Appendix-3: Aligning the Telescope to Polaris (North Star)

1. ***DO NOT* Turn the Power On:**
2. **Remove all caps** from the finder scope and the telescope and place these in the small plastic box. Turn on the reticle illuminators if conditions are dark enough.
3. **Index markers aligned:** Move each axis so that the index markers on both axes are pointing towards each other. The telescope should now be "looking" north.
4. **If it is dark enough, locate Polaris in the sky** to see if the telescope is essentially pointing in the direction of that star.
5. **Locate Polaris in the smaller finder scope.** If Polaris is not in the finder, use the ultra-widefield box finder with the bullseye. Move the telescope in azimuth by working the two horizonal azimuth screws found near the (declination) shaft supporting the counterweight. Adjust these knobs back and forth until Polaris is located and best centered on the bullseye and then in the finder scope. One person should be doing the looking, while another individual makes the adjustments. A third individual could be looking into the main telescope's eyepiece. The fourth individual should be reading the directions.
6. **Loosen the altitude screw** (front of mount) and work both the from and back adjustment screws together to raise or lower the mount to center Polaris. A readjustment of the azimuth may also be necessary.
7. **Center Polaris in the telescope eyepiece:** Look through the main telescope and use the same procedures to adjust Polaris, so that it is located in the center of the eyepiece's field of view in the main telescope. The last three

procedures could be accomplished simultaneously. See below.

8. **Aligning as a team:** One person looks through the finder scope; one person looks through the main telescope; one person controls the azimuth screws, and one person controls the altitude screws… **Do not perform altitude and azimuth adjustments simultaneously.**
9. **Tighten all screws uniformly** once Polaris is centered in the main telescope. This may include the screw that attaches the equatorial head to the tripod. Keep watching Polaris in the main telescope to make sure that all screws are tightened to similar tensions and that Polaris remains in the center of the field of view in the main telescope.
10. **Check the finder scope** to make sure that Polaris is also located in the center of its field of view. If Polaris is not centered, adjust the finder scope's alignment screws so that Polar is centered.

Syncing the Mount and Telescope to the Sky

1. **Turn on the power switch of the telescope.** The Power Tank should have been turned on previously.
2. **Set the time and date:** Follow the instructions displayed on the hand controller to set the time and date. Your latitude and longitude are already inputted into the system. **Use atomic time for best precision.**
3. **The hand controller will display "2-star alignment." Press ENTER**, and it will pick a star. **Press ENTER** again, and the telescope will begin slewing to that object.
4. **Center the star in the finder scope:** When the scope stops and the propeller on the right side of the hand

controller stops twirling, look through the finder. Move the telescope using the Up-Down-Right-Left arrow keys on the hand controller, so that the bright alignment star is centered on the crosshairs of the finder telescope. Then make sure the star is also in the main telescope eyepiece. **Press ENTER.**

5. **Center the star in the main telescope:** Perform the same procedure with the hand controller; but this time, look through the main telescope. The telescope will move more slowly. Position the star in the center of the eyepiece. **Press ALIGN.**
6. **The controller will suggest a second alignment star. Press ENTER.** The telescope will slew to that star. The procedure for the first star alignment using the finder scope first will be repeated. When centered in the finder, **press ENTER**. Center the star in the eyepiece of the main telescope and then **press ALIGN**.
7. **Calibration stars:** The hand controller will then ask if you would like to repeat the procedure for several calibration stars. **Press ENTER**, and the hand controller will select the stars for you. Follow the same procedure. **Press ENTER** for the finder scope alignment. **Press ALIGN** when the star is centered in the main telescope. This will be repeated for three or four stars.
8. **Telescope ready:** When the internal computer believes the telescope to be properly aligned, the hand controller will display **"Advanced VX" or "CGEM ready."** You are now set to take control of the universe.

August 8, 2024

NOTES