SHOC INSTRUMENT CHANGE NOTES: APPLICABLE TO LESEDI TELESCOPE ON

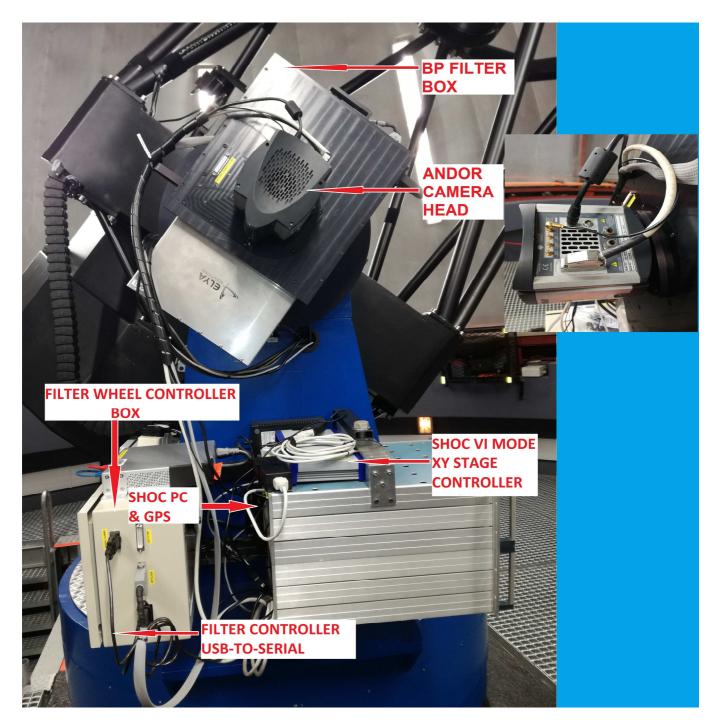


Figure 1: SHOC VIEW FROM WEST

ON THE TELESCOPE:

- 1. Mount SHOC PC Crate on Telescope (see picture). See Appendix for the implications of mounting the "wrong" PC Crate. Do NOT Connect the mains power cable at this stage.
- 2. Mount Andor Camera Unit on Telescope de-rotator see picture. (Ensure Camera lens has been cleaned by gently blowing with compressed air.)
- 3. Connect the Filter Wheel Controller (permanently mounted on telescope) USB-to-serial cable to SHOC PC (see pic.)
- 4. Connect USB-to-serial cable from shoc vi mode xy stage controller to SHOC PC however do not connect its power supply (see pic.) this is not in use yet.
- 5. Connect Acq. Camera usb to SHOC PC
- 6. Connect GPS Antenna to GPS Unit inside PC Crate
- 7. Connect Network Cable to PC Crate
- 8. Connect SHOC PC to Andor Camera Unit
- 9. Connect PSU to Andor Camera Unit
- 10. Connect GPS trigger signal cable to Andor Camera unit "ext trig"
- 11. Connect PC Crate to Telescope mains (normal Kettle plug lead)
- 12. Switch on Crate Power & SHOC PC (in front behind black tape)

IN THE CONTROL ROOM:

- Useful info may be available at: <u>http://topswiki.saao.ac.za/index.php/SHOC</u> especially if there's any doubt as to whether these instrument change notes are up-to-date with possible software updates . . .
- Ensure that IT updates DNS records to allow correct web browser access this is particularly important now that SHOCnDisblief is regularly swapped between Lesedi & 74" telescopes......
- 3. After IT has updated the DNS records do the following:
 - 3.1 Open xterminal, type in "ssh <u>ccd@shocndisbelief.suth.saao.ac.za</u>" when prompt for a password type "Saaoccd".
 - 3.2 Run *shocboxswitch.sh* command, then when asked "Do you wish to revert to the default?" type "NO"
 - 3.3 When asked "which telescope should be used?" then type in **1M** and when prompt for a password type "*Saaoccd*" the script will run.
- Connect to the web browser: <u>http://shoc1m.suth.saao.ac.za:5000</u>. When prompted to log in, use the username and password below:

***VERY IMPORTANT!** See Appendix for a detailed explanation by Amanda about the implications of mounting the "wrong" SHOC Computer on the "wrong" Telescope.

Username: shoc1m Password: Saao1m

There are three tabs, for Filter control, GPS control, and Camera control

5. Go to the **Camera** tab, click the "**Turn Camera on**" button – see figure 2. If the camera switches on OK the "Control" tab GUI will appear – See Figure 3.

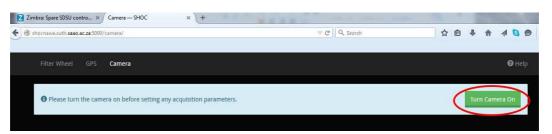


Figure 2: Initial state of "Camera" tab

Filter Wheel GPS Camera		🛛 Неір
File View Zoom Scale Color Region WCS Analysis Help	Controls Analysis Advar	iced
value(0.000) image(0.592, 0.506)	Triggering Exposure	Kinetic Series Cycle Time
	Internal - 1.109	s 1 1.116 s 0.8961Hz
	Sub Imaging & Binning	0.890112
	Sub Image	Binning
	1024x1024 (Full)	1x1
	Horizontal Pixel Shift	
		Amp Gain EM Gain Output Amplifier
	1.0MHz at 16-bit • 1.0	Conventional
	SHA_20150517.0041	
	Start	Preview Turn Camera Off

Figure 3: Camera "Control" tab GUI

- 6. Set the camera temperature: See the temperature display/button in the top RH corner. It should have a red background and the reading should start dropping.
 - a. Click on the Temperature display button. The "advanced" tab GUI should appear see Figure 4.
 - b. To avoid unnecessary stress to the thermoelectric cooler, click on the "Set Temperature" box (Figure 4) and change the set point to -25°C. Check that the temperature settles at the new set point. Note that the servo seems to overshoot quite a lot. Once at the set point, the button background colour changes to green. This can take a few minutes . . .

Filter Wheel GPS Camera		0 Help
File View Zoom Scale Color Region WCS Analysis	Help Controls Analysis	Advanced TEMP: -22* C
value(0.000) image(0.848, 0.529)	Temperature	Start Index
	-50	42
	Degrees Celsius	Specify the starting index that will be used to name your data files.
	Additional Header	Keywords
	Observer	Observation Type Object
	Lizelke	Object J1218
	Right Ascension	Declination
	Epoch	Equinox
	Image Orientation	
	Flip X Axis	Flip Y Axis OFF ON

Figure 4: "Advanced" tab GUI

7. Check that the camera is reading out: Click on the "Controls" tab (Figure 5), confirm the setting is full frame, conventional mode (the default) and press "preview". Images should appear every ~ 1.2 sec. Once confirmed that images are coming through, press "stop". Note that camera has no shutter, therefore before bias frames can be taken, the dome lights must be switched off, ensure dome shutters and cover is closed (it's not necessary that it should be completely dark inside the dome, but there should be no direct light falling on the optical path). Running the cursor over the image display area will bring up a notification panel with X,Y coordinates and the count at this position. The counts should be around 400 or so.

Filter Wheel GPS Camera			🛛 Helj
File View Zoom Scale Color Region WCS Analysis Help	Controls Analysis Adv	vanced	TEMP: -25° C
value(0.000) image(0.865, 0.540)	Triggering Exposure Internal - 1.109	Kinetic Series	Cycle Time
	Sub Imaging & Binnin	g	0.8961Hz
	Sub Image 1024x1024 (Full)	Binning	
	Horizontal Pixel Shift		
	10 10 10 10 Sectors	re-Amp Gain EM Gain 1.0 • 0	Output Amplifier EM O Conventional
	SHA_20150517.0041		
	Start	Preview	Turn Camera Off

Figure 5: Camera "Controls" Tab

- 8. Check that the camera fan is running. (Check this at the camera)
- 9. Turn the camera off: Click on the "Turn Camera Off" button at the LHS bottom corner of the GUI.
- 10. Check the Filter & GPS operation: Click on the "Filter Wheel" and "GPS" Tabs at the top RH corner of the web GUI to access the controls . See Figures 6 & 7.
- 11. On the web page Filter Tab initialize and move filters to check their operation.

Wetter GPS Filter Wheel GPS Filter B: 100 Immutation # Mark Contract Position U - Ultraviolet 1 Required Position U - Ultraviolet 1 Move Initialise Move Initialise	Weather S GuperWASP KELT BSF LCOOT CLOOT SHOC N Nagios M MS Report System Peults 2 Zmbras Inbost HR Online 8 Google Internet banking Filter Wheel GPS Preferences + Help Itter A: 011 Filter B: 100 Internet Position U - Ultrawiolet 1 Current Position U - Ultrawiolet 1 Current Position U - Ultrawiolet 1 Move Initialise Move Initialise	Weather SuperWASP KELT INSF LCOOT ALCOOT SHOC N Nagios M MS Report System Peults Zimbris Inbox HR Omline S Google Internet banking Filter Wheel GPS Preferences + Help iller A: 011 Filter B: 100 Filter B: 100 U - Ultraviolet 1 U - Ultraviolet 1 U - Ultraviolet 1 Move Initialise Move Initialise	Filter Wheel +	
Filter Wheel GPS Filter A: 011 Filter B: 100 Immussee # MAX. Commente Filter D: Unitariolet Immussee # MAX. Commente Filter B: 100 Immussee # MAX. Commente Immussee # MAX. Com	Filter Wheel GPS Filter B: 100 Inter A: 011 Filter B: 100 <th>Filter Wheel GPS Preferences • Help filter A: 011 Filter B: 100 unrent Position U - Ultraviolet 1 U - Ultraviolet 1 Move Initialize Preferences • Help Move</th> <th></th> <th></th>	Filter Wheel GPS Preferences • Help filter A: 011 Filter B: 100 unrent Position U - Ultraviolet 1 U - Ultraviolet 1 Move Initialize Preferences • Help Move		
Filter A: 011 Filter B: 100 INTRALISES # REF, CANTREE MOONE Current Position U - Ultraviolet 1 Current Position U - Ultraviolet I Current Position U - Ultr	liter A: 011 Filter B: 100 nmmutate at at contrast works nmmutate at at contrast works arrent Position Current Position U - Ultraviolet 1 Guired Position U - Ultraviolet U - Ultraviolet 1 Move Initialise	iliter A: 011 Filter B: 100 mmulate a set contrast works urrent Position U - Ultraviolet I U - Ultraviolet U - Ultraviolet U - Ultraviolet I U - Ultraviole		
Initialise Initialise Initialise Initialise	NITRALISES # Ser. CANTERNO MOVING urrent Position Current Position u - Ultraviolet 1 cquired Position Required Position u - Ultraviolet 1	NUMBLISSE # Set Christelle Moving urrent Position Current Position U - Ultraviolet 1 U - Ultraviolet 1 U - Ultraviolet 1 U - Ultraviolet 1 Initialise Initialise	Filter Wheel GPS	
Current Position Current Position U - Ultraviolet 1 Q - Ultraviolet 1	Current Position Current Position U - Ultraviolet 1 squired Position Required Position U - Ultraviolet 1 U - Ultraviolet 1 Or - Ultraviolet 1 Initialise Move	urrent Position Current Position U - Ultraviolet 1 equired Position Required Position U - Ultraviolet 1 U - Ultraviolet 1 U - Ultraviolet 1 Initialise Move	Filter A: 011	Filter B: 100
U - Ultraviolet 1 U - Ultraviolet 1 Required Position Required Position U - Ultraviolet 1 Wove Initialise Move	U - Ultraviolet 1 U - Ultraviolet 1 equired Position Required Position U - Ultraviolet 1 U - Ultraviolet 1 1 1 Move Initialise Move Initialise	U - Ultraviolet 1 equired Position Required Position U - Ultraviolet 1 U - Ultraviolet 1 U - Ultraviolet 1 Move Initialise	INITIALISED AT REF. CENTERED MOVING	INITIALISED AFREF. CENTERED MOVING
Required Position U - Ultraviolet U - Ultraviolet I Move Initialise Move Initialise	equired Position U - Ultraviolet U - Ultraviolet Move Initialise Move Initialise	equired Position U - Ultraviolet I Move Initialise Move Initialise	Current Position	Current Position
U - Ultraviolet 1 🗘 U - Ultraviolet 1 🗘	U - Ultraviolet 1 Move Initialise Move Initialise	U - Ultraviolet 1 Move Initialise Move Initialise	U - Ultraviolet	U - Ultraviolet 1
Move Initialise Move Initialise	Move Initialise Move Initialise	Move Initialise Move Initialise	Required Position	Required Position
			U - Ultraviolet 1	U - Ultraviolet 1
More	Ke More	ore More	Move Initialise	Move Initialise
			More	More

Figure 6: Filter Wheel GUI

- 12. On the web page GPS Tab, just check to ensure that there is no Antenna Fault (If this happens check that the antenna has been connected properly to the GPS unit in the port labelled "antenna" also refer to page 18 of the user manual under the section titled "hardware fault monitoring" point 2.)
- 13. GPS data acquisition is an automatic process and will start as soon as dome is opened.
- 14. Further information and user manuals (for trouble shooting) can be found at http://shoc.saao.ac.za/Documentation.html

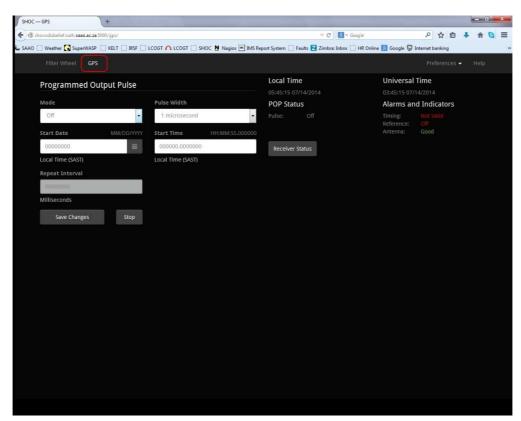


Figure 7: GPS Tab GUI

Appendix:

In an email dated 15 January 2016, Amanda explained the implications of mounting the "wrong" CHOC Computer on the "wrong" telescope, as follows:

"If the boxes are switched (i.e. shocnawe goes on the 40in or shocndisbelief goes on the 74in), then the observer will not be able to connect to the machine using the appropriate website and account (which is shoc40in or shoc74in for each telescope, respectively).

The instrument could be accessed by logging into the WRONG account, so if shocndisbelief were mounted on the 74in, then the 74" observer could run the shoc40in web interface and transfer data as shoc40in. This would be functional, but then all of the data paths would be incorrect because files would be stored under the 40in telescope folders, and the observer is likely to get confused when logging in and out. Things could get really hairy in this case if for some reason multiple SHOCs were mounted and an observer mistakenly logged into the wrong one, thus controlling the instrument on a different telescope.

The preferred solution is for IT to know how to change whatever information is required so that the SHOC box can be correctly tied to the correct telescope username where it is mounted."