

In part five of How I Do What I Do, I will discuss tips and tricks I have learned to aid you in doing some of the observing club programs of the Astronomical League.

Lunar and Lunar II Observing Clubs

Being a deep sky kind of guy, I used to find the moon an annoyance. After completing both of these programs, I have found a new appreciation of this bright and near object.

On the moon, you do something called 'crater hopping'. Similar to 'star hopping', you move from a known crater to the one you are looking for on the observing list. To aid me in this, I purchased a lunar atlas. I purchased The Atlas of the Moon by Antonin Rukl. This book was invaluable in finding the exact features that I needed to observe.

Then I downloaded the Virtual Moon Atlas from the website http://www.astrosurf.com/avl/UK_index.html. Its free software. I used this program to determine when the terminator line would be near the objects on the lunar surface. Observing some of these features near lunar sunrise or sunset was vital to being able to see them. Lava domes and riles are impossible to see if the sun is too high. They disappear. But observing these objects within hours of the sunrise or sunset, illuminates them just so as to make them stand right out on the lunar surface.

Earth Orbiting Satellite Observing Club

I choose this program for I thought it would be easy. Geez. I see these things all the time, how hard can it be?

There were some challenging aspects of this program that were indeed, very surprising. I learned how to handle a tape recorder, binoculars and radio, all at once. I became very good at this. Also, I was surprised at the speed of low earth orbiting (LEO) satellites.

A nice formation set of satellites were Grace 1 and 2. Grace 2 follows Grace 1 by about a minute. The requirements of this program is to log the satellite going past 2 stars. Well, Grace 1 flew past the first star, and before Grace 1 passed by the second star, you need to go back, find Grace 2, log its time past the first star. Go back, pickup Grace 1 and log its passage by the second star, then pickup Grace 2 and log its time going past the second star.

These guys are faint, usually seen while twilight is happening and you need to use binoculars. It took me until the 3rd time Grace 1 and 2 passed overhead before I bagged the observation needed for the program. The first 2 passes were practice.

Using the web site <http://www.heavens-above.com> was instrumental to achieving a certificate for this program. There is a feature, once you enter a satellite name, to print the predicted path of the satellite. I used this printout to choose the two stars I would use in the observation of the pass of this satellite.

I also choose, when available, satellites that pass nearly overhead, for it gave you more time to spot the satellite before it passed by your first reference stars. For satellites like the Hubble Space Telescope, its always on the horizon for us here in Colorado, but is high in the sky at the Texas Star party.

I bought a radio that played WWV, the old time broadcast station. I found this to be invaluable, for if you took your eyes off the satellite to look at your watch, sometimes you could not pick it back up before it passed your second star. Did I mention that some of these move very fast!

I also used a tape recorder. So, this is how I planned to observe a satellite pass. I choose a satellite that matched one of the criteria of the program. I entered its name in heavens-above.com and noted when the next week it would be in a favorable position to be observed from my back yard. I would then print the predicted path chart for that satellite on that date and choose the two reference stars I would use for the observation.

On the night/morning of the pass, I would setup my equipment about 30 minutes before the pass. Tune the radio to WWV. About 5 minutes before the pass, I pressed the record button on the recorder and placed it in front of the radio playing WWV. If I needed to use binoculars, I would find a star ahead of my 1st reference star and sit on this star, waiting for the satellite to appear. Once I acquired the satellite (which is not easy, I missed a few), I followed it past the 1st reference star, picked up the recorder without taking my eyes off the satellite and said "Now". I put the recorder down in front of the radio again, playing the WWV time signal. When the satellite passed the 2nd reference star, I picked up the recorder and said "Now!". I put the recorder down in front of radio again to record more time signals from WWV as I watched the satellite continue across the sky until it disappeared in the earth's shadow or below the horizon.

Later, I would replay the tape with the WWV time signal and my Nows! and could nail the time the satellite passed the reference stars within a second. I then used the printout from heavens-above to add the time to the reference stars and this is what I handed in for my observation of that satellite.

Finding international active payloads was a challenge. I used the internet to research which countries owned which satellites. Then I looked for any recent data from the satellite, to indicate it was still active. This is the learning part of the program, for I learned that a lot of countries have put satellites into orbit, not just the big countries.

Also, be prepared to miss an observation. There is a tremendous learning curve to this program. I learned one night that with the tape record in front of the speaker of the radio playing WWV, and my getting close to the recorder and shouting Now!, the recorder was overwhelmed by the radio signal and only recorded that. I never heard my Now!. That is why I picked up the recorder to near my mouth to say Now! and then place it back in front of the radio. I missed that satellite pass.

Iridium flares. We all have seen them, but you need to see one in the daytime. I found that two things about daytime iridium flares, one, you need to be very near the center of the flare. This information is on the heavens-above.com site for the satellite. If you pick your location, like Broomfield, one, you need to find WHERE in Broomfield heavens-above is predicting from (the center for Broomfield), and how far from the flare center this is (measured in kilometers). I found the Broomfield center to be about a mile from my house to the south, near the edge of a park by a fire station on Midway.

I also found that daytime Iridium flares have a higher probability of happening in Boulder and North Glenn. I observed mine in North Glenn. The Boulder Flare Center is near some ball fields just south of Araphoe Road, in a student housing parking lot. The North Glenn Flare Center is about a ½ mile northwest of I-25 and 104th Ave. I setup near a bus stop, just west of the North Glenn Mall. The daytime flare I observed was directly overhead and bright.

To find the center of your location that heavens-above.com uses, I used mapquest.com and fed in the coordinates heavens-above.com used for the observing site. Then I could see where heavens-above.com was using. But feeding latitude and longitude to mapquest.com was not easy. I used mapquest.com and found my house. Then, on the address line that is displayed at the top of the web browser, I replaced my latitude and longitude that were used to find my house with the latitude and longitude heavens-above.com used for the center of the observation, and then hit return in this address line. Mapquest.com responded with a map with a star in the location of this latitude and longitude.

I hope that these tricks and tips will help you start and enjoy these 3 observing programs. I really enjoyed doing all these programs. The key is for you to enjoy them also.