GHHS ASTRONOMY VIEWING PROGRAM

CHECK LIST (Ver 3.01)

1) Tripod & Stabilizer	2) Mount	3) Camera Bag
4) Laptop w/Charger	5) Telescope	Tub #1: Startup Cables
Tub #2: Pwr Supplies/Batts	Tub #3: Tools & Such	Tub #4: Heater Equip.
Tub #5: Spare USBs/Cables	Counterweights (2) Ext Bar	

Telescope & Mount	
1) Turn On Laptop and Connect to Power Source	
2) Verify laptop is plugged into the 6 Port USB Hub	
3) Verify 6 Port USB Hub is plugged in to Power Source	
4) Plug in Headlamps, e^- socks, speaker & Celestron Power Bricks as needed	
5) Deploy Tripod – extend legs, verify legs are secure/NOT slipping	
6) Add mount and secure to tripod using long bolt	
7) Verify tube/3rd tripod leg/mount are all aligned pointing ➔ Polaris	
8) Check Dec Axis using level app & rotate green ring to match	
9) Check RA Axis using level app & rotate green ring to match	
10) Secure round tripod leg stabilizer is secure between tripod legs	
11) Add counterweights & extension rod	
12) Add telescope to mount & verify that markings match	
13) Verify telescope is balanced in Dec & RA	
14) Verify RA Clutch is secure (not TOO tight though)	
15) Verify telescope cover is off the telescope & Place in Camera Bag	
16) Extend tube cover to fullest extent (4-5 inches)	
17) Install heater wrap and plug into power source	
18) Set heater temp to middle to start	

Telescope & Mount Problems & Solutions
Wondering monster/everything going wrong problems: Check legs, are they collapsing? If so, use oil to lubricate threads on the tightening bolts on the leg extensions
Telescope is sliding down the tube. Unloosen the four ½ wing nuts that hold the telescope support brace. Slide the telescope up or down to match the orange markings on the mount.

Signal Cables	
1) Verify power cable to Main Camera (red light on and steady)	
2) Verify power cable to Auto Focus and turn AF on by turning the entire tube to the right (red light on and steady)	
3) Verify power cable to Mount	
4) Verify USB Extension Cable to USB-C on Laptop	
5) Add USB signal cable (**blue**) from Main Camera to hub Port #6	
6) Add USB signal cable (white) from mount to hub Port #2	
7) Add USB signal cable (white) from autofocus to hub Port #3	
8) Add USB signal cable (white) from Electronic Filter Wheel (EFW) to hub Port #4	
9) Add USB signal cable (*orange* braided) from guide camera to hub Port #5	
10) Verify 3 ***blue*** lights on Powered USB Hub:	

Mount	***Hub Port #: 2***	EFW	***Hub Port #:4***	**Camera**	***Hub Port#: 6***

Problems/Solutions for Signal Cables
If 3 hub lights don't go on, try reseating USBs in different slots
Check EFW USB – that one is a bit twitchy
If all 5 hub lights still don't go on, try going into Device Manager in Windows and rescanning USB ports
Blinking Red light on AF means it is not correctly plugged into power supply and is trying to draw power through USB only

SOFTWARE STARTUP	
1) Open FocusLynx software and verify that the AF is “Connected”	
2) Verify correct com port (com2, com3 or com8)	
3) Open SharpCap – ensure the ASCOM drivers/screen loads	
3) Open Stellarium software and verify it is working	
Stellarium Software	
A) Slide mouse to left side of the screen B) Select “Configuration” C) Click on “Information” Icon D) Click on “Customized” E) Close F) Slide mouse to left side of the screen and select Sky & Viewing Options G) Click on DSO icon H) Select everything but star clusters I) Verify Labels & Markers are Selected J) Change slider to taste	

Polar Alignment	
1) Display SharpCap	
2) Select “Early Polar Align Vals” and hit “Load”	
3) Verify that EFW filter is set to “L” – visible light in SharpCap	
4) Adjust exposure/gain to match light conditions	
5) ~ ¼ turn in RA to Start	
6) Follow instructions in SharpCap	

Polar Alignment Problems/Solutions

Problem: Step #1 works, and message to rotate telescope occurs. However, the plate won't resolve after several attempts at rotation. Same error keeps popping up.

Answer #1: Verify exposure time is short enough for plate solving (1 – 2 seconds-ish). Verify gain is appropriate (> 200)

Answer #2: The telescope was poorly aligned with Polaris **TO START WITH**.

1. Turn Off the Camera in SharpCap
2. Close SharpCap
3. Close Stellarium
4. Close phd2
5. Verify ASCOM is shut down.
6. Turn OFF the mount.
7. Return the telescope to HOME BASE
8. Start Again
9. If it still fails, shut down the computer and try again

Problem: Tube moves in DEC; motor engages in RA but tube doesn't turn.

Answer: RA clutch is loose. Tighten it.

Problem: Mount is a bit "loose" in RA. Getting RA to align within 5^{o} is difficult as there are times when tightening the knob doesn't engage. RA numbers jump around.

Answer#1: If the knobs are not making sufficient contact to the small post on the tripod there will be 'give'. Verify the knob on the tripod is tightly secured.

Answer#1: Verify that the tripod stabilizer (between the tripod legs) is secure.

AUTO Focus	
1) Verify FocusLynx software is working	
2) Verify Sidereal tracking in ASCOM & SharpCap	
3) Set exposure & gain: Typically 1 – 2 seconds, 200 – 400 gain	
4) Set SmartCap to: Tools **|** Focus Assistant **|** FWHM Multi-Star	
5) Verify enough stars are present (>> 10 the better!). Adjust gain/exp to assure more stars as needed	
Focus Problems & Solutions	
Verify that the exposure time is appropriate (< 1 sec) & high gain	
Did a meridian-flip occur? If so, then refocus the main camera and the mini camera	
Check for condensation on the lens	

PHD2 Tracking	
1) Turn on phd2 tracking application on Laptop	
2) Verify USB cable to laptop is secure on both ends and not hung up	
3) Verify tiny setscrew is secure	
4) Connect mount and ASI 1600 mini camera in dialog box	
5) Click the 2 – green arrows icon to begin looping image	
6) Click the target icon for guiding star auto select or pick a star	
7) Click the start icon – calibration will start	
8)	
PHD2 Tracking – Problems & Solutions	
Verify USB cable is secure.	
Snow in the background indicates poor focus with either the main camera or just with the ZWO mini camera. Verify main camera focus FIRST.	
If snow persists, then check to see if the tiny set screw holding the OAG into place is loose.	
If snow persists, loosen housing for the ZWO mini camera and SLOWLY (by mm) move up and down. Focus will come quickly.	

IMAGING	
1) Verify "RESUME" status	
2) Turn off *Live View* and make appropriate gain and exposure settings	
3) Verify sidereal tracking in both ASCOM and SharpCap is ON	
4) Verify weather conditions - especially for long exposures	
5) Verify appropriate filter	
6) Turn on *Live View*	
7) Verify appropriate Gain for DSOs	
8) Verify exposure time: ms vs seconds and seconds = minutes ok	
9) Verify **phd2** is tracking properly (blacker background = better focus)	
10) Turn on live stacking	

Imaging Problems/Solutions
Imaging Problems **Poor Images, no stars and similar** **Solution:**

1. *Verify Exposure is ~ 1 sec and gain is ~ 250.*
2. *Make sure Live Stack is off*

General Solutions

Solutions to Try*:*

1. Check for condensation on the lens
2. Verify "resume" is not active in LiveStack.
3. *Verify sidereal tracking in SmartCap AND ASCOM*
4. *Verify power ALL power supplies.*
5. *Verify tracking in phd2.*
6. *Verify ALL cables are secure.*
7. Turn OFF camera, CLOSE SmartCap, CLOSE Stellarium, VERIFY ASCOM is closed, Turn mount OFF, BACK to Home Base and Polar Align Again