

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:

***** 2024 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 hemishpheres. 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 2024, 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 12	16 32	Dec 19	11 40	Dec 26	17 34	Jan 03	20 33
Jan 11	4 58	Jan 17	20 54	Jan 25	10 55	Feb 02	16 20
Feb 09	16 01	Feb 16	8 02	Feb 24	5 31	Mar 03	8 25
Mar 10	2 03	Mar 16	21 12	Mar 25	0 02	Apr 01	20 16
Apr 08	11 23	Apr 15	12 14	Apr 23	16 51	May 01	4 28
May 07	20 24	May 15	4 50	May 23	6 56	May 30	10 14
Jun 06	5 40	Jun 13	22 20	Jun 21	18 11	Jun 28	14 55
Jul 05	15 59	Jul 13	15 50	Jul 21	3 20	Jul 27	19 54
Aug 04	4 14	Aug 12	8 20	Aug 19	11 29	Aug 26	2 29
Sep 02	18 57	Sep 10	23 07	Sep 17	19 37	Sep 24	11 53
Oct 02	11 51	Oct 10	11 56	Oct 17	4 28	Oct 24	1 05
Nov 01	5 48	Nov 08	22 57	Nov 15	14 30	Nov 22	18 30
Nov 30	23 22	Dec 08	8 28	Dec 15	2 03	Dec 22	15 20
Dec 30	15 28	Jan 06	16 58	Jan 13	15 28	Jan 21	13 32

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.

***** 2024 JANUARY *****

Date (eve/morn)			LMST	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
			midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Mon	Jan 01/Tue	Jan 02	6 19	17 37	19 00	6 00	7 23	1 19	12 20	22 53	.....	66	11 34.8	5 19	11.0
Tue	Jan 02/Wed	Jan 03	6 23	17 38	19 01	6 00	7 24	1 23	12 24	23 47	.....	57	12 16.8	- 0 16	11.0
Wed	Jan 03/Thu	Jan 04	6 27	17 38	19 02	6 01	7 24	1 28	12 29	0 41	.....	48	12 59.1	- 5 53	11.0
Thu	Jan 04/Fri	Jan 05	6 31	17 39	19 02	6 01	7 24	1 33	12 33	1 37	.....	38	13 42.9	-11 23	11.0
Fri	Jan 05/Sat	Jan 06	6 35	17 40	19 03	6 01	7 24	1 37	12 37	2 36	.....	29	14 29.2	-16 33	11.0
Sat	Jan 06/Sun	Jan 07	6 39	17 41	19 04	6 01	7 24	1 42	12 41	3 39	.....	20	15 19.2	-21 09	11.0
Sun	Jan 07/Mon	Jan 08	6 43	17 41	19 04	6 01	7 24	1 46	12 45	4 45	.....	13	16 13.7	-24 53	10.9
Mon	Jan 08/Tue	Jan 09	6 47	17 42	19 05	6 01	7 24	1 51	12 49	5 52	.....	6	17 12.7	-27 21	10.9
Tue	Jan 09/Wed	Jan 10	6 51	17 43	19 06	6 01	7 24	1 56	12 53	6 56	15 49	2	18 15.2	-28 14	10.9
Wed	Jan 10/Thu	Jan 11	6 55	17 44	19 07	6 01	7 24	2 01	12 57	7 54	16 54	0	19 19.3	-27 18	10.9
Thu	Jan 11/Fri	Jan 12	6 59	17 45	19 07	6 01	7 24	2 05	13 01	.....	18 05	1	20 22.4	-24 31	10.9
Fri	Jan 12/Sat	Jan 13	7 03	17 46	19 08	6 01	7 24	2 10	13 05	.....	19 19	5	21 22.7	-20 08	10.9
Sat	Jan 13/Sun	Jan 14	7 07	17 47	19 09	6 01	7 24	2 15	13 09	.....	20 32	11	22 19.5	-14 32	10.9
Sun	Jan 14/Mon	Jan 15	7 10	17 47	19 10	6 01	7 24	2 19	13 13	.....	21 42	19	23 12.9	- 8 10	10.9
Mon	Jan 15/Tue	Jan 16	7 14	17 48	19 10	6 01	7 23	2 24	13 17	.....	22 50	29	0 04.1	- 1 27	10.8
Tue	Jan 16/Wed	Jan 17	7 18	17 49	19 11	6 01	7 23	2 29	13 21	.....	23 56	39	0 54.2	5 14	10.8
Wed	Jan 17/Thu	Jan 18	7 22	17 50	19 12	6 01	7 23	2 34	13 24	.....	1 02	51	1 44.4	11 33	10.8
Thu	Jan 18/Fri	Jan 19	7 26	17 51	19 13	6 01	7 23	2 38	13 28	.....	2 07	62	2 35.9	17 12	10.8
Fri	Jan 19/Sat	Jan 20	7 30	17 52	19 14	6 01	7 22	2 43	13 32	.....	3 13	72	3 29.4	21 54	10.8
Sat	Jan 20/Sun	Jan 21	7 34	17 53	19 14	6 01	7 22	2 48	13 36	.....	4 17	81	4 25.1	25 25	10.8
Sun	Jan 21/Mon	Jan 22	7 38	17 54	19 15	6 00	7 22	2 52	13 39	.....	5 19	88	5 22.6	27 32	10.8
Mon	Jan 22/Tue	Jan 23	7 42	17 55	19 16	6 00	7 21	2 57	13 43	.....	6 15	94	6 20.6	28 07	10.7
Tue	Jan 23/Wed	Jan 24	7 46	17 56	19 17	6 00	7 21	3 02	13 47	15 55	7 04	98	7 17.6	27 12	10.7
Wed	Jan 24/Thu	Jan 25	7 50	17 56	19 18	5 59	7 20	3 07	13 50	16 54	7 46	100	8 12.3	24 54	10.7
Thu	Jan 25/Fri	Jan 26	7 54	17 57	19 18	5 59	7 20	3 11	13 54	17 54	.....	100	9 03.9	21 28	10.7
Fri	Jan 26/Sat	Jan 27	7 58	17 58	19 19	5 59	7 19	3 16	13 57	18 53	.....	98	9 52.2	17 08	10.7
Sat	Jan 27/Sun	Jan 28	8 02	17 59	19 20	5 58	7 19	3 21	14 01	19 50	.....	94	10 37.7	12 10	10.6
Sun	Jan 28/Mon	Jan 29	8 06	18 00	19 21	5 58	7 18	3 26	14 05	20 45	.....	89	11 21.0	6 48	10.6
Mon	Jan 29/Tue	Jan 30	8 10	18 01	19 22	5 57	7 18	3 30	14 08	21 39	.....	82	12 03.2	1 13	10.6
Tue	Jan 30/Wed	Jan 31	8 14	18 02	19 22	5 57	7 17	3 35	14 12	22 32	.....	74	12 45.3	- 4 25	10.6
Wed	Jan 31/Thu	Feb 01	8 18	18 03	19 23	5 56	7 17	3 40	14 15	23 27	.....	65	13 28.1	- 9 57	10.6

***** 2024 FEBRUARY *****

Date (eve/morn)			LMST	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
			midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Thu	Feb 01/Fri	Feb 02	8 21	18 04	19 24	5 56	7 16	3 45	14 18	0 24	.....	56	14 13.0	-15 11	10.5
Fri	Feb 02/Sat	Feb 03	8 25	18 05	19 25	5 55	7 15	3 49	14 22	1 23	.....	46	15 00.8	-19 56	10.5
Sat	Feb 03/Sun	Feb 04	8 29	18 06	19 25	5 55	7 15	3 54	14 25	2 26	.....	36	15 52.6	-23 55	10.5
Sun	Feb 04/Mon	Feb 05	8 33	18 07	19 26	5 54	7 14	3 59	14 28	3 31	.....	26	16 48.8	-26 49	10.5
Mon	Feb 05/Tue	Feb 06	8 37	18 07	19 27	5 54	7 13	4 04	14 32	4 36	.....	18	17 49.0	-28 19	10.4
Tue	Feb 06/Wed	Feb 07	8 41	18 08	19 28	5 53	7 12	4 08	14 35	5 37	.....	10	18 52.0	-28 06	10.4
Wed	Feb 07/Thu	Feb 08	8 45	18 09	19 29	5 52	7 12	4 13	14 38	6 31	.....	4	19 55.6	-26 03	10.4
Thu	Feb 08/Fri	Feb 09	8 49	18 10	19 29	5 52	7 11	4 18	14 42	7 17	16 52	1	20 57.6	-22 14	10.4
Fri	Feb 09/Sat	Feb 10	8 53	18 11	19 30	5 51	7 10	4 22	14 45	7 57	18 07	0	21 56.7	-16 57	10.3
Sat	Feb 10/Sun	Feb 11	8 57	18 12	19 31	5 50	7 09	4 27	14 48	.....	19 21	3	22 52.6	-10 38	10.3
Sun	Feb 11/Mon	Feb 12	9 01	18 13	19 32	5 49	7 08	4 32	14 51	.....	20 32	8	23 46.0	- 3 45	10.3
Mon	Feb 12/Tue	Feb 13	9 05	18 14	19 32	5 48	7 07	4 37	14 54	.....	21 41	15	0 37.9	3 13	10.3
Tue	Feb 13/Wed	Feb 14	9 09	18 14	19 33	5 48	7 06	4 41	14 57	.....	22 50	24	1 29.4	9 53	10.2
Wed	Feb 14/Thu	Feb 15	9 13	18 15	19 34	5 47	7 05	4 46	15 00	.....	23 58	35	2 21.7	15 54	10.2
Thu	Feb 15/Fri	Feb 16	9 17	18 16	19 35	5 46	7 04	4 51	15 04	.....	1 05	46	3 15.4	20 58	10.2
Fri	Feb 16/Sat	Feb 17	9 21	18 17	19 36	5 45	7 04	4 55	15 07	.....	2 11	56	4 11.0	24 49	10.2
Sat	Feb 17/Sun	Feb 18	9 25	18 18	19 36	5 44	7 03	5 00	15 10	.....	3 14	67	5 08.1	27 15	10.1
Sun	Feb 18/Mon	Feb 19	9 28	18 19	19 37	5 43	7 02	5 05	15 13	.....	4 12	76	6 05.8	28 11	10.1
Mon	Feb 19/Tue	Feb 20	9 32	18 19	19 38	5 42	7 01	5 09	15 16	.....	5 02	84	7 02.6	27 37	10.1
Tue	Feb 20/Wed	Feb 21	9 36	18 20	19 39	5 41	6 59	5 14	15 19	.....	5 46	90	7 57.4	25 40	10.0
Wed	Feb 21/Thu	Feb 22	9 40	18 21	19 39	5 40	6 58	5 19	15 22	.....	6 23	95	8 49.3	22 30	10.0
Thu	Feb 22/Fri	Feb 23	9 44	18 22	19 40	5 39	6 57	5 24	15 25	16 45	6 54	99	9 38.2	18 23	10.0
Fri	Feb 23/Sat	Feb 24	9 48	18 23	19 41	5 38	6 56	5 28	15 27	17 43	7 22	100	10 24.3	13 33	10.0
Sat	Feb 24/Sun	Feb 25	9 52	18 24	19 42	5 37	6 55	5 33	15 30	18 39	.....	99	11 08.2	8 14	9.9
Sun	Feb 25/Mon	Feb 26	9 56	18 24	19 42	5 36	6 54	5 38	15 33	19 33	.....	97	11 50.7	2 37	9.9
Mon	Feb 26/Tue	Feb 27	10 00	18 25	19 43	5 35	6 53	5 42	15 36	20 27	.....	93	12 32.9	- 3 05	9.9
Tue	Feb 27/Wed	Feb 28	10 04	18 26	19 44	5 34	6 52	5 47	15 39	21 21	.....	87	13 15.5	- 8 42	9.8
Wed	Feb 28/Thu	Feb 29	10 08	18 27	19 44	5 33	6 51	5 52	15 42	22 16	.....	80	13 59.7	-14 03	9.8
Thu	Feb 29/Fri	Mar 01	10 12	18 27	19 45	5 32	6 50	5 56	15 45	23 14	.....	72	14 46.3	-18 57	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.

***** 2024 MARCH *****

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 Mar 01/Sat Mar 02	10 16	18 28	19 46	5 31	6 48	6 01	15 47	0 15	.....	63	15 36.2	-23 08	9.7
Sat Mar 02/Sun Mar 03	10 20	18 29	19 47	5 30	6 47	6 06	15 50	1 17	.....	53	16 30.0	-26 21	9.7
Sun Mar 03/Mon Mar 04	10 24	18 30	19 47	5 28	6 46	6 10	15 53	2 20	.....	42	17 27.7	-28 18	9.7
Mon Mar 04/Tue Mar 05	10 28	18 30	19 48	5 27	6 45	6 15	15 56	3 21	.....	32	18 28.3	-28 42	9.7
Tue Mar 05/Wed Mar 06	10 32	18 31	19 49	5 26	6 44	6 20	15 58	4 17	.....	22	19 30.3	-27 22	9.6
Wed Mar 06/Thu Mar 07	10 36	18 32	19 50	5 25	6 42	6 24	16 01	5 06	.....	14	20 31.7	-24 18	9.6
Thu Mar 07/Fri Mar 08	10 39	18 33	19 50	5 24	6 41	6 29	16 04	5 48	.....	7	21 31.2	-19 38	9.6
Fri Mar 08/Sat Mar 09	10 43	18 33	19 51	5 22	6 40	6 34	16 07	6 25	16 52	2	22 28.1	-13 42	9.5
Sat Mar 09/Sun Mar 10	10 47	18 34	19 52	5 21	6 39	6 38	16 09	6 59	18 05	0	23 22.8	- 6 57	9.5
Sun Mar 10/Mon Mar 11	10 51	18 35	19 53	5 20	6 37	6 43	16 12	.....	19 17	1	0 15.9	0 11	9.5
Mon Mar 11/Tue Mar 12	10 55	18 36	19 53	5 19	6 36	6 48	16 15	.....	20 28	5	1 08.7	7 13	9.4
Tue Mar 12/Wed Mar 13	10 59	18 36	19 54	5 17	6 35	6 53	16 17	.....	21 38	12	2 02.1	13 44	9.4
Wed Mar 13/Thu Mar 14	11 03	18 37	19 55	5 16	6 34	6 57	16 20	.....	22 49	20	2 56.9	19 21	9.4
Thu Mar 14/Fri Mar 15	11 07	18 38	19 56	5 15	6 32	7 02	16 23	.....	23 58	30	3 53.4	23 45	9.3
Fri Mar 15/Sat Mar 16	11 11	18 38	19 56	5 13	6 31	7 07	16 25	.....	1 05	40	4 51.5	26 42	9.3
Sat Mar 16/Sun Mar 17	11 15	18 39	19 57	5 12	6 30	7 11	16 28	.....	2 06	51	5 50.0	28 05	9.2
Sun Mar 17/Mon Mar 18	11 19	18 40	19 58	5 11	6 29	7 16	16 30	.....	3 00	61	6 47.6	27 54	9.2
Mon Mar 18/Tue Mar 19	11 23	18 40	19 59	5 09	6 27	7 21	16 33	.....	3 46	70	7 43.1	26 16	9.2
Tue Mar 19/Wed Mar 20	11 27	18 41	19 59	5 08	6 26	7 25	16 36	.....	4 24	79	8 35.6	23 24	9.1
Wed Mar 20/Thu Mar 21	11 31	18 42	20 00	5 07	6 25	7 30	16 38	.....	4 57	86	9 25.0	19 31	9.1
Thu Mar 21/Fri Mar 22	11 35	18 43	20 01	5 05	6 23	7 35	16 41	.....	5 26	92	10 11.4	14 52	9.1
Fri Mar 22/Sat Mar 23	11 39	18 43	20 02	5 04	6 22	7 40	16 43	.....	5 52	96	10 55.7	9 39	9.0
Sat Mar 23/Sun Mar 24	11 43	18 44	20 02	5 02	6 21	7 44	16 46	17 27	6 17	99	11 38.5	4 05	9.0
Sun Mar 24/Mon Mar 25	11 46	18 45	20 03	5 01	6 20	7 49	16 48	18 21	6 41	100	12 20.8	- 1 39	9.0
Mon Mar 25/Tue Mar 26	11 50	18 45	20 04	5 00	6 18	7 54	16 51	19 16	7 05	99	13 03.5	- 7 22	8.9
Tue Mar 26/Wed Mar 27	11 54	18 46	20 05	4 58	6 17	7 58	16 53	20 11	.....	96	13 47.5	-12 53	8.9
Wed Mar 27/Thu Mar 28	11 58	18 47	20 06	4 57	6 16	8 03	16 56	21 08	.....	92	14 33.7	-17 58	8.9
Thu Mar 28/Fri Mar 29	12 02	18 47	20 06	4 56	6 14	8 08	16 59	22 08	.....	85	15 22.9	-22 23	8.8
Fri Mar 29/Sat Mar 30	12 06	18 48	20 07	4 54	6 13	8 13	17 01	23 09	.....	77	16 15.7	-25 53	8.8
Sat Mar 30/Sun Mar 31	12 10	18 49	20 08	4 53	6 12	8 17	17 04	0 12	.....	68	17 11.9	-28 11	8.7
Sun Mar 31/Mon Apr 01	12 14	18 49	20 09	4 51	6 11	8 22	17 06	1 12	.....	58	18 11.0	-29 01	8.7

***** 2024 APRIL *****

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	
Mon Apr 01/Tue Apr 02	12 18	18 50	20 10	4 50	6 09	8 27	17 09	2 08	.....	48	19 11.4	-28 13	8.7
Tue Apr 02/Wed Apr 03	12 22	18 51	20 10	4 48	6 08	8 32	17 11	2 58	.....	37	20 11.5	-25 45	8.6
Wed Apr 03/Thu Apr 04	12 26	18 51	20 11	4 47	6 07	8 37	17 14	3 41	.....	26	21 10.0	-21 44	8.6
Thu Apr 04/Fri Apr 05	12 30	18 52	20 12	4 46	6 06	8 41	17 16	4 19	.....	17	22 06.2	-16 23	8.6
Fri Apr 05/Sat Apr 06	12 34	18 53	20 13	4 44	6 04	8 46	17 19	4 54	.....	9	23 00.4	-10 03	8.5
Sat Apr 06/Sun Apr 07	12 38	18 53	20 14	4 43	6 03	8 51	17 21	5 26	.....	3	23 53.2	- 3 07	8.5
Sun Apr 07/Mon Apr 08	12 42	18 54	20 15	4 41	6 02	8 56	17 24	5 58	18 01	0	0 45.7	3 59	8.4
Mon Apr 08/Tue Apr 09	12 46	18 55	20 16	4 40	6 01	9 01	17 26	6 32	19 12	0	1 38.9	10 50	8.4
Tue Apr 09/Wed Apr 10	12 50	18 55	20 16	4 39	5 59	9 05	17 29	.....	20 24	3	2 33.8	16 58	8.4
Wed Apr 10/Thu Apr 11	12 53	18 56	20 17	4 37	5 58	9 10	17 31	.....	21 36	9	3 30.9	22 00	8.3
Thu Apr 11/Fri Apr 12	12 57	18 57	20 18	4 36	5 57	9 15	17 34	.....	22 47	16	4 29.8	25 38	8.3
Fri Apr 12/Sat Apr 13	13 01	18 58	20 19	4 34	5 56	9 20	17 36	.....	23 53	25	5 29.8	27 38	8.3
Sat Apr 13/Sun Apr 14	13 05	18 58	20 20	4 33	5 55	9 25	17 39	.....	0 52	34	6 29.1	27 58	8.2
Sun Apr 14/Mon Apr 15	13 09	18 59	20 21	4 32	5 54	9 30	17 42	.....	1 42	44	7 26.3	26 45	8.2
Mon Apr 15/Tue Apr 16	13 13	19 00	20 22	4 30	5 52	9 34	17 44	.....	2 24	54	8 20.3	24 13	8.1
Tue Apr 16/Wed Apr 17	13 17	19 00	20 23	4 29	5 51	9 39	17 47	.....	2 59	64	9 10.7	20 35	8.1
Wed Apr 17/Thu Apr 18	13 21	19 01	20 24	4 27	5 50	9 44	17 49	.....	3 29	73	9 57.9	16 08	8.1
Thu Apr 18/Fri Apr 19	13 25	19 02	20 25	4 26	5 49	9 49	17 52	.....	3 56	81	10 42.6	11 05	8.0
Fri Apr 19/Sat Apr 20	13 29	19 02	20 26	4 25	5 48	9 54	17 54	.....	4 21	88	11 25.6	5 37	8.0
Sat Apr 20/Sun Apr 21	13 33	19 03	20 26	4 23	5 47	9 59	17 57	.....	4 45	93	12 07.9	- 0 05	7.9
Sun Apr 21/Mon Apr 22	13 37	19 04	20 27	4 22	5 46	10 04	18 00	17 09	5 09	97	12 50.4	- 5 50	7.9
Mon Apr 22/Tue Apr 23	13 41	19 05	20 28	4 21	5 45	10 09	18 02	18 04	5 35	100	13 34.2	-11 28	7.9
Tue Apr 23/Wed Apr 24	13 45	19 05	20 29	4 19	5 43	10 14	18 05	19 01	6 04	100	14 20.2	-16 44	7.8
Wed Apr 24/Thu Apr 25	13 49	19 06	20 30	4 18	5 42	10 18	18 08	20 01	6 38	98	15 09.2	-21 25	7.8
Thu Apr 25/Fri Apr 26	13 53	19 07	20 31	4 17	5 41	10 23	18 10	21 03	.....	94	16 01.7	-25 14	7.8
Fri Apr 26/Sat Apr 27	13 57	19 07	20 32	4 16	5 40	10 28	18 13	22 05	.....	89	16 57.8	-27 53	7.7
Sat Apr 27/Sun Apr 28	14 01	19 08	20 33	4 14	5 39	10 33	18 15	23 06	.....	81	17 56.7	-29 05	7.7
Sun Apr 28/Mon Apr 29	14 04	19 09	20 34	4 13	5 38	10 38	18 18	0 04	.....	73	18 56.9	-28 41	7.6
Mon Apr 29/Tue Apr 30	14 08	19 10	20 35	4 12	5 37	10 43	18 21	0 55	.....	62	19 56.7	-26 38	7.6
Tue Apr 30/Wed May 01	14 12	19 10	20 36	4 11	5 36	10 48	18 24	1 39	.....	52	20 54.7	-23 03	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.

***** 2024 MAY *****

Date (eve/morn)	LMST midn	----- Sun: -----			LST twilight:		----- Moon: -----				Twilight		
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Wed May 01/Thu May 02	14 16	19 11	20 37	4 09	5 36	10 53	18 26	2 17	.....	40	21 50.3	-18 10	7.5
Thu May 02/Fri May 03	14 20	19 12	20 38	4 08	5 35	10 58	18 29	2 52	.....	29	22 43.5	-12 16	7.5
Fri May 03/Sat May 04	14 24	19 12	20 39	4 07	5 34	11 03	18 32	3 23	.....	19	23 35.1	- 5 42	7.5
Sat May 04/Sun May 05	14 28	19 13	20 40	4 06	5 33	11 08	18 35	3 54	.....	11	0 26.2	1 12	7.4
Sun May 05/Mon May 06	14 32	19 14	20 41	4 05	5 32	11 13	18 37	4 26	.....	5	1 17.9	8 02	7.4
Mon May 06/Tue May 07	14 36	19 15	20 42	4 04	5 31	11 18	18 40	5 01	18 00	1	2 11.4	14 24	7.4
Tue May 07/Wed May 08	14 40	19 15	20 43	4 02	5 30	11 23	18 43	5 40	19 11	0	3 07.3	19 54	7.3
Wed May 08/Thu May 09	14 44	19 16	20 44	4 01	5 30	11 28	18 46	6 25	20 23	2	4 05.8	24 08	7.3
Thu May 09/Fri May 10	14 48	19 17	20 45	4 00	5 29	11 33	18 49	.....	21 33	6	5 06.2	26 48	7.3
Fri May 10/Sat May 11	14 52	19 17	20 46	3 59	5 28	11 37	18 52	.....	22 37	12	6 06.8	27 47	7.2
Sat May 11/Sun May 12	14 56	19 18	20 47	3 58	5 27	11 42	18 55	.....	23 32	20	7 05.9	27 06	7.2
Sun May 12/Mon May 13	15 00	19 19	20 48	3 57	5 27	11 47	18 57	.....	0 19	29	8 01.9	24 57	7.1
Mon May 13/Tue May 14	15 04	19 20	20 49	3 56	5 26	11 52	19 00	.....	0 57	38	8 54.2	21 38	7.1
Tue May 14/Wed May 15	15 08	19 20	20 50	3 55	5 25	11 57	19 03	.....	1 30	48	9 42.7	17 23	7.1
Wed May 15/Thu May 16	15 11	19 21	20 51	3 54	5 24	12 02	19 06	.....	1 58	57	10 28.2	12 30	7.1
Thu May 16/Fri May 17	15 15	19 22	20 52	3 53	5 24	12 07	19 09	.....	2 23	66	11 11.6	7 10	7.0
Fri May 17/Sat May 18	15 19	19 22	20 53	3 52	5 23	12 12	19 12	.....	2 48	75	11 53.9	1 33	7.0
Sat May 18/Sun May 19	15 23	19 23	20 54	3 52	5 23	12 17	19 16	.....	3 12	83	12 36.1	- 4 09	7.0
Sun May 19/Mon May 20	15 27	19 24	20 55	3 51	5 22	12 22	19 19	.....	3 37	90	13 19.3	- 9 49	6.9
Mon May 20/Tue May 21	15 31	19 24	20 56	3 50	5 22	12 27	19 22	.....	4 05	95	14 04.6	-15 13	6.9
Tue May 21/Wed May 22	15 35	19 25	20 57	3 49	5 21	12 32	19 25	17 51	4 37	98	14 52.9	-20 08	6.9
Wed May 22/Thu May 23	15 39	19 26	20 58	3 48	5 21	12 36	19 28	18 53	5 15	100	15 44.9	-24 16	6.8
Thu May 23/Fri May 24	15 43	19 26	20 59	3 48	5 20	12 41	19 31	19 56	5 59	99	16 40.9	-27 19	6.8
Fri May 24/Sat May 25	15 47	19 27	21 00	3 47	5 20	12 46	19 35	20 59	.....	96	17 40.2	-28 57	6.8
Sat May 25/Sun May 26	15 51	19 28	21 01	3 46	5 19	12 51	19 38	21 58	.....	91	18 41.4	-28 58	6.8
Sun May 26/Mon May 27	15 55	19 28	21 01	3 46	5 19	12 56	19 41	22 52	.....	84	19 42.5	-27 16	6.7
Mon May 27/Tue May 28	15 59	19 29	21 02	3 45	5 19	13 01	19 45	23 38	.....	76	20 41.6	-23 59	6.7
Tue May 28/Wed May 29	16 03	19 29	21 03	3 45	5 18	13 05	19 48	0 18	.....	65	21 37.8	-19 21	6.7
Wed May 29/Thu May 30	16 07	19 30	21 04	3 44	5 18	13 10	19 51	0 53	.....	54	22 31.1	-13 41	6.7
Thu May 30/Fri May 31	16 11	19 31	21 05	3 44	5 18	13 15	19 55	1 25	.....	43	23 22.2	- 7 21	6.6
Fri May 31/Sat Jun 01	16 15	19 31	21 05	3 43	5 17	13 20	19 58	1 55	.....	32	0 12.3	- 0 39	6.6

***** 2024 JUNE *****

Date (eve/morn)	LMST midn	----- Sun: -----			LST twilight:		----- Moon: -----				Twilight		
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Sat Jun 01/Sun Jun 02	16 19	19 32	21 06	3 43	5 17	13 24	20 02	2 25	.....	22	1 02.5	6 03	6.6
Sun Jun 02/Mon Jun 03	16 22	19 32	21 07	3 42	5 17	13 29	20 05	2 58	.....	13	1 54.1	12 25	6.6
Mon Jun 03/Tue Jun 04	16 26	19 33	21 08	3 42	5 17	13 34	20 09	3 34	.....	6	2 48.0	18 05	6.6
Tue Jun 04/Wed Jun 05	16 30	19 33	21 08	3 42	5 17	13 38	20 13	4 15	18 03	2	3 44.7	22 40	6.6
Wed Jun 05/Thu Jun 06	16 34	19 34	21 09	3 41	5 16	13 43	20 16	5 04	19 13	0	4 43.9	25 52	6.5
Thu Jun 06/Fri Jun 07	16 38	19 34	21 10	3 41	5 16	13 47	20 20	6 00	20 20	1	5 44.4	27 26	6.5
Fri Jun 07/Sat Jun 08	16 42	19 35	21 10	3 41	5 16	13 52	20 24	.....	21 19	4	6 44.4	27 19	6.5
Sat Jun 08/Sun Jun 09	16 46	19 35	21 11	3 41	5 16	13 57	20 27	.....	22 10	9	7 42.0	25 38	6.5
Sun Jun 09/Mon Jun 10	16 50	19 36	21 12	3 40	5 16	14 01	20 31	.....	22 53	15	8 36.0	22 39	6.5
Mon Jun 10/Tue Jun 11	16 54	19 36	21 12	3 40	5 16	14 06	20 35	.....	23 28	23	9 26.1	18 39	6.5
Tue Jun 11/Wed Jun 12	16 58	19 37	21 13	3 40	5 16	14 10	20 39	.....	23 58	32	10 12.8	13 55	6.5
Wed Jun 12/Thu Jun 13	17 02	19 37	21 13	3 40	5 16	14 14	20 43	.....	0 25	41	10 56.9	8 42	6.5
Thu Jun 13/Fri Jun 14	17 06	19 37	21 13	3 40	5 16	14 19	20 47	.....	0 50	50	11 39.3	3 12	6.4
Fri Jun 14/Sat Jun 15	17 10	19 38	21 14	3 40	5 16	14 23	20 50	.....	1 14	60	12 21.1	- 2 27	6.4
Sat Jun 15/Sun Jun 16	17 14	19 38	21 14	3 40	5 16	14 28	20 54	.....	1 38	69	13 03.6	- 8 05	6.4
Sun Jun 16/Mon Jun 17	17 18	19 38	21 15	3 40	5 17	14 32	20 59	.....	2 05	77	13 47.7	-13 32	6.4
Mon Jun 17/Tue Jun 18	17 22	19 39	21 15	3 40	5 17	14 36	21 03	.....	2 35	85	14 34.5	-18 36	6.4
Tue Jun 18/Wed Jun 19	17 26	19 39	21 15	3 41	5 17	14 40	21 07	.....	3 10	91	15 25.1	-23 01	6.4
Wed Jun 19/Thu Jun 20	17 29	19 39	21 16	3 41	5 17	14 45	21 11	17 42	3 52	96	16 20.0	-26 28	6.4
Thu Jun 20/Fri Jun 21	17 33	19 39	21 16	3 41	5 17	14 49	21 15	18 46	4 43	99	17 19.0	-28 37	6.4
Fri Jun 21/Sat Jun 22	17 37	19 40	21 16	3 41	5 18	14 53	21 19	19 48	5 42	100	18 20.9	-29 10	6.4
Sat Jun 22/Sun Jun 23	17 41	19 40	21 16	3 41	5 18	14 57	21 23	20 45	.....	98	19 23.6	-27 56	6.4
Sun Jun 23/Mon Jun 24	17 45	19 40	21 16	3 42	5 18	15 01	21 28	21 35	.....	93	20 24.9	-24 59	6.4
Mon Jun 24/Tue Jun 25	17 49	19 40	21 16	3 42	5 18	15 05	21 32	22 18	.....	87	21 23.3	-20 33	6.4
Tue Jun 25/Wed Jun 26	17 53	19 40	21 16	3 43	5 19	15 09	21 36	22 55	.....	78	22 18.3	-14 58	6.4
Wed Jun 26/Thu Jun 27	17 57	19 40	21 16	3 43	5 19	15 13	21 41	23 27	.....	68	23 10.6	- 8 39	6.4
Thu Jun 27/Fri Jun 28	18 01	19 40	21 16	3 43	5 19	15 17	21 45	23 58	.....	57	0 01.1	- 1 58	6.5
Fri Jun 28/Sat Jun 29	18 05	19 40	21 16	3 44	5 20	15 21	21 49	0 27	.....	45	0 51.0	4 44	6.5
Sat Jun 29/Sun Jun 30	18 09	19 40	21 16	3 44	5 20	15 25	21 54	0 58	.....	34	1 41.7	11 08	6.5
Sun Jun 30/Mon Jul 01	18 13	19 40	21 16	3 45	5 21	15 28	21 58	1 32	.....	24	2 34.1	16 53	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.

***** 2024 JULY *****

Date (eve/morn)		LMST	----- Sun: -----					LST twilight:		----- Moon: -----					Twi-Twi
		midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours	
Mon Jul 01/Tue Jul 02		18 17	19 40	21 16	3 45	5 21	15 32	22 03	2 11	.....	15	3 29.1	21 39	6.5
Tue Jul 02/Wed Jul 03		18 21	19 40	21 16	3 46	5 22	15 36	22 07	2 56	.....	8	4 26.6	25 09	6.5
Wed Jul 03/Thu Jul 04		18 25	19 40	21 15	3 47	5 22	15 40	22 12	3 48	18 06	3	5 25.9	27 08	6.5	
Thu Jul 04/Fri Jul 05		18 29	19 40	21 15	3 47	5 22	15 43	22 16	4 47	19 08	1	6 25.5	27 29	6.5	
Fri Jul 05/Sat Jul 06		18 33	19 40	21 15	3 48	5 23	15 47	22 21	5 49	20 02	0	7 23.6	26 14	6.6	
Sat Jul 06/Sun Jul 07		18 37	19 40	21 15	3 49	5 23	15 51	22 26	.....	20 47	2	8 18.6	23 37	6.6
Sun Jul 07/Mon Jul 08		18 40	19 39	21 14	3 49	5 24	15 54	22 30	.....	21 25	6	9 09.9	19 53	6.6
Mon Jul 08/Tue Jul 09		18 44	19 39	21 14	3 50	5 24	15 58	22 35	.....	21 57	11	9 57.6	15 19	6.6
Tue Jul 09/Wed Jul 10		18 48	19 39	21 13	3 51	5 25	16 01	22 40	.....	22 25	18	10 42.4	10 13	6.6
Wed Jul 10/Thu Jul 11		18 52	19 39	21 13	3 51	5 26	16 05	22 44	.....	22 51	25	11 25.2	4 47	6.6
Thu Jul 11/Fri Jul 12		18 56	19 38	21 12	3 52	5 26	16 08	22 49	.....	23 15	34	12 06.9	- 0 49	6.7
Fri Jul 12/Sat Jul 13		19 00	19 38	21 12	3 53	5 27	16 11	22 54	.....	23 39	43	12 48.6	- 6 25	6.7
Sat Jul 13/Sun Jul 14		19 04	19 38	21 11	3 54	5 27	16 15	22 59	.....	0 05	53	13 31.5	-11 52	6.7
Sun Jul 14/Mon Jul 15		19 08	19 37	21 11	3 55	5 28	16 18	23 03	.....	0 33	62	14 16.6	-17 00	6.7
Mon Jul 15/Tue Jul 16		19 12	19 37	21 10	3 55	5 28	16 21	23 08	.....	1 05	72	15 05.0	-21 36	6.8
Tue Jul 16/Wed Jul 17		19 16	19 37	21 09	3 56	5 29	16 25	23 13	.....	1 44	80	15 57.6	-25 23	6.8
Wed Jul 17/Thu Jul 18		19 20	19 36	21 09	3 57	5 30	16 28	23 18	.....	2 30	88	16 54.6	-28 02	6.8
Thu Jul 18/Fri Jul 19		19 24	19 36	21 08	3 58	5 30	16 31	23 23	17 33	3 26	94	17 55.5	-29 12	6.8	
Fri Jul 19/Sat Jul 20		19 28	19 35	21 07	3 59	5 31	16 34	23 27	18 32	4 30	98	18 58.6	-28 38	6.9	
Sat Jul 20/Sun Jul 21		19 32	19 35	21 06	4 00	5 32	16 37	23 32	19 26	5 40	100	20 01.6	-26 15	6.9	
Sun Jul 21/Mon Jul 22		19 36	19 34	21 05	4 01	5 32	16 41	23 37	20 13	.....	99	21 02.5	-22 11	6.9
Mon Jul 22/Tue Jul 23		19 40	19 33	21 05	4 02	5 33	16 44	23 42	20 53	.....	95	22 00.3	-16 45	7.0
Tue Jul 23/Wed Jul 24		19 44	19 33	21 04	4 03	5 33	16 47	23 47	21 28	.....	89	22 55.0	-10 23	7.0
Wed Jul 24/Thu Jul 25		19 47	19 32	21 03	4 04	5 34	16 50	23 52	21 59	.....	80	23 47.4	- 3 32	7.0
Thu Jul 25/Fri Jul 26		19 51	19 32	21 02	4 04	5 35	16 53	23 57	22 30	.....	70	0 38.6	3 24	7.0
Fri Jul 26/Sat Jul 27		19 55	19 31	21 01	4 05	5 35	16 56	0 01	23 01	.....	59	1 29.9	10 01	7.1
Sat Jul 27/Sun Jul 28		19 59	19 30	21 00	4 06	5 36	16 59	0 06	23 34	.....	48	2 22.4	15 59	7.1
Sun Jul 28/Mon Jul 29		20 03	19 29	20 59	4 07	5 37	17 02	0 11	0 11	.....	36	3 16.9	20 59	7.1
Mon Jul 29/Tue Jul 30		20 07	19 29	20 58	4 08	5 37	17 05	0 16	0 53	.....	26	4 13.6	24 44	7.2
Tue Jul 30/Wed Jul 31		20 11	19 28	20 57	4 09	5 38	17 07	0 21	1 42	.....	17	5 12.1	27 01	7.2
Wed Jul 31/Thu Aug 01		20 15	19 27	20 56	4 10	5 39	17 10	0 26	2 38	.....	10	6 11.0	27 42	7.2

***** 2024 AUGUST *****

Date (eve/morn)		LMST	----- Sun: -----					LST twilight:		----- Moon: -----					Twi-Twi
		midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours	
Thu Aug 01/Fri Aug 02		20 19	19 26	20 55	4 11	5 39	17 13	0 31	3 38	17 56	5	7 08.8	26 49	7.3	
Fri Aug 02/Sat Aug 03		20 23	19 26	20 54	4 12	5 40	17 16	0 36	4 41	18 44	1	8 04.1	24 31	7.3	
Sat Aug 03/Sun Aug 04		20 27	19 25	20 52	4 13	5 41	17 19	0 41	5 42	19 24	0	8 55.9	21 02	7.3	
Sun Aug 04/Mon Aug 05		20 31	19 24	20 51	4 14	5 41	17 22	0 45	.....	19 57	1	9 44.3	16 41	7.4
Mon Aug 05/Tue Aug 06		20 35	19 23	20 50	4 15	5 42	17 24	0 50	.....	20 27	3	10 29.6	11 41	7.4
Tue Aug 06/Wed Aug 07		20 39	19 22	20 49	4 16	5 43	17 27	0 55	.....	20 53	7	11 12.7	6 19	7.4
Wed Aug 07/Thu Aug 08		20 43	19 21	20 48	4 17	5 43	17 30	1 00	.....	21 17	13	11 54.4	0 45	7.5
Thu Aug 08/Fri Aug 09		20 47	19 20	20 47	4 18	5 44	17 33	1 05	.....	21 41	20	12 35.8	- 4 51	7.5
Fri Aug 09/Sat Aug 10		20 51	19 19	20 45	4 19	5 45	17 35	1 10	.....	22 06	28	13 17.8	-10 19	7.6
Sat Aug 10/Sun Aug 11		20 54	19 18	20 44	4 20	5 45	17 38	1 15	.....	22 33	37	14 01.4	-15 30	7.6
Sun Aug 11/Mon Aug 12		20 58	19 17	20 43	4 21	5 46	17 41	1 20	.....	23 03	46	14 47.7	-20 12	7.6
Mon Aug 12/Tue Aug 13		21 02	19 16	20 41	4 21	5 47	17 43	1 25	.....	23 38	56	15 37.5	-24 12	7.7
Tue Aug 13/Wed Aug 14		21 06	19 15	20 40	4 22	5 47	17 46	1 29	.....	0 20	66	16 31.6	-27 14	7.7
Wed Aug 14/Thu Aug 15		21 10	19 14	20 39	4 23	5 48	17 49	1 34	.....	1 10	75	17 29.8	-28 58	7.7
Thu Aug 15/Fri Aug 16		21 14	19 13	20 38	4 24	5 49	17 51	1 39	.....	2 09	84	18 31.1	-29 08	7.8
Fri Aug 16/Sat Aug 17		21 18	19 12	20 36	4 25	5 49	17 54	1 44	17 13	3 16	91	19 33.8	-27 30	7.8	
Sat Aug 17/Sun Aug 18		21 22	19 11	20 35	4 26	5 50	17 56	1 49	18 03	4 28	97	20 35.8	-24 06	7.9	
Sun Aug 18/Mon Aug 19		21 26	19 10	20 34	4 27	5 51	17 59	1 54	18 46	5 41	99	21 35.6	-19 07	7.9	
Mon Aug 19/Tue Aug 20		21 30	19 09	20 32	4 28	5 51	18 02	1 59	19 24	.....	100	22 32.7	-12 55	7.9
Tue Aug 20/Wed Aug 21		21 34	19 08	20 31	4 29	5 52	18 04	2 03	19 57	.....	97	23 27.4	- 5 58	8.0
Wed Aug 21/Thu Aug 22		21 38	19 06	20 29	4 30	5 53	18 07	2 08	20 29	.....	91	0 20.7	1 16	8.0
Thu Aug 22/Fri Aug 23		21 42	19 05	20 28	4 30	5 53	18 09	2 13	21 01	.....	82	1 13.8	8 19	8.0
Fri Aug 23/Sat Aug 24		21 46	19 04	20 27	4 31	5 54	18 12	2 18	21 34	.....	73	2 07.6	14 44	8.1
Sat Aug 24/Sun Aug 25		21 50	19 03	20 25	4 32	5 54	18 14	2 23	22 10	.....	62	3 03.1	20 11	8.1
Sun Aug 25/Mon Aug 26		21 54	19 02	20 24	4 33	5 55	18 17	2 27	22 51	.....	50	4 00.6	24 20	8.2
Mon Aug 26/Tue Aug 27		21 58	19 01	20 22	4 34	5 56	18 19	2 32	23 39	.....	40	4 59.5	26 58	8.2
Tue Aug 27/Wed Aug 28		22 02	18 59	20 21	4 35	5 56	18 22	2 37	0 32	.....	30	5 58.8	27 58	8.2
Wed Aug 28/Thu Aug 29		22 05	18 58	20 19	4 36	5 57	18 24	2 42	1 31	.....	21	6 56.9	27 23	8.3
Thu Aug 29/Fri Aug 30		22 09	18 57	20 18	4 36	5 58	18 27	2 46	2 33	.....	13	7 52.4	25 21	8.3
Fri Aug 30/Sat Aug 31		22 13	18 56	20 17	4 37	5 58	18 29	2 51	3 34	17 24	7	8 44.6	22 07	8.3	
Sat Aug 31/Sun Sep 01		22 17	18 54	20 15	4 38	5 59	18 32	2 56	4 34	17 59	3	9 33.3	17 56	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.

***** 2024 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	
Sun Sep 01/Mon Sep 02	22 21	18 53	20 14	4 39	5 59	18 34	3 01	5 32	18 30	1	10 18.9	13 05	8.4
Mon Sep 02/Tue Sep 03	22 25	18 52	20 12	4 40	6 00	18 37	3 05	6 28	18 56	0	11 02.2	7 47	8.5
Tue Sep 03/Wed Sep 04	22 29	18 51	20 11	4 40	6 01	18 39	3 10	.....	19 21	1	11 44.0	2 14	8.5
Wed Sep 04/Thu Sep 05	22 33	18 49	20 09	4 41	6 01	18 42	3 15	.....	19 45	4	12 25.2	- 3 22	8.5
Thu Sep 05/Fri Sep 06	22 37	18 48	20 08	4 42	6 02	18 44	3 20	.....	20 09	9	13 06.7	- 8 53	8.6
Fri Sep 06/Sat Sep 07	22 41	18 47	20 06	4 43	6 03	18 47	3 24	.....	20 35	15	13 49.4	-14 07	8.6
Sat Sep 07/Sun Sep 08	22 45	18 45	20 05	4 43	6 03	18 49	3 29	.....	21 03	22	14 34.3	-18 55	8.6
Sun Sep 08/Mon Sep 09	22 49	18 44	20 04	4 44	6 04	18 52	3 34	.....	21 36	31	15 22.2	-23 05	8.7
Mon Sep 09/Tue Sep 10	22 53	18 43	20 02	4 45	6 04	18 54	3 38	.....	22 14	40	16 13.7	-26 22	8.7
Tue Sep 10/Wed Sep 11	22 57	18 41	20 01	4 46	6 05	18 57	3 43	.....	23 00	50	17 08.9	-28 30	8.7
Wed Sep 11/Thu Sep 12	23 01	18 40	19 59	4 46	6 06	18 59	3 48	.....	23 54	60	18 07.3	-29 14	8.8
Thu Sep 12/Fri Sep 13	23 05	18 39	19 58	4 47	6 06	19 02	3 53	.....	0 56	70	19 07.7	-28 20	8.8
Fri Sep 13/Sat Sep 14	23 09	18 37	19 56	4 48	6 07	19 04	3 57	.....	2 04	80	20 08.4	-25 44	8.9
Sat Sep 14/Sun Sep 15	23 12	18 36	19 55	4 49	6 07	19 07	4 02	.....	3 15	88	21 08.0	-21 30	8.9
Sun Sep 15/Mon Sep 16	23 16	18 35	19 53	4 49	6 08	19 09	4 07	17 16	4 27	95	22 05.7	-15 51	8.9
Mon Sep 16/Tue Sep 17	23 20	18 34	19 52	4 50	6 09	19 12	4 11	17 52	5 39	99	23 01.5	- 9 09	9.0
Tue Sep 17/Wed Sep 18	23 24	18 32	19 51	4 51	6 09	19 14	4 16	18 25	6 50	100	23 56.1	- 1 52	9.0
Wed Sep 18/Thu Sep 19	23 28	18 31	19 49	4 51	6 10	19 17	4 20	18 57	.....	98	0 50.5	5 32	9.0
Thu Sep 19/Fri Sep 20	23 32	18 30	19 48	4 52	6 10	19 19	4 25	19 30	.....	93	1 45.8	12 31	9.1
Fri Sep 20/Sat Sep 21	23 36	18 28	19 46	4 53	6 11	19 22	4 30	20 06	.....	85	2 42.9	18 37	9.1
Sat Sep 21/Sun Sep 22	23 40	18 27	19 45	4 54	6 12	19 24	4 34	20 46	.....	76	3 42.1	23 26	9.1
Sun Sep 22/Mon Sep 23	23 44	18 26	19 44	4 54	6 12	19 27	4 39	21 33	.....	65	4 42.8	26 39	9.2
Mon Sep 23/Tue Sep 24	23 48	18 24	19 42	4 55	6 13	19 29	4 44	22 26	.....	55	5 44.0	28 07	9.2
Tue Sep 24/Wed Sep 25	23 52	18 23	19 41	4 56	6 14	19 32	4 48	23 24	.....	44	6 43.7	27 54	9.2
Wed Sep 25/Thu Sep 26	23 56	18 22	19 39	4 56	6 14	19 35	4 53	0 26	.....	34	7 40.7	26 08	9.3
Thu Sep 26/Fri Sep 27	24 00	18 20	19 38	4 57	6 15	19 37	4 58	1 28	.....	25	8 33.9	23 07	9.3
Fri Sep 27/Sat Sep 28	0 04	18 19	19 37	4 58	6 15	19 40	5 02	2 28	.....	17	9 23.4	19 06	9.3
Sat Sep 28/Sun Sep 29	0 08	18 18	19 35	4 58	6 16	19 42	5 07	3 26	16 33	10	10 09.5	14 22	9.4
Sun Sep 29/Mon Sep 30	0 12	18 16	19 34	4 59	6 17	19 45	5 11	4 22	17 01	5	10 53.0	9 10	9.4
Mon Sep 30/Tue Oct 01	0 16	18 15	19 33	5 00	6 17	19 48	5 16	5 17	17 26	2	11 34.9	3 40	9.4

***** 2024 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	
Tue Oct 01/Wed Oct 02	0 20	18 14	19 31	5 00	6 18	19 50	5 21	6 10	17 50	0	12 16.0	- 1 56	9.5
Wed Oct 02/Thu Oct 03	0 23	18 13	19 30	5 01	6 19	19 53	5 25	7 04	18 14	0	12 57.3	- 7 29	9.5
Thu Oct 03/Fri Oct 04	0 27	18 11	19 29	5 02	6 19	19 56	5 30	.....	18 39	2	13 39.7	-12 48	9.5
Fri Oct 04/Sat Oct 05	0 31	18 10	19 28	5 02	6 20	19 58	5 34	.....	19 06	5	14 23.9	-17 43	9.6
Sat Oct 05/Sun Oct 06	0 35	18 09	19 26	5 03	6 21	20 01	5 39	.....	19 37	11	15 10.7	-22 01	9.6
Sun Oct 06/Mon Oct 07	0 39	18 08	19 25	5 04	6 21	20 04	5 44	.....	20 13	17	16 00.7	-25 29	9.6
Mon Oct 07/Tue Oct 08	0 43	18 06	19 24	5 04	6 22	20 06	5 48	.....	20 56	25	16 54.0	-27 54	9.7
Tue Oct 08/Wed Oct 09	0 47	18 05	19 23	5 05	6 23	20 09	5 53	.....	21 45	34	17 50.2	-29 00	9.7
Wed Oct 09/Thu Oct 10	0 51	18 04	19 21	5 06	6 23	20 12	5 58	.....	22 43	44	18 48.2	-28 37	9.7
Thu Oct 10/Fri Oct 11	0 55	18 03	19 20	5 06	6 24	20 15	6 02	.....	23 47	55	19 46.8	-26 40	9.8
Fri Oct 11/Sat Oct 12	0 59	18 01	19 19	5 07	6 25	20 17	6 07	.....	0 54	65	20 44.6	-23 10	9.8
Sat Oct 12/Sun Oct 13	1 03	18 00	19 18	5 08	6 26	20 20	6 11	.....	2 04	76	21 40.9	-18 14	9.8
Sun Oct 13/Mon Oct 14	1 07	17 59	19 17	5 08	6 26	20 23	6 16	.....	3 13	85	22 35.7	-12 09	9.9
Mon Oct 14/Tue Oct 15	1 11	17 58	19 16	5 09	6 27	20 26	6 21	16 19	4 23	93	23 29.5	- 5 14	9.9
Tue Oct 15/Wed Oct 16	1 15	17 57	19 15	5 10	6 28	20 29	6 25	16 51	5 34	98	0 23.4	2 06	9.9
Wed Oct 16/Thu Oct 17	1 19	17 56	19 14	5 10	6 28	20 31	6 30	17 24	6 47	100	1 18.4	9 22	9.9
Thu Oct 17/Fri Oct 18	1 23	17 54	19 12	5 11	6 29	20 34	6 34	17 58	.....	99	2 15.6	16 04	10.0
Fri Oct 18/Sat Oct 19	1 27	17 53	19 11	5 12	6 30	20 37	6 39	18 37	.....	95	3 15.6	21 39	10.0
Sat Oct 19/Sun Oct 20	1 30	17 52	19 10	5 12	6 31	20 40	6 44	19 22	.....	88	4 18.1	25 42	10.0
Sun Oct 20/Mon Oct 21	1 34	17 51	19 09	5 13	6 31	20 43	6 48	20 15	.....	80	5 21.8	27 56	10.1
Mon Oct 21/Tue Oct 22	1 38	17 50	19 08	5 14	6 32	20 46	6 53	21 13	.....	70	6 24.6	28 17	10.1
Tue Oct 22/Wed Oct 23	1 42	17 49	19 07	5 14	6 33	20 49	6 58	22 16	.....	60	7 24.5	26 55	10.1
Wed Oct 23/Thu Oct 24	1 46	17 48	19 06	5 15	6 34	20 52	7 02	23 19	.....	50	8 20.3	24 08	10.1
Thu Oct 24/Fri Oct 25	1 50	17 47	19 05	5 16	6 34	20 55	7 07	0 21	.....	40	9 11.6	20 17	10.2
Fri Oct 25/Sat Oct 26	1 54	17 46	19 05	5 17	6 35	20 58	7 12	1 20	.....	30	9 59.0	15 39	10.2
Sat Oct 26/Sun Oct 27	1 58	17 45	19 04	5 17	6 36	21 01	7 16	2 17	.....	22	10 43.3	10 31	10.2
Sun Oct 27/Mon Oct 28	2 02	17 44	19 03	5 18	6 37	21 04	7 21	3 11	.....	15	11 25.6	5 04	10.3
Mon Oct 28/Tue Oct 29	2 06	17 43	19 02	5 19	6 38	21 07	7 25	4 05	.....	9	12 06.8	- 0 31	10.3
Tue Oct 29/Wed Oct 30	2 10	17 42	19 01	5 19	6 38	21 10	7 30	4 59	16 18	4	12 48.0	- 6 05	10.3
Wed Oct 30/Thu Oct 31	2 14	17 41	19 00	5 20	6 39	21 13	7 35	5 54	16 43	1	13 30.1	-11 27	10.3
Thu Oct 31/Fri Nov 01	2 18	17 40	19 00	5 21	6 40	21 17	7 39	6 50	17 10	0	14 14.0	-16 28	10.4

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.

***** 2024 NOVEMBER *****

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 Nov 01/Sat Nov 02	2 22	17 40	18 59	5 22	6 41	21 20	7 44	7 49	17 39	1	15 00.3	-20 56	10.4
Sat Nov 02/Sun Nov 03	2 26	17 39	18 58	5 22	6 42	21 23	7 49	.....	18 14	3	15 49.8	-24 36	10.4
Sun Nov 03/Mon Nov 04	2 30	17 38	18 57	5 23	6 43	21 26	7 53	.....	18 54	7	16 42.4	-27 14	10.4
Mon Nov 04/Tue Nov 05	2 34	17 37	18 57	5 24	6 43	21 29	7 58	.....	19 42	13	17 37.7	-28 37	10.5
Tue Nov 05/Wed Nov 06	2 37	17 36	18 56	5 24	6 44	21 33	8 03	.....	20 37	20	18 34.7	-28 34	10.5
Wed Nov 06/Thu Nov 07	2 41	17 36	18 55	5 25	6 45	21 36	8 08	.....	21 38	29	19 32.0	-27 01	10.5
Thu Nov 07/Fri Nov 08	2 45	17 35	18 55	5 26	6 46	21 39	8 12	.....	22 43	39	20 28.3	-24 00	10.5
Fri Nov 08/Sat Nov 09	2 49	17 34	18 54	5 27	6 47	21 43	8 17	.....	23 50	50	21 23.0	-19 38	10.5
Sat Nov 09/Sun Nov 10	2 53	17 34	18 54	5 27	6 48	21 46	8 22	.....	0 57	61	22 16.1	-14 08	10.6
Sun Nov 10/Mon Nov 11	2 57	17 33	18 53	5 28	6 49	21 50	8 26	.....	2 04	72	23 07.9	- 7 46	10.6
Mon Nov 11/Tue Nov 12	3 01	17 32	18 53	5 29	6 49	21 53	8 31	.....	3 11	82	23 59.6	- 0 51	10.6
Tue Nov 12/Wed Nov 13	3 05	17 32	18 52	5 30	6 50	21 56	8 36	.....	4 21	90	0 52.4	6 16	10.6
Wed Nov 13/Thu Nov 14	3 09	17 31	18 52	5 30	6 51	22 00	8 40	15 51	5 33	96	1 47.4	13 07	10.6
Thu Nov 14/Fri Nov 15	3 13	17 31	18 51	5 31	6 52	22 03	8 45	16 27	6 47	99	2 45.7	19 13	10.7
Fri Nov 15/Sat Nov 16	3 17	17 30	18 51	5 32	6 53	22 07	8 50	17 09	8 02	100	3 47.5	24 04	10.7
Sat Nov 16/Sun Nov 17	3 21	17 30	18 51	5 33	6 54	22 11	8 54	17 58	.....	97	4 52.2	27 11	10.7
Sun Nov 17/Mon Nov 18	3 25	17 29	18 50	5 33	6 55	22 14	8 59	18 55	.....	92	5 57.5	28 22	10.7
Mon Nov 18/Tue Nov 19	3 29	17 29	18 50	5 34	6 56	22 18	9 04	19 58	.....	85	7 00.9	27 39	10.7
Tue Nov 19/Wed Nov 20	3 33	17 28	18 50	5 35	6 56	22 21	9 09	21 04	.....	76	8 00.3	25 16	10.8
Wed Nov 20/Thu Nov 21	3 37	17 28	18 49	5 36	6 57	22 25	9 13	22 09	.....	67	8 54.9	21 37	10.8
Thu Nov 21/Fri Nov 22	3 41	17 28	18 49	5 36	6 58	22 29	9 18	23 10	.....	57	9 44.7	17 05	10.8
Fri Nov 22/Sat Nov 23	3 45	17 27	18 49	5 37	6 59	22 33	9 23	0 09	.....	47	10 30.8	11 59	10.8
Sat Nov 23/Sun Nov 24	3 48	17 27	18 49	5 38	7 00	22 36	9 27	1 04	.....	38	11 14.1	6 32	10.8
Sun Nov 24/Mon Nov 25	3 52	17 27	18 49	5 39	7 01	22 40	9 32	1 58	.....	29	11 55.9	0 57	10.8
Mon Nov 25/Tue Nov 26	3 56	17 26	18 48	5 39	7 02	22 44	9 37	2 52	.....	21	12 37.2	- 4 38	10.9
Tue Nov 26/Wed Nov 27	4 00	17 26	18 48	5 40	7 02	22 48	9 41	3 46	.....	14	13 19.1	-10 04	10.9
Wed Nov 27/Thu Nov 28	4 04	17 26	18 48	5 41	7 03	22 52	9 46	4 42	.....	8	14 02.5	-15 11	10.9
Thu Nov 28/Fri Nov 29	4 08	17 26	18 48	5 42	7 04	22 56	9 51	5 41	.....	4	14 48.4	-19 47	10.9
Fri Nov 29/Sat Nov 30	4 12	17 26	18 48	5 42	7 05	22 59	9 55	6 41	16 14	1	15 37.4	-23 39	10.9
Sat Nov 30/Sun Dec 01	4 16	17 26	18 48	5 43	7 06	23 03	10 00	7 41	16 52	0	16 29.7	-26 33	10.9

***** 2024 DECEMBER *****

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 Dec 01/Mon Dec 02	4 20	17 26	18 48	5 44	7 07	23 07	10 05	.....	17 39	1	17 25.0	-28 13	10.9
Mon Dec 02/Tue Dec 03	4 24	17 26	18 48	5 45	7 07	23 11	10 09	.....	18 32	4	18 22.1	-28 28	10.9
Tue Dec 03/Wed Dec 04	4 28	17 26	18 48	5 45	7 08	23 15	10 14	.....	19 32	9	19 19.7	-27 12	10.9
Wed Dec 04/Thu Dec 05	4 32	17 26	18 49	5 46	7 09	23 20	10 19	.....	20 37	16	20 16.2	-24 27	11.0
Thu Dec 05/Fri Dec 06	4 36	17 26	18 49	5 47	7 10	23 24	10 23	.....	21 43	25	21 10.7	-20 23	11.0
Fri Dec 06/Sat Dec 07	4 40	17 26	18 49	5 47	7 10	23 28	10 28	.....	22 49	34	22 03.0	-15 13	11.0
Sat Dec 07/Sun Dec 08	4 44	17 26	18 49	5 48	7 11	23 32	10 33	.....	23 54	45	22 53.7	- 9 13	11.0
Sun Dec 08/Mon Dec 09	4 48	17 26	18 49	5 49	7 12	23 36	10 37	.....	0 59	56	23 43.5	- 2 40	11.0
Mon Dec 09/Tue Dec 10	4 52	17 26	18 49	5 49	7 13	23 40	10 42	.....	2 05	68	0 33.8	4 07	11.0
Tue Dec 10/Wed Dec 11	4 55	17 26	18 50	5 50	7 13	23 44	10 46	.....	3 13	78	1 25.8	10 49	11.0
Wed Dec 11/Thu Dec 12	4 59	17 27	18 50	5 51	7 14	23 49	10 51	.....	4 24	87	2 20.8	17 01	11.0
Thu Dec 12/Fri Dec 13	5 03	17 27	18 50	5 51	7 15	23 53	10 56	.....	5 37	94	3 19.5	22 15	11.0
Fri Dec 13/Sat Dec 14	5 07	17 27	18 51	5 52	7 15	23 57	11 00	15 44	6 49	98	4 22.1	26 04	11.0
Sat Dec 14/Sun Dec 15	5 11	17 28	18 51	5 52	7 16	0 01	11 05	16 37	7 58	100	5 27.1	28 05	11.0
Sun Dec 15/Mon Dec 16	5 15	17 28	18 51	5 53	7 17	0 06	11 09	17 38	.....	99	6 32.2	28 10	11.0
Mon Dec 16/Tue Dec 17	5 19	17 28	18 52	5 54	7 17	0 10	11 14	18 43	.....	95	7 34.6	26 24	11.0
Tue Dec 17/Wed Dec 18	5 23	17 29	18 52	5 54	7 18	0 15	11 18	19 50	.....	89	8 32.5	23 08	11.0
Wed Dec 18/Thu Dec 19	5 27	17 29	18 53	5 55	7 18	0 19	11 23	20 55	.....	82	9 25.6	18 47	11.0
Thu Dec 19/Fri Dec 20	5 31	17 30	18 53	5 55	7 19	0 23	11 27	21 56	.....	74	10 14.1	13 42	11.0
Fri Dec 20/Sat Dec 21	5 35	17 30	18 54	5 56	7 19	0 28	11 32	22 54	.....	65	10 59.3	8 13	11.0
Sat Dec 21/Sun Dec 22	5 39	17 31	18 54	5 56	7 20	0 32	11 36	23 49	.....	55	11 42.2	2 34	11.0
Sun Dec 22/Mon Dec 23	5 43	17 31	18 55	5 57	7 20	0 37	11 40	0 43	.....	46	12 24.0	- 3 06	11.0
Mon Dec 23/Tue Dec 24	5 47	17 32	18 55	5 57	7 21	0 41	11 45	1 37	.....	37	13 05.9	- 8 37	11.0
Tue Dec 24/Wed Dec 25	5 51	17 32	18 56	5 58	7 21	0 46	11 49	2 32	.....	28	13 48.9	-13 49	11.0
Wed Dec 25/Thu Dec 26	5 55	17 33	18 56	5 58	7 22	0 50	11 54	3 29	.....	20	14 34.1	-18 35	11.0
Thu Dec 26/Fri Dec 27	5 59	17 33	18 57	5 58	7 22	0 55	11 58	4 29	.....	13	15 22.2	-22 40	11.0
Fri Dec 27/Sat Dec 28	6 03	17 34	18 58	5 59	7 22	0 59	12 02	5 30	.....	7	16 13.7	-25 50	11.0
Sat Dec 28/Sun Dec 29	6 06	17 35	18 58	5 59	7 23	1 04	12 06	6 30	.....	3	17 08.6	-27 52	11.0
Sun Dec 29/Mon Dec 30	6 10	17 35	18 59	5 59	7 23	1 08	12 11	7 28	16 23	1	18 05.9	-28 29	11.0
Mon Dec 30/Tue Dec 31	6 14	17 36	18 59	6 00	7 23	1 13	12 15	8 20	17 22	0	19 04.3	-27 34	11.0
Tue Dec 31/Wed Jan 01	6 18	17 37	19 00	6 00	7 23	1 18	12 19	.....	18 26	2	20 02.1	-25 07	11.0