Work Completed

Over the last week our team worked to finalize the designs for all movements of the easel, and over the weekend the easel was welded together. Three main parts, the base, the platform, and the frame are now assembled. These pieces are integral to further completion of the project. Now that they are constructed, they can be put together and we can see how exactly the actuators and wiring systems will be installed. Currently, the tilt actuator and vertical motion actuator are ready to be installed into the frame. Their locations in the easel have been determined and the design fabricated around them.

I also sent an email to the engineer at P-Q Controls to check on the status of the joystick and to make sure that he received all necessary information from our team in order to manufacture it. His response informed us that it was scheduled to ship on February 23rd. Once the unit arrives we will be able to begin wiring the easel and installing the actuators.

One problem that surfaced with the new horizontal motion screw drive was the lack of ability to regulate the range of travel. As a result, I researched a system for installing limit switches at both ends to prevent the carriage from traveling past its limit. These limit switches will be installed with a diode. The diode will allow the current to be
reversed to the actuator (to reverse the direction) once it has tripped a limit switch and is stopped.

Two additional relays were also found in the lab among extra supplies. Because these did not have the base attachment, two were ordered from Jameco Electronics along with a rocker switch which will be placed alongside the joystick so that the client can turn it “off” when not in use and to prevent any accidental movement. A picture of the relays and base, as well as some limit switch choices can be seen in Figures 1 and 2 below.

![Figure 1: Relay and Socket](image1.jpg)

![Figure 2: Limit Switches](image2.jpg)
Future Work

Over the next week I will be wiring up a joystick, relays, actuators, master switch, and motor to ensure that the entire electrical system will work without problems. I also plan to try the limit switch system, complete with diodes, to ensure that it functions as expected. Hopefully, the last two relay sockets and rocker switch will arrive so that they can be included in the setup. This wiring will be temporary until the components can be installed into the easel at which point we will be concerned with neatly running wires and ensuring that their location does not interfere with any moving parts.

We will also be assembling the easel parts including the base, platform, and frame. These pieces are currently assembled individually. In the next week we will begin assembling them together and determining attachment points for the actuators, ensuring the collapsing feature functions as expected, and also finalizing designs for a box which will enclose and house all the electronic components including the relays, sockets, wiring, master switch, and emergency switch, and also deciding the best location for the box.

Lastly, we will continue research on a power supply for the project. We will need one that is capable of converting 120 volts AC to 12 volts DC and maintain 6 amps of current at 12 volts.

Project Review

The project seems to be coming along quite well and we feel that we are on schedule. Our aluminum tracking order that was missing has finally arrived and we can begin to use that material. Now that we have a larger portion of the easel assembled
we can also move forward with the fabrication and finish working out any additional
problems that may surface as we go along.

**Hours Worked**

Around 2 hours was spent looking for the appropriate relays socket and also for a
rocker switch that can be used with the project. Five to six hours was spent in the lab
finalizing the pieces of the easel so that they could be welded together over the weekend.
We also tested some limit switches and did some research on their current capacity.
Total time for the week is around 8-9 hours.