

# Full Cold SHUT DOWN Checklist

## Mt. Bigelow Schmidt

ver 4.0 09/01/2019

### **This is for a NORMAL Shutdown to a Lightning Safe Condition.**

Note that CSS cables that MUST be disconnected for shutdown are marked with RED tape. Cables that should NOT be disconnected are marked with WHITE tape. **DO NOT** disconnect ANY cables marked with WHITE tape! Disconnecting or unplugging them from their respective outlets or connections is unnecessary and may cause problems if the next observer misses that they have been disconnected!

NOTE: THIS CHECKLIST DESCRIBES THE CORRECT PROCESS, **IN THE PROPER ORDER**, TO PUT THE TELESCOPE INTO A FULL COLD SHUT DOWN. FOLLOWING THESE PROCEDURES WILL LEAVE THE TELESCOPE IN A **LIGHTNING SAFE CONDITION** FOR THE NEXT START UP.

**NOTE: If the telescope and dome are not at stow position, return them to those positions BEFORE continuing!**

1. IF you have been operating the 1-m (40") telescope remotely, complete this section first. Otherwise, go to the next main section to shutdown the telescope.

#### **Initial 1-meter Lightning Shutdown**

1. When the telescopes are going to be put into lightning shutdown, the observer at the 1.5-m (60") telescope is responsible for the majority of the tasks required to put the 1-m (40") telescope into shutdown too. Some of these tasks can be completed by the remote observer, but the division of labor should always be coordinated with the observer at the Lemmon site to ensure that the telescope is completely shut down and ready for the physical disconnection of cabling.

#### **Remote shutdown**

2. It is often easier for the remote observer to complete these tasks at the end of the night before shutdown, or at whichever time it is agreed that a full lightning shutdown should occur. Regardless of who does the actual remote shutdown of the equipment at the telescope, the observer on Mt. Lemmon should confirm that the equipment has been powered off before performing the shut down of the 1.5-m telescope.
3. When it is time to put the telescopes into shutdown, perform your nominal end of night tasks, i.e., send the telescope and dome back to their stow positions if they are not already there, turn off the fans, close the mirror covers, close the slit.
4. Once these tasks have been completed, turn off the power to the TCS UPS (including the interior light if it was turned on for any reason)
5. Turn off the power to the camera controller on "UPS40".
6. SSH into Atacama and issue a shutdown command.

7. SSH into Gobi and issue a shutdown command.
8. Wait a few minutes so these two computers can completely shut themselves off.
9. While the shutdown of these computers in the computer rack -should- be an indication to the observer at the Lemmon site that the 1-m (40") telescope is powered off and ready for shutdown, an email or telephone call to the on site observer confirming that fact would be helpful.

At this point the 1.5-m (60") observer can then go over to the 1-m (40") dome and proceed to put the telescope into a physical lightning shut down.

## 2. Location: **“Warm Room”**

**It is assumed you have completed all of your other observing tasks before starting this process.**

1. In the CSS Control software, **“Stop Cooling”** and then **“Stop Camera”**
2. **Stop** the Telemetry in the Acquisition window.
3. Leave the primary control computer and TCS running!
4. Open a terminal window, and ssh into each of the computers in the rack in turn. Issue the **“sudo poweroff”** command.
5. As each computer begins its shutdown, you will get booted out of your ssh for that computer and return to the prompt in Tohono
6. Send the telescope to STOW if you have not already done so.

## 3. Location **“Tiger Cage”**

1. Turn **“OFF”** the CHILLER.
2. Turn **“OFF”** the CSM.
3. If there is an extended time before you will be leaving, operate the vacuum pump while the camera is warming. This may take several hours. See the the Wiki for instructions on proper use.

**DO NOT POWER OFF THE UPS UNTIL THE VACUUM HAS BEEN PUMPIED DOWN, THE VACUUM HAS SPUN DOWN AND THE UNIT TURNED OFF!**

4. Press and hold the “OFF” switch on the UPS until the unit powers off.



5. Unplug the electrical cables for the Chiller and UPS from the wall outlets next to the wall fan. DO NOT unplug the compressor, air dryer or the network. The air dryer should be left running at all times! Confirm that the flow rate of the air dryer is 1.0 (One) cubic foot per minute or more.

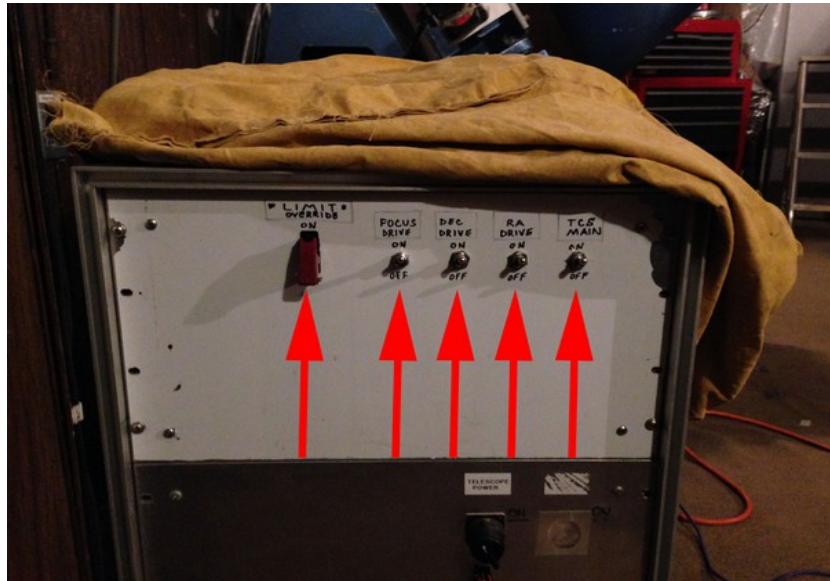
In cold weather, CONFIRM the radiator is still plugged in and on the lowest setting.



4. Location: **“Dome Floor”**

**(IF you had forgotten to send the telescope and dome to their stow positions, head down to the warm room and send them to stow NOW! Once you are sure that the telescope and dome has stowed you may now disconnect and exit the TCS GUI.)**

1. Attach the dust cover to the end of the dew shield.
2. If you have not already done so, close the dome slit.

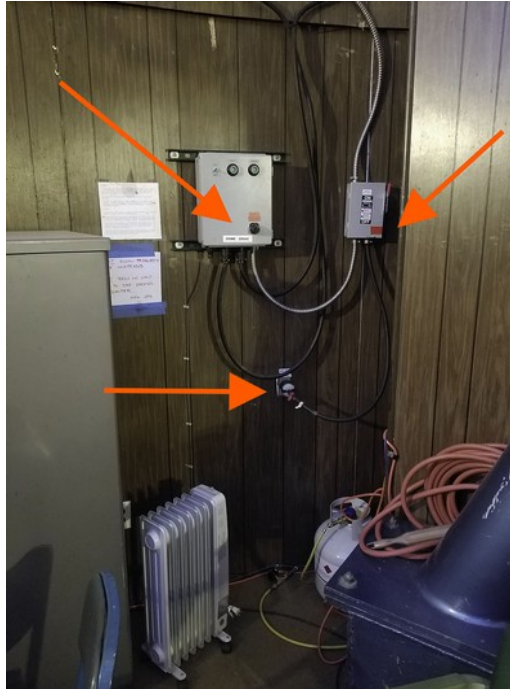


3. With the telescope and dome at their stowed positions, turn OFF the Focus Drive, RA & DEC Drives, and the Main TCS Power switch.

Cross over to the west wall of the dome and,

4. Turn OFF the rotating power switch on the Dome rotation box.
5. Place the Knife Switch on the “Service Disconnect” box to the right in the OFF position.

6. Unplug the “**DOME**” **power cable** from the wall outlet.  
DO NOT unplug any of the other connections here!



7. Disconnect the Cable from the CSM on the cable harness on the mount's yoke.



8. Unplug the **“Dome Encoder”** connection on the north wall. (This is the only encoder connection that needs to be disconnected now.)



5. Location: **“Warm Room”**

1. Close the TCS GUI if it is still open, as well as any remaining programs.
2. Power off the control computer.
3. Press and hold the **“OFF”** button on the **UPS** until it powers down completely.
4. On the west (left) side of the telescope pier, **unplug the UPS** power cord.



The telescope & associated systems are now in **FULL COLD Shutdown**, a Lightning Safe Condition.