

# 1 Opening up: Eyepiece Observing

1. First, open the slit. This helps air circulate and equalize temperature between the dome and surrounding air, and also may help blow out some of the dust. Make sure and stop the slit's opening before the metal bar reaches the hard-stop. Keep the door closed, to prevent a draft. You have to decide whether you will be looking at objects closer to the horizon or zenith now (or have to close and re-open it later).
  - (a) Zenith: Pull down the handle before you open the slit. It will make a "clunk" sound as it jumps free.
  - (b) Horizon: Leave the handle where it is.
2. Gently pull the plastic cover off the telescope. You may need to get up on the ladder to get it over the top of the guide scope. As you are doing this, watch the slit open, and be sure to stop it before it hits the hard stop.
3. Using the combination given (Hint: it is not 0123) to unlock the storage cabinet.
4. Remove the five following protective covers, placing each of them in the cabinet or onto the table:
  - (a) Front of the telescope (place it somewhere it won't get stepped on)
  - (b) Front/back of the finder
  - (c) Yellow plug from inside the fine-focuser
5. Remove the 5 pound rear weight from the back of the telescope and put it in the cabinet or onto the table.
6. Insert a star diagonal (after removing the cap and plug) and an eyepiece (typically a 32mm) into the rear of the main telescope.
7. Get the paddle out of the cabinet and plug it into the slot marked HBX.
8. Connect the telescope's power to the main power outlet on the west wall (near the dome roof controls and light switches).
9. Turn on the telescope with the switch. The paddle should beep and light up with a version number, and the fan on the back of the telescope should start blowing air out. The paddle will ask for daylight savings time, the time (24hr), and date. Input these values. You can proceed to the next steps while you wait for the telescope to initialize.
10. Attach the Focuser control box to the velcro on the right fork.
11. Connect the ethernet-plug-like Focus cable (which should be hanging from the focuser on the end of the telescope) to the focuser box.
12. Plug the focuser box into power outlet on the shaft of the pier; use the plug with the transformer box. Turn on the power to outlet with light switch.
13. Unhook the temperature sensor cable from the focuser. Plug in the red control wand to the port you just freed up.
14. Make sure the power switch near the outlet on the pier is switched on to ensure that it will provide power to the focuser box.
15. Turn on the focuser box and give it a minute or so to boot up

## 2 Closing down: Eyepiece Observing

1. Move the scope to the “parked” position: horizontal, facing south. This will help keep water and/or dust from pooling on the corrector plate, and makes it easier to put the covers on. Use the “park telescope” option on the hand controller to do this.
  - (a) Go up to the root menu by pressing MODE several times
  - (b) Press the UP arrow (bottom of paddle) until you get to Utilities
  - (c) Press the UP menu arrow once and select "Park Scope"
2. Turn off the telescope’s mount with the switch. Once off, unplug the transformer from the wall.
3. Remove all eyepieces and return them to their cases.
4. Remove the star diagonal and replace the two protective covers. The black cap goes over the slivered end, and the little black plug goes in the 1.25” adapter which should be placed on the other end.
5. Set the counterweight system to the “park” position marked on it.
6. Re-attach the temperature cable to the focuser.
7. Retrieve the 5 pound rear weight from the cabinet and place it on the back handle of the telescope.
8. Replace five protective covers:
  - (a) Front of the telescope
  - (b) Front/back of the finder
  - (c) Yellow plug from inside the fine-focuser
  - (d) Front cover of the guide scope (if you took it off)
  - (e) Rear plug from the guide scope (if you took it off)
9. Unplug the paddle from the base and return it to the cabinet.
10. Turn off the focuser, unplug its power cable (stow it), focusing wand (stow it), and ethernet cable (let it dangle).
11. Unhook the focuser box and stow it in the cabinet.
12. Turn off the power switch on the pier’s outlet to ensure no power is being supplied to it.
13. Gently pull the plastic tarp over the telescope, to keep dust and water off of it. Make sure you don’t snag the finder or anything else in the process.
14. Close the dome slit. There is no need to watch it, as it will automatically shut down when it reaches the bottom. Also, rotate the dome so that the slit faces west, to reduce the amount of leakage into the dome. If the slit is over the fire extinguisher, you’re in the correct position.
15. Ensure everything is in its correct place within the cabinet. Lock the cabinet and spin the tumblers to mix the combination.

### 3 Opening Up: CCD Observing

1. First, open the slit. This helps air circulate and equalize temperature between the dome and surrounding air, and also may help blow out some of the dust. Make sure and stop the slit's opening before the metal bar reaches the hard-stop. Keep the door closed, to prevent a draft. You have to decide whether you will be looking at objects closer to the horizon or zenith now (or have to close and re-open it later).
  - (a) Zenith: Pull down the handle before you open the slit. It will make a "clunk" sound as it jumps free.
  - (b) Horizon: Leave the handle where it is.
2. Gently pull the blue plastic cover off the telescope. You may need to get up on the ladder to get it over the top of the guide scope. As you are doing this, watch the slit open, and be sure to stop it before it hits the hard stop.
3. Remove five protective covers and place them in the cabinet (combination is not 0123):
  - (a) Front of the telescope (place it somewhere it won't get stepped on)
  - (b) Front/back of the finder
  - (c) Yellow plug from inside the fine-focuser
  - (d) Front cover of the guide scope
  - (e) Rear plug from the guide scope
4. Remove the 5 pound rear weight from the back of the telescope and put it in the cabinet.
5. Attach the CCD to the rear of the telescope. Orient it so that its ports are facing directly down. **Important:** secure it to the telescope with the bungee cable. Also, double check that the screws are all holding it tight. This will save you around \$10,000 if it should slip later on.
6. Attach the 2" star diagonal to the guide scope.
7. Attach the Meade DSI to the guide scope:
  - (a) First remove the filter slide
  - (b) Attach the 1.25 inch adapter
  - (c) Slide adapter into star diagonal
  - (d) Tighten the screws firmly
  - (e) Place the filter slide back into its slot so that the clear filter is being used
8. Adjust the counterweights to the "CCD" position marked on the track on the underside of the scope. Add a weight to the second (closest to the back of the telescope) counterweight mount.
9. Get the paddle out of the cabinet and plug it into the slot marked HBX.
10. Connect the telescope's power to the main power outlet on the west wall (near the dome roof controls and light switches).
11. Turn on the telescope with the switch. The paddle should beep and light up with a version number, and the fan on the back of the telescope should start blowing air out. The paddle will ask for daylight savings time, the time and date. Input these values. You can proceed to the next steps while waiting for the telescope to initialize.
12. Attach the Focuser control box to the velcro on the right fork.

13. Connect the ethernet-plug-like Focus cable (which should be hanging from the end of the telescope) to the focuser box.
14. Plug the focuser box into power outlet on the shaft of the pier; use the plug with the transformer box. Turn on the power to outlet with light switch.
15. Set up the Mac near the rear of the telescope. Plug it into the main power and attach its USB hub (it should be stowed in the Mac's bag).
16. Turn on the Mac and log in.
17. Connect the CCD to the Mac's USB hub with the USB cable in the CCD box.
18. Connect the CCD's power cable (big transformer in CCD case; two separate pieces) to the wall outlet.
19. Connect the focuser to the pier's USB hub with the black cable in the focuser box. Ensure the focuser switch is set to "manual."
20. Connect the telescope's RS232 port to the Mac's USB hub with the grey/blue RS232 cable from the Mac's bag.
21. Connect the guide camera to the Mac's USB port using the white cable from its box. **DO NOT** use the Mac's USB hub - the camera cannot draw enough power from it to operate.
22. Open Equinox Image on the Mac. Go to the "Connect" tab and choose "Connect." You should see "connected" displayed.
23. Set the CCD temperature (40°C cooler than **ambient temperature**) , and check the "Regulate" box. This will begin cooling the CCD chip.
24. In the "Focuser" menu, choose the "Optec" option. You can now connect the computer to the focuser here.
25. Open Equinox Pro on the Mac. Go to the "Connect" menu and choose the "LX200GPS" option. A window with telescope controls will pop up if it successfully connects. **Important:** Don't drive the telescope at the "fast" speed (or faster than speed "6" on the hand controller)! You're very near the maximum weight that the declination motor can handle.
26. Start PHD Guide on the Mac. Click the Telescope button to connect to the telescope, and the Camera button to connect to the guide camera. **NOTE:** Sometimes the camera will fail to connect to PHD Guide. Just try again. If you are still having connection issues, exit and reopen PHD guide and try it again.

## 4 Closing Down: CCD Observing

1. On the Mac, go to Equinox Image and uncheck the “Regulate” box. This will begin warming the CCD back to ambient temperature in a controlled fashion. You can proceed with all other steps up to Step 11 while this process occurs, though lending a watchful eye is encouraged to spot problems quickly should they arise.
2. Quit Equinox Pro and PHD Guide. Leave Equinox Image running for now.
3. Move the scope to the “parked” position: horizontal, facing south. This will help keep water and/or dust from pooling on the corrector plate, and makes it easier to put the covers on. Use the “park telescope” option on the hand controller to do this.
  - (a) Go up to the root menu by pressing MODE several times
  - (b) Press the UP arrow (bottom of paddle) until you get to Utilities
  - (c) Press the UP menu arrow once and select "Park Scope"
4. Turn off the telescope’s mount with the switch. Once off, unplug the transformer from the wall.
5. Adjust the counterweights to the “Parked” position marked on the track on the underside of the scope. Remove the additional weight to the second (closest to the back of the telescope) counterweight mount.
6. Unplug the paddle from the base and return it to the cabinet.
7. Remove the guide camera and the star diagonal. Stow the camera and its USB cable in the cabinet, as labeled. For the diagonal, the black cap goes over the slivered end, and the little black plug goes in the 1.25” adapter which should be placed on the other end. Stow it in the cabinet, as labeled.
8. In Equinox Image, disconnect from the Optec Focuser.
9. Unhook the focuser box and stow it in the cabinet, with power cable. Leave the focuser-box-to-telescope cable dangling in a safe manner.
10. Unhook the RS232 cable from the telescope mount. Stow it in the cabinet, as marked.
11. Check Equinox Image. Once the CCD temperature is within **2 degrees of the current ambient temperature**, press the “disconnect” button, unplug the CCD data and power cables and stow them.
12. Remove the CCD and stow it. A cover goes over the nose. Be very careful, and watch the bungee cord.
13. Attach the 5 pound weight on the bar at the rear of the telescope.
14. Replace five protective covers:
  - (a) Front of the telescope
  - (b) Front/back of the finder
  - (c) Yellow plug from inside the fine-focuser
  - (d) Front cover of the guide scope; just screw it on a few turns, not all the way
  - (e) Rear plug from the guide scope
15. Gently pull the plastic tarp over the telescope, to keep dust and water off of it. Make sure you don’t snag the finder or anything else in the process.

16. Close the dome slit. There is no need to watch it, as it will automatically shut down when it reaches the bottom. Also, rotate the dome so that the slit faces west, to reduce the amount of leakage into the dome. If the slit is over the fire extinguisher, you're in the correct position.
17. Copy your data off of the Mac.
18. Unplug the Mac's USB hub from the Mac and stow it in the Mac's bag.
19. Power down the Mac and stow it.
20. Double-check that the CCD and the Mac are in the cabinet.
21. Lock the cabinet and spin the tumblers.