

Nighttime astronomical calendar program. Select a site: *SELECT SITE* - Enter single-character code: n .. new site (enter all parameters). x .. exit without change (current: Kitt Peak) k .. Kitt Peak s .. Shattuck Observatory c .. Cambridge, MA - Harvard Coll. Obs. h .. Mt. Hopkins, AZ (MMT, FLWO) p .. Palomar Observatory t .. Tololo (Cerro Tololo Interamerican Obs.) r .. Roque de los Muchachos, La Palma, Canary Is. b .. Black Moshannon Obs., Penn State U. d .. Dominion Astrophysical Obs., Victoria, BC m .. Mauna Kea, Hawaii l .. Lick Observatory Any other char .. OTHER (You'll be prompted for params.) Your answer -j The site you've selected is: Kitt Peak. Type 0 for ordinary text, 1 for TeX-style output with one month per page, or 2 for TeX-style output with two months per page: You'll have to edit the TeX output ... look for 'CUT HERE'

This program takes a while to run and produces wide and voluminous output. You probably want to run it in background. See source code or documentation for details of what program will expect. To exit now, give a negative year at the next prompt. Year to print, negative to abort:

***** 2032 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 18.0 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 NAOA 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 2032, 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 14 2 06	Dec 20 17 02	Dec 28 10 34	Jan 05 15 07
Jan 12 13 07	Jan 19 5 15	Jan 27 5 53	Feb 04 6 50
Feb 10 23 26	Feb 17 20 29	Feb 26 0 44	Mar 04 18 48
Mar 11 9 27	Mar 18 13 56	Mar 26 17 48	Apr 03 3 11
Apr 09 19 42	Apr 17 8 24	Apr 25 8 12	May 02 9 03
May 09 6 38	May 17 2 45	May 24 19 40	May 31 13 52
Jun 07 18 35	Jun 15 20 02	Jun 23 4 35	Jun 29 19 13
Jul 07 7 44	Jul 15 11 34	Jul 22 11 54	Jul 29 2 27
Aug 05 22 13	Aug 14 0 53	Aug 20 18 49	Aug 27 12 36
Sep 04 13 58	Sep 12 11 51	Sep 19 2 32	Sep 26 2 14
Oct 04 6 27	Oct 11 20 49	Oct 18 11 59	Oct 25 19 31
Nov 02 22 45	Nov 10 4 35	Nov 16 23 43	Nov 24 15 51
Dec 02 13 53	Dec 09 12 10	Dec 16 13 50	Dec 24 13 42
Jan 01 3 18	Jan 07 20 36	Jan 15 6 08	Jan 23 10 48

***** 2032 JANUARY *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8

Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.

Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: ----- set twi.end twi.beg rise				LST twilight: eve morn		----- Moon: ----- rise set %illum RA Dec				
Thu Jan 01/Fri Jan 02	3233.8	6 19 33	17 38	19 00	6 00	7 22	1 19	12 21	21 20	.....	82	10 07.9	6 02
Fri Jan 02/Sat Jan 03	3234.8	6 23 30	17 39	19 01	6 00	7 22	1 24	12 25	22 13	.....	74	10 53.1	1 58
Sat Jan 03/Sun Jan 04	3235.8	6 27 26	17 40	19 02	6 00	7 22	1 28	12 29	23 06	.....	65	11 38.5	- 2 13
Sun Jan 04/Mon Jan 05	3236.8	6 31 23	17 40	19 02	6 01	7 22	1 33	12 33	0 01	.....	55	12 24.7	- 6 23
Mon Jan 05/Tue Jan 06	3237.8	6 35 19	17 41	19 03	6 01	7 23	1 37	12 37	0 57	.....	45	13 12.8	-10 23
Tue Jan 06/Wed Jan 07	3238.8	6 39 16	17 42	19 04	6 01	7 23	1 42	12 41	1 56	.....	35	14 03.3	-14 01
Wed Jan 07/Thu Jan 08	3239.8	6 43 12	17 43	19 04	6 01	7 23	1 47	12 45	2 57	.....	26	14 56.8	-17 04
Thu Jan 08/Fri Jan 09	3240.8	6 47 09	17 44	19 05	6 01	7 23	1 51	12 49	4 00	.....	17	15 53.7	-19 17
Fri Jan 09/Sat Jan 10	3241.8	6 51 05	17 44	19 06	6 01	7 23	1 56	12 53	5 02	.....	9	16 53.6	-20 25
Sat Jan 10/Sun Jan 11	3242.8	6 55 02	17 45	19 07	6 01	7 23	2 01	12 57	6 03	15 50	4	17 55.6	-20 16
Sun Jan 11/Mon Jan 12	3243.8	6 58 59	17 46	19 07	6 01	7 23	2 06	13 01	6 59	16 56	1	18 58.3	-18 44
Mon Jan 12/Tue Jan 13	3244.8	7 02 55	17 47	19 08	6 01	7 22	2 10	13 05	7 50	18 05	0	20 00.1	-15 54
Tue Jan 13/Wed Jan 14	3245.8	7 06 52	17 48	19 09	6 01	7 22	2 15	13 09	.....	19 16	3	20 59.9	-12 02
Wed Jan 14/Thu Jan 15	3246.8	7 10 48	17 49	19 10	6 01	7 22	2 20	13 13	.....	20 25	9	21 57.5	- 7 28
Thu Jan 15/Fri Jan 16	3247.8	7 14 45	17 50	19 10	6 01	7 22	2 24	13 17	.....	21 33	17	22 52.8	- 2 33
Fri Jan 16/Sat Jan 17	3248.8	7 18 41	17 50	19 11	6 01	7 22	2 29	13 21	.....	22 38	26	23 46.4	2 23
Sat Jan 17/Sun Jan 18	3249.8	7 22 38	17 51	19 12	6 01	7 22	2 34	13 25	.....	23 42	36	0 38.9	7 02
Sun Jan 18/Mon Jan 19	3250.8	7 26 34	17 52	19 13	6 01	7 21	2 39	13 28	.....	0 43	47	1 30.9	11 12
Mon Jan 19/Tue Jan 20	3251.8	7 30 31	17 53	19 14	6 01	7 21	2 43	13 32	.....	1 43	57	2 22.9	14 41
Tue Jan 20/Wed Jan 21	3252.8	7 34 28	17 54	19 14	6 00	7 21	2 48	13 36	.....	2 40	67	3 15.1	17 21
Wed Jan 21/Thu Jan 22	3253.8	7 38 24	17 55	19 15	6 00	7 20	2 53	13 40	.....	3 35	76	4 07.5	19 08
Thu Jan 22/Fri Jan 23	3254.8	7 42 21	17 56	19 16	6 00	7 20	2 57	13 43	.....	4 26	84	4 59.9	19 57
Fri Jan 23/Sat Jan 24	3255.8	7 46 17	17 57	19 17	6 00	7 19	3 02	13 47	.....	5 14	91	5 51.9	19 48
Sat Jan 24/Sun Jan 25	3256.8	7 50 14	17 58	19 18	5 59	7 19	3 07	13 51	.....	5 58	95	6 43.1	18 44
Sun Jan 25/Mon Jan 26	3257.8	7 54 10	17 59	19 18	5 59	7 19	3 12	13 54	16 35	6 38	98	7 33.1	16 49
Mon Jan 26/Tue Jan 27	3258.8	7 58 07	17 59	19 19	5 59	7 18	3 16	13 58	17 28	7 15	100	8 21.7	14 10
Tue Jan 27/Wed Jan 28	3259.8	8 02 03	18 00	19 20	5 58	7 18	3 21	14 01	18 21	7 50	99	9 09.1	10 55
Wed Jan 28/Thu Jan 29	3260.8	8 06 00	18 01	19 21	5 58	7 17	3 26	14 05	19 14	.....	97	9 55.3	7 13
Thu Jan 29/Fri Jan 30	3261.8	8 09 57	18 02	19 21	5 57	7 16	3 31	14 08	20 07	.....	93	10 40.9	3 13
Fri Jan 30/Sat Jan 31	3262.8	8 13 53	18 03	19 22	5 57	7 16	3 35	14 12	21 01	.....	87	11 26.4	- 0 56
Sat Jan 31/Sun Feb 01	3263.8	8 17 50	18 04	19 23	5 56	7 15	3 40	14 15	21 55	.....	80	12 12.3	- 5 06

***** 2032 FEBRUARY *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8

Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.

Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: ----- set twi.end twi.beg rise				LST twilight: eve morn		----- Moon: ----- rise set %illum RA Dec				
Sun Feb 01/Mon Feb 02	3264.8	8 21 46	18 05	19 24	5 56	7 15	3 45	14 19	22 50	.....	72	12 59.4	- 9 06
Mon Feb 02/Tue Feb 03	3265.8	8 25 43	18 06	19 25	5 55	7 14	3 50	14 22	23 46	.....	62	13 48.4	-12 48
Tue Feb 03/Wed Feb 04	3266.8	8 29 39	18 07	19 25	5 55	7 13	3 54	14 25	0 44	.....	52	14 39.7	-15 59
Wed Feb 04/Thu Feb 05	3267.8	8 33 36	18 08	19 26	5 54	7 12	3 59	14 29	1 44	.....	42	15 33.9	-18 28
Thu Feb 05/Fri Feb 06	3268.8	8 37 32	18 09	19 27	5 53	7 12	4 04	14 32	2 44	.....	31	16 30.9	-20 00
Fri Feb 06/Sat Feb 07	3269.8	8 41 29	18 09	19 28	5 53	7 11	4 09	14 35	3 44	.....	21	17 30.4	-20 23
Sat Feb 07/Sun Feb 08	3270.8	8 45 26	18 10	19 29	5 52	7 10	4 13	14 39	4 41	.....	13	18 31.4	-19 31
Sun Feb 08/Mon Feb 09	3271.8	8 49 22	18 11	19 29	5 51	7 09	4 18	14 42	5 34	.....	6	19 32.7	-17 20
Mon Feb 09/Tue Feb 10	3272.8	8 53 19	18 12	19 30	5 51	7 09	4 23	14 45	6 23	16 48	2	20 33.2	-13 59
Tue Feb 10/Wed Feb 11	3273.8	8 57 15	18 13	19 31	5 50	7 08	4 27	14 48	7 08	17 59	0	21 32.2	- 9 44
Wed Feb 11/Thu Feb 12	3274.8	9 01 12	18 14	19 32	5 49	7 07	4 32	14 51	7 50	19 09	2	22 29.5	- 4 54
Thu Feb 12/Fri Feb 13	3275.8	9 05 08	18 15	19 32	5 48	7 06	4 37	14 54	.....	20 17	6	23 25.2	0 08
Fri Feb 13/Sat Feb 14	3276.8	9 09 05	18 16	19 33	5 48	7 05	4 42	14 58	.....	21 24	13	0 19.7	5 01
Sat Feb 14/Sun Feb 15	3277.8	9 13 01	18 16	19 34	5 47	7 04	4 46	15 01	.....	22 29	21	1 13.4	9 29
Sun Feb 15/Mon Feb 16	3278.8	9 16 58	18 17	19 35	5 46	7 03	4 51	15 04	.....	23 31	30	2 06.8	13 18
Mon Feb 16/Tue Feb 17	3279.8	9 20 55	18 18	19 35	5 45	7 02	4 56	15 07	.....	0 31	41	2 59.9	16 17
Tue Feb 17/Wed Feb 18	3280.8	9 24 51	18 19	19 36	5 44	7 01	5 00	15 10	.....	1 28	51	3 53.0	18 22
Wed Feb 18/Thu Feb 19	3281.8	9 28 48	18 20	19 37	5 43	7 00	5 05	15 13	.....	2 21	61	4 45.7	19 28
Thu Feb 19/Fri Feb 20	3282.8	9 32 44	18 21	19 38	5 42	6 59	5 10	15 16	.....	3 11	70	5 37.8	19 37
Fri Feb 20/Sat Feb 21	3283.8	9 36 41	18 21	19 39	5 41	6 58	5 14	15 19	.....	3 56	78	6 29.0	18 50
Sat Feb 21/Sun Feb 22	3284.8	9 40 37	18 22	19 39	5 40	6 57	5 19	15 22	.....	4 38	86	7 19.0	17 12
Sun Feb 22/Mon Feb 23	3285.8	9 44 34	18 23	19 40	5 39	6 56	5 24	15 25	.....	5 16	92	8 07.8	14 48
Mon Feb 23/Tue Feb 24	3286.8	9 48 30	18 24	19 41	5 38	6 55	5 29	15 28	16 16	5 51	96	8 55.5	11 46
Tue Feb 24/Wed Feb 25	3287.8	9 52 27	18 25	19 41	5 37	6 54	5 33	15 31	17 09	6 24	99	9 42.1	8 13
Wed Feb 25/Thu Feb 26	3288.8	9 56 24	18 25	19 42	5 36	6 53	5 38	15 33	18 03	6 56	100	10 28.2	4 19
Thu Feb 26/Fri Feb 27	3289.8	10 00 20	18 26	19 43	5 35	6 52	5 43	15 36	18 56	7 28	99	11 14.1	0 12
Fri Feb 27/Sat Feb 28	3290.8	10 04 17	18 27	19 44	5 34	6 51	5 47	15 39	19 50	.....	96	12 00.4	- 3 59
Sat Feb 28/Sun Feb 29	3291.8	10 08 13	18 28	19 44	5 33	6 49	5 52	15 42	20 45	.....	91	12 47.6	- 8 03
Sun Feb 29/Mon Mar 01	3292.8	10 12 10	18 29	19 45	5 32	6 48	5 57	15 45	21 41	.....	85	13 36.3	-11 49

***** 2032 MARCH *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8

Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.

Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: -----				LST twilight:		----- Moon: -----				
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Mon Mar 01/Tue Mar 02	3293.8	10 16 06	18 29	19 46	5 31	6 47	6 01	15 48	22 38	.....	77	14 27.0	-15 08
Tue Mar 02/Wed Mar 03	3294.8	10 20 03	18 30	19 47	5 29	6 46	6 06	15 50	23 36	.....	68	15 19.9	-17 46
Wed Mar 03/Thu Mar 04	3295.8	10 23 59	18 31	19 47	5 28	6 45	6 11	15 53	0 35	.....	58	16 15.2	-19 32
Thu Mar 04/Fri Mar 05	3296.8	10 27 56	18 32	19 48	5 27	6 43	6 15	15 56	1 32	.....	47	17 12.5	-20 16
Fri Mar 05/Sat Mar 06	3297.8	10 31 53	18 32	19 49	5 26	6 42	6 20	15 59	2 28	.....	36	18 11.2	-19 50
Sat Mar 06/Sun Mar 07	3298.8	10 35 49	18 33	19 50	5 25	6 41	6 25	16 01	3 21	.....	25	19 10.6	-18 12
Sun Mar 07/Mon Mar 08	3299.8	10 39 46	18 34	19 50	5 23	6 40	6 29	16 04	4 11	.....	16	20 09.7	-15 24
Mon Mar 08/Tue Mar 09	3300.8	10 43 42	18 35	19 51	5 22	6 39	6 34	16 07	4 56	.....	8	21 07.9	-11 38
Tue Mar 09/Wed Mar 10	3301.8	10 47 39	18 35	19 52	5 21	6 37	6 39	16 09	5 40	16 44	3	22 05.0	- 7 08
Wed Mar 10/Thu Mar 11	3302.8	10 51 35	18 36	19 53	5 20	6 36	6 43	16 12	6 21	17 52	0	23 01.1	- 2 14
Thu Mar 11/Fri Mar 12	3303.8	10 55 32	18 37	19 53	5 18	6 35	6 48	16 15	7 01	19 00	1	23 56.3	2 43
Fri Mar 12/Sat Mar 13	3304.8	10 59 28	18 37	19 54	5 17	6 34	6 53	16 17	.....	20 07	3	0 51.1	7 25
Sat Mar 13/Sun Mar 14	3305.8	11 03 25	18 38	19 55	5 16	6 32	6 58	16 20	.....	21 12	9	1 45.7	11 33
Sun Mar 14/Mon Mar 15	3306.8	11 07 22	18 39	19 56	5 14	6 31	7 02	16 23	.....	22 15	16	2 40.2	14 56
Mon Mar 15/Tue Mar 16	3307.8	11 11 18	18 39	19 56	5 13	6 30	7 07	16 25	.....	23 16	24	3 34.6	17 23
Tue Mar 16/Wed Mar 17	3308.8	11 15 15	18 40	19 57	5 12	6 29	7 12	16 28	.....	0 12	34	4 28.4	18 51
Wed Mar 17/Thu Mar 18	3309.8	11 19 11	18 41	19 58	5 10	6 27	7 16	16 31	.....	1 04	44	5 21.4	19 19
Thu Mar 18/Fri Mar 19	3310.8	11 23 08	18 42	19 59	5 09	6 26	7 21	16 33	.....	1 52	53	6 13.3	18 50
Fri Mar 19/Sat Mar 20	3311.8	11 27 04	18 42	19 59	5 08	6 25	7 26	16 36	.....	2 35	63	7 03.8	17 27
Sat Mar 20/Sun Mar 21	3312.8	11 31 01	18 43	20 00	5 06	6 23	7 30	16 38	.....	3 14	72	7 52.9	15 18
Sun Mar 21/Mon Mar 22	3313.8	11 34 57	18 44	20 01	5 05	6 22	7 35	16 41	.....	3 50	80	8 40.7	12 30
Mon Mar 22/Tue Mar 23	3314.8	11 38 54	18 44	20 02	5 04	6 21	7 40	16 43	.....	4 25	87	9 27.5	9 09
Tue Mar 23/Wed Mar 24	3315.8	11 42 51	18 45	20 02	5 02	6 20	7 45	16 46	.....	4 57	93	10 13.6	5 23
Wed Mar 24/Thu Mar 25	3316.8	11 46 47	18 46	20 03	5 01	6 18	7 49	16 49	16 49	5 29	97	10 59.7	1 20
Thu Mar 25/Fri Mar 26	3317.8	11 50 44	18 46	20 04	5 00	6 17	7 54	16 51	17 43	6 02	99	11 46.2	- 2 50
Fri Mar 26/Sat Mar 27	3318.8	11 54 40	18 47	20 05	4 58	6 16	7 59	16 54	18 38	6 36	100	12 33.7	- 6 58
Sat Mar 27/Sun Mar 28	3319.8	11 58 37	18 48	20 06	4 57	6 14	8 04	16 56	19 35	7 12	98	13 22.8	-10 52
Sun Mar 28/Mon Mar 29	3320.8	12 02 33	18 48	20 06	4 55	6 13	8 08	16 59	20 32	.....	95	14 13.7	-14 21
Mon Mar 29/Tue Mar 30	3321.8	12 06 30	18 49	20 07	4 54	6 12	8 13	17 01	21 31	.....	89	15 06.8	-17 11
Tue Mar 30/Wed Mar 31	3322.8	12 10 26	18 50	20 08	4 53	6 11	8 18	17 04	22 29	.....	81	16 02.1	-19 11
Wed Mar 31/Thu Apr 01	3323.8	12 14 23	18 50	20 09	4 51	6 09	8 23	17 06	23 27	.....	72	16 59.0	-20 09

***** 2032 APRIL *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8
 Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given
 in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.
 Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: -----				LST twilight:		----- Moon: -----				
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Thu Apr 01/Fri Apr 02	3324.8	12 18 20	18 51	20 10	4 50	6 08	8 27	17 09	0 23	.....	62	17 57.1	-20 00
Fri Apr 02/Sat Apr 03	3325.8	12 22 16	18 52	20 10	4 48	6 07	8 32	17 11	1 16	.....	51	18 55.4	-18 41
Sat Apr 03/Sun Apr 04	3326.8	12 26 13	18 53	20 11	4 47	6 06	8 37	17 14	2 05	.....	40	19 53.2	-16 16
Sun Apr 04/Mon Apr 05	3327.8	12 30 09	18 53	20 12	4 45	6 04	8 42	17 16	2 50	.....	29	20 50.1	-12 53
Mon Apr 05/Tue Apr 06	3328.8	12 34 06	18 54	20 13	4 44	6 03	8 46	17 19	3 33	.....	19	21 45.9	- 8 44
Tue Apr 06/Wed Apr 07	3329.8	12 38 02	18 55	20 14	4 43	6 02	8 51	17 21	4 13	.....	11	22 40.8	- 4 06
Wed Apr 07/Thu Apr 08	3330.8	12 41 59	18 55	20 15	4 41	6 01	8 56	17 24	4 53	.....	5	23 35.2	0 43
Thu Apr 08/Fri Apr 09	3331.8	12 45 55	18 56	20 16	4 40	5 59	9 01	17 26	5 33	17 46	1	0 29.4	5 27
Fri Apr 09/Sat Apr 10	3332.8	12 49 52	18 57	20 16	4 38	5 58	9 06	17 29	6 15	18 51	0	1 23.7	9 47
Sat Apr 10/Sun Apr 11	3333.8	12 53 49	18 57	20 17	4 37	5 57	9 11	17 32	6 58	19 56	2	2 18.4	13 29
Sun Apr 11/Mon Apr 12	3334.8	12 57 45	18 58	20 18	4 36	5 56	9 15	17 34	.....	20 58	6	3 13.4	16 19
Mon Apr 12/Tue Apr 13	3335.8	13 01 42	18 59	20 19	4 34	5 55	9 20	17 37	.....	21 58	12	4 08.2	18 11
Tue Apr 13/Wed Apr 14	3336.8	13 05 38	18 59	20 20	4 33	5 53	9 25	17 39	.....	22 53	19	5 02.3	19 01
Wed Apr 14/Thu Apr 15	3337.8	13 09 35	19 00	20 21	4 31	5 52	9 30	17 42	.....	23 44	27	5 55.3	18 51
Thu Apr 15/Fri Apr 16	3338.8	13 13 31	19 01	20 22	4 30	5 51	9 35	17 44	.....	0 29	37	6 46.8	17 46
Fri Apr 16/Sat Apr 17	3339.8	13 17 28	19 02	20 23	4 29	5 50	9 40	17 47	.....	1 11	46	7 36.6	15 52
Sat Apr 17/Sun Apr 18	3340.8	13 21 24	19 02	20 24	4 27	5 49	9 44	17 49	.....	1 48	56	8 24.8	13 16
Sun Apr 18/Mon Apr 19	3341.8	13 25 21	19 03	20 25	4 26	5 48	9 49	17 52	.....	2 23	65	9 11.7	10 07
Mon Apr 19/Tue Apr 20	3342.8	13 29 18	19 04	20 26	4 25	5 46	9 54	17 55	.....	2 56	74	9 57.7	6 30
Tue Apr 20/Wed Apr 21	3343.8	13 33 14	19 04	20 26	4 23	5 45	9 59	17 57	.....	3 29	82	10 43.5	2 35
Wed Apr 21/Thu Apr 22	3344.8	13 37 11	19 05	20 27	4 22	5 44	10 04	18 00	.....	4 01	89	11 29.7	- 1 32
Thu Apr 22/Fri Apr 23	3345.8	13 41 07	19 06	20 28	4 21	5 43	10 09	18 02	.....	4 35	94	12 16.9	- 5 41
Fri Apr 23/Sat Apr 24	3346.8	13 45 04	19 06	20 29	4 19	5 42	10 14	18 05	17 25	5 10	98	13 05.7	- 9 42
Sat Apr 24/Sun Apr 25	3347.8	13 49 00	19 07	20 30	4 18	5 41	10 19	18 08	18 22	5 49	100	13 56.6	-13 23
Sun Apr 25/Mon Apr 26	3348.8	13 52 57	19 08	20 31	4 17	5 40	10 24	18 10	19 22	6 32	99	14 50.1	-16 29
Mon Apr 26/Tue Apr 27	3349.8	13 56 53	19 09	20 32	4 15	5 39	10 29	18 13	20 22	.....	97	15 45.9	-18 47
Tue Apr 27/Wed Apr 28	3350.8	14 00 50	19 09	20 33	4 14	5 38	10 34	18 16	21 21	.....	92	16 43.8	-20 05
Wed Apr 28/Thu Apr 29	3351.8	14 04 47	19 10	20 34	4 13	5 37	10 38	18 18	22 18	.....	84	17 42.9	-20 13
Thu Apr 29/Fri Apr 30	3352.8	14 08 43	19 11	20 35	4 12	5 36	10 43	18 21	23 13	.....	75	18 42.0	-19 09
Fri Apr 30/Sat May 01	3353.8	14 12 40	19 11	20 36	4 10	5 35	10 48	18 24	0 03	.....	65	19 40.4	-16 57

***** 2032 MAY *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8
 Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given
 in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.
 Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: -----				LST twilight:		----- Moon: -----				
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Sat May 01/Sun May 02	3354.8	14 16 36	19 12	20 37	4 09	5 34	10 53	18 26	0 49	.....	54	20 37.3	-13 47
Sun May 02/Mon May 03	3355.8	14 20 33	19 13	20 38	4 08	5 33	10 58	18 29	1 31	.....	42	21 32.7	- 9 51
Mon May 03/Tue May 04	3356.8	14 24 29	19 14	20 39	4 07	5 32	11 03	18 32	2 11	.....	31	22 26.8	- 5 24
Tue May 04/Wed May 05	3357.8	14 28 26	19 14	20 40	4 06	5 31	11 08	18 35	2 50	.....	21	23 20.0	- 0 43
Wed May 05/Thu May 06	3358.8	14 32 22	19 15	20 41	4 04	5 31	11 13	18 38	3 29	.....	13	0 12.8	3 57
Thu May 06/Fri May 07	3359.8	14 36 19	19 16	20 42	4 03	5 30	11 18	18 40	4 09	.....	6	1 05.9	8 21
Fri May 07/Sat May 08	3360.8	14 40 16	19 17	20 43	4 02	5 29	11 23	18 43	4 50	17 40	2	1 59.6	12 12
Sat May 08/Sun May 09	3361.8	14 44 12	19 17	20 44	4 01	5 28	11 28	18 46	5 35	18 42	0	2 53.8	15 19
Sun May 09/Mon May 10	3362.8	14 48 09	19 18	20 45	4 00	5 27	11 33	18 49	6 22	19 43	1	3 48.4	17 32
Mon May 10/Tue May 11	3363.8	14 52 05	19 19	20 46	3 59	5 27	11 38	18 52	.....	20 40	3	4 42.9	18 44
Tue May 11/Wed May 12	3364.8	14 56 02	19 19	20 47	3 58	5 26	11 43	18 55	.....	21 34	8	5 36.7	18 56
Wed May 12/Thu May 13	3365.8	14 59 58	19 20	20 48	3 57	5 25	11 48	18 58	.....	22 22	14	6 29.1	18 09
Thu May 13/Fri May 14	3366.8	15 03 55	19 21	20 49	3 56	5 24	11 53	19 01	.....	23 06	22	7 19.7	16 31
Fri May 14/Sat May 15	3367.8	15 07 51	19 22	20 50	3 55	5 24	11 58	19 04	.....	23 45	30	8 08.6	14 09
Sat May 15/Sun May 16	3368.8	15 11 48	19 22	20 51	3 54	5 23	12 02	19 07	.....	0 22	39	8 55.8	11 10
Sun May 16/Mon May 17	3369.8	15 15 45	19 23	20 52	3 53	5 22	12 07	19 10	.....	0 55	48	9 41.9	7 44
Mon May 17/Tue May 18	3370.8	15 19 41	19 24	20 53	3 52	5 22	12 12	19 13	.....	1 28	58	10 27.3	3 57
Tue May 18/Wed May 19	3371.8	15 23 38	19 24	20 54	3 51	5 21	12 17	19 16	.....	2 00	67	11 12.7	- 0 04
Wed May 19/Thu May 20	3372.8	15 27 34	19 25	20 55	3 51	5 21	12 22	19 19	.....	2 32	76	11 58.9	- 4 11
Thu May 20/Fri May 21	3373.8	15 31 31	19 26	20 56	3 50	5 20	12 27	19 22	.....	3 06	84	12 46.5	- 8 14
Fri May 21/Sat May 22	3374.8	15 35 27	19 26	20 57	3 49	5 20	12 32	19 25	.....	3 44	91	13 36.4	-12 04
Sat May 22/Sun May 23	3375.8	15 39 24	19 27	20 58	3 48	5 19	12 37	19 28	.....	4 25	96	14 29.0	-15 26
Sun May 23/Mon May 24	3376.8	15 43 20	19 28	20 59	3 48	5 19	12 42	19 32	18 08	5 11	99	15 24.6	-18 07
Mon May 24/Tue May 25	3377.8	15 47 17	19 28	21 00	3 47	5 18	12 46	19 35	19 09	6 02	100	16 22.9	-19 51
Tue May 25/Wed May 26	3378.8	15 51 13	19 29	21 01	3 46	5 18	12 51	19 38	20 09	.....	98	17 23.2	-20 26
Wed May 26/Thu May 27	3379.8	15 55 10	19 30	21 01	3 46	5 18	12 56	19 41	21 06	.....	94	18 24.2	-19 44
Thu May 27/Fri May 28	3380.8	15 59 07	19 30	21 02	3 45	5 17	13 01	19 45	21 59	.....	87	19 24.7	-17 48
Fri May 28/Sat May 29	3381.8	16 03 03	19 31	21 03	3 44	5 17	13 06	19 48	22 47	.....	78	20 23.5	-14 48
Sat May 29/Sun May 30	3382.8	16 07 00	19 31	21 04	3 44	5 17	13 10	19 52	23 32	.....	67	21 20.4	-10 57
Sun May 30/Mon May 31	3383.8	16 10 56	19 32	21 05	3 43	5 16	13 15	19 55	0 13	.....	56	22 15.3	- 6 33
Mon May 31/Tue Jun 01	3384.8	16 14 53	19 33	21 06	3 43	5 16	13 20	19 58	0 51	.....	45	23 08.7	- 1 52

***** 2032 JUNE *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8

Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.

Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: -----				LST twilight:		----- Moon: -----				
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Tue Jun 01/Wed Jun 02	3385.8	16 18 49	19 33	21 06	3 43	5 16	13 25	20 02	1 29	.....	34	0 01.2	2 48
Wed Jun 02/Thu Jun 03	3386.8	16 22 46	19 34	21 07	3 42	5 16	13 29	20 06	2 08	.....	24	0 53.4	7 14
Thu Jun 03/Fri Jun 04	3387.8	16 26 42	19 34	21 08	3 42	5 15	13 34	20 09	2 48	.....	15	1 45.9	11 11
Fri Jun 04/Sat Jun 05	3388.8	16 30 39	19 35	21 08	3 41	5 15	13 39	20 13	3 30	.....	8	2 39.0	14 28
Sat Jun 05/Sun Jun 06	3389.8	16 34 36	19 35	21 09	3 41	5 15	13 43	20 16	4 15	17 32	3	3 32.7	16 56
Sun Jun 06/Mon Jun 07	3390.8	16 38 32	19 36	21 10	3 41	5 15	13 48	20 20	5 03	18 30	1	4 26.5	18 27
Mon Jun 07/Tue Jun 08	3391.8	16 42 29	19 36	21 10	3 41	5 15	13 52	20 24	5 54	19 25	0	5 20.1	18 58
Tue Jun 08/Wed Jun 09	3392.8	16 46 25	19 37	21 11	3 40	5 15	13 57	20 27	.....	20 15	2	6 12.8	18 31
Wed Jun 09/Thu Jun 10	3393.8	16 50 22	19 37	21 12	3 40	5 15	14 01	20 31	.....	21 01	5	7 04.0	17 10
Thu Jun 10/Fri Jun 11	3394.8	16 54 18	19 37	21 12	3 40	5 15	14 06	20 35	.....	21 42	10	7 53.4	15 01
Fri Jun 11/Sat Jun 12	3395.8	16 58 15	19 38	21 13	3 40	5 15	14 10	20 39	.....	22 20	16	8 41.2	12 15
Sat Jun 12/Sun Jun 13	3396.8	17 02 11	19 38	21 13	3 40	5 15	14 15	20 43	.....	22 55	24	9 27.4	8 58
Sun Jun 13/Mon Jun 14	3397.8	17 06 08	19 39	21 14	3 40	5 15	14 19	20 47	.....	23 28	32	10 12.6	5 19
Mon Jun 14/Tue Jun 15	3398.8	17 10 05	19 39	21 14	3 40	5 15	14 24	20 51	.....	23 59	42	10 57.4	1 25
Tue Jun 15/Wed Jun 16	3399.8	17 14 01	19 39	21 14	3 40	5 15	14 28	20 55	.....	0 31	51	11 42.5	- 2 37
Wed Jun 16/Thu Jun 17	3400.8	17 17 58	19 40	21 15	3 40	5 15	14 32	20 59	.....	1 04	61	12 28.7	- 6 38
Thu Jun 17/Fri Jun 18	3401.8	17 21 54	19 40	21 15	3 40	5 15	14 36	21 03	.....	1 39	70	13 16.6	-10 30
Fri Jun 18/Sat Jun 19	3402.8	17 25 51	19 40	21 15	3 40	5 16	14 41	21 07	.....	2 17	79	14 07.2	-14 03
Sat Jun 19/Sun Jun 20	3403.8	17 29 47	19 40	21 16	3 41	5 16	14 45	21 11	.....	3 01	87	15 00.8	-17 02
Sun Jun 20/Mon Jun 21	3404.8	17 33 44	19 41	21 16	3 41	5 16	14 49	21 15	.....	3 49	94	15 57.7	-19 13
Mon Jun 21/Tue Jun 22	3405.8	17 37 40	19 41	21 16	3 41	5 16	14 53	21 19	17 53	4 44	98	16 57.6	-20 21
Tue Jun 22/Wed Jun 23	3406.8	17 41 37	19 41	21 16	3 41	5 16	14 57	21 24	18 52	5 45	100	17 59.5	-20 14
Wed Jun 23/Thu Jun 24	3407.8	17 45 34	19 41	21 16	3 42	5 17	15 01	21 28	19 49	.....	99	19 01.9	-18 47
Thu Jun 24/Fri Jun 25	3408.8	17 49 30	19 41	21 16	3 42	5 17	15 05	21 32	20 41	.....	95	20 03.4	-16 05
Fri Jun 25/Sat Jun 26	3409.8	17 53 27	19 41	21 16	3 42	5 17	15 09	21 37	21 28	.....	89	21 03.0	-12 23
Sat Jun 26/Sun Jun 27	3410.8	17 57 23	19 42	21 16	3 43	5 18	15 13	21 41	22 12	.....	80	22 00.4	- 7 59
Sun Jun 27/Mon Jun 28	3411.8	18 01 20	19 42	21 16	3 43	5 18	15 17	21 45	22 52	.....	70	22 55.8	- 3 14
Mon Jun 28/Tue Jun 29	3412.8	18 05 16	19 42	21 16	3 44	5 18	15 21	21 50	23 31	.....	59	23 49.6	1 34
Tue Jun 29/Wed Jun 30	3413.8	18 09 13	19 42	21 16	3 44	5 19	15 25	21 54	0 10	.....	47	0 42.5	6 08
Wed Jun 30/Thu Jul 01	3414.8	18 13 09	19 42	21 16	3 45	5 19	15 29	21 59	0 49	.....	36	1 35.2	10 15

***** 2032 JULY *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8

Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.

Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn)		JDmid	LMSTmidn	Sun: -----				LST twilight:		Moon: -----				
(2032 at start)		(-2460000)		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Thu Jul 01/Fri Jul 02	3415.8	18 17 06	19 42	21 16	3 45	5 20	15 33	22 03	1 30	.....	26	2 27.9	13 42
Fri Jul 02/Sat Jul 03	3416.8	18 21 03	19 41	21 16	3 46	5 20	15 36	22 08	2 13	.....	18	3 20.9	16 22
Sat Jul 03/Sun Jul 04	3417.8	18 24 59	19 41	21 15	3 47	5 21	15 40	22 12	3 00	.....	11	4 14.1	18 07
Sun Jul 04/Mon Jul 05	3418.8	18 28 56	19 41	21 15	3 47	5 21	15 44	22 17	3 49	.....	5	5 07.1	18 54
Mon Jul 05/Tue Jul 06	3419.8	18 32 52	19 41	21 15	3 48	5 22	15 47	22 21	4 41	18 10	2	5 59.5	18 44	
Tue Jul 06/Wed Jul 07	3420.8	18 36 49	19 41	21 14	3 49	5 22	15 51	22 26	5 34	18 57	0	6 50.7	17 39	
Wed Jul 07/Thu Jul 08	3421.8	18 40 45	19 41	21 14	3 49	5 23	15 54	22 31	6 28	19 40	1	7 40.4	15 46	
Thu Jul 08/Fri Jul 09	3422.8	18 44 42	19 41	21 14	3 50	5 23	15 58	22 35	.....	20 19	3	8 28.5	13 11
Fri Jul 09/Sat Jul 10	3423.8	18 48 38	19 40	21 13	3 51	5 24	16 01	22 40	.....	20 55	7	9 15.0	10 04
Sat Jul 10/Sun Jul 11	3424.8	18 52 35	19 40	21 13	3 51	5 24	16 05	22 45	.....	21 29	12	10 00.3	6 33
Sun Jul 11/Mon Jul 12	3425.8	18 56 32	19 40	21 12	3 52	5 25	16 08	22 49	.....	22 01	19	10 44.9	2 46
Mon Jul 12/Tue Jul 13	3426.8	19 00 28	19 39	21 12	3 53	5 25	16 12	22 54	.....	22 32	27	11 29.3	- 1 10
Tue Jul 13/Wed Jul 14	3427.8	19 04 25	19 39	21 11	3 54	5 26	16 15	22 59	.....	23 04	35	12 14.3	- 5 07
Wed Jul 14/Thu Jul 15	3428.8	19 08 21	19 39	21 11	3 55	5 27	16 18	23 04	.....	23 38	45	13 00.5	- 8 58
Thu Jul 15/Fri Jul 16	3429.8	19 12 18	19 38	21 10	3 55	5 27	16 22	23 08	.....	0 14	55	13 48.7	-12 33
Fri Jul 16/Sat Jul 17	3430.8	19 16 14	19 38	21 09	3 56	5 28	16 25	23 13	.....	0 53	65	14 39.6	-15 43
Sat Jul 17/Sun Jul 18	3431.8	19 20 11	19 37	21 08	3 57	5 28	16 28	23 18	.....	1 38	74	15 33.7	-18 13
Sun Jul 18/Mon Jul 19	3432.8	19 24 07	19 37	21 08	3 58	5 29	16 31	23 23	.....	2 29	83	16 31.1	-19 49
Mon Jul 19/Tue Jul 20	3433.8	19 28 04	19 36	21 07	3 59	5 30	16 35	23 28	.....	3 26	91	17 31.4	-20 19
Tue Jul 20/Wed Jul 21	3434.8	19 32 01	19 36	21 06	4 00	5 30	16 38	23 33	17 33	4 29	97	18 33.5	-19 31	
Wed Jul 21/Thu Jul 22	3435.8	19 35 57	19 35	21 05	4 01	5 31	16 41	23 37	18 28	5 36	99	19 36.1	-17 25	
Thu Jul 22/Fri Jul 23	3436.8	19 39 54	19 35	21 04	4 02	5 32	16 44	23 42	19 18	.....	99	20 38.0	-14 06
Fri Jul 23/Sat Jul 24	3437.8	19 43 50	19 34	21 04	4 03	5 32	16 47	23 47	20 05	.....	96	21 38.2	- 9 53
Sat Jul 24/Sun Jul 25	3438.8	19 47 47	19 33	21 03	4 04	5 33	16 50	23 52	20 48	.....	90	22 36.4	- 5 05
Sun Jul 25/Mon Jul 26	3439.8	19 51 43	19 33	21 02	4 04	5 33	16 53	23 57	21 29	.....	82	23 32.9	- 0 07
Mon Jul 26/Tue Jul 27	3440.8	19 55 40	19 32	21 01	4 05	5 34	16 56	0 02	22 09	.....	72	0 28.0	4 42
Tue Jul 27/Wed Jul 28	3441.8	19 59 36	19 31	21 00	4 06	5 35	16 59	0 07	22 49	.....	62	1 22.2	9 05
Wed Jul 28/Thu Jul 29	3442.8	20 03 33	19 31	20 59	4 07	5 35	17 02	0 11	23 30	.....	51	2 16.1	12 48
Thu Jul 29/Fri Jul 30	3443.8	20 07 30	19 30	20 58	4 08	5 36	17 05	0 16	0 13	.....	40	3 09.7	15 42
Fri Jul 30/Sat Jul 31	3444.8	20 11 26	19 29	20 57	4 09	5 37	17 08	0 21	0 59	.....	30	4 03.2	17 41
Sat Jul 31/Sun Aug 01	3445.8	20 15 23	19 28	20 56	4 10	5 37	17 11	0 26	1 47	.....	21	4 56.2	18 43

***** 2032 AUGUST *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8
 Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given
 in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.
 Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: -----				LST twilight:		----- Moon: -----				
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Sun Aug 01/Mon Aug 02	3446.8	20 19 19	19 28	20 55	4 11	5 38	17 13	0 31	2 37	.....	14	5 48.5	18 47
Mon Aug 02/Tue Aug 03	3447.8	20 23 16	19 27	20 53	4 12	5 39	17 16	0 36	3 29	.....	8	6 39.7	17 57
Tue Aug 03/Wed Aug 04	3448.8	20 27 12	19 26	20 52	4 13	5 39	17 19	0 41	4 23	17 39	4	7 29.4	16 17
Wed Aug 04/Thu Aug 05	3449.8	20 31 09	19 25	20 51	4 14	5 40	17 22	0 46	5 16	18 19	1	8 17.6	13 55
Thu Aug 05/Fri Aug 06	3450.8	20 35 05	19 24	20 50	4 15	5 41	17 25	0 51	6 09	18 56	0	9 04.4	10 58
Fri Aug 06/Sat Aug 07	3451.8	20 39 02	19 23	20 49	4 16	5 41	17 27	0 56	.....	19 30	1	9 49.9	7 35
Sat Aug 07/Sun Aug 08	3452.8	20 42 59	19 22	20 48	4 17	5 42	17 30	1 00	.....	20 03	4	10 34.5	3 54
Sun Aug 08/Mon Aug 09	3453.8	20 46 55	19 21	20 46	4 18	5 43	17 33	1 05	.....	20 35	8	11 18.8	0 03
Mon Aug 09/Tue Aug 10	3454.8	20 50 52	19 20	20 45	4 19	5 43	17 35	1 10	.....	21 07	14	12 03.2	- 3 51
Tue Aug 10/Wed Aug 11	3455.8	20 54 48	19 19	20 44	4 20	5 44	17 38	1 15	.....	21 39	21	12 48.5	- 7 40
Wed Aug 11/Thu Aug 12	3456.8	20 58 45	19 18	20 43	4 21	5 45	17 41	1 20	.....	22 14	30	13 35.2	-11 15
Thu Aug 12/Fri Aug 13	3457.8	21 02 41	19 17	20 41	4 21	5 45	17 44	1 25	.....	22 51	39	14 23.9	-14 27
Fri Aug 13/Sat Aug 14	3458.8	21 06 38	19 16	20 40	4 22	5 46	17 46	1 30	.....	23 32	49	15 15.2	-17 06
Sat Aug 14/Sun Aug 15	3459.8	21 10 34	19 15	20 39	4 23	5 47	17 49	1 35	.....	0 19	60	16 09.5	-19 00
Sun Aug 15/Mon Aug 16	3460.8	21 14 31	19 14	20 37	4 24	5 47	17 51	1 39	.....	1 11	70	17 06.6	-19 57
Mon Aug 16/Tue Aug 17	3461.8	21 18 28	19 13	20 36	4 25	5 48	17 54	1 44	.....	2 10	80	18 06.2	-19 46
Tue Aug 17/Wed Aug 18	3462.8	21 22 24	19 12	20 35	4 26	5 49	17 57	1 49	.....	3 14	88	19 07.2	-18 19
Wed Aug 18/Thu Aug 19	3463.8	21 26 21	19 11	20 33	4 27	5 49	17 59	1 54	.....	4 21	95	20 08.8	-15 39
Thu Aug 19/Fri Aug 20	3464.8	21 30 17	19 10	20 32	4 28	5 50	18 02	1 59	17 53	5 31	99	21 09.8	-11 53
Fri Aug 20/Sat Aug 21	3465.8	21 34 14	19 09	20 31	4 29	5 51	18 04	2 04	18 39	6 41	100	22 09.8	- 7 19
Sat Aug 21/Sun Aug 22	3466.8	21 38 10	19 07	20 29	4 30	5 51	18 07	2 08	19 22	.....	98	23 08.5	- 2 19
Sun Aug 22/Mon Aug 23	3467.8	21 42 07	19 06	20 28	4 30	5 52	18 09	2 13	20 04	.....	92	0 06.1	2 44
Mon Aug 23/Tue Aug 24	3468.8	21 46 03	19 05	20 26	4 31	5 53	18 12	2 18	20 45	.....	85	1 02.8	7 27
Tue Aug 24/Wed Aug 25	3469.8	21 50 00	19 04	20 25	4 32	5 53	18 14	2 23	21 27	.....	76	1 58.9	11 32
Wed Aug 25/Thu Aug 26	3470.8	21 53 57	19 03	20 24	4 33	5 54	18 17	2 28	22 11	.....	65	2 54.5	14 48
Thu Aug 26/Fri Aug 27	3471.8	21 57 53	19 02	20 22	4 34	5 55	18 20	2 32	22 56	.....	55	3 49.5	17 07
Fri Aug 27/Sat Aug 28	3472.8	22 01 50	19 00	20 21	4 35	5 55	18 22	2 37	23 44	.....	44	4 43.8	18 25
Sat Aug 28/Sun Aug 29	3473.8	22 05 46	18 59	20 19	4 35	5 56	18 25	2 42	0 34	.....	35	5 36.9	18 44
Sun Aug 29/Mon Aug 30	3474.8	22 09 43	18 58	20 18	4 36	5 56	18 27	2 47	1 26	.....	26	6 28.7	18 07
Mon Aug 30/Tue Aug 31	3475.8	22 13 39	18 57	20 16	4 37	5 57	18 30	2 52	2 19	.....	18	7 18.8	16 39
Tue Aug 31/Wed Sep 01	3476.8	22 17 36	18 55	20 15	4 38	5 58	18 32	2 56	3 12	.....	11	8 07.4	14 28

***** 2032 SEPTEMBER *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8
 Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given
 in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.
 Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: -----				LST twilight:		----- Moon: -----					
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Wed Sep 01/Thu Sep 02	3477.8	22 21 32	18 54	20 14	4 39	5 58	18 35	3 01	4 05	.....	6	8 54.3	11 41
Thu Sep 02/Fri Sep 03	3478.8	22 25 29	18 53	20 12	4 40	5 59	18 37	3 06	4 57	17 32	2	9 40.1	8 26	
Fri Sep 03/Sat Sep 04	3479.8	22 29 26	18 52	20 11	4 40	5 59	18 40	3 11	5 50	18 05	0	10 24.9	4 51	
Sat Sep 04/Sun Sep 05	3480.8	22 33 22	18 50	20 09	4 41	6 00	18 42	3 15	6 42	18 37	0	11 09.3	1 04	
Sun Sep 05/Mon Sep 06	3481.8	22 37 19	18 49	20 08	4 42	6 01	18 44	3 20	.....	19 09	2	11 53.7	- 2 48
Mon Sep 06/Tue Sep 07	3482.8	22 41 15	18 48	20 06	4 43	6 01	18 47	3 25	.....	19 42	5	12 38.7	- 6 36
Tue Sep 07/Wed Sep 08	3483.8	22 45 12	18 46	20 05	4 43	6 02	18 49	3 29	.....	20 16	10	13 24.8	-10 12
Wed Sep 08/Thu Sep 09	3484.8	22 49 08	18 45	20 03	4 44	6 03	18 52	3 34	.....	20 52	17	14 12.6	-13 27
Thu Sep 09/Fri Sep 10	3485.8	22 53 05	18 44	20 02	4 45	6 03	18 54	3 39	.....	21 32	25	15 02.4	-16 11
Fri Sep 10/Sat Sep 11	3486.8	22 57 01	18 42	20 01	4 46	6 04	18 57	3 43	.....	22 15	34	15 54.5	-18 14
Sat Sep 11/Sun Sep 12	3487.8	23 00 58	18 41	19 59	4 46	6 04	18 59	3 48	.....	23 04	44	16 49.0	-19 26
Sun Sep 12/Mon Sep 13	3488.8	23 04 55	18 40	19 58	4 47	6 05	19 02	3 53	.....	23 58	55	17 45.6	-19 38
Mon Sep 13/Tue Sep 14	3489.8	23 08 51	18 39	19 56	4 48	6 06	19 04	3 57	.....	0 58	66	18 43.8	-18 42
Tue Sep 14/Wed Sep 15	3490.8	23 12 48	18 37	19 55	4 49	6 06	19 07	4 02	.....	2 01	76	19 43.0	-16 37
Wed Sep 15/Thu Sep 16	3491.8	23 16 44	18 36	19 53	4 49	6 07	19 09	4 07	.....	3 08	86	20 42.4	-13 27
Thu Sep 16/Fri Sep 17	3492.8	23 20 41	18 35	19 52	4 50	6 07	19 12	4 11	.....	4 16	93	21 41.5	- 9 21
Fri Sep 17/Sat Sep 18	3493.8	23 24 37	18 33	19 50	4 51	6 08	19 14	4 16	17 11	5 25	98	22 40.2	- 4 37
Sat Sep 18/Sun Sep 19	3494.8	23 28 34	18 32	19 49	4 51	6 09	19 17	4 21	17 53	6 34	100	23 38.5	0 25
Sun Sep 19/Mon Sep 20	3495.8	23 32 30	18 31	19 48	4 52	6 09	19 19	4 25	18 36	99	0 36.6	5 21
Mon Sep 20/Tue Sep 21	3496.8	23 36 27	18 29	19 46	4 53	6 10	19 22	4 30	19 18	95	1 34.5	9 50
Tue Sep 21/Wed Sep 22	3497.8	23 40 24	18 28	19 45	4 54	6 11	19 25	4 35	20 03	88	2 32.2	13 34
Wed Sep 22/Thu Sep 23	3498.8	23 44 20	18 27	19 43	4 54	6 11	19 27	4 39	20 49	80	3 29.5	16 19
Thu Sep 23/Fri Sep 24	3499.8	23 48 17	18 25	19 42	4 55	6 12	19 30	4 44	21 38	70	4 26.0	18 02
Fri Sep 24/Sat Sep 25	3500.8	23 52 13	18 24	19 41	4 56	6 12	19 32	4 49	22 28	60	5 21.2	18 40
Sat Sep 25/Sun Sep 26	3501.8	23 56 10	18 23	19 39	4 56	6 13	19 35	4 53	23 20	50	6 14.6	18 18
Sun Sep 26/Mon Sep 27	3502.8	0 00 06	18 21	19 38	4 57	6 14	19 37	4 58	0 13	40	7 06.1	17 03
Mon Sep 27/Tue Sep 28	3503.8	0 04 03	18 20	19 37	4 58	6 14	19 40	5 02	1 07	31	7 55.6	15 02
Tue Sep 28/Wed Sep 29	3504.8	0 07 59	18 19	19 35	4 58	6 15	19 43	5 07	2 00	23	8 43.2	12 24
Wed Sep 29/Thu Sep 30	3505.8	0 11 56	18 17	19 34	4 59	6 16	19 45	5 12	2 52	15	9 29.3	9 16
Thu Sep 30/Fri Oct 01	3506.8	0 15 53	18 16	19 33	5 00	6 16	19 48	5 16	3 45	9	10 14.4	5 46

***** 2032 OCTOBER *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8

Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.

Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn)		JDmid	LMSTmidn	Sun: -----				LST twilight:		Moon: -----				
(2032 at start)		(-2460000)		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Fri Oct 01/Sat Oct 02	3507.8	0 19 49	18 15 19 31	5 00	6 17	19 50	5 21	4 37	16 39	5	10 59.0	2 02		
Sat Oct 02/Sun Oct 03	3508.8	0 23 46	18 14 19 30	5 01	6 18	19 53	5 26	5 30	17 11	2	11 43.5	- 1 48		
Sun Oct 03/Mon Oct 04	3509.8	0 27 42	18 12 19 29	5 02	6 18	19 56	5 30	6 24	17 44	0	12 28.6	- 5 38		
Mon Oct 04/Tue Oct 05	3510.8	0 31 39	18 11 19 27	5 02	6 19	19 58	5 35	7 18	18 17	1	13 14.7	- 9 17		
Tue Oct 05/Wed Oct 06	3511.8	0 35 35	18 10 19 26	5 03	6 20	20 01	5 39	.....	18 53	3	14 02.3	-12 36		
Wed Oct 06/Thu Oct 07	3512.8	0 39 32	18 09 19 25	5 04	6 20	20 04	5 44	.....	19 32	7	14 51.8	-15 27		
Thu Oct 07/Fri Oct 08	3513.8	0 43 28	18 07 19 24	5 04	6 21	20 06	5 49	.....	20 15	13	15 43.3	-17 38		
Fri Oct 08/Sat Oct 09	3514.8	0 47 25	18 06 19 23	5 05	6 22	20 09	5 53	.....	21 02	20	16 36.7	-19 01		
Sat Oct 09/Sun Oct 10	3515.8	0 51 22	18 05 19 21	5 06	6 22	20 12	5 58	.....	21 54	30	17 31.8	-19 26		
Sun Oct 10/Mon Oct 11	3516.8	0 55 18	18 04 19 20	5 06	6 23	20 15	6 02	.....	22 50	40	18 28.1	-18 49		
Mon Oct 11/Tue Oct 12	3517.8	0 59 15	18 02 19 19	5 07	6 24	20 17	6 07	.....	23 50	51	19 25.0	-17 08		
Tue Oct 12/Wed Oct 13	3518.8	1 03 11	18 01 19 18	5 08	6 24	20 20	6 12	.....	0 53	62	20 22.0	-14 24		
Wed Oct 13/Thu Oct 14	3519.8	1 07 08	18 00 19 17	5 08	6 25	20 23	6 16	.....	1 58	73	21 19.0	-10 47		
Thu Oct 14/Fri Oct 15	3520.8	1 11 04	17 59 19 16	5 09	6 26	20 26	6 21	.....	3 04	83	22 15.7	- 6 27		
Fri Oct 15/Sat Oct 16	3521.8	1 15 01	17 58 19 14	5 10	6 26	20 29	6 26	.....	4 11	91	23 12.4	- 1 40		
Sat Oct 16/Sun Oct 17	3522.8	1 18 57	17 57 19 13	5 10	6 27	20 32	6 30	16 26	5 19	97	0 09.4	3 14		
Sun Oct 17/Mon Oct 18	3523.8	1 22 54	17 56 19 12	5 11	6 28	20 34	6 35	17 08	6 26	100	1 06.9	7 54		
Mon Oct 18/Tue Oct 19	3524.8	1 26 51	17 54 19 11	5 12	6 29	20 37	6 39	17 51	7 33	100	2 05.0	12 01		
Tue Oct 19/Wed Oct 20	3525.8	1 30 47	17 53 19 10	5 12	6 29	20 40	6 44	18 37	.....	97	3 03.5	15 16		
Wed Oct 20/Thu Oct 21	3526.8	1 34 44	17 52 19 09	5 13	6 30	20 43	6 49	19 26	.....	92	4 01.9	17 29		
Thu Oct 21/Fri Oct 22	3527.8	1 38 40	17 51 19 08	5 14	6 31	20 46	6 53	20 17	.....	85	4 59.4	18 35		
Fri Oct 22/Sat Oct 23	3528.8	1 42 37	17 50 19 07	5 14	6 32	20 49	6 58	21 10	.....	76	5 55.3	18 36		
Sat Oct 23/Sun Oct 24	3529.8	1 46 33	17 49 19 06	5 15	6 32	20 52	7 03	22 04	.....	67	6 49.0	17 37		
Sun Oct 24/Mon Oct 25	3530.8	1 50 30	17 48 19 05	5 16	6 33	20 55	7 07	22 58	.....	57	7 40.3	15 47		
Mon Oct 25/Tue Oct 26	3531.8	1 54 26	17 47 19 04	5 17	6 34	20 58	7 12	23 52	.....	47	8 29.3	13 17		
Tue Oct 26/Wed Oct 27	3532.8	1 58 23	17 46 19 04	5 17	6 35	21 01	7 16	0 45	.....	38	9 16.4	10 15		
Wed Oct 27/Thu Oct 28	3533.8	2 02 20	17 45 19 03	5 18	6 36	21 04	7 21	1 38	.....	29	10 02.0	6 50		
Thu Oct 28/Fri Oct 29	3534.8	2 06 16	17 44 19 02	5 19	6 36	21 07	7 26	2 30	.....	21	10 46.8	3 09		
Fri Oct 29/Sat Oct 30	3535.8	2 10 13	17 43 19 01	5 19	6 37	21 10	7 30	3 23	.....	14	11 31.4	- 0 41		
Sat Oct 30/Sun Oct 31	3536.8	2 14 09	17 42 19 00	5 20	6 38	21 14	7 35	4 16	.....	8	12 16.4	- 4 31		
Sun Oct 31/Mon Nov 01	3537.8	2 18 06	17 42 18 59	5 21	6 39	21 17	7 40	5 10	16 17	4	13 02.4	- 8 15		

***** 2032 NOVEMBER *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8

Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.

Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: ----- set twi.end twi.beg rise				LST twilight: eve morn		----- Moon: ----- rise set %illum RA Dec					
Mon Nov 01/Tue Nov 02	3538.8	2 22 02	17 41	18 59	5 22	6 40	21 20	7 44	6 06	16 52	1	13	50.0	-11 42
Tue Nov 02/Wed Nov 03	3539.8	2 25 59	17 40	18 58	5 22	6 41	21 23	7 49	7 02	17 30	0	14	39.5	-14 43
Wed Nov 03/Thu Nov 04	3540.8	2 29 55	17 39	18 57	5 23	6 41	21 26	7 54	8 00	18 12	1	15	31.0	-17 06
Thu Nov 04/Fri Nov 05	3541.8	2 33 52	17 38	18 57	5 24	6 42	21 30	7 58	.....	18 59	4	16	24.6	-18 41
Fri Nov 05/Sat Nov 06	3542.8	2 37 49	17 37	18 56	5 24	6 43	21 33	8 03	.....	19 50	10	17	19.8	-19 20
Sat Nov 06/Sun Nov 07	3543.8	2 41 45	17 37	18 55	5 25	6 44	21 36	8 08	.....	20 45	17	18	15.9	-18 57
Sun Nov 07/Mon Nov 08	3544.8	2 45 42	17 36	18 55	5 26	6 45	21 40	8 12	.....	21 44	26	19	12.4	-17 30
Mon Nov 08/Tue Nov 09	3545.8	2 49 38	17 35	18 54	5 27	6 46	21 43	8 17	.....	22 46	36	20	08.6	-15 03
Tue Nov 09/Wed Nov 10	3546.8	2 53 35	17 35	18 54	5 27	6 46	21 46	8 22	.....	23 49	47	21	04.1	-11 43
Wed Nov 10/Thu Nov 11	3547.8	2 57 31	17 34	18 53	5 28	6 47	21 50	8 27	.....	0 53	58	21	59.0	- 7 42
Thu Nov 11/Fri Nov 12	3548.8	3 01 28	17 33	18 53	5 29	6 48	21 53	8 31	.....	1 57	70	22	53.6	- 3 11
Fri Nov 12/Sat Nov 13	3549.8	3 05 24	17 33	18 52	5 30	6 49	21 57	8 36	.....	3 02	80	23	48.3	1 31
Sat Nov 13/Sun Nov 14	3550.8	3 09 21	17 32	18 52	5 30	6 50	22 00	8 41	.....	4 08	88	0	43.7	6 10
Sun Nov 14/Mon Nov 15	3551.8	3 13 18	17 32	18 51	5 31	6 51	22 04	8 45	.....	5 13	95	1	40.0	10 26
Mon Nov 15/Tue Nov 16	3552.8	3 17 14	17 31	18 51	5 32	6 52	22 07	8 50	16 26	6 18	99	2	37.5	14 03
Tue Nov 16/Wed Nov 17	3553.8	3 21 11	17 31	18 50	5 33	6 53	22 11	8 55	17 13	7 21	100	3	35.7	16 44
Wed Nov 17/Thu Nov 18	3554.8	3 25 07	17 30	18 50	5 33	6 53	22 14	8 59	18 03	.....	99	4	34.0	18 22
Thu Nov 18/Fri Nov 19	3555.8	3 29 04	17 30	18 50	5 34	6 54	22 18	9 04	18 56	.....	95	5	31.5	18 51
Fri Nov 19/Sat Nov 20	3556.8	3 33 00	17 29	18 49	5 35	6 55	22 22	9 09	19 50	.....	89	6	27.4	18 15
Sat Nov 20/Sun Nov 21	3557.8	3 36 57	17 29	18 49	5 36	6 56	22 25	9 14	20 46	.....	82	7	20.9	16 43
Sun Nov 21/Mon Nov 22	3558.8	3 40 53	17 29	18 49	5 36	6 57	22 29	9 18	21 41	.....	74	8	12.0	14 24
Mon Nov 22/Tue Nov 23	3559.8	3 44 50	17 28	18 49	5 37	6 58	22 33	9 23	22 35	.....	65	9	00.6	11 29
Tue Nov 23/Wed Nov 24	3560.8	3 48 47	17 28	18 49	5 38	6 59	22 37	9 28	23 28	.....	55	9	47.3	8 08
Wed Nov 24/Thu Nov 25	3561.8	3 52 43	17 28	18 48	5 39	6 59	22 40	9 32	0 21	.....	46	10	32.7	4 30
Thu Nov 25/Fri Nov 26	3562.8	3 56 40	17 28	18 48	5 39	7 00	22 44	9 37	1 13	.....	37	11	17.4	0 41
Fri Nov 26/Sat Nov 27	3563.8	4 00 36	17 27	18 48	5 40	7 01	22 48	9 42	2 06	.....	28	12	02.2	- 3 10
Sat Nov 27/Sun Nov 28	3564.8	4 04 33	17 27	18 48	5 41	7 02	22 52	9 46	3 00	.....	20	12	47.7	- 6 57
Sun Nov 28/Mon Nov 29	3565.8	4 08 29	17 27	18 48	5 42	7 03	22 56	9 51	3 54	.....	13	13	34.7	-10 32
Mon Nov 29/Tue Nov 30	3566.8	4 12 26	17 27	18 48	5 42	7 04	23 00	9 56	4 51	.....	7	14	23.6	-13 43
Tue Nov 30/Wed Dec 01	3567.8	4 16 22	17 27	18 48	5 43	7 04	23 04	10 00	5 48	16 06	3	15	14.8	-16 22

***** 2032 DECEMBER *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8
 Note that each line lists events of one night, spanning two calendar dates. Rise/set times are given
 in Mountain time (7 hr W), for 900 m above surroundings, in standard time all year.
 Moon coords. and illum. are for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

Date (eve/morn) (2032 at start)	JDmid (-2460000)	LMSTmidn	----- Sun: -----				LST twilight:		----- Moon: -----				
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec
Wed Dec 01/Thu Dec 02	3568.8	4 20 19	17 27	18 48	5 44	7 05	23 08	10 05	6 46	16 51	0	16 08.5	-18 16
Thu Dec 02/Fri Dec 03	3569.8	4 24 16	17 27	18 48	5 45	7 06	23 12	10 10	7 43	17 41	0	17 04.1	-19 15
Fri Dec 03/Sat Dec 04	3570.8	4 28 12	17 27	18 48	5 45	7 07	23 16	10 14	.....	18 37	2	18 01.2	-19 10
Sat Dec 04/Sun Dec 05	3571.8	4 32 09	17 27	18 48	5 46	7 08	23 20	10 19	.....	19 36	7	18 58.7	-18 00
Sun Dec 05/Mon Dec 06	3572.8	4 36 05	17 27	18 49	5 47	7 08	23 24	10 24	.....	20 38	14	19 55.9	-15 46
Mon Dec 06/Tue Dec 07	3573.8	4 40 02	17 27	18 49	5 47	7 09	23 28	10 28	.....	21 42	22	20 52.0	-12 36
Tue Dec 07/Wed Dec 08	3574.8	4 43 58	17 27	18 49	5 48	7 10	23 32	10 33	.....	22 46	32	21 47.1	- 8 43
Wed Dec 08/Thu Dec 09	3575.8	4 47 55	17 27	18 49	5 49	7 11	23 36	10 38	.....	23 50	43	22 41.1	- 4 21
Thu Dec 09/Fri Dec 10	3576.8	4 51 51	17 27	18 49	5 49	7 11	23 40	10 42	.....	0 54	55	23 34.6	0 15
Fri Dec 10/Sat Dec 11	3577.8	4 55 48	17 28	18 50	5 50	7 12	23 45	10 47	.....	1 58	66	0 28.3	4 49
Sat Dec 11/Sun Dec 12	3578.8	4 59 45	17 28	18 50	5 51	7 13	23 49	10 51	.....	3 01	76	1 22.5	9 07
Sun Dec 12/Mon Dec 13	3579.8	5 03 41	17 28	18 50	5 51	7 13	23 53	10 56	.....	4 04	85	2 17.8	12 52
Mon Dec 13/Tue Dec 14	3580.8	5 07 38	17 28	18 51	5 52	7 14	23 57	11 00	.....	5 06	92	3 14.1	15 52
Tue Dec 14/Wed Dec 15	3581.8	5 11 34	17 29	18 51	5 52	7 15	0 02	11 05	15 53	6 06	97	4 11.3	17 54
Wed Dec 15/Thu Dec 16	3582.8	5 15 31	17 29	18 51	5 53	7 15	0 06	11 09	16 44	7 03	99	5 08.5	18 51
Thu Dec 16/Fri Dec 17	3583.8	5 19 27	17 29	18 52	5 54	7 16	0 10	11 14	17 37	7 55	100	6 05.0	18 44
Fri Dec 17/Sat Dec 18	3584.8	5 23 24	17 30	18 52	5 54	7 16	0 15	11 18	18 32	.....	98	6 59.8	17 35
Sat Dec 18/Sun Dec 19	3585.8	5 27 20	17 30	18 53	5 55	7 17	0 19	11 23	19 28	.....	93	7 52.5	15 33
Sun Dec 19/Mon Dec 20	3586.8	5 31 17	17 31	18 53	5 55	7 18	0 24	11 27	20 23	.....	88	8 42.8	12 50
Mon Dec 20/Tue Dec 21	3587.8	5 35 14	17 31	18 54	5 56	7 18	0 28	11 32	21 18	.....	81	9 31.0	9 36
Tue Dec 21/Wed Dec 22	3588.8	5 39 10	17 32	18 54	5 56	7 18	0 32	11 36	22 11	.....	73	10 17.3	6 00
Wed Dec 22/Thu Dec 23	3589.8	5 43 07	17 32	18 55	5 57	7 19	0 37	11 41	23 04	.....	64	11 02.6	2 13
Thu Dec 23/Fri Dec 24	3590.8	5 47 03	17 33	18 55	5 57	7 19	0 41	11 45	23 56	.....	55	11 47.4	- 1 39
Fri Dec 24/Sat Dec 25	3591.8	5 51 00	17 33	18 56	5 57	7 20	0 46	11 49	0 48	.....	45	12 32.4	- 5 28
Sat Dec 25/Sun Dec 26	3592.8	5 54 56	17 34	18 56	5 58	7 20	0 50	11 54	1 42	.....	36	13 18.4	- 9 07
Sun Dec 26/Mon Dec 27	3593.8	5 58 53	17 35	18 57	5 58	7 21	0 55	11 58	2 37	.....	27	14 06.1	-12 28
Mon Dec 27/Tue Dec 28	3594.8	6 02 49	17 35	18 57	5 59	7 21	0 59	12 02	3 33	.....	19	14 56.0	-15 20
Tue Dec 28/Wed Dec 29	3595.8	6 06 46	17 36	18 58	5 59	7 21	1 04	12 07	4 31	.....	11	15 48.5	-17 34
Wed Dec 29/Thu Dec 30	3596.8	6 10 43	17 37	18 59	5 59	7 21	1 09	12 11	5 29	.....	6	16 43.5	-18 57
Thu Dec 30/Fri Dec 31	3597.8	6 14 39	17 37	18 59	6 00	7 22	1 13	12 15	6 26	16 22	2	17 40.6	-19 19
Fri Dec 31/Sat Jan 01	3598.8	6 18 36	17 38	19 00	6 00	7 22	1 18	12 19	7 20	17 21	0	18 39.0	-18 34