

## **EE/CprE/SE 491 BI-WEEKLY REPORT 1**

**Start Semester – 2/18/2023**

### **Group number:**

**sdmay23-41**

### **Project title:**

**Automated Testing Station for Sensing Applications**

### **Client &/Advisor:**

**Moneim Ismail**

### **Team Members/Role:**

**Thomas McCoy - Group Organizer, Software developer**

**Matthew Rief - CAD designs/3D printing**

**Garth Anderson - PCB designs**

**Malvin Lim - PCB designs**

### ○ **Weekly Summary**

Overall objective for this week was to get as close as possible to a testable design. Garth and Malvin continued working on PCB design, improvements, fixes, etc. Thomas continued work on the LabView program for project interface, and Matt started 3D printing components and continued work on DUT platform design.

### ○ **Past week accomplishments**

#### **Thomas McCoy:**

- Fixed PWM channel problems.
- LEDs are now dimmable
- LEDs can blink at a settable frequency or be solid
- Started framework for Keithley sweep measurements
- Cleaned up LabView program.

#### **Garth Anderson:**

- Modified the electrical schematics to include a switch for toggling ground between the two peripheral PCBs which have the LEDs. This required adding a switch on the main board which would be grounded on one end and connected to the peripheral PCBs on the other end.
- Had to change the LED circuits to share ground between LED and photodetector with a pin for connecting to the main board ground switch. This change made some switches unnecessary, which I removed.
- I also had to change the footprint for the op amp in this circuit since Mo said to use the same footprint as we would use for a 555 timer. This required rerouting everything involved in this portion of the circuit. I changed some of the pinouts for the controller to make sure that we had PWM signals for all LEDs and the motors.

- Made some other small changes like adding no connect symbols and changing labels to make the schematics neater and easier to understand. Searched the web to compare viable RGBW LEDs and choose which to use for our project.
- made the edge cuts for the peripheral PCBs

**Malvin Lim:**

- Designed a backup plan PCB that would place on top of an Arduino Uno
- Measured the dimension of Arduino Uno to get the backup PCB fit
- Tested circuits that are included in the PCB; +15V, -15V, and 0 to 5V.
- Got approximate LED and Servo PCB edge cut dimensions.
- Placed a ticket for ordering components from ETG for the project.
- Got links from Digikey and compiled an Excel sheet for ETG to get an order.
- Vitiated ETG to get an update on the component's approximate arrival date.

**Matthew Rief:**

- Designed the frame of the box
- Edited/tweaked design

○ **Individual contributions**

<b><u>NAME</u></b>	<b><u>Individual Contributions</u></b> <i>(Quick list of contributions. This should be short.)</i>	<b><u>Hours this week</u></b>	<b><u>HOURS cumulative</u></b>
Thomas McCoy	LabView programming (see list above)	6	24
Garth Anderson	PCB design improvements (see list above)	4	20
Malvin Lim	PCB design improvements (see list above)	6	22
Matthew Rief	CAD designs and 3D printing (see list above)	2	16

○ **Plans for the upcoming week**

**Thomas McCoy:**

- Continue LabView programming, get Keithley sweep data collection finalized.

**Garth Anderson:**

- Both PCBs need to be in the same “sketch”
- Have designs ready for printing on Tuesday
- Work on Shield and LED PCBs.

**Malvin Lim:**

- Same as listed under Garth.

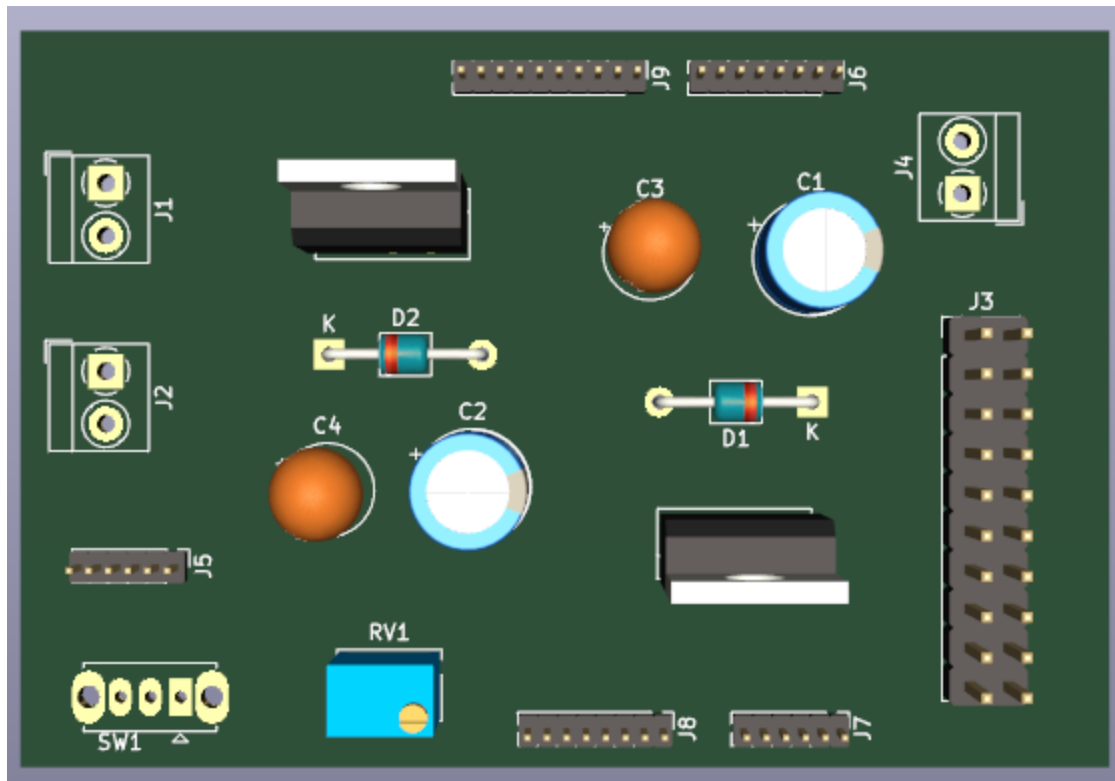
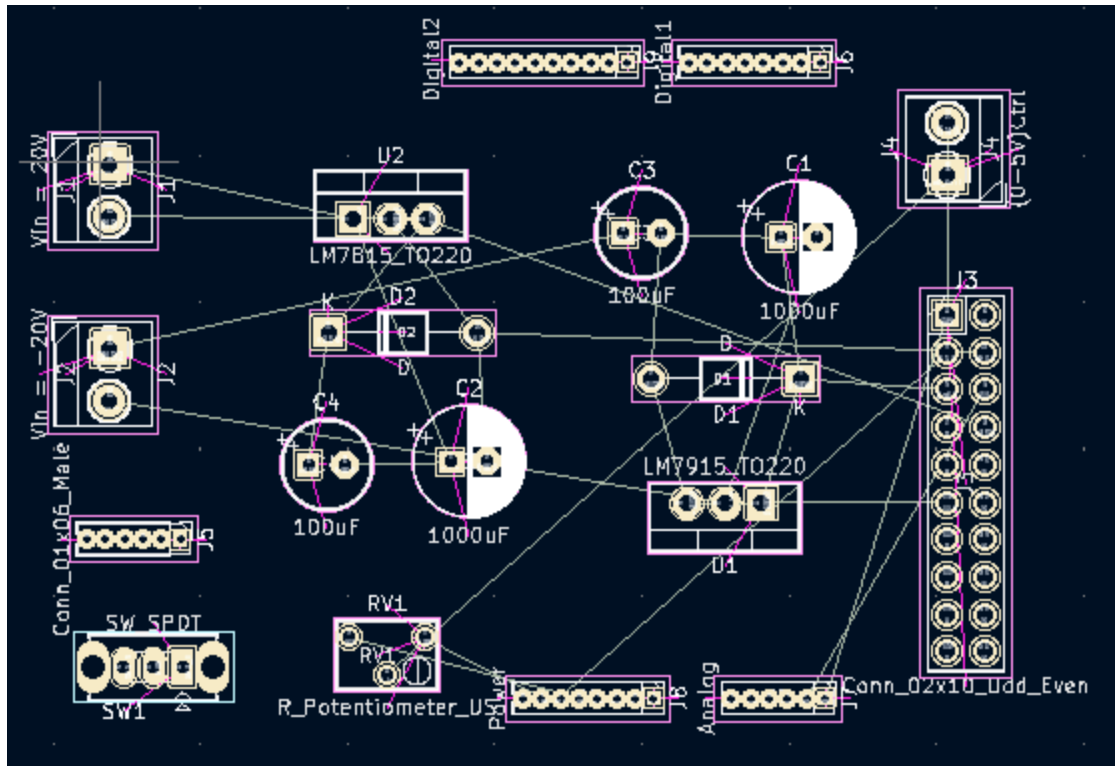
**Matthew Rief:**

- Start pressure container, update designs based on Mo’s recommendations.
- Less fill, smaller o-rings, larger overall size, etc. Get parts from Mo.
- Try to finish CAD designs.

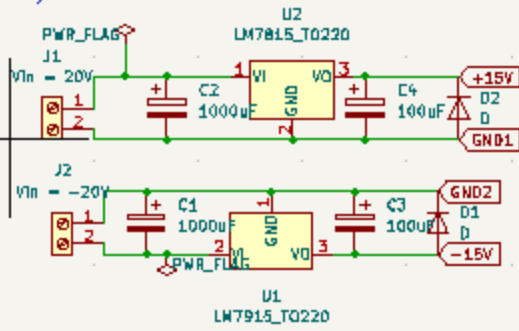
○ **Summary of weekly advisor meeting**

Discussed progress over the last two weeks (last week’s meeting was canceled due to unsafe driving conditions.) Had a discussion about possible design improvements, including for the vacuum chamber. Planned on sending PCB designs for printing next Tuesday. Parts were ordered by Malvin from the ETG. Discussed needs of each group member and work to be completed before the next meeting.

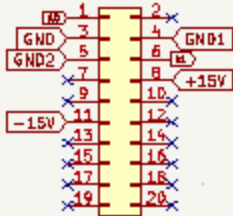
○ Diagrams



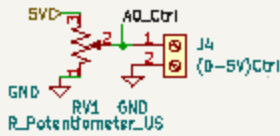
## +/-15V OUTPUT VOLTAGE SOURCE



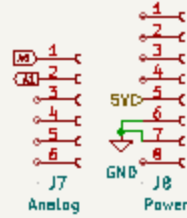
## Connector



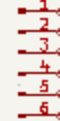
## 0-5V



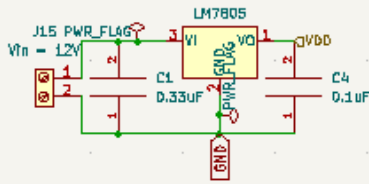
## Connector Pins



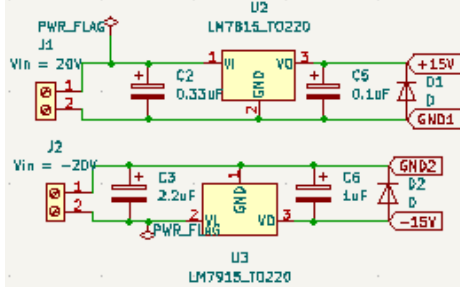
## J5 Conn\_01x06\_Male



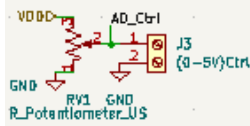
### MC VOLTAGE SOURCE (5V Reg)



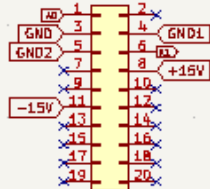
### +/-15V OUTPUT VOLTAGE SOURCE



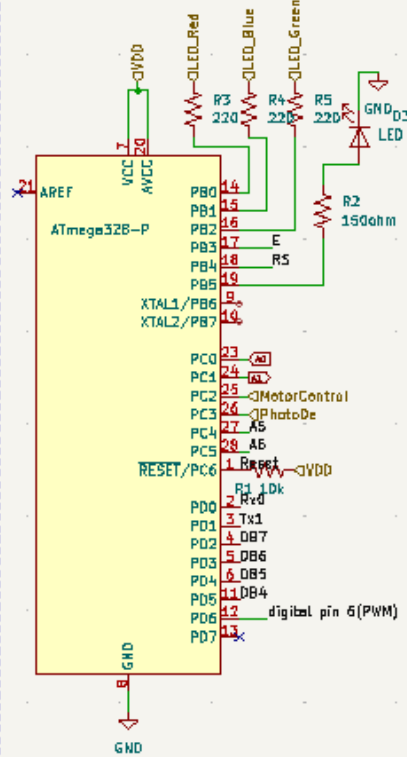
### 0-5V



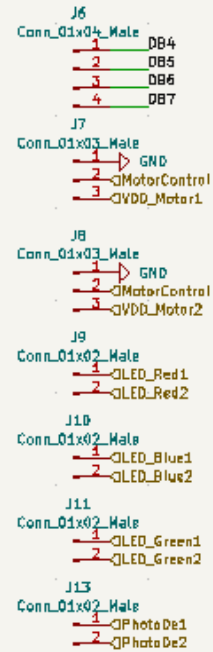
### Connector



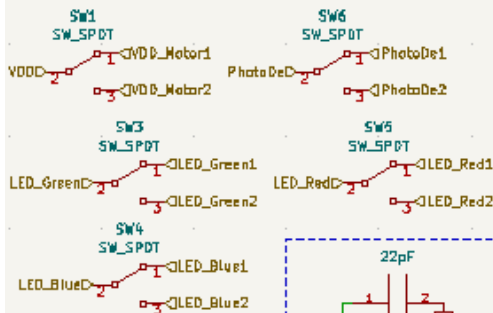
### MICROCONTROLLER



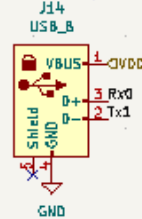
### Connector pins



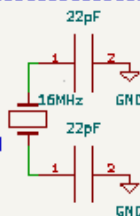
### Switches



### USB B port



### Crystal for Atmega



Sheet  
File:  
776  
Size:  
KiCo

