

I slightly modified Thorstensen's code to print out the time between evening twilight and morning twilight. For Okie-Tex site (site code = o) near Kenton OK I used same time zone as for Oklahoma City.

W. Romanishin- August 2013 - email: wromanishin at ou.edu - Here is stuff from John T. intro:

***** 2018 Night-time Astronomical Calendar for VATT *****

By John Thorstensen, Dartmouth College

This calendar is designed to provide information useful for the planning of nighttime observations. The format should minimize confusion; each line gives the phenomena for a single (local!) night, and each line is labeled with both evening and morning (local) day and date. Note that all times given are LOCAL CIVIL (zone) times.

The rise/set times printed are the times at which the center of the object is 50 arcminutes below the geometrical horizon. At the given twilight, the center of the sun is 0.0 degrees below the geometrical horizon.

The moon positions (and rise/set times) are generated by an implementation of the Low-Precision formulae in the Astronomical Almanac. The Almanac states that the error seldom exceeds 0.3 degrees. Topocentric corrections are included. Comparisons with tables for Kitt Peak in the NOAO Newsletter indicate that the rise-set times are good to +/- 2 min or so. The moon's RA, Dec, and illuminated fraction are given for local midnight, regardless of whether the moon is actually up at that time. Note that the moonrise and moonset times are not printed if they occur near mid-day.

The LST at evening and morning twilight are tabulated. This gives an accurate idea of the range of RA's accessible during the night.

The JD is given (severely rounded off) for local midnight. Again, this avoids any ambiguity.

Some credits: The sidereal time and Julian date routines were originally coded in PL/I by Steve Maker of Dartmouth College. The algorithms originated in the old American Ephemeris. The routine to convert JD back to calendar date is adapted from Numerical Recipes in C, by Press et al.

CAUTIONS: I believe that the program which generates these tables is reasonably accurate. However, it has not been exhaustively tested, so you should be sure to run 'sanity checks' on the results. Also, in view of the approximations used, the results should not be used when high precision is needed. Extension to dates far from the present (1990) should be done with great caution. The code has not been tested for the eastern or southern hemispheres. Rise/set times are slightly inaccurate and rather confusing at circumpolar latitudes, where the concept of a 'night' is blurry.

The daylight savings time conventions (if used) are quite specific (to U. S., post-1986) and subject to change. I know that the code has many infelicities; if you should find actual errors, please notify
John.Thorstensen@dartmouth.edu

[This output comes from a (hopefully) portable, completely self-contained program in the c language. It is available from the author and may be used freely for scientific or educational purposes. If you use it for profit, please contact the author to arrange a (modest!) fee.
Source code is copyright John Thorstensen, 1990.]

MOON PHASES FOR 2018, at VATT

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 17 23 31	Dec 26 2 20	Jan 01 19 25	Jan 08 15 27
Jan 16 19 18	Jan 24 15 21	Jan 31 6 28	Feb 07 8 56
Feb 15 14 07	Feb 23 1 09	Mar 01 17 52	Mar 09 4 23
Mar 17 6 14	Mar 24 8 36	Mar 31 5 38	Apr 08 0 21
Apr 15 19 00	Apr 22 14 47	Apr 29 17 59	May 07 19 12
May 15 4 50	May 21 20 51	May 29 7 21	Jun 06 11 34
Jun 13 12 45	Jun 20 3 53	Jun 27 21 55	Jul 06 0 53
Jul 12 19 50	Jul 19 12 54	Jul 27 13 22	Aug 04 11 20
Aug 11 2 59	Aug 18 0 50	Aug 26 4 58	Sep 02 19 39
Sep 09 11 03	Sep 16 16 16	Sep 24 19 55	Oct 02 2 47
Oct 08 20 48	Oct 16 11 02	Oct 24 9 48	Oct 31 9 42
Nov 07 9 03	Nov 15 7 54	Nov 22 22 41	Nov 29 17 21
Dec 07 0 22	Dec 15 4 50	Dec 22 10 50	Dec 29 2 37
Jan 05 18 30	Jan 13 23 46	Jan 20 22 17	Jan 27 14 12

Calendar for VATT, west longitude (h.m.s) = 7 19 34, latitude (d.m) = 32 42.1
 Rise/set times in Mountain time (7 hr W), uncorrected for elevation, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2018 JANUARY *****

Date (eve/morn)	LMST midn	----- set	Sun: ----- twi.end twi.beg	rise	LST twilight: eve morn	----- rise	Moon: ----- set %illum	RA	Dec	Twi-Twi hours	
Mon Jan 01/Tue Jan 02	6 28	17 25	18 53	5 54 7 22	1 20 12 23	17 24	7 46	100	7 02.6	19 46	11.0
Tue Jan 02/Wed Jan 03	6 32	17 26	18 53	5 55 7 22	1 24 12 27	18 30	.....	98	8 08.0	18 34	11.0
Wed Jan 03/Thu Jan 04	6 36	17 26	18 54	5 55 7 22	1 29 12 32	19 38	.....	93	9 10.9	16 02	11.0
Thu Jan 04/Fri Jan 05	6 40	17 27	18 55	5 55 7 22	1 34 12 36	20 46	.....	85	10 10.2	12 30	11.0
Fri Jan 05/Sat Jan 06	6 44	17 28	18 55	5 55 7 23	1 38 12 40	21 51	.....	76	11 05.8	8 20	11.0
Sat Jan 06/Sun Jan 07	6 48	17 29	18 56	5 55 7 23	1 43 12 44	22 54	.....	66	11 58.0	3 52	11.0
Sun Jan 07/Mon Jan 08	6 52	17 29	18 57	5 55 7 23	1 48 12 48	23 54	.....	56	12 47.8	- 0 38	11.0
Mon Jan 08/Tue Jan 09	6 56	17 30	18 58	5 55 7 23	1 52 12 52	0 51	.....	46	13 36.0	- 4 58	11.0
Tue Jan 09/Wed Jan 10	6 59	17 31	18 58	5 55 7 23	1 57 12 56	1 47	.....	36	14 23.3	- 8 58	11.0
Wed Jan 10/Thu Jan 11	7 03	17 32	18 59	5 56 7 22	2 02 13 00	2 42	.....	27	15 10.4	-12 32	10.9
Thu Jan 11/Fri Jan 12	7 07	17 33	19 00	5 56 7 22	2 06 13 04	3 37	.....	19	15 57.9	-15 31	10.9
Fri Jan 12/Sat Jan 13	7 11	17 34	19 01	5 55 7 22	2 11 13 08	4 30	.....	12	16 46.1	-17 51	10.9
Sat Jan 13/Sun Jan 14	7 15	17 35	19 01	5 55 7 22	2 16 13 12	5 21	.....	7	17 34.9	-19 25	10.9
Sun Jan 14/Mon Jan 15	7 19	17 36	19 02	5 55 7 22	2 21 13 16	6 11	15 55	3	18 24.4	-20 11	10.9
Mon Jan 15/Tue Jan 16	7 23	17 36	19 03	5 55 7 22	2 25 13 19	6 58	16 42	1	19 14.2	-20 05	10.9
Tue Jan 16/Wed Jan 17	7 27	17 37	19 04	5 55 7 21	2 30 13 23	7 42	17 33	0	20 03.8	-19 07	10.9
Wed Jan 17/Thu Jan 18	7 31	17 38	19 05	5 55 7 21	2 35 13 27	.....	18 25	1	20 53.0	-17 20	10.8
Thu Jan 18/Fri Jan 19	7 35	17 39	19 05	5 55 7 21	2 40 13 31	.....	19 19	4	21 41.5	-14 49	10.8
Fri Jan 19/Sat Jan 20	7 39	17 40	19 06	5 55 7 20	2 44 13 34	.....	20 15	9	22 29.4	-11 38	10.8
Sat Jan 20/Sun Jan 21	7 43	17 41	19 07	5 54 7 20	2 49 13 38	.....	21 10	15	23 16.8	- 7 55	10.8
Sun Jan 21/Mon Jan 22	7 47	17 42	19 08	5 54 7 20	2 54 13 42	.....	22 07	23	0 04.2	- 3 49	10.8
Mon Jan 22/Tue Jan 23	7 51	17 43	19 09	5 54 7 19	2 59 13 45	.....	23 05	32	0 52.3	0 32	10.8
Tue Jan 23/Wed Jan 24	7 55	17 44	19 09	5 53 7 19	3 03 13 49	.....	0 04	42	1 41.6	4 57	10.7
Wed Jan 24/Thu Jan 25	7 59	17 45	19 10	5 53 7 18	3 08 13 53	.....	1 05	53	2 33.1	9 15	10.7
Thu Jan 25/Fri Jan 26	8 03	17 46	19 11	5 53 7 18	3 13 13 56	.....	2 09	64	3 27.5	13 11	10.7
Fri Jan 26/Sat Jan 27	8 06	17 47	19 12	5 52 7 17	3 18 14 00	.....	3 14	75	4 25.3	16 27	10.7
Sat Jan 27/Sun Jan 28	8 10	17 48	19 13	5 52 7 17	3 22 14 03	.....	4 20	84	5 26.5	18 44	10.7
Sun Jan 28/Mon Jan 29	8 14	17 49	19 14	5 51 7 16	3 27 14 07	.....	5 24	92	6 30.3	19 45	10.6
Mon Jan 29/Tue Jan 30	8 18	17 50	19 14	5 51 7 16	3 32 14 10	16 05	6 24	98	7 35.3	19 19	10.6
Tue Jan 30/Wed Jan 31	8 22	17 51	19 15	5 50 7 15	3 37 14 14	17 12	7 19	100	8 39.6	17 27	10.6
Wed Jan 31/Thu Feb 01	8 26	17 52	19 16	5 50 7 14	3 41 14 17	18 21	8 07	99	9 41.5	14 21	10.6

***** 2018 FEBRUARY *****

Date (eve/morn)	LMST midn	----- set	Sun: ----- twi.end twi.beg	rise	LST twilight: eve morn	----- rise	Moon: ----- set %illum	RA	Dec	Twi-Twi hours	
Thu Feb 01/Fri Feb 02	8 30	17 52	19 17	5 49 7 14	3 46 14 20	19 29	.....	96	10 40.3	10 21	10.5
Fri Feb 02/Sat Feb 03	8 34	17 53	19 18	5 49 7 13	3 51 14 24	20 35	.....	89	11 35.9	5 50	10.5
Sat Feb 03/Sun Feb 04	8 38	17 54	19 18	5 48 7 12	3 56 14 27	21 38	.....	82	12 28.6	1 09	10.5
Sun Feb 04/Mon Feb 05	8 42	17 55	19 19	5 48 7 11	4 00 14 30	22 39	.....	73	13 19.1	- 3 26	10.5
Mon Feb 05/Tue Feb 06	8 46	17 56	19 20	5 47 7 11	4 05 14 34	23 37	.....	63	14 08.2	- 7 43	10.4
Tue Feb 06/Wed Feb 07	8 50	17 57	19 21	5 46 7 10	4 10 14 37	0 34	.....	53	14 56.7	-11 32	10.4
Wed Feb 07/Thu Feb 08	8 54	17 58	19 22	5 45 7 09	4 15 14 40	1 29	.....	43	15 44.9	-14 45	10.4
Thu Feb 08/Fri Feb 09	8 58	17 59	19 22	5 45 7 08	4 19 14 43	2 23	.....	34	16 33.5	-17 18	10.4
Fri Feb 09/Sat Feb 10	9 02	18 00	19 23	5 44 7 07	4 24 14 47	3 16	.....	25	17 22.5	-19 06	10.3
Sat Feb 10/Sun Feb 11	9 06	18 01	19 24	5 43 7 06	4 29 14 50	4 06	.....	18	18 11.9	-20 05	10.3
Sun Feb 11/Mon Feb 12	9 10	18 02	19 25	5 42 7 05	4 34 14 53	4 54	.....	11	19 01.7	-20 13	10.3
Mon Feb 12/Tue Feb 13	9 14	18 03	19 26	5 42 7 04	4 38 14 56	5 39	.....	6	19 51.5	-19 29	10.3
Tue Feb 13/Wed Feb 14	9 17	18 03	19 26	5 41 7 03	4 43 14 59	6 21	16 19	2	20 41.0	-17 54	10.2
Wed Feb 14/Thu Feb 15	9 21	18 04	19 27	5 40 7 03	4 48 15 02	7 00	17 13	0	21 30.0	-15 32	10.2
Thu Feb 15/Fri Feb 16	9 25	18 05	19 28	5 39 7 02	4 53 15 05	7 37	18 08	0	22 18.4	-12 28	10.2
Fri Feb 16/Sat Feb 17	9 29	18 06	19 29	5 38 7 01	4 57 15 08	.....	19 05	2	23 06.3	- 8 50	10.2
Sat Feb 17/Sun Feb 18	9 33	18 07	19 30	5 37 6 59	5 02 15 11	.....	20 02	6	23 53.9	- 4 47	10.1
Sun Feb 18/Mon Feb 19	9 37	18 08	19 30	5 36 6 58	5 07 15 14	.....	21 00	11	0 41.9	- 0 28	10.1
Mon Feb 19/Tue Feb 20	9 41	18 09	19 31	5 35 6 57	5 11 15 17	.....	21 58	19	1 30.7	3 57	10.1
Tue Feb 20/Wed Feb 21	9 45	18 10	19 32	5 34 6 56	5 16 15 20	.....	22 59	27	2 20.9	8 14	10.0
Wed Feb 21/Thu Feb 22	9 49	18 10	19 33	5 33 6 55	5 21 15 23	.....	0 00	38	3 13.3	12 12	10.0
Thu Feb 22/Fri Feb 23	9 53	18 11	19 33	5 32 6 54	5 26 15 26	.....	1 03	49	4 08.4	15 34	10.0
Fri Feb 23/Sat Feb 24	9 57	18 12	19 34	5 31 6 53	5 30 15 29	.....	2 07	60	5 06.4	18 05	9.9
Sat Feb 24/Sun Feb 25	10 01	18 13	19 35	5 30 6 52	5 35 15 32	.....	3 10	71	6 06.9	19 30	9.9
Sun Feb 25/Mon Feb 26	10 05	18 14	19 36	5 29 6 51	5 40 15 34	.....	4 09	81	7 09.1	19 37	9.9
Mon Feb 26/Tue Feb 27	10 09	18 15	19 37	5 28 6 50	5 45 15 37	.....	5 05	90	8 11.7	18 22	9.9
Tue Feb 27/Wed Feb 28	10 13	18 15	19 37	5 27 6 48	5 49 15 40	.....	5 55	96	9 13.3	15 50	9.8
Wed Feb 28/Thu Mar 01	10 17	18 16	19 38	5 25 6 47	5 54 15 43	17 06	6 40	99	10 12.8	12 14	9.8

Calendar for VATT, west longitude (h.m.s) = 7 19 34, latitude (d.m) = 32 42.1
 Rise/set times in Mountain time (7 hr W), uncorrected for elevation, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2018 MARCH *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Thu Mar 01/Fri Mar 02	10 21	18 17	19 39	5 24	6 46	5 59	15 46	18 13	7 21	100	11 09.8	7 54	9.8
Fri Mar 02/Sat Mar 03	10 24	18 18	19 40	5 23	6 45	6 03	15 48	19 18	.....	98	12 04.4	3 11	9.7
Sat Mar 03/Sun Mar 04	10 28	18 19	19 40	5 22	6 44	6 08	15 51	20 21	.....	93	12 56.9	- 1 35	9.7
Sun Mar 04/Mon Mar 05	10 32	18 19	19 41	5 21	6 42	6 13	15 54	21 22	.....	87	13 47.9	- 6 09	9.7
Mon Mar 05/Tue Mar 06	10 36	18 20	19 42	5 19	6 41	6 17	15 57	22 21	.....	79	14 38.1	-10 18	9.6
Tue Mar 06/Wed Mar 07	10 40	18 21	19 43	5 18	6 40	6 22	15 59	23 18	.....	70	15 27.8	-13 52	9.6
Wed Mar 07/Thu Mar 08	10 44	18 22	19 43	5 17	6 39	6 27	16 02	0 14	.....	61	16 17.4	-16 44	9.6
Thu Mar 08/Fri Mar 09	10 48	18 22	19 44	5 16	6 37	6 32	16 05	1 08	.....	51	17 07.2	-18 49	9.5
Fri Mar 09/Sat Mar 10	10 52	18 23	19 45	5 14	6 36	6 36	16 07	1 59	.....	42	17 57.1	-20 04	9.5
Sat Mar 10/Sun Mar 11	10 56	18 24	19 46	5 13	6 35	6 41	16 10	2 48	.....	33	18 47.2	-20 27	9.5
Sun Mar 11/Mon Mar 12	11 00	18 25	19 46	5 12	6 34	6 46	16 13	3 35	.....	24	19 37.2	-19 57	9.4
Mon Mar 12/Tue Mar 13	11 04	18 25	19 47	5 11	6 32	6 50	16 15	4 18	.....	17	20 26.8	-18 35	9.4
Tue Mar 13/Wed Mar 14	11 08	18 26	19 48	5 09	6 31	6 55	16 18	4 58	.....	10	21 16.0	-16 25	9.4
Wed Mar 14/Thu Mar 15	11 12	18 27	19 49	5 08	6 30	7 00	16 21	5 36	.....	5	22 04.8	-13 31	9.3
Thu Mar 15/Fri Mar 16	11 16	18 28	19 50	5 07	6 28	7 05	16 23	6 11	16 55	2	22 53.1	- 9 59	9.3
Fri Mar 16/Sat Mar 17	11 20	18 28	19 50	5 05	6 27	7 09	16 26	6 46	17 53	0	23 41.2	- 5 58	9.2
Sat Mar 17/Sun Mar 18	11 24	18 29	19 51	5 04	6 26	7 14	16 28	7 21	18 51	1	0 29.7	- 1 37	9.2
Sun Mar 18/Mon Mar 19	11 28	18 30	19 52	5 02	6 25	7 19	16 31	.....	19 51	3	1 18.8	2 52	9.2
Mon Mar 19/Tue Mar 20	11 32	18 31	19 53	5 01	6 23	7 24	16 33	.....	20 52	8	2 09.3	7 17	9.1
Tue Mar 20/Wed Mar 21	11 35	18 31	19 54	5 00	6 22	7 28	16 36	.....	21 54	15	3 01.6	11 23	9.1
Wed Mar 21/Thu Mar 22	11 39	18 32	19 54	4 58	6 21	7 33	16 38	.....	22 57	24	3 56.1	14 56	9.1
Thu Mar 22/Fri Mar 23	11 43	18 33	19 55	4 57	6 19	7 38	16 41	.....	0 01	34	4 52.9	17 39	9.0
Fri Mar 23/Sat Mar 24	11 47	18 33	19 56	4 55	6 18	7 43	16 44	.....	1 03	45	5 51.8	19 19	9.0
Sat Mar 24/Sun Mar 25	11 51	18 34	19 57	4 54	6 17	7 47	16 46	.....	2 03	57	6 52.1	19 46	9.0
Sun Mar 25/Mon Mar 26	11 55	18 35	19 58	4 53	6 15	7 52	16 49	.....	2 58	68	7 52.7	18 55	8.9
Mon Mar 26/Tue Mar 27	11 59	18 36	19 58	4 51	6 14	7 57	16 51	.....	3 48	78	8 52.6	16 49	8.9
Tue Mar 27/Wed Mar 28	12 03	18 36	19 59	4 50	6 13	8 02	16 54	.....	4 34	87	9 51.0	13 38	8.8
Wed Mar 28/Thu Mar 29	12 07	18 37	20 00	4 48	6 11	8 06	16 56	.....	5 15	94	10 47.3	9 37	8.8
Thu Mar 29/Fri Mar 30	12 11	18 38	20 01	4 47	6 10	8 11	16 59	17 00	5 54	98	11 41.7	5 04	8.8
Fri Mar 30/Sat Mar 31	12 15	18 38	20 02	4 45	6 09	8 16	17 01	18 03	6 30	100	12 34.5	0 17	8.7
Sat Mar 31/Sun Apr 01	12 19	18 39	20 03	4 44	6 07	8 21	17 04	19 05	7 06	99	13 26.1	- 4 27	8.7

***** 2018 APRIL *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Sun Apr 01/Mon Apr 02	12 23	18 40	20 03	4 43	6 06	8 26	17 06	20 05	.....	96	14 17.0	- 8 53	8.7
Mon Apr 02/Tue Apr 03	12 27	18 40	20 04	4 41	6 05	8 30	17 09	21 04	.....	91	15 07.6	-12 47	8.6
Tue Apr 03/Wed Apr 04	12 31	18 41	20 05	4 40	6 04	8 35	17 11	22 02	.....	84	15 58.3	-16 02	8.6
Wed Apr 04/Thu Apr 05	12 35	18 42	20 06	4 38	6 02	8 40	17 14	22 58	.....	77	16 49.0	-18 29	8.5
Thu Apr 05/Fri Apr 06	12 39	18 43	20 07	4 37	6 01	8 45	17 16	23 51	.....	68	17 39.9	-20 04	8.5
Fri Apr 06/Sat Apr 07	12 42	18 43	20 08	4 35	6 00	8 50	17 19	0 42	.....	59	18 30.7	-20 45	8.5
Sat Apr 07/Sun Apr 08	12 46	18 44	20 09	4 34	5 59	8 54	17 21	1 29	.....	50	19 21.1	-20 32	8.4
Sun Apr 08/Mon Apr 09	12 50	18 45	20 10	4 32	5 57	8 59	17 24	2 13	.....	40	20 11.1	-19 26	8.4
Mon Apr 09/Tue Apr 10	12 54	18 45	20 10	4 31	5 56	9 04	17 26	2 54	.....	31	21 00.5	-17 30	8.3
Tue Apr 10/Wed Apr 11	12 58	18 46	20 11	4 30	5 55	9 09	17 29	3 33	.....	23	21 49.2	-14 48	8.3
Wed Apr 11/Thu Apr 12	13 02	18 47	20 12	4 28	5 54	9 14	17 31	4 09	.....	15	22 37.5	-11 27	8.3
Thu Apr 12/Fri Apr 13	13 06	18 48	20 13	4 27	5 52	9 19	17 34	4 44	.....	9	23 25.6	- 7 32	8.2
Fri Apr 13/Sat Apr 14	13 10	18 48	20 14	4 25	5 51	9 24	17 36	5 18	.....	4	0 14.1	- 3 13	8.2
Sat Apr 14/Sun Apr 15	13 14	18 49	20 15	4 24	5 50	9 29	17 39	5 54	17 38	1	1 03.4	1 20	8.1
Sun Apr 15/Mon Apr 16	13 18	18 50	20 16	4 22	5 49	9 33	17 41	6 30	18 39	0	1 54.1	5 55	8.1
Mon Apr 16/Tue Apr 17	13 22	18 50	20 17	4 21	5 48	9 38	17 44	.....	19 43	2	2 46.7	10 15	8.1
Tue Apr 17/Wed Apr 18	13 26	18 51	20 18	4 20	5 46	9 43	17 46	.....	20 47	6	3 41.6	14 05	8.0
Wed Apr 18/Thu Apr 19	13 30	18 52	20 19	4 18	5 45	9 48	17 49	.....	21 53	13	4 38.9	17 08	8.0
Thu Apr 19/Fri Apr 20	13 34	18 53	20 20	4 17	5 44	9 53	17 51	.....	22 57	21	5 38.1	19 07	7.9
Fri Apr 20/Sat Apr 21	13 38	18 53	20 21	4 15	5 43	9 58	17 54	.....	23 59	31	6 38.6	19 52	7.9
Sat Apr 21/Sun Apr 22	13 42	18 54	20 22	4 14	5 42	10 03	17 56	.....	0 56	42	7 39.0	19 20	7.9
Sun Apr 22/Mon Apr 23	13 46	18 55	20 23	4 13	5 41	10 08	17 59	.....	1 47	54	8 38.5	17 31	7.8
Mon Apr 23/Tue Apr 24	13 49	18 55	20 24	4 11	5 40	10 13	18 01	.....	2 33	65	9 36.1	14 38	7.8
Tue Apr 24/Wed Apr 25	13 53	18 56	20 25	4 10	5 39	10 18	18 04	.....	3 15	75	10 31.5	10 53	7.8
Wed Apr 25/Thu Apr 26	13 57	18 57	20 26	4 09	5 38	10 23	18 07	.....	3 53	84	11 25.0	6 32	7.7
Thu Apr 26/Fri Apr 27	14 01	18 58	20 27	4 07	5 36	10 28	18 09	.....	4 29	91	12 16.9	1 51	7.7
Fri Apr 27/Sat Apr 28	14 05	18 58	20 28	4 06	5 35	10 33	18 12	.....	5 04	96	13 07.7	- 2 53	7.6
Sat Apr 28/Sun Apr 29	14 09	18 59	20 29	4 05	5 34	10 38	18 15	17 53	5 39	99	13 58.1	- 7 26	7.6
Sun Apr 29/Mon Apr 30	14 13	19 00	20 30	4 03	5 33	10 42	18 17	18 52	6 15	100	14 48.4	-11 35	7.6
Mon Apr 30/Tue May 01	14 17	19 01	20 31	4 02	5 32	10 47	18 20	19 50	.....	98	15 39.1	-15 09	7.5

Calendar for VATT, west longitude (h.m.s) = 7 19 34, latitude (d.m) = 32 42.1
 Rise/set times in Mountain time (7 hr W), uncorrected for elevation, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2018 MAY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Tue May 01/Wed May 02	14 21	19 01	20 32	4 01	5 31	10 52	18 23	20 47	.....	95	16 30.2	-17 58	7.5
Wed May 02/Thu May 03	14 25	19 02	20 33	4 00	5 31	10 57	18 25	21 42	.....	89	17 21.6	-19 56	7.4
Thu May 03/Fri May 04	14 29	19 03	20 34	3 58	5 30	11 02	18 28	22 34	.....	83	18 13.1	-20 58	7.4
Fri May 04/Sat May 05	14 33	19 04	20 35	3 57	5 29	11 07	18 31	23 23	.....	75	19 04.3	-21 04	7.4
Sat May 05/Sun May 06	14 37	19 04	20 36	3 56	5 28	11 12	18 33	0 09	.....	66	19 54.9	-20 16	7.3
Sun May 06/Mon May 07	14 41	19 05	20 37	3 55	5 27	11 17	18 36	0 51	.....	57	20 44.6	-18 35	7.3
Mon May 07/Tue May 08	14 45	19 06	20 38	3 54	5 26	11 22	18 39	1 30	.....	48	21 33.4	-16 08	7.3
Tue May 08/Wed May 09	14 49	19 06	20 39	3 52	5 25	11 27	18 42	2 06	.....	38	22 21.5	-12 59	7.2
Wed May 09/Thu May 10	14 53	19 07	20 40	3 51	5 24	11 32	18 45	2 41	.....	29	23 09.2	-9 16	7.2
Thu May 10/Fri May 11	14 57	19 08	20 41	3 50	5 24	11 37	18 47	3 15	.....	20	23 57.0	-5 05	7.1
Fri May 11/Sat May 12	15 00	19 09	20 42	3 49	5 23	11 42	18 50	3 49	.....	13	0 45.5	-0 34	7.1
Sat May 12/Sun May 13	15 04	19 09	20 43	3 48	5 22	11 47	18 53	4 25	.....	6	1 35.5	4 04	7.1
Sun May 13/Mon May 14	15 08	19 10	20 44	3 47	5 21	11 52	18 56	5 04	17 25	2	2 27.6	8 36	7.0
Mon May 14/Tue May 15	15 12	19 11	20 45	3 46	5 21	11 57	18 59	5 46	18 30	0	3 22.3	12 45	7.0
Tue May 15/Wed May 16	15 16	19 11	20 46	3 45	5 20	12 02	19 02	6 33	19 37	1	4 19.8	16 12	7.0
Wed May 16/Thu May 17	15 20	19 12	20 47	3 44	5 19	12 07	19 05	.....	20 44	5	5 19.9	18 40	6.9
Thu May 17/Fri May 18	15 24	19 13	20 48	3 43	5 19	12 12	19 08	.....	21 49	11	6 21.6	19 52	6.9
Fri May 18/Sat May 19	15 28	19 14	20 49	3 42	5 18	12 17	19 11	.....	22 50	19	7 23.6	19 42	6.9
Sat May 19/Sun May 20	15 32	19 14	20 50	3 41	5 18	12 22	19 14	.....	23 45	29	8 24.4	18 11	6.8
Sun May 20/Mon May 21	15 36	19 15	20 51	3 41	5 17	12 27	19 17	.....	0 33	40	9 23.1	15 31	6.8
Mon May 21/Tue May 22	15 40	19 16	20 52	3 40	5 17	12 32	19 20	.....	1 16	51	10 19.1	11 56	6.8
Tue May 22/Wed May 23	15 44	19 16	20 53	3 39	5 16	12 37	19 23	.....	1 55	62	11 12.5	7 43	6.8
Wed May 23/Thu May 24	15 48	19 17	20 54	3 38	5 16	12 42	19 27	.....	2 31	72	12 04.0	3 08	6.7
Thu May 24/Fri May 25	15 52	19 18	20 55	3 37	5 15	12 46	19 30	.....	3 06	81	12 54.1	-1 33	6.7
Fri May 25/Sat May 26	15 56	19 18	20 56	3 37	5 15	12 51	19 33	.....	3 40	89	13 43.5	-6 08	6.7
Sat May 26/Sun May 27	16 00	19 19	20 57	3 36	5 14	12 56	19 36	.....	4 15	95	14 32.9	-10 24	6.7
Sun May 27/Mon May 28	16 04	19 20	20 58	3 35	5 14	13 01	19 40	17 41	4 51	98	15 22.7	-14 10	6.6
Mon May 28/Tue May 29	16 07	19 20	20 59	3 35	5 14	13 06	19 43	18 38	5 30	100	16 13.3	-17 16	6.6
Tue May 29/Wed May 30	16 11	19 21	21 00	3 34	5 13	13 11	19 46	19 34	6 12	99	17 04.5	-19 34	6.6
Wed May 30/Thu May 31	16 15	19 21	21 01	3 34	5 13	13 15	19 50	20 27	.....	97	17 56.2	-20 57	6.6
Thu May 31/Fri Jun 01	16 19	19 22	21 01	3 33	5 13	13 20	19 53	21 18	.....	93	18 47.9	-21 24	6.5

***** 2018 JUNE *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Fri Jun 01/Sat Jun 02	16 23	19 23	21 02	3 33	5 12	13 25	19 57	22 05	.....	88	19 39.1	-20 54	6.5
Sat Jun 02/Sun Jun 03	16 27	19 23	21 03	3 32	5 12	13 30	20 00	22 49	.....	81	20 29.4	-19 30	6.5
Sun Jun 03/Mon Jun 04	16 31	19 24	21 04	3 32	5 12	13 34	20 04	23 29	.....	73	21 18.6	-17 18	6.5
Mon Jun 04/Tue Jun 05	16 35	19 24	21 04	3 32	5 12	13 39	20 07	0 05	.....	64	22 06.7	-14 22	6.5
Tue Jun 05/Wed Jun 06	16 39	19 25	21 05	3 31	5 12	13 44	20 11	0 40	.....	54	22 54.0	-10 51	6.4
Wed Jun 06/Thu Jun 07	16 43	19 25	21 06	3 31	5 11	13 48	20 14	1 14	.....	44	23 41.1	-6 50	6.4
Thu Jun 07/Fri Jun 08	16 47	19 26	21 06	3 31	5 11	13 53	20 18	1 47	.....	35	0 28.5	-2 28	6.4
Fri Jun 08/Sat Jun 09	16 51	19 26	21 07	3 30	5 11	13 57	20 22	2 21	.....	25	1 17.0	2 05	6.4
Sat Jun 09/Sun Jun 10	16 55	19 27	21 08	3 30	5 11	14 02	20 26	2 57	.....	16	2 07.4	6 40	6.4
Sun Jun 10/Mon Jun 11	16 59	19 27	21 08	3 30	5 11	14 07	20 29	3 36	.....	9	3 00.5	11 00	6.4
Mon Jun 11/Tue Jun 12	17 03	19 28	21 09	3 30	5 11	14 11	20 33	4 21	.....	4	3 56.7	14 49	6.4
Tue Jun 12/Wed Jun 13	17 07	19 28	21 09	3 30	5 11	14 15	20 37	5 12	18 23	1	4 56.2	17 46	6.3
Wed Jun 13/Thu Jun 14	17 11	19 28	21 10	3 30	5 11	14 20	20 41	6 09	19 31	0	5 58.4	19 33	6.3
Thu Jun 14/Fri Jun 15	17 15	19 29	21 10	3 30	5 11	14 24	20 45	.....	20 36	3	7 01.9	19 56	6.3
Fri Jun 15/Sat Jun 16	17 18	19 29	21 11	3 30	5 11	14 29	20 49	.....	21 35	9	8 04.9	18 53	6.3
Sat Jun 16/Sun Jun 17	17 22	19 29	21 11	3 30	5 12	14 33	20 53	.....	22 28	17	9 06.0	16 31	6.3
Sun Jun 17/Mon Jun 18	17 26	19 30	21 11	3 30	5 12	14 37	20 57	.....	23 15	26	10 04.2	13 06	6.3
Mon Jun 18/Tue Jun 19	17 30	19 30	21 12	3 30	5 12	14 42	21 01	.....	23 56	37	10 59.3	8 57	6.3
Tue Jun 19/Wed Jun 20	17 34	19 30	21 12	3 30	5 12	14 46	21 05	.....	0 34	48	11 51.8	4 24	6.3
Wed Jun 20/Thu Jun 21	17 38	19 30	21 12	3 30	5 12	14 50	21 09	.....	1 09	59	12 42.2	-0 19	6.3
Thu Jun 21/Fri Jun 22	17 42	19 31	21 12	3 31	5 12	14 54	21 13	.....	1 43	69	13 31.5	-4 56	6.3
Fri Jun 22/Sat Jun 23	17 46	19 31	21 13	3 31	5 13	14 58	21 18	.....	2 17	78	14 20.4	-9 17	6.3
Sat Jun 23/Sun Jun 24	17 50	19 31	21 13	3 31	5 13	15 02	21 22	.....	2 52	86	15 09.4	-13 11	6.3
Sun Jun 24/Mon Jun 25	17 54	19 31	21 13	3 32	5 13	15 06	21 26	.....	3 30	92	15 59.1	-16 28	6.3
Mon Jun 25/Tue Jun 26	17 58	19 31	21 13	3 32	5 14	15 10	21 30	.....	4 10	97	16 49.6	-19 00	6.3
Tue Jun 26/Wed Jun 27	18 02	19 31	21 13	3 32	5 14	15 14	21 35	18 22	4 54	99	17 40.9	-20 42	6.3
Wed Jun 27/Thu Jun 28	18 06	19 31	21 13	3 33	5 14	15 18	21 39	19 13	5 41	100	18 32.5	-21 27	6.3
Thu Jun 28/Fri Jun 29	18 10	19 31	21 13	3 33	5 15	15 22	21 44	20 02	.....	99	19 24.0	-21 16	6.3
Fri Jun 29/Sat Jun 30	18 14	19 31	21 13	3 34	5 15	15 26	21 48	20 47	.....	96	20 14.8	-20 09	6.3
Sat Jun 30/Sun Jul 01	18 18	19 31	21 13	3 34	5 15	15 30	21 52	21 28	.....	92	21 04.6	-18 10	6.4

Calendar for VATT, west longitude (h.m.s) = 7 19 34, latitude (d.m) = 32 42.1
 Rise/set times in Mountain time (7 hr W), uncorrected for elevation, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2018 JULY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Sun Jul 01/Mon Jul 02	18 22	19 31	21 12	3 35	5 16	15 34	21 57	22 06	.....	85	21 53.2	-15 27	6.4
Mon Jul 02/Tue Jul 03	18 25	19 31	21 12	3 35	5 16	15 37	22 01	22 41	.....	78	22 40.7	-12 06	6.4
Tue Jul 03/Wed Jul 04	18 29	19 31	21 12	3 36	5 17	15 41	22 06	23 14	.....	69	23 27.5	- 8 14	6.4
Wed Jul 04/Thu Jul 05	18 33	19 31	21 12	3 37	5 17	15 45	22 11	23 47	.....	60	0 14.2	- 4 01	6.4
Thu Jul 05/Fri Jul 06	18 37	19 31	21 11	3 37	5 18	15 48	22 15	0 19	.....	50	1 01.4	0 26	6.4
Fri Jul 06/Sat Jul 07	18 41	19 31	21 11	3 38	5 18	15 52	22 20	0 53	.....	40	1 50.0	4 56	6.4
Sat Jul 07/Sun Jul 08	18 45	19 31	21 11	3 39	5 19	15 55	22 24	1 30	.....	29	2 40.8	9 19	6.5
Sun Jul 08/Mon Jul 09	18 49	19 30	21 10	3 39	5 19	15 59	22 29	2 11	.....	20	3 34.6	13 18	6.5
Mon Jul 09/Tue Jul 10	18 53	19 30	21 10	3 40	5 20	16 02	22 34	2 57	.....	11	4 31.8	16 36	6.5
Tue Jul 10/Wed Jul 11	18 57	19 30	21 09	3 41	5 20	16 06	22 39	3 51	.....	5	5 32.3	18 55	6.5
Wed Jul 11/Thu Jul 12	19 01	19 30	21 09	3 42	5 21	16 09	22 43	4 51	18 14	1	6 35.4	19 55	6.5
Thu Jul 12/Fri Jul 13	19 05	19 29	21 08	3 42	5 21	16 13	22 48	5 57	19 18	0	7 39.4	19 29	6.6
Fri Jul 13/Sat Jul 14	19 09	19 29	21 08	3 43	5 22	16 16	22 53	.....	20 15	2	8 42.6	17 36	6.6
Sat Jul 14/Sun Jul 15	19 13	19 29	21 07	3 44	5 23	16 19	22 58	.....	21 06	7	9 43.4	14 30	6.6
Sun Jul 15/Mon Jul 16	19 17	19 28	21 06	3 45	5 23	16 23	23 02	.....	21 52	14	10 41.2	10 29	6.6
Mon Jul 16/Tue Jul 17	19 21	19 28	21 06	3 46	5 24	16 26	23 07	.....	22 32	23	11 35.9	5 55	6.7
Tue Jul 17/Wed Jul 18	19 25	19 27	21 05	3 47	5 24	16 29	23 12	.....	23 09	33	12 28.0	1 08	6.7
Wed Jul 18/Thu Jul 19	19 29	19 27	21 04	3 48	5 25	16 32	23 17	.....	23 44	44	13 18.4	- 3 37	6.7
Thu Jul 19/Fri Jul 20	19 32	19 26	21 04	3 49	5 26	16 36	23 22	.....	0 19	54	14 07.8	- 8 06	6.8
Fri Jul 20/Sat Jul 21	19 36	19 26	21 03	3 49	5 26	16 39	23 27	.....	0 54	64	14 56.8	-12 09	6.8
Sat Jul 21/Sun Jul 22	19 40	19 25	21 02	3 50	5 27	16 42	23 31	.....	1 31	74	15 46.2	-15 36	6.8
Sun Jul 22/Mon Jul 23	19 44	19 25	21 01	3 51	5 28	16 45	23 36	.....	2 10	82	16 36.2	-18 21	6.8
Mon Jul 23/Tue Jul 24	19 48	19 24	21 00	3 52	5 28	16 48	23 41	.....	2 52	89	17 26.9	-20 17	6.9
Tue Jul 24/Wed Jul 25	19 52	19 24	20 59	3 53	5 29	16 51	23 46	.....	3 38	94	18 18.2	-21 18	6.9
Wed Jul 25/Thu Jul 26	19 56	19 23	20 58	3 54	5 30	16 54	23 51	.....	4 27	98	19 09.5	-21 24	6.9
Thu Jul 26/Fri Jul 27	20 00	19 22	20 57	3 55	5 30	16 57	23 56	.....	5 18	100	20 00.6	-20 33	7.0
Fri Jul 27/Sat Jul 28	20 04	19 22	20 56	3 56	5 31	17 00	0 01	.....	6 11	100	20 50.8	-18 48	7.0
Sat Jul 28/Sun Jul 29	20 08	19 21	20 55	3 57	5 32	17 03	0 06	.....	7 07	98	21 40.0	-16 16	7.0
Sun Jul 29/Mon Jul 30	20 12	19 20	20 54	3 58	5 32	17 06	0 11	.....	8 00	95	22 28.1	-13 03	7.1
Mon Jul 30/Tue Jul 31	20 16	19 19	20 53	3 59	5 33	17 09	0 16	.....	9 00	89	23 15.2	- 9 18	7.1
Tue Jul 31/Wed Aug 01	20 20	19 19	20 52	4 00	5 34	17 11	0 21	.....	10 00	82	0 01.9	- 5 10	7.1

***** 2018 AUGUST *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Wed Aug 01/Thu Aug 02	20 24	19 18	20 51	4 01	5 34	17 14	0 26	22 21	.....	74	0 48.6	- 0 47	7.2
Thu Aug 02/Fri Aug 03	20 28	19 17	20 50	4 02	5 35	17 17	0 30	22 54	.....	65	1 36.2	3 41	7.2
Fri Aug 03/Sat Aug 04	20 32	19 16	20 49	4 03	5 36	17 20	0 35	23 28	.....	54	2 25.4	8 03	7.2
Sat Aug 04/Sun Aug 05	20 36	19 15	20 47	4 04	5 36	17 23	0 40	0 06	.....	44	3 16.9	12 05	7.3
Sun Aug 05/Mon Aug 06	20 40	19 14	20 46	4 05	5 37	17 25	0 45	0 48	.....	33	4 11.5	15 35	7.3
Mon Aug 06/Tue Aug 07	20 43	19 13	20 45	4 06	5 38	17 28	0 50	1 36	.....	23	5 09.3	18 13	7.3
Tue Aug 07/Wed Aug 08	20 47	19 12	20 44	4 07	5 38	17 31	0 55	2 32	.....	14	6 10.1	19 44	7.4
Wed Aug 08/Thu Aug 09	20 51	19 11	20 43	4 08	5 39	17 33	1 00	3 34	.....	7	7 12.9	19 53	7.4
Thu Aug 09/Fri Aug 10	20 55	19 11	20 41	4 09	5 40	17 36	1 05	4 42	17 58	2	8 16.1	18 37	7.5
Fri Aug 10/Sat Aug 11	20 59	19 10	20 40	4 10	5 40	17 39	1 10	5 52	18 52	0	9 18.1	15 59	7.5
Sat Aug 11/Sun Aug 12	21 03	19 09	20 39	4 11	5 41	17 41	1 15	.....	19 41	1	10 17.8	12 16	7.5
Sun Aug 12/Mon Aug 13	21 07	19 07	20 37	4 12	5 42	17 44	1 20	.....	20 24	5	11 14.8	7 47	7.6
Mon Aug 13/Tue Aug 14	21 11	19 06	20 36	4 13	5 43	17 47	1 25	.....	21 04	11	12 09.1	2 56	7.6
Tue Aug 14/Wed Aug 15	21 15	19 05	20 35	4 14	5 43	17 49	1 29	.....	21 41	20	13 01.3	- 1 59	7.7
Wed Aug 15/Thu Aug 16	21 19	19 04	20 33	4 15	5 44	17 52	1 34	.....	22 17	29	13 52.0	- 6 41	7.7
Thu Aug 16/Fri Aug 17	21 23	19 03	20 32	4 16	5 45	17 54	1 39	.....	22 53	39	14 42.1	-10 57	7.7
Fri Aug 17/Sat Aug 18	21 27	19 02	20 31	4 17	5 45	17 57	1 44	.....	23 30	49	15 32.0	-14 39	7.8
Sat Aug 18/Sun Aug 19	21 31	19 01	20 29	4 18	5 46	17 59	1 49	.....	0 09	59	16 22.1	-17 38	7.8
Sun Aug 19/Mon Aug 20	21 35	19 00	20 28	4 19	5 47	18 02	1 54	.....	0 50	68	17 12.7	-19 48	7.8
Mon Aug 20/Tue Aug 21	21 39	18 59	20 26	4 19	5 47	18 05	1 59	.....	1 35	77	18 03.7	-21 04	7.9
Tue Aug 21/Wed Aug 22	21 43	18 58	20 25	4 20	5 48	18 07	2 04	.....	2 22	84	18 54.9	-21 25	7.9
Wed Aug 22/Thu Aug 23	21 47	18 56	20 24	4 21	5 49	18 10	2 09	.....	3 13	91	19 45.9	-20 50	8.0
Thu Aug 23/Fri Aug 24	21 50	18 55	20 22	4 22	5 49	18 12	2 13	.....	4 05	95	20 36.4	-19 20	8.0
Fri Aug 24/Sat Aug 25	21 54	18 54	20 21	4 23	5 50	18 15	2 18	.....	4 59	99	21 26.0	-17 00	8.0
Sat Aug 25/Sun Aug 26	21 58	18 53	20 19	4 24	5 50	18 17	2 23	.....	5 54	100	22 14.6	-13 56	8.1
Sun Aug 26/Mon Aug 27	22 02	18 52	20 18	4 25	5 51	18 20	2 28	.....	6 49	99	23 02.4	-10 16	8.1
Mon Aug 27/Tue Aug 28	22 06	18 50	20 16	4 26	5 52	18 22	2 33	.....	7 44	97	23 49.5	- 6 10	8.2
Tue Aug 28/Wed Aug 29	22 10	18 49	20 15	4 27	5 52	18 25	2 37	.....	8 49	92	0 36.6	- 1 46	8.2
Wed Aug 29/Thu Aug 30	22 14	18 48	20 14	4 27	5 53	18 27	2 42	.....	9 54	86	1 24.2	2 44	8.2
Thu Aug 30/Fri Aug 31	22 18	18 47	20 12	4 28	5 54	18 29	2 47	.....	10 59	78	2 12.9	7 09	8.3
Fri Aug 31/Sat Sep 01	22 22	18 45	20 11	4 29	5 54	18 32	2 52	.....	12 04	69	3 03.5	11 17	8.3

Calendar for VATT, west longitude (h.m.s) = 7 19 34, latitude (d.m) = 32 42.1
 Rise/set times in Mountain time (7 hr W), uncorrected for elevation, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2018 SEPTEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----			LST twilight:		----- Moon: -----				Twilight		
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Sat Sep 01/Sun Sep 02	22 26	18 44	20 09	4 30	5 55	18 34	2 57	22 45	.....	58	3 56.5	14 54	8.3
Sun Sep 02/Mon Sep 03	22 30	18 43	20 08	4 31	5 56	18 37	3 01	23 30	.....	47	4 52.2	17 45	8.4
Mon Sep 03/Tue Sep 04	22 34	18 41	20 06	4 32	5 56	18 39	3 06	0 20	.....	36	5 50.7	19 35	8.4
Tue Sep 04/Wed Sep 05	22 38	18 40	20 05	4 32	5 57	18 42	3 11	1 18	.....	26	6 51.3	20 11	8.5
Wed Sep 05/Thu Sep 06	22 42	18 39	20 03	4 33	5 58	18 44	3 16	2 21	.....	16	7 52.8	19 25	8.5
Thu Sep 06/Fri Sep 07	22 46	18 38	20 02	4 34	5 58	18 47	3 21	3 29	.....	8	8 54.1	17 18	8.5
Fri Sep 07/Sat Sep 08	22 50	18 36	20 00	4 35	5 59	18 49	3 25	4 38	17 29	3	9 53.9	14 00	8.6
Sat Sep 08/Sun Sep 09	22 54	18 35	19 59	4 36	5 59	18 52	3 30	5 47	18 14	0	10 51.5	9 48	8.6
Sun Sep 09/Mon Sep 10	22 58	18 34	19 57	4 36	6 00	18 54	3 35	6 55	18 56	1	11 47.0	5 01	8.7
Mon Sep 10/Tue Sep 11	23 01	18 32	19 56	4 37	6 01	18 57	3 39	.....	19 34	3	12 40.5	0 01	8.7
Tue Sep 11/Wed Sep 12	23 05	18 31	19 54	4 38	6 01	18 59	3 44	.....	20 11	9	13 32.6	- 4 54	8.7
Wed Sep 12/Thu Sep 13	23 09	18 30	19 53	4 39	6 02	19 01	3 49	.....	20 48	16	14 23.8	- 9 28	8.8
Thu Sep 13/Fri Sep 14	23 13	18 28	19 51	4 40	6 03	19 04	3 54	.....	21 25	24	15 14.7	-13 29	8.8
Fri Sep 14/Sat Sep 15	23 17	18 27	19 50	4 40	6 03	19 06	3 58	.....	22 04	33	16 05.6	-16 47	8.8
Sat Sep 15/Sun Sep 16	23 21	18 26	19 48	4 41	6 04	19 09	4 03	.....	22 46	43	16 56.7	-19 15	8.9
Sun Sep 16/Mon Sep 17	23 25	18 24	19 47	4 42	6 05	19 11	4 08	.....	23 30	52	17 48.0	-20 49	8.9
Mon Sep 17/Tue Sep 18	23 29	18 23	19 45	4 43	6 05	19 14	4 12	.....	0 17	62	18 39.2	-21 27	9.0
Tue Sep 18/Wed Sep 19	23 33	18 21	19 44	4 43	6 06	19 16	4 17	.....	1 06	71	19 30.3	-21 07	9.0
Wed Sep 19/Thu Sep 20	23 37	18 20	19 43	4 44	6 07	19 19	4 22	.....	1 58	79	20 20.7	-19 53	9.0
Thu Sep 20/Fri Sep 21	23 41	18 19	19 41	4 45	6 07	19 21	4 26	.....	2 52	86	21 10.4	-17 47	9.1
Fri Sep 21/Sat Sep 22	23 45	18 17	19 40	4 45	6 08	19 24	4 31	16 43	3 46	92	21 59.3	-14 55	9.1
Sat Sep 22/Sun Sep 23	23 49	18 16	19 38	4 46	6 08	19 26	4 36	17 19	4 42	97	22 47.4	-11 23	9.1
Sun Sep 23/Mon Sep 24	23 53	18 15	19 37	4 47	6 09	19 29	4 40	17 52	5 37	99	23 35.0	- 7 20	9.2
Mon Sep 24/Tue Sep 25	23 57	18 13	19 35	4 48	6 10	19 31	4 45	18 25	6 34	100	0 22.6	- 2 55	9.2
Tue Sep 25/Wed Sep 26	0 01	18 12	19 34	4 48	6 10	19 34	4 50	18 57	.....	98	1 10.7	1 41	9.2
Wed Sep 26/Thu Sep 27	0 05	18 11	19 33	4 49	6 11	19 36	4 54	19 31	.....	95	1 59.8	6 15	9.3
Thu Sep 27/Fri Sep 28	0 08	18 09	19 31	4 50	6 12	19 39	4 59	20 06	.....	89	2 50.6	10 35	9.3
Fri Sep 28/Sat Sep 29	0 12	18 08	19 30	4 50	6 12	19 42	5 04	20 45	.....	81	3 43.5	14 25	9.3
Sat Sep 29/Sun Sep 30	0 16	18 07	19 28	4 51	6 13	19 44	5 08	21 28	.....	72	4 38.8	17 30	9.4
Sun Sep 30/Mon Oct 01	0 20	18 05	19 27	4 52	6 14	19 47	5 13	22 16	.....	62	5 36.5	19 35	9.4

***** 2018 OCTOBER *****

Date (eve/morn)	LMST midn	----- Sun: -----			LST twilight:		----- Moon: -----				Twilight		
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Mon Oct 01/Tue Oct 02	0 24	18 04	19 26	4 53	6 14	19 49	5 18	23 10	.....	51	6 35.9	20 29	9.4
Tue Oct 02/Wed Oct 03	0 28	18 03	19 24	4 53	6 15	19 52	5 22	0 10	.....	39	7 36.1	20 05	9.5
Wed Oct 03/Thu Oct 04	0 32	18 01	19 23	4 54	6 16	19 54	5 27	1 14	.....	28	8 36.1	18 22	9.5
Thu Oct 04/Fri Oct 05	0 36	18 00	19 22	4 55	6 16	19 57	5 32	2 21	.....	19	9 34.8	15 28	9.5
Fri Oct 05/Sat Oct 06	0 40	17 59	19 21	4 55	6 17	20 00	5 36	3 28	.....	10	10 31.7	11 35	9.6
Sat Oct 06/Sun Oct 07	0 44	17 58	19 19	4 56	6 18	20 02	5 41	4 35	16 49	5	11 26.8	7 01	9.6
Sun Oct 07/Mon Oct 08	0 48	17 56	19 18	4 57	6 19	20 05	5 45	5 41	17 28	1	12 20.2	2 04	9.6
Mon Oct 08/Tue Oct 09	0 52	17 55	19 17	4 57	6 19	20 08	5 50	6 45	18 05	0	13 12.4	- 2 57	9.7
Tue Oct 09/Wed Oct 10	0 56	17 54	19 15	4 58	6 20	20 10	5 55	.....	18 42	2	14 04.0	- 7 44	9.7
Wed Oct 10/Thu Oct 11	1 00	17 53	19 14	4 59	6 21	20 13	5 59	.....	19 19	6	14 55.3	-12 04	9.7
Thu Oct 11/Fri Oct 12	1 04	17 51	19 13	5 00	6 21	20 16	6 04	.....	19 57	11	15 46.8	-15 43	9.8
Fri Oct 12/Sat Oct 13	1 08	17 50	19 12	5 00	6 22	20 19	6 09	.....	20 38	18	16 38.5	-18 34	9.8
Sat Oct 13/Sun Oct 14	1 12	17 49	19 11	5 01	6 23	20 21	6 13	.....	21 22	27	17 30.4	-20 29	9.8
Sun Oct 14/Mon Oct 15	1 16	17 48	19 10	5 02	6 24	20 24	6 18	.....	22 09	36	18 22.1	-21 27	9.9
Mon Oct 15/Tue Oct 16	1 19	17 46	19 08	5 02	6 24	20 27	6 23	.....	22 58	45	19 13.5	-21 27	9.9
Tue Oct 16/Wed Oct 17	1 23	17 45	19 07	5 03	6 25	20 30	6 27	.....	23 49	54	20 04.1	-20 30	9.9
Wed Oct 17/Thu Oct 18	1 27	17 44	19 06	5 04	6 26	20 33	6 32	.....	0 42	64	20 53.8	-18 40	10.0
Thu Oct 18/Fri Oct 19	1 31	17 43	19 05	5 04	6 27	20 36	6 37	.....	1 36	72	21 42.6	-16 02	10.0
Fri Oct 19/Sat Oct 20	1 35	17 42	19 04	5 05	6 27	20 38	6 41	.....	2 31	81	22 30.6	-12 43	10.0
Sat Oct 20/Sun Oct 21	1 39	17 41	19 03	5 06	6 28	20 41	6 46	.....	3 27	88	23 18.1	- 8 48	10.0
Sun Oct 21/Mon Oct 22	1 43	17 40	19 02	5 07	6 29	20 44	6 51	16 24	4 23	93	0 05.6	- 4 27	10.1
Mon Oct 22/Tue Oct 23	1 47	17 38	19 01	5 07	6 30	20 47	6 55	16 57	5 21	98	0 53.7	0 11	10.1
Tue Oct 23/Wed Oct 24	1 51	17 37	19 00	5 08	6 31	20 50	7 00	17 30	6 21	100	1 43.0	4 54	10.1
Wed Oct 24/Thu Oct 25	1 55	17 36	18 59	5 09	6 31	20 53	7 05	18 05	7 22	99	2 34.1	9 28	10.2
Thu Oct 25/Fri Oct 26	1 59	17 35	18 58	5 09	6 32	20 56	7 09	18 43	.....	97	3 27.5	13 38	10.2
Fri Oct 26/Sat Oct 27	2 03	17 34	18 57	5 10	6 33	20 59	7 14	19 25	.....	92	4 23.6	17 04	10.2
Sat Oct 27/Sun Oct 28	2 07	17 33	18 56	5 11	6 34	21 02	7 19	20 12	.....	85	5 22.0	19 32	10.2
Sun Oct 28/Mon Oct 29	2 11	17 32	18 55	5 12	6 35	21 05	7 23	21 05	.....	75	6 22.1	20 47	10.3
Mon Oct 29/Tue Oct 30	2 15	17 31	18 54	5 12	6 36	21 08	7 28	22 03	.....	65	7 22.8	20 41	10.3
Tue Oct 30/Wed Oct 31	2 19	17 30	18 54	5 13	6 36	21 11	7 33	23 06	.....	54	8 22.9	19 15	10.3
Wed Oct 31/Thu Nov 01	2 23	17 29	18 53	5 14	6 37	21 14	7 37	0 11	.....	42	9 21.4	16 37	10.4

Calendar for VATT, west longitude (h.m.s) = 7 19 34, latitude (d.m) = 32 42.1
 Rise/set times in Mountain time (7 hr W), uncorrected for elevation, in standard time all year.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2018 NOVEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Thu Nov 01/Fri Nov 02	2 26	17 29	18 52	5 15	6 38	21 18	7 42	1 17	.....	31	10 17.8	12 59	10.4
Fri Nov 02/Sat Nov 03	2 30	17 28	18 51	5 15	6 39	21 21	7 47	2 22	.....	22	11 12.1	8 38	10.4
Sat Nov 03/Sun Nov 04	2 34	17 27	18 50	5 16	6 40	21 24	7 51	3 26	.....	13	12 04.6	3 50	10.4
Sun Nov 04/Mon Nov 05	2 38	17 26	18 50	5 17	6 41	21 27	7 56	4 30	16 02	7	12 55.9	- 1 08	10.5
Mon Nov 05/Tue Nov 06	2 42	17 25	18 49	5 18	6 42	21 30	8 01	5 32	16 38	2	13 46.6	- 6 00	10.5
Tue Nov 06/Wed Nov 07	2 46	17 24	18 48	5 18	6 43	21 34	8 05	6 34	17 14	0	14 37.4	-10 31	10.5
Wed Nov 07/Thu Nov 08	2 50	17 24	18 48	5 19	6 43	21 37	8 10	7 35	17 51	1	15 28.5	-14 29	10.5
Thu Nov 08/Fri Nov 09	2 54	17 23	18 47	5 20	6 44	21 40	8 15	.....	18 31	3	16 20.1	-17 41	10.5
Fri Nov 09/Sat Nov 10	2 58	17 22	18 47	5 21	6 45	21 44	8 20	.....	19 14	7	17 12.2	-20 00	10.6
Sat Nov 10/Sun Nov 11	3 02	17 21	18 46	5 21	6 46	21 47	8 24	.....	19 59	13	18 04.4	-21 20	10.6
Sun Nov 11/Mon Nov 12	3 06	17 21	18 45	5 22	6 47	21 50	8 29	.....	20 48	20	18 56.3	-21 41	10.6
Mon Nov 12/Tue Nov 13	3 10	17 20	18 45	5 23	6 48	21 54	8 34	.....	21 39	28	19 47.3	-21 04	10.6
Tue Nov 13/Wed Nov 14	3 14	17 20	18 44	5 24	6 49	21 57	8 38	.....	22 32	37	20 37.3	-19 31	10.7
Wed Nov 14/Thu Nov 15	3 18	17 19	18 44	5 25	6 50	22 01	8 43	.....	23 25	46	21 26.0	-17 10	10.7
Thu Nov 15/Fri Nov 16	3 22	17 18	18 44	5 25	6 51	22 04	8 48	.....	0 20	56	22 13.6	-14 06	10.7
Fri Nov 16/Sat Nov 17	3 26	17 18	18 43	5 26	6 52	22 08	8 53	.....	1 14	65	23 00.5	-10 26	10.7
Sat Nov 17/Sun Nov 18	3 30	17 17	18 43	5 27	6 52	22 11	8 57	.....	2 10	74	23 47.2	- 6 16	10.7
Sun Nov 18/Mon Nov 19	3 33	17 17	18 42	5 28	6 53	22 15	9 02	.....	3 07	82	0 34.3	- 1 44	10.8
Mon Nov 19/Tue Nov 20	3 37	17 16	18 42	5 28	6 54	22 19	9 07	.....	4 05	89	1 22.7	2 59	10.8
Tue Nov 20/Wed Nov 21	3 41	17 16	18 42	5 29	6 55	22 22	9 11	16 01	5 06	95	2 13.0	7 42	10.8
Wed Nov 21/Thu Nov 22	3 45	17 16	18 42	5 30	6 56	22 26	9 16	16 37	6 09	99	3 05.9	12 10	10.8
Thu Nov 22/Fri Nov 23	3 49	17 15	18 41	5 31	6 57	22 30	9 21	17 18	7 14	100	4 02.0	16 03	10.8
Fri Nov 23/Sat Nov 24	3 53	17 15	18 41	5 31	6 58	22 33	9 26	18 04	8 20	98	5 01.2	19 02	10.8
Sat Nov 24/Sun Nov 25	3 57	17 15	18 41	5 32	6 59	22 37	9 30	18 56	.....	94	6 02.9	20 48	10.9
Sun Nov 25/Mon Nov 26	4 01	17 14	18 41	5 33	7 00	22 41	9 35	19 54	.....	88	7 05.7	21 10	10.9
Mon Nov 26/Tue Nov 27	4 05	17 14	18 41	5 34	7 00	22 45	9 40	20 57	.....	79	8 08.0	20 05	10.9
Tue Nov 27/Wed Nov 28	4 09	17 14	18 41	5 35	7 01	22 49	9 44	22 03	.....	68	9 08.4	17 40	10.9
Wed Nov 28/Thu Nov 29	4 13	17 14	18 40	5 35	7 02	22 52	9 49	23 10	.....	57	10 06.1	14 11	10.9
Thu Nov 29/Fri Nov 30	4 17	17 14	18 40	5 36	7 03	22 56	9 54	0 15	.....	46	11 01.0	9 56	10.9
Fri Nov 30/Sat Dec 01	4 21	17 13	18 40	5 37	7 04	23 00	9 59	1 19	.....	35	11 53.5	5 13	10.9

***** 2018 DECEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Sat Dec 01/Sun Dec 02	4 25	17 13	18 40	5 38	7 05	23 04	10 03	2 21	.....	25	12 44.3	0 17	11.0
Sun Dec 02/Mon Dec 03	4 29	17 13	18 40	5 38	7 06	23 08	10 08	3 23	.....	16	13 34.2	- 4 35	11.0
Mon Dec 03/Tue Dec 04	4 33	17 13	18 41	5 39	7 06	23 12	10 13	4 23	.....	9	14 23.9	- 9 10	11.0
Tue Dec 04/Wed Dec 05	4 37	17 13	18 41	5 40	7 07	23 16	10 17	5 24	15 49	4	15 13.9	-13 16	11.0
Wed Dec 05/Thu Dec 06	4 41	17 13	18 41	5 40	7 08	23 20	10 22	6 23	16 27	1	16 04.7	-16 43	11.0
Thu Dec 06/Fri Dec 07	4 44	17 13	18 41	5 41	7 09	23 24	10 26	7 21	17 08	0	16 56.2	-19 20	11.0
Fri Dec 07/Sat Dec 08	4 48	17 13	18 41	5 42	7 09	23 29	10 31	8 15	17 52	1	17 48.1	-21 02	11.0
Sat Dec 08/Sun Dec 09	4 52	17 14	18 41	5 42	7 10	23 33	10 36	.....	18 40	4	18 40.1	-21 44	11.0
Sun Dec 09/Mon Dec 10	4 56	17 14	18 41	5 43	7 11	23 37	10 40	.....	19 30	8	19 31.5	-21 26	11.0
Mon Dec 10/Tue Dec 11	5 00	17 14	18 42	5 44	7 12	23 41	10 45	.....	20 22	14	20 21.9	-20 12	11.0
Tue Dec 11/Wed Dec 12	5 04	17 14	18 42	5 44	7 12	23 45	10 50	.....	21 16	21	21 10.8	-18 07	11.0
Wed Dec 12/Thu Dec 13	5 08	17 14	18 42	5 45	7 13	23 50	10 54	.....	22 10	29	21 58.4	-15 18	11.0
Thu Dec 13/Fri Dec 14	5 12	17 15	18 43	5 46	7 14	23 54	10 59	.....	23 04	38	22 44.8	-11 52	11.1
Fri Dec 14/Sat Dec 15	5 16	17 15	18 43	5 46	7 14	23 58	11 03	.....	23 58	47	23 30.6	- 7 55	11.1
Sat Dec 15/Sun Dec 16	5 20	17 15	18 43	5 47	7 15	0 02	11 08	.....	0 53	57	0 16.4	- 3 36	11.1
Sun Dec 16/Mon Dec 17	5 24	17 16	18 44	5 47	7 16	0 07	11 12	.....	1 49	67	1 02.9	0 58	11.1
Mon Dec 17/Tue Dec 18	5 28	17 16	18 44	5 48	7 16	0 11	11 17	.....	2 48	76	1 51.1	5 37	11.1
Tue Dec 18/Wed Dec 19	5 32	17 16	18 45	5 49	7 17	0 15	11 21	.....	3 49	85	2 41.8	10 11	11.1
Wed Dec 19/Thu Dec 20	5 36	17 17	18 45	5 49	7 17	0 20	11 26	.....	4 52	92	3 35.8	14 22	11.1
Thu Dec 20/Fri Dec 21	5 40	17 17	18 45	5 50	7 18	0 24	11 30	15 52	5 59	97	4 33.7	17 50	11.1
Fri Dec 21/Sat Dec 22	5 44	17 18	18 46	5 50	7 18	0 29	11 35	16 41	7 05	100	5 35.2	20 16	11.1
Sat Dec 22/Sun Dec 23	5 48	17 18	18 46	5 51	7 19	0 33	11 39	17 38	8 09	100	6 39.3	21 19	11.1
Sun Dec 23/Mon Dec 24	5 51	17 19	18 47	5 51	7 19	0 38	11 43	18 41	.....	96	7 44.3	20 49	11.1
Mon Dec 24/Tue Dec 25	5 55	17 19	18 48	5 51	7 20	0 42	11 48	19 48	.....	90	8 48.1	18 49	11.1
Tue Dec 25/Wed Dec 26	5 59	17 20	18 48	5 52	7 20	0 47	11 52	20 57	.....	82	9 49.2	15 32	11.1
Wed Dec 26/Thu Dec 27	6 03	17 20	18 49	5 52	7 20	0 51	11 57	22 05	.....	72	10 47.0	11 20	11.1
Thu Dec 27/Fri Dec 28	6 07	17 21	18 49	5 53	7 21	0 56	12 01	23 11	.....	61	11 41.5	6 34	11.1
Fri Dec 28/Sat Dec 29	6 11	17 22	18 50	5 53	7 21	1 00	12 05	0 15	.....	50	12 33.6	1 34	11.1
Sat Dec 29/Sun Dec 30	6 15	17 22	18 50	5 53	7 21	1 05	12 09	1 17	.....	40	13 24.0	- 3 23	11.0
Sun Dec 30/Mon Dec 31	6 19	17 23	18 51	5 54	7 22	1 09	12 14	2 17	.....	29	14 13.6	- 8 04	11.0
Mon Dec 31/Tue Jan 01	6 23	17 24	18 52	5 54	7 22	1 14	12 18	3 17	.....	21	15 03.1	-12 17	11.0