Project Identity

Easelectric

Week #6

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Work Completed

This week our team finished the assembly of the frame of the easel. The only major piece remaining is the attachment for the canvas as well as the vertical and horizontal motion assemblies. Each part is being built individually and then, once completed, they whole easel will be assembled. We also began drilling holes for the base and frame attachment points.

Personally, I spend a significant amount of time test wiring the electrical system for the easel. An order was placed to Jameco Electronics for the final two relay sockets and a rocker switch to use used with the joystick. Unfortunately they had not arrived before I test wired the electrical system; however, I was able to connect wires directly to the relays to allow them to work. The system is connected as follows: A +12VDC power supply is run in series through an emergency kill switch, which when activated, will completely sever all power to the easel. This then runs to the joystick to one terminal on each of the four microswitches and the toggle switch. This supply power also runs through 3 separate 2amp circuit breakers (one for each actuators/motor). From each breaker, two separate relays are powered. A ground wire is attached directly to the relays, and the outputs of each set of relays are wired oppositely (to reverse polarity to the
actuators/motor). The positive output from each microswitch (when triggered) is used to activate the relay coil. The use of the relays requires that the joystick to only handle a few hundred milliamps of current while the relays will carry a maximum of up to 2 amps. A picture of the wired relays is shown below.

![Relays Wired for Testing Purposes](image)

**Figure 1: Relays Wired for Testing Purposes**

We were excited to find that the electrical system works exactly as planned and no shorts or circuit problems were found. We are confident that this system will work well when the final wiring into the easel is completed. We also considered many safety aspects as far as the circuit is concerned. A master key switch will eventually be added as well as the rocker switch once it arrives. A picture of the electrical system wired for testing purposes can be seen in the following photo.
Future Work

Over the next week I will be finalizing orders for any additional electronic components needed. We will also be working to finish designs and built an enclosure for the components that will fit into the easel itself. This enclosure must fit nicely into the easel and still allow it to collapse as planned. Also, we will need to choose a final method to connect the joystick to the easel. Most likely there will be an enclosure for the joystick which will have a wire with a plug attached. This wire will be plugged into the easel which will connect it to the rest of the electrical system. We also need a way to attach the joystick to the easel.
Project Review

The project is coming along quite well and we feel that we are progressing quickly. The easel will be fully assembled soon and then the electrical system can be added and wired. This will leave us some time to test our easel and ensure that its safety and function are adequate. Once the relay sockets arrive we will be able to include them in the electrical system as well as the toggle switch so that our client can “turn off” the joystick to prevent any accidental movement.

Hours Worked

Wiring the electrical system took roughly 4-5 hours to complete and get working as expected. An additional 2-3 hours was spent considering designs for both a joystick enclosure and an electrical components enclosure. Lastly an hour or so was spent purchasing some supplies needed for grinding some parts of the easel. Total time for the week is roughly 8-9 hours.