

MSD 2 Weekly Status Report

Week 4 (3/31-4/6)

Firstly, the piston cylinders arrived this week. There was one problem with them, the pistons being used for the pump were spring loaded and the pistons for the manipulator did not have springs. This was opposite of what we wanted. After opening up one of each, we determined that it would be easiest and fastest to just remove the spring from the pump cylinders and purchase springs for the manipulator cylinders. The springs have already been ordered and should arrive Monday. This method also gave us more control over the spring rate to minimize the stress on the lead screw. And since the piston was originally selected so that the range of motion exceeded the customer spec, we had extra room to fit the spring in the cylinder while still meeting the spec of 1 cm. However, there is almost no margin of safety with respect to that specification anymore.

Our other limiting piece of hardware, the lead screws, has shipped and is in transit to campus. We expect to receive them early next week. Once received, we can perform the necessary operations on them and then begin assembly of the pumps. The rest of the update follows the normal format stating our goals for this week, our progress towards them, and our goals for next week. Also, our gantt chart has been uploaded to edge that has some visual indicators of our current status vs. the plan. Also all previous updates as well as tracking documents for build status are on the site as well. They are under the page titled "[Build, Test Document](#)".

Goals for the current week:

- Complete machining all parts
- Begin assembly of the manipulator subsystem. A stretch goal would be to begin testing this subsystem by Friday.
- Control the motors via software as opposed to showing movement through the test chip.
- Come up with an outline for our technical paper and a basic layout for our project.

And here is what we accomplished in relation to these goals:

- There is still some machining that needs to be accomplished. Some parts took longer than anticipated. All that is left is locating, drilling, and tapping holes. The lead screws have to be machined as well, and they have not arrived. In a second tab in the attached excel sheet is a machining tracking document. This is also posted on EDGE
- Since there are one or two parts to be machined still, the manipulator has not been fully assembled. We will assemble next week.
- Sabine has the microcontroller and the PC sending signals to each other now. And the microcontroller is processing the signals and setting the values that the driver chip needs. Now that this is done not much more will need to be done to start driving the motor. And she also has her program interpreting input signals from the joystick.
- The paper outline is complete and we have a poster template. We sent these to Bill earlier today for review.

Week 5 Goals:

- Complete machining all parts by Wednesday at the latest
- Assemble the manipulator. This should happen Monday or Tuesday based on our current status
- Have computer program drive the motors through the microcontroller.
- Begin assembly of the pump system. This is pending arrival of lead screws and completing of machining of these parts.

These goals align closely with our MSD2 Gantt Chart. The pump subsystem is slipping slightly behind, but there is enough extra time cooked into the plan that we should be able to recover at this point.

Budget Update:

We have not placed any more orders since last week so this is the same as before.

Spending charged to ME account: \$1476.12

Pending charges to MSD Account: \$330.78

Total Expenditures (including pending charges): **\$1806.90**

Remaining Budget: **\$693.10**

Note: the springs were ordered on a personal card for ~\$16 and we will seek reimbursement for in the near future.