Article Title: **To Be, Or Not To Be, Prepared**

By Mike Hotka

Have you ever driven to the middle of no-where, setup your equipment, and only then, wondered what you were going to look at that night? That described my early observing outings many years ago. With a young family at home, when I would get out to observe, I wanted to maximize my observing efforts. What became apparent to me was that I needed a plan for each observing outing to achieve this.

How many of you have driven to your planned observing location, just to realize you left some important items at home? Hopefully, it was not that one item you needed to salvage any chance to observe that night.

If you chose to do Astronomical League Observing Programs (ALOP), the *what* you will observe on your next outing is answered. There is so much more that goes into planning your next observing outing than just what you will observe.

The process I use to plan my next observing outing has evolved over many years. At the heart of this process is the use of an astronomy database program. In 1999, I used Steve Tuma's Deepsky Astronomy Software (Deepsky Astronomy Software - The best deep sky astronomy software (mikehotka.com)) program on my PC. Today, I use the Greg Crinklaw's Standard Edition of SkyTools 4 (ST4) (SkyTools 4 Standard Edition (skyhound.com)).

All I need are two, of the many features of these programs to plan my next observing outing. One feature allows you to create a log entry for each object I have observed. The other feature generates observing lists. These observing lists contain the object designations for the ALOP you are currently working on.
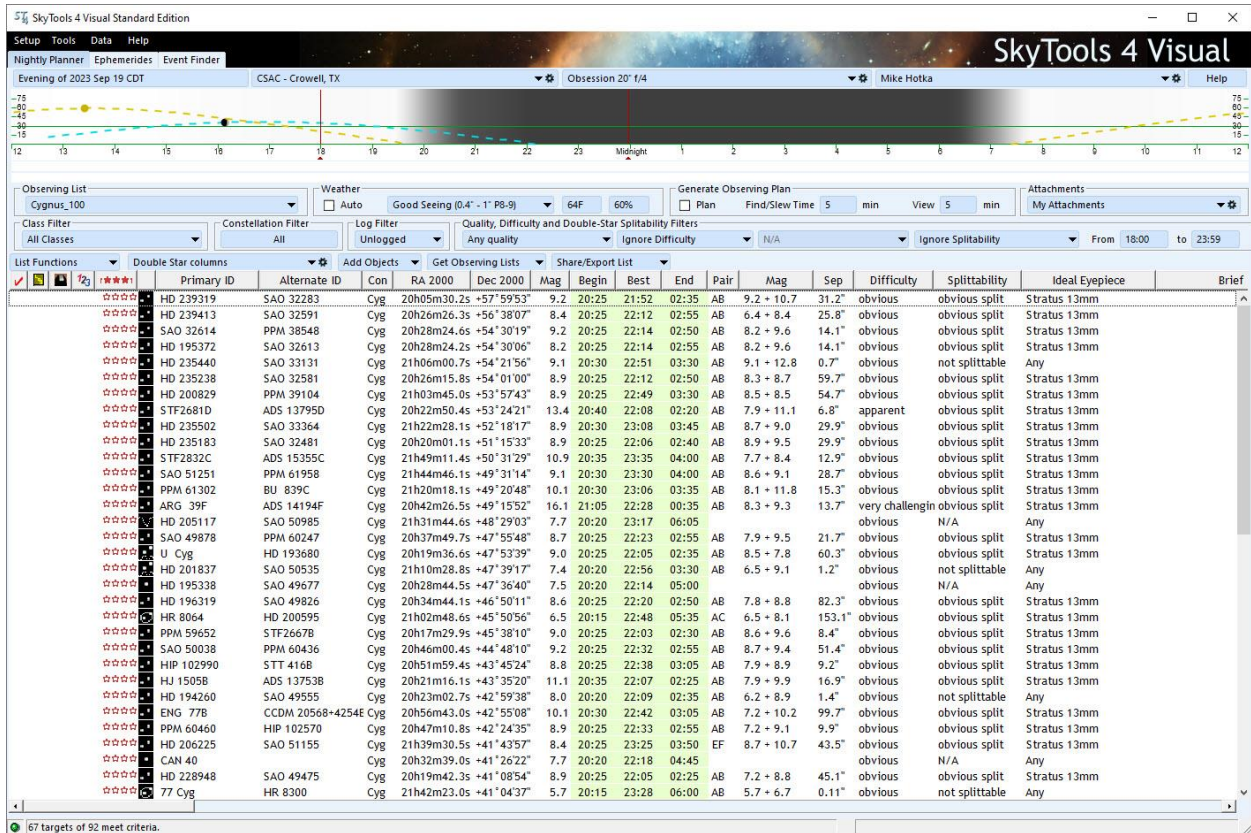
Managing observing lists is what ST4 does very well. ST4 can import a list of object designations defined in a text file into a named observing list, add objects one at a time using a search feature to an observing list, or download popular observing lists from the skyhound website with a built-in download feature.

ST4 can store many different observing lists. I have an observing list for each ALOP I am working on, a few double star lists, and other lists for objects I want to observe from sources I found on the Internet.

As seen in the above image, ST4 manages only one observing list in its active observing mode. In this example, it is one of my double star observing lists. One of the many sort features for the active list allows you to display those objects you have not observed before, i.e., those object designations that do not have a log entry record in the ST4 database. ST4 will then sort the objects by their best time they can be observed.

	Primary ID	Alternate ID	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	P.
	HD 239319	SAO 32283	Cyg	20h05m30.2s	+57°59'53"	9.2	20:25	21:52	02:35	AI
	HD 239413	SAO 32591	Cyg	20h26m26.3s	+56°38'07"	8.4	20:25	22:12	02:55	AI
	SAO 32614	PPM 38548	Cyg	20h28m24.6s	+54°30'19"	9.2	20:25	22:14	02:50	AI
	HD 195372	SAO 32613	Cyg	20h28m24.2s	+54°30'06"	8.2	20:25	22:14	02:55	AI
	HD 235440	SAO 33131	Cyg	21h06m00.7s	+54°21'56"	9.1	20:30	22:51	03:30	AI
	HD 235238	SAO 32581	Cyg	20h26m15.8s	+54°01'00"	8.9	20:25	22:12	02:50	AI
	HD 200829	PPM 39104	Cyg	21h03m45.0s	+53°57'43"	8.9	20:25	22:49	03:30	AI
	STF2681D	ADS 13795D	Cyg	20h22m50.4s	+53°24'21"	13.4	20:40	22:08	02:20	AI
	HD 235502	SAO 33364	Cyg	21h22m28.1s	+52°18'17"	8.9	20:30	23:08	03:45	AI
	HD 235183	SAO 32481	Cyg	20h20m01.1s	+51°15'33"	8.9	20:25	22:06	02:40	AI
	STF2832C	ADS 15355C	Cyg	21h49m11.4s	+50°31'29"	10.9	20:35	23:35	04:00	AI
	SAO 51251	PPM 61958	Cyg	21h44m46.1s	+49°31'14"	9.1	20:30	23:30	04:00	AI
	PPM 61302	BU 839C	Cyg	21h20m18.1s	+49°20'48"	10.1	20:30	23:06	03:35	AI

With this best time to observe an object list, the order you will observe each object on your next outing is complete.

At home, I manage my ST4 observing lists using my tower PC. It is the master ST4 database repository for all the items ST4 manages. In the field, I run ST4 on my laptop next to my telescope. I use a thumb drive to transfer the complete exported ST4 database from the tower PC to the laptop. I use the ST4 database import function on the laptop to update all the ST4 information managed on the tower PC.

I use a Sky Commander (SC) Digital Setting Circles with my telescopes. If the objects on your next outing's observing list are not in the SC's database of objects, I program the 100 user defined objects with the Right Ascension and Declination of those objects. The SC uses a SXX designation for these objects, starting with index S00 through index S99. As I program each object into my SC, I add a note to that object in ST4 with the SXX index I used. When I am ready to observe this object in the field, I can see the note and use the SC accordingly to locate the object.

I always am considering having resources available in the field if my technology refuses to work in the field. I always print a paper copy of the ST4 best time to observe the objects display for my next outing observing list. I use my PC's screen capture function and capture an image of each *section* of the observing list as displayed by ST4. Once printed, I can use this printout as a backup, if needed.

When my observing location has 120v electricity, I don't worry about my laptop batteries dying. If something happens and they do expire, I have the SkySafari app (SkySafari 7 | Professional Astronomy Telescope Control Software for iOS (skysafariastronomy.com)) loaded on my Android phone. This is where my backup star charts are if I need to star-hop to the objects on my observing list.

It is rare, but I've had my SC fail to find objects on a few occasions. In almost all cases, the encoder for one axis was slipping. The other culprit is a bad cable connection between the encoders and the SC computer. Both issues would be difficult to diagnose using a red light.

You drove to this observing location to observe, not to fix your technology in the dark. If I align my SC twice and it still fails to find objects, I turn off the SC and star-hop the rest of the night. The SkySafari interface provides me with enough reference stars to allow me to do this.

The next thing to consider is where you are going to go to observe on your next outing. For me, it all depends on which of my favorite observing locations will have the best viewing forecast. I watch the forecasts for each of these locations in the days leading up to the night I chose to observe. Sometimes, I make my decision of which site to drive too at the very last moment. On my website, I have many links I can click and quickly determine which observing location will be the best.

Weather at My Observing Locations

My Backyard	Denver DSS
Broomfield, CO Local Forecast	Deer Trail, CO Local Forecast
Hourly Key Weather Indicators	Hourly Key Weather Indicators
Broomfield Clear Sky Clock	DSS Clear Sky Clock
Berthoud LTO	**Pawnee Grasslands**
Berthoud, CO Local Forecast	Keota, CO Local Forecast
Hourly Key Weather Indicators	Hourly Key Weather Indicators
Berthoud Clear Sky Clock	Pawnee Clear Sky Clock
3RF	**Iowa City, IA**
Crowell, TX Local Forecast	Iowa City, IA Local Forecast
Hourly Key Weather Indicators	Pentacrest Webcam
3RF Clear Sky Clock	Iowa River Webcam
Okie-Tex Star Party	**Texas Star Party**
Kenton, OK Local Forecast	Fort Davis, TX Local Forecast
Hourly Key Weather Indicators	Hourly Key Weather Indicators
Okie-Tex Clear Sky Clock	TSP Clear Sky Clock

At this point, you are ready for your next outing. All you need to do is to load your vehicle and off you go. To ensure I have everything I need for observing, I have made two lists of things I take with me to make my observing outings successful. One list is for an overnight outing and the other list is for a multi-night outing. Below is the overnight list I use to pack my car. This is an all-inclusive list and there are seasonal items listed that I might not take with me in the summer.

Overnight List of Items to Pack

12.5" Base/Poles/Upper Cage/ Finder Platform	Alieve	Winter Boots	Chart Box(es)
Little Giant ladder	Tums	Wool Socks	Night Sky Guides
Black 12.5" Equipment Case	Bug Spray	Ski Pants	Double Star Charts
8" Scope/Base	Hand Sanitizer	Long Johns	2 Seasonal Notebooks
Telrad for 8" Scope	Sun Screen	Thermal Wools	Pgm Notebook(s)
Sky Commander/Pedestal/Alt Arm	Water	Sweat Shirt	Spiral Notes Book
Weights (2 small clamps)	Snacks	Gloves	Double Star List
Rock Weights	Dinner	Ski Hat	Pencils
Table	Sleeping Bags/Foam	Ear Muff Hat	Blue Tape
Chair	My Pillow	Neck Gator	Duct Tape
8x50 Binoculars	Camera/Tripod	Jacket	Needle Nose Pliers
3 Eyepiece Cases	4 - AA Batteries	Winter Coat	Leveling Blocks
20x80 Binoculars/Mount/Weights	1 - 9V Battery	Coveralls	Toilet Set/Enclosure
Multi-Band Radio		Eye Shade	Table Top Dew Guard
Scope Cover	Hat	Ear Plugs	Back Brace
Ground Tarp	Shovel	Noise Maker	
12V Deep Cycle Battery	Toilet Paper		
Extension Cord/3 way connector	Paper Towels		
DC/AC Power Converter	Fly Swatter		
Window Net/Magnets	Electric Fan		
Phone Red Screen	Electric Heater		
Phone Charger	Window Net/Magnets		
PC/Red Screen/Box	Observing Chair		

When I am ready to load my car, I print out the appropriate list. I check an item off the list only when I physically load it into my vehicle.

If you are in the field and find you wished you had a certain item or tool with you right now, add a note about this to your observing log and when you get home, add it to your packing list so you will have the item with you the next time you go out.

My vehicle is a Toyota Pruis V. Below are picture of how I packed it with all the items, including my 12.5", f/8 telescope, I needed when I attended the 2019 Texas Star Party.

There is much more to planning your next observing outing that I will expand upon in future articles. The additional resources you will need are important to gather during the planning process. For instance, if you are going to do the Open Cluster Observing Program, you need pictures of the open clusters. The Messier open clusters are obvious knots of many stars. But the Berkeley or Harvard open clusters are often just a few stars and sometimes in a star rich area of the sky. To identify which stars are part of the open cluster, you need an image. More on this in later articles.