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 –¿ 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:

```
          ***** 2034 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 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 incaccurate 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 2034, 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 21	11 48	Dec 28	17 22	Jan 04	12 48	Jan 12	6 19
Jan 20	3 03	Jan 27	1 34	Feb 03	3 06	Feb 11	4 11
Feb 18	16 12	Feb 25	9 36	Mar 04	19 12	Mar 12	23 47
Mar 20	3 17	Mar 26	18 20	Apr 03	12 20	Apr 11	15 47
Apr 18	12 28	Apr 25	4 36	May 03	5 17	May 11	3 58
May 17	20 14	May 24	16 58	Jun 01	20 56	Jun 09	12 45
Jun 16	3 27	Jun 23	7 35	Jul 01	10 46	Jul 08	19 01
Jul 15	11 17	Jul 23	0 05	Jul 30	22 57	Aug 06	23 52
Aug 13	20 54	Aug 21	17 44	Aug 29	9 52	Sep 05	4 44
Sep 12	9 15	Sep 20	11 41	Sep 27	19 59	Oct 04	11 07
Oct 12	0 34	Oct 20	5 05	Oct 27	5 44	Nov 02	20 30
Nov 10	18 18	Nov 18	21 03	Nov 25	15 34	Dec 02	9 48
Dec 10	13 16	Dec 18	10 46	Dec 25	1 56	Jan 01	3 02

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Sun Jan 01/Mon Jan 02	3964.8	6 21 35	17 38	19 01	6 00	7 22	1 21	12 23	.....	5 11	91	4 28.5	17 06
Mon Jan 02/Tue Jan 03	3965.8	6 25 32	17 39	19 01	6 00	7 22	1 26	12 27	15 54	6 11	97	5 29.3	18 09
Tue Jan 03/Wed Jan 04	3966.8	6 29 28	17 40	19 02	6 01	7 22	1 31	12 31	16 52	7 07	99	6 29.6	18 01
Wed Jan 04/Thu Jan 05	3967.8	6 33 25	17 41	19 03	6 01	7 23	1 35	12 35	17 51	7 58	100	7 28.5	16 44
Thu Jan 05/Fri Jan 06	3968.8	6 37 21	17 42	19 03	6 01	7 23	1 40	12 39	18 52	.....	97	8 24.9	14 30
Fri Jan 06/Sat Jan 07	3969.8	6 41 18	17 42	19 04	6 01	7 23	1 44	12 43	19 51	.....	93	9 18.6	11 31
Sat Jan 07/Sun Jan 08	3970.8	6 45 14	17 43	19 05	6 01	7 23	1 49	12 47	20 49	.....	86	10 09.5	8 03
Sun Jan 08/Mon Jan 09	3971.8	6 49 11	17 44	19 05	6 01	7 23	1 54	12 51	21 45	.....	79	10 58.0	4 18
Mon Jan 09/Tue Jan 10	3972.8	6 53 07	17 45	19 06	6 01	7 23	1 59	12 55	22 39	.....	70	11 44.8	0 27
Tue Jan 10/Wed Jan 11	3973.8	6 57 04	17 46	19 07	6 01	7 23	2 03	12 59	23 32	.....	61	12 30.7	- 3 20
Wed Jan 11/Thu Jan 12	3974.8	7 01 00	17 46	19 08	6 01	7 23	2 08	13 03	0 25	.....	52	13 16.1	- 6 57
Thu Jan 12/Fri Jan 13	3975.8	7 04 57	17 47	19 08	6 01	7 22	2 13	13 07	1 17	.....	42	14 01.9	-10 17
Fri Jan 13/Sat Jan 14	3976.8	7 08 54	17 48	19 09	6 01	7 22	2 17	13 11	2 10	.....	33	14 48.6	-13 13
Sat Jan 14/Sun Jan 15	3977.8	7 12 50	17 49	19 10	6 01	7 22	2 22	13 15	3 03	.....	25	15 36.7	-15 38
Sun Jan 15/Mon Jan 16	3978.8	7 16 47	17 50	19 11	6 01	7 22	2 27	13 19	3 56	.....	17	16 26.4	-17 25
Mon Jan 16/Tue Jan 17	3979.8	7 20 43	17 51	19 12	6 01	7 22	2 32	13 23	4 48	.....	10	17 17.7	-18 26
Tue Jan 17/Wed Jan 18	3980.8	7 24 40	17 52	19 12	6 01	7 21	2 36	13 27	5 40	.....	5	18 10.6	-18 36
Wed Jan 18/Thu Jan 19	3981.8	7 28 36	17 53	19 13	6 01	7 21	2 41	13 30	6 30	16 38	2	19 04.6	-17 51
Thu Jan 19/Fri Jan 20	3982.8	7 32 33	17 54	19 14	6 01	7 21	2 46	13 34	7 17	17 35	0	19 59.0	-16 08
Fri Jan 20/Sat Jan 21	3983.8	7 36 29	17 54	19 15	6 00	7 20	2 50	13 38	8 02	18 35	1	20 53.4	-13 33
Sat Jan 21/Sun Jan 22	3984.8	7 40 26	17 55	19 16	6 00	7 20	2 55	13 41	.....	19 37	4	21 47.5	-10 11
Sun Jan 22/Mon Jan 23	3985.8	7 44 23	17 56	19 16	6 00	7 20	3 00	13 45	.....	20 40	10	22 41.1	- 6 15
Mon Jan 23/Tue Jan 24	3986.8	7 48 19	17 57	19 17	5 59	7 19	3 05	13 49	.....	21 43	17	23 34.5	- 1 57
Tue Jan 24/Wed Jan 25	3987.8	7 52 16	17 58	19 18	5 59	7 19	3 09	13 52	.....	22 47	27	0 28.0	2 29
Wed Jan 25/Thu Jan 26	3988.8	7 56 12	17 59	19 19	5 59	7 18	3 14	13 56	.....	23 51	37	1 22.1	6 46
Thu Jan 26/Fri Jan 27	3989.8	8 00 09	18 00	19 20	5 58	7 18	3 19	14 00	.....	0 55	48	2 17.2	10 39
Fri Jan 27/Sat Jan 28	3990.8	8 04 05	18 01	19 20	5 58	7 17	3 24	14 03	.....	1 59	60	3 13.6	13 55
Sat Jan 28/Sun Jan 29	3991.8	8 08 02	18 02	19 21	5 58	7 17	3 28	14 07	.....	3 01	71	4 11.3	16 21
Sun Jan 29/Mon Jan 30	3992.8	8 11 58	18 03	19 22	5 57	7 16	3 33	14 10	.....	4 01	80	5 09.9	17 45
Mon Jan 30/Tue Jan 31	3993.8	8 15 55	18 04	19 23	5 57	7 16	3 38	14 13	.....	4 57	88	6 08.7	18 03
Tue Jan 31/Wed Feb 01	3994.8	8 19 52	18 05	19 23	5 56	7 15	3 43	14 17	.....	5 49	95	7 06.7	17 14

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Wed Feb 01/Thu Feb 02	3995.8	8 23 48	18 05	19 24	5 56	7 14	3 47	14 20	16 38	6 36	98	8 03.1	15 26
Thu Feb 02/Fri Feb 03	3996.8	8 27 45	18 06	19 25	5 55	7 14	3 52	14 24	17 37	7 19	100	8 57.5	12 47
Fri Feb 03/Sat Feb 04	3997.8	8 31 41	18 07	19 26	5 54	7 13	3 57	14 27	18 35	7 58	99	9 49.5	9 32
Sat Feb 04/Sun Feb 05	3998.8	8 35 38	18 08	19 27	5 54	7 12	4 02	14 30	19 32	.....	96	10 39.4	5 53
Sun Feb 05/Mon Feb 06	3999.8	8 39 34	18 09	19 27	5 53	7 11	4 06	14 34	20 28	.....	91	11 27.4	2 02
Mon Feb 06/Tue Feb 07	4000.8	8 43 31	18 10	19 28	5 52	7 11	4 11	14 37	21 22	.....	85	12 14.2	- 1 49
Tue Feb 07/Wed Feb 08	4001.8	8 47 27	18 11	19 29	5 52	7 10	4 16	14 40	22 15	.....	78	13 00.4	- 5 33
Wed Feb 08/Thu Feb 09	4002.8	8 51 24	18 12	19 30	5 51	7 09	4 20	14 43	23 07	.....	69	13 46.5	- 9 01
Thu Feb 09/Fri Feb 10	4003.8	8 55 21	18 13	19 31	5 50	7 08	4 25	14 47	24 00	.....	60	14 33.0	-12 06
Fri Feb 10/Sat Feb 11	4004.8	8 59 17	18 13	19 31	5 50	7 07	4 30	14 50	0 52	.....	51	15 20.5	-14 43
Sat Feb 11/Sun Feb 12	4005.8	9 03 14	18 14	19 32	5 49	7 06	4 35	14 53	1 44	.....	41	16 09.3	-16 44
Sun Feb 12/Mon Feb 13	4006.8	9 07 10	18 15	19 33	5 48	7 05	4 39	14 56	2 36	.....	32	16 59.6	-18 03
Mon Feb 13/Tue Feb 14	4007.8	9 11 07	18 16	19 34	5 47	7 05	4 44	14 59	3 28	.....	23	17 51.4	-18 33
Tue Feb 14/Wed Feb 15	4008.8	9 15 03	18 17	19 34	5 46	7 04	4 49	15 02	4 18	.....	15	18 44.5	-18 11
Wed Feb 15/Thu Feb 16	4009.8	9 19 00	18 18	19 35	5 45	7 03	4 53	15 05	5 07	.....	9	19 38.7	-16 52
Thu Feb 16/Fri Feb 17	4010.8	9 22 56	18 19	19 36	5 44	7 02	4 58	15 08	5 53	16 18	4	20 33.4	-14 38
Fri Feb 17/Sat Feb 18	4011.8	9 26 53	18 19	19 37	5 44	7 01	5 03	15 11	6 38	17 20	1	21 28.2	-11 33
Sat Feb 18/Sun Feb 19	4012.8	9 30 50	18 20	19 37	5 43	7 00	5 07	15 14	7 20	18 24	0	22 23.1	- 7 46
Sun Feb 19/Mon Feb 20	4013.8	9 34 46	18 21	19 38	5 42	6 59	5 12	15 17	.....	19 29	2	23 17.8	- 3 30
Mon Feb 20/Tue Feb 21	4014.8	9 38 43	18 22	19 39	5 41	6 58	5 17	15 20	.....	20 35	7	0 12.7	0 59
Tue Feb 21/Wed Feb 22	4015.8	9 42 39	18 23	19 40	5 40	6 57	5 22	15 23	.....	21 41	14	1 07.9	5 25
Wed Feb 22/Thu Feb 23	4016.8	9 46 36	18 23	19 40	5 39	6 55	5 26	15 26	.....	22 46	23	2 03.8	9 30
Thu Feb 23/Fri Feb 24	4017.8	9 50 32	18 24	19 41	5 38	6 54	5 31	15 29	.....	23 51	34	3 00.5	12 58
Fri Feb 24/Sat Feb 25	4018.8	9 54 29	18 25	19 42	5 37	6 53	5 36	15 32	.....	0 55	45	3 58.0	15 36
Sat Feb 25/Sun Feb 26	4019.8	9 58 25	18 26	19 43	5 36	6 52	5 40	15 35	.....	1 56	56	4 56.0	17 15
Sun Feb 26/Mon Feb 27	4020.8	10 02 22	18 27	19 43	5 34	6 51	5 45	15 38	.....	2 52	67	5 53.8	17 50
Mon Feb 27/Tue Feb 28	4021.8	10 06 19	18 27	19 44	5 33	6 50	5 50	15 41	.....	3 45	77	6 50.9	17 21
Tue Feb 28/Wed Mar 01	4022.8	10 10 15	18 28	19 45	5 32	6 49	5 54	15 43	.....	4 33	85	7 46.6	15 53

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Wed Mar 01/Thu Mar 02	4023.8	10 14 12	18 29	19 46	5 31	6 48	5 59	15 46	.....	5 16	92	8 40.4	13 33
Thu Mar 02/Fri Mar 03	4024.8	10 18 08	18 30	19 46	5 30	6 46	6 04	15 49	16 26	5 56	97	9 32.3	10 33
Fri Mar 03/Sat Mar 04	4025.8	10 22 05	18 30	19 47	5 29	6 45	6 08	15 52	17 22	6 33	99	10 22.3	7 05
Sat Mar 04/Sun Mar 05	4026.8	10 26 01	18 31	19 48	5 28	6 44	6 13	15 55	18 18	7 08	100	11 10.7	3 20
Sun Mar 05/Mon Mar 06	4027.8	10 29 58	18 32	19 49	5 26	6 43	6 18	15 57	19 12	.....	99	11 58.0	- 0 31
Mon Mar 06/Tue Mar 07	4028.8	10 33 54	18 33	19 49	5 25	6 42	6 22	16 00	20 06	.....	95	12 44.6	- 4 18
Tue Mar 07/Wed Mar 08	4029.8	10 37 51	18 33	19 50	5 24	6 40	6 27	16 03	20 59	.....	90	13 31.0	- 7 53
Wed Mar 08/Thu Mar 09	4030.8	10 41 48	18 34	19 51	5 23	6 39	6 32	16 05	21 51	.....	84	14 17.7	-11 07
Thu Mar 09/Fri Mar 10	4031.8	10 45 44	18 35	19 51	5 22	6 38	6 37	16 08	22 43	.....	76	15 05.0	-13 54
Fri Mar 10/Sat Mar 11	4032.8	10 49 41	18 36	19 52	5 20	6 37	6 41	16 11	23 35	.....	68	15 53.3	-16 07
Sat Mar 11/Sun Mar 12	4033.8	10 53 37	18 36	19 53	5 19	6 36	6 46	16 13	0 27	.....	59	16 42.7	-17 40
Sun Mar 12/Mon Mar 13	4034.8	10 57 34	18 37	19 54	5 18	6 34	6 51	16 16	1 18	.....	49	17 33.4	-18 28
Mon Mar 13/Tue Mar 14	4035.8	11 01 30	18 38	19 54	5 16	6 33	6 55	16 19	2 07	.....	39	18 25.3	-18 25
Tue Mar 14/Wed Mar 15	4036.8	11 05 27	18 38	19 55	5 15	6 32	7 00	16 21	2 56	.....	30	19 18.2	-17 29
Wed Mar 15/Thu Mar 16	4037.8	11 09 23	18 39	19 56	5 14	6 30	7 05	16 24	3 42	.....	21	20 11.8	-15 39
Thu Mar 16/Fri Mar 17	4038.8	11 13 20	18 40	19 57	5 12	6 29	7 09	16 27	4 27	.....	13	21 06.0	-12 57
Fri Mar 17/Sat Mar 18	4039.8	11 17 17	18 41	19 57	5 11	6 28	7 14	16 29	5 10	.....	6	22 00.6	- 9 29
Sat Mar 18/Sun Mar 19	4040.8	11 21 13	18 41	19 58	5 10	6 27	7 19	16 32	5 53	17 07	2	22 55.5	- 5 24
Sun Mar 19/Mon Mar 20	4041.8	11 25 10	18 42	19 59	5 08	6 25	7 23	16 34	6 35	18 13	0	23 51.0	- 0 56
Mon Mar 20/Tue Mar 21	4042.8	11 29 06	18 43	20 00	5 07	6 24	7 28	16 37	7 18	19 21	1	0 47.3	3 38
Tue Mar 21/Wed Mar 22	4043.8	11 33 03	18 43	20 00	5 06	6 23	7 33	16 40	.....	20 29	5	1 44.4	7 58
Wed Mar 22/Thu Mar 23	4044.8	11 36 59	18 44	20 01	5 04	6 22	7 38	16 42	.....	21 37	11	2 42.6	11 46
Thu Mar 23/Fri Mar 24	4045.8	11 40 56	18 45	20 02	5 03	6 20	7 42	16 45	.....	22 44	20	3 41.5	14 45
Fri Mar 24/Sat Mar 25	4046.8	11 44 52	18 45	20 03	5 02	6 19	7 47	16 47	.....	23 48	30	4 40.7	16 44
Sat Mar 25/Sun Mar 26	4047.8	11 48 49	18 46	20 04	5 00	6 18	7 52	16 50	.....	0 47	41	5 39.5	17 37
Sun Mar 26/Mon Mar 27	4048.8	11 52 46	18 47	20 04	4 59	6 16	7 56	16 52	.....	1 42	52	6 37.1	17 24
Mon Mar 27/Tue Mar 28	4049.8	11 56 42	18 47	20 05	4 57	6 15	8 01	16 55	.....	2 31	63	7 33.1	16 10
Tue Mar 28/Wed Mar 29	4050.8	12 00 39	18 48	20 06	4 56	6 14	8 06	16 57	.....	3 16	73	8 26.9	14 04
Wed Mar 29/Thu Mar 30	4051.8	12 04 35	18 49	20 07	4 55	6 13	8 11	17 00	.....	3 56	81	9 18.6	11 16
Thu Mar 30/Fri Mar 31	4052.8	12 08 32	18 49	20 08	4 53	6 11	8 15	17 03	.....	4 33	89	10 08.3	7 58
Fri Mar 31/Sat Apr 01	4053.8	12 12 28	18 50	20 08	4 52	6 10	8 20	17 05	.....	5 08	94	10 56.5	4 20

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Sat Apr 01/Sun Apr 02	4054.8	12 16 25	18 51	20 09	4 50	6 09	8 25	17 08	17 06	5 42	98	11 43.6	0 32
Sun Apr 02/Mon Apr 03	4055.8	12 20 21	18 52	20 10	4 49	6 07	8 30	17 10	18 00	6 15	100	12 30.2	- 3 16
Mon Apr 03/Tue Apr 04	4056.8	12 24 18	18 52	20 11	4 48	6 06	8 35	17 13	18 52	6 49	100	13 16.5	- 6 55
Tue Apr 04/Wed Apr 05	4057.8	12 28 15	18 53	20 12	4 46	6 05	8 39	17 15	19 45	.....	98	14 03.2	-10 17
Wed Apr 05/Thu Apr 06	4058.8	12 32 11	18 54	20 13	4 45	6 04	8 44	17 18	20 37	.....	94	14 50.5	-13 14
Thu Apr 06/Fri Apr 07	4059.8	12 36 08	18 54	20 13	4 43	6 02	8 49	17 20	21 29	.....	89	15 38.7	-15 39
Fri Apr 07/Sat Apr 08	4060.8	12 40 04	18 55	20 14	4 42	6 01	8 54	17 23	22 21	.....	82	16 28.0	-17 25
Sat Apr 08/Sun Apr 09	4061.8	12 44 01	18 56	20 15	4 40	6 00	8 59	17 25	23 12	.....	75	17 18.2	-18 27
Sun Apr 09/Mon Apr 10	4062.8	12 47 57	18 56	20 16	4 39	5 59	9 03	17 28	0 01	.....	66	18 09.3	-18 40
Mon Apr 10/Tue Apr 11	4063.8	12 51 54	18 57	20 17	4 38	5 58	9 08	17 30	0 49	.....	56	19 01.2	-18 02
Tue Apr 11/Wed Apr 12	4064.8	12 55 50	18 58	20 18	4 36	5 56	9 13	17 33	1 35	.....	46	19 53.5	-16 32
Wed Apr 12/Thu Apr 13	4065.8	12 59 47	18 58	20 19	4 35	5 55	9 18	17 35	2 19	.....	36	20 46.3	-14 11
Thu Apr 13/Fri Apr 14	4066.8	13 03 44	18 59	20 20	4 33	5 54	9 23	17 38	3 01	.....	26	21 39.4	-11 03
Fri Apr 14/Sat Apr 15	4067.8	13 07 40	19 00	20 20	4 32	5 53	9 28	17 41	3 43	.....	17	22 33.1	- 7 16
Sat Apr 15/Sun Apr 16	4068.8	13 11 37	19 00	20 21	4 31	5 52	9 32	17 43	4 24	.....	9	23 27.5	- 2 59
Sun Apr 16/Mon Apr 17	4069.8	13 15 33	19 01	20 22	4 29	5 50	9 37	17 46	5 07	.....	3	0 23.0	1 33
Mon Apr 17/Tue Apr 18	4070.8	13 19 30	19 02	20 23	4 28	5 49	9 42	17 48	5 51	18 05	0	1 20.0	6 03
Tue Apr 18/Wed Apr 19	4071.8	13 23 26	19 03	20 24	4 27	5 48	9 47	17 51	6 37	19 14	0	2 18.5	10 11
Wed Apr 19/Thu Apr 20	4072.8	13 27 23	19 03	20 25	4 25	5 47	9 52	17 53	.....	20 23	3	3 18.4	13 37
Thu Apr 20/Fri Apr 21	4073.8	13 31 19	19 04	20 26	4 24	5 46	9 57	17 56	.....	21 31	9	4 19.2	16 04
Fri Apr 21/Sat Apr 22	4074.8	13 35 16	19 05	20 27	4 23	5 45	10 02	17 59	.....	22 35	17	5 20.0	17 23
Sat Apr 22/Sun Apr 23	4075.8	13 39 13	19 05	20 28	4 21	5 44	10 07	18 01	.....	23 34	26	6 19.8	17 32
Sun Apr 23/Mon Apr 24	4076.8	13 43 09	19 06	20 29	4 20	5 43	10 11	18 04	.....	0 27	37	7 17.6	16 34
Mon Apr 24/Tue Apr 25	4077.8	13 47 06	19 07	20 30	4 19	5 42	10 16	18 06	.....	1 14	47	8 12.9	14 40
Tue Apr 25/Wed Apr 26	4078.8	13 51 02	19 08	20 31	4 17	5 41	10 21	18 09	.....	1 57	58	9 05.5	12 01
Wed Apr 26/Thu Apr 27	4079.8	13 54 59	19 08	20 32	4 16	5 40	10 26	18 12	.....	2 35	68	9 55.8	8 49
Thu Apr 27/Fri Apr 28	4080.8	13 58 55	19 09	20 33	4 15	5 39	10 31	18 14	.....	3 10	77	10 44.1	5 15
Fri Apr 28/Sat Apr 29	4081.8	14 02 52	19 10	20 34	4 13	5 38	10 36	18 17	.....	3 44	85	11 31.1	1 30
Sat Apr 29/Sun Apr 30	4082.8	14 06 48	19 10	20 35	4 12	5 37	10 41	18 20	.....	4 17	91	12 17.3	- 2 18
Sun Apr 30/Mon May 01	4083.8	14 10 45	19 11	20 36	4 11	5 36	10 46	18 22	.....	4 51	96	13 03.4	- 6 00

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Mon May 01/Tue May 02	4084.8	14 14 42	19 12	20 37	4 10	5 35	10 51	18 25	17 40	5 25	99	13 49.8	- 9 29
Tue May 02/Wed May 03	4085.8	14 18 38	19 13	20 38	4 09	5 34	10 56	18 28	18 33	6 01	100	14 36.9	-12 35
Wed May 03/Thu May 04	4086.8	14 22 35	19 13	20 39	4 07	5 33	11 01	18 31	19 25	6 39	99	15 25.0	-15 12
Thu May 04/Fri May 05	4087.8	14 26 31	19 14	20 40	4 06	5 32	11 06	18 33	20 17	.....	97	16 14.2	-17 11
Fri May 05/Sat May 06	4088.8	14 30 28	19 15	20 41	4 05	5 31	11 11	18 36	21 08	.....	93	17 04.5	-18 27
Sat May 06/Sun May 07	4089.8	14 34 24	19 15	20 42	4 04	5 30	11 16	18 39	21 58	.....	87	17 55.6	-18 55
Sun May 07/Mon May 08	4090.8	14 38 21	19 16	20 43	4 03	5 29	11 21	18 42	22 46	.....	80	18 47.3	-18 31
Mon May 08/Tue May 09	4091.8	14 42 17	19 17	20 44	4 02	5 29	11 26	18 45	23 32	.....	71	19 39.3	-17 16
Tue May 09/Wed May 10	4092.8	14 46 14	19 18	20 45	4 01	5 28	11 30	18 47	0 16	.....	62	20 31.3	-15 11
Wed May 10/Thu May 11	4093.8	14 50 11	19 18	20 46	4 00	5 27	11 35	18 50	0 57	.....	51	21 23.3	-12 20
Thu May 11/Fri May 12	4094.8	14 54 07	19 19	20 47	3 59	5 26	11 40	18 53	1 38	.....	41	22 15.4	- 8 50
Fri May 12/Sat May 13	4095.8	14 58 04	19 20	20 48	3 57	5 25	11 45	18 56	2 18	.....	30	23 08.0	- 4 47
Sat May 13/Sun May 14	4096.8	15 02 00	19 20	20 49	3 56	5 25	11 50	18 59	2 58	.....	20	0 01.6	- 0 25
Sun May 14/Mon May 15	4097.8	15 05 57	19 21	20 50	3 56	5 24	11 55	19 02	3 40	.....	12	0 56.6	4 04
Mon May 15/Tue May 16	4098.8	15 09 53	19 22	20 51	3 55	5 23	12 00	19 05	4 24	.....	5	1 53.5	8 22
Tue May 16/Wed May 17	4099.8	15 13 50	19 23	20 52	3 54	5 23	12 05	19 08	5 12	17 58	1	2 52.5	12 09
Wed May 17/Thu May 18	4100.8	15 17 46	19 23	20 53	3 53	5 22	12 10	19 11	6 05	19 07	0	3 53.3	15 06
Thu May 18/Fri May 19	4101.8	15 21 43	19 24	20 54	3 52	5 22	12 15	19 14	.....	20 15	2	4 55.1	16 59
Fri May 19/Sat May 20	4102.8	15 25 40	19 25	20 55	3 51	5 21	12 20	19 17	.....	21 18	7	5 56.7	17 38
Sat May 20/Sun May 21	4103.8	15 29 36	19 25	20 56	3 50	5 20	12 25	19 20	.....	22 16	14	6 56.9	17 06
Sun May 21/Mon May 22	4104.8	15 33 33	19 26	20 56	3 49	5 20	12 30	19 24	.....	23 08	22	7 54.6	15 29
Mon May 22/Tue May 23	4105.8	15 37 29	19 27	20 57	3 49	5 19	12 34	19 27	.....	23 54	32	8 49.5	13 00
Tue May 23/Wed May 24	4106.8	15 41 26	19 27	20 58	3 48	5 19	12 39	19 30	.....	0 35	42	9 41.4	9 54
Wed May 24/Thu May 25	4107.8	15 45 22	19 28	20 59	3 47	5 19	12 44	19 33	.....	1 12	52	10 30.9	6 23
Thu May 25/Fri May 26	4108.8	15 49 19	19 29	21 00	3 47	5 18	12 49	19 37	.....	1 46	62	11 18.4	2 38
Fri May 26/Sat May 27	4109.8	15 53 15	19 29	21 01	3 46	5 18	12 54	19 40	.....	2 20	72	12 04.8	- 1 12
Sat May 27/Sun May 28	4110.8	15 57 12	19 30	21 02	3 45	5 17	12 59	19 43	.....	2 53	80	12 50.7	- 4 57
Sun May 28/Mon May 29	4111.8	16 01 09	19 30	21 03	3 45	5 17	13 03	19 47	.....	3 26	87	13 36.7	- 8 31
Mon May 29/Tue May 30	4112.8	16 05 05	19 31	21 04	3 44	5 17	13 08	19 50	.....	4 02	93	14 23.4	-11 46
Tue May 30/Wed May 31	4113.8	16 09 02	19 32	21 04	3 44	5 16	13 13	19 53	.....	4 39	97	15 11.1	-14 34
Wed May 31/Thu Jun 01	4114.8	16 12 58	19 32	21 05	3 43	5 16	13 18	19 57	18 12	5 19	99	16 00.1	-16 47

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Thu Jun 01/Fri Jun 02	4115.8	16 16 55	19 33	21 06	3 43	5 16	13 22	20 00	19 04	6 03	100	16 50.5	-18 19
Fri Jun 02/Sat Jun 03	4116.8	16 20 51	19 33	21 07	3 42	5 16	13 27	20 04	19 55	.....	99	17 41.9	-19 03
Sat Jun 03/Sun Jun 04	4117.8	16 24 48	19 34	21 07	3 42	5 15	13 32	20 07	20 44	.....	95	18 34.0	-18 55
Sun Jun 04/Mon Jun 05	4118.8	16 28 44	19 34	21 08	3 42	5 15	13 36	20 11	21 31	.....	90	19 26.4	-17 54
Mon Jun 05/Tue Jun 06	4119.8	16 32 41	19 35	21 09	3 41	5 15	13 41	20 15	22 16	.....	84	20 18.7	-16 02
Tue Jun 06/Wed Jun 07	4120.8	16 36 38	19 35	21 09	3 41	5 15	13 46	20 18	22 58	.....	75	21 10.7	-13 23
Wed Jun 07/Thu Jun 08	4121.8	16 40 34	19 36	21 10	3 41	5 15	13 50	20 22	23 38	.....	66	22 02.4	-10 04
Thu Jun 08/Fri Jun 09	4122.8	16 44 31	19 36	21 11	3 41	5 15	13 55	20 26	0 17	.....	55	22 54.1	- 6 12
Fri Jun 09/Sat Jun 10	4123.8	16 48 27	19 37	21 11	3 40	5 15	13 59	20 29	0 56	.....	44	23 46.1	- 1 59
Sat Jun 10/Sun Jun 11	4124.8	16 52 24	19 37	21 12	3 40	5 15	14 04	20 33	1 35	.....	33	0 39.1	2 24
Sun Jun 11/Mon Jun 12	4125.8	16 56 20	19 38	21 12	3 40	5 15	14 08	20 37	2 17	.....	23	1 33.7	6 42
Mon Jun 12/Tue Jun 13	4126.8	17 00 17	19 38	21 13	3 40	5 15	14 13	20 41	3 01	.....	14	2 30.4	10 39
Tue Jun 13/Wed Jun 14	4127.8	17 04 13	19 38	21 13	3 40	5 15	14 17	20 45	3 50	.....	7	3 29.1	13 56
Wed Jun 14/Thu Jun 15	4128.8	17 08 10	19 39	21 14	3 40	5 15	14 21	20 49	4 43	17 53	2	4 29.8	16 18
Thu Jun 15/Fri Jun 16	4129.8	17 12 07	19 39	21 14	3 40	5 15	14 26	20 53	5 42	18 58	0	5 31.3	17 31
Fri Jun 16/Sat Jun 17	4130.8	17 16 03	19 40	21 15	3 40	5 15	14 30	20 57	.....	20 00	1	6 32.6	17 31
Sat Jun 17/Sun Jun 18	4131.8	17 20 00	19 40	21 15	3 40	5 15	14 34	21 01	.....	20 56	5	7 32.2	16 20
Sun Jun 18/Mon Jun 19	4132.8	17 23 56	19 40	21 15	3 40	5 15	14 39	21 05	.....	21 46	11	8 29.3	14 10
Mon Jun 19/Tue Jun 20	4133.8	17 27 53	19 40	21 15	3 41	5 16	14 43	21 09	.....	22 30	18	9 23.4	11 14
Tue Jun 20/Wed Jun 21	4134.8	17 31 49	19 41	21 16	3 41	5 16	14 47	21 13	.....	23 10	27	10 14.8	7 47
Wed Jun 21/Thu Jun 22	4135.8	17 35 46	19 41	21 16	3 41	5 16	14 51	21 17	.....	23 46	37	11 03.7	4 02
Thu Jun 22/Fri Jun 23	4136.8	17 39 42	19 41	21 16	3 41	5 16	14 55	21 22	.....	0 21	46	11 50.9	0 11
Fri Jun 23/Sat Jun 24	4137.8	17 43 39	19 41	21 16	3 42	5 17	14 59	21 26	.....	0 54	56	12 37.2	- 3 39
Sat Jun 24/Sun Jun 25	4138.8	17 47 36	19 41	21 16	3 42	5 17	15 03	21 30	.....	1 28	66	13 23.1	- 7 18
Sun Jun 25/Mon Jun 26	4139.8	17 51 32	19 41	21 16	3 42	5 17	15 07	21 34	.....	2 02	74	14 09.4	-10 40
Mon Jun 26/Tue Jun 27	4140.8	17 55 29	19 41	21 16	3 43	5 18	15 11	21 39	.....	2 38	82	14 56.6	-13 38
Tue Jun 27/Wed Jun 28	4141.8	17 59 25	19 42	21 16	3 43	5 18	15 15	21 43	.....	3 17	89	15 45.0	-16 05
Wed Jun 28/Thu Jun 29	4142.8	18 03 22	19 42	21 16	3 44	5 18	15 19	21 48	.....	4 00	94	16 34.9	-17 53
Thu Jun 29/Fri Jun 30	4143.8	18 07 18	19 42	21 16	3 44	5 19	15 23	21 52	17 50	4 46	98	17 26.2	-18 55
Fri Jun 30/Sat Jul 01	4144.8	18 11 15	19 42	21 16	3 45	5 19	15 27	21 56	18 40	5 35	100	18 18.6	-19 06

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Sat Jul 01/Sun Jul 02	4145.8	18 15 11	19 42	21 16	3 45	5 20	15 31	22 01	19 29	6 28	100	19 11.7	-18 23
Sun Jul 02/Mon Jul 03	4146.8	18 19 08	19 42	21 16	3 46	5 20	15 34	22 05	20 15	.....	97	20 04.9	-16 46
Mon Jul 03/Tue Jul 04	4147.8	18 23 05	19 41	21 16	3 46	5 20	15 38	22 10	20 58	.....	93	20 57.8	-14 19
Tue Jul 04/Wed Jul 05	4148.8	18 27 01	19 41	21 15	3 47	5 21	15 42	22 15	21 40	.....	87	21 50.3	-11 08
Wed Jul 05/Thu Jul 06	4149.8	18 30 58	19 41	21 15	3 48	5 21	15 46	22 19	22 19	.....	79	22 42.4	- 7 22
Thu Jul 06/Fri Jul 07	4150.8	18 34 54	19 41	21 15	3 48	5 22	15 49	22 24	22 57	.....	69	23 34.3	- 3 14
Fri Jul 07/Sat Jul 08	4151.8	18 38 51	19 41	21 14	3 49	5 22	15 53	22 28	23 36	.....	58	0 26.6	1 06
Sat Jul 08/Sun Jul 09	4152.8	18 42 47	19 41	21 14	3 50	5 23	15 56	22 33	0 16	.....	47	1 19.9	5 23
Sun Jul 09/Mon Jul 10	4153.8	18 46 44	19 40	21 13	3 50	5 23	16 00	22 38	0 57	.....	36	2 14.6	9 24
Mon Jul 10/Tue Jul 11	4154.8	18 50 40	19 40	21 13	3 51	5 24	16 03	22 42	1 43	.....	25	3 11.2	12 51
Tue Jul 11/Wed Jul 12	4155.8	18 54 37	19 40	21 13	3 52	5 25	16 07	22 47	2 32	.....	16	4 09.7	15 31
Wed Jul 12/Thu Jul 13	4156.8	18 58 34	19 40	21 12	3 53	5 25	16 10	22 52	3 27	.....	8	5 09.5	17 09
Thu Jul 13/Fri Jul 14	4157.8	19 02 30	19 39	21 11	3 53	5 26	16 13	22 57	4 25	17 44	3	6 09.9	17 38
Fri Jul 14/Sat Jul 15	4158.8	19 06 27	19 39	21 11	3 54	5 26	16 17	23 01	5 27	18 42	1	7 09.7	16 57
Sat Jul 15/Sun Jul 16	4159.8	19 10 23	19 38	21 10	3 55	5 27	16 20	23 06	6 29	19 34	1	8 07.7	15 12
Sun Jul 16/Mon Jul 17	4160.8	19 14 20	19 38	21 10	3 56	5 27	16 23	23 11	.....	20 22	3	9 03.3	12 34
Mon Jul 17/Tue Jul 18	4161.8	19 18 16	19 38	21 09	3 57	5 28	16 27	23 16	.....	21 04	8	9 56.2	9 17
Tue Jul 18/Wed Jul 19	4162.8	19 22 13	19 37	21 08	3 58	5 29	16 30	23 21	.....	21 43	14	10 46.7	5 37
Wed Jul 19/Thu Jul 20	4163.8	19 26 09	19 37	21 07	3 59	5 29	16 33	23 25	.....	22 19	22	11 35.1	1 45
Thu Jul 20/Fri Jul 21	4164.8	19 30 06	19 36	21 07	3 59	5 30	16 36	23 30	.....	22 53	31	12 22.1	- 2 08
Fri Jul 21/Sat Jul 22	4165.8	19 34 03	19 36	21 06	4 00	5 31	16 39	23 35	.....	23 27	40	13 08.4	- 5 53
Sat Jul 22/Sun Jul 23	4166.8	19 37 59	19 35	21 05	4 01	5 31	16 42	23 40	.....	0 02	49	13 54.6	- 9 22
Sun Jul 23/Mon Jul 24	4167.8	19 41 56	19 34	21 04	4 02	5 32	16 45	23 45	.....	0 37	59	14 41.3	-12 29
Mon Jul 24/Tue Jul 25	4168.8	19 45 52	19 34	21 03	4 03	5 32	16 49	23 50	.....	1 15	68	15 29.0	-15 07
Tue Jul 25/Wed Jul 26	4169.8	19 49 49	19 33	21 02	4 04	5 33	16 52	23 54	.....	1 56	77	16 18.0	-17 10
Wed Jul 26/Thu Jul 27	4170.8	19 53 45	19 32	21 01	4 05	5 34	16 55	23 59	.....	2 40	84	17 08.5	-18 30
Thu Jul 27/Fri Jul 28	4171.8	19 57 42	19 32	21 00	4 06	5 34	16 58	0 04	.....	3 28	91	18 00.4	-19 01
Fri Jul 28/Sat Jul 29	4172.8	20 01 38	19 31	20 59	4 07	5 35	17 00	0 09	.....	4 20	96	18 53.5	-18 40
Sat Jul 29/Sun Jul 30	4173.8	20 05 35	19 30	20 58	4 08	5 36	17 03	0 14	18 10	5 15	99	19 47.2	-17 22
Sun Jul 30/Mon Jul 31	4174.8	20 09 32	19 30	20 57	4 09	5 36	17 06	0 19	18 55	6 13	100	20 41.1	-15 12
Mon Jul 31/Tue Aug 01	4175.8	20 13 28	19 29	20 56	4 10	5 37	17 09	0 24	19 38	.....	99	21 34.8	-12 12

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Tue Aug 01/Wed Aug 02	4176.8	20 17 25	19 28	20 55	4 11	5 38	17 12	0 29	20 19	.....	95	22 28.2	- 8 33
Wed Aug 02/Thu Aug 03	4177.8	20 21 21	19 27	20 54	4 12	5 38	17 15	0 34	20 59	.....	89	23 21.3	- 4 26
Thu Aug 03/Fri Aug 04	4178.8	20 25 18	19 26	20 53	4 13	5 39	17 18	0 39	21 38	.....	81	0 14.4	- 0 04
Fri Aug 04/Sat Aug 05	4179.8	20 29 14	19 25	20 52	4 13	5 40	17 20	0 43	22 17	.....	72	1 08.0	4 17
Sat Aug 05/Sun Aug 06	4180.8	20 33 11	19 25	20 51	4 14	5 40	17 23	0 48	22 58	.....	61	2 02.5	8 23
Sun Aug 06/Mon Aug 07	4181.8	20 37 07	19 24	20 49	4 15	5 41	17 26	0 53	23 41	.....	49	2 58.2	11 59
Mon Aug 07/Tue Aug 08	4182.8	20 41 04	19 23	20 48	4 16	5 42	17 29	0 58	0 28	.....	38	3 55.4	14 50
Tue Aug 08/Wed Aug 09	4183.8	20 45 01	19 22	20 47	4 17	5 42	17 31	1 03	1 20	.....	27	4 53.7	16 44
Wed Aug 09/Thu Aug 10	4184.8	20 48 57	19 21	20 46	4 18	5 43	17 34	1 08	2 15	.....	18	5 52.7	17 34
Thu Aug 10/Fri Aug 11	4185.8	20 52 54	19 20	20 45	4 19	5 44	17 37	1 13	3 14	.....	10	6 51.4	17 16
Fri Aug 11/Sat Aug 12	4186.8	20 56 50	19 19	20 43	4 20	5 44	17 40	1 18	4 14	17 25	4	7 48.9	15 55
Sat Aug 12/Sun Aug 13	4187.8	21 00 47	19 18	20 42	4 21	5 45	17 42	1 22	5 16	18 14	1	8 44.6	13 37
Sun Aug 13/Mon Aug 14	4188.8	21 04 43	19 17	20 41	4 22	5 46	17 45	1 27	6 16	18 58	0	9 38.1	10 36
Mon Aug 14/Tue Aug 15	4189.8	21 08 40	19 16	20 39	4 23	5 46	17 48	1 32	.....	19 38	1	10 29.3	7 05
Tue Aug 15/Wed Aug 16	4190.8	21 12 36	19 15	20 38	4 24	5 47	17 50	1 37	.....	20 16	5	11 18.6	3 17
Wed Aug 16/Thu Aug 17	4191.8	21 16 33	19 14	20 37	4 25	5 48	17 53	1 42	.....	20 51	10	12 06.3	- 0 37
Thu Aug 17/Fri Aug 18	4192.8	21 20 30	19 13	20 35	4 26	5 48	17 55	1 47	.....	21 26	17	12 53.0	- 4 26
Fri Aug 18/Sat Aug 19	4193.8	21 24 26	19 11	20 34	4 26	5 49	17 58	1 52	.....	22 00	25	13 39.4	- 8 01
Sat Aug 19/Sun Aug 20	4194.8	21 28 23	19 10	20 33	4 27	5 50	18 00	1 56	.....	22 35	33	14 25.9	-11 16
Sun Aug 20/Mon Aug 21	4195.8	21 32 19	19 09	20 31	4 28	5 50	18 03	2 01	.....	23 12	42	15 13.0	-14 04
Mon Aug 21/Tue Aug 22	4196.8	21 36 16	19 08	20 30	4 29	5 51	18 06	2 06	.....	23 51	52	16 01.1	-16 18
Tue Aug 22/Wed Aug 23	4197.8	21 40 12	19 07	20 29	4 30	5 52	18 08	2 11	.....	0 34	61	16 50.4	-17 53
Wed Aug 23/Thu Aug 24	4198.8	21 44 09	19 06	20 27	4 31	5 52	18 11	2 16	.....	1 20	71	17 41.2	-18 43
Thu Aug 24/Fri Aug 25	4199.8	21 48 05	19 05	20 26	4 32	5 53	18 13	2 21	.....	2 09	79	18 33.2	-18 43
Fri Aug 25/Sat Aug 26	4200.8	21 52 02	19 03	20 24	4 33	5 54	18 16	2 25	.....	3 03	87	19 26.3	-17 49
Sat Aug 26/Sun Aug 27	4201.8	21 55 59	19 02	20 23	4 33	5 54	18 18	2 30	.....	4 00	93	20 20.1	-16 01
Sun Aug 27/Mon Aug 28	4202.8	21 59 55	19 01	20 21	4 34	5 55	18 21	2 35	17 32	4 59	97	21 14.2	-13 20
Mon Aug 28/Tue Aug 29	4203.8	22 03 52	19 00	20 20	4 35	5 55	18 23	2 40	18 14	6 00	100	22 08.5	- 9 53
Tue Aug 29/Wed Aug 30	4204.8	22 07 48	18 58	20 19	4 36	5 56	18 26	2 44	18 55	.....	100	23 02.9	- 5 51
Wed Aug 30/Thu Aug 31	4205.8	22 11 45	18 57	20 17	4 37	5 57	18 28	2 49	19 36	.....	97	23 57.5	- 1 27
Thu Aug 31/Fri Sep 01	4206.8	22 15 41	18 56	20 16	4 38	5 57	18 31	2 54	20 16	.....	91	0 52.5	3 03

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Fri Sep 01/Sat Sep 02	4207.8	22 19 38	18 55	20 14	4 38	5 58	18 33	2 59	20 57	.....	83	1 48.2	7 21
Sat Sep 02/Sun Sep 03	4208.8	22 23 34	18 53	20 13	4 39	5 59	18 36	3 03	21 41	.....	74	2 44.9	11 10
Sun Sep 03/Mon Sep 04	4209.8	22 27 31	18 52	20 11	4 40	5 59	18 38	3 08	22 27	.....	63	3 42.6	14 15
Mon Sep 04/Tue Sep 05	4210.8	22 31 28	18 51	20 10	4 41	6 00	18 41	3 13	23 17	.....	52	4 41.0	16 24
Tue Sep 05/Wed Sep 06	4211.8	22 35 24	18 50	20 09	4 41	6 00	18 43	3 18	0 10	.....	40	5 39.7	17 29
Wed Sep 06/Thu Sep 07	4212.8	22 39 21	18 48	20 07	4 42	6 01	18 46	3 22	1 07	.....	29	6 37.9	17 27
Thu Sep 07/Fri Sep 08	4213.8	22 43 17	18 47	20 06	4 43	6 02	18 48	3 27	2 06	.....	20	7 34.9	16 22
Fri Sep 08/Sat Sep 09	4214.8	22 47 14	18 46	20 04	4 44	6 02	18 51	3 32	3 06	.....	12	8 30.1	14 22
Sat Sep 09/Sun Sep 10	4215.8	22 51 10	18 44	20 03	4 45	6 03	18 53	3 36	4 05	16 54	6	9 23.3	11 35
Sun Sep 10/Mon Sep 11	4216.8	22 55 07	18 43	20 01	4 45	6 03	18 56	3 41	5 04	17 35	2	10 14.4	8 15
Mon Sep 11/Tue Sep 12	4217.8	22 59 03	18 42	20 00	4 46	6 04	18 58	3 46	6 02	18 13	0	11 03.7	4 34
Tue Sep 12/Wed Sep 13	4218.8	23 03 00	18 40	19 58	4 47	6 05	19 01	3 51	6 58	18 49	0	11 51.6	0 43
Wed Sep 13/Thu Sep 14	4219.8	23 06 57	18 39	19 57	4 47	6 05	19 03	3 55	.....	19 24	3	12 38.5	- 3 07
Thu Sep 14/Fri Sep 15	4220.8	23 10 53	18 38	19 55	4 48	6 06	19 06	4 00	.....	19 58	7	13 24.9	- 6 46
Fri Sep 15/Sat Sep 16	4221.8	23 14 50	18 37	19 54	4 49	6 07	19 08	4 05	.....	20 33	12	14 11.3	-10 08
Sat Sep 16/Sun Sep 17	4222.8	23 18 46	18 35	19 53	4 50	6 07	19 11	4 09	.....	21 10	19	14 58.1	-13 05
Sun Sep 17/Mon Sep 18	4223.8	23 22 43	18 34	19 51	4 50	6 08	19 13	4 14	.....	21 48	27	15 45.5	-15 30
Mon Sep 18/Tue Sep 19	4224.8	23 26 39	18 33	19 50	4 51	6 08	19 16	4 19	.....	22 29	35	16 33.9	-17 17
Tue Sep 19/Wed Sep 20	4225.8	23 30 36	18 31	19 48	4 52	6 09	19 18	4 23	.....	23 13	45	17 23.4	-18 22
Wed Sep 20/Thu Sep 21	4226.8	23 34 32	18 30	19 47	4 52	6 10	19 21	4 28	.....	24 00	54	18 14.0	-18 40
Thu Sep 21/Fri Sep 22	4227.8	23 38 29	18 29	19 46	4 53	6 10	19 23	4 32	.....	0 51	64	19 05.6	-18 08
Fri Sep 22/Sat Sep 23	4228.8	23 42 26	18 27	19 44	4 54	6 11	19 26	4 37	.....	1 45	73	19 58.1	-16 43
Sat Sep 23/Sun Sep 24	4229.8	23 46 22	18 26	19 43	4 55	6 11	19 28	4 42	.....	2 42	82	20 51.2	-14 26
Sun Sep 24/Mon Sep 25	4230.8	23 50 19	18 25	19 41	4 55	6 12	19 31	4 46	.....	3 42	90	21 44.9	-11 20
Mon Sep 25/Tue Sep 26	4231.8	23 54 15	18 23	19 40	4 56	6 13	19 34	4 51	16 48	4 44	95	22 39.2	- 7 33
Tue Sep 26/Wed Sep 27	4232.8	23 58 12	18 22	19 39	4 57	6 13	19 36	4 56	17 28	5 48	99	23 34.1	- 3 14
Wed Sep 27/Thu Sep 28	4233.8	0 02 08	18 21	19 37	4 57	6 14	19 39	5 00	18 09	6 54	100	0 30.0	1 21
Thu Sep 28/Fri Sep 29	4234.8	0 06 05	18 19	19 36	4 58	6 15	19 41	5 05	18 51	.....	98	1 27.1	5 53
Fri Sep 29/Sat Sep 30	4235.8	0 10 01	18 18	19 35	4 59	6 15	19 44	5 09	19 35	.....	93	2 25.4	10 03
Sat Sep 30/Sun Oct 01	4236.8	0 13 58	18 17	19 33	4 59	6 16	19 47	5 14	20 22	.....	86	3 24.9	13 31

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Sun Oct 01/Mon Oct 02	4237.8	0 17 55	18 15	19 32	5 00	6 17	19 49	5 19	21 12	.....	76	4 25.2	16 02
Mon Oct 02/Tue Oct 03	4238.8	0 21 51	18 14	19 31	5 01	6 17	19 52	5 23	22 06	.....	66	5 25.6	17 27
Tue Oct 03/Wed Oct 04	4239.8	0 25 48	18 13	19 29	5 01	6 18	19 54	5 28	23 02	.....	54	6 25.1	17 41
Wed Oct 04/Thu Oct 05	4240.8	0 29 44	18 12	19 28	5 02	6 19	19 57	5 33	0 01	.....	43	7 23.0	16 49
Thu Oct 05/Fri Oct 06	4241.8	0 33 41	18 10	19 27	5 03	6 19	20 00	5 37	1 00	.....	33	8 18.7	14 59
Fri Oct 06/Sat Oct 07	4242.8	0 37 37	18 09	19 26	5 03	6 20	20 02	5 42	1 59	.....	23	9 12.0	12 23
Sat Oct 07/Sun Oct 08	4243.8	0 41 34	18 08	19 24	5 04	6 21	20 05	5 46	2 57	.....	15	10 03.0	9 11
Sun Oct 08/Mon Oct 09	4244.8	0 45 30	18 07	19 23	5 05	6 21	20 08	5 51	3 54	.....	8	10 52.1	5 36
Mon Oct 09/Tue Oct 10	4245.8	0 49 27	18 05	19 22	5 05	6 22	20 11	5 56	4 50	16 49	4	11 39.7	1 49
Tue Oct 10/Wed Oct 11	4246.8	0 53 24	18 04	19 21	5 06	6 23	20 13	6 00	5 45	17 24	1	12 26.3	- 2 01
Wed Oct 11/Thu Oct 12	4247.8	0 57 20	18 03	19 20	5 07	6 23	20 16	6 05	6 39	17 58	0	13 12.5	- 5 43
Thu Oct 12/Fri Oct 13	4248.8	1 01 17	18 02	19 18	5 07	6 24	20 19	6 09	7 32	18 32	1	13 58.6	- 9 10
Fri Oct 13/Sat Oct 14	4249.8	1 05 13	18 01	19 17	5 08	6 25	20 22	6 14	.....	19 08	4	14 45.1	-12 15
Sat Oct 14/Sun Oct 15	4250.8	1 09 10	17 59	19 16	5 09	6 25	20 24	6 19	.....	19 45	8	15 32.2	-14 49
Sun Oct 15/Mon Oct 16	4251.8	1 13 06	17 58	19 15	5 09	6 26	20 27	6 23	.....	20 25	14	16 20.0	-16 48
Mon Oct 16/Tue Oct 17	4252.8	1 17 03	17 57	19 14	5 10	6 27	20 30	6 28	.....	21 08	21	17 08.8	-18 05
Tue Oct 17/Wed Oct 18	4253.8	1 20 59	17 56	19 13	5 11	6 28	20 33	6 33	.....	21 53	29	17 58.3	-18 38
Wed Oct 18/Thu Oct 19	4254.8	1 24 56	17 55	19 12	5 11	6 28	20 36	6 37	.....	22 42	38	18 48.5	-18 22
Thu Oct 19/Fri Oct 20	4255.8	1 28 53	17 54	19 11	5 12	6 29	20 39	6 42	.....	23 34	47	19 39.4	-17 17
Fri Oct 20/Sat Oct 21	4256.8	1 32 49	17 53	19 10	5 13	6 30	20 42	6 46	.....	0 28	57	20 30.7	-15 23
Sat Oct 21/Sun Oct 22	4257.8	1 36 46	17 52	19 09	5 13	6 31	20 45	6 51	.....	1 25	67	21 22.6	-12 40
Sun Oct 22/Mon Oct 23	4258.8	1 40 42	17 51	19 08	5 14	6 31	20 48	6 56	.....	2 25	77	22 15.1	- 9 14
Mon Oct 23/Tue Oct 24	4259.8	1 44 39	17 50	19 07	5 15	6 32	20 51	7 00	.....	3 27	85	23 08.6	- 5 12
Tue Oct 24/Wed Oct 25	4260.8	1 48 35	17 49	19 06	5 15	6 33	20 54	7 05	.....	4 31	93	0 03.4	- 0 45
Wed Oct 25/Thu Oct 26	4261.8	1 52 32	17 48	19 05	5 16	6 34	20 57	7 10	16 41	5 38	98	0 59.8	3 52
Thu Oct 26/Fri Oct 27	4262.8	1 56 28	17 47	19 04	5 17	6 34	21 00	7 14	17 24	6 46	100	1 58.3	8 20
Fri Oct 27/Sat Oct 28	4263.8	2 00 25	17 46	19 03	5 18	6 35	21 03	7 19	18 10	.....	99	2 58.8	12 17
Sat Oct 28/Sun Oct 29	4264.8	2 04 22	17 45	19 02	5 18	6 36	21 06	7 24	19 00	.....	95	4 01.0	15 22
Sun Oct 29/Mon Oct 30	4265.8	2 08 18	17 44	19 01	5 19	6 37	21 09	7 28	19 54	.....	88	5 04.0	17 18
Mon Oct 30/Tue Oct 31	4266.8	2 12 15	17 43	19 01	5 20	6 38	21 12	7 33	20 52	.....	80	6 06.4	17 58
Tue Oct 31/Wed Nov 01	4267.8	2 16 11	17 42	19 00	5 20	6 38	21 15	7 37	21 52	.....	69	7 07.2	17 25

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Wed Nov 01/Thu Nov 02	4268.8	2 20 08	17 41	18 59	5 21	6 39	21 18	7 42	22 53	.....	58	8 05.3	15 46
Thu Nov 02/Fri Nov 03	4269.8	2 24 04	17 40	18 58	5 22	6 40	21 22	7 47	23 53	.....	48	9 00.3	13 16
Fri Nov 03/Sat Nov 04	4270.8	2 28 01	17 39	18 58	5 23	6 41	21 25	7 51	0 52	.....	37	9 52.5	10 08
Sat Nov 04/Sun Nov 05	4271.8	2 31 57	17 39	18 57	5 23	6 42	21 28	7 56	1 50	.....	28	10 42.1	6 35
Sun Nov 05/Mon Nov 06	4272.8	2 35 54	17 38	18 56	5 24	6 43	21 31	8 01	2 45	.....	19	11 29.9	2 49
Mon Nov 06/Tue Nov 07	4273.8	2 39 51	17 37	18 56	5 25	6 43	21 35	8 06	3 40	.....	12	12 16.4	- 1 01
Tue Nov 07/Wed Nov 08	4274.8	2 43 47	17 36	18 55	5 26	6 44	21 38	8 10	4 34	15 59	7	13 02.2	- 4 46
Wed Nov 08/Thu Nov 09	4275.8	2 47 44	17 36	18 54	5 26	6 45	21 41	8 15	5 27	16 33	3	13 48.0	- 8 18
Thu Nov 09/Fri Nov 10	4276.8	2 51 40	17 35	18 54	5 27	6 46	21 45	8 20	6 20	17 08	1	14 34.1	-11 29
Fri Nov 10/Sat Nov 11	4277.8	2 55 37	17 34	18 53	5 28	6 47	21 48	8 24	7 12	17 45	0	15 20.8	-14 13
Sat Nov 11/Sun Nov 12	4278.8	2 59 33	17 34	18 53	5 29	6 48	21 51	8 29	8 04	18 23	1	16 08.4	-16 22
Sun Nov 12/Mon Nov 13	4279.8	3 03 30	17 33	18 52	5 29	6 49	21 55	8 34	.....	19 05	4	16 56.8	-17 52
Mon Nov 13/Tue Nov 14	4280.8	3 07 26	17 32	18 52	5 30	6 49	21 58	8 38	.....	19 50	9	17 46.0	-18 38
Tue Nov 14/Wed Nov 15	4281.8	3 11 23	17 32	18 51	5 31	6 50	22 02	8 43	.....	20 37	15	18 35.6	-18 36
Wed Nov 15/Thu Nov 16	4282.8	3 15 20	17 31	18 51	5 32	6 51	22 05	8 48	.....	21 27	22	19 25.6	-17 46
Thu Nov 16/Fri Nov 17	4283.8	3 19 16	17 31	18 51	5 32	6 52	22 09	8 52	.....	22 20	31	20 15.8	-16 08
Fri Nov 17/Sat Nov 18	4284.8	3 23 13	17 30	18 50	5 33	6 53	22 13	8 57	.....	23 15	40	21 06.0	-13 44
Sat Nov 18/Sun Nov 19	4285.8	3 27 09	17 30	18 50	5 34	6 54	22 16	9 02	.....	0 12	50	21 56.5	-10 38
Sun Nov 19/Mon Nov 20	4286.8	3 31 06	17 30	18 50	5 35	6 55	22 20	9 07	.....	1 10	61	22 47.6	- 6 57
Mon Nov 20/Tue Nov 21	4287.8	3 35 02	17 29	18 49	5 35	6 56	22 24	9 11	.....	2 11	71	23 39.8	- 2 46
Tue Nov 21/Wed Nov 22	4288.8	3 38 59	17 29	18 49	5 36	6 56	22 27	9 16	.....	3 15	81	0 33.6	1 42
Wed Nov 22/Thu Nov 23	4289.8	3 42 55	17 28	18 49	5 37	6 57	22 31	9 21	.....	4 21	89	1 29.6	6 13
Thu Nov 23/Fri Nov 24	4290.8	3 46 52	17 28	18 49	5 38	6 58	22 35	9 25	15 57	5 29	96	2 28.3	10 28
Fri Nov 24/Sat Nov 25	4291.8	3 50 49	17 28	18 49	5 38	6 59	22 38	9 30	16 44	6 38	99	3 29.8	14 04
Sat Nov 25/Sun Nov 26	4292.8	3 54 45	17 28	18 48	5 39	7 00	22 42	9 35	17 36	7 47	100	4 33.6	16 41
Sun Nov 26/Mon Nov 27	4293.8	3 58 42	17 27	18 48	5 40	7 01	22 46	9 39	18 33	.....	97	5 38.3	18 03
Mon Nov 27/Tue Nov 28	4294.8	4 02 38	17 27	18 48	5 41	7 02	22 50	9 44	19 35	.....	91	6 42.4	18 03
Tue Nov 28/Wed Nov 29	4295.8	4 06 35	17 27	18 48	5 41	7 02	22 54	9 49	20 38	.....	83	7 44.3	16 47
Wed Nov 29/Thu Nov 30	4296.8	4 10 31	17 27	18 48	5 42	7 03	22 58	9 53	21 41	.....	74	8 42.9	14 29
Thu Nov 30/Fri Dec 01	4297.8	4 14 28	17 27	18 48	5 43	7 04	23 02	9 58	22 43	.....	64	9 38.0	11 24

***** 2034 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) (2034 at start)	JDmid (-2460000)	LMSTmidn	Sun: set	Sun: twi.end	Sun: twi.beg	Sun: rise	LST twilight: eve	LST twilight: morn	Moon: rise	Moon: set	Moon: %illum	Moon: RA	Moon: Dec
Fri Dec 01/Sat Dec 02	4298.8	4 18 24	17 27	18 48	5 43	7 05	23 06	10 03	23 42	.....	53	10 29.8	7 50
Sat Dec 02/Sun Dec 03	4299.8	4 22 21	17 27	18 48	5 44	7 06	23 10	10 07	0 40	.....	43	11 19.0	4 01
Sun Dec 03/Mon Dec 04	4300.8	4 26 18	17 27	18 48	5 45	7 07	23 14	10 12	1 35	.....	34	12 06.4	0 07
Mon Dec 04/Tue Dec 05	4301.8	4 30 14	17 27	18 48	5 46	7 07	23 18	10 17	2 29	.....	25	12 52.5	- 3 43
Tue Dec 05/Wed Dec 06	4302.8	4 34 11	17 27	18 49	5 46	7 08	23 22	10 21	3 22	.....	17	13 38.2	- 7 21
Wed Dec 06/Thu Dec 07	4303.8	4 38 07	17 27	18 49	5 47	7 09	23 26	10 26	4 15	.....	11	14 24.1	-10 39
Thu Dec 07/Fri Dec 08	4304.8	4 42 04	17 27	18 49	5 48	7 10	23 30	10 31	5 07	15 45	6	15 10.5	-13 32
Fri Dec 08/Sat Dec 09	4305.8	4 46 00	17 27	18 49	5 48	7 10	23 34	10 35	5 59	16 23	2	15 57.7	-15 52
Sat Dec 09/Sun Dec 10	4306.8	4 49 57	17 27	18 49	5 49	7 11	23 38	10 40	6 50	17 04	0	16 45.9	-17 35
Sun Dec 10/Mon Dec 11	4307.8	4 53 53	17 28	18 50	5 50	7 12	23 43	10 44	7 40	17 47	0	17 35.0	-18 33
Mon Dec 11/Tue Dec 12	4308.8	4 57 50	17 28	18 50	5 50	7 12	23 47	10 49	.....	18 34	2	18 24.7	-18 45
Tue Dec 12/Wed Dec 13	4309.8	5 01 47	17 28	18 50	5 51	7 13	23 51	10 54	.....	19 23	5	19 14.7	-18 08
Wed Dec 13/Thu Dec 14	4310.8	5 05 43	17 28	18 50	5 52	7 14	23 55	10 58	.....	20 15	10	20 04.7	-16 43
Thu Dec 14/Fri Dec 15	4311.8	5 09 40	17 29	18 51	5 52	7 14	24 00	11 03	.....	21 09	17	20 54.5	-14 32
Fri Dec 15/Sat Dec 16	4312.8	5 13 36	17 29	18 51	5 53	7 15	0 04	11 07	.....	22 05	25	21 44.1	-11 40
Sat Dec 16/Sun Dec 17	4313.8	5 17 33	17 29	18 52	5 53	7 16	0 08	11 12	.....	23 02	34	22 33.7	- 8 13
Sun Dec 17/Mon Dec 18	4314.8	5 21 29	17 30	18 52	5 54	7 16	0 13	11 16	.....	24 00	44	23 23.8	- 4 18
Mon Dec 18/Tue Dec 19	4315.8	5 25 26	17 30	18 52	5 54	7 17	0 17	11 21	.....	1 00	55	0 14.8	- 0 04
Tue Dec 19/Wed Dec 20	4316.8	5 29 22	17 31	18 53	5 55	7 17	0 21	11 25	.....	2 02	66	1 07.6	4 18
Wed Dec 20/Thu Dec 21	4317.8	5 33 19	17 31	18 53	5 55	7 18	0 26	11 30	.....	3 07	77	2 02.8	8 33
Thu Dec 21/Fri Dec 22	4318.8	5 37 16	17 31	18 54	5 56	7 18	0 30	11 34	.....	4 14	86	3 00.9	12 24
Fri Dec 22/Sat Dec 23	4319.8	5 41 12	17 32	18 54	5 56	7 19	0 35	11 39	.....	5 21	93	4 02.1	15 31
Sat Dec 23/Sun Dec 24	4320.8	5 45 09	17 33	18 55	5 57	7 19	0 39	11 43	16 13	6 28	98	5 05.7	17 34
Sun Dec 24/Mon Dec 25	4321.8	5 49 05	17 33	18 55	5 57	7 20	0 44	11 47	17 12	7 32	100	6 10.5	18 19
Mon Dec 25/Tue Dec 26	4322.8	5 53 02	17 34	18 56	5 58	7 20	0 48	11 52	18 15	.....	99	7 14.8	17 42
Tue Dec 26/Wed Dec 27	4323.8	5 56 58	17 34	18 57	5 58	7 20	0 53	11 56	19 20	.....	94	8 16.8	15 51
Wed Dec 27/Thu Dec 28	4324.8	6 00 55	17 35	18 57	5 58	7 21	0 57	12 00	20 25	.....	88	9 15.7	13 01
Thu Dec 28/Fri Dec 29	4325.8	6 04 51	17 36	18 58	5 59	7 21	1 02	12 05	21 28	.....	80	10 11.0	9 30
Fri Dec 29/Sat Dec 30	4326.8	6 08 48	17 36	18 58	5 59	7 21	1 06	12 09	22 28	.....	70	11 03.0	5 37
Sat Dec 30/Sun Dec 31	4327.8	6 12 45	17 37	18 59	5 59	7 22	1 11	12 13	23 26	.....	60	11 52.5	1 35
Sun Dec 31/Mon Jan 01	4328.8	6 16 41	17 38	19 00	6 00	7 22	1 16	12 17	0 22	.....	50	12 40.1	- 2 24