***** 2009 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

MOON PHASES FOR 2009, 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 27	5 24	Jan 04	4 57	Jan 10	20 28	Jan 17	19 47
Jan 26	0 56	Feb 02	16 13	Feb 09	7 50	Feb 16	14 39
Feb 24	18 37	Mar 04	0 46	Mar 10	19 38	Mar 18	10 50
Mar 26	9 08	Apr 02	7 34	Apr 09	7 56	Apr 17	6 39
Apr 24	20 24	May 01	13 45	May 08	21 02	May 17	0 28
May 24	5 12	May 30	20 23	Jun 07	11 12	Jun 15	15 16
Jun 22	12 36	Jun 29	4 29	Jul 07	2 22	Jul 15	2 54
Jul 21	19 35	Jul 28	15 00	Aug 05	17 56	Aug 13	11 56
Aug 20	3 02	Aug 27	4 42	Sep 04	9 04	Sep 11	19 17
Sep 18	11 45	Sep 25	21 50	Oct 03	23 12	Oct 11	1 57
Oct 17	22 33	Oct 25	17 42	Nov 02	12 15	Nov 09	8 58
Nov 16	12 14	Nov 24	14 39	Dec 02	0 32	Dec 08	17 16
Dec 16	5 03	Dec 24	10 37	Dec 31	12 14	Jan 07	3 42

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Jan 01/Fri Jan 02	4833.8	6 21 48	17 39	19 01	6 00	7 22	1 22	12 23	.....	22 35	27	22 59.8	- 3 13
Fri Jan 02/Sat Jan 03	4834.8	6 25 44	17 39	19 01	6 00	7 22	1 26	12 27	.....	23 33	37	23 45.0	2 32
Sat Jan 03/Sun Jan 04	4835.8	6 29 41	17 40	19 02	6 01	7 22	1 31	12 31	.....	0 33	47	0 31.8	8 20
Sun Jan 04/Mon Jan 05	4836.8	6 33 38	17 41	19 03	6 01	7 23	1 35	12 35	.....	1 36	58	1 21.6	13 57
Mon Jan 05/Tue Jan 06	4837.8	6 37 34	17 42	19 03	6 01	7 23	1 40	12 40	.....	2 44	69	2 15.6	19 03
Tue Jan 06/Wed Jan 07	4838.8	6 41 31	17 42	19 04	6 01	7 23	1 45	12 44	.....	3 54	79	3 14.7	23 14
Wed Jan 07/Thu Jan 08	4839.8	6 45 27	17 43	19 05	6 01	7 23	1 49	12 48	.....	5 06	88	4 18.9	26 00
Thu Jan 08/Fri Jan 09	4840.8	6 49 24	17 44	19 06	6 01	7 23	1 54	12 52	.....	6 14	95	5 26.8	26 57
Fri Jan 09/Sat Jan 10	4841.8	6 53 20	17 45	19 06	6 01	7 23	1 59	12 56	16 05	7 14	99	6 35.7	25 49
Sat Jan 10/Sun Jan 11	4842.8	6 57 17	17 46	19 07	6 01	7 23	2 04	13 00	17 19	8 05	100	7 42.3	22 42
Sun Jan 11/Mon Jan 12	4843.8	7 01 13	17 47	19 08	6 01	7 23	2 08	13 04	18 34	.....	98	8 44.6	18 00
Mon Jan 12/Tue Jan 13	4844.8	7 05 10	17 47	19 09	6 01	7 22	2 13	13 08	19 47	.....	93	9 42.1	12 16
Tue Jan 13/Wed Jan 14	4845.8	7 09 07	17 48	19 09	6 01	7 22	2 18	13 11	20 55	.....	86	10 35.2	6 01
Wed Jan 14/Thu Jan 15	4846.8	7 13 03	17 49	19 10	6 01	7 22	2 22	13 15	22 00	.....	77	11 25.3	- 0 18
Thu Jan 15/Fri Jan 16	4847.8	7 17 00	17 50	19 11	6 01	7 22	2 27	13 19	23 02	.....	68	12 13.5	- 6 23
Fri Jan 16/Sat Jan 17	4848.8	7 20 56	17 51	19 12	6 01	7 22	2 32	13 23	0 02	.....	58	13 00.9	-11 59
Sat Jan 17/Sun Jan 18	4849.8	7 24 53	17 52	19 12	6 01	7 21	2 37	13 27	1 01	.....	47	13 48.6	-16 55
Sun Jan 18/Mon Jan 19	4850.8	7 28 49	17 53	19 13	6 01	7 21	2 41	13 31	2 00	.....	38	14 37.2	-21 02
Mon Jan 19/Tue Jan 20	4851.8	7 32 46	17 54	19 14	6 01	7 21	2 46	13 34	2 58	.....	29	15 27.2	-24 11
Tue Jan 20/Wed Jan 21	4852.8	7 36 42	17 55	19 15	6 00	7 21	2 51	13 38	3 54	.....	21	16 18.5	-26 16
Wed Jan 21/Thu Jan 22	4853.8	7 40 39	17 55	19 16	6 00	7 20	2 55	13 42	4 47	.....	14	17 10.6	-27 10
Thu Jan 22/Fri Jan 23	4854.8	7 44 36	17 56	19 16	6 00	7 20	3 00	13 45	5 36	.....	8	18 03.0	-26 53
Fri Jan 23/Sat Jan 24	4855.8	7 48 32	17 57	19 17	6 00	7 19	3 05	13 49	6 20	.....	4	18 54.6	-25 24
Sat Jan 24/Sun Jan 25	4856.8	7 52 29	17 58	19 18	5 59	7 19	3 10	13 53	6 59	16 40	1	19 44.9	-22 49
Sun Jan 25/Mon Jan 26	4857.8	7 56 25	17 59	19 19	5 59	7 18	3 14	13 56	7 33	17 37	0	20 33.4	-19 15
Mon Jan 26/Tue Jan 27	4858.8	8 00 22	18 00	19 20	5 58	7 18	3 19	14 00	8 04	18 35	1	21 20.2	-14 53
Tue Jan 27/Wed Jan 28	4859.8	8 04 18	18 01	19 20	5 58	7 17	3 24	14 03	.....	19 33	3	22 05.6	- 9 54
Wed Jan 28/Thu Jan 29	4860.8	8 08 15	18 02	19 21	5 58	7 17	3 29	14 07	.....	20 30	8	22 50.2	- 4 28
Thu Jan 29/Fri Jan 30	4861.8	8 12 11	18 03	19 22	5 57	7 16	3 33	14 10	.....	21 28	14	23 35.0	1 13
Fri Jan 30/Sat Jan 31	4862.8	8 16 08	18 04	19 23	5 57	7 16	3 38	14 14	.....	22 27	22	0 20.8	6 58
Sat Jan 31/Sun Feb 01	4863.8	8 20 05	18 05	19 24	5 56	7 15	3 43	14 17	.....	23 28	31	1 08.8	12 32

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Feb 01/Mon Feb 02	4864.8	8 24 01	18 06	19 24	5 56	7 14	3 48	14 21	.....	0 32	42	2 00.0	17 39
Mon Feb 02/Tue Feb 03	4865.8	8 27 58	18 06	19 25	5 55	7 14	3 52	14 24	.....	1 39	53	2 55.4	21 59
Tue Feb 03/Wed Feb 04	4866.8	8 31 54	18 07	19 26	5 54	7 13	3 57	14 27	.....	2 48	64	3 55.4	25 08
Wed Feb 04/Thu Feb 05	4867.8	8 35 51	18 08	19 27	5 54	7 12	4 02	14 31	.....	3 55	75	4 59.4	26 44
Thu Feb 05/Fri Feb 06	4868.8	8 39 47	18 09	19 28	5 53	7 11	4 07	14 34	.....	4 57	84	6 05.6	26 29
Fri Feb 06/Sat Feb 07	4869.8	8 43 44	18 10	19 28	5 52	7 11	4 11	14 37	.....	5 51	92	7 11.5	24 17
Sat Feb 07/Sun Feb 08	4870.8	8 47 40	18 11	19 29	5 52	7 10	4 16	14 40	16 06	6 37	97	8 14.7	20 21
Sun Feb 08/Mon Feb 09	4871.8	8 51 37	18 12	19 30	5 51	7 09	4 21	14 44	17 20	7 17	100	9 14.2	15 05
Mon Feb 09/Tue Feb 10	4872.8	8 55 34	18 13	19 31	5 50	7 08	4 25	14 47	18 31	7 51	99	10 09.8	8 58
Tue Feb 10/Wed Feb 11	4873.8	8 59 30	18 14	19 31	5 50	7 07	4 30	14 50	19 38	.....	96	11 02.2	2 30
Wed Feb 11/Thu Feb 12	4874.8	9 03 27	18 14	19 32	5 49	7 06	4 35	14 53	20 43	.....	90	11 52.5	- 3 54
Thu Feb 12/Fri Feb 13	4875.8	9 07 23	18 15	19 33	5 48	7 05	4 40	14 56	21 46	.....	83	12 41.8	- 9 55
Fri Feb 13/Sat Feb 14	4876.8	9 11 20	18 16	19 34	5 47	7 05	4 44	14 59	22 47	.....	74	13 30.9	-15 18
Sat Feb 14/Sun Feb 15	4877.8	9 15 16	18 17	19 34	5 46	7 04	4 49	15 02	23 48	.....	65	14 20.7	-19 51
Sun Feb 15/Mon Feb 16	4878.8	9 19 13	18 18	19 35	5 45	7 03	4 54	15 06	0 47	.....	55	15 11.5	-23 25
Mon Feb 16/Tue Feb 17	4879.8	9 23 09	18 19	19 36	5 44	7 02	4 58	15 09	1 45	.....	46	16 03.4	-25 52
Tue Feb 17/Wed Feb 18	4880.8	9 27 06	18 19	19 37	5 44	7 01	5 03	15 12	2 40	.....	36	16 56.0	-27 08
Wed Feb 18/Thu Feb 19	4881.8	9 31 03	18 20	19 37	5 43	7 00	5 08	15 15	3 31	.....	28	17 48.7	-27 11
Thu Feb 19/Fri Feb 20	4882.8	9 34 59	18 21	19 38	5 42	6 59	5 12	15 18	4 16	.....	20	18 40.7	-26 01
Fri Feb 20/Sat Feb 21	4883.8	9 38 56	18 22	19 39	5 41	6 58	5 17	15 21	4 57	.....	13	19 31.5	-23 43
Sat Feb 21/Sun Feb 22	4884.8	9 42 52	18 23	19 40	5 40	6 57	5 22	15 23	5 33	.....	7	20 20.6	-20 25
Sun Feb 22/Mon Feb 23	4885.8	9 46 49	18 24	19 40	5 39	6 55	5 27	15 26	6 05	16 26	3	21 08.1	-16 15
Mon Feb 23/Tue Feb 24	4886.8	9 50 45	18 24	19 41	5 38	6 54	5 31	15 29	6 35	17 24	1	21 54.1	-11 23
Tue Feb 24/Wed Feb 25	4887.8	9 54 42	18 25	19 42	5 37	6 53	5 36	15 32	7 03	18 22	0	22 39.4	- 6 00
Wed Feb 25/Thu Feb 26	4888.8	9 58 38	18 26	19 43	5 36	6 52	5 41	15 35	7 31	19 21	2	23 24.6	- 0 18
Thu Feb 26/Fri Feb 27	4889.8	10 02 35	18 27	19 43	5 34	6 51	5 45	15 38	.....	20 20	5	0 10.6	5 30
Fri Feb 27/Sat Feb 28	4890.8	10 06 32	18 27	19 44	5 33	6 50	5 50	15 41	.....	21 21	11	0 58.4	11 09
Sat Feb 28/Sun Mar 01	4891.8	10 10 28	18 28	19 45	5 32	6 49	5 55	15 44	.....	22 25	18	1 48.8	16 22

***** 2009 MARCH *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8
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Sun Mar 01/Mon Mar 02	4892.8	10 14 25	18 29	19 46	5 31	6 48	5 59	15 46	.....	23 31	27	2 42.8	20 51
Mon Mar 02/Tue Mar 03	4893.8	10 18 21	18 30	19 46	5 30	6 46	6 04	15 49	.....	0 39	38	3 40.7	24 15
Tue Mar 03/Wed Mar 04	4894.8	10 22 18	18 31	19 47	5 29	6 45	6 09	15 52	.....	1 46	49	4 42.0	26 14
Wed Mar 04/Thu Mar 05	4895.8	10 26 14	18 31	19 48	5 28	6 44	6 13	15 55	.....	2 48	60	5 45.5	26 31
Thu Mar 05/Fri Mar 06	4896.8	10 30 11	18 32	19 49	5 26	6 43	6 18	15 57	.....	3 43	71	6 49.2	25 00
Fri Mar 06/Sat Mar 07	4897.8	10 34 07	18 33	19 49	5 25	6 42	6 23	16 00	.....	4 30	81	7 51.2	21 47
Sat Mar 07/Sun Mar 08	4898.8	10 38 04	18 33	19 50	5 24	6 40	6 27	16 03	.....	5 11	90	8 50.2	17 10
Sun Mar 08/Mon Mar 09	4899.8	10 42 01	18 34	19 51	5 23	6 39	6 32	16 06	.....	5 47	96	9 45.9	11 31
Mon Mar 09/Tue Mar 10	4900.8	10 45 57	18 35	19 52	5 21	6 38	6 37	16 08	17 17	6 19	99	10 38.9	5 16
Tue Mar 10/Wed Mar 11	4901.8	10 49 54	18 36	19 52	5 20	6 37	6 41	16 11	18 23	6 50	100	11 29.9	- 1 09
Wed Mar 11/Thu Mar 12	4902.8	10 53 50	18 36	19 53	5 19	6 35	6 46	16 14	19 27	7 21	98	12 19.9	- 7 25
Thu Mar 12/Fri Mar 13	4903.8	10 57 47	18 37	19 54	5 18	6 34	6 51	16 16	20 29	.....	94	13 09.9	-13 10
Fri Mar 13/Sat Mar 14	4904.8	11 01 43	18 38	19 54	5 16	6 33	6 56	16 19	21 31	.....	88	14 00.5	-18 10
Sat Mar 14/Sun Mar 15	4905.8	11 05 40	18 39	19 55	5 15	6 32	7 00	16 22	22 33	.....	80	14 52.1	-22 13
Sun Mar 15/Mon Mar 16	4906.8	11 09 36	18 39	19 56	5 14	6 30	7 05	16 24	23 33	.....	72	15 44.8	-25 08
Mon Mar 16/Tue Mar 17	4907.8	11 13 33	18 40	19 57	5 12	6 29	7 10	16 27	0 30	.....	63	16 38.3	-26 51
Tue Mar 17/Wed Mar 18	4908.8	11 17 30	18 41	19 57	5 11	6 28	7 14	16 29	1 22	.....	54	17 31.8	-27 18
Wed Mar 18/Thu Mar 19	4909.8	11 21 26	18 41	19 58	5 10	6 27	7 19	16 32	2 10	.....	44	18 24.5	-26 31
Thu Mar 19/Fri Mar 20	4910.8	11 25 23	18 42	19 59	5 08	6 25	7 24	16 35	2 53	.....	35	19 15.9	-24 34
Fri Mar 20/Sat Mar 21	4911.8	11 29 19	18 43	20 00	5 07	6 24	7 28	16 37	3 31	.....	26	20 05.6	-21 35
Sat Mar 21/Sun Mar 22	4912.8	11 33 16	18 43	20 01	5 06	6 23	7 33	16 40	4 04	.....	18	20 53.5	-17 41
Sun Mar 22/Mon Mar 23	4913.8	11 37 12	18 44	20 01	5 04	6 21	7 38	16 42	4 35	.....	12	21 40.0	-13 03
Mon Mar 23/Tue Mar 24	4914.8	11 41 09	18 45	20 02	5 03	6 20	7 43	16 45	5 04	.....	6	22 25.6	- 7 49
Tue Mar 24/Wed Mar 25	4915.8	11 45 05	18 45	20 03	5 02	6 19	7 47	16 47	5 32	17 09	2	23 11.1	- 2 12
Wed Mar 25/Thu Mar 26	4916.8	11 49 02	18 46	20 04	5 00	6 18	7 52	16 50	6 01	18 09	0	23 57.3	3 37
Thu Mar 26/Fri Mar 27	4917.8	11 52 59	18 47	20 04	4 59	6 16	7 57	16 53	6 32	19 10	1	0 45.3	9 23
Fri Mar 27/Sat Mar 28	4918.8	11 56 55	18 47	20 05	4 57	6 15	8 02	16 55	7 07	20 14	3	1 35.9	14 49
Sat Mar 28/Sun Mar 29	4919.8	12 00 52	18 48	20 06	4 56	6 14	8 06	16 58	.....	21 21	8	2 29.8	19 33
Sun Mar 29/Mon Mar 30	4920.8	12 04 48	18 49	20 07	4 55	6 12	8 11	17 00	.....	22 30	15	3 27.5	23 15
Mon Mar 30/Tue Mar 31	4921.8	12 08 45	18 50	20 08	4 53	6 11	8 16	17 03	.....	23 38	24	4 28.4	25 34
Tue Mar 31/Wed Apr 01	4922.8	12 12 41	18 50	20 08	4 52	6 10	8 21	17 05	.....	0 42	34	5 31.2	26 13

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Apr 01/Thu Apr 02	4923.8	12 16 38	18 51	20 09	4 50	6 09	8 25	17 08	.....	1 39	46	6 34.1	25 08
Thu Apr 02/Fri Apr 03	4924.8	12 20 34	18 52	20 10	4 49	6 07	8 30	17 10	.....	2 28	57	7 35.3	22 24
Fri Apr 03/Sat Apr 04	4925.8	12 24 31	18 52	20 11	4 47	6 06	8 35	17 13	.....	3 10	68	8 33.4	18 16
Sat Apr 04/Sun Apr 05	4926.8	12 28 28	18 53	20 12	4 46	6 05	8 40	17 15	.....	3 46	78	9 28.4	13 05
Sun Apr 05/Mon Apr 06	4927.8	12 32 24	18 54	20 13	4 45	6 04	8 44	17 18	.....	4 19	87	10 20.6	7 12
Mon Apr 06/Tue Apr 07	4928.8	12 36 21	18 54	20 13	4 43	6 02	8 49	17 20	.....	4 49	94	11 10.9	1 00
Tue Apr 07/Wed Apr 08	4929.8	12 40 17	18 55	20 14	4 42	6 01	8 54	17 23	17 11	5 20	98	12 00.3	- 5 12
Wed Apr 08/Thu Apr 09	4930.8	12 44 14	18 56	20 15	4 40	6 00	8 59	17 25	18 13	5 51	100	12 49.8	-11 04
Thu Apr 09/Fri Apr 10	4931.8	12 48 10	18 56	20 16	4 39	5 59	9 04	17 28	19 15	6 24	99	13 40.1	-16 21
Fri Apr 10/Sat Apr 11	4932.8	12 52 07	18 57	20 17	4 38	5 57	9 08	17 30	20 17	.....	97	14 31.7	-20 47
Sat Apr 11/Sun Apr 12	4933.8	12 56 03	18 58	20 18	4 36	5 56	9 13	17 33	21 18	.....	92	15 24.6	-24 10
Sun Apr 12/Mon Apr 13	4934.8	13 00 00	18 58	20 19	4 35	5 55	9 18	17 36	22 17	.....	86	16 18.7	-26 20
Mon Apr 13/Tue Apr 14	4935.8	13 03 57	18 59	20 20	4 33	5 54	9 23	17 38	23 12	.....	79	17 13.0	-27 13
Tue Apr 14/Wed Apr 15	4936.8	13 07 53	19 00	20 21	4 32	5 53	9 28	17 41	0 03	.....	70	18 06.7	-26 50
Wed Apr 15/Thu Apr 16	4937.8	13 11 50	19 01	20 21	4 31	5 51	9 33	17 43	0 47	.....	61	18 59.0	-25 15
Thu Apr 16/Fri Apr 17	4938.8	13 15 46	19 01	20 22	4 29	5 50	9 38	17 46	1 27	.....	52	19 49.3	-22 35
Fri Apr 17/Sat Apr 18	4939.8	13 19 43	19 02	20 23	4 28	5 49	9 42	17 48	2 02	.....	43	20 37.6	-19 00
Sat Apr 18/Sun Apr 19	4940.8	13 23 39	19 03	20 24	4 26	5 48	9 47	17 51	2 33	.....	33	21 24.3	-14 38
Sun Apr 19/Mon Apr 20	4941.8	13 27 36	19 03	20 25	4 25	5 47	9 52	17 53	3 03	.....	25	22 09.8	- 9 40
Mon Apr 20/Tue Apr 21	4942.8	13 31 32	19 04	20 26	4 24	5 46	9 57	17 56	3 31	.....	17	22 55.1	- 4 13
Tue Apr 21/Wed Apr 22	4943.8	13 35 29	19 05	20 27	4 22	5 45	10 02	17 59	4 00	.....	10	23 40.9	1 30
Wed Apr 22/Thu Apr 23	4944.8	13 39 26	19 05	20 28	4 21	5 44	10 07	18 01	4 30	.....	4	0 28.4	7 17
Thu Apr 23/Fri Apr 24	4945.8	13 43 22	19 06	20 29	4 20	5 43	10 12	18 04	5 03	17 58	1	1 18.5	12 51
Fri Apr 24/Sat Apr 25	4946.8	13 47 19	19 07	20 30	4 18	5 42	10 17	18 06	5 42	19 04	0	2 12.2	17 53
Sat Apr 25/Sun Apr 26	4947.8	13 51 15	19 08	20 31	4 17	5 40	10 22	18 09	6 27	20 14	2	3 09.8	21 59
Sun Apr 26/Mon Apr 27	4948.8	13 55 12	19 08	20 32	4 16	5 39	10 26	18 12	.....	21 25	6	4 11.2	24 45
Mon Apr 27/Tue Apr 28	4949.8	13 59 08	19 09	20 33	4 15	5 38	10 31	18 14	.....	22 32	13	5 14.9	25 51
Tue Apr 28/Wed Apr 29	4950.8	14 03 05	19 10	20 34	4 13	5 37	10 36	18 17	.....	23 33	21	6 19.0	25 10
Wed Apr 29/Thu Apr 30	4951.8	14 07 01	19 10	20 35	4 12	5 36	10 41	18 20	.....	0 25	32	7 21.1	22 46
Thu Apr 30/Fri May 01	4952.8	14 10 58	19 11	20 36	4 11	5 35	10 46	18 23	.....	1 09	43	8 20.0	18 55

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 May 01/Sat May 02	4953.8	14 14 55	19 12	20 37	4 10	5 35	10 51	18 25	.....	1 47	54	9 15.2	14 00
Sat May 02/Sun May 03	4954.8	14 18 51	19 13	20 38	4 08	5 34	10 56	18 28	.....	2 21	65	10 07.2	8 22
Sun May 03/Mon May 04	4955.8	14 22 48	19 13	20 39	4 07	5 33	11 01	18 31	.....	2 51	75	10 57.0	2 23
Mon May 04/Tue May 05	4956.8	14 26 44	19 14	20 40	4 06	5 32	11 06	18 33	.....	3 21	84	11 45.5	- 3 40
Tue May 05/Wed May 06	4957.8	14 30 41	19 15	20 41	4 05	5 31	11 11	18 36	.....	3 51	91	12 33.9	- 9 30
Wed May 06/Thu May 07	4958.8	14 34 37	19 15	20 42	4 04	5 30	11 16	18 39	.....	4 23	96	13 23.1	-14 51
Thu May 07/Fri May 08	4959.8	14 38 34	19 16	20 43	4 03	5 29	11 21	18 42	18 06	4 58	99	14 13.7	-19 29
Fri May 08/Sat May 09	4960.8	14 42 30	19 17	20 44	4 02	5 28	11 26	18 45	19 06	5 37	100	15 06.0	-23 11
Sat May 09/Sun May 10	4961.8	14 46 27	19 18	20 45	4 01	5 28	11 31	18 48	20 06	6 21	98	15 59.7	-25 44
Sun May 10/Mon May 11	4962.8	14 50 24	19 18	20 46	3 59	5 27	11 36	18 50	21 03	.....	95	16 54.3	-27 02
Mon May 11/Tue May 12	4963.8	14 54 20	19 19	20 47	3 58	5 26	11 41	18 53	21 55	.....	90	17 48.7	-27 02
Tue May 12/Wed May 13	4964.8	14 58 17	19 20	20 48	3 57	5 25	11 46	18 56	22 42	.....	84	18 41.9	-25 48
Wed May 13/Thu May 14	4965.8	15 02 13	19 20	20 49	3 56	5 25	11 50	18 59	23 23	.....	77	19 33.1	-23 26
Thu May 14/Fri May 15	4966.8	15 06 10	19 21	20 50	3 55	5 24	11 55	19 02	24 00	.....	68	20 22.1	-20 07
Fri May 15/Sat May 16	4967.8	15 10 06	19 22	20 51	3 54	5 23	12 00	19 05	0 32	.....	59	21 09.0	-16 00
Sat May 16/Sun May 17	4968.8	15 14 03	19 23	20 52	3 54	5 23	12 05	19 08	1 02	.....	50	21 54.5	-11 15
Sun May 17/Mon May 18	4969.8	15 17 59	19 23	20 53	3 53	5 22	12 10	19 11	1 30	.....	40	22 39.2	- 6 02
Mon May 18/Tue May 19	4970.8	15 21 56	19 24	20 54	3 52	5 22	12 15	19 14	1 58	.....	30	23 24.1	- 0 30
Tue May 19/Wed May 20	4971.8	15 25 53	19 25	20 55	3 51	5 21	12 20	19 17	2 27	.....	21	0 10.3	5 11
Wed May 20/Thu May 21	4972.8	15 29 49	19 25	20 56	3 50	5 20	12 25	19 21	2 58	.....	13	0 58.9	10 47
Thu May 21/Fri May 22	4973.8	15 33 46	19 26	20 56	3 49	5 20	12 30	19 24	3 34	.....	7	1 51.0	16 00
Fri May 22/Sat May 23	4974.8	15 37 42	19 27	20 57	3 49	5 19	12 35	19 27	4 16	17 52	2	2 47.4	20 28
Sat May 23/Sun May 24	4975.8	15 41 39	19 27	20 58	3 48	5 19	12 39	19 30	5 07	19 03	0	3 48.1	23 45
Sun May 24/Mon May 25	4976.8	15 45 35	19 28	20 59	3 47	5 18	12 44	19 33	6 07	20 14	1	4 52.4	25 27
Mon May 25/Tue May 26	4977.8	15 49 32	19 29	21 00	3 46	5 18	12 49	19 37	.....	21 20	4	5 58.0	25 20
Tue May 26/Wed May 27	4978.8	15 53 28	19 29	21 01	3 46	5 18	12 54	19 40	.....	22 17	11	7 02.5	23 21
Wed May 27/Thu May 28	4979.8	15 57 25	19 30	21 02	3 45	5 17	12 59	19 43	.....	23 06	19	8 03.8	19 47
Thu May 28/Fri May 29	4980.8	16 01 22	19 30	21 03	3 45	5 17	13 04	19 47	.....	23 47	29	9 01.0	15 01
Fri May 29/Sat May 30	4981.8	16 05 18	19 31	21 04	3 44	5 17	13 08	19 50	.....	0 22	40	9 54.4	9 28
Sat May 30/Sun May 31	4982.8	16 09 15	19 32	21 04	3 44	5 16	13 13	19 53	.....	0 54	51	10 44.9	3 31
Sun May 31/Mon Jun 01	4983.8	16 13 11	19 32	21 05	3 43	5 16	13 18	19 57	.....	1 24	62	11 33.5	- 2 30

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Jun 01/Tue Jun 02	4984.8	16 17 08	19 33	21 06	3 43	5 16	13 23	20 00	.....	1 54	72	12 21.4	- 8 19
Tue Jun 02/Wed Jun 03	4985.8	16 21 04	19 33	21 07	3 42	5 16	13 27	20 04	.....	2 25	81	13 09.7	-13 43
Wed Jun 03/Thu Jun 04	4986.8	16 25 01	19 34	21 07	3 42	5 15	13 32	20 07	.....	2 59	88	13 59.2	-18 27
Thu Jun 04/Fri Jun 05	4987.8	16 28 57	19 34	21 08	3 42	5 15	13 37	20 11	.....	3 36	94	14 50.4	-22 20
Fri Jun 05/Sat Jun 06	4988.8	16 32 54	19 35	21 09	3 41	5 15	13 41	20 15	17 58	4 18	98	15 43.3	-25 10
Sat Jun 06/Sun Jun 07	4989.8	16 36 51	19 35	21 09	3 41	5 15	13 46	20 18	18 55	5 04	100	16 37.4	-26 48
Sun Jun 07/Mon Jun 08	4990.8	16 40 47	19 36	21 10	3 41	5 15	13 50	20 22	19 49	5 56	100	17 31.9	-27 10
Mon Jun 08/Tue Jun 09	4991.8	16 44 44	19 36	21 11	3 40	5 15	13 55	20 26	20 38	.....	98	18 25.6	-26 16
Tue Jun 09/Wed Jun 10	4992.8	16 48 40	19 37	21 11	3 40	5 15	13 59	20 30	21 21	.....	94	19 17.6	-24 12
Wed Jun 10/Thu Jun 11	4993.8	16 52 37	19 37	21 12	3 40	5 15	14 04	20 33	21 59	.....	89	20 07.5	-21 06
Thu Jun 11/Fri Jun 12	4994.8	16 56 33	19 38	21 12	3 40	5 15	14 08	20 37	22 32	.....	82	20 55.0	-17 11
Fri Jun 12/Sat Jun 13	4995.8	17 00 30	19 38	21 13	3 40	5 15	14 13	20 41	23 03	.....	74	21 40.7	-12 36
Sat Jun 13/Sun Jun 14	4996.8	17 04 26	19 38	21 13	3 40	5 15	14 17	20 45	23 31	.....	65	22 25.2	- 7 32
Sun Jun 14/Mon Jun 15	4997.8	17 08 23	19 39	21 14	3 40	5 15	14 22	20 49	23 58	.....	56	23 09.4	- 2 09
Mon Jun 15/Tue Jun 16	4998.8	17 12 20	19 39	21 14	3 40	5 15	14 26	20 53	0 26	.....	46	23 54.3	3 25
Tue Jun 16/Wed Jun 17	4999.8	17 16 16	19 39	21 14	3 40	5 15	14 30	20 57	0 55	.....	36	0 41.1	8 56
Wed Jun 17/Thu Jun 18	5000.8	17 20 13	19 40	21 15	3 40	5 15	14 35	21 01	1 28	.....	26	1 30.8	14 12
Thu Jun 18/Fri Jun 19	5001.8	17 24 09	19 40	21 15	3 40	5 15	14 39	21 05	2 06	.....	17	2 24.6	18 54
Fri Jun 19/Sat Jun 20	5002.8	17 28 06	19 40	21 15	3 40	5 16	14 43	21 09	2 52	.....	9	3 22.9	22 37
Sat Jun 20/Sun Jun 21	5003.8	17 32 02	19 41	21 16	3 41	5 16	14 47	21 13	3 47	17 50	4	4 25.7	24 58
Sun Jun 21/Mon Jun 22	5004.8	17 35 59	19 41	21 16	3 41	5 16	14 51	21 18	4 52	18 59	0	5 31.4	25 34
Mon Jun 22/Tue Jun 23	5005.8	17 39 55	19 41	21 16	3 41	5 16	14 55	21 22	6 04	20 01	0	6 37.5	24 15
Tue Jun 23/Wed Jun 24	5006.8	17 43 52	19 41	21 16	3 42	5 17	15 00	21 26	.....	20 56	3	7 41.5	21 09
Wed Jun 24/Thu Jun 25	5007.8	17 47 49	19 41	21 16	3 42	5 17	15 04	21 30	.....	21 41	9	8 41.6	16 37
Thu Jun 25/Fri Jun 26	5008.8	17 51 45	19 41	21 16	3 42	5 17	15 08	21 35	.....	22 20	17	9 37.7	11 07
Fri Jun 26/Sat Jun 27	5009.8	17 55 42	19 41	21 16	3 43	5 18	15 12	21 39	.....	22 54	26	10 30.2	5 06
Sat Jun 27/Sun Jun 28	5010.8	17 59 38	19 42	21 16	3 43	5 18	15 16	21 43	.....	23 26	37	11 20.2	- 1 02
Sun Jun 28/Mon Jun 29	5011.8	18 03 35	19 42	21 16	3 44	5 18	15 19	21 48	.....	23 56	48	12 08.9	- 7 00
Mon Jun 29/Tue Jun 30	5012.8	18 07 31	19 42	21 16	3 44	5 19	15 23	21 52	.....	0 27	58	12 57.3	-12 33
Tue Jun 30/Wed Jul 01	5013.8	18 11 28	19 42	21 16	3 45	5 19	15 27	21 57	.....	1 00	68	13 46.4	-17 27

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Jul 01/Thu Jul 02	5014.8	18 15 24	19 42	21 16	3 45	5 19	15 31	22 01	.....	1 36	77	14 36.9	-21 32
Thu Jul 02/Fri Jul 03	5015.8	18 19 21	19 41	21 16	3 46	5 20	15 35	22 06	.....	2 16	85	15 29.0	-24 36
Fri Jul 03/Sat Jul 04	5016.8	18 23 18	19 41	21 16	3 46	5 20	15 38	22 10	.....	3 01	91	16 22.4	-26 32
Sat Jul 04/Sun Jul 05	5017.8	18 27 14	19 41	21 15	3 47	5 21	15 42	22 15	17 45	3 51	96	17 16.6	-27 13
Sun Jul 05/Mon Jul 06	5018.8	18 31 11	19 41	21 15	3 47	5 21	15 46	22 19	18 35	4 44	99	18 10.4	-26 39
Mon Jul 06/Tue Jul 07	5019.8	18 35 07	19 41	21 15	3 48	5 22	15 49	22 24	19 20	5 40	100	19 02.9	-24 52
Tue Jul 07/Wed Jul 08	5020.8	18 39 04	19 41	21 14	3 49	5 22	15 53	22 29	19 59	.....	99	19 53.5	-22 01
Wed Jul 08/Thu Jul 09	5021.8	18 43 00	19 41	21 14	3 50	5 23	15 56	22 33	20 34	.....	97	20 41.8	-18 17
Thu Jul 09/Fri Jul 10	5022.8	18 46 57	19 40	21 13	3 50	5 23	16 00	22 38	21 05	.....	92	21 28.2	-13 50
Fri Jul 10/Sat Jul 11	5023.8	18 50 53	19 40	21 13	3 51	5 24	16 03	22 43	21 34	.....	87	22 13.0	- 8 51
Sat Jul 11/Sun Jul 12	5024.8	18 54 50	19 40	21 12	3 52	5 24	16 07	22 47	22 01	.....	79	22 57.1	- 3 32
Sun Jul 12/Mon Jul 13	5025.8	18 58 47	19 39	21 12	3 53	5 25	16 10	22 52	22 28	.....	71	23 41.4	1 58
Mon Jul 13/Tue Jul 14	5026.8	19 02 43	19 39	21 11	3 53	5 26	16 14	22 57	22 56	.....	61	0 26.9	7 27
Tue Jul 14/Wed Jul 15	5027.8	19 06 40	19 39	21 11	3 54	5 26	16 17	23 02	23 26	.....	51	1 14.7	12 44
Wed Jul 15/Thu Jul 16	5028.8	19 10 36	19 38	21 10	3 55	5 27	16 20	23 06	0 01	.....	40	2 05.8	17 32
Thu Jul 16/Fri Jul 17	5029.8	19 14 33	19 38	21 09	3 56	5 27	16 24	23 11	0 41	.....	30	3 01.1	21 32
Fri Jul 17/Sat Jul 18	5030.8	19 18 29	19 37	21 09	3 57	5 28	16 27	23 16	1 31	.....	20	4 00.9	24 21
Sat Jul 18/Sun Jul 19	5031.8	19 22 26	19 37	21 08	3 58	5 29	16 30	23 21	2 30	.....	11	5 04.5	25 38
Sun Jul 19/Mon Jul 20	5032.8	19 26 22	19 37	21 07	3 58	5 29	16 33	23 26	3 38	17 42	5	6 10.0	25 06
Mon Jul 20/Tue Jul 21	5033.8	19 30 19	19 36	21 06	3 59	5 30	16 36	23 30	4 52	18 40	1	7 14.9	22 43
Tue Jul 21/Wed Jul 22	5034.8	19 34 16	19 35	21 06	4 00	5 31	16 39	23 35	6 07	19 30	0	8 17.1	18 42
Wed Jul 22/Thu Jul 23	5035.8	19 38 12	19 35	21 05	4 01	5 31	16 43	23 40	.....	20 13	2	9 15.7	13 27
Thu Jul 23/Fri Jul 24	5036.8	19 42 09	19 34	21 04	4 02	5 32	16 46	23 45	.....	20 50	7	10 10.7	7 26
Fri Jul 24/Sat Jul 25	5037.8	19 46 05	19 34	21 03	4 03	5 32	16 49	23 50	.....	21 24	14	11 02.8	1 08
Sat Jul 25/Sun Jul 26	5038.8	19 50 02	19 33	21 02	4 04	5 33	16 52	23 55	.....	21 56	23	11 53.1	- 5 05
Sun Jul 26/Mon Jul 27	5039.8	19 53 58	19 32	21 01	4 05	5 34	16 55	24 00	.....	22 27	33	12 42.6	-10 54
Mon Jul 27/Tue Jul 28	5040.8	19 57 55	19 32	21 00	4 06	5 34	16 58	0 04	.....	23 00	43	13 32.3	-16 06
Tue Jul 28/Wed Jul 29	5041.8	20 01 51	19 31	20 59	4 07	5 35	17 01	0 09	.....	23 36	53	14 23.0	-20 28
Wed Jul 29/Thu Jul 30	5042.8	20 05 48	19 30	20 58	4 08	5 36	17 04	0 14	.....	0 15	63	15 14.8	-23 50
Thu Jul 30/Fri Jul 31	5043.8	20 09 44	19 29	20 57	4 09	5 36	17 06	0 19	.....	0 59	72	16 07.9	-26 05
Fri Jul 31/Sat Aug 01	5044.8	20 13 41	19 29	20 56	4 10	5 37	17 09	0 24	.....	1 47	81	17 01.8	-27 06

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Aug 01/Sun Aug 02	5045.8	20 17 38	19 28	20 55	4 11	5 38	17 12	0 29	.....	2 39	88	17 55.5	-26 52
Sun Aug 02/Mon Aug 03	5046.8	20 21 34	19 27	20 54	4 12	5 38	17 15	0 34	.....	3 34	93	18 48.3	-25 25
Mon Aug 03/Tue Aug 04	5047.8	20 25 31	19 26	20 53	4 12	5 39	17 18	0 39	17 59	4 31	97	19 39.3	-22 51
Tue Aug 04/Wed Aug 05	5048.8	20 29 27	19 25	20 52	4 13	5 40	17 21	0 44	18 36	5 27	99	20 28.4	-19 20
Wed Aug 05/Thu Aug 06	5049.8	20 33 24	19 24	20 51	4 14	5 40	17 23	0 48	19 08	6 23	100	21 15.5	-15 03
Thu Aug 06/Fri Aug 07	5050.8	20 37 20	19 24	20 49	4 15	5 41	17 26	0 53	19 37	.....	99	22 01.0	-10 09
Fri Aug 07/Sat Aug 08	5051.8	20 41 17	19 23	20 48	4 16	5 42	17 29	0 58	20 05	.....	95	22 45.5	- 4 52
Sat Aug 08/Sun Aug 09	5052.8	20 45 13	19 22	20 47	4 17	5 42	17 32	1 03	20 32	.....	90	23 30.0	0 38
Sun Aug 09/Mon Aug 10	5053.8	20 49 10	19 21	20 46	4 18	5 43	17 34	1 08	20 59	.....	83	0 15.2	6 09
Mon Aug 10/Tue Aug 11	5054.8	20 53 07	19 20	20 44	4 19	5 44	17 37	1 13	21 29	.....	75	1 02.1	11 30
Tue Aug 11/Wed Aug 12	5055.8	20 57 03	19 19	20 43	4 20	5 44	17 40	1 18	22 01	.....	65	1 51.8	16 24
Wed Aug 12/Thu Aug 13	5056.8	21 01 00	19 18	20 42	4 21	5 45	17 42	1 23	22 38	.....	55	2 45.0	20 35
Thu Aug 13/Fri Aug 14	5057.8	21 04 56	19 17	20 41	4 22	5 46	17 45	1 28	23 23	.....	44	3 42.1	23 43
Fri Aug 14/Sat Aug 15	5058.8	21 08 53	19 16	20 39	4 23	5 46	17 48	1 32	0 16	.....	33	4 42.9	25 30
Sat Aug 15/Sun Aug 16	5059.8	21 12 49	19 15	20 38	4 24	5 47	17 50	1 37	1 18	.....	23	5 46.2	25 37
Sun Aug 16/Mon Aug 17	5060.8	21 16 46	19 14	20 37	4 25	5 48	17 53	1 42	2 27	.....	13	6 50.0	23 58
Mon Aug 17/Tue Aug 18	5061.8	21 20 42	19 12	20 35	4 26	5 48	17 55	1 47	3 40	17 18	6	7 52.3	20 38
Tue Aug 18/Wed Aug 19	5062.8	21 24 39	19 11	20 34	4 26	5 49	17 58	1 52	4 54	18 04	2	8 51.8	15 53
Wed Aug 19/Thu Aug 20	5063.8	21 28 36	19 10	20 33	4 27	5 50	18 01	1 57	6 06	18 43	0	9 48.2	10 10
Thu Aug 20/Fri Aug 21	5064.8	21 32 32	19 09	20 31	4 28	5 50	18 03	2 02	.....	19 19	1	10 41.8	3 54
Fri Aug 21/Sat Aug 22	5065.8	21 36 29	19 08	20 30	4 29	5 51	18 06	2 06	.....	19 52	5	11 33.5	- 2 29
Sat Aug 22/Sun Aug 23	5066.8	21 40 25	19 07	20 28	4 30	5 52	18 08	2 11	.....	20 25	11	12 24.3	- 8 36
Sun Aug 23/Mon Aug 24	5067.8	21 44 22	19 06	20 27	4 31	5 52	18 11	2 16	.....	20 58	19	13 15.0	-14 10
Mon Aug 24/Tue Aug 25	5068.8	21 48 18	19 04	20 26	4 32	5 53	18 13	2 21	.....	21 33	28	14 06.3	-18 55
Tue Aug 25/Wed Aug 26	5069.8	21 52 15	19 03	20 24	4 33	5 54	18 16	2 26	.....	22 12	38	14 58.6	-22 41
Wed Aug 26/Thu Aug 27	5070.8	21 56 11	19 02	20 23	4 33	5 54	18 18	2 30	.....	22 55	47	15 52.0	-25 18
Thu Aug 27/Fri Aug 28	5071.8	22 00 08	19 01	20 21	4 34	5 55	18 21	2 35	.....	23 42	57	16 45.9	-26 42
Fri Aug 28/Sat Aug 29	5072.8	22 04 05	19 00	20 20	4 35	5 55	18 23	2 40	.....	0 33	67	17 39.8	-26 50
Sat Aug 29/Sun Aug 30	5073.8	22 08 01	18 58	20 19	4 36	5 56	18 26	2 45	.....	1 27	75	18 32.7	-25 45
Sun Aug 30/Mon Aug 31	5074.8	22 11 58	18 57	20 17	4 37	5 57	18 28	2 49	.....	2 23	83	19 24.1	-23 32
Mon Aug 31/Tue Sep 01	5075.8	22 15 54	18 56	20 16	4 38	5 57	18 31	2 54	.....	3 20	89	20 13.6	-20 19

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Sep 01/Wed Sep 02	5076.8	22 19 51	18 55	20 14	4 38	5 58	18 33	2 59	17 09	4 16	95	21 01.3	-16 15
Wed Sep 02/Thu Sep 03	5077.8	22 23 47	18 53	20 13	4 39	5 59	18 36	3 04	17 40	5 12	98	21 47.4	-11 32
Thu Sep 03/Fri Sep 04	5078.8	22 27 44	18 52	20 11	4 40	5 59	18 38	3 08	18 08	6 08	100	22 32.6	- 6 19
Fri Sep 04/Sat Sep 05	5079.8	22 31 40	18 51	20 10	4 41	6 00	18 41	3 13	18 36	.....	100	23 17.5	- 0 49
Sat Sep 05/Sun Sep 06	5080.8	22 35 37	18 50	20 08	4 42	6 00	18 43	3 18	19 03	.....	97	0 03.0	4 46
Sun Sep 06/Mon Sep 07	5081.8	22 39 34	18 48	20 07	4 42	6 01	18 46	3 23	19 32	.....	93	0 50.1	10 14
Mon Sep 07/Tue Sep 08	5082.8	22 43 30	18 47	20 06	4 43	6 02	18 48	3 27	20 04	.....	87	1 39.5	15 18
Tue Sep 08/Wed Sep 09	5083.8	22 47 27	18 46	20 04	4 44	6 02	18 51	3 32	20 40	.....	78	2 32.0	19 41
Wed Sep 09/Thu Sep 10	5084.8	22 51 23	18 44	20 03	4 45	6 03	18 53	3 37	21 21	.....	69	3 28.1	23 06
Thu Sep 10/Fri Sep 11	5085.8	22 55 20	18 43	20 01	4 45	6 03	18 56	3 41	22 10	.....	58	4 27.4	25 12
Fri Sep 11/Sat Sep 12	5086.8	22 59 16	18 42	20 00	4 46	6 04	18 58	3 46	23 08	.....	47	5 29.0	25 46
Sat Sep 12/Sun Sep 13	5087.8	23 03 13	18 40	19 58	4 47	6 05	19 01	3 51	0 12	.....	36	6 31.2	24 40
Sun Sep 13/Mon Sep 14	5088.8	23 07 09	18 39	19 57	4 48	6 05	19 03	3 55	1 22	.....	25	7 32.4	21 56
Mon Sep 14/Tue Sep 15	5089.8	23 11 06	18 38	19 55	4 48	6 06	19 06	4 00	2 33	.....	16	8 31.3	17 46
Tue Sep 15/Wed Sep 16	5090.8	23 15 03	18 36	19 54	4 49	6 07	19 08	4 05	3 44	.....	8	9 27.5	12 31
Wed Sep 16/Thu Sep 17	5091.8	23 18 59	18 35	19 53	4 50	6 07	19 11	4 09	4 53	17 14	3	10 21.3	6 33
Thu Sep 17/Fri Sep 18	5092.8	23 22 56	18 34	19 51	4 50	6 08	19 13	4 14	6 00	17 48	0	11 13.2	0 16
Fri Sep 18/Sat Sep 19	5093.8	23 26 52	18 32	19 50	4 51	6 08	19 16	4 19	7 07	18 20	1	12 04.3	- 5 58
Sat Sep 19/Sun Sep 20	5094.8	23 30 49	18 31	19 48	4 52	6 09	19 18	4 23	.....	18 54	3	12 55.3	-11 48
Sun Sep 20/Mon Sep 21	5095.8	23 34 45	18 30	19 47	4 52	6 10	19 21	4 28	.....	19 29	8	13 47.0	-16 56
Mon Sep 21/Tue Sep 22	5096.8	23 38 42	18 28	19 45	4 53	6 10	19 23	4 33	.....	20 07	15	14 39.8	-21 07
Tue Sep 22/Wed Sep 23	5097.8	23 42 38	18 27	19 44	4 54	6 11	19 26	4 37	.....	20 49	23	15 33.6	-24 11
Wed Sep 23/Thu Sep 24	5098.8	23 46 35	18 26	19 43	4 55	6 11	19 29	4 42	.....	21 35	31	16 28.0	-26 01
Thu Sep 24/Fri Sep 25	5099.8	23 50 32	18 25	19 41	4 55	6 12	19 31	4 47	.....	22 25	41	17 22.3	-26 34
Fri Sep 25/Sat Sep 26	5100.8	23 54 28	18 23	19 40	4 56	6 13	19 34	4 51	.....	23 19	50	18 15.7	-25 52
Sat Sep 26/Sun Sep 27	5101.8	23 58 25	18 22	19 39	4 57	6 13	19 36	4 56	.....	0 15	60	19 07.5	-24 01
Sun Sep 27/Mon Sep 28	5102.8	0 02 21	18 21	19 37	4 57	6 14	19 39	5 00	.....	1 11	69	19 57.4	-21 08
Mon Sep 28/Tue Sep 29	5103.8	0 06 18	18 19	19 36	4 58	6 15	19 41	5 05	.....	2 07	77	20 45.3	-17 23
Tue Sep 29/Wed Sep 30	5104.8	0 10 14	18 18	19 35	4 59	6 15	19 44	5 10	.....	3 03	85	21 31.7	-12 55
Wed Sep 30/Thu Oct 01	5105.8	0 14 11	18 17	19 33	4 59	6 16	19 47	5 14	.....	3 59	91	22 17.1	- 7 54

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Oct 01/Fri Oct 02	5106.8	0 18 07	18 15	19 32	5 00	6 17	19 49	5 19	16 38	4 55	96	23 02.2	- 2 29
Fri Oct 02/Sat Oct 03	5107.8	0 22 04	18 14	19 31	5 01	6 17	19 52	5 24	17 05	5 53	99	23 47.9	3 06
Sat Oct 03/Sun Oct 04	5108.8	0 26 01	18 13	19 29	5 01	6 18	19 55	5 28	17 34	6 52	100	0 35.2	8 40
Sun Oct 04/Mon Oct 05	5109.8	0 29 57	18 12	19 28	5 02	6 19	19 57	5 33	18 05	.....	99	1 24.8	13 56
Mon Oct 05/Tue Oct 06	5110.8	0 33 54	18 10	19 27	5 03	6 19	20 00	5 37	18 40	.....	95	2 17.5	18 36
Tue Oct 06/Wed Oct 07	5111.8	0 37 50	18 09	19 26	5 03	6 20	20 03	5 42	19 21	.....	89	3 13.8	22 20
Wed Oct 07/Thu Oct 08	5112.8	0 41 47	18 08	19 24	5 04	6 21	20 05	5 47	20 08	.....	82	4 13.2	24 47
Thu Oct 08/Fri Oct 09	5113.8	0 45 43	18 07	19 23	5 05	6 21	20 08	5 51	21 03	.....	72	5 14.9	25 43
Fri Oct 09/Sat Oct 10	5114.8	0 49 40	18 05	19 22	5 05	6 22	20 11	5 56	22 05	.....	61	6 17.0	25 00
Sat Oct 10/Sun Oct 11	5115.8	0 53 36	18 04	19 21	5 06	6 23	20 14	6 00	23 12	.....	50	7 18.0	22 40
Sun Oct 11/Mon Oct 12	5116.8	0 57 33	18 03	19 19	5 07	6 23	20 16	6 05	0 21	.....	39	8 16.5	18 55
Mon Oct 12/Tue Oct 13	5117.8	1 01 30	18 02	19 18	5 07	6 24	20 19	6 10	1 30	.....	28	9 12.1	14 04
Tue Oct 13/Wed Oct 14	5118.8	1 05 26	18 01	19 17	5 08	6 25	20 22	6 14	2 38	.....	18	10 05.1	8 27
Wed Oct 14/Thu Oct 15	5119.8	1 09 23	17 59	19 16	5 09	6 25	20 25	6 19	3 44	.....	11	10 56.4	2 25
Thu Oct 15/Fri Oct 16	5120.8	1 13 19	17 58	19 15	5 09	6 26	20 27	6 24	4 49	16 18	5	11 46.7	- 3 42
Fri Oct 16/Sat Oct 17	5121.8	1 17 16	17 57	19 14	5 10	6 27	20 30	6 28	5 54	16 50	1	12 37.0	- 9 35
Sat Oct 17/Sun Oct 18	5122.8	1 21 12	17 56	19 13	5 11	6 28	20 33	6 33	6 58	17 24	0	13 28.1	-14 54
Sun Oct 18/Mon Oct 19	5123.8	1 25 09	17 55	19 12	5 11	6 28	20 36	6 37	.....	18 01	2	14 20.4	-19 25
Mon Oct 19/Tue Oct 20	5124.8	1 29 05	17 54	19 11	5 12	6 29	20 39	6 42	.....	18 41	5	15 14.1	-22 54
Tue Oct 20/Wed Oct 21	5125.8	1 33 02	17 53	19 10	5 13	6 30	20 42	6 47	.....	19 26	10	16 08.8	-25 10
Wed Oct 21/Thu Oct 22	5126.8	1 36 59	17 52	19 09	5 13	6 31	20 45	6 51	.....	20 16	17	17 03.6	-26 09
Thu Oct 22/Fri Oct 23	5127.8	1 40 55	17 51	19 08	5 14	6 31	20 48	6 56	.....	21 09	25	17 57.7	-25 51
Fri Oct 23/Sat Oct 24	5128.8	1 44 52	17 50	19 07	5 15	6 32	20 51	7 01	.....	22 04	33	18 50.1	-24 21
Sat Oct 24/Sun Oct 25	5129.8	1 48 48	17 49	19 06	5 16	6 33	20 54	7 05	.....	23 01	42	19 40.5	-21 49
Sun Oct 25/Mon Oct 26	5130.8	1 52 45	17 48	19 05	5 16	6 34	20 57	7 10	.....	23 57	52	20 28.6	-18 23
Mon Oct 26/Tue Oct 27	5131.8	1 56 41	17 47	19 04	5 17	6 34	21 00	7 15	.....	0 53	61	21 15.0	-14 12
Tue Oct 27/Wed Oct 28	5132.8	2 00 38	17 46	19 03	5 18	6 35	21 03	7 19	.....	1 48	70	22 00.1	- 9 27
Wed Oct 28/Thu Oct 29	5133.8	2 04 34	17 45	19 02	5 18	6 36	21 06	7 24	.....	2 44	79	22 44.8	- 4 15
Thu Oct 29/Fri Oct 30	5134.8	2 08 31	17 44	19 01	5 19	6 37	21 09	7 28	.....	3 40	86	23 29.9	1 13
Fri Oct 30/Sat Oct 31	5135.8	2 12 28	17 43	19 01	5 20	6 38	21 12	7 33	.....	4 39	92	0 16.5	6 46
Sat Oct 31/Sun Nov 01	5136.8	2 16 24	17 42	19 00	5 21	6 39	21 15	7 38	16 04	5 40	97	1 05.5	12 10

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Nov 01/Mon Nov 02	5137.8	2 20 21	17 41	18 59	5 21	6 39	21 19	7 42	16 38	6 45	99	1 57.8	17 06
Mon Nov 02/Tue Nov 03	5138.8	2 24 17	17 40	18 58	5 22	6 40	21 22	7 47	17 17	7 51	100	2 54.1	21 14
Tue Nov 03/Wed Nov 04	5139.8	2 28 14	17 39	18 58	5 23	6 41	21 25	7 52	18 03	.....	97	3 54.2	24 10
Wed Nov 04/Thu Nov 05	5140.8	2 32 10	17 39	18 57	5 23	6 42	21 28	7 56	18 56	.....	92	4 57.2	25 34
Thu Nov 05/Fri Nov 06	5141.8	2 36 07	17 38	18 56	5 24	6 43	21 32	8 01	19 58	.....	85	6 01.0	25 15
Fri Nov 06/Sat Nov 07	5142.8	2 40 03	17 37	18 56	5 25	6 44	21 35	8 06	21 05	.....	75	7 03.7	23 14
Sat Nov 07/Sun Nov 08	5143.8	2 44 00	17 36	18 55	5 26	6 44	21 38	8 11	22 14	.....	65	8 03.6	19 44
Sun Nov 08/Mon Nov 09	5144.8	2 47 57	17 36	18 54	5 26	6 45	21 41	8 15	23 23	.....	53	9 00.0	15 05
Mon Nov 09/Tue Nov 10	5145.8	2 51 53	17 35	18 54	5 27	6 46	21 45	8 20	0 30	.....	42	9 53.3	9 39
Tue Nov 10/Wed Nov 11	5146.8	2 55 50	17 34	18 53	5 28	6 47	21 48	8 25	1 35	.....	31	10 44.1	3 47
Wed Nov 11/Thu Nov 12	5147.8	2 59 46	17 34	18 53	5 29	6 48	21 52	8 29	2 38	.....	22	11 33.7	- 2 11
Thu Nov 12/Fri Nov 13	5148.8	3 03 43	17 33	18 52	5 29	6 49	21 55	8 34	3 41	.....	13	12 23.0	- 7 59
Fri Nov 13/Sat Nov 14	5149.8	3 07 39	17 32	18 52	5 30	6 50	21 59	8 39	4 45	.....	7	13 12.8	-13 21
Sat Nov 14/Sun Nov 15	5150.8	3 11 36	17 32	18 51	5 31	6 50	22 02	8 43	5 48	15 57	3	14 04.0	-18 01
Sun Nov 15/Mon Nov 16	5151.8	3 15 32	17 31	18 51	5 32	6 51	22 06	8 48	6 51	16 36	0	14 56.7	-21 45
Mon Nov 16/Tue Nov 17	5152.8	3 19 29	17 31	18 51	5 32	6 52	22 09	8 53	7 51	17 19	0	15 50.8	-24 22
Tue Nov 17/Wed Nov 18	5153.8	3 23 26	17 30	18 50	5 33	6 53	22 13	8 57	.....	18 07	2	16 45.6	-25 43
Wed Nov 18/Thu Nov 19	5154.8	3 27 22	17 30	18 50	5 34	6 54	22 16	9 02	.....	18 59	6	17 40.0	-25 48
Thu Nov 19/Fri Nov 20	5155.8	3 31 19	17 30	18 50	5 35	6 55	22 20	9 07	.....	19 54	11	18 33.1	-24 40
Fri Nov 20/Sat Nov 21	5156.8	3 35 15	17 29	18 49	5 35	6 56	22 24	9 12	.....	20 50	18	19 24.1	-22 26
Sat Nov 21/Sun Nov 22	5157.8	3 39 12	17 29	18 49	5 36	6 57	22 27	9 16	.....	21 47	26	20 12.7	-19 16
Sun Nov 22/Mon Nov 23	5158.8	3 43 08	17 28	18 49	5 37	6 57	22 31	9 21	.....	22 42	34	20 59.2	-15 21
Mon Nov 23/Tue Nov 24	5159.8	3 47 05	17 28	18 49	5 38	6 58	22 35	9 26	.....	23 37	43	21 44.0	-10 50
Tue Nov 24/Wed Nov 25	5160.8	3 51 01	17 28	18 49	5 38	6 59	22 39	9 30	.....	0 32	53	22 27.9	- 5 53
Wed Nov 25/Thu Nov 26	5161.8	3 54 58	17 28	18 48	5 39	7 00	22 43	9 35	.....	1 27	63	23 11.9	- 0 38
Thu Nov 26/Fri Nov 27	5162.8	3 58 55	17 27	18 48	5 40	7 01	22 46	9 40	.....	2 23	72	23 56.9	4 46
Fri Nov 27/Sat Nov 28	5163.8	4 02 51	17 27	18 48	5 41	7 02	22 50	9 44	.....	3 23	81	0 44.0	10 08
Sat Nov 28/Sun Nov 29	5164.8	4 06 48	17 27	18 48	5 41	7 03	22 54	9 49	.....	4 25	88	1 34.3	15 13
Sun Nov 29/Mon Nov 30	5165.8	4 10 44	17 27	18 48	5 42	7 03	22 58	9 54	.....	5 31	94	2 28.8	19 42
Mon Nov 30/Tue Dec 01	5166.8	4 14 41	17 27	18 48	5 43	7 04	23 02	9 58	15 51	6 39	98	3 28.0	23 10

***** 2009 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) (2009 at start)	JDmid (-2450000)	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 Dec 01/Wed Dec 02	5167.8	4 18 37	17 27	18 48	5 44	7 05	23 06	10 03	16 43	7 46	100	4 31.2	25 14
Wed Dec 02/Thu Dec 03	5168.8	4 22 34	17 27	18 48	5 44	7 06	23 10	10 08	17 43	.....	99	5 36.8	25 34
Thu Dec 03/Fri Dec 04	5169.8	4 26 30	17 27	18 48	5 45	7 07	23 14	10 12	18 50	.....	94	6 42.3	24 03
Fri Dec 04/Sat Dec 05	5170.8	4 30 27	17 27	18 48	5 46	7 07	23 18	10 17	20 01	.....	88	7 45.5	20 50
Sat Dec 05/Sun Dec 06	5171.8	4 34 24	17 27	18 49	5 46	7 08	23 22	10 22	21 12	.....	79	8 44.9	16 18
Sun Dec 06/Mon Dec 07	5172.8	4 38 20	17 27	18 49	5 47	7 09	23 26	10 26	22 22	.....	68	9 40.4	10 53
Mon Dec 07/Tue Dec 08	5173.8	4 42 17	17 27	18 49	5 48	7 10	23 30	10 31	23 28	.....	57	10 32.7	4 58
Tue Dec 08/Wed Dec 09	5174.8	4 46 13	17 27	18 49	5 48	7 10	23 34	10 36	0 32	.....	46	11 23.0	- 1 03
Wed Dec 09/Thu Dec 10	5175.8	4 50 10	17 27	18 49	5 49	7 11	23 39	10 40	1 35	.....	35	12 12.3	- 6 54
Thu Dec 10/Fri Dec 11	5176.8	4 54 06	17 28	18 50	5 50	7 12	23 43	10 45	2 37	.....	25	13 01.6	-12 19
Fri Dec 11/Sat Dec 12	5177.8	4 58 03	17 28	18 50	5 50	7 13	23 47	10 49	3 39	.....	17	13 51.8	-17 04
Sat Dec 12/Sun Dec 13	5178.8	5 01 59	17 28	18 50	5 51	7 13	23 51	10 54	4 41	.....	10	14 43.4	-20 57
Sun Dec 13/Mon Dec 14	5179.8	5 05 56	17 28	18 51	5 52	7 14	23 56	10 59	5 42	.....	5	15 36.5	-23 47
Mon Dec 14/Tue Dec 15	5180.8	5 09 53	17 29	18 51	5 52	7 14	24 00	11 03	6 39	16 00	1	16 30.6	-25 26
Tue Dec 15/Wed Dec 16	5181.8	5 13 49	17 29	18 51	5 53	7 15	0 04	11 08	7 32	16 51	0	17 24.7	-25 50
Wed Dec 16/Thu Dec 17	5182.8	5 17 46	17 29	18 52	5 53	7 16	0 09	11 12	8 19	17 45	1	18 18.0	-25 01
Thu Dec 17/Fri Dec 18	5183.8	5 21 42	17 30	18 52	5 54	7 16	0 13	11 17	.....	18 41	3	19 09.5	-23 03
Fri Dec 18/Sat Dec 19	5184.8	5 25 39	17 30	18 52	5 54	7 17	0 17	11 21	.....	19 38	7	19 58.6	-20 07
Sat Dec 19/Sun Dec 20	5185.8	5 29 35	17 31	18 53	5 55	7 17	0 22	11 26	.....	20 34	12	20 45.5	-16 24
Sun Dec 20/Mon Dec 21	5186.8	5 33 32	17 31	18 53	5 56	7 18	0 26	11 30	.....	21 29	19	21 30.4	-12 05
Mon Dec 21/Tue Dec 22	5187.8	5 37 28	17 32	18 54	5 56	7 18	0 31	11 34	.....	22 23	27	22 14.0	- 7 18
Tue Dec 22/Wed Dec 23	5188.8	5 41 25	17 32	18 54	5 56	7 19	0 35	11 39	.....	23 17	35	22 57.0	- 2 14
Wed Dec 23/Thu Dec 24	5189.8	5 45 22	17 33	18 55	5 57	7 19	0 39	11 43	.....	0 12	45	23 40.4	3 01
Thu Dec 24/Fri Dec 25	5190.8	5 49 18	17 33	18 56	5 57	7 20	0 44	11 48	.....	1 08	55	0 25.4	8 15
Fri Dec 25/Sat Dec 26	5191.8	5 53 15	17 34	18 56	5 58	7 20	0 48	11 52	.....	2 07	65	1 12.8	13 18
Sat Dec 26/Sun Dec 27	5192.8	5 57 11	17 34	18 57	5 58	7 20	0 53	11 56	.....	3 10	74	2 04.0	17 56
Sun Dec 27/Mon Dec 28	5193.8	6 01 08	17 35	18 57	5 59	7 21	0 58	12 01	.....	4 15	83	2 59.8	21 47
Mon Dec 28/Tue Dec 29	5194.8	6 05 04	17 36	18 58	5 59	7 21	1 02	12 05	.....	5 23	91	4 00.4	24 30
Tue Dec 29/Wed Dec 30	5195.8	6 09 01	17 36	18 58	5 59	7 21	1 07	12 09	.....	6 28	97	5 05.0	25 39
Wed Dec 30/Thu Dec 31	5196.8	6 12 57	17 37	18 59	6 00	7 22	1 11	12 14	16 26	7 28	100	6 11.6	24 58
Thu Dec 31/Fri Jan 01	5197.8	6 16 54	17 38	19 00	6 00	7 22	1 16	12 18	17 37	8 21	100	7 17.6	22 25