**Checklist: 1-m Telescope Operations (Oct 2020)**

1. Open the dome leaving the drop down shutter in the “down” position (unless you are sure that low altitude viewing is needed). To raise the “upper” shutter ONLY, pull down on the rope to the right of the shutter while the “upper” shutter is activated and raised.
2. Turn on the power to the telescope (lever on telescope base) and remove the two covers: baffle and secondary mirror. Ensure everything is clear of the telescope.
3. Check to make sure the two emergency stop switches are not engaged.
4. On *Milky Way*, open the “Plane Wave Shutter Control” program in the taskbar. Connect “Comm 3”, and open the shutters (4 petals).

* make sure to select the newest version of Shutter Control pinned to the taskbar
* **when the temperature is BELOW freezing** you may need to disable the current limit for the shutters. To do this, after a new power on, inside the Shutter Control window:
  + - * Select TOOLS
      * Select Low-Level Control
      * Select Option Disable Current Limit. You should now see the numbers at the bottom update to 00 00 01
* note that in this mode the actuators have the potential to damage the telescope or themselves so only use in COLD conditions and make sure the telescope is CLEAR.

1. Open the “Plane Wave Interface” (PWI for short) in the taskbar. In the “Mount” tab, connect to the telescope. Click “Enable Az” and “Enable Alt” to be able to remote control the telescope’s azimuth and altitude motors.
2. In the M3 (third mirror) tab, go to your desired port. The port currently in use will be green and say “Port X active”. To change ports, click the port you would like to go to. For visual observing, go to Port 2. For astrophotography, go to Port 1.
3. For visual observing (PV and tours), the telescope is sufficiently connected.
4. The location where the telescope is pointing is represented by the green circle with crosshairs in the “Sky Viewer” tab on the right of PWI.
5. If a desired target appears in Sky Viewer, click on it, and press, “Go To”. The telescope will then slew to the target, and start tracking. **Be sure to warn anyone on the platform that the telescope is about to move**.
6. To go to objects that do not appear in Sky Viewer, there are two options. Click “Find Targets” under the View menu, and search for your object. If your object cannot be found, use a program such as Stellarium to find the RA and Dec of your object, enter these values into Find Targets, and Go To. (Normally you will select J2000 coordinates.)
7. The same thing can be accomplished by using the “Go To” tab on the right of PWI.
8. You can tell how well the telescope is tracking by looking at the values of “Axis 0 RMS” (Azimuth) and “Axis 1 RMS” (Altitude). While tracking, these values should be between 0.07 and 0.25. The telescope has a built in “Hard Stop”, so will not go to certain altitudes (near to the horizontal or the horizon). If you selected an object lower than its hard stop, the telescope will not go to it, and you will see Axis 1 RMS have very high values. Drive to another object if this happens.
9. *On the dropdown portion of the telescope, there is a yellow cord that will hang from the dome when the drop down section is up. This cord is located at the perfect height to bump into the secondary mirror, which could damage it. When you must bring up the drop down section, pay careful attention to the location of this rope to avoid hitting the secondary mirror.*
10. A Logitech Joystick controller can be used to manually move the telescope in RA and Dec. To use it, go into the View menu, click Joystick Controller, and Enable movement with joystick. Then click the Logitech button on the front of the controller. Change the Slow Vel to 0.05 deg/s, and use the bottom left nob to move the telescope. If a faster speed is desired, press the RB button on the front right of the controller to slew at the Fast vel speed. Be cautious as to what value Fast vel is set to. You do not want to lose control of the telescope. The default speed of 2 deg/sec should be sufficient.
11. In the “Fans” tab, turn on all fans. This will cool all the mirrors to the ambient temperature, improving the seeing, which is important for quality viewing.
12. Shutting down … To park the telescope, go into the Mount tab of PWI, click Commands, and Go to Park Position.
13. Next, turn off the fans.
14. Open Plane Wave Shutter Control and close the mirror covers. Put the covers on the secondary and tertiary mirror, paying special attention not to touch the secondary mirror with the cover.
15. Disconnect the telescope in the Mount tab of PWI, and turn off the telescope.
16. Close the dome.

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