Work Completed:

The final week of the device’s fabrication was spent finishing assembling some of the minor components which needed to be built after most of the main parts of the easel. I spent the last day at the shop welding little odds and ends that needed to be finalized before the device could operate successfully. This included making handles for the underarm clamps of the base, fabricating a bracket to connect the easel face to the 80/20 track, and making a coupler for the gear motor to connect to the screw drive.

The original plans were to weld the gear drive of the motor to the screw drive assembly. After some theoretical analysis, welding was determined to be an inefficient way of connecting these parts, as the weld may distort the perfect alignment needed for these too intrinsic parts. Instead I was able to find two small pieces of pipe which matched each of the two drives, and tapped each side with a hard milled steel tap. The next step involved finding small bolts to fit the tapped holes which would clamp the coupler to each drive, connecting the screw drive to the gear motor. Using the box Adam made, I bought self tapping screws and using the ¼” threaded rod connected the box to the motor, and screwed the box to the end of the screw drive.

The handles for the clamps were made using the same “round peg through a square hole” idea from the vertical rods. Two small pieces of half inch tubing were welded to the threaded rod of the clamps. Rods were then sent through the tubing and sphere heads cut from steel pegs were used to keep the rod from sliding out of the tubing. A MIG welder was used for these steel parts.
The bracket for the easel face was also constructed. A piece of 2” steel pipe was cut 4” long and notched to fit the 80/20 tracking. This pipe will house the bracket connecting the screw drive to the tracking. Small 1” x 1” pads were welded to the ends of the pipe as seen in the figures below. Finally, a 10” long piece of 1” steel angle was welded level across the top of the pipe. Holes were drilled through the top and bottom of the angle for the back tracking of the easel’s spine to slide up and down for more of a manually adjustable vertical range.

Future Work:

Final touch ups and patient testing of the device are left for next week. We are expecting plastic end caps to go into the top tubing pieces which are being shipped within the next week or so. The easel has been planned to be painted dark blue, keeping the
UCONN theme in the design. Last minute touch ups and other small tweaks in the devices operation may be worked on in the next week or two.

Project Review:

With all of our parts now in the lab, we can successfully complete the fabrication of the easel. A few problems still under consideration for failure include the damped movements of some actuators and the end of the screw drive due to friction of the slides and bearings. This was caused by the aluminum's tendency to warp under the extreme temperatures of welding. Through careful filing, sanding and grinding of these integrated parts, smoother motions will come about. I do not see anything too severe to hinder the completion of the device over the next week or so, and I certainly expect a great final product.

Hours Worked:

I spent 20 hours the last week welding the feet of the carriage, stopper on the tilting track, assembling the handles, coupler, easel face bracket, finding/buying self tapping screws, extra hardware, threaded rod, pins, and time spent commuting.