mar 26	11 47	18 45 20 03 5 01 6 19	7 50 16 49	..... 23 20 23 4 00.2 22 44	9.0
Sun Mar 26/Mon Mar 27	11 51	18 45 20 04 4 59 6 18	7 55 16 52	..... 0 22 32 4 54.1 25 38	8.9
Mon Mar 27/Tue Mar 28	11 55	18 46 20 05 4 58 6 17	8 00 16 54	..... 1 20 41 5 48.8 27 13	8.9
Tue Mar 28/Wed Mar 29	11 59	18 47 20 06 4 57 6 15	8 04 16 57	..... 2 12 51 6 43.4 27 27	8.8
Wed Mar 29/Thu Mar 30	12 03	18 47 20 07 4 55 6 14	8 09 16 59	..... 2 59 61 7 37.0 26 21	8.8
Thu Mar 30/Fri Mar 31	12 07	18 48 20 07 4 54 6 13	8 14 17 02	..... 3 39 70 8 28.8 24 02	8.8
Fri Mar 31/Sat Apr 01	12 11	18 49 20 08 4 52 6 12	8 19 17 04	..... 4 14 78 9 18.4 20 39	8.7

***** 2023 APRIL *****

Date (eve/morn)	LMST midn	----- Sun: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Sat Apr 01/Sun Apr 02	12 15	18 50 20 09 4 51 6 10	8 23 17 07	..... 4 45 86 10 06.0 16 22	8.7
Sun Apr 02/Mon Apr 03	12 19	18 50 20 10 4 50 6 09	8 28 17 09	..... 5 13 92 10 51.9 11 23	8.7
Mon Apr 03/Tue Apr 04	12 23	18 51 20 11 4 48 6 08	8 33 17 12	..... 5 39 96 11 36.8 5 51	8.6
Tue Apr 04/Wed Apr 05	12 27	18 52 20 11 4 47 6 07	8 38 17 14	17 36 6 05 99 12 21.5 - 0 01	8.6
Wed Apr 05/Thu Apr 06	12 31	18 52 20 12 4 45 6 05	8 43 17 17	18 34 6 32 100 13 07.0 - 6 01	8.5
Thu Apr 06/Fri Apr 07	12 35	18 53 20 13 4 44 6 04	8 47 17 19	19 33 7 02 99 13 54.3 -11 53	8.5
Fri Apr 07/Sat Apr 08	12 39	18 54 20 14 4 42 6 03	8 52 17 22	20 35 95 14 44.4 -17 21	8.5
Sat Apr 08/Sun Apr 09	12 43	18 54 20 15 4 41 6 02	8 57 17 24	21 40 89 15 37.9 -22 05	8.4
Sun Apr 09/Mon Apr 10	12 47	18 55 20 16 4 40 6 00	9 02 17 27	22 47 82 16 35.3 -25 43	8.4
Mon Apr 10/Tue Apr 11	12 51	18 56 20 17 4 38 5 59	9 07 17 29	23 54 72 17 36.2 -27 54	8.4
Tue Apr 11/Wed Apr 12	12 54	18 56 20 18 4 37 5 58	9 11 17 32	0 57 62 18 39.1 -28 25	8.3
Wed Apr 12/Thu Apr 13	12 58	18 57 20 18 4 35 5 57	9 16 17 35	1 54 50 19 42.0 -27 08	8.3
Thu Apr 13/Fri Apr 14	13 02	18 58 20 19 4 34 5 56	9 21 17 37	2 43 39 20 43.0 -24 10	8.2
Fri Apr 14/Sat Apr 15	13 06	18 58 20 20 4 33 5 54	9 26 17 40	3 25 28 21 41.0 -19 46	8.2
Sat Apr 15/Sun Apr 16	13 10	18 59 20 21 4 31 5 53	9 31 17 42	4 02 19 22 35.7 -14 18	8.2
Sun Apr 16/Mon Apr 17	13 14	19 00 20 22 4 30 5 52	9 36 17 45	4 35 11 23 27.7 - 8 07	8.1
Mon Apr 17/Tue Apr 18	13 18	19 01 20 23 4 28 5 51	9 40 17 47	5 05 5 0 17.9 - 1 35	8.1
Tue Apr 18/Wed Apr 19	13 22	19 01 20 24 4 27 5 50	9 45 17 50	5 36 17 45 1 1 07.3 4 56	8.1
Wed Apr 19/Thu Apr 20	13 26	19 02 20 25 4 26 5 49	9 50 17 52	6 07 18 51 0 1 57.0 11 05	8.0
Thu Apr 20/Fri Apr 21	13 30	19 03 20 26 4 24 5 48	9 55 17 55	6 41 19 56 1 2 47.8 16 36	8.0
Fri Apr 21/Sat Apr 22	13 34	19 03 20 27 4 23 5 46	10 00 17 58	..... 21 02 5 3 40.2 21 11	7.9
Sat Apr 22/Sun Apr 23	13 38	19 04 20 28 4 22 5 45	10 05 18 00	..... 22 06 10 4 34.2 24 36	7.9
Sun Apr 23/Mon Apr 24	13 42	19 05 20 29 4 20 5 44	10 10 18 03	..... 23 07 17 5 29.2 26 42	7.9
Mon Apr 24/Tue Apr 25	13 46	19 05 20 30 4 19 5 43	10 15 18 06	..... 0 03 26 6 24.5 27 25	7.8
Tue Apr 25/Wed Apr 26	13 50	19 06 20 31 4 18 5 42	10 20 18 08	..... 0 53 34 7 18.9 26 45	7.8
Wed Apr 26/Thu Apr 27	13 54	19 07 20 32 4 17 5 41	10 25 18 11	..... 1 36 44 8 11.4 24 50	7.7
Thu Apr 27/Fri Apr 28	13 58	19 08 20 32 4 15 5 40	10 29 18 13	..... 2 13 53 9 01.6 21 48	7.7
Fri Apr 28/Sat Apr 29	14 01	19 08 20 33 4 14 5 39	10 34 18 16	..... 2 45 63 9 49.4 17 50	7.7
Sat Apr 29/Sun Apr 30	14 05	19 09 20 34 4 13 5 38	10 39 18 19	..... 3 14 72 10 35.4 13 07	7.6
Sun Apr 30/Mon May 01	14 09	19 10 20 35 4 11 5 37	10 44 18 22	..... 3 41 80 11 20.2 7 47	7.6

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 28, latitude (d.m) = 31 57.2
 Rise/set times in Mountain time (7 hr W), for 500 m above surroundings, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2023 MAY *****

Date (eve/morn)	LMST midn	----- Sun: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Mon May 01/Tue May 02	14 13	19 10 20 36	4 10 5 36	10 49 18 24	..... 4 07 87 12 04.6 2 03 7.6
Tue May 02/Wed May 03	14 17	19 11 20 37	4 09 5 35	10 54 18 27	..... 4 33 93 12 49.7 - 3 56 7.5
Wed May 03/Thu May 04	14 21	19 12 20 38	4 08 5 34	10 59 18 30	17 20 5 01 98 13 36.5 - 9 56 7.5
Thu May 04/Fri May 05	14 25	19 13 20 39	4 07 5 33	11 04 18 32	18 22 5 33 100 14 26.2 -15 40 7.5
Fri May 05/Sat May 06	14 29	19 13 20 40	4 05 5 33	11 09 18 35	19 27 6 10 100 15 19.5 -20 47 7.4
Sat May 06/Sun May 07	14 33	19 14 20 41	4 04 5 32	11 14 18 38	20 35 97 16 17.2 -24 55 7.4
Sun May 07/Mon May 08	14 37	19 15 20 42	4 03 5 31	11 19 18 41	21 44 92 17 18.8 -27 38 7.3
Mon May 08/Tue May 09	14 41	19 15 20 43	4 02 5 30	11 24 18 44	22 50 84 18 23.0 -28 37 7.3
Tue May 09/Wed May 10	14 45	19 16 20 44	4 01 5 29	11 29 18 47	23 50 75 19 27.5 -27 45 7.3
Wed May 10/Thu May 11	14 49	19 17 20 45	4 00 5 29	11 34 18 49	0 42 64 20 29.8 -25 07 7.2
Thu May 11/Fri May 12	14 53	19 18 20 46	3 59 5 28	11 39 18 52	1 26 53 21 28.7 -20 59 7.2
Fri May 12/Sat May 13	14 57	19 18 20 47	3 58 5 27	11 44 18 55	2 03 42 22 23.8 -15 45 7.2
Sat May 13/Sun May 14	15 01	19 19 20 48	3 57 5 26	11 49 18 58	2 36 31 23 15.6 - 9 47 7.1
Sun May 14/Mon May 15	15 05	19 20 20 49	3 56 5 26	11 53 19 01	3 07 21 0 05.1 - 3 25 7.1
Mon May 15/Tue May 16	15 08	19 20 20 50	3 55 5 25	11 58 19 04	3 36 13 0 53.6 2 59 7.1
Tue May 16/Wed May 17	15 12	19 21 20 51	3 54 5 24	12 03 19 07	4 06 6 1 42.2 9 09 7.0
Wed May 17/Thu May 18	15 16	19 22 20 52	3 53 5 24	12 08 19 10	4 38 17 41 2 2 31.7 14 47 7.0
Thu May 18/Fri May 19	15 20	19 22 20 53	3 52 5 23	12 13 19 13	5 14 18 46 0 3 22.9 19 38 7.0
Fri May 19/Sat May 20	15 24	19 23 20 54	3 51 5 23	12 18 19 16	5 54 19 50 0 4 16.0 23 25 7.0
Sat May 20/Sun May 21	15 28	19 24 20 55	3 51 5 22	12 23 19 19	..... 20 53 3 5 10.7 25 58 6.9
Sun May 21/Mon May 22	15 32	19 25 20 56	3 50 5 21	12 28 19 23	..... 21 52 7 6 06.0 27 08 6.9
Mon May 22/Tue May 23	15 36	19 25 20 57	3 49 5 21	12 33 19 26	..... 22 45 13 7 00.9 26 55 6.9
Tue May 23/Wed May 24	15 40	19 26 20 58	3 48 5 20	12 38 19 29	..... 23 31 20 7 54.1 25 24 6.8
Wed May 24/Thu May 25	15 44	19 26 20 59	3 48 5 20	12 42 19 32	..... 0 10 28 8 45.0 22 43 6.8
Thu May 25/Fri May 26	15 48	19 27 21 00	3 47 5 20	12 47 19 35	..... 0 44 37 9 33.3 19 04 6.8
Fri May 26/Sat May 27	15 52	19 28 21 01	3 46 5 19	12 52 19 39	..... 1 14 46 10 19.4 14 37 6.8
Sat May 27/Sun May 28	15 56	19 28 21 02	3 46 5 19	12 57 19 42	..... 1 41 56 11 03.9 9 34 6.7
Sun May 28/Mon May 29	16 00	19 29 21 02	3 45 5 18	13 02 19 45	..... 2 07 65 11 47.6 4 03 6.7
Mon May 29/Tue May 30	16 04	19 30 21 03	3 44 5 18	13 06 19 49	..... 2 33 74 12 31.6 - 1 46 6.7
Tue May 30/Wed May 31	16 08	19 30 21 04	3 44 5 18	13 11 19 52	..... 3 00 83 13 17.1 - 7 42 6.7
Wed May 31/Thu Jun 01	16 12	19 31 21 05	3 43 5 18	13 16 19 56	..... 3 30 90 14 05.1 -13 31 6.6

***** 2023 JUNE *****

Date (eve/morn)	LMST midn	----- Sun: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Thu Jun 01/Fri Jun 02	16 16	19 31 21 06	3 43 5 17	13 21 19 59	..... 4 04 96 14 56.9 -18 56 6.6
Fri Jun 02/Sat Jun 03	16 19	19 32 21 06	3 43 5 17	13 25 20 03	18 16 4 45 99 15 53.5 -23 32 6.6
Sat Jun 03/Sun Jun 04	16 23	19 32 21 07	3 42 5 17	13 30 20 06	19 26 5 35 100 16 54.9 -26 53 6.6
Sun Jun 04/Mon Jun 05	16 27	19 33 21 08	3 42 5 17	13 35 20 10	20 36 98 18 00.1 -28 33 6.6
Mon Jun 05/Tue Jun 06	16 31	19 34 21 09	3 41 5 17	13 39 20 13	21 40 93 19 06.8 -28 17 6.5
Tue Jun 06/Wed Jun 07	16 35	19 34 21 09	3 41 5 16	13 44 20 17	22 37 86 20 12.1 -26 04 6.5
Wed Jun 07/Thu Jun 08	16 39	19 34 21 10	3 41 5 16	13 49 20 21	23 25 77 21 13.9 -22 11 6.5
Thu Jun 08/Fri Jun 09	16 43	19 35 21 10	3 41 5 16	13 53 20 24	0 05 67 22 11.2 -17 03 6.5
Fri Jun 09/Sat Jun 10	16 47	19 35 21 11	3 41 5 16	13 58 20 28	0 39 55 23 04.4 -11 07 6.5
Sat Jun 10/Sun Jun 11	16 51	19 36 21 12	3 40 5 16	14 02 20 32	1 10 44 23 54.7 - 4 46 6.5
Sun Jun 11/Mon Jun 12	16 55	19 36 21 12	3 40 5 16	14 07 20 36	1 39 33 0 43.2 1 38 6.5
Mon Jun 12/Tue Jun 13	16 59	19 37 21 13	3 40 5 16	14 11 20 40	2 08 24 1 31.3 7 49 6.5
Tue Jun 13/Wed Jun 14	17 03	19 37 21 13	3 40 5 16	14 16 20 44	2 39 15 2 19.9 13 30 6.4
Wed Jun 14/Thu Jun 15	17 07	19 37 21 14	3 40 5 16	14 20 20 47	3 13 8 3 09.9 18 28 6.4
Thu Jun 15/Fri Jun 16	17 11	19 38 21 14	3 40 5 16	14 24 20 51	3 51 17 39 4 4 01.8 22 28 6.4
Fri Jun 16/Sat Jun 17	17 15	19 38 21 14	3 40 5 16	14 29 20 55	4 35 18 42 1 4 55.5 25 18 6.4
Sat Jun 17/Sun Jun 18	17 19	19 38 21 15	3 40 5 17	14 33 20 59	5 24 19 42 0 5 50.3 26 49 6.4
Sun Jun 18/Mon Jun 19	17 23	19 39 21 15	3 40 5 17	14 37 21 04	6 18 20 37 1 6 45.1 26 58 6.4
Mon Jun 19/Tue Jun 20	17 26	19 39 21 15	3 41 5 17	14 41 21 08	..... 21 25 4 7 38.7 25 47 6.4
Tue Jun 20/Wed Jun 21	17 30	19 39 21 16	3 41 5 17	14 46 21 12	..... 22 07 9 8 30.1 23 24 6.4
Wed Jun 21/Thu Jun 22	17 34	19 39 21 16	3 41 5 17	14 50 21 16	..... 22 43 15 9 18.9 20 01 6.4
Thu Jun 22/Fri Jun 23	17 38	19 40 21 16	3 41 5 18	14 54 21 20	..... 23 14 22 10 05.2 15 49 6.4
Fri Jun 23/Sat Jun 24	17 42	19 40 21 16	3 42 5 18	14 58 21 24	..... 23 42 31 10 49.6 10 59 6.4
Sat Jun 24/Sun Jun 25	17 46	19 40 21 16	3 42 5 18	15 02 21 29	..... 0 08 40 11 32.7 5 41 6.4
Sun Jun 25/Mon Jun 26	17 50	19 40 21 16	3 42 5 19	15 06 21 33	..... 0 34 49 12 15.6 0 05 6.4
Mon Jun 26/Tue Jun 27	17 54	19 40 21 16	3 43 5 19	15 10 21 37	..... 0 59 59 12 59.4 - 5 41 6.4
Tue Jun 27/Wed Jun 28	17 58	19 40 21 16	3 43 5 19	15 14 21 42	..... 1 27 69 13 45.2 -11 26 6.4
Wed Jun 28/Thu Jun 29	18 02	19 40 21 16	3 43 5 20	15 18 21 46	..... 1 59 78 14 34.4 -16 54 6.5
Thu Jun 29/Fri Jun 30	18 06	19 40 21 16	3 44 5 20	15 22 21 50	..... 2 36 86 15 28.0 -21 48 6.5
Fri Jun 30/Sat Jul 01	18 10	19 40 21 16	3 44 5 20	15 26 21 55	..... 3 21 93 16 27.0 -25 42 6.5

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 28, latitude (d.m) = 31 57.2
 Rise/set times in Mountain time (7 hr W), for 500 m above surroundings, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2023 JULY *****

Date (eve/morn)	LMST midn	----- Sun: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Sat Jul 01/Sun Jul 02	18 14	19 40 21 16 3 45 5 21	15 29 21 59	18 14 4 16 98 17 31.0 -28 07	6.5
Sun Jul 02/Mon Jul 03	18 18	19 40 21 16 3 46 5 21	15 33 22 04	19 22 5 21 100 18 38.4 -28 40	6.5
Mon Jul 03/Tue Jul 04	18 22	19 40 21 16 3 46 5 22	15 37 22 08	20 24 99 19 46.2 -27 09	6.5
Tue Jul 04/Wed Jul 05	18 26	19 40 21 15 3 47 5 22	15 41 22 13	21 17 95 20 51.5 -23 43	6.5
Wed Jul 05/Thu Jul 06	18 30	19 40 21 15 3 47 5 23	15 44 22 18	22 01 88 21 52.5 -18 46	6.5
Thu Jul 06/Fri Jul 07	18 34	19 40 21 15 3 48 5 23	15 48 22 22	22 39 79 22 48.9 -12 47	6.6
Fri Jul 07/Sat Jul 08	18 37	19 40 21 14 3 49 5 24	15 51 22 27	23 12 69 23 41.5 - 6 18	6.6
Sat Jul 08/Sun Jul 09	18 41	19 39 21 14 3 49 5 24	15 55 22 31	23 42 58 0 31.6 0 18	6.6
Sun Jul 09/Mon Jul 10	18 45	19 39 21 14 3 50 5 25	15 59 22 36	0 11 47 1 20.5 6 40	6.6
Mon Jul 10/Tue Jul 11	18 49	19 39 21 13 3 51 5 25	16 02 22 41	0 42 36 2 09.4 12 32	6.6
Tue Jul 11/Wed Jul 12	18 53	19 39 21 13 3 52 5 26	16 05 22 46	1 14 27 2 59.2 17 39	6.6
Wed Jul 12/Thu Jul 13	18 57	19 38 21 12 3 52 5 26	16 09 22 50	1 51 18 3 50.6 21 50	6.7
Thu Jul 13/Fri Jul 14	19 01	19 38 21 12 3 53 5 27	16 12 22 55	2 32 11 4 43.6 24 52	6.7
Fri Jul 14/Sat Jul 15	19 05	19 38 21 11 3 54 5 27	16 16 23 00	3 19 17 36 6 5 37.8 26 38	6.7
Sat Jul 15/Sun Jul 16	19 09	19 37 21 10 3 55 5 28	16 19 23 04	4 11 18 32 2 6 32.2 27 04	6.7
Sun Jul 16/Mon Jul 17	19 13	19 37 21 10 3 56 5 29	16 22 23 09	5 07 19 22 0 7 25.8 26 09	6.8
Mon Jul 17/Tue Jul 18	19 17	19 36 21 09 3 57 5 29	16 25 23 14	6 05 20 06 0 8 17.5 24 01	6.8
Tue Jul 18/Wed Jul 19	19 21	19 36 21 08 3 57 5 30	16 29 23 19	..... 20 43 2 9 06.7 20 51	6.8
Wed Jul 19/Thu Jul 20	19 25	19 35 21 08 3 58 5 30	16 32 23 24	..... 21 16 6 9 53.4 16 49	6.8
Thu Jul 20/Fri Jul 21	19 29	19 35 21 07 3 59 5 31	16 35 23 29	..... 21 44 11 10 37.9 12 08	6.9
Fri Jul 21/Sat Jul 22	19 33	19 34 21 06 4 00 5 32	16 38 23 33	..... 22 11 17 11 20.8 6 59	6.9
Sat Jul 22/Sun Jul 23	19 37	19 34 21 05 4 01 5 32	16 41 23 38	..... 22 36 25 12 03.0 1 30	6.9
Sun Jul 23/Mon Jul 24	19 41	19 33 21 04 4 02 5 33	16 44 23 43	..... 23 01 34 12 45.5 - 4 08	7.0
Mon Jul 24/Tue Jul 25	19 44	19 33 21 03 4 03 5 34	16 47 23 48	..... 23 27 43 13 29.5 - 9 45	7.0
Tue Jul 25/Wed Jul 26	19 48	19 32 21 03 4 04 5 34	16 51 23 53	..... 23 56 53 14 16.0 -15 11	7.0
Wed Jul 26/Thu Jul 27	19 52	19 31 21 02 4 05 5 35	16 54 23 58	..... 0 30 64 15 06.3 -20 10	7.1
Thu Jul 27/Fri Jul 28	19 56	19 31 21 01 4 06 5 36	16 56 0 03	..... 1 10 74 16 01.5 -24 22	7.1
Fri Jul 28/Sat Jul 29	20 00	19 30 21 00 4 07 5 36	16 59 0 07	..... 1 59 83 17 02.0 -27 21	7.1
Sat Jul 29/Sun Jul 30	20 04	19 29 20 59 4 08 5 37	17 02 0 12	..... 2 58 91 18 07.1 -28 43	7.1
Sun Jul 30/Mon Jul 31	20 08	19 29 20 58 4 08 5 38	17 05 0 17	18 05 4 07 96 19 14.7 -28 07	7.2
Mon Jul 31/Tue Aug 01	20 12	19 28 20 57 4 09 5 38	17 08 0 22	19 03 5 22 99 20 21.8 -25 27	7.2

***** 2023 AUGUST *****

Date (eve/morn)	LMST midn	----- Sun: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Tue Aug 01/Wed Aug 02	20 16	19 27 20 56 4 10 5 39	17 11 0 27	19 52 99 21 25.9 -20 59	7.2
Wed Aug 02/Thu Aug 03	20 20	19 26 20 54 4 11 5 40	17 14 0 32	20 33 96 22 25.8 -15 10	7.3
Thu Aug 03/Fri Aug 04	20 24	19 25 20 53 4 12 5 40	17 17 0 37	21 09 90 23 21.7 - 8 34	7.3
Fri Aug 04/Sat Aug 05	20 28	19 25 20 52 4 13 5 41	17 20 0 42	21 41 82 0 14.5 - 1 40	7.4
Sat Aug 05/Sun Aug 06	20 32	19 24 20 51 4 14 5 42	17 22 0 47	22 12 72 1 05.5 5 05	7.4
Sun Aug 06/Mon Aug 07	20 36	19 23 20 50 4 15 5 42	17 25 0 52	22 43 62 1 56.0 11 19	7.4
Mon Aug 07/Tue Aug 08	20 40	19 22 20 49 4 16 5 43	17 28 0 56	23 15 51 2 46.8 16 47	7.5
Tue Aug 08/Wed Aug 09	20 44	19 21 20 47 4 17 5 44	17 31 1 01	23 51 41 3 38.8 21 17	7.5
Wed Aug 09/Thu Aug 10	20 48	19 20 20 46 4 18 5 44	17 33 1 06	0 31 31 4 32.0 24 36	7.5
Thu Aug 10/Fri Aug 11	20 52	19 19 20 45 4 19 5 45	17 36 1 11	1 16 22 5 26.3 26 37	7.6
Fri Aug 11/Sat Aug 12	20 55	19 18 20 44 4 20 5 46	17 39 1 16	2 07 15 6 20.9 27 17	7.6
Sat Aug 12/Sun Aug 13	20 59	19 17 20 42 4 21 5 46	17 41 1 21	3 02 17 20 8 7 14.6 26 37	7.6
Sun Aug 13/Mon Aug 14	21 03	19 16 20 41 4 22 5 47	17 44 1 26	3 59 18 05 4 8 06.6 24 42	7.7
Mon Aug 14/Tue Aug 15	21 07	19 15 20 40 4 23 5 48	17 47 1 31	4 57 18 44 1 8 56.1 21 42	7.7
Tue Aug 15/Wed Aug 16	21 11	19 14 20 39 4 24 5 48	17 49 1 35	5 54 19 18 0 9 43.2 17 49	7.7
Wed Aug 16/Thu Aug 17	21 15	19 13 20 37 4 24 5 49	17 52 1 40	..... 19 48 1 10 28.0 13 14	7.8
Thu Aug 17/Fri Aug 18	21 19	19 12 20 36 4 25 5 49	17 54 1 45	..... 20 14 3 11 11.0 8 08	7.8
Fri Aug 18/Sat Aug 19	21 23	19 11 20 35 4 26 5 50	17 57 1 50	..... 20 40 7 11 53.1 2 43	7.9
Sat Aug 19/Sun Aug 20	21 27	19 10 20 33 4 27 5 51	18 00 1 55	..... 21 04 13 12 35.1 - 2 52	7.9
Sun Aug 20/Mon Aug 21	21 31	19 08 20 32 4 28 5 51	18 02 2 00	..... 21 30 20 13 18.0 - 8 27	7.9
Mon Aug 21/Tue Aug 22	21 35	19 07 20 30 4 29 5 52	18 05 2 05	..... 21 57 28 14 02.9 -13 52	8.0
Tue Aug 22/Wed Aug 23	21 39	19 06 20 29 4 30 5 53	18 07 2 09	..... 22 28 38 14 50.7 -18 52	8.0
Wed Aug 23/Thu Aug 24	21 43	19 05 20 28 4 31 5 53	18 10 2 14	..... 23 04 48 15 42.6 -23 12	8.0
Thu Aug 24/Fri Aug 25	21 47	19 04 20 26 4 31 5 54	18 12 2 19	..... 23 48 59 16 39.3 -26 32	8.1
Fri Aug 25/Sat Aug 26	21 51	19 03 20 25 4 32 5 55	18 15 2 24	..... 0 41 69 17 40.6 -28 28	8.1
Sat Aug 26/Sun Aug 27	21 55	19 01 20 23 4 33 5 55	18 17 2 29	..... 1 44 79 18 45.4 -28 39	8.2
Sun Aug 27/Mon Aug 28	21 59	19 00 20 22 4 34 5 56	18 20 2 33	..... 2 55 88 19 51.3 -26 54	8.2
Mon Aug 28/Tue Aug 29	22 02	18 59 20 21 4 35 5 56	18 22 2 38	17 39 4 10 95 20 55.9 -23 14	8.2
Tue Aug 29/Wed Aug 30	22 06	18 58 20 19 4 36 5 57	18 25 2 43	18 24 5 25 99 21 57.5 -17 58	8.3
Wed Aug 30/Thu Aug 31	22 10	18 57 20 18 4 37 5 58	18 27 2 48	19 02 6 39 100 22 55.6 -11 33	8.3
Thu Aug 31/Fri Sep 01	22 14	18 55 20 16 4 37 5 58	18 30 2 52	19 37 98 23 50.8 - 4 32	8.4

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 28, latitude (d.m) = 31 57.2
 Rise/set times in Mountain time (7 hr W), for 500 m above surroundings, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2023 SEPTEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----					Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Fri Sep 01/Sat Sep 02	22 18	18 54	20 15	4 38	5 59	18 32	2 57	20 09	.....	93	0 44.0	2 35	8.4
Sat Sep 02/Sun Sep 03	22 22	18 53	20 13	4 39	6 00	18 35	3 02	20 40	.....	85	1 36.4	9 19	8.4
Sun Sep 03/Mon Sep 04	22 26	18 52	20 12	4 40	6 00	18 37	3 07	21 13	.....	76	2 28.9	15 21	8.5
Mon Sep 04/Tue Sep 05	22 30	18 50	20 10	4 41	6 01	18 40	3 11	21 48	.....	66	3 22.4	20 21	8.5
Tue Sep 05/Wed Sep 06	22 34	18 49	20 09	4 41	6 01	18 42	3 16	22 27	.....	56	4 17.0	24 09	8.5
Wed Sep 06/Thu Sep 07	22 38	18 48	20 08	4 42	6 02	18 45	3 21	23 12	.....	46	5 12.4	26 34	8.6
Thu Sep 07/Fri Sep 08	22 42	18 46	20 06	4 43	6 03	18 47	3 26	0 01	.....	36	6 08.0	27 34	8.6
Fri Sep 08/Sat Sep 09	22 46	18 45	20 05	4 44	6 03	18 50	3 30	0 55	.....	27	7 02.6	27 11	8.6
Sat Sep 09/Sun Sep 10	22 50	18 44	20 03	4 44	6 04	18 52	3 35	1 53	.....	19	7 55.3	25 30	8.7
Sun Sep 10/Mon Sep 11	22 54	18 42	20 02	4 45	6 05	18 55	3 40	2 51	.....	12	8 45.5	22 41	8.7
Mon Sep 11/Tue Sep 12	22 58	18 41	20 00	4 46	6 05	18 57	3 44	3 48	17 20	7	9 33.1	18 57	8.8
Tue Sep 12/Wed Sep 13	23 02	18 40	19 59	4 47	6 06	19 00	3 49	4 45	17 51	3	10 18.3	14 28	8.8
Wed Sep 13/Thu Sep 14	23 06	18 38	19 57	4 47	6 06	19 02	3 54	5 40	18 18	1	11 01.8	9 26	8.8
Thu Sep 14/Fri Sep 15	23 09	18 37	19 56	4 48	6 07	19 05	3 58	6 35	18 44	0	11 44.1	4 01	8.9
Fri Sep 15/Sat Sep 16	23 13	18 36	19 55	4 49	6 08	19 07	4 03	.....	19 09	1	12 26.1	- 1 35	8.9
Sat Sep 16/Sun Sep 17	23 17	18 35	19 53	4 49	6 08	19 10	4 08	.....	19 34	4	13 08.7	- 7 13	8.9
Sun Sep 17/Mon Sep 18	23 21	18 33	19 52	4 50	6 09	19 12	4 12	.....	20 01	9	13 52.9	-12 41	9.0
Mon Sep 18/Tue Sep 19	23 25	18 32	19 50	4 51	6 09	19 15	4 17	.....	20 30	16	14 39.6	-17 47	9.0
Tue Sep 19/Wed Sep 20	23 29	18 31	19 49	4 52	6 10	19 17	4 22	.....	21 04	24	15 29.8	-22 15	9.0
Wed Sep 20/Thu Sep 21	23 33	18 29	19 47	4 52	6 11	19 20	4 26	.....	21 45	33	16 24.0	-25 47	9.1
Thu Sep 21/Fri Sep 22	23 37	18 28	19 46	4 53	6 11	19 22	4 31	.....	22 33	44	17 22.4	-28 03	9.1
Fri Sep 22/Sat Sep 23	23 41	18 27	19 45	4 54	6 12	19 25	4 36	.....	23 30	55	18 24.0	-28 46	9.2
Sat Sep 23/Sun Sep 24	23 45	18 25	19 43	4 54	6 12	19 28	4 40	.....	0 36	66	19 27.2	-27 43	9.2
Sun Sep 24/Mon Sep 25	23 49	18 24	19 42	4 55	6 13	19 30	4 45	.....	1 47	76	20 30.1	-24 51	9.2
Mon Sep 25/Tue Sep 26	23 53	18 23	19 41	4 56	6 14	19 33	4 49	.....	3 00	86	21 30.9	-20 19	9.3
Tue Sep 26/Wed Sep 27	23 57	18 21	19 39	4 56	6 14	19 35	4 54	16 56	4 13	93	22 29.0	-14 29	9.3
Wed Sep 27/Thu Sep 28	0 01	18 20	19 38	4 57	6 15	19 38	4 59	17 31	5 24	98	23 24.6	- 7 44	9.3
Thu Sep 28/Fri Sep 29	0 05	18 19	19 36	4 58	6 16	19 40	5 03	18 04	6 34	100	0 18.5	- 0 36	9.4
Fri Sep 29/Sat Sep 30	0 09	18 17	19 35	4 58	6 16	19 43	5 08	18 35	.....	99	1 11.7	6 29	9.4
Sat Sep 30/Sun Oct 01	0 13	18 16	19 34	4 59	6 17	19 46	5 13	19 08	.....	95	2 05.3	13 02	9.4

***** 2023 OCTOBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----					Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Sun Oct 01/Mon Oct 02	0 17	18 15	19 32	5 00	6 18	19 48	5 17	19 42	.....	89	2 59.9	18 42	9.5
Mon Oct 02/Tue Oct 03	0 20	18 14	19 31	5 00	6 18	19 51	5 22	20 21	.....	81	3 55.9	23 09	9.5
Tue Oct 03/Wed Oct 04	0 24	18 12	19 30	5 01	6 19	19 54	5 26	21 04	.....	72	4 53.1	26 11	9.5
Wed Oct 04/Thu Oct 05	0 28	18 11	19 29	5 02	6 20	19 56	5 31	21 53	.....	62	5 50.4	27 42	9.6
Thu Oct 05/Fri Oct 06	0 32	18 10	19 27	5 02	6 20	19 59	5 36	22 47	.....	52	6 46.9	27 43	9.6
Fri Oct 06/Sat Oct 07	0 36	18 08	19 26	5 03	6 21	20 02	5 40	23 44	.....	42	7 41.2	26 21	9.6
Sat Oct 07/Sun Oct 08	0 40	18 07	19 25	5 04	6 22	20 04	5 45	0 42	.....	33	8 32.8	23 47	9.6
Sun Oct 08/Mon Oct 09	0 44	18 06	19 24	5 04	6 22	20 07	5 49	1 40	.....	25	9 21.3	20 14	9.7
Mon Oct 09/Tue Oct 10	0 48	18 05	19 22	5 05	6 23	20 10	5 54	2 37	.....	17	10 07.3	15 53	9.7
Tue Oct 10/Wed Oct 11	0 52	18 04	19 21	5 06	6 24	20 12	5 59	3 33	16 22	11	10 51.2	10 57	9.7
Wed Oct 11/Thu Oct 12	0 56	18 02	19 20	5 06	6 24	20 15	6 03	4 28	16 48	5	11 33.8	5 35	9.8
Thu Oct 12/Fri Oct 13	1 00	18 01	19 19	5 07	6 25	20 18	6 08	5 23	17 13	2	12 16.0	- 0 01	9.8
Fri Oct 13/Sat Oct 14	1 04	18 00	19 18	5 08	6 26	20 21	6 12	6 19	17 38	0	12 58.6	- 5 43	9.8
Sat Oct 14/Sun Oct 15	1 08	17 59	19 17	5 08	6 26	20 24	6 17	7 17	18 04	0	13 42.7	-11 18	9.9
Sun Oct 15/Mon Oct 16	1 12	17 58	19 15	5 09	6 27	20 26	6 22	.....	18 33	2	14 29.2	-16 34	9.9
Mon Oct 16/Tue Oct 17	1 16	17 56	19 14	5 10	6 28	20 29	6 26	.....	19 06	6	15 18.8	-21 13	9.9
Tue Oct 17/Wed Oct 18	1 20	17 55	19 13	5 11	6 29	20 32	6 31	.....	19 44	12	16 12.2	-24 59	10.0
Wed Oct 18/Thu Oct 19	1 24	17 54	19 12	5 11	6 29	20 35	6 36	.....	20 30	20	17 09.4	-27 33	10.0
Thu Oct 19/Fri Oct 20	1 27	17 53	19 11	5 12	6 30	20 38	6 40	.....	21 24	29	18 09.5	-28 38	10.0
Fri Oct 20/Sat Oct 21	1 31	17 52	19 10	5 13	6 31	20 41	6 45	.....	22 26	40	19 11.1	-28 01	10.0
Sat Oct 21/Sun Oct 22	1 35	17 51	19 09	5 13	6 32	20 44	6 49	.....	23 34	51	20 12.3	-25 42	10.1
Sun Oct 22/Mon Oct 23	1 39	17 50	19 08	5 14	6 32	20 47	6 54	.....	0 45	62	21 11.6	-21 47	10.1
Mon Oct 23/Tue Oct 24	1 43	17 49	19 07	5 15	6 33	20 50	6 59	.....	1 55	73	22 08.3	-16 32	10.1
Tue Oct 24/Wed Oct 25	1 47	17 48	19 06	5 15	6 34	20 53	7 03	.....	3 04	83	23 02.7	-10 19	10.2
Wed Oct 25/Thu Oct 26	1 51	17 47	19 05	5 16	6 35	20 56	7 08	.....	4 13	91	23 55.4	- 3 29	10.2
Thu Oct 26/Fri Oct 27	1 55	17 46	19 04	5 17	6 35	20 59	7 13	16 31	5 21	97	0 47.6	3 31	10.2
Fri Oct 27/Sat Oct 28	1 59	17 45	19 03	5 17	6 36	21 02	7 17	17 03	6 29	100	1 40.3	10 18	10.2
Sat Oct 28/Sun Oct 29	2 03	17 44	19 03	5 18	6 37	21 05	7 22	17 36	7 38	100	2 34.5	16 25	10.3
Sun Oct 29/Mon Oct 30	2 07	17 43	19 02	5 19	6 38	21 08	7 27	18 13	.....	97	3 30.6	21 30	10.3
Mon Oct 30/Tue Oct 31	2 11	17 42	19 01	5 20	6 39	21 11	7 31	18 54	.....	92	4 28.6	25 15	10.3
Tue Oct 31/Wed Nov 01	2 15	17 41	19 00	5 20	6 39	21 14	7 36	19 42	.....	86	5 27.5	27 27	10.3

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 28, latitude (d.m) = 31 57.2
Rise/set times in Mountain time (7 hr W), for 500 m above surroundings, in standard time all year.
Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2023 NOVEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Wed Nov 01/Thu Nov 02	2 19	17 40	18 59	5 21	6 40	21 17	7 41	20 35	.....	78	6 26.0	28 02	10.4
Thu Nov 02/Fri Nov 03	2 23	17 39	18 59	5 22	6 41	21 21	7 45	21 32	.....	69	7 22.7	27 07	10.4
Fri Nov 03/Sat Nov 04	2 27	17 39	18 58	5 22	6 42	21 24	7 50	22 31	.....	59	8 16.3	24 53	10.4
Sat Nov 04/Sun Nov 05	2 31	17 38	18 57	5 23	6 43	21 27	7 55	23 30	.....	50	9 06.6	21 34	10.4
Sun Nov 05/Mon Nov 06	2 35	17 37	18 57	5 24	6 44	21 30	7 59	0 27	.....	40	9 53.7	17 25	10.5
Mon Nov 06/Tue Nov 07	2 38	17 36	18 56	5 25	6 44	21 34	8 04	1 24	.....	31	10 38.4	12 37	10.5
Tue Nov 07/Wed Nov 08	2 42	17 35	18 55	5 25	6 45	21 37	8 09	2 19	.....	23	11 21.3	7 21	10.5
Wed Nov 08/Thu Nov 09	2 46	17 35	18 55	5 26	6 46	21 40	8 13	3 14	.....	16	12 03.5	1 48	10.5
Thu Nov 09/Fri Nov 10	2 50	17 34	18 54	5 27	6 47	21 44	8 18	4 09	.....	9	12 46.1	- 3 54	10.5
Fri Nov 10/Sat Nov 11	2 54	17 33	18 54	5 28	6 48	21 47	8 23	5 07	16 06	4	13 29.8	- 9 33	10.6
Sat Nov 11/Sun Nov 12	2 58	17 33	18 53	5 28	6 49	21 50	8 27	6 07	16 33	1	14 15.9	-14 58	10.6
Sun Nov 12/Mon Nov 13	3 02	17 32	18 53	5 29	6 50	21 54	8 32	7 10	17 05	0	15 05.2	-19 52	10.6
Mon Nov 13/Tue Nov 14	3 06	17 32	18 52	5 30	6 50	21 57	8 37	.....	17 42	1	15 58.4	-23 57	10.6
Tue Nov 14/Wed Nov 15	3 10	17 31	18 52	5 31	6 51	22 01	8 41	.....	18 26	4	16 55.5	-26 52	10.6
Wed Nov 15/Thu Nov 16	3 14	17 30	18 51	5 31	6 52	22 04	8 46	.....	19 19	9	17 55.8	-28 19	10.7
Thu Nov 16/Fri Nov 17	3 18	17 30	18 51	5 32	6 53	22 08	8 51	.....	20 20	17	18 57.6	-28 04	10.7
Fri Nov 17/Sat Nov 18	3 22	17 29	18 50	5 33	6 54	22 11	8 56	.....	21 27	26	19 58.9	-26 06	10.7
Sat Nov 18/Sun Nov 19	3 26	17 29	18 50	5 34	6 55	22 15	9 00	.....	22 36	36	20 58.0	-22 34	10.7
Sun Nov 19/Mon Nov 20	3 30	17 29	18 50	5 34	6 56	22 19	9 05	.....	23 46	47	21 54.2	-17 42	10.7
Mon Nov 20/Tue Nov 21	3 34	17 28	18 50	5 35	6 57	22 22	9 10	.....	0 54	59	22 47.6	-11 52	10.8
Tue Nov 21/Wed Nov 22	3 38	17 28	18 49	5 36	6 57	22 26	9 14	.....	2 00	70	23 39.0	- 5 24	10.8
Wed Nov 22/Thu Nov 23	3 42	17 27	18 49	5 37	6 58	22 30	9 19	.....	3 06	80	0 29.4	1 20	10.8
Thu Nov 23/Fri Nov 24	3 45	17 27	18 49	5 37	6 59	22 33	9 24	.....	4 12	88	1 20.2	8 00	10.8
Fri Nov 24/Sat Nov 25	3 49	17 27	18 49	5 38	7 00	22 37	9 28	.....	5 19	95	2 12.4	14 14	10.8
Sat Nov 25/Sun Nov 26	3 53	17 27	18 49	5 39	7 01	22 41	9 33	16 07	6 27	98	3 06.8	19 40	10.8
Sun Nov 26/Mon Nov 27	3 57	17 26	18 48	5 40	7 02	22 45	9 38	16 46	7 34	100	4 03.6	23 56	10.9
Mon Nov 27/Tue Nov 28	4 01	17 26	18 48	5 40	7 03	22 49	9 43	17 31	.....	99	5 02.5	26 47	10.9
Tue Nov 28/Wed Nov 29	4 05	17 26	18 48	5 41	7 03	22 53	9 47	18 21	.....	96	6 02.1	28 01	10.9
Wed Nov 29/Thu Nov 30	4 09	17 26	18 48	5 42	7 04	22 57	9 52	19 18	.....	90	7 00.5	27 40	10.9
Thu Nov 30/Fri Dec 01	4 13	17 26	18 48	5 43	7 05	23 00	9 57	20 17	.....	84	7 56.4	25 52	10.9

***** 2023 DECEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Fri Dec 01/Sat Dec 02	4 17	17 26	18 48	5 43	7 06	23 04	10 01	21 17	.....	76	8 48.8	22 51	10.9
Sat Dec 02/Sun Dec 03	4 21	17 26	18 48	5 44	7 07	23 08	10 06	22 16	.....	67	9 37.7	18 54	10.9
Sun Dec 03/Mon Dec 04	4 25	17 26	18 48	5 45	7 08	23 12	10 11	23 13	.....	58	10 23.5	14 15	10.9
Mon Dec 04/Tue Dec 05	4 29	17 26	18 48	5 45	7 08	23 16	10 15	0 08	.....	49	11 07.0	9 06	10.9
Tue Dec 05/Wed Dec 06	4 33	17 26	18 49	5 46	7 09	23 21	10 20	1 03	.....	39	11 49.4	3 39	11.0
Wed Dec 06/Thu Dec 07	4 37	17 26	18 49	5 47	7 10	23 25	10 25	1 57	.....	30	12 31.5	- 1 59	11.0
Thu Dec 07/Fri Dec 08	4 41	17 26	18 49	5 48	7 11	23 29	10 29	2 53	.....	22	13 14.6	- 7 38	11.0
Fri Dec 08/Sat Dec 09	4 45	17 26	18 49	5 48	7 11	23 33	10 34	3 52	.....	14	13 59.6	-13 07	11.0
Sat Dec 09/Sun Dec 10	4 49	17 26	18 49	5 49	7 12	23 37	10 38	4 53	.....	8	14 47.8	-18 12	11.0
Sun Dec 10/Mon Dec 11	4 52	17 26	18 50	5 49	7 13	23 41	10 43	5 59	.....	3	15 39.9	-22 36	11.0
Mon Dec 11/Tue Dec 12	4 56	17 26	18 50	5 50	7 14	23 45	10 48	7 06	16 18	1	16 36.5	-25 56	11.0
Tue Dec 12/Wed Dec 13	5 00	17 27	18 50	5 51	7 14	23 50	10 52	8 12	17 08	0	17 36.9	-27 53	11.0
Wed Dec 13/Thu Dec 14	5 04	17 27	18 50	5 51	7 15	23 54	10 57	.....	18 07	2	18 39.8	-28 07	11.0
Thu Dec 14/Fri Dec 15	5 08	17 27	18 51	5 52	7 16	23 58	11 01	.....	19 15	7	19 42.7	-26 34	11.0
Fri Dec 15/Sat Dec 16	5 12	17 28	18 51	5 53	7 16	0 03	11 06	.....	20 26	14	20 43.6	-23 18	11.0
Sat Dec 16/Sun Dec 17	5 16	17 28	18 52	5 53	7 17	0 07	11 10	.....	21 37	22	21 41.2	-18 39	11.0
Sun Dec 17/Mon Dec 18	5 20	17 28	18 52	5 54	7 17	0 11	11 15	.....	22 46	33	22 35.4	-12 58	11.0
Mon Dec 18/Tue Dec 19	5 24	17 29	18 52	5 54	7 18	0 16	11 19	.....	23 53	44	23 26.9	- 6 39	11.0
Tue Dec 19/Wed Dec 20	5 28	17 29	18 53	5 55	7 18	0 20	11 24	.....	0 58	55	0 16.8	- 0 03	11.0
Wed Dec 20/Thu Dec 21	5 32	17 30	18 53	5 55	7 19	0 24	11 28	.....	2 03	66	1 06.3	6 31	11.0
Thu Dec 21/Fri Dec 22	5 36	17 30	18 54	5 56	7 19	0 29	11 33	.....	3 08	76	1 56.8	12 43	11.0
Fri Dec 22/Sat Dec 23	5 40	17 31	18 54	5 56	7 20	0 33	11 37	.....	4 14	85	2 49.0	18 14	11.0
Sat Dec 23/Sun Dec 24	5 44	17 31	18 55	5 57	7 20	0 38	11 42	.....	5 20	92	3 43.8	22 46	11.0
Sun Dec 24/Mon Dec 25	5 48	17 32	18 55	5 57	7 21	0 42	11 46	.....	6 25	97	4 41.0	26 01	11.0
Mon Dec 25/Tue Dec 26	5 52	17 32	18 56	5 58	7 21	0 47	11 50	16 12	7 26	99	5 39.8	27 47	11.0
Tue Dec 26/Wed Dec 27	5 56	17 33	18 56	5 58	7 22	0 51	11 55	17 05	8 21	100	6 38.6	27 58	11.0
Wed Dec 27/Thu Dec 28	6 00	17 34	18 57	5 58	7 22	0 56	11 59	18 04	.....	98	7 35.7	26 38	11.0
Thu Dec 28/Fri Dec 29	6 03	17 34	18 58	5 59	7 22	1 00	12 03	19 04	.....	95	8 29.8	23 58	11.0
Fri Dec 29/Sat Dec 30	6 07	17 35	18 58	5 59	7 23	1 05	12 08	20 04	.....	89	9 20.4	20 16	11.0
Sat Dec 30/Sun Dec 31	6 11	17 35	18 59	5 59	7 23	1 09	12 12	21 02	.....	83	10 07.6	15 46	11.0
Sun Dec 31/Mon Jan 01	6 15	17 36	19 00	6 00	7 23	1 14	12 16	21 58	.....	75	10 52.1	10 43	11.0