***** 2010 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 2010, 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 16	5 03	Dec 24	10 37	Dec 31	12 14	Jan 07	3 42
Jan 15	0 13	Jan 23	3 54	Jan 29	23 19	Feb 05	16 51
Feb 13	19 53	Feb 21	17 43	Feb 28	9 39	Mar 07	8 44
Mar 15	14 03	Mar 23	4 00	Mar 29	19 26	Apr 06	2 39
Apr 14	5 31	Apr 21	11 20	Apr 28	5 19	May 05	21 16
May 13	18 06	May 20	16 44	May 27	16 08	Jun 04	15 14
Jun 12	4 16	Jun 18	21 31	Jun 26	4 31	Jul 04	7 37
Jul 11	12 41	Jul 18	3 12	Jul 25	18 38	Aug 02	22 01
Aug 09	20 09	Aug 16	11 15	Aug 24	10 06	Sep 01	10 24
Sep 08	3 30	Sep 14	22 50	Sep 23	2 19	Sep 30	20 53
Oct 07	11 45	Oct 14	14 27	Oct 22	18 38	Oct 30	5 47
Nov 05	21 52	Nov 13	9 38	Nov 21	10 29	Nov 28	13 38
Dec 05	10 37	Dec 13	6 59	Dec 21	1 15	Dec 27	21 20
Jan 04	2 05	Jan 12	4 33	Jan 19	14 23	Jan 26	5 59

***** 2010 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) (2010 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 Jan 01/Sat Jan 02	5198.8	6 20 51	17 38	19 00	6 00	7 22	1 20	12 22	18 51	.....	97	8 20.7	18 14
Sat Jan 02/Sun Jan 03	5199.8	6 24 47	17 39	19 01	6 00	7 22	1 25	12 26	20 04	.....	91	9 20.1	12 53
Sun Jan 03/Mon Jan 04	5200.8	6 28 44	17 40	19 02	6 01	7 22	1 30	12 30	21 15	.....	82	10 15.8	6 50
Mon Jan 04/Tue Jan 05	5201.8	6 32 40	17 41	19 03	6 01	7 23	1 34	12 34	22 22	.....	73	11 08.6	0 33
Tue Jan 05/Wed Jan 06	5202.8	6 36 37	17 41	19 03	6 01	7 23	1 39	12 39	23 27	.....	62	11 59.7	- 5 34
Wed Jan 06/Thu Jan 07	5203.8	6 40 33	17 42	19 04	6 01	7 23	1 44	12 43	0 31	.....	51	12 50.1	-11 14
Thu Jan 07/Fri Jan 08	5204.8	6 44 30	17 43	19 05	6 01	7 23	1 48	12 47	1 33	.....	40	13 40.8	-16 13
Fri Jan 08/Sat Jan 09	5205.8	6 48 26	17 44	19 05	6 01	7 23	1 53	12 51	2 35	.....	30	14 32.4	-20 19
Sat Jan 09/Sun Jan 10	5206.8	6 52 23	17 45	19 06	6 01	7 23	1 58	12 55	3 36	.....	21	15 25.1	-23 22
Sun Jan 10/Mon Jan 11	5207.8	6 56 20	17 46	19 07	6 01	7 23	2 02	12 59	4 34	.....	14	16 18.6	-25 16
Mon Jan 11/Tue Jan 12	5208.8	7 00 16	17 46	19 08	6 01	7 23	2 07	13 03	5 27	.....	8	17 12.4	-25 56
Tue Jan 12/Wed Jan 13	5209.8	7 04 13	17 47	19 08	6 01	7 22	2 12	13 07	6 16	.....	4	18 05.5	-25 22
Wed Jan 13/Thu Jan 14	5210.8	7 08 09	17 48	19 09	6 01	7 22	2 17	13 11	6 59	16 34	1	18 57.1	-23 40
Thu Jan 14/Fri Jan 15	5211.8	7 12 06	17 49	19 10	6 01	7 22	2 21	13 14	7 36	17 30	0	19 46.7	-20 58
Fri Jan 15/Sat Jan 16	5212.8	7 16 02	17 50	19 11	6 01	7 22	2 26	13 18	8 10	18 27	1	20 34.0	-17 26
Sat Jan 16/Sun Jan 17	5213.8	7 19 59	17 51	19 11	6 01	7 22	2 31	13 22	.....	19 22	3	21 19.3	-13 15
Sun Jan 17/Mon Jan 18	5214.8	7 23 55	17 52	19 12	6 01	7 22	2 35	13 26	.....	20 17	8	22 02.9	- 8 35
Mon Jan 18/Tue Jan 19	5215.8	7 27 52	17 53	19 13	6 01	7 21	2 40	13 30	.....	21 10	13	22 45.7	- 3 37
Tue Jan 19/Wed Jan 20	5216.8	7 31 49	17 53	19 14	6 01	7 21	2 45	13 33	.....	22 04	20	23 28.4	1 32
Wed Jan 20/Thu Jan 21	5217.8	7 35 45	17 54	19 15	6 00	7 21	2 50	13 37	.....	22 59	28	0 12.0	6 41
Thu Jan 21/Fri Jan 22	5218.8	7 39 42	17 55	19 15	6 00	7 20	2 54	13 41	.....	23 56	38	0 57.3	11 40
Fri Jan 22/Sat Jan 23	5219.8	7 43 38	17 56	19 16	6 00	7 20	2 59	13 45	.....	0 55	48	1 45.5	16 18
Sat Jan 23/Sun Jan 24	5220.8	7 47 35	17 57	19 17	6 00	7 19	3 04	13 48	.....	1 57	58	2 37.5	20 20
Sun Jan 24/Mon Jan 25	5221.8	7 51 31	17 58	19 18	5 59	7 19	3 09	13 52	.....	3 02	68	3 33.9	23 26
Mon Jan 25/Tue Jan 26	5222.8	7 55 28	17 59	19 19	5 59	7 18	3 13	13 55	.....	4 06	78	4 34.7	25 15
Tue Jan 26/Wed Jan 27	5223.8	7 59 24	18 00	19 19	5 59	7 18	3 18	13 59	.....	5 08	87	5 38.9	25 27
Wed Jan 27/Thu Jan 28	5224.8	8 03 21	18 01	19 20	5 58	7 17	3 23	14 02	.....	6 04	94	6 44.5	23 50
Thu Jan 28/Fri Jan 29	5225.8	8 07 18	18 02	19 21	5 58	7 17	3 28	14 06	16 21	6 54	99	7 49.1	20 27
Fri Jan 29/Sat Jan 30	5226.8	8 11 14	18 03	19 22	5 57	7 16	3 32	14 09	17 36	7 37	100	8 51.2	15 33
Sat Jan 30/Sun Jan 31	5227.8	8 15 11	18 03	19 23	5 57	7 16	3 37	14 13	18 50	.....	98	9 50.1	9 38
Sun Jan 31/Mon Feb 01	5228.8	8 19 07	18 04	19 23	5 56	7 15	3 42	14 16	20 01	.....	93	10 46.1	3 11

***** 2010 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) (2010 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 Feb 01/Tue Feb 02	5229.8	8 23 04	18 05	19 24	5 56	7 14	3 46	14 20	21 10	.....	86	11 40.1	- 3 19
Tue Feb 02/Wed Feb 03	5230.8	8 27 00	18 06	19 25	5 55	7 14	3 51	14 23	22 17	.....	77	12 32.9	- 9 26
Wed Feb 03/Thu Feb 04	5231.8	8 30 57	18 07	19 26	5 55	7 13	3 56	14 26	23 22	.....	67	13 25.5	-14 52
Thu Feb 04/Fri Feb 05	5232.8	8 34 53	18 08	19 27	5 54	7 12	4 01	14 30	0 26	.....	57	14 18.6	-19 22
Fri Feb 05/Sat Feb 06	5233.8	8 38 50	18 09	19 27	5 53	7 12	4 05	14 33	1 29	.....	46	15 12.3	-22 47
Sat Feb 06/Sun Feb 07	5234.8	8 42 47	18 10	19 28	5 53	7 11	4 10	14 36	2 28	.....	36	16 06.5	-24 59
Sun Feb 07/Mon Feb 08	5235.8	8 46 43	18 11	19 29	5 52	7 10	4 15	14 40	3 23	.....	27	17 00.7	-25 56
Mon Feb 08/Tue Feb 09	5236.8	8 50 40	18 12	19 30	5 51	7 09	4 20	14 43	4 13	.....	19	17 54.1	-25 39
Tue Feb 09/Wed Feb 10	5237.8	8 54 36	18 12	19 30	5 50	7 08	4 24	14 46	4 58	.....	12	18 46.0	-24 12
Wed Feb 10/Thu Feb 11	5238.8	8 58 33	18 13	19 31	5 50	7 07	4 29	14 49	5 37	.....	7	19 35.9	-21 44
Thu Feb 11/Fri Feb 12	5239.8	9 02 29	18 14	19 32	5 49	7 07	4 34	14 52	6 12	16 21	3	20 23.6	-18 24
Fri Feb 12/Sat Feb 13	5240.8	9 06 26	18 15	19 33	5 48	7 06	4 38	14 56	6 43	17 16	1	21 09.2	-14 22
Sat Feb 13/Sun Feb 14	5241.8	9 10 22	18 16	19 33	5 47	7 05	4 43	14 59	7 11	18 11	0	21 53.3	- 9 49
Sun Feb 14/Mon Feb 15	5242.8	9 14 19	18 17	19 34	5 46	7 04	4 48	15 02	7 39	19 05	1	22 36.3	- 4 55
Mon Feb 15/Tue Feb 16	5243.8	9 18 16	18 18	19 35	5 46	7 03	4 53	15 05	.....	19 59	4	23 19.0	0 11
Tue Feb 16/Wed Feb 17	5244.8	9 22 12	18 18	19 36	5 45	7 02	4 57	15 08	.....	20 54	9	0 02.2	5 18
Wed Feb 17/Thu Feb 18	5245.8	9 26 09	18 19	19 37	5 44	7 01	5 02	15 11	.....	21 50	15	0 46.7	10 18
Thu Feb 18/Fri Feb 19	5246.8	9 30 05	18 20	19 37	5 43	7 00	5 07	15 14	.....	22 48	23	1 33.4	14 57
Fri Feb 19/Sat Feb 20	5247.8	9 34 02	18 21	19 38	5 42	6 59	5 11	15 17	.....	23 48	31	2 23.1	19 03
Sat Feb 20/Sun Feb 21	5248.8	9 37 58	18 22	19 39	5 41	6 58	5 16	15 20	.....	0 49	41	3 16.4	22 21
Sun Feb 21/Mon Feb 22	5249.8	9 41 55	18 23	19 40	5 40	6 57	5 21	15 23	.....	1 52	52	4 13.6	24 32
Mon Feb 22/Tue Feb 23	5250.8	9 45 51	18 23	19 40	5 39	6 56	5 25	15 26	.....	2 53	63	5 14.0	25 20
Tue Feb 23/Wed Feb 24	5251.8	9 49 48	18 24	19 41	5 38	6 55	5 30	15 29	.....	3 49	74	6 16.5	24 30
Wed Feb 24/Thu Feb 25	5252.8	9 53 45	18 25	19 42	5 37	6 54	5 35	15 32	.....	4 40	83	7 19.4	21 59
Thu Feb 25/Fri Feb 26	5253.8	9 57 41	18 26	19 43	5 36	6 52	5 39	15 34	.....	5 26	91	8 21.1	17 54
Fri Feb 26/Sat Feb 27	5254.8	10 01 38	18 27	19 43	5 35	6 51	5 44	15 37	16 21	6 06	97	9 20.7	12 32
Sat Feb 27/Sun Feb 28	5255.8	10 05 34	18 27	19 44	5 34	6 50	5 49	15 40	17 33	6 43	100	10 18.1	6 20
Sun Feb 28/Mon Mar 01	5256.8	10 09 31	18 28	19 45	5 32	6 49	5 54	15 43	18 44	7 18	99	11 13.8	- 0 15

***** 2010 MARCH *****

Calendar for Kitt Peak, west longitude (h.m.s) = 7 26 24, latitude (d.m) = 31 57.8
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Mon Mar 01/Tue Mar 02	5257.8	10 13 27	18 29	19 45	5 31	6 48	5 58	15 46	19 54	.....	96	12 08.5	- 6 43
Tue Mar 02/Wed Mar 03	5258.8	10 17 24	18 30	19 46	5 30	6 47	6 03	15 49	21 02	.....	90	13 03.1	-12 40
Wed Mar 03/Thu Mar 04	5259.8	10 21 20	18 30	19 47	5 29	6 46	6 08	15 51	22 09	.....	82	13 58.1	-17 45
Thu Mar 04/Fri Mar 05	5260.8	10 25 17	18 31	19 48	5 28	6 44	6 12	15 54	23 15	.....	73	14 53.7	-21 43
Fri Mar 05/Sat Mar 06	5261.8	10 29 14	18 32	19 48	5 27	6 43	6 17	15 57	0 17	.....	63	15 49.7	-24 24
Sat Mar 06/Sun Mar 07	5262.8	10 33 10	18 33	19 49	5 25	6 42	6 22	16 00	1 16	.....	53	16 45.5	-25 46
Sun Mar 07/Mon Mar 08	5263.8	10 37 07	18 33	19 50	5 24	6 41	6 26	16 02	2 09	.....	43	17 40.4	-25 49
Mon Mar 08/Tue Mar 09	5264.8	10 41 03	18 34	19 51	5 23	6 39	6 31	16 05	2 55	.....	34	18 33.4	-24 39
Tue Mar 09/Wed Mar 10	5265.8	10 45 00	18 35	19 51	5 22	6 38	6 36	16 08	3 36	.....	25	19 24.1	-22 25
Wed Mar 10/Thu Mar 11	5266.8	10 48 56	18 35	19 52	5 21	6 37	6 40	16 10	4 13	.....	18	20 12.5	-19 17
Thu Mar 11/Fri Mar 12	5267.8	10 52 53	18 36	19 53	5 19	6 36	6 45	16 13	4 45	.....	11	20 58.6	-15 26
Fri Mar 12/Sat Mar 13	5268.8	10 56 49	18 37	19 54	5 18	6 35	6 50	16 16	5 14	.....	6	21 43.1	-11 02
Sat Mar 13/Sun Mar 14	5269.8	11 00 46	18 38	19 54	5 17	6 33	6 54	16 18	5 42	17 00	2	22 26.4	- 6 14
Sun Mar 14/Mon Mar 15	5270.8	11 04 43	18 38	19 55	5 15	6 32	6 59	16 21	6 09	17 54	0	23 09.4	- 1 11
Mon Mar 15/Tue Mar 16	5271.8	11 08 39	18 39	19 56	5 14	6 31	7 04	16 24	6 37	18 48	0	23 52.7	3 57
Tue Mar 16/Wed Mar 17	5272.8	11 12 36	18 40	19 57	5 13	6 29	7 08	16 26	7 06	19 44	2	0 37.1	8 58
Wed Mar 17/Thu Mar 18	5273.8	11 16 32	18 40	19 57	5 11	6 28	7 13	16 29	.....	20 42	6	1 23.5	13 42
Thu Mar 18/Fri Mar 19	5274.8	11 20 29	18 41	19 58	5 10	6 27	7 18	16 31	.....	21 41	11	2 12.5	17 54
Fri Mar 19/Sat Mar 20	5275.8	11 24 25	18 42	19 59	5 09	6 26	7 23	16 34	.....	22 43	18	3 04.6	21 21
Sat Mar 20/Sun Mar 21	5276.8	11 28 22	18 43	20 00	5 07	6 24	7 27	16 37	.....	23 44	27	4 00.0	23 45
Sun Mar 21/Mon Mar 22	5277.8	11 32 18	18 43	20 00	5 06	6 23	7 32	16 39	.....	0 45	37	4 58.2	24 52
Mon Mar 22/Tue Mar 23	5278.8	11 36 15	18 44	20 01	5 05	6 22	7 37	16 42	.....	1 41	47	5 58.2	24 31
Tue Mar 23/Wed Mar 24	5279.8	11 40 12	18 45	20 02	5 03	6 20	7 41	16 44	.....	2 33	59	6 58.7	22 37
Wed Mar 24/Thu Mar 25	5280.8	11 44 08	18 45	20 03	5 02	6 19	7 46	16 47	.....	3 18	70	7 58.3	19 14
Thu Mar 25/Fri Mar 26	5281.8	11 48 05	18 46	20 03	5 00	6 18	7 51	16 49	.....	3 59	80	8 56.4	14 33
Fri Mar 26/Sat Mar 27	5282.8	11 52 01	18 47	20 04	4 59	6 17	7 56	16 52	.....	4 36	89	9 52.8	8 53
Sat Mar 27/Sun Mar 28	5283.8	11 55 58	18 47	20 05	4 58	6 15	8 00	16 54	.....	5 12	95	10 47.9	2 37
Sun Mar 28/Mon Mar 29	5284.8	11 59 54	18 48	20 06	4 56	6 14	8 05	16 57	17 29	5 47	99	11 42.4	- 3 50
Mon Mar 29/Tue Mar 30	5285.8	12 03 51	18 49	20 07	4 55	6 13	8 10	17 00	18 38	6 22	100	12 37.1	-10 02
Tue Mar 30/Wed Mar 31	5286.8	12 07 47	18 49	20 07	4 53	6 11	8 15	17 02	19 46	7 01	98	13 32.6	-15 35
Wed Mar 31/Thu Apr 01	5287.8	12 11 44	18 50	20 08	4 52	6 10	8 19	17 05	20 54	.....	93	14 29.3	-20 08

***** 2010 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) (2010 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 Apr 01/Fri Apr 02	5288.8	12 15 41	18 51	20 09	4 51	6 09	8 24	17 07	22 00	.....	87	15 26.9	-23 26
Fri Apr 02/Sat Apr 03	5289.8	12 19 37	18 51	20 10	4 49	6 08	8 29	17 10	23 02	.....	79	16 24.7	-25 20
Sat Apr 03/Sun Apr 04	5290.8	12 23 34	18 52	20 11	4 48	6 06	8 34	17 12	23 59	.....	70	17 21.6	-25 51
Sun Apr 04/Mon Apr 05	5291.8	12 27 30	18 53	20 12	4 46	6 05	8 38	17 15	0 49	.....	60	18 16.7	-25 03
Mon Apr 05/Tue Apr 06	5292.8	12 31 27	18 53	20 12	4 45	6 04	8 43	17 17	1 33	.....	50	19 09.2	-23 05
Tue Apr 06/Wed Apr 07	5293.8	12 35 23	18 54	20 13	4 44	6 03	8 48	17 20	2 11	.....	41	19 58.9	-20 11
Wed Apr 07/Thu Apr 08	5294.8	12 39 20	18 55	20 14	4 42	6 01	8 53	17 22	2 45	.....	32	20 46.1	-16 30
Thu Apr 08/Fri Apr 09	5295.8	12 43 16	18 56	20 15	4 41	6 00	8 58	17 25	3 15	.....	24	21 31.1	-12 15
Fri Apr 09/Sat Apr 10	5296.8	12 47 13	18 56	20 16	4 39	5 59	9 02	17 27	3 44	.....	16	22 14.8	- 7 33
Sat Apr 10/Sun Apr 11	5297.8	12 51 10	18 57	20 17	4 38	5 58	9 07	17 30	4 11	.....	10	22 57.9	- 2 36
Sun Apr 11/Mon Apr 12	5298.8	12 55 06	18 58	20 18	4 37	5 57	9 12	17 32	4 39	.....	5	23 41.3	2 30
Mon Apr 12/Tue Apr 13	5299.8	12 59 03	18 58	20 18	4 35	5 55	9 17	17 35	5 08	17 36	2	0 25.7	7 33
Tue Apr 13/Wed Apr 14	5300.8	13 02 59	18 59	20 19	4 34	5 54	9 22	17 37	5 39	18 34	0	1 11.9	12 22
Wed Apr 14/Thu Apr 15	5301.8	13 06 56	19 00	20 20	4 32	5 53	9 27	17 40	6 15	19 33	1	2 00.8	16 43
Thu Apr 15/Fri Apr 16	5302.8	13 10 52	19 00	20 21	4 31	5 52	9 31	17 43	6 55	20 35	3	2 52.7	20 21
Fri Apr 16/Sat Apr 17	5303.8	13 14 49	19 01	20 22	4 30	5 51	9 36	17 45	.....	21 37	8	3 47.8	23 00
Sat Apr 17/Sun Apr 18	5304.8	13 18 45	19 02	20 23	4 28	5 49	9 41	17 48	.....	22 39	15	4 45.6	24 23
Sun Apr 18/Mon Apr 19	5305.8	13 22 42	19 02	20 24	4 27	5 48	9 46	17 50	.....	23 37	23	5 45.0	24 20
Mon Apr 19/Tue Apr 20	5306.8	13 26 39	19 03	20 25	4 25	5 47	9 51	17 53	.....	0 29	33	6 44.7	22 47
Tue Apr 20/Wed Apr 21	5307.8	13 30 35	19 04	20 26	4 24	5 46	9 56	17 55	.....	1 16	44	7 43.2	19 48
Wed Apr 21/Thu Apr 22	5308.8	13 34 32	19 05	20 27	4 23	5 45	10 01	17 58	.....	1 57	55	8 40.0	15 35
Thu Apr 22/Fri Apr 23	5309.8	13 38 28	19 05	20 28	4 21	5 44	10 06	18 01	.....	2 34	67	9 34.9	10 23
Fri Apr 23/Sat Apr 24	5310.8	13 42 25	19 06	20 29	4 20	5 43	10 11	18 03	.....	3 09	77	10 28.4	4 31
Sat Apr 24/Sun Apr 25	5311.8	13 46 21	19 07	20 30	4 19	5 42	10 15	18 06	.....	3 43	86	11 21.2	- 1 39
Sun Apr 25/Mon Apr 26	5312.8	13 50 18	19 07	20 31	4 17	5 41	10 20	18 08	.....	4 17	93	12 14.4	- 7 46
Mon Apr 26/Tue Apr 27	5313.8	13 54 14	19 08	20 32	4 16	5 40	10 25	18 11	17 26	4 54	98	13 08.6	-13 28
Tue Apr 27/Wed Apr 28	5314.8	13 58 11	19 09	20 33	4 15	5 39	10 30	18 14	18 33	5 34	100	14 04.4	-18 23
Wed Apr 28/Thu Apr 29	5315.8	14 02 08	19 10	20 34	4 14	5 38	10 35	18 16	19 40	6 18	99	15 01.8	-22 12
Thu Apr 29/Fri Apr 30	5316.8	14 06 04	19 10	20 35	4 12	5 37	10 40	18 19	20 44	.....	96	16 00.3	-24 42
Fri Apr 30/Sat May 01	5317.8	14 10 01	19 11	20 36	4 11	5 36	10 45	18 22	21 44	.....	91	16 58.8	-25 45

***** 2010 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) (2010 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 May 01/Sun May 02	5318.8	14 13 57	19 12	20 37	4 10	5 35	10 50	18 25	22 39	.....	84	17 55.9	-25 25
Sun May 02/Mon May 03	5319.8	14 17 54	19 12	20 38	4 09	5 34	10 55	18 27	23 26	.....	76	18 50.6	-23 49
Mon May 03/Tue May 04	5320.8	14 21 50	19 13	20 39	4 08	5 33	11 00	18 30	0 07	.....	67	19 42.2	-21 09
Tue May 04/Wed May 05	5321.8	14 25 47	19 14	20 40	4 06	5 32	11 05	18 33	0 43	.....	58	20 30.9	-17 39
Wed May 05/Thu May 06	5322.8	14 29 43	19 15	20 41	4 05	5 31	11 10	18 36	1 15	.....	48	21 17.0	-13 32
Thu May 06/Fri May 07	5323.8	14 33 40	19 15	20 42	4 04	5 30	11 15	18 38	1 44	.....	39	22 01.3	- 8 57
Fri May 07/Sat May 08	5324.8	14 37 37	19 16	20 43	4 03	5 29	11 20	18 41	2 12	.....	30	22 44.6	- 4 04
Sat May 08/Sun May 09	5325.8	14 41 33	19 17	20 44	4 02	5 29	11 25	18 44	2 39	.....	22	23 27.8	0 58
Sun May 09/Mon May 10	5326.8	14 45 30	19 17	20 45	4 01	5 28	11 29	18 47	3 07	.....	14	0 11.8	6 01
Mon May 10/Tue May 11	5327.8	14 49 26	19 18	20 46	4 00	5 27	11 34	18 50	3 38	.....	8	0 57.6	10 54
Tue May 11/Wed May 12	5328.8	14 53 23	19 19	20 47	3 59	5 26	11 39	18 53	4 12	.....	4	1 45.9	15 24
Wed May 12/Thu May 13	5329.8	14 57 19	19 20	20 48	3 58	5 26	11 44	18 56	4 51	18 23	1	2 37.4	19 16
Thu May 13/Fri May 14	5330.8	15 01 16	19 20	20 49	3 57	5 25	11 49	18 59	5 37	19 26	0	3 32.4	22 12
Fri May 14/Sat May 15	5331.8	15 05 12	19 21	20 50	3 56	5 24	11 54	19 02	6 30	20 29	2	4 30.4	23 56
Sat May 15/Sun May 16	5332.8	15 09 09	19 22	20 51	3 55	5 24	11 59	19 05	.....	21 30	6	5 30.4	24 13
Sun May 16/Mon May 17	5333.8	15 13 06	19 22	20 51	3 54	5 23	12 04	19 08	.....	22 25	12	6 30.8	22 59
Mon May 17/Tue May 18	5334.8	15 17 02	19 23	20 52	3 53	5 22	12 09	19 11	.....	23 14	20	7 30.1	20 16
Tue May 18/Wed May 19	5335.8	15 20 59	19 24	20 53	3 52	5 22	12 14	19 14	.....	23 57	30	8 27.3	16 18
Wed May 19/Thu May 20	5336.8	15 24 55	19 24	20 54	3 51	5 21	12 19	19 17	.....	0 35	41	9 22.1	11 20
Thu May 20/Fri May 21	5337.8	15 28 52	19 25	20 55	3 50	5 21	12 24	19 20	.....	1 10	53	10 14.9	5 43
Fri May 21/Sat May 22	5338.8	15 32 48	19 26	20 56	3 50	5 20	12 29	19 23	.....	1 44	64	11 06.6	- 0 14
Sat May 22/Sun May 23	5339.8	15 36 45	19 26	20 57	3 49	5 19	12 33	19 26	.....	2 17	75	11 58.1	- 6 12
Sun May 23/Mon May 24	5340.8	15 40 41	19 27	20 58	3 48	5 19	12 38	19 29	.....	2 52	84	12 50.4	-11 52
Mon May 24/Tue May 25	5341.8	15 44 38	19 28	20 59	3 47	5 19	12 43	19 33	.....	3 29	91	13 44.3	-16 55
Tue May 25/Wed May 26	5342.8	15 48 35	19 28	21 00	3 47	5 18	12 48	19 36	.....	4 11	97	14 40.1	-21 02
Wed May 26/Thu May 27	5343.8	15 52 31	19 29	21 01	3 46	5 18	12 53	19 39	18 29	4 58	99	15 37.6	-23 58
Thu May 27/Fri May 28	5344.8	15 56 28	19 30	21 02	3 45	5 17	12 58	19 42	19 31	5 49	100	16 36.0	-25 33
Fri May 28/Sat May 29	5345.8	16 00 24	19 30	21 03	3 45	5 17	13 02	19 46	20 27	.....	98	17 34.0	-25 42
Sat May 29/Sun May 30	5346.8	16 04 21	19 31	21 03	3 44	5 17	13 07	19 49	21 18	.....	94	18 30.1	-24 31
Sun May 30/Mon May 31	5347.8	16 08 17	19 32	21 04	3 44	5 16	13 12	19 53	22 02	.....	89	19 23.6	-22 10
Mon May 31/Tue Jun 01	5348.8	16 12 14	19 32	21 05	3 43	5 16	13 17	19 56	22 40	.....	82	20 13.9	-18 53

***** 2010 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) (2010 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	%illum	Moon: RA	Moon: Dec
Tue Jun 01/Wed Jun 02	5349.8	16 16 10	19 33	21 06	3 43	5 16	13 21	20 00	23 14	.....	74	21 01.4	-14 54
Wed Jun 02/Thu Jun 03	5350.8	16 20 07	19 33	21 06	3 42	5 16	13 26	20 03	23 44	.....	65	21 46.6	-10 24
Thu Jun 03/Fri Jun 04	5351.8	16 24 04	19 34	21 07	3 42	5 15	13 31	20 07	0 12	.....	56	22 30.3	- 5 35
Fri Jun 04/Sat Jun 05	5352.8	16 28 00	19 34	21 08	3 42	5 15	13 35	20 10	0 39	.....	46	23 13.4	- 0 36
Sat Jun 05/Sun Jun 06	5353.8	16 31 57	19 35	21 09	3 41	5 15	13 40	20 14	1 07	.....	37	23 56.9	4 26
Sun Jun 06/Mon Jun 07	5354.8	16 35 53	19 35	21 09	3 41	5 15	13 45	20 17	1 36	.....	28	0 41.7	9 21
Mon Jun 07/Tue Jun 08	5355.8	16 39 50	19 36	21 10	3 41	5 15	13 49	20 21	2 08	.....	19	1 28.9	13 57
Tue Jun 08/Wed Jun 09	5356.8	16 43 46	19 36	21 11	3 41	5 15	13 54	20 25	2 45	.....	12	2 19.1	18 02
Wed Jun 09/Thu Jun 10	5357.8	16 47 43	19 37	21 11	3 40	5 15	13 58	20 29	3 27	.....	6	3 13.0	21 18
Thu Jun 10/Fri Jun 11	5358.8	16 51 39	19 37	21 12	3 40	5 15	14 03	20 32	4 18	18 13	2	4 10.5	23 27
Fri Jun 11/Sat Jun 12	5359.8	16 55 36	19 38	21 12	3 40	5 15	14 07	20 36	5 16	19 16	0	5 10.7	24 13
Sat Jun 12/Sun Jun 13	5360.8	16 59 33	19 38	21 13	3 40	5 15	14 12	20 40	6 21	20 15	1	6 12.3	23 25
Sun Jun 13/Mon Jun 14	5361.8	17 03 29	19 38	21 13	3 40	5 15	14 16	20 44	.....	21 08	4	7 13.2	21 04
Mon Jun 14/Tue Jun 15	5362.8	17 07 26	19 39	21 14	3 40	5 15	14 21	20 48	.....	21 54	10	8 12.2	17 19
Tue Jun 15/Wed Jun 16	5363.8	17 11 22	19 39	21 14	3 40	5 15	14 25	20 52	.....	22 35	18	9 08.6	12 29
Wed Jun 16/Thu Jun 17	5364.8	17 15 19	19 39	21 14	3 40	5 15	14 29	20 56	.....	23 12	28	10 02.5	6 56
Thu Jun 17/Fri Jun 18	5365.8	17 19 15	19 40	21 15	3 40	5 15	14 34	21 00	.....	23 46	39	10 54.6	1 00
Fri Jun 18/Sat Jun 19	5366.8	17 23 12	19 40	21 15	3 40	5 15	14 38	21 04	.....	0 19	51	11 45.8	- 4 57
Sat Jun 19/Sun Jun 20	5367.8	17 27 08	19 40	21 15	3 40	5 16	14 42	21 08	.....	0 53	62	12 37.3	-10 38
Sun Jun 20/Mon Jun 21	5368.8	17 31 05	19 40	21 16	3 41	5 16	14 46	21 12	.....	1 29	72	13 29.8	-15 45
Mon Jun 21/Tue Jun 22	5369.8	17 35 02	19 41	21 16	3 41	5 16	14 50	21 17	.....	2 09	82	14 23.9	-20 03
Tue Jun 22/Wed Jun 23	5370.8	17 38 58	19 41	21 16	3 41	5 16	14 54	21 21	.....	2 53	89	15 19.8	-23 16
Wed Jun 23/Thu Jun 24	5371.8	17 42 55	19 41	21 16	3 41	5 17	14 59	21 25	.....	3 42	95	16 17.0	-25 13
Thu Jun 24/Fri Jun 25	5372.8	17 46 51	19 41	21 16	3 42	5 17	15 03	21 29	18 19	4 35	98	17 14.5	-25 49
Fri Jun 25/Sat Jun 26	5373.8	17 50 48	19 41	21 16	3 42	5 17	15 07	21 34	19 11	5 32	100	18 10.9	-25 04
Sat Jun 26/Sun Jun 27	5374.8	17 54 44	19 41	21 16	3 43	5 17	15 11	21 38	19 57	6 30	99	19 05.3	-23 05
Sun Jun 27/Mon Jun 28	5375.8	17 58 41	19 41	21 16	3 43	5 18	15 15	21 42	20 38	.....	97	19 56.8	-20 05
Mon Jun 28/Tue Jun 29	5376.8	18 02 37	19 42	21 16	3 43	5 18	15 18	21 47	21 13	.....	92	20 45.5	-16 16
Tue Jun 29/Wed Jun 30	5377.8	18 06 34	19 42	21 16	3 44	5 19	15 22	21 51	21 44	.....	87	21 31.7	-11 53
Wed Jun 30/Thu Jul 01	5378.8	18 10 31	19 42	21 16	3 44	5 19	15 26	21 56	22 13	.....	79	22 16.1	- 7 08

***** 2010 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) (2010 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 Jul 01/Fri Jul 02	5379.8	18 14 27	19 42	21 16	3 45	5 19	15 30	22 00	22 41	.....	71	22 59.4	- 2 09
Fri Jul 02/Sat Jul 03	5380.8	18 18 24	19 41	21 16	3 45	5 20	15 34	22 05	23 08	.....	62	23 42.6	2 52
Sat Jul 03/Sun Jul 04	5381.8	18 22 20	19 41	21 16	3 46	5 20	15 37	22 09	23 36	.....	53	0 26.6	7 49
Sun Jul 04/Mon Jul 05	5382.8	18 26 17	19 41	21 15	3 47	5 21	15 41	22 14	0 06	.....	43	1 12.4	12 29
Mon Jul 05/Tue Jul 06	5383.8	18 30 13	19 41	21 15	3 47	5 21	15 45	22 18	0 39	.....	33	2 00.8	16 43
Tue Jul 06/Wed Jul 07	5384.8	18 34 10	19 41	21 15	3 48	5 22	15 48	22 23	1 18	.....	24	2 52.7	20 16
Wed Jul 07/Thu Jul 08	5385.8	18 38 06	19 41	21 14	3 49	5 22	15 52	22 27	2 04	.....	15	3 48.4	22 50
Thu Jul 08/Fri Jul 09	5386.8	18 42 03	19 41	21 14	3 49	5 23	15 56	22 32	2 59	.....	8	4 47.4	24 09
Fri Jul 09/Sat Jul 10	5387.8	18 46 00	19 40	21 14	3 50	5 23	15 59	22 37	4 01	17 59	3	5 48.7	23 57
Sat Jul 10/Sun Jul 11	5388.8	18 49 56	19 40	21 13	3 51	5 24	16 03	22 41	5 10	18 55	0	6 50.7	22 09
Sun Jul 11/Mon Jul 12	5389.8	18 53 53	19 40	21 13	3 52	5 24	16 06	22 46	6 21	19 46	0	7 51.5	18 49
Mon Jul 12/Tue Jul 13	5390.8	18 57 49	19 40	21 12	3 52	5 25	16 09	22 51	.....	20 30	3	8 50.1	14 13
Tue Jul 13/Wed Jul 14	5391.8	19 01 46	19 39	21 11	3 53	5 25	16 13	22 56	.....	21 10	9	9 46.1	8 43
Wed Jul 14/Thu Jul 15	5392.8	19 05 42	19 39	21 11	3 54	5 26	16 16	23 00	.....	21 46	17	10 40.0	2 43
Thu Jul 15/Fri Jul 16	5393.8	19 09 39	19 38	21 10	3 55	5 27	16 19	23 05	.....	22 20	26	11 32.5	- 3 23
Fri Jul 16/Sat Jul 17	5394.8	19 13 35	19 38	21 10	3 56	5 27	16 23	23 10	.....	22 55	37	12 24.6	- 9 14
Sat Jul 17/Sun Jul 18	5395.8	19 17 32	19 38	21 09	3 57	5 28	16 26	23 15	.....	23 30	48	13 17.1	-14 33
Sun Jul 18/Mon Jul 19	5396.8	19 21 29	19 37	21 08	3 57	5 28	16 29	23 20	.....	0 09	59	14 10.8	-19 03
Mon Jul 19/Tue Jul 20	5397.8	19 25 25	19 37	21 07	3 58	5 29	16 32	23 24	.....	0 51	69	15 05.8	-22 31
Tue Jul 20/Wed Jul 21	5398.8	19 29 22	19 36	21 07	3 59	5 30	16 36	23 29	.....	1 38	79	16 02.0	-24 47
Wed Jul 21/Thu Jul 22	5399.8	19 33 18	19 36	21 06	4 00	5 30	16 39	23 34	.....	2 30	86	16 58.7	-25 43
Thu Jul 22/Fri Jul 23	5400.8	19 37 15	19 35	21 05	4 01	5 31	16 42	23 39	.....	3 25	93	17 54.7	-25 21
Fri Jul 23/Sat Jul 24	5401.8	19 41 11	19 34	21 04	4 02	5 32	16 45	23 44	17 55	4 22	97	18 49.2	-23 44
Sat Jul 24/Sun Jul 25	5402.8	19 45 08	19 34	21 03	4 03	5 32	16 48	23 49	18 37	5 19	99	19 41.2	-21 03
Sun Jul 25/Mon Jul 26	5403.8	19 49 04	19 33	21 02	4 04	5 33	16 51	23 53	19 13	6 16	100	20 30.6	-17 29
Mon Jul 26/Tue Jul 27	5404.8	19 53 01	19 33	21 01	4 05	5 34	16 54	23 58	19 46	.....	99	21 17.6	-13 15
Tue Jul 27/Wed Jul 28	5405.8	19 56 58	19 32	21 00	4 06	5 34	16 57	0 03	20 16	.....	95	22 02.6	- 8 35
Wed Jul 28/Thu Jul 29	5406.8	20 00 54	19 31	20 59	4 07	5 35	17 00	0 08	20 43	.....	91	22 46.3	- 3 39
Thu Jul 29/Fri Jul 30	5407.8	20 04 51	19 30	20 58	4 08	5 36	17 03	0 13	21 10	.....	84	23 29.6	1 24
Fri Jul 30/Sat Jul 31	5408.8	20 08 47	19 30	20 57	4 08	5 36	17 06	0 18	21 38	.....	77	0 13.3	6 22
Sat Jul 31/Sun Aug 01	5409.8	20 12 44	19 29	20 56	4 09	5 37	17 09	0 23	22 07	.....	68	0 58.1	11 07

***** 2010 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) (2010 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 Aug 01/Mon Aug 02	5410.8	20 16 40	19 28	20 55	4 10	5 38	17 11	0 28	22 38	.....	59	1 45.2	15 28
Mon Aug 02/Tue Aug 03	5411.8	20 20 37	19 27	20 54	4 11	5 38	17 14	0 33	23 14	.....	49	2 35.1	19 12
Tue Aug 03/Wed Aug 04	5412.8	20 24 33	19 26	20 53	4 12	5 39	17 17	0 38	23 56	.....	38	3 28.3	22 05
Wed Aug 04/Thu Aug 05	5413.8	20 28 30	19 26	20 52	4 13	5 40	17 20	0 42	0 44	.....	28	4 25.1	23 51
Thu Aug 05/Fri Aug 06	5414.8	20 32 27	19 25	20 51	4 14	5 40	17 23	0 47	1 42	.....	19	5 24.6	24 16
Fri Aug 06/Sat Aug 07	5415.8	20 36 23	19 24	20 50	4 15	5 41	17 25	0 52	2 46	.....	11	6 25.7	23 08
Sat Aug 07/Sun Aug 08	5416.8	20 40 20	19 23	20 48	4 16	5 42	17 28	0 57	3 56	17 33	5	7 26.8	20 27
Sun Aug 08/Mon Aug 09	5417.8	20 44 16	19 22	20 47	4 17	5 42	17 31	1 02	5 09	18 20	1	8 26.6	16 20
Mon Aug 09/Tue Aug 10	5418.8	20 48 13	19 21	20 46	4 18	5 43	17 34	1 07	6 21	19 02	0	9 24.4	11 07
Tue Aug 10/Wed Aug 11	5419.8	20 52 09	19 20	20 45	4 19	5 44	17 36	1 12	.....	19 41	2	10 20.1	5 10
Wed Aug 11/Thu Aug 12	5420.8	20 56 06	19 19	20 43	4 20	5 44	17 39	1 17	.....	20 17	7	11 14.4	- 1 05
Thu Aug 12/Fri Aug 13	5421.8	21 00 02	19 18	20 42	4 21	5 45	17 42	1 22	.....	20 53	14	12 08.1	- 7 12
Fri Aug 13/Sat Aug 14	5422.8	21 03 59	19 17	20 41	4 22	5 46	17 44	1 26	.....	21 29	23	13 01.8	-12 51
Sat Aug 14/Sun Aug 15	5423.8	21 07 56	19 16	20 40	4 23	5 46	17 47	1 31	.....	22 08	34	13 56.2	-17 41
Sun Aug 15/Mon Aug 16	5424.8	21 11 52	19 15	20 38	4 24	5 47	17 50	1 36	.....	22 50	44	14 51.7	-21 30
Mon Aug 16/Tue Aug 17	5425.8	21 15 49	19 14	20 37	4 24	5 48	17 52	1 41	.....	23 36	55	15 48.0	-24 06
Tue Aug 17/Wed Aug 18	5426.8	21 19 45	19 13	20 36	4 25	5 48	17 55	1 46	.....	0 27	65	16 44.6	-25 23
Wed Aug 18/Thu Aug 19	5427.8	21 23 42	19 12	20 34	4 26	5 49	17 57	1 51	.....	1 21	75	17 40.6	-25 21
Thu Aug 19/Fri Aug 20	5428.8	21 27 38	19 11	20 33	4 27	5 50	18 00	1 56	.....	2 17	83	18 35.0	-24 04
Fri Aug 20/Sat Aug 21	5429.8	21 31 35	19 09	20 32	4 28	5 50	18 03	2 00	.....	3 14	89	19 27.2	-21 42
Sat Aug 21/Sun Aug 22	5430.8	21 35 31	19 08	20 30	4 29	5 51	18 05	2 05	17 14	4 10	95	20 16.9	-18 24
Sun Aug 22/Mon Aug 23	5431.8	21 39 28	19 07	20 29	4 30	5 51	18 08	2 10	17 48	5 06	98	21 04.3	-14 24
Mon Aug 23/Tue Aug 24	5432.8	21 43 25	19 06	20 27	4 31	5 52	18 10	2 15	18 19	6 00	100	21 49.8	- 9 52
Tue Aug 24/Wed Aug 25	5433.8	21 47 21	19 05	20 26	4 32	5 53	18 13	2 20	18 47	6 54	100	22 34.0	- 5 00
Wed Aug 25/Thu Aug 26	5434.8	21 51 18	19 04	20 25	4 32	5 53	18 15	2 24	19 14	.....	98	23 17.5	0 01
Thu Aug 26/Fri Aug 27	5435.8	21 55 14	19 02	20 23	4 33	5 54	18 18	2 29	19 42	.....	94	0 01.2	5 02
Fri Aug 27/Sat Aug 28	5436.8	21 59 11	19 01	20 22	4 34	5 55	18 20	2 34	20 10	.....	88	0 45.8	9 51
Sat Aug 28/Sun Aug 29	5437.8	22 03 07	19 00	20 20	4 35	5 55	18 23	2 39	20 40	.....	82	1 32.2	14 18
Sun Aug 29/Mon Aug 30	5438.8	22 07 04	18 59	20 19	4 36	5 56	18 25	2 44	21 14	.....	73	2 20.9	18 12
Mon Aug 30/Tue Aug 31	5439.8	22 11 00	18 57	20 17	4 37	5 57	18 28	2 48	21 53	.....	64	3 12.5	21 18
Tue Aug 31/Wed Sep 01	5440.8	22 14 57	18 56	20 16	4 37	5 57	18 30	2 53	22 37	.....	54	4 07.2	23 24

***** 2010 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) (2010 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 Sep 01/Thu Sep 02	5441.8	22 18 54	18 55	20 15	4 38	5 58	18 33	2 58	23 29	.....	43	5 04.5	24 16
Thu Sep 02/Fri Sep 03	5442.8	22 22 50	18 54	20 13	4 39	5 58	18 35	3 03	0 29	.....	33	6 03.7	23 43
Fri Sep 03/Sat Sep 04	5443.8	22 26 47	18 52	20 12	4 40	5 59	18 38	3 07	1 34	.....	23	7 03.4	21 41
Sat Sep 04/Sun Sep 05	5444.8	22 30 43	18 51	20 10	4 41	6 00	18 40	3 12	2 44	.....	14	8 02.5	18 13
Sun Sep 05/Mon Sep 06	5445.8	22 34 40	18 50	20 09	4 41	6 00	18 43	3 17	3 55	.....	7	9 00.4	13 31
Mon Sep 06/Tue Sep 07	5446.8	22 38 36	18 49	20 07	4 42	6 01	18 45	3 21	5 07	17 33	2	9 56.7	7 54
Tue Sep 07/Wed Sep 08	5447.8	22 42 33	18 47	20 06	4 43	6 02	18 48	3 26	6 18	18 10	0	10 51.9	1 45
Wed Sep 08/Thu Sep 09	5448.8	22 46 29	18 46	20 04	4 44	6 02	18 50	3 31	.....	18 47	1	11 46.5	- 4 30
Thu Sep 09/Fri Sep 10	5449.8	22 50 26	18 45	20 03	4 44	6 03	18 53	3 36	.....	19 24	5	12 41.3	-10 28
Fri Sep 10/Sat Sep 11	5450.8	22 54 23	18 43	20 02	4 45	6 03	18 55	3 40	.....	20 03	12	13 36.9	-15 45
Sat Sep 11/Sun Sep 12	5451.8	22 58 19	18 42	20 00	4 46	6 04	18 58	3 45	.....	20 45	20	14 33.5	-20 01
Sun Sep 12/Mon Sep 13	5452.8	23 02 16	18 41	19 59	4 47	6 05	19 00	3 50	.....	21 31	29	15 30.9	-23 05
Mon Sep 13/Tue Sep 14	5453.8	23 06 12	18 39	19 57	4 47	6 05	19 03	3 54	.....	22 21	40	16 28.5	-24 47
Tue Sep 14/Wed Sep 15	5454.8	23 10 09	18 38	19 56	4 48	6 06	19 05	3 59	.....	23 15	50	17 25.3	-25 07
Wed Sep 15/Thu Sep 16	5455.8	23 14 05	18 37	19 54	4 49	6 06	19 08	4 04	.....	0 11	60	18 20.5	-24 11
Thu Sep 16/Fri Sep 17	5456.8	23 18 02	18 35	19 53	4 50	6 07	19 10	4 08	.....	1 08	69	19 13.2	-22 06
Fri Sep 17/Sat Sep 18	5457.8	23 21 58	18 34	19 51	4 50	6 08	19 13	4 13	.....	2 05	78	20 03.4	-19 05
Sat Sep 18/Sun Sep 19	5458.8	23 25 55	18 33	19 50	4 51	6 08	19 15	4 18	.....	3 01	85	20 51.2	-15 18
Sun Sep 19/Mon Sep 20	5459.8	23 29 52	18 31	19 49	4 52	6 09	19 18	4 22	.....	3 55	91	21 37.0	-10 57
Mon Sep 20/Tue Sep 21	5460.8	23 33 48	18 30	19 47	4 52	6 09	19 20	4 27	16 50	4 49	96	22 21.4	- 6 13
Tue Sep 21/Wed Sep 22	5461.8	23 37 45	18 29	19 46	4 53	6 10	19 23	4 32	17 18	5 42	99	23 05.1	- 1 16
Wed Sep 22/Thu Sep 23	5462.8	23 41 41	18 27	19 44	4 54	6 11	19 25	4 36	17 45	6 36	100	23 49.0	3 45
Thu Sep 23/Fri Sep 24	5463.8	23 45 38	18 26	19 43	4 54	6 11	19 28	4 41	18 14	.....	99	0 33.7	8 38
Fri Sep 24/Sat Sep 25	5464.8	23 49 34	18 25	19 42	4 55	6 12	19 30	4 45	18 44	.....	96	1 19.9	13 12
Sat Sep 25/Sun Sep 26	5465.8	23 53 31	18 24	19 40	4 56	6 13	19 33	4 50	19 16	.....	92	2 08.4	17 15
Sun Sep 26/Mon Sep 27	5466.8	23 57 27	18 22	19 39	4 56	6 13	19 36	4 55	19 54	.....	86	2 59.5	20 33
Mon Sep 27/Tue Sep 28	5467.8	0 01 24	18 21	19 38	4 57	6 14	19 38	4 59	20 36	.....	78	3 53.3	22 54
Tue Sep 28/Wed Sep 29	5468.8	0 05 21	18 20	19 36	4 58	6 14	19 41	5 04	21 25	.....	69	4 49.4	24 04
Wed Sep 29/Thu Sep 30	5469.8	0 09 17	18 18	19 35	4 58	6 15	19 43	5 09	22 20	.....	59	5 47.2	23 55
Thu Sep 30/Fri Oct 01	5470.8	0 13 14	18 17	19 34	4 59	6 16	19 46	5 13	23 22	.....	48	6 45.4	22 22

***** 2010 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) (2010 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 Oct 01/Sat Oct 02	5471.8	0 17 10	18 16	19 32	5 00	6 16	19 49	5 18	0 27	.....	37	7 43.2	19 27
Sat Oct 02/Sun Oct 03	5472.8	0 21 07	18 14	19 31	5 01	6 17	19 51	5 22	1 35	.....	26	8 39.8	15 18
Sun Oct 03/Mon Oct 04	5473.8	0 25 03	18 13	19 30	5 01	6 18	19 54	5 27	2 44	.....	17	9 35.1	10 11
Mon Oct 04/Tue Oct 05	5474.8	0 29 00	18 12	19 28	5 02	6 18	19 57	5 32	3 53	.....	9	10 29.5	4 23
Tue Oct 05/Wed Oct 06	5475.8	0 32 56	18 11	19 27	5 03	6 19	19 59	5 36	5 03	16 39	3	11 23.6	- 1 44
Wed Oct 06/Thu Oct 07	5476.8	0 36 53	18 09	19 26	5 03	6 20	20 02	5 41	6 13	17 16	1	12 18.1	- 7 48
Thu Oct 07/Fri Oct 08	5477.8	0 40 50	18 08	19 25	5 04	6 20	20 05	5 46	7 23	17 54	1	13 13.6	-13 23
Fri Oct 08/Sat Oct 09	5478.8	0 44 46	18 07	19 23	5 05	6 21	20 07	5 50	.....	18 35	3	14 10.6	-18 07
Sat Oct 09/Sun Oct 10	5479.8	0 48 43	18 06	19 22	5 05	6 22	20 10	5 55	.....	19 21	9	15 08.9	-21 42
Sun Oct 10/Mon Oct 11	5480.8	0 52 39	18 04	19 21	5 06	6 22	20 13	5 59	.....	20 11	16	16 07.8	-23 57
Mon Oct 11/Tue Oct 12	5481.8	0 56 36	18 03	19 20	5 07	6 23	20 16	6 04	.....	21 05	24	17 06.2	-24 45
Tue Oct 12/Wed Oct 13	5482.8	1 00 32	18 02	19 19	5 07	6 24	20 18	6 09	.....	22 02	34	18 02.9	-24 12
Wed Oct 13/Thu Oct 14	5483.8	1 04 29	18 01	19 17	5 08	6 25	20 21	6 13	.....	23 00	43	18 57.1	-22 26
Thu Oct 14/Fri Oct 15	5484.8	1 08 25	18 00	19 16	5 09	6 25	20 24	6 18	.....	23 58	53	19 48.5	-19 40
Fri Oct 15/Sat Oct 16	5485.8	1 12 22	17 59	19 15	5 09	6 26	20 27	6 22	.....	0 54	63	20 37.0	-16 07
Sat Oct 16/Sun Oct 17	5486.8	1 16 19	17 57	19 14	5 10	6 27	20 30	6 27	.....	1 49	72	21 23.2	-11 57
Sun Oct 17/Mon Oct 18	5487.8	1 20 15	17 56	19 13	5 11	6 27	20 32	6 32	.....	2 43	80	22 07.8	- 7 22
Mon Oct 18/Tue Oct 19	5488.8	1 24 12	17 55	19 12	5 11	6 28	20 35	6 36	.....	3 36	87	22 51.6	- 2 31
Tue Oct 19/Wed Oct 20	5489.8	1 28 08	17 54	19 11	5 12	6 29	20 38	6 41	.....	4 30	92	23 35.3	2 26
Wed Oct 20/Thu Oct 21	5490.8	1 32 05	17 53	19 10	5 13	6 30	20 41	6 46	16 16	5 24	97	0 19.8	7 21
Thu Oct 21/Fri Oct 22	5491.8	1 36 01	17 52	19 09	5 13	6 30	20 44	6 50	16 46	6 20	99	1 06.0	12 01
Fri Oct 22/Sat Oct 23	5492.8	1 39 58	17 51	19 08	5 14	6 31	20 47	6 55	17 18	7 18	100	1 54.3	16 14
Sat Oct 23/Sun Oct 24	5493.8	1 43 54	17 50	19 07	5 15	6 32	20 50	6 59	17 54	.....	98	2 45.4	19 46
Sun Oct 24/Mon Oct 25	5494.8	1 47 51	17 49	19 06	5 15	6 33	20 53	7 04	18 35	.....	95	3 39.3	22 23
Mon Oct 25/Tue Oct 26	5495.8	1 51 48	17 48	19 05	5 16	6 34	20 56	7 09	19 23	.....	89	4 35.6	23 50
Tue Oct 26/Wed Oct 27	5496.8	1 55 44	17 47	19 04	5 17	6 34	20 59	7 13	20 16	.....	82	5 33.4	23 59
Wed Oct 27/Thu Oct 28	5497.8	1 59 41	17 46	19 03	5 17	6 35	21 02	7 18	21 16	.....	73	6 31.6	22 45
Thu Oct 28/Fri Oct 29	5498.8	2 03 37	17 45	19 02	5 18	6 36	21 05	7 23	22 19	.....	63	7 29.0	20 10
Fri Oct 29/Sat Oct 30	5499.8	2 07 34	17 44	19 02	5 19	6 37	21 08	7 27	23 24	.....	52	8 24.9	16 24
Sat Oct 30/Sun Oct 31	5500.8	2 11 30	17 43	19 01	5 20	6 38	21 11	7 32	0 31	.....	41	9 19.2	11 39
Sun Oct 31/Mon Nov 01	5501.8	2 15 27	17 42	19 00	5 20	6 38	21 15	7 37	1 37	.....	30	10 12.3	6 13

***** 2010 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) (2010 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 Nov 01/Tue Nov 02	5502.8	2 19 23	17 41	18 59	5 21	6 39	21 18	7 41	2 44	.....	20	11 04.9	0 22
Tue Nov 02/Wed Nov 03	5503.8	2 23 20	17 40	18 58	5 22	6 40	21 21	7 46	3 52	.....	11	11 57.7	- 5 32
Wed Nov 03/Thu Nov 04	5504.8	2 27 17	17 40	18 58	5 22	6 41	21 24	7 51	5 00	.....	5	12 51.7	-11 11
Thu Nov 04/Fri Nov 05	5505.8	2 31 13	17 39	18 57	5 23	6 42	21 27	7 55	6 09	16 26	1	13 47.4	-16 11
Fri Nov 05/Sat Nov 06	5506.8	2 35 10	17 38	18 56	5 24	6 42	21 31	8 00	7 18	17 09	0	14 45.0	-20 12
Sat Nov 06/Sun Nov 07	5507.8	2 39 06	17 37	18 56	5 25	6 43	21 34	8 05	.....	17 57	2	15 44.0	-22 58
Sun Nov 07/Mon Nov 08	5508.8	2 43 03	17 37	18 55	5 25	6 44	21 37	8 09	.....	18 50	5	16 43.3	-24 19
Mon Nov 08/Tue Nov 09	5509.8	2 46 59	17 36	18 55	5 26	6 45	21 41	8 14	.....	19 47	11	17 41.7	-24 15
Tue Nov 09/Wed Nov 10	5510.8	2 50 56	17 35	18 54	5 27	6 46	21 44	8 19	.....	20 46	18	18 37.8	-22 52
Wed Nov 10/Thu Nov 11	5511.8	2 54 52	17 34	18 53	5 28	6 47	21 47	8 23	.....	21 46	27	19 30.8	-20 23
Thu Nov 11/Fri Nov 12	5512.8	2 58 49	17 34	18 53	5 28	6 48	21 51	8 28	.....	22 44	36	20 20.7	-17 02
Fri Nov 12/Sat Nov 13	5513.8	3 02 46	17 33	18 52	5 29	6 48	21 54	8 33	.....	23 40	45	21 07.9	-13 02
Sat Nov 13/Sun Nov 14	5514.8	3 06 42	17 33	18 52	5 30	6 49	21 58	8 38	.....	0 34	55	21 53.0	- 8 35
Sun Nov 14/Mon Nov 15	5515.8	3 10 39	17 32	18 51	5 31	6 50	22 01	8 42	.....	1 28	64	22 36.8	- 3 51
Mon Nov 15/Tue Nov 16	5516.8	3 14 35	17 32	18 51	5 31	6 51	22 05	8 47	.....	2 21	73	23 20.2	1 02
Tue Nov 16/Wed Nov 17	5517.8	3 18 32	17 31	18 51	5 32	6 52	22 08	8 52	.....	3 15	81	0 04.2	5 55
Wed Nov 17/Thu Nov 18	5518.8	3 22 28	17 31	18 50	5 33	6 53	22 12	8 56	.....	4 11	88	0 49.5	10 38
Thu Nov 18/Fri Nov 19	5519.8	3 26 25	17 30	18 50	5 34	6 54	22 16	9 01	.....	5 08	94	1 37.2	14 59
Fri Nov 19/Sat Nov 20	5520.8	3 30 21	17 30	18 50	5 34	6 55	22 19	9 06	15 52	6 07	98	2 27.7	18 46
Sat Nov 20/Sun Nov 21	5521.8	3 34 18	17 29	18 49	5 35	6 55	22 23	9 10	16 32	7 07	100	3 21.4	21 43
Sun Nov 21/Mon Nov 22	5522.8	3 38 15	17 29	18 49	5 36	6 56	22 27	9 15	17 18	8 06	100	4 18.1	23 33
Mon Nov 22/Tue Nov 23	5523.8	3 42 11	17 29	18 49	5 37	6 57	22 30	9 20	18 10	.....	97	5 16.8	24 04
Tue Nov 23/Wed Nov 24	5524.8	3 46 08	17 28	18 49	5 37	6 58	22 34	9 25	19 09	.....	92	6 16.3	23 10
Wed Nov 24/Thu Nov 25	5525.8	3 50 04	17 28	18 49	5 38	6 59	22 38	9 29	20 12	.....	86	7 15.0	20 50
Thu Nov 25/Fri Nov 26	5526.8	3 54 01	17 28	18 48	5 39	7 00	22 42	9 34	21 18	.....	77	8 12.0	17 16
Fri Nov 26/Sat Nov 27	5527.8	3 57 57	17 27	18 48	5 40	7 01	22 45	9 39	22 24	.....	67	9 06.9	12 42
Sat Nov 27/Sun Nov 28	5528.8	4 01 54	17 27	18 48	5 40	7 02	22 49	9 43	23 29	.....	56	9 59.9	7 26
Sun Nov 28/Mon Nov 29	5529.8	4 05 50	17 27	18 48	5 41	7 02	22 53	9 48	0 35	.....	44	10 51.8	1 45
Mon Nov 29/Tue Nov 30	5530.8	4 09 47	17 27	18 48	5 42	7 03	22 57	9 53	1 40	.....	33	11 43.3	- 4 02
Tue Nov 30/Wed Dec 01	5531.8	4 13 44	17 27	18 48	5 43	7 04	23 01	9 57	2 46	.....	23	12 35.6	- 9 36

***** 2010 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) (2010 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 Dec 01/Thu Dec 02	5532.8	4 17 40	17 27	18 48	5 43	7 05	23 05	10 02	3 52	.....	14	13 29.3	-14 40
Thu Dec 02/Fri Dec 03	5533.8	4 21 37	17 27	18 48	5 44	7 06	23 09	10 07	4 59	.....	7	14 24.9	-18 55
Fri Dec 03/Sat Dec 04	5534.8	4 25 33	17 27	18 48	5 45	7 06	23 13	10 11	6 06	15 46	3	15 22.4	-22 04
Sat Dec 04/Sun Dec 05	5535.8	4 29 30	17 27	18 48	5 46	7 07	23 17	10 16	7 08	16 36	0	16 21.2	-23 54
Sun Dec 05/Mon Dec 06	5536.8	4 33 26	17 27	18 49	5 46	7 08	23 21	10 21	8 06	17 31	0	17 19.8	-24 20
Mon Dec 06/Tue Dec 07	5537.8	4 37 23	17 27	18 49	5 47	7 09	23 25	10 25	.....	18 30	3	18 16.9	-23 24
Tue Dec 07/Wed Dec 08	5538.8	4 41 19	17 27	18 49	5 48	7 09	23 29	10 30	.....	19 30	7	19 11.5	-21 16
Wed Dec 08/Thu Dec 09	5539.8	4 45 16	17 27	18 49	5 48	7 10	23 33	10 34	.....	20 30	13	20 03.0	-18 10
Thu Dec 09/Fri Dec 10	5540.8	4 49 13	17 27	18 49	5 49	7 11	23 38	10 39	.....	21 28	20	20 51.4	-14 20
Fri Dec 10/Sat Dec 11	5541.8	4 53 09	17 28	18 50	5 50	7 12	23 42	10 44	.....	22 24	28	21 37.4	-10 00
Sat Dec 11/Sun Dec 12	5542.8	4 57 06	17 28	18 50	5 50	7 12	23 46	10 48	.....	23 18	37	22 21.6	- 5 20
Sun Dec 12/Mon Dec 13	5543.8	5 01 02	17 28	18 50	5 51	7 13	23 50	10 53	.....	0 11	46	23 04.8	- 0 31
Mon Dec 13/Tue Dec 14	5544.8	5 04 59	17 28	18 50	5 51	7 14	23 55	10 57	.....	1 05	56	23 48.1	4 19
Tue Dec 14/Wed Dec 15	5545.8	5 08 55	17 29	18 51	5 52	7 14	23 59	11 02	.....	1 59	65	0 32.4	9 03
Wed Dec 15/Thu Dec 16	5546.8	5 12 52	17 29	18 51	5 53	7 15	0 03	11 06	.....	2 55	74	1 18.5	13 30
Thu Dec 16/Fri Dec 17	5547.8	5 16 48	17 29	18 52	5 53	7 16	0 08	11 11	.....	3 53	82	2 07.4	17 28
Fri Dec 17/Sat Dec 18	5548.8	5 20 45	17 30	18 52	5 54	7 16	0 12	11 16	.....	4 52	89	2 59.6	20 44
Sat Dec 18/Sun Dec 19	5549.8	5 24 42	17 30	18 52	5 54	7 17	0 16	11 20	.....	5 52	95	3 55.2	23 01
Sun Dec 19/Mon Dec 20	5550.8	5 28 38	17 30	18 53	5 55	7 17	0 21	11 24	15 58	6 51	99	4 53.9	24 04
Mon Dec 20/Tue Dec 21	5551.8	5 32 35	17 31	18 53	5 55	7 18	0 25	11 29	16 56	7 47	100	5 54.4	23 40
Tue Dec 21/Wed Dec 22	5552.8	5 36 31	17 31	18 54	5 56	7 18	0 29	11 33	17 59	.....	99	6 55.1	21 46
Wed Dec 22/Thu Dec 23	5553.8	5 40 28	17 32	18 54	5 56	7 19	0 34	11 38	19 06	.....	95	7 54.5	18 28
Thu Dec 23/Fri Dec 24	5554.8	5 44 24	17 32	18 55	5 57	7 19	0 38	11 42	20 14	.....	89	8 51.8	14 02
Fri Dec 24/Sat Dec 25	5555.8	5 48 21	17 33	18 55	5 57	7 20	0 43	11 47	21 21	.....	80	9 46.7	8 46
Sat Dec 25/Sun Dec 26	5556.8	5 52 17	17 34	18 56	5 58	7 20	0 47	11 51	22 28	.....	70	10 39.8	3 02
Sun Dec 26/Mon Dec 27	5557.8	5 56 14	17 34	18 57	5 58	7 20	0 52	11 55	23 33	.....	59	11 31.9	- 2 49
Mon Dec 27/Tue Dec 28	5558.8	6 00 11	17 35	18 57	5 58	7 21	0 56	12 00	0 38	.....	48	12 24.0	- 8 28
Tue Dec 28/Wed Dec 29	5559.8	6 04 07	17 35	18 58	5 59	7 21	1 01	12 04	1 44	.....	37	13 16.8	-13 37
Wed Dec 29/Thu Dec 30	5560.8	6 08 04	17 36	18 58	5 59	7 21	1 06	12 08	2 49	.....	26	14 11.1	-18 01
Thu Dec 30/Fri Dec 31	5561.8	6 12 00	17 37	18 59	5 59	7 22	1 10	12 12	3 54	.....	17	15 07.0	-21 23
Fri Dec 31/Sat Jan 01	5562.8	6 15 57	17 38	19 00	6 00	7 22	1 15	12 17	4 57	.....	10	16 04.3	-23 33