# CprE 492 3D Metal Printer

## Progress report 2

*1/26/18 to 2/9/18*

*Client: Dr. Bigelow*
*Faculty Advisor: Dr. Bigelow*

## Team Members:

Ben Pieper - Control Software
Caleb Toney - Sensor System
Jett Ptacek - Control Software
Kevin Oran - Mechanical Design
Rachel Shannon - Sensor System

## Accomplishments during reporting period

- Vacuum Chamber
    - Updates to Vacuum Chamber are done. Will request a second quote copying Bigelow over the weekend.
    - I feel we can go ahead and order now. All ports are NPT threaded and can use teflon seals and epoxy seals as needed.
- Velmex
    - System was redesigned to include Bislides. Quote has been requested. Updated quote is pending.
- Manufacturing
    - Spoke with Sukup and Boyd Lab. We will use the water jet to manufacture plates and boyd can tap holes and mill down the sides of the plates for us.
    - Lead time for water jet: 3-4 weeks
    - Boyd will be an online form.
- Motor control
    - Made final decision to use Velmex controls after discussion with Dr. Bigelow on 2/7

## Pending Issues

- Drawings
    - Water jet process will create a beveled edge. I need to at 100 thou to the edges and get boyd to clean the edges and tap/thread for me.
    - Need updated quote request and will copy Bigelow. This way he can handle ordering.
    - Next step is to begin part drawings for chemistry machine shop.
- Motor control
    - Need to ensure current plan to drive 2 axis system with Velmex controllers will work as desired

## Individual Contributions

| Team Member | Contribution | Weekly Hours | Total Hours |
|---|---|---|---|
| Ben Pieper | Researched alternative motor control methods, met with Dr. Bigelow to make final motor control decision | 5 | 15 |
| Caleb Toney | Began working with oxygen sensor for integration | 6 | 12 |
| Jett Ptacek | Researched hobbyist 2 axis laser printer for alternative motor control methods, met with Dr. Bigelow to make final motor control decision | 5 | 13 |
| Kevin Oran | Vacuum Chamber revisions, Design revision for Bislides, water jet and boyd meetings | 11 | 25 |
| Rachel Shannon | Worked on barometer pressure sensor for use with Arduino, researched cameras for monitoring | 5 | 11 |
| | Total Hours | 32 | 76 |

## Plans for next work period

- Sensor System
    - Continue integration into a more cohesive sensor/safety unit rather than individual sensors
    - Spend more time working with the internal oxygen sensor system.
- Mechanical
    - Order stock and finalize orders and part descriptions for Sukup and Sgt Metal.
    - Make drawings for sukup to get initial parts created.
- Software/motor control

- Write software to generate g-code for cubes of various dimensions and parameters
- Start testing Velmex control interface with controller Dr. Bigelow already has

## Summary of Advisor Meeting

Advisor meeting was largely technical discussion over a few key technical details. Specifically, discussions centered on the merits of several different motor controllers. We also took some time to look at the connections in a preexisting vacuum chamber for comparison purposes.