## Article Title: Personal Observing Goal Verification

## By Mike Hotka

At the end of last month's article, I left you driving home from your observing location after a successful night of observing. Now I'll discuss what I do after I get home. I have a few more tasks to do before I consider this observing session complete.

The first thing I do is to log all my outing's observed objects into my Standard Edition of SkyTools 4 (ST4) (<u>SkyTools 4 Standard Edition (skyhound.com</u>)) database. First, I open the observing list I was working on during the outing in the main ST4 display:

5 SkyTools 4 Visu	al Standard	Edition															-	
etup Tools Da	ita Help						-	and the		1.1	10.1	and a	100	1	100	CL	Tools 4 V	licus
lightly Planner E	phemerides	Event Finder														SK	y 10015 4 V	ISUal
Evening of 2023 N	ov 8 MST		Little Thompson Ob	servatory			-	18 f/14.2 C	assegrain					• Mike Hotka	8			₩ Help
10																		
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2 13	14	15 18	17 18	10	20	21 22		23	Midnight	1	ż	5	à	b	8	+	8 9 10	ń
			<u> </u>		_				-									
Observing List			Weat	her						Gene	rate Ob	serving Plan				12	Attachments	
Herschel 500			- DA	uto A	verage Seeing (	1" - 2.5" P6-7)		54F	65%	P	lan	Find/Slew Time	5	min View	v 5	min	My Attachments	
Class Filter		Const	tellation Filter	- Log Filter		auality Difficul	by and D	ouble.Sta	r Splitabilit	Filters								
All Classes		-	All	Any		Any quality	9 4110 0	-	Ignore D	ifficulty		▼ N/A		▼ 1a	nore Splitat	bility	▼ From 18:00	to 23:59
	read Participa									13				23 C.*				
st Functions	- Dour	ble Star columns	<b>VU</b> /	Add Objects		serving Lists		are/Export	List	1	1			1	1			
	***1	Primary ID	Alternate ID	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Pair	Mag	Sep	Difficulty	Splitta	bility	Ideal Eyepiece	E
		Gamma Her	20 Her	Her	16h21m55.1	5 +19"09'12"	3.8	06:00	15:05	15:05	AB	3.8 + 9.8	43.2"	very challengi	n not visit	ole	Plössl 55mm	
	2222	5 Ser	MQ Ser	Ser	15h19m19.4	5 +01 4543	5.1	17:05	17:13	17:30	AB	5.1 + 10.2	11.4"	apparent	not visit	ole	Plössl 55mm	
	0000	HD 156252	SAO 185233	Oph	17h17m39.5	·26°37'45"	6.8	17:10	17:19	17:35	AB	6.8 + 9.1	5.3"	apparent	not visit	ole	Plössl 55mm	
	0000	STF1998C	ADS 9909C	Sco	16h04m22.5	5 -11"22'18"	7.2	17:15	17:21	17:35	AB	4.2 + 5.1	1.1"	apparent	not split	table	Nagler 13mm	
		Alniyat	Sigma Sco	Sco	16h21m11.3	5 -25"35"34"	2.9	17:10	17:24	17:40	AB	2.9 + 8.7	19.7	easy	not visit	ole	Plössl 55mm	
	0000	60 Her	HR 6355	Her	17h05m22.8	5 +12*44'27*	4.9	17:00	17:30	18:40	AB	4.9 + 10.9	58.7	obvious	not visit	ole	Plössl 55mm	
	0000	19 Oph	HR 6232	Oph	16h4/m09./	5 +02 0352	0.1	17:05	17:30	18:15	AB	0.1 + 9.4	23.0	obvious	not visit	ole	Plossi 55mm	
	0000	Zeta 1 CrB	7 CFB	CrB	15h39m22.29	5 +36 3812	5.9	17:05	17:32	18:40	AB	4.0 + 5.9	0.3	obvious	ODVIOUS	sput	Plossi 55mm	
	****	Delta Sct	Delta Sct	SCL	18h42m16.49	5 -09 0309	4./	17:00	17:33	19:00	AB	4.7 + 12.2	15.2	obvious	not visit	ole	Plossi 55mm	
	****	HD 13///8	SAU 140552	LID	15h28m12.3	5 -09 21 37	1.0	17:30	17:34	17:40	AB	6.9 + 8.2	52.5	very chattengt	n not visit	ne	Plossi Somm	
	0000	A2 Hor	HR 5597	BOO	16b29m44.7	+47 10.39	0.4	17:05	17:35	10:45	AB	0.3 + 8.8	33.0	obvious	oovious	spin	Plossi somm	
	0000	Marfie	Lambda Oob	Oob	16h20m54.9	+01"59'00"	2.9	17:20	17.35	19.00	AD	28+52	1 4"	obvious	not colit	tabla	Nagler 12mm	
	0000	V451 Hor	LIP 6226	Hor	17h01m22.1s	+14"56'59"	6.2	17:05	17.35	12:45	AD	6 2 + 11 0	19.7	obvious	not vicit	la	Plöcci 55mm	
	0000	SAO 121276	PPM 162086	Sor	15h57m14 4	+03"24'28"	8.9	17-20	17.36	18.00	AR	73+91	10.9"	0001003	obvious	solit	Plössl 55mm	
	****	59 Ser	d Ser	Ser	18h27m12.5	+00"11'46"	5.3	17:05	17:36	19:10	AB	5.2 + 7.6	3.9"	obvious	not split	table	Ontiluxe 32mm	
	****	61 Oph	HR 6609	Oph	17h44m34.1	+02 "34'46"	6.2	17:05	17:37	18:50	AB	6.2 + 6.4	20.4	obvious	obvious	split	Plössl 55mm	
	****	Rho Oph	5 Oph	Oph	16h25m35.1	-23"26'50"	4.6	17:20	17:37	17:50	AB	4.6 + 5.7	2.9"	easy	not split	table	Optiluxe 32mm	
	****	HD 135145	SAO 83717	Boo	15h12m47.8	+27"55'32"	8.4	17:15	17:38	18:15	AB	8.4 + 9.5	32.2"	obvious	obvious	split	Plössl 55mm	
	****	HD 150891	SAO 121816	Her	16h43m38.8	+06"3707"	7.7	17:15	17:38	18:25	AB	7.7 + 9.1	53.3"	obvious	obvious	split	Plössl 55mm	
	0000	Zeta Her	40 Her	Her	16h41m16.3	+31"36'18"	2.8	17:00	17:40	19:50	AB	2.8 + 5.7	1.5"	obvious	not split	table	Nagler 13mm	
	***	HD 143707	SAO 84144	CrB	16h01m03.8	+26"10'22"	7.9	17:15	17:40	18:35	AB	7.9 + 11.0	55.0"	obvious	obvious	split	Plössl 55mm	
	***	Eta CrB	2 CrB	CrB	15h23m12.5	s +30°17'12"	5.0	17:20	17:42	18:25	AB	5.0 + 6.0	0.6"	obvious	not split	table	Any	
	<u>àààà</u>	46 Her	HD 151237	Her	16h45m05.2	+28"21"29"	7.1	17:10	17:42	19:05	AB	7.1 + 9.4	5.3"	obvious	obvious	split	Plössl 55mm	
	****	23 Aql	HR 7319	Aql	19h18m32.5	s +01°05'07"	5.2	17:00	17:42	19:50	AB	5.2 + 8.8	3.0"	obvious	not split	table	Optiluxe 32mm	
	0000	HR 6776	HD 165910	Oph	18h07m48.4	+13"04'16"	6.6	17:10	17:43	19:25	AB	6.6 + 9.6	41.7"	obvious	obvious	split	Plössl 55mm	
	****	PPM 132077	HIP 79386	Her	16h12m07.4	5 +11"54'32"	9.4	17:25	17:44	18:20	AB	8.2 + 9.7	7.2"	easy	obvious	split	Plössl 55mm	
	0000	HD 180699	SAO 162432	Sgr	19h18m10.9	-18'51'50"	7.0	17:10	17:44	19:00	AB	7.0 + 9.0	36.9"	obvious	obvious	split	Plössl 55mm	
	0000	HD 147009	SAO 159858	Sco	16h20m04.0	5 -20°02'42"	8.1	17:35	17:44	17:55	AB	7.4 + 8.8	46.9"	apparent	not visit	ole	Plössl 55mm	
	2020	HD 147103	SAO 159865	Sco	16h20m30.55	s -20°06'53"	8.4	17:35	17:44	17:55	AC	7.6 + 8.5	12.8"	apparent	not visit	ole	Plössl 55mm	
	0000	HD 314059	BD -21 04907	Sgr	18h13m43.2	5 -21°03'00"	9.6	17:25	17:45	18:20	AB	3.9 + 11.5	16.3"	easy	obvious	split	Plössl 55mm	
	1222	44 Boo	I Boo	Boo	15h03m46.3	5 +47 39'15"	4.8	17:15	17:46	19:20	AB	4.8 + 6.1	0.8"	obvious	not split	table	Nagler 13mm	

I highlight an object I observed during the outing (the blue highlighted area). In this example, the double star Gamma Her is selected. I can either, hover the cursor over this blue, highlighted area, and click the right mouse button to select the *Create Log Entry* choice in the pull-down menu, or I can just press the hotkey *m* to add a new log entry. In either case, the following input dialogue window will be displayed:

	Attachments -	
ļ	lew Log Defaults	
	This dialog serves two purposes. It is used t select the defaults that will be applied when you enter a new "quick" log entry, and it is handy for entering more than one log entry a time.	o rer at
	⊂ Object	
	Gamma Her	
	-Night (Date of Evening)	
	2023 November 8	
	17:05:00	
	Observing Location	1
	Observer	
	Mike Hotka	
	- Instrument	
	18 f/14.2 Cassegrain	
	- Observing Conditions	
	Seeing presets Transparency presets	0.0
	Granta Lon Entry Cave Defaults 2	
	Create Log Entry Save Defaults ?	

I then verify/adjust the fields of the Date, Local Time and Instrument (arrowed) to match the Gamma Her observation's data and click the *Create Log Entry* button at the bottom of this window. The following window will pop-up, allowing me to verify a log entry was properly created for this object:

AvisFV	Observing List	W	/eather		Generate Observing Plan		Attachments
	Herschel_500	- [	Auto Average Seeir	ng (1° - 2.5° P6-7) 🔻 64F 65%	Plan Find/Slew Time 5	min New Log Def	aults ×
-	Class Filter	Constellation Filter	Log Filter	Quality, Difficulty and Double-Star Splita	bility Filters		
	All Classes 👻	All	Any 🔻	Any quality 👻 Ignor	e Difficulty 👻 N/A	This dialog select the d	serves two purposes. It is used to lefaults that will be applied when
9	List Functions    Double Star colu	ımns 🗸 🗸	Add Objects 🔻 Get (	Observing Lists 🔻 Share/Export List	-	you enter a	new "quick" log entry, and it is very
Observation	n Log					- nandy for e	intering more than one log entry at
	1						
Gan	nma Her	R.A. 16h2	2m56.7s Dec. +19*05'56" He	er 3.8V Alt. 38*		More Info	1
-							
Observa	tions			Description			e of Evening)
Da	te and Time Telescope	Location	Observer	Insert Eyepiece			rember 8
2023 N	lov 08 17:05 18 f/14.2 Cassegrain	Little Thompson Obser	Vike Hotka			~	
							Location
							mpson Observatory
		Observing Conditions					
2023 N	Vov 8 17:05 MST 00:05 UT	Seeing presets	Transparency presets				4.2
Example 1							.Ku
Mike	Hotka						
Little T	Thompson Observatory						Cassegrain
18 f/14	4.2 Cassegrain						Candidana
	-						Conditions
Estimate	d Difficulty						esets Transparency presets
Select	difficulty						
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Print/C	Copy Share Delete						
G Sala	Brow	se New Entry I	Night Log Help			~	Fater Controller 2
Sere Sere							g chuy Save Delauits :
					Close	Cancel	at visible Plossi Somm
							Prosst Somme

Close the *Observation Log* window and the *New Log Defaults* window and this object is now in the ST4's database as observed. I repeat these steps until all the objects I recorded in my field logbook are logged.

Then I open a blank Microsoft Word document and transpose all the text notes from my field logbook into this MS Word document. An example page from my logbook is displayed below:

3/28/14 10-6:50P Clear. Bisk breeze from NEI Rt Blue Lock tite on Theads of AZ bilt of ±749 (#737 doesn't have locktite). will see how that works. Pre (minaus tests this afternoon films see missed owner. Blue type down threads just didn't do it. Slipped Right after solar. Singet 7154P. 61° Still breaky from NE. Claub /fog law along western horizon. 9:05 5 walkings MER Aussame 6 stors seen in toperand. GZOS STOUS AND Cost. Thick Aliments in a loop. w/03. on Bottom on top is a much bimmer To are that thickens of two. 2 Pov of 17 mm 1 3 FOU tell NZ532 9137 A small round dim you, can see mothing of glow, may be can acus, m center of glow o tiny hb core NZ649 A small wind very Low vil glow has brighter FS 9:42 an upper part of hals glow give A very faint fat oval u.l. glow 9:49 A surel, filted and, domilias larger brighter coro. Then above + Z. left - near + under + Bright FS is this smaller roundish u. I. very faint glow 9:54 A small, long thing glow w/large, linear one that is buildhest a small bright one in centr. lace fant Int easy to see w/ fr.

Once I am done entering all the text from every logbook page of this outing into the MS Word document, I print a hard copy of these observing notes. I then can add any sketches I did in the field logbook to the corresponding printed pages. The below example is the finished, printed page of the above logbook example:

## Friday, March 28, 2014 Cady Alverado brought Blue Locktite to lock the AZ bold to the ground board of scope #749 (#737 doesn't have Locktite for the threads grabbed by themselves and there is no AZ slippage). Preliminary tests showed this solved the slippage issue (didn't see missed counts) and I used the Sky Commander the rest of the night. The blue masking tape down the threads from the night before just didn't do it. It slipped right after the setup steps. 6:50 PM. Clear, Brisk breeze from NE. Sunset at 7:54 PM. 61 degrees. Smoke low along western horizon. 9:05 PM. Sky Commander works. M42 awesome. 6 stars seen in trapezium. Slewed between M41 and M42 twice and object in FOV both times. G205.5+00.5 9:10 PM 17mm - Cool. This. Easy to see with O3. Thick filaments in a loop on bottom and arc that thickens at top. 2 FOV wide and 3 FOV tall. NGC 2532 9:37 PM 17mm - A small, round, dim glow. Can see mottling of glow, maybe 2 CCW arms. In center of glow is a tiny, hare brighter core. NGC 2649 9:42 PM 17mm - A small, round, very dim, uniformly lit glow. Has brighter field star on upper part of halo glow. NGC 2604 9:46 PM 17mm - A very faint, fat oval, uniformly lit glow. NGC 2577 9:49 PM 17mm - A very small, tilted oval. Dim. Has larger, UGC 4367 brighter core. Then above and to right and near and under a bright field star is this smaller, roundish, uniformly lit, very faint glow of U4367. 14367 NGC 2764 9:54 PM 17mm - A small, long thin, very dim glow with larger, linear core that is brighter with small, bright core in center. Core faint but easy to see w/AV.

I punch 3 holes in these pages and put the pages in a 3-ring notebook for future reference:

A few years ago, I started a second 2-inch binder of these printed logbook pages.

Remember my goal of observing 10,000 unique celestial objects?

With all my observed objects now recorded in ST4's database, I can measure the progress I have made towards completing my observation goal. I use ST4's ability to count the different *class* of objects. I click each class of object and enter the number of observed objects into an Excel spreadsheet I use to support my observing goal.

	Sky	Tools 4 Visual
og Browser	Mile Hotks	T Hain
Class Night Observer Los	ration Instrument Constellation Search Mis	Objects with Matching Log Entries
Comets Stars Galaxy groups Quasars Planetary nebulae Nebulae Dark nebulae Open dusters Globular dusters		Andromeda Galaxy Arp 141 Arp 233 Arp 248 Arp 248 Arp 273 Arp 291 Arp 324 Barnard's Galaxy Bear Paw Black Eye Galaxy Blinking Galaxy Bode's Galaxy
Comment:		Bow and Arrow Centaruts A Cigar Galaxy Cocoon Galaxy Cocoon Galaxy Coddinaton's Nebula 3576 objects View Export Share Print/Copy

Once I am done with entering all these class object counts into the corresponding cells of the spreadsheet, it automatically calculates the current number of unique celestial objects observed (count circle in red in the below image):

14	A	В
1	Class of Objects	Count
2	Galaxies	3576
3	Galaxy Clusters	88
4	Nebulas	206
5	Planetary Nebulas	176
6	Clusters+Nebula	36
7	Dark Nebulas	120
8	Reflection Nebula	206
9	Globular Clusters	148
10	Open Clusters	541
11	Knots	4
12	Super Nova Remnants	14
13	Super Novae	10
14	Novae	3
15	Unknown & Other	100
16	Comets	49
17	Double Stars	426
18	Triple Star	6
19	Solar Neighborhood Stars	196
20	Carbon Stars	101
21	Variable Stars	107
22	Quasars	4
23	Star Asterisms	37
24	Solar System	1037
25	Meteor Showers	38
26	Total Objects Seen	7725

I can easily see the progress I have made towards completing my observation goal.

**Now** I am done with this most recent observing session. With all these observations logged in the ST4's database, I can start planning my next outing of objects I have yet to see.

This process I describe in last month's and this month's articles is a process I've developed over the years. I described it in detail so that you might adjust my process, or create a process of your own, that will work for you. Regardless, you need an automated way to keep track of what you have observed, and depending on your astronomical goal(s), to summarize these observed objects in a way that you can see the progress towards completing your goal(s).

An alternative to using ST4 to record your observed objects is to use an Excel spreadsheet. This kind of spreadsheet can contain all the objects you wish to observe and with embedded equations, can easily calculate the number of objects observed.

My current observing project is to view double stars. I have accumulated a total of 3965 double stars I will observe. I still use ST4 to log a record of my observed stars, but I also keep a separate Excel spreadsheet of the many double star lists I have accumulated over the years. The bottom of this Excel spreadsheet double star list is as follows:

B3970		• (m	f <sub>x</sub>	(COUNTA(A3:A3967))+B3977										
1	A	В	С	D	E	F	G	Н	1	J	K	L	M	
1								Mitsky	Bino	Adv	AL	Mul	Her	
2	Date	Time	Con	RA	Dec	Name	Other Name	Double	DS	DS	DS	Stars	500	Description
3956			Vul	20:14:30	+24d50m00s	STT 402								"Mags 7/10.5 Sep 15.4 PA 33 Spect B9"
3957			Vul	20:15:18	+25d35m00s	BU 983								"Mags 6/10 Sep 0.7 PA 166 Spect B3"
3958			Vul	20:17:30	+29d08m00s	BU 441	Burnham 441	Y						"COLOR Mags 7/11.5 Sep 5.9 PA 64 Spect K
3959			Vul	20:18:18	+25d38m00s	BU 985								"Mags 7/9.5 Sep 21.6 PA 356 Spect B3"
3960			Vul	20:24:12	+28d59m00s	BU 443								"Mags 7.5/11.5 Sep 14 PA 138 Spect A5"
3961			Vul	20:31:54	+25d48m00s	STF 2695								"Mags 6.5/8.5 Sep 0.8 PA 87 Spect A2/G"
3962			Vul	20:33:48	+28d07m00s	STF 2698								"Mags 8/9 Sep 4.4 PA 302 Spect A0 On the e
3963			Vul	20:44:30	+23d55m00s	STF 2724								"Mags 8/8 Sep 2.4 PA 329 Spect G0"
3964			Vul	21:07:24	+24d29m00s	STF 2761								"Mags 8.5/9 Sep 5.6 PA 111 Spect A2"
3965	12/11/2014	18:57	Vul	21:10:36	+22d27m00s	STF 2769	Struve 2769	Y		Y				"Mags 6.5/7.5 Sep 17.9 PA 300 Spect A0"
3966			Vul	21:11:54	+24d09m00s	STT 430								"Mags 8/10 Sep 1.3 PA 205 Spect F8"
3967			Vul	21:24:06	+25d18m00s	BU 447								"Mags 6.5/11 Sep 9.3 PA 320 Spect A2"
3968			1						1	1			1 1	
3969														
3970		426	of	3965	Total Doubles	Seen	0							
3971		179	of	815	Mitsky Doubles	s Seen								
3972		103	of	103	AL Double Star	s Seen								
3973		96	of	122	AL Bino Double	Stars Seen								
3974		63	of	96	AL Advanced B	ino Double Stars Seen								
3975		48			AL Multiple Sta	irs Seen								
3976		73	of	500	Herschel 500 S	tars Seen								
3977		100	of	100	Cygnus 100									
				125	58 7.552		0							

From the above spreadsheet image, you can see an equation for the number found in cell B3970. Almost all the numbers in the summary lines 3970 to 3977 are driven by counting whether there is a date value in column A and whether there is a Y in columns H to M. In this one spreadsheet, I can monitor the progress of the Mitsky Double Star List, the Astronomical League's Binocular, Advanced and Telescopic Double Star observing programs, the Multiple Star observing program, and the 500 best William Herschel double stars he monitored in the late 18-th century.

I added this Double Star Excel spreadsheet example to illustrate how an Excel spreadsheet might be used to record you observed objects instead of a program like ST4.

I am sure there are other alternatives to ST4 or an Excel spreadsheet to keep track of what you have observed. Whatever you chose, I think it is important to know what celestial objects you have observed over the years.