I Can See Clearly Now

Twilight, Atmospheric Refraction, Seeing, Settings, Transits and All That Stuff

I Love to See That Evening Sun Go Down

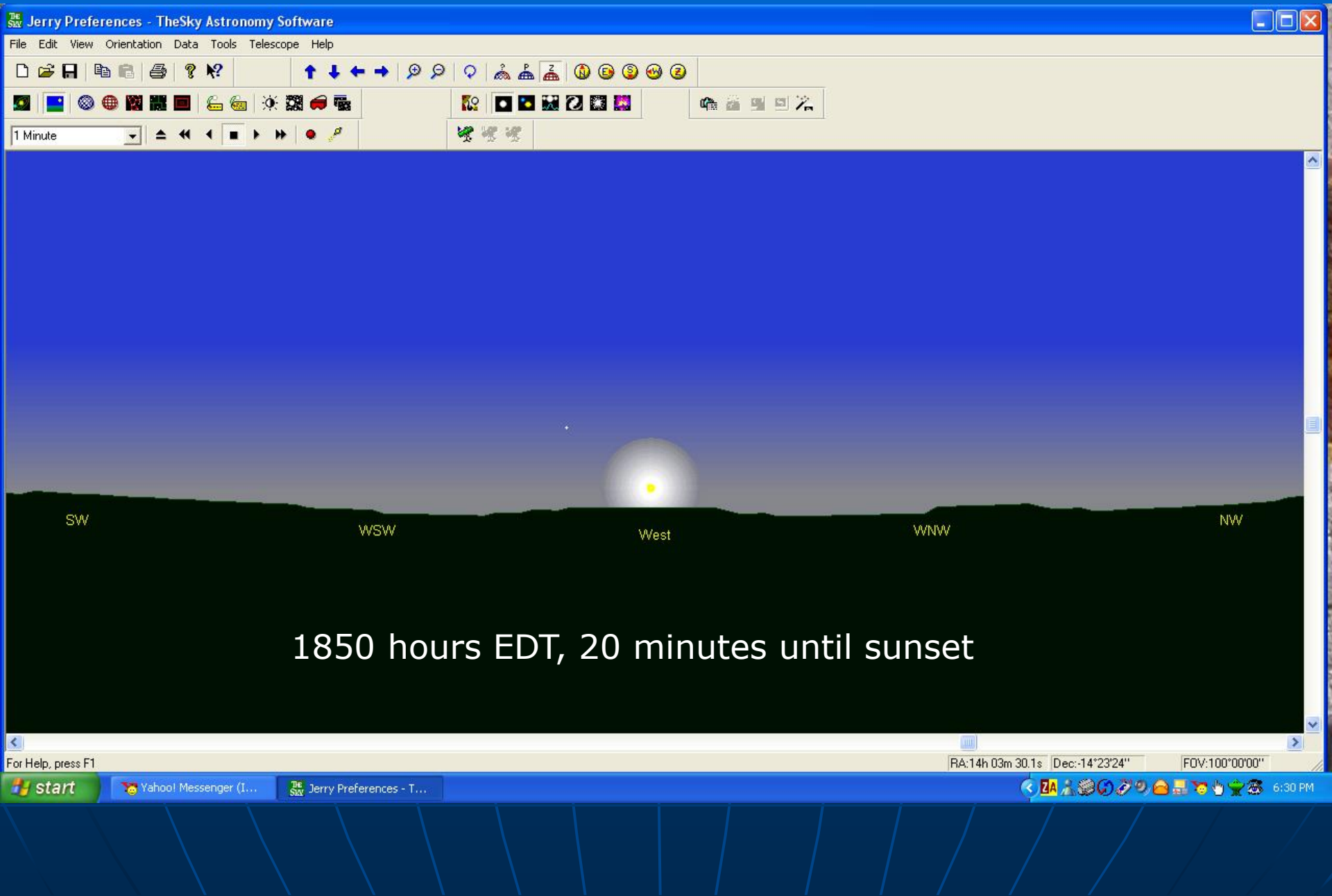
Rise, Set, and Twilight Definitions

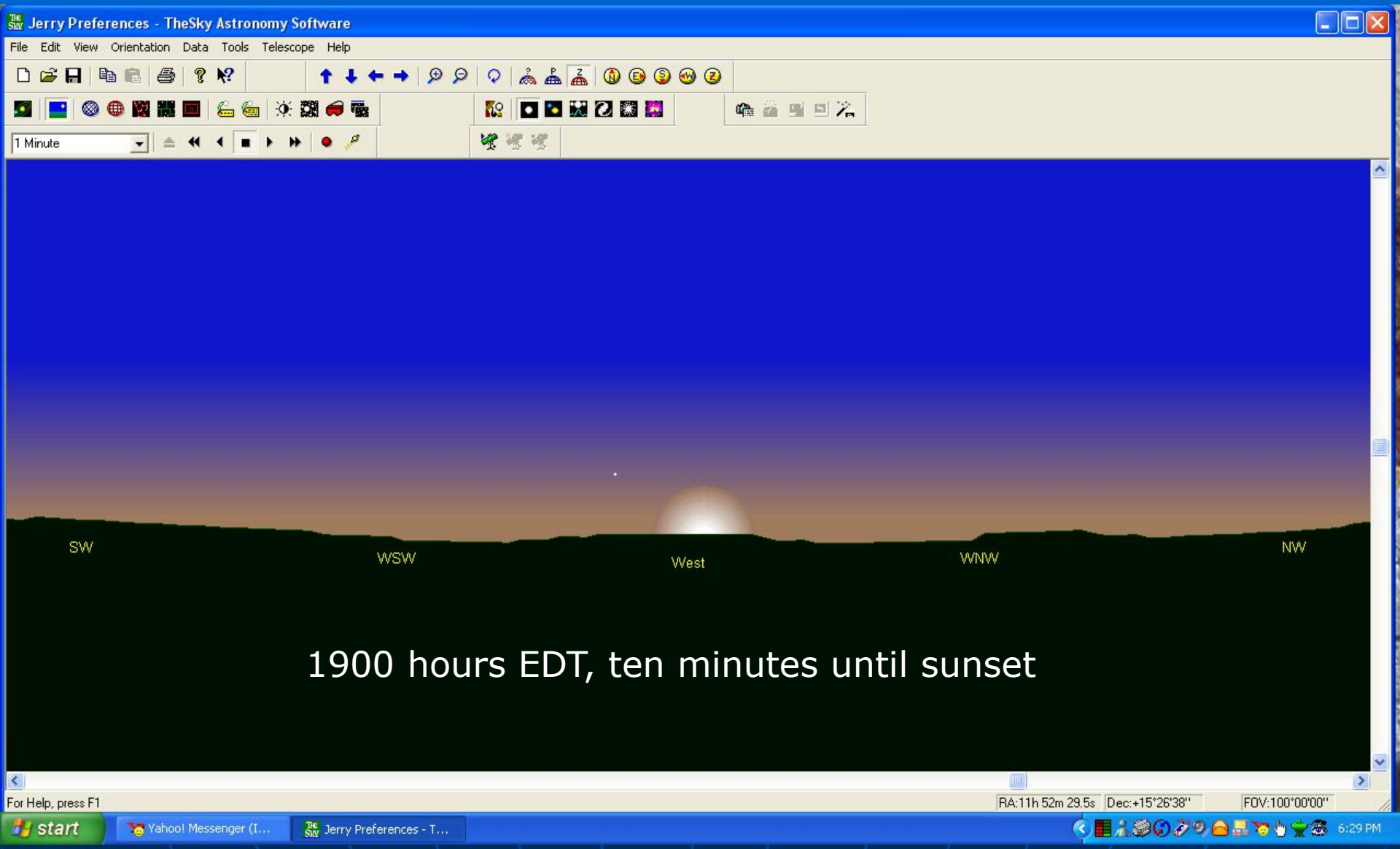
Sunrise, Sunset

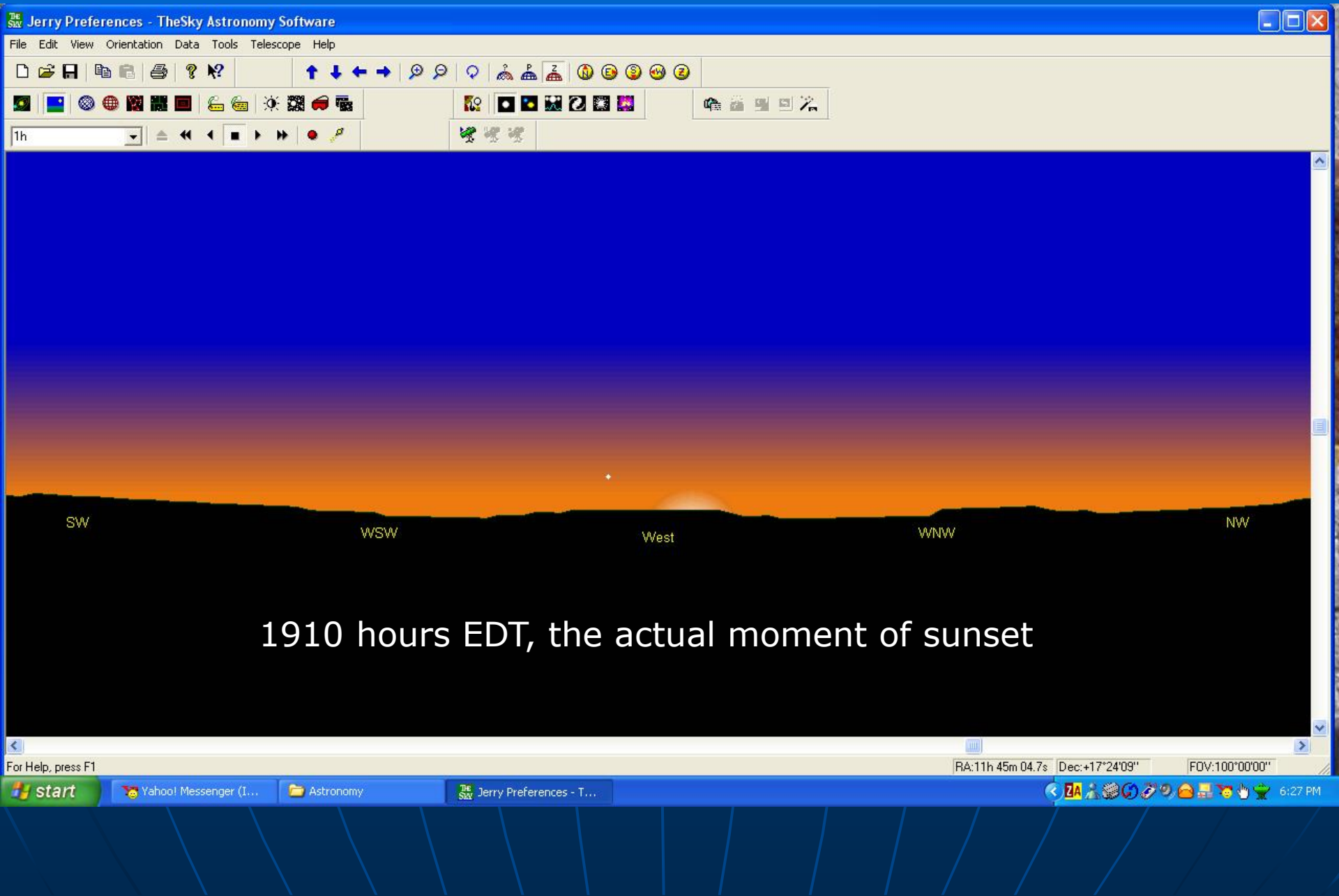
- conventionally refer to the times when the upper edge of the disk of the Sun is on the horizon, considered unobstructed relative to the location of interest. Atmospheric conditions are assumed to be average, and the location is in a level region on the Earth's surface.

Tonight's Sunset

1910 hours EDT
Using TheSky Software


Jerry Preferences - TheSky Astronomy Software
File Edit View Orientation Data Tools Telescope Help
1 Minute
SW
WSW
West
WNW
NW
1850 hours EDT, 20 minutes until sunset
For Help, press F1
RA:14h 03m 30.1s
Dec:-14°23'24"
FOV:100°00'00"
start
Yahoo! Messenger (I...
Jerry Preferences - T...
6:30 PM


Jerry Preferences - TheSky Astronomy Software
File Edit View Orientation Data Tools Telescope Help
1 Minute
SW
WSW
West
WNW
NW
1900 hours EDT, ten minutes until sunset
For Help, press F1
RA:11h 52m 29.5s
Dec:+15°26'38"
FOV:100°00'00"
start
Yahoo! Messenger (I...
Jerry Preferences - T...
6:29 PM


Jerry Preferences - TheSky Astronomy Software
File Edit View Orientation Data Tools Telescope Help
1h
SW
WSW
West
WNW
NW
1910 hours EDT, the actual moment of sunset
For Help, press F1
RA:11h 45m 04.7s
Dec:+17°24'09"
FOV:100°00'00"
start
Yahoo! Messenger (I...
Astronomy
Jerry Preferences - T...
6:27 PM

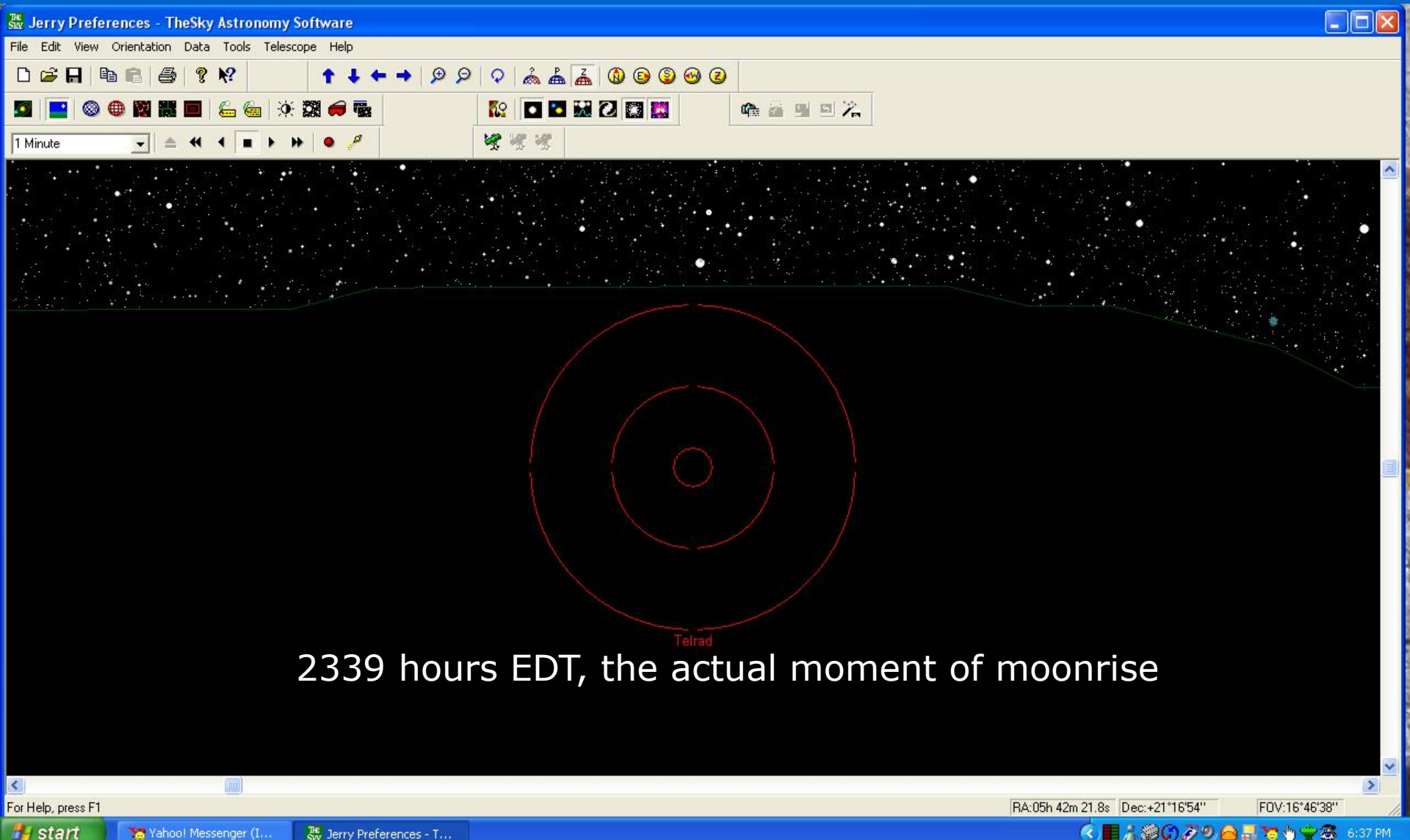
Moonrise, Moonset

- times are computed for exactly the same circumstances as for sunrise and sunset. However, moonrise and moonset may occur at any time during a 24 hour period and, consequently, it is often possible for the Moon to be seen during daylight, and to have moonless nights. It is also possible that a moonrise or moonset does not occur relative to a specific place on a given date.

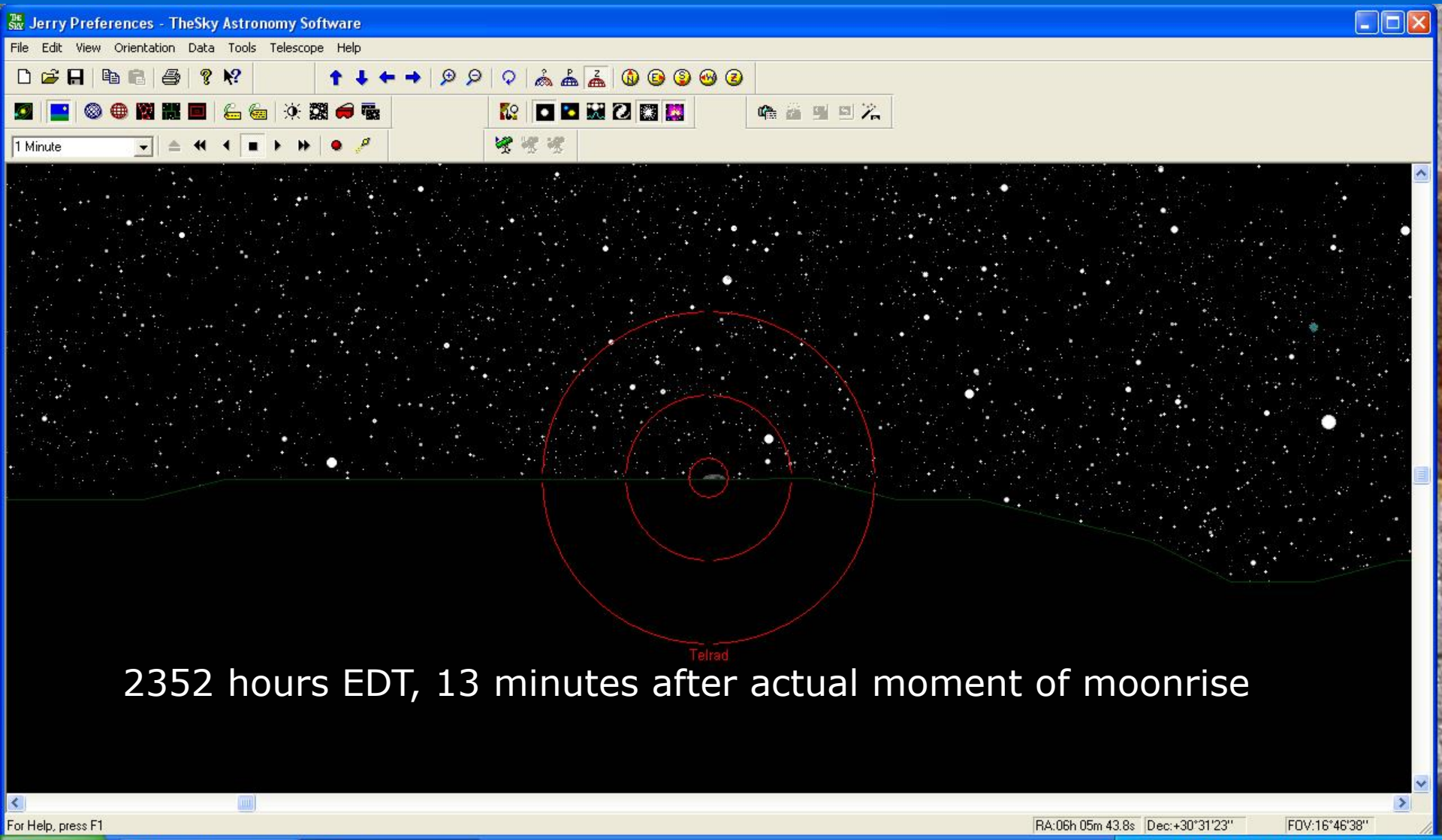
Tonight's Moonrise

2339 hours EDT

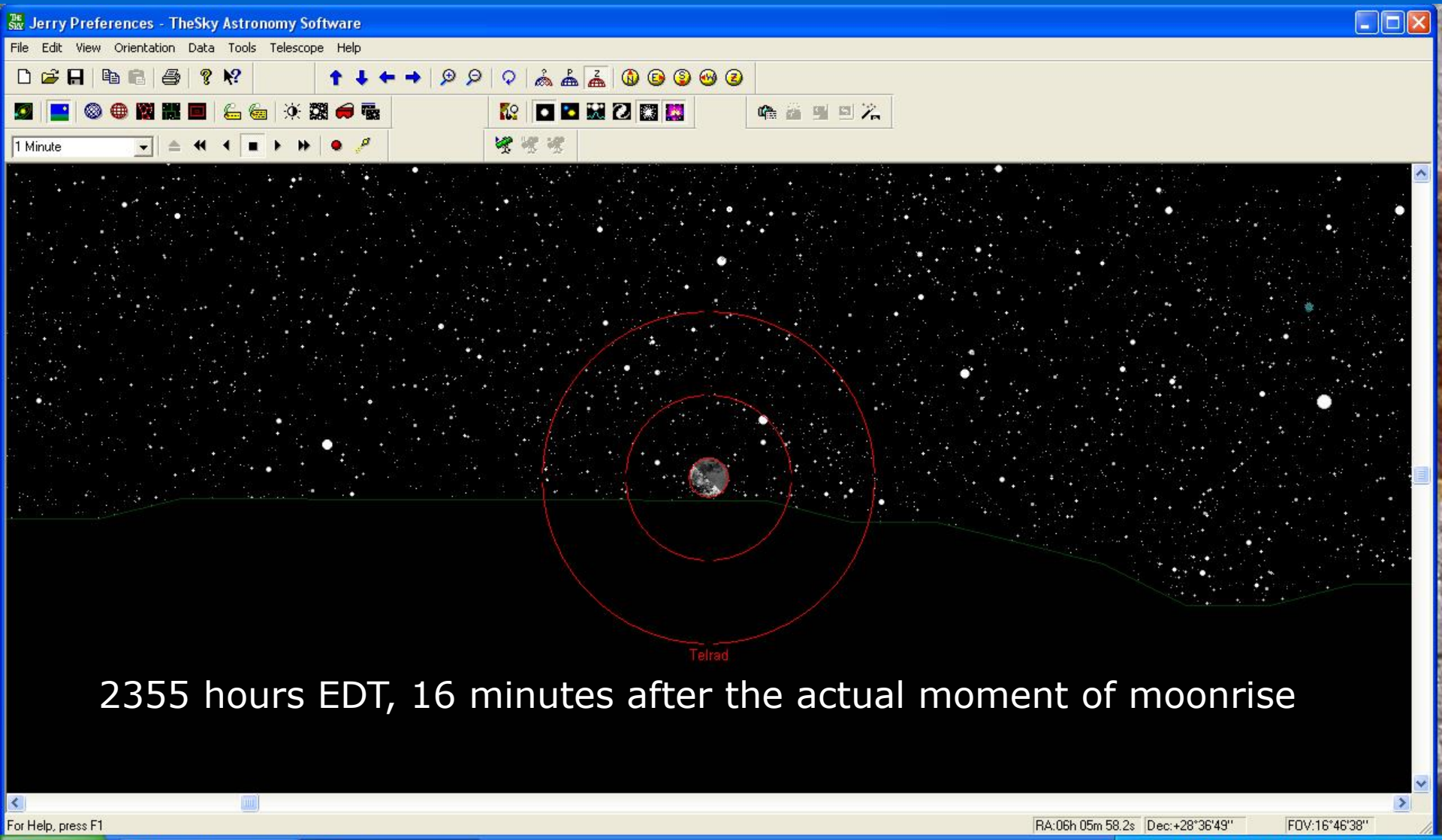
Using TheSky Software



2339 hours EDT, the actual moment of moonrise



2352 hours EDT, 13 minutes after actual moment of moonrise



2355 hours EDT, 16 minutes after the actual moment of moonrise

Aha! You thought you only had sunset and sunrise to worry about, eh? Well, you're wrong. You also have twilight to worry about - and not just one either, there's three of them:

The Twilights

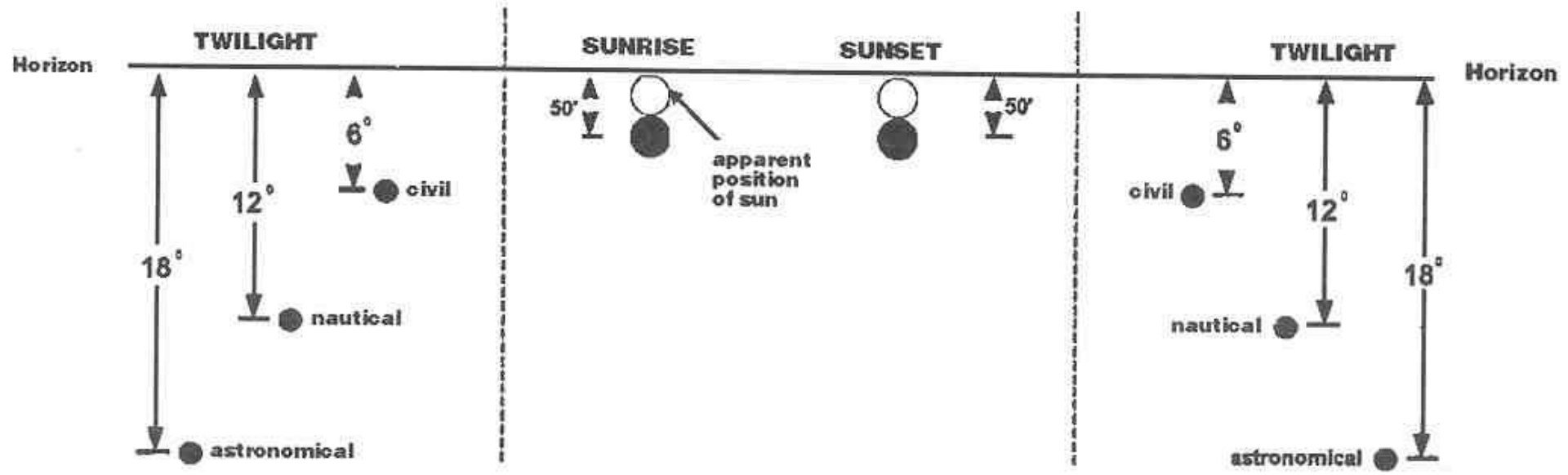
- **Astronomical** - The period of twilight beginning (or ending) when the center of the (refracted) Sun is more than 18° below the horizon. Defined as being 'dark', when serious astronomy can begin and when you can see what you're looking at clearly.

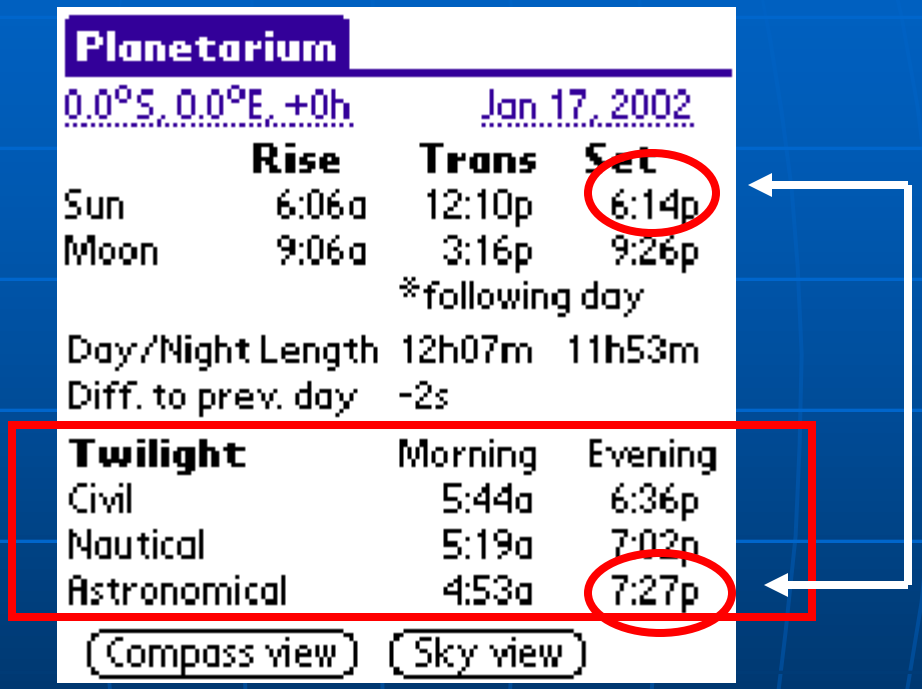
The Twilights

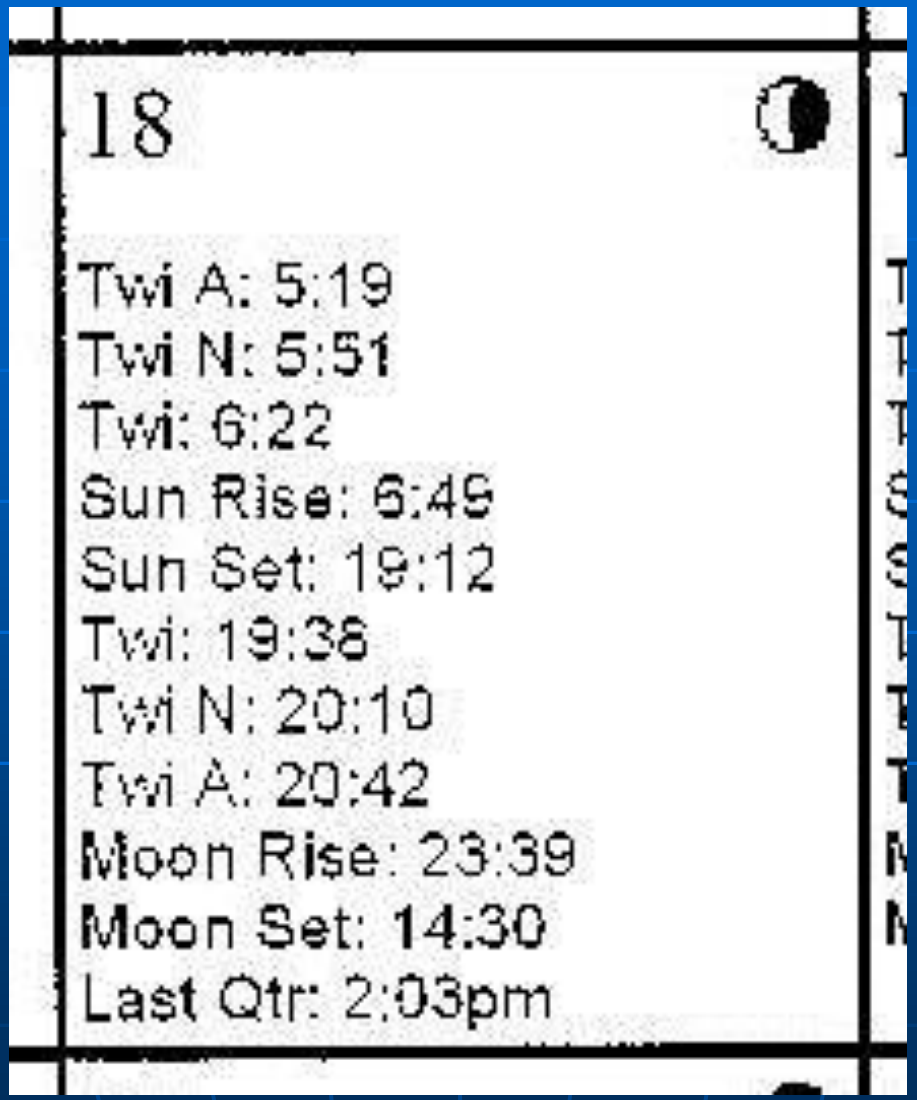
- **Nautical** - The period of twilight beginning (or ending) when the center of the (refracted) Sun is more than 12° below the horizon. Defined traditionally as when you can no longer distinguish the horizon at sea, hence 'nautical'. In perspective, it's about when you can start to see detail in your observations.

The Twilights

- **Civil** - The period of twilight beginning (or ending) when the center of the (refracted) Sun is more than 6° below the horizon. Generally defined as when you can still read a newspaper unaided, but as usual this varies from person to person. From an astronomer's point of view, this is about when the bright stars begin to appear


Horizon
TWILIGHT
18°
astronomical
12°
nautical
6°
civil
SUNRISE
50'
apparent
position
of sun
SUNSET
50'
TWILIGHT
6°
civil
12°
nautical
18°
astronomical
Horizon


Planetarium
0.0°S, 0.0°E, +0h
Jan 17, 2002
Rise
Trans
Set
Sun 6:06a 12:10p 6:14p
Moon 9:06a 3:16p 9:26p
*following day
Day/Night Length 12h07m 11h53m
Diff. to prev. day -2s
Twilight Morning Evening
Civil 5:44a 6:36p
Nautical 5:19a 7:02p
Astronomical 4:53a 7:27p
Compass view
Sky view


18
Twi A: 5:19
Twi N: 5:51
Twi: 6:22
Sun Rise: 6:49
Sun Set: 19:12
Twi: 19:38
Twi N: 20:10
Twi A: 20:42
Moon Rise: 23:39
Moon Set: 14:30
Last Qtr: 2:03pm

Night Hours: The night is the astronomer's day

astronomical night hours:
from the end of astron. twilight to the beginning of astron. twilight next day,
The Sun is 18° below the horizon.

Clouds

In My Coffee

Cloudy Issues

- Clear Sky Clock cloud forecast images are produced ONLY TWICE A DAY.
- You cannot interpret cloud heights or cloud types with these images unless you are an expert.
- The only information available is the cloud cover forecast for the next 48 hours.

More Cloudy Issues

- The models do a good job on cirrus (thin high clouds).
- They overforecast cloud cover.
- You have to distinguish between cloud cover and opacity.

Sky Transparency

For astronomical purposes

Seeing

But not as in clairvoyance

The Clear Sky Clock Parameters

- **Cloud Cover** is visible-light cloud forecast. It forecasts percentage cloud cover.

The Clear Sky Clock Parameters

- **Transparency** the total transparency of the atmosphere from ground to space. It's calculated from the total amount of water vapor in the air.

The Clear Sky Clock Parameters

- **Seeing** is the astronomical seeing forecast. This is an experimental forecast.
- Excellent seeing means at high magnification you will see fine detail on planets and stars will show diffraction rings.
- In bad seeing, planets might look like they are under a layer of rippling water and show little detail at any magnification, but the view of galaxies is will probably be undiminished.
- Bad seeing is caused by turbulence combined with temperature differences in the atmosphere.
- This forecast attempts to predict turbulence and temperature differences that affect seeing for all altitudes.

V ….. Perfect motionless diffraction pattern.
IV….. Light undulations across diffraction rings.
III….. Central disc deformations. Broken diffraction rings.
II…… Important eddy streams in the central disc. Missing or partly missing diffraction rings.
I……. Boiling image without any sign of diffraction pattern.

V..... < 0.4"
IV..... ~ 0.4-0.9"
III..... ~ 1.0-2.0"
II..... ~ 3.0-4.0"
I..... > 4"

The Clear Sky Clock Parameters

- **Darkness** is not a weather forecast. It shows when the sky will be dark, assuming no light pollution and a clear sky.