Work Completed:

The issue of limited horizontal movement was tackled more over the past week, as last week’s designs were reviewed and analyzed. Unfortunately, the problem maintains a lack of horizontal range for the canvas. Our actuators account for only six inches of travel, which was thought to be justified, using a lever system Adam and I developed last week. However, this required swing arms and more cluttering of parts from the front of the easel. It would also add weight hanging off the front of the tilting arms that may build up a rather large moment about the pivoting points. The ideas from last week were scrapped due to these measures.

Fortunately for us, while I worked on grinding down parts for fabrication in the stock room, our team came across a screw drive set up, with a horizontal span of 24 inches which would perfectly fit the width of the easel. Using the gear motor in our inventory, the drive was tested and works beautifully. Its speed is still slow enough to control and really matches the design of the project. I began taking dimensions of the preset bracket holes on the back of the drive, and worked on plans to attach it to the vertical channel pieces originally planned for the design.

On Tuesday I headed down to the shop once again and punched holes in a piece of 1.5” by 2.5” angle that was originally going to be used as the bracket for the horizontal motion. These holes will match up to the ones on the back of the drive and fit nicely off the front of the easel.
I also cut end caps to all the tubing parts of the base.

Still awaiting the arrival of the 80/20 track that will tie the base components and carriage together, the rest of the preliminary fabrication steps was completed.

Future Work:

This Saturday I will be heading once again to the welding shop where most of the carriage will be welded and assembled. The 80/20 track will be in and cut to lengths as well. Designs on how the canvas bracket will attach to the drive, as well as a box to enclose and attach the gear motor will be designed. Having an extra actuator may mean we can have an automatic forward and back motion as planned in our initial designs.

Further testing of the gear motor and screw drive will also proceed next week. Incorporating the amperage required to run the gear motor may differ than the actuators required power, resulting in more analysis of the circuit design.
Project Review:

The addition of the screw drive was a huge lifesaver for our project. The problem of limited horizontal range has been eliminated. The only foreseeable problems include a more complicated circuit design, and a heavier contraption hanging off the front of the easel. We will need to test the strength of the 80/20 clamps so slipping of the bearings will not occur.

Hours Worked:

The past week, about 10 hours were spent on the project. Next week will have much more time, as much of the fabrication will be completed.