Easelectric
Group #4

Weekly Report
Week #3
February 10, 2006
Adam Ross
**Work Completed**

This week saw the first actual engineering challenge of the project; however it was a rather simple one. We had ordered three six-inch linear actuators with the intention of using them for vertical, horizontal and tilt motions. However, upon closer consideration the team came to the realization that the 3 inches of travel in either direction when using a 32-inch wide canvas is completely negligible. We did not want to return the actuator due to the high cost and the amount of time required to exchange the part, so Frank and I designed a lever system to amplify the movement of the actuator from a mere 3 inches in each direction to around 6 inches in each direction, allowing us to cover a larger portion of the canvas (figure 1). The lever is pinned 1 inch from the end acted on by the linear actuator and the easel is fastened to an arm 3 inches away from the pin. More tweaking of this system may be needed in the following weeks in order to achieve the range of movement needed.

![Amplified Movement](image)

**Figure 1. Simple Representation of Lever Mechanism**

Also designed this week was a box that will contain the electrical relays powering the linear actuators (figure 2). There also is the possibility that the box may contain the
power supply as well, however a final decision has not yet been made on which supply to use.

Figure 2. “Fold Up” Representation of Bottom Portion of Electrical Box

Figure 3. My Hacksaw and Grinder that was brought up to do Work in the Lab
Future Work

Additional tweaking of the lever mechanism will be needed over this week and perhaps many more weeks to come. Additionally, the adding of the lever mechanism adds another moving part to the easel, making it potentially dangerous. A significant amount of consideration must be taken to insure that the device is safe and there is no chance of being hurt by the moving parts. Also needing to be done this week is to make a final decision on the electrical components. 12VDC 3A relays have proven to be nearly impossible to find, and when we have found them the expense has been tremendous. We may decide to go with 10A relays, even though they’re overkill, simply because they are cheaper. A final decision must also be made regarding the power supply to be used on the easel. We have several options in mind.

Project Review

For a third straight week in a row we are making excellent progress on the easel. Earlier this week Jon was able to obtain a custom joystick from P-Q Controls in Bristol, CT free of charge. This joystick is a regular 2-axis joystick utilizing micro switches; however it has an added rocker switch on top that will control the tilt functions of the easel. After finding out that our client has the use of only one arm, it became even more imperative that we create a control system for 3 movements that can be controlled using only one hand. We feel like this joystick is an excellent solution to the problem at hand. Additionally, we are waiting for our misplaced 80/20 order to arrive so that we can assemble the tracking for the easel. Once this is arrived we will be able to join two major
pieces of the device together and finalize the placement of the remaining features of the device.

**Hours Worked**

Design: 4 hours

Lab Time: 4 hours

Research and Paperwork: 3 hours

*Total Time: 11 hours*