Throw Away Your Wristwatch

Pennsic 36 Edition

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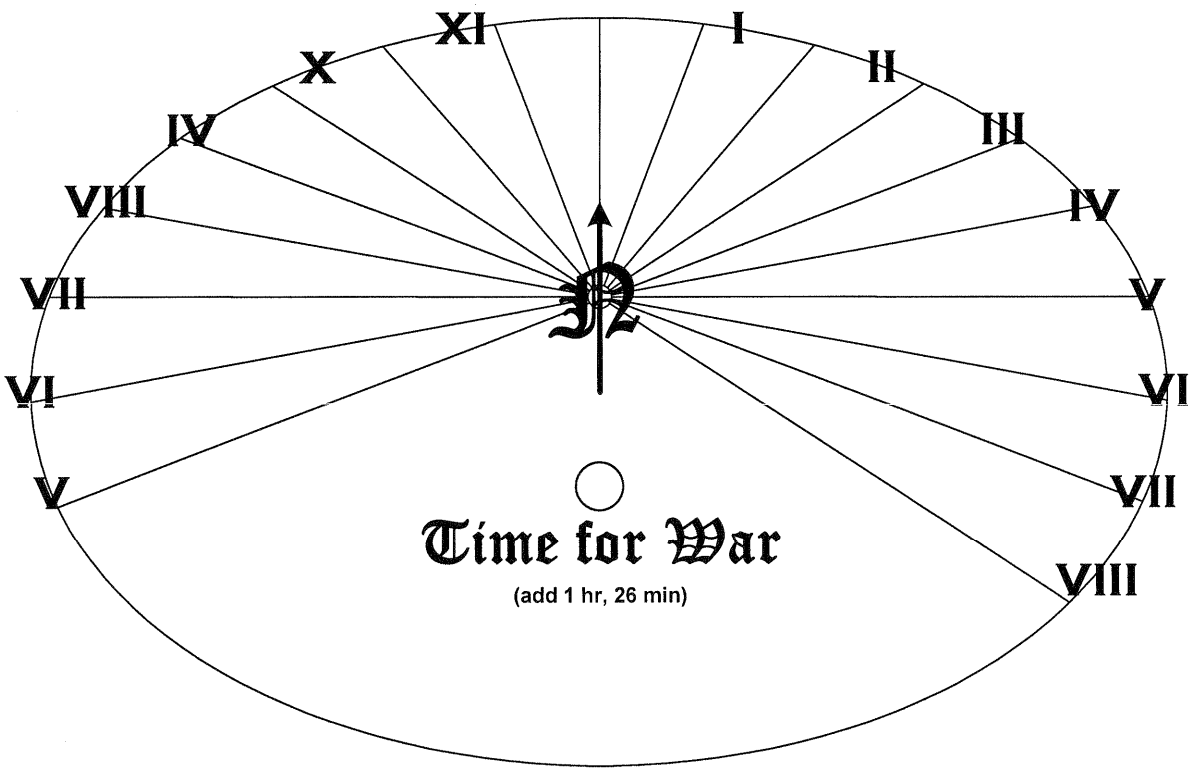
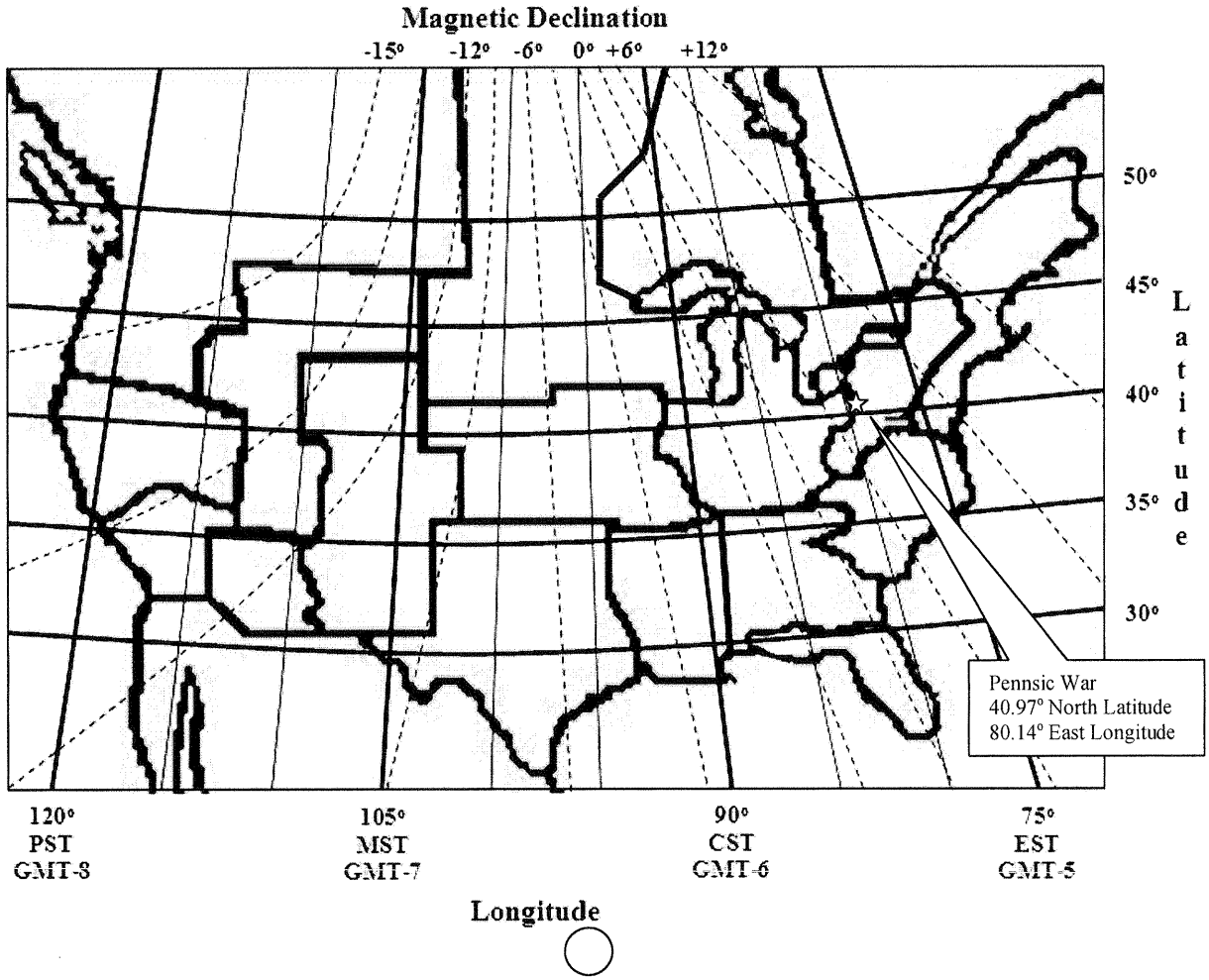


To tell the time by day



To tell time by your shadow, look due North and visualize a 24-hr sundial face.
(Note: if using a compass, you must account for magnetic declination)

- Add for Daylight Saving Time, if applicable
- Add/subtract for deviation from standard time zone meridian (4 minutes/degree)
- Add/subtract for equation of time (see analemma)

For the Pennsic War

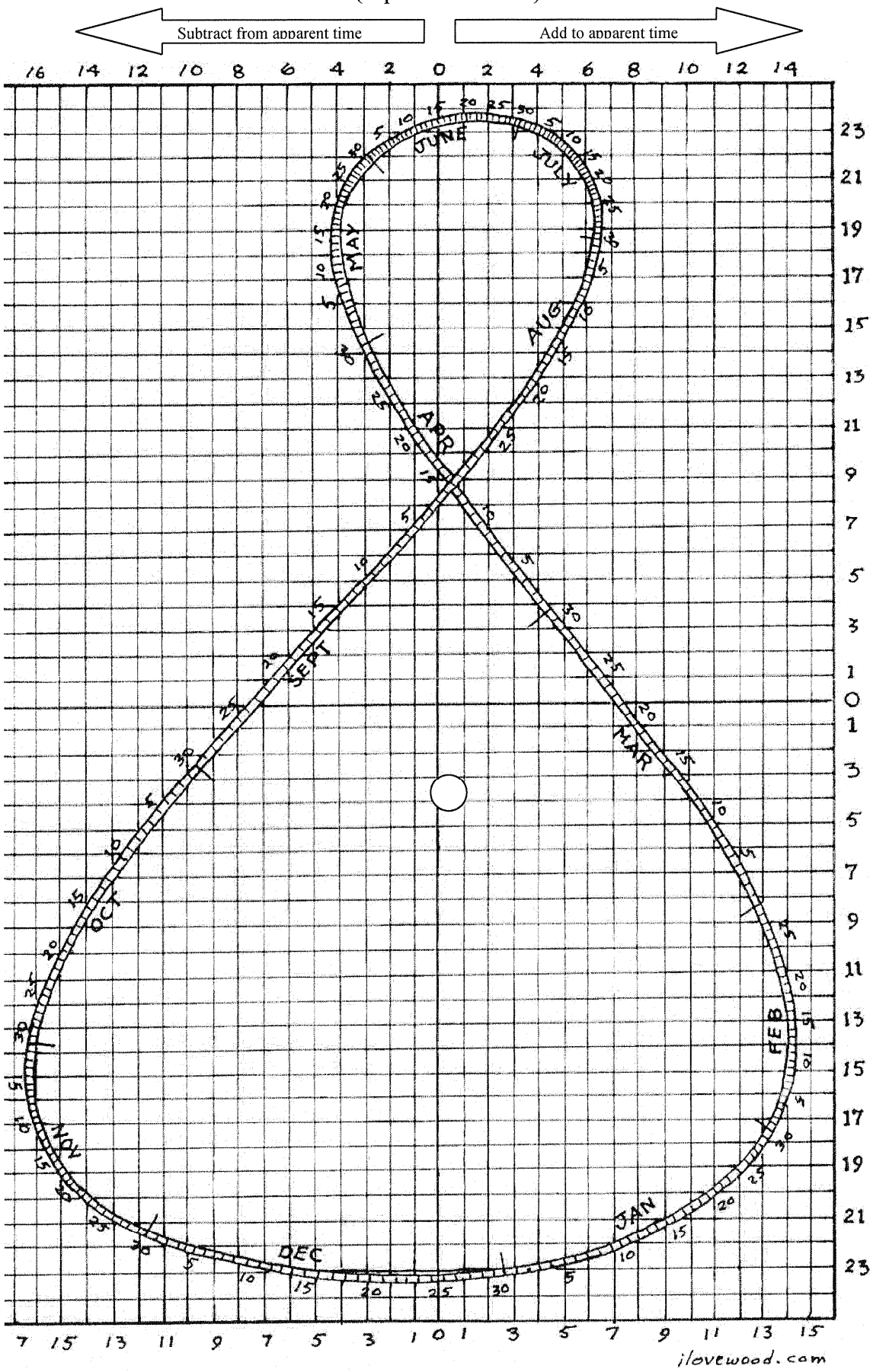
- Eastern Daylight Saving Time
  - Add 1 hour
- 80.13 ° longitude (Eastern Standard Time = 75° meridian)
  - add 20 minutes
- Equation of time for August 6th
  - add 6 minutes

Total variation = 1 hour 26 minutes

So when your shadow points due North, the actual time at Pennsic is 1:26 pm.

Analemma

(Equation of Time)



Another way to tell the time by day

It was four o'clock according to my guess,
Since eleven feet, a little more or less,
My shadow at the time did fall,
Considering that I myself am six feet tall.

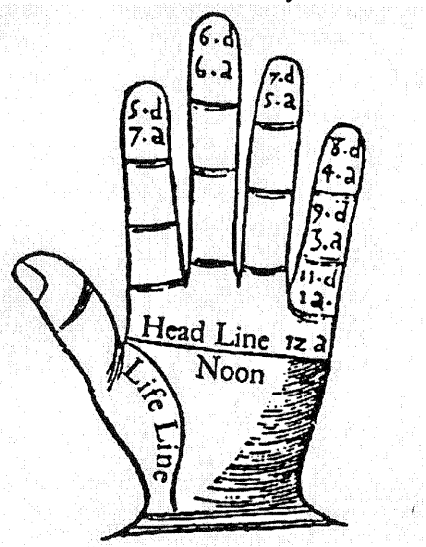
Geoffry Chaucer, Canterbury Tales, Parson's Prologue

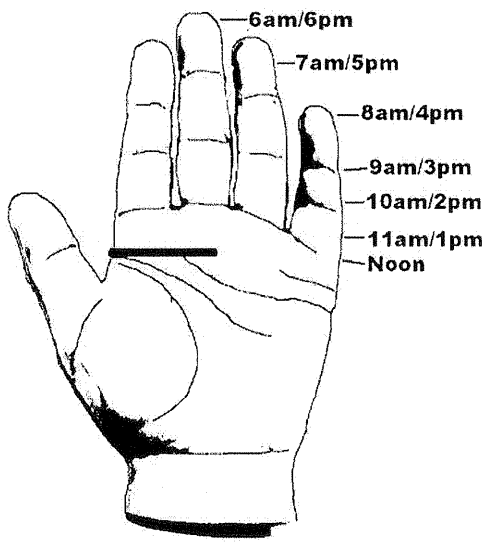
Pennsic Foots	Time			My feets
3.25	1:00 PM	or	1:30 PM	
3.50	12:30 PM	or	2:00 PM	
3.75			2:30 PM	
4.00	12:00 PM			
4.25			3:00 PM	
4.75	11:30 AM			
5.00			3:30 PM	
5.50	11:00 AM			
6.00			4:00 PM	
6.50	10:30 AM			
7.00			4:30 PM	
8.00	10:00 AM			
8.50			5:00 PM	
10.00	9:30 AM			
10.50			5:30 PM	
12.50	9:00 AM			
13.25			6:00 PM	
16.00	8:30 AM			
17.50			6:30 PM	
22.50	8:00 AM			
25.00			7:00 PM	
35.25	7:30 AM			
42.00			7:30 PM	
77.00	7:00 AM			

And yet another way to tell the time by day

Clear and Pleasant Inventions, Part One. J. Prevost (1584 - France)

Because one does not always have a clock or a watch or sundial, here is a most ingenious method to serve you on the spot, by using the hand instead of a watch. Thus, during the spring and summer, place the wrist of your left hand to point towards the sun; that is to say, turn your back to the sun and hold your hand and its fingers stretched out fully, so that the rays of the sun strike your wrist from behind. Then take a straw or small peeled stick (to serve as an indicator) of the length there is from the root of the thumb to the tip of the index finger. Hold it by one end, between the thumb and the mount of the index finger, at the beginning of the life line. Keep it pressed with the thumb straight out and held low, so that the stick passes beyond the palm of the hand, with as much projecting, or the same length, as the index finger to its tip. If you wish to use this device, having first placed and positioned the stick as described, without letting it shift from one side to another, make it so that the shadow of the thickness of the thumb, that is to say the base of the thumb, touches the life line. Then lift the straw or stick little by little (taking care not to change the position of your body) until the very tip of the stick will show you what hour it shall be, according to how you see it marked in the drawing of the hand here represented below, from five o'clock in the morning or forenoon, until noon, and immediately after noon, until seven o'clock in the evening. Note well that in our drawing the "d" denotes the hours before noon, and the "a" those after. Then the place where the shadow of the straw falls will show you the hour. However, I shall further explain it to you, so that you may understand it more easily. Five o'clock in the morning, that is, of the forenoon, s as you see on the first joint (marked 5d), near the end of the index finger. Six o'clock is at the outer joint of the middle finger; seven o'clock on the outer of the ring finger. Eight o'clock is on the end of the little finger; nine o'clock, on the joint beneath it; ten o'clock, on the one below that. Eleven o'clock is found on the mount of the same little finger; and twelve o'clock, that is noon, on the head line. Then, coming back up after noon, one o'clock in the afternoon (marked I.a) is found on the mount of the same little finger (which at the bottom ◯ indicated eleven o'clock in the morning). Two o'clock is now on the first joint of the same little finger; three o'clock on the joint above; four o'clock on the top joint of the little finger. Five o'clock is on the outer joint of the ring finger. Six o'clock is on the end of the middle finger, and seven o'clock on the outer joint of the index finger, as you can se in the following drawing. There are those who use this natural sundial in winter and in autumn by turning the hand and body toward the sun in a different manner, but I have not yet tried this. We shall therefore content ourselves with using this method six months out of the year.

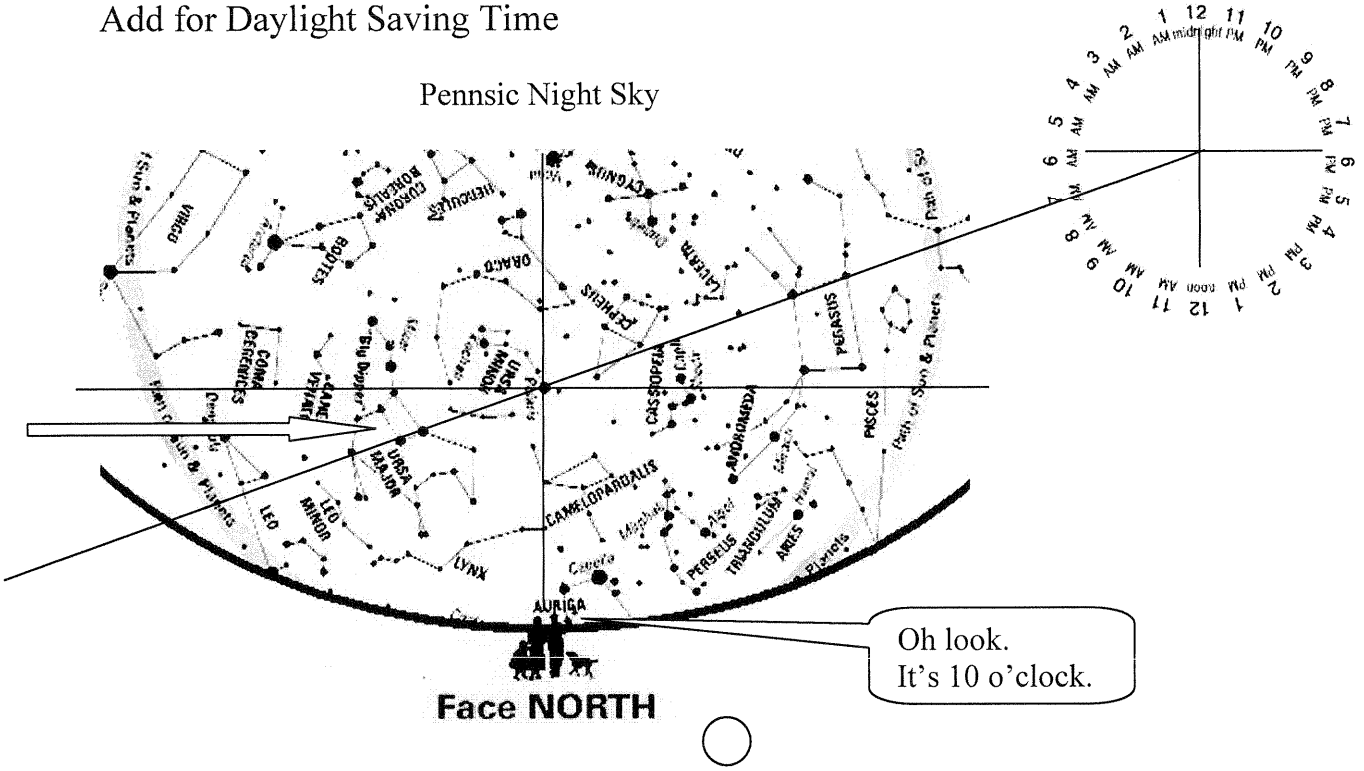




To tell the time by night

Find the Big Dipper and Polaris.
Visualize Polaris at the center of a 24-hour, backwards running clock.
(12 Midnight at the top, 6 am at the 9 o'clock position, etc.)
The line running from Polaris to the Big Dipper is the hour hand
Add/subtract for time of year (see chart below or from Noctural)
Add for Daylight Saving Time

Pennsic Night Sky



FOR PENNSIC, SUBTRACT 9 HOURS (-10 for time of year, +1 for DST)

Nocturnal Clock Seasonal Adjustment							
JAN 10	+4	APR 10	-2	JUL 10	-8	OCT 10	+10
FEB 10	+2	MAY 10	-4	AUG 10	-10	NOV 10	+8
MAR 10	+0	JUN 10	-6	SEP 10	+12	DEC 10	+6

If you can't visualize a backwards 24-hour clock, visualize a normal clock face:

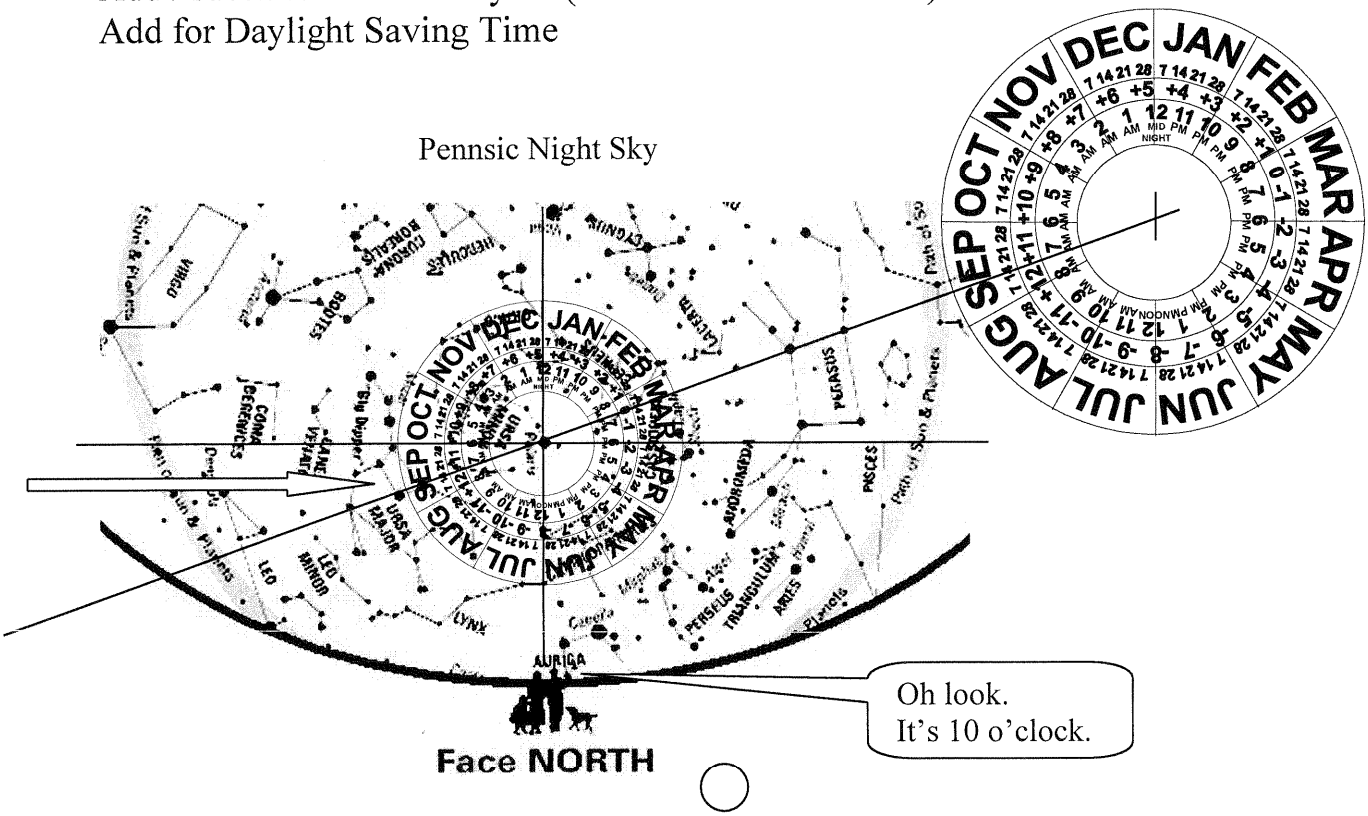
Normal clock apparent time:	8:30 pm (pm because it's night)
Mirror image time:	3:30 am
Double for 24-hour clock:	7:00 am
-9 hours for Pennsic War:	10:00 pm

Clock Apparent Time	9 pm	8:30 pm	8 pm	7:30 pm	7 pm	6:30 pm	6 pm
Mirror Image Time	3 am	3:30 am	4 am	4:30 am	5 am	5:30 am	6 am
Celestial Time	6 am	7 am	8 am	9 am	10 am	11 am	12 noon
Pennsic Time	9 pm	10 pm	11 pm	12 mid	1 am	2 am	3 am

Another way to tell the time by night

Find the Big Dipper and Polaris.
Hold the Nocturnal (see last page) so 12 AM / Jan 1st is at the top.
Place Polaris in the center of the dial.
Read the time as on a backwards running clock.
Add / subtract for time of year (see numbers under date)
Add for Daylight Saving Time

Pennsic Night Sky



The Nocturnal indicates 7 AM
For August 1st - 7th, subtract 10 hours.
Add back 1 hour for Daylight Saving Time.

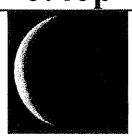
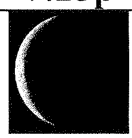
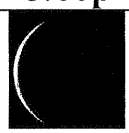
Pennsic Planetary Events

(Pennsic Local Times)

Sun

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
	29th	30th	31st	1st	2nd	3rd	4th
Sunrise	6:14	6:15	6:16	6:17	6:18	6:19	6:20
"Noon"	1:28	1:28	1:27	1:27	1:27	1:27	1:27
Sunset	8:41	8:40	8:39	8:38	8:37	8:36	8:34
	5th	6th	7th	8th	9th	10th	11th
Sunrise	6:21	6:22	6:23	6:24	6:25	6:26	6:27
"Noon"	1:27	1:27	1:27	1:27	1:26	1:26	1:26
Sunset	8:33	8:32	8:31	8:30	8:28	8:27	8:26

Moon

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
	29th	30th	31st	1st	2nd	3rd	4th
Moonrise	8:51p	9:21p	9:47p	10:11p	10:34p	10:58p	11:25p
Transit	12:59a	3:56a	4:04a	4:06a	4:06a	4:03a	4:02a
Moonset	5:26a	6:40a	7:54a	9:08a	10:21a	11:35a	12:49p
		 Full					
	5th	6th	7th	8th	9th	10th	11th
Moonrise	11:57p		12:36a	1:24a	2:23a	3:31a	4:42a
Transit	6:41a	7:35a	8:32a	9:33a	10:33a	11:31a	12:27p
Moonset	2:06p	3:23p	4:37p	5:44p	6:40p	7:25p	8:00p
		 Last Quarter					

References

Most Excellent Book

Sundials - Their Theory and Construction
Albert E. Waugh, Dover Books, 1973, ISBN 0-486-22947-5
http://store.doverpublications.com/0486229475.html, $9.95

Useful Websites

Mine:
http://www.michiganleftturn.org

For sun and moon positions:

U.S. Navy Observatory
http://mach.usno.navy.mil

For star charts:

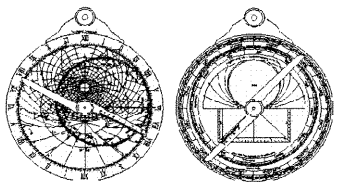
http://skyandtelescope.com

For lots of sundialing links:

The North American Sundial Society

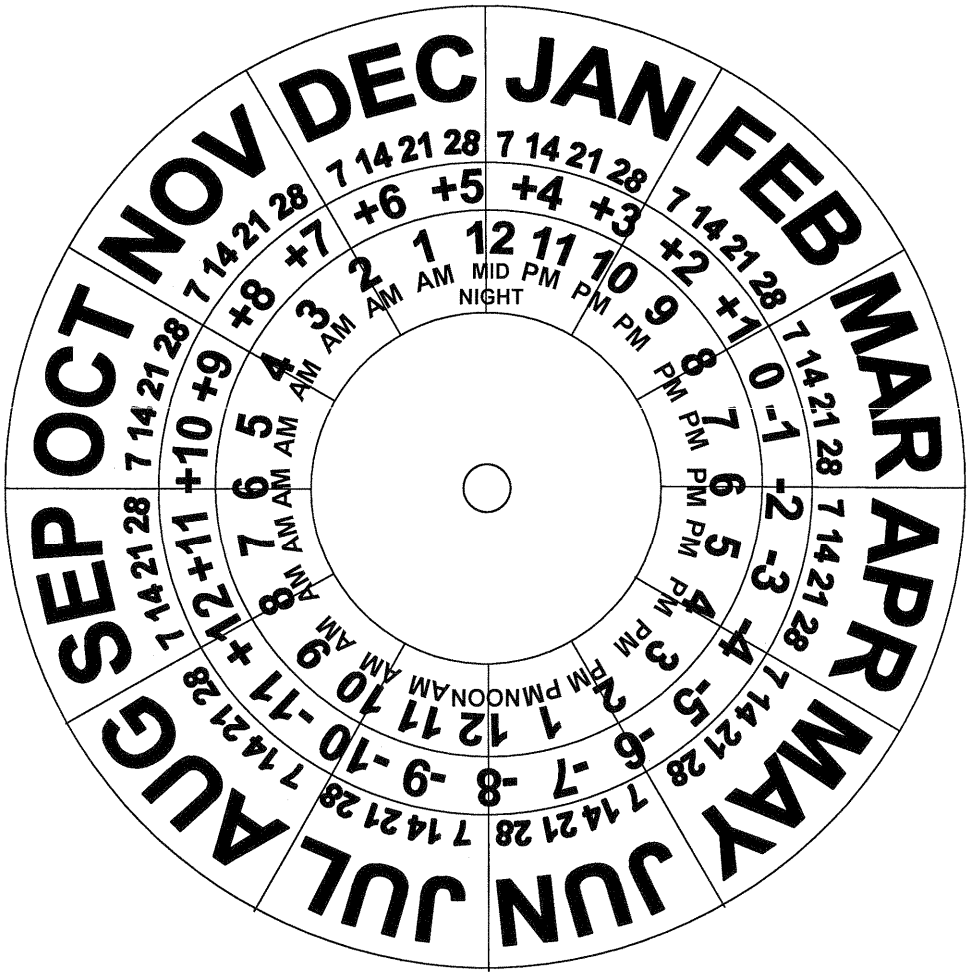
http://sundials.org/

To get your own Personal Astrolabe



http://www.astrolabes.org/

Nocturnal


DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
7 14 21 28
+6 +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11 +12 +11 +10 +9 +8 +7
1 12 11 10 9 8 7 6 5 4 3 2
AM MID PM NIGHT
NOON