Restoring the UMD Heliostat

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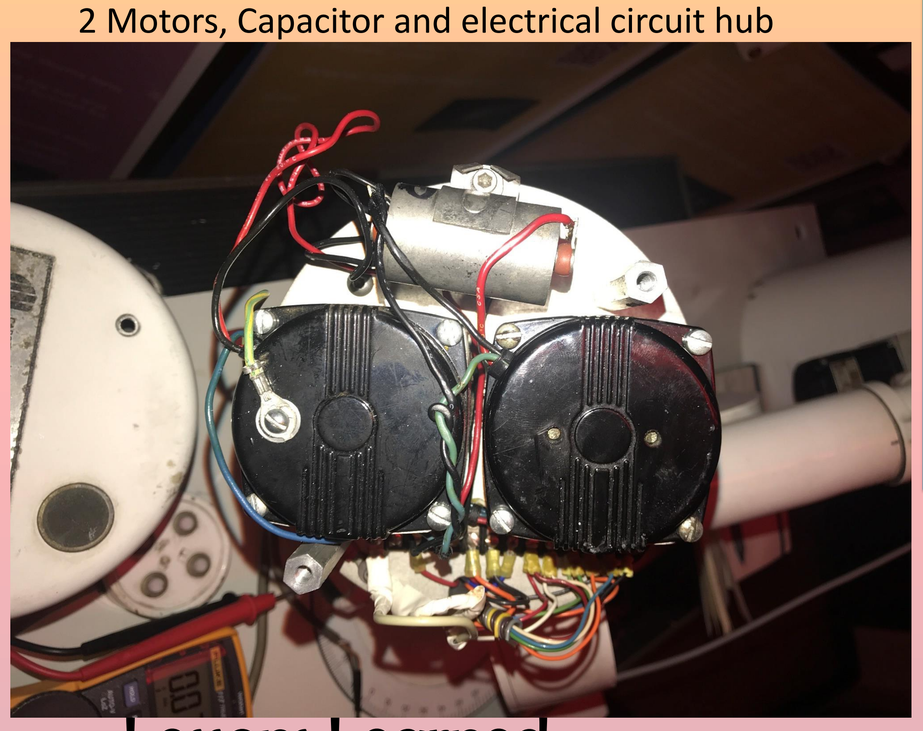
Introduction / Description

The purpose of my project is working to fix the 60-year old Helioscope at the UMD observatory.

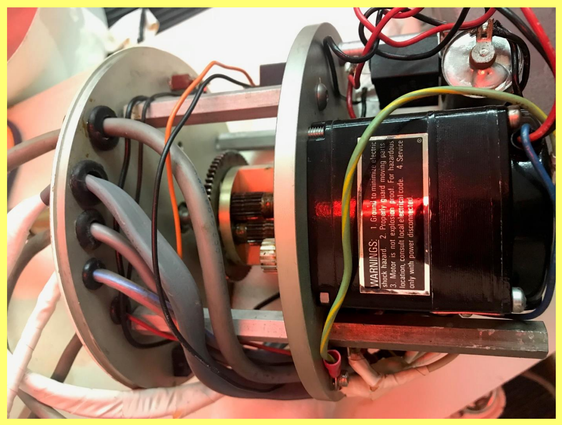
The Helioscope has been out of commission for the last 2 decades.

My approach was to take careful measurements to find out what is not working and what needs to be repaired or replaced.

2 Motors, Capacitor and electrical circuit hub



Uncovered Control Hub



Primary Goal:

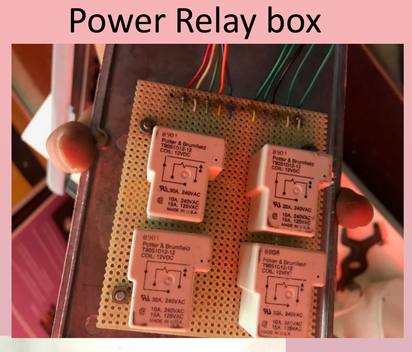
My main objective was to restore the helioscope to working order. The ultimate plan was to use the heliostat to set up livestream of the sun to a monitor in the Atlantic building. I started by taking measurements and observations, took the output of each electrical component and made a diagram to try and find the disconnect.

Notable Milestones

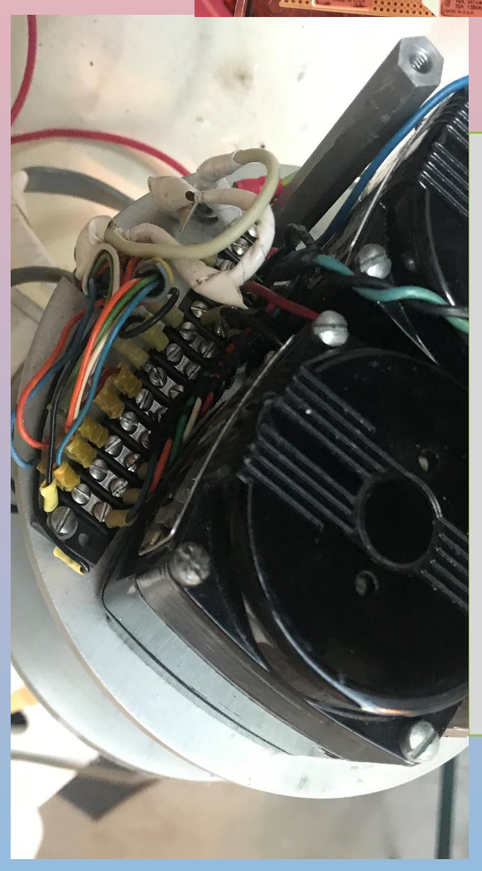
- **Soldered Front motor wires back together**
- **Created Wire Diagram with Volt and Amp measurements**
- **Replaced dead switch with new LED switch**

Partially Dissembled Helioscope

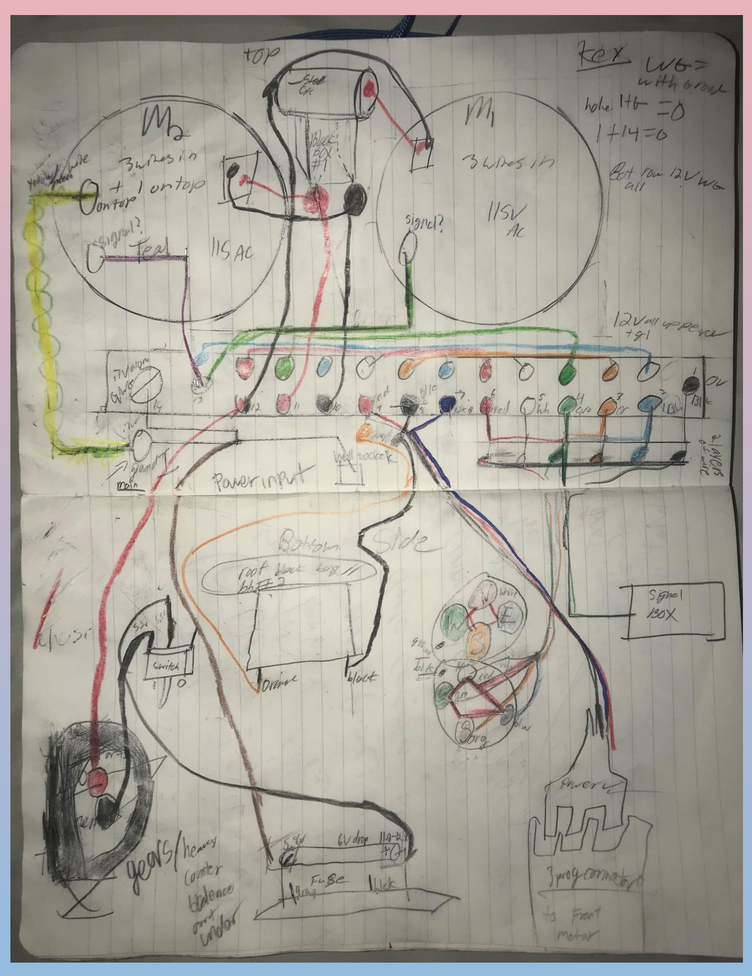
Power Relay box



Central Wire Bar



Hand Drawn Circuit Diagram



Lessons Learned

Through the process of classifying each component I learned a great deal about electrical circuits.

- **I learned about rectifiers and how they convert AC to DC power.**
- **I spent a lot of time working on the switch to discover it needed to be replaced**
- **Learned about stepping motors and how they differ from conventional motors.**

Final product

Due to Covid-19 and the quarantine, the Heliostat is not yet operational. The Heliostat is however, in far better shape and condition now and will be much easier for the next person to repair it.

Acknowledgments :
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