VATTSpec Guider Notes

Introduction

VATTSpec's guider uses an Apogee, now Andor, Aspen CG8050, cooled, interline CCD. The array is 3296x2472, with pixels of 5.5x5.5 microns. The software is Craig Stark's PHD2 Guiding, so see its manual for details on normal guiding. The parameters below are for on-slit guiding. The control software is on "vattautoguide.vatt".

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SETUP

Beginning from the Desktop

- Start INDI server via its icon.
- Start PHD2 via its icon
- In PHD2, press Camera button to connect to the Apogee camera and the mount.
- Select INDI Camera and INDI Mount (no Aux Mount)

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• Under Camera tools (tools icon), set...

Then press OK

And then press Camera Connect TWICE.



Under Mount tools, set...
Then press OK

And then press Mount Connect.

• <u>At end of night</u>, "Disconnect All".

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ADVANCED SETUP (the Brain icon)

• Under **Global** – check "Auto restore calibration" box, and set anything else desired.

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Advanced setup + 3			CONTRACTOR OF A PROPERTY OF		

• Under **Guiding** – set Search region to 25 pixels, or more if seeing is poor.

• For on-slit guiding, probably better to **un-**check "Star mass change detection".

	Advan	ced setup		+ ×
Global	Guiding	Camera	Mount	
Guider S	ettings			
Alwa	iys Scale Im	nages		
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Search r	egion (pixe	ls): 25	3	
Star	mass chan	ge detectio	n kr	
Star ma	ss tolerance	e: 50.0]	

- Under **Camera** set Pixel size to 5.5
- x 5.5 microns.



• Under **Mount** – especially <u>Hysteresis</u> and <u>Aggression</u> are critical settings for on-slit guiding, so tweak these suggested values as appropriate.

Minimum Move is about right at 0.20 pixels, but if star stays above or below green crosshairs, then adjust down to, say, 0.15 pixels.

Hover cursor over parameter to get brief help box.

	Advan	ced setup		+ ×			
Global	Guiding	Camera	Mount				
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Aggress	sion: 50	:					
Minimu	im Move (p	ixels): 0.20	:				
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Max Du	Max Duration RA: 2000 C Dec: 2000 C						
C Reve	rse Dec out	tput after m	eridian flip	,			
Assu	me Dec ort	hogonal to	RA				
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	[Cancel	1	OK			

CAM DIALOG

INDI Options setup

 VATT-GUIDE-INDI – Focus Stage Set focus steps to100 for tweaking, 1000 or more for defocusing to make collimation setting.

Press <u>and release</u> "Scan Positive /Negative " to start changing focus, and stop with "Terminate".

Apogee	CCD VATT-0	SUIDE-INDI			
Main	Focus Stage				
Focu	s Position	Focus Steps	100.000000	200	Set
Scan	Positive	positive			
Scan Negative		negative			
Term	ninate Focus	Terminate			

Apogee CCD Main Control Set Camera Head Temperature, if desired.

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in Control O	ptions Image S	ettings In	nage Info	wcs	
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Port	USB	Network			
Port	Port USB			Set	
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info	Name As	pen-ausu			
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Apogee CCD Image Settings Check Frame is Width = 2206 Hoight

Width = 3296, Height = 2472

Binning (<u>need to reset this each time PHD is run</u>) X = 3, Y= 3

Then press "Set" to register values.

			INDI Op	ptions				+
Apogee CCD	VATT-GUID	E-INDI						
Main Control	Options	Image	Settings	Image I	Info	wcs		
 Frame Binning 	Left Top Width Height X 3.0	0.000000 0.000000 3296.000000 2472.000000		3296 2472			Set	
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Image	Com	oress	Rav	v				
Frame Type	Lig	Light		5	Dark		Flat	
Frame Value	S Res	et						

IN MENU ON TOP OF PHD2 WINDOW

View

 Slit Position (to make a box the size of the slit) Be sure to have first set the Binning to 3 x 3.
 And check the "Spectrograph Slit" option.

Shown are approximate values for narrow slit. For wide slit, X same, Y=250, Height=16. Tweak by using a calibration lamp, with Guider Mirror in Center position, to illuminate slit.

sition (center	Size		
559	Wi	th 130	:
270	He	ght 10	:

Darks

- The Dark Library is probably made and in use. This practically eliminates the streaking down a column of pixels for the longer exposures and fainter objects.
- If the library is not running and the dome is completely dark, click on "Dark Library" and rebuild a library of darks. Suggested range is 1 to 15 secs, with 5 frames per exposure time.
- The Bad-pixel Map was no significant help in removing the streaks.

Dark Libran	Creation			2
Dark Lib	rary			
Min Ex	posure Time:	1.0 s 💌	Max Exposure Time:	15.0 s 🔻
Frame expos	s taken for each ure time:	5		
Notes:				
l				
	Reset	Star	t Cancel	
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ACTUAL ON-SLIT GUIDING

- Hit the Loop button, bottom left of screen, to start the camera.
- Center star in slit with telescope paddle, and click on it to get the green box.

Yes, this one is not quite centered!



• Press PHD button to start guiding, and a green cross will appear.



- Center the green cross on the slit with the Adjust Lock Position buttons (under Tools).
 - o Use "Save" when centered and "Restore" for auto-centering the next star.
 - If the star, during guiding, favors being up or down from the center of the slit, then nudge the cross a bit in the opposite direction from center, or lower "Minimum Move" (see p.3, Mount controls).

-		Adjust Lock P	osition	and the second	+ ×
		Up			
	Left		R	light	
		Down			
Step 💳		= 1.00 px		Sticky Loo	k Position
Lock Pos:	566.03	270.91	Set	Save	Restore

Checking the "Sticky Lock Position" will prevent losing centering if re-calibration is done (automatically) after pressing the PHD button.

If the star is lost, then the green box turns red until the star is found again.
 Regular beeping on turning red is "normal" when guiding on slit.



NOW START INTEGRATING ON YOUR OBJECT AND RELAX!

The whole screen, when on-slit guiding, might look like this...



You could keep a check on the discussion of spilled-light / on-slit guiding at Google Groups' Open PHD Guiding.

GUIDING ON A SUITABLE FIELD STAR,

away from the slit, is covered in the PHD2 manual.

The parameters for on-slit guiding are probably still suitable. The whole screen, with two useful side displays from the View menu, Target and Star Profile, might look like this...



Please send comments on these VATTSpec specific notes to corbally@as.arizona.edu