Easelectric

Week #2

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Work Completed

In the last week our team began assembling a model of the design. Over winter break, Frank began work on the base of the easel since he was first to obtain the materials. The base was set up in the lab and then the rest of the easel was modeled using cardboard in order to present an overall design and to help visualize the look of the project. The cardboard is easy to assemble and can fairly accurately provide an idea of how the completed project will function. We observed a few design areas of the project that will need further development, such as the mechanism for clamping the canvas to the easel. Also, we realized that we needed an additional piece of tracking for the slide mechanisms.

In addition to the construction of the easel itself, consideration was given to the electrical control system. In order to stay within the project budget, the in/out (z-direction) movement had to be eliminated. The easel will still be able to be adjusted in this axis, however it will no longer be motorized. This in turn, changed the joystick design. Originally, two joysticks were to be used, each with 2-axis motion, thus providing control of 4 actuators (4 axes total). However, with the elimination of one actuator only
three controls are necessary. This in turn would leave one joystick with 2 axes of which only one would be used.

Our group did however, come across another joystick which utilizes 2-axes of motion as well as a toggle switch which can be seen in Figure 1 below. This design is well suited for our project. It provides control for 3 directions of motion in one joystick. Unfortunately, the joystick is analog, and after some initial testing, we realized that it may not be able to be used for the project due to the method in which it functions.

![Analog Joystick with Thumb Toggle Switch](image)

**Figure 1: Analog Joystick with Thumb Toggle Switch**

**Future Work**

Over the next week, plans are to complete the cardboard model and ensure that we have thoroughly designed all necessary pieces. Any existing problems should be redesigned and solved as well as look for any additional problems that may arise. A wheelchair will also be brought in to allow us to test size and movement limitations of
the easel, and ensure that it will work with our client. In addition, we will also complete
design of the track mechanisms and most likely submit a purchase order for any
additional items needed.

As far as the electrical system, we will be contacting the manufacturer of the
joystick to price and check availability of a digital joystick that utilizes microswitches
and will be much more suited for our project. This joystick should be configured with
the toggle switch.

Project Review

So far, the project is on schedule with our groups plans. Over the last semester a
solid design was made and initial work has finally begun. The base is completed as
designed and the electrical design is also finished. It was unfortunate that the project had
to be simplified in order to meet budget restrictions, however this will allow us to better
construct the overall project. The joystick problem has not hindered the design of the
project, but merely enticed our group to find a more efficient means of controlling the
easel. The original design, however, is still completely feasible.

Hours Worked

All together as a team our group worked roughly 5-7 hours over the last week,
however individually, a number of additional hours were worked. The base of the easel
took in the range of 20 hours to complete. Obtaining a wheel chair and bringing it to the
lab as well as testing the joystick and designing a mechanism for the canvas clamp also
required a number of hours. Additional time was spent researching alternate joysticks and
relays.