**Final Prototype Test Report**

To: Professor Pisano

From: Team 15

Team: Team 15

Date: 4/18/24

Subject: Final Prototype Test Report

1. **Reflector Control System + Webserver Pairing**
   1. **Set up**
      * **Reflector frame is fully assembled with sliding elements properly attached/ reflector panels have been attached at the rotating corner pieces of the face plates and lower bar sliders. The ball screw and stepper motor are attached to both sides of the frame to move the reflectors up and down.**
      * **The control system (including soldered/prepared PCB) is connected to the reflector system, allowing light sensor output to be sent to our web application.**
      * **We confirmed the reflector control system code is properly uploaded to the pico w being used for the test.**
   2. **Pre-testing Setup Procedure**
      * **The team checks to ensure that all parts of the system are properly connected and that sliding parts move as intended/without resistance.**
      * **We experienced a delay in our system functioning while setting up for today’s testing, but it was remedied before beginning our demonstration.**
   3. **Testing Procedure**
      * **We initialized the program and then ran the demonstration program, which moves the reflectors incrementally as our system searches for the optimal position. It does this by averaging the output from our two light sensors, and moves towards the direction in which it determines a greater total of received light. In a static environment, like the senior design lab, this results in the reflectors moving all the way up and down cyclically through their full range of motion.**
   4. **Measurable Criteria**
      * **Reflectors moving smoothly in synch**
      * **When hit, the limit switches cause the system to stop and reverse directions**
      * **The system visibly responds to change in light measured by the BH1750 sensors**
2. **Conclusion**

**We have put together a functioning proof of concept for our client as requested. Our prototype system demonstrates the functionality of this solar panel configuration, namely the use of reflectors to direct additional light to the panels. While there is still some improvement and polishing to be done in preparation for ECE Day, we have successfully demonstrated a functional prototype with a full range of reflector movement. Combined with our robust web application, we have done our part to advance the state of our client’s research endeavor. We have prepared his main team and any future senior design teams brought onboard to make continued advances as we have given them something to truly build off of.**