2/3/25 - 2 hrs

Begin researching charge circuit. Need to decide battery size. Would like to stay around 5V. 3.3V min for ESP 32. Power motor off of ESP32 or relay? Brandon needs to look on output of ESP32 above to just try to power out of esp32 is my recommendation. Really need to decide on battery prior to charge circuit. ~~After research, need to try to get a BMS ic rather than 2 separate circuits.~~ This can control the charge and discharge of the system. Thought - Use a charging IC and then just 5v input USB to linear regulator ~~(LM3940, AMS1117)~~. TLV75533PDBVR. Use an XOR gate to control whether the battery output it put to the ESP32 or whether it is disconnected. Change - Use a NOT gate for a signal wire into a relay. We can use the signal of if there is a logic one (AC) power, relay not active. 2 fold is switching circuit will need to be powered off of the battery to be usable. This implementation will not require a BMS as it will control and save the battery from charging and discharging at the same time. Just need a charging IC. Use NAND for NOT gate. IRLZ34NPBF for switching circuit (mosfet) will need NAND gate.

2/3/25 - 0.5 hrs

Addressing concerns of needing a sensor to calculate food. Want to use a hall-effect sensor for rpm calculation but can also use a TMCS1100A3QDR. This spits out a voltage that is linear with the current drawn. Put in series with motor. Would not have to undervolt the motor, but need to make sure that the load is at least 50% at empty. Linear current to load is 50%-100% load. Could get whatever motor then. Needs to be less than 5V and possibly drive direct from the ESP32. This will be a bit tricky because we will need to figure out how the esp32 will collect that data.

2/5/25 - 0.5 hrs

Battery research. Looks like a good battery to use is LP503562JU+PCM+2 WIRES 50MM - 3.7V so we must drive the motor off of 3.3 V whether that is through the ESP 32 or not. Charging characteristics need to be 4.2V, 250mA. May want temp sensor. Charge circuit found with thermal protection. WIll use BQ21040DBVR for charge IC and 103AT-4-70374 for the thermistor. Will electrical tape thermistor to the battery for good thermal measurement. Take battery dimensions into consideration when building enclosure.

2/10/25 - 1.5 hrs

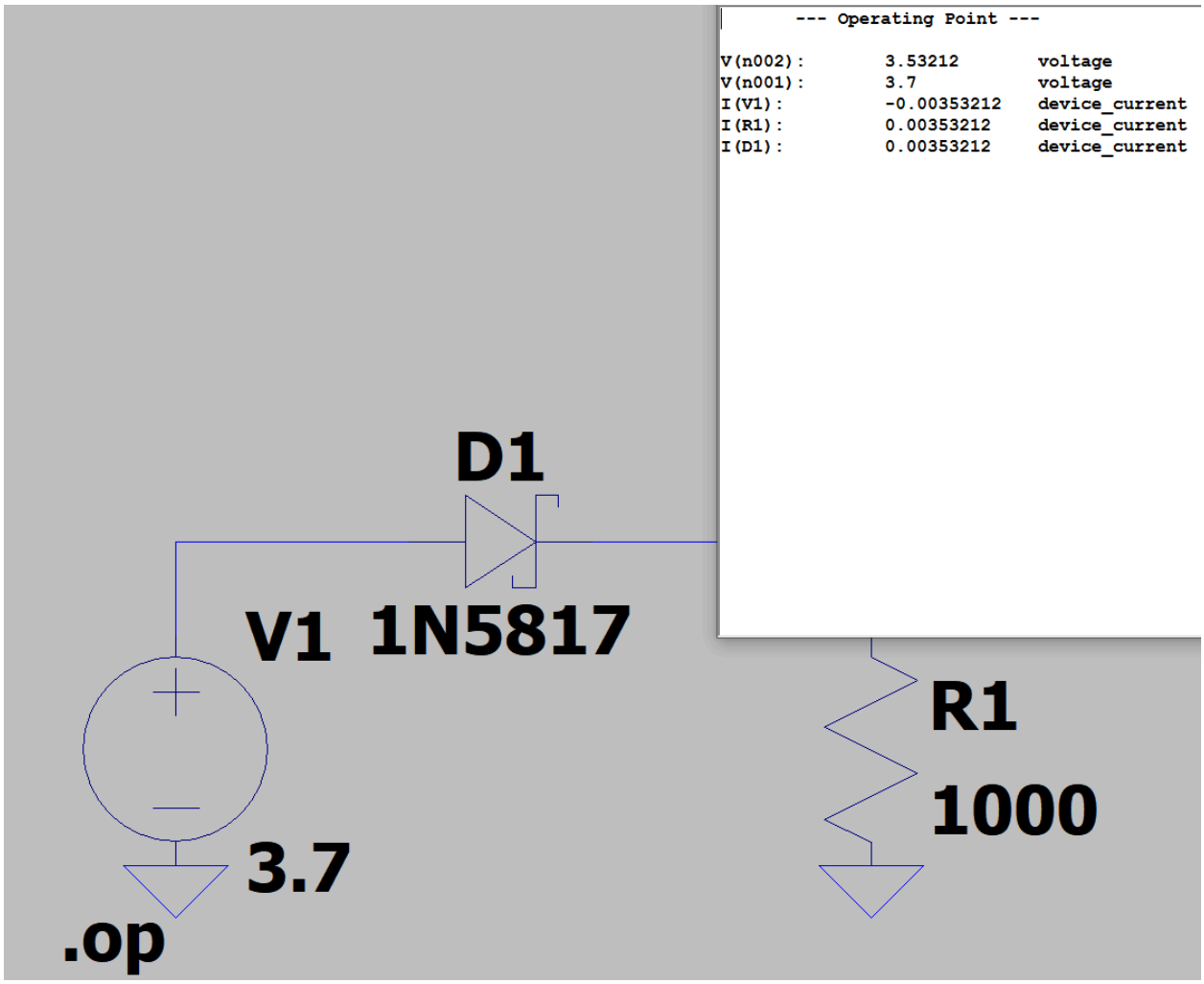
Research Hall-effect sensors along with creating block diagrams and writing proposal. Hall effect sensor will probably have to be surface mount without exposed pins. USB-C Connector
https://www.digikey.com/en/products/detail/amphenol-cs-commercial-products/12401610E4-2A/5775519

2/22/25 - 3 hours

Begin designing circuit schematic to find approximate parts to order. Will probably need a higher voltage battery. Need to rethink switching circuit https://electronics.stackexchange.com/questions/271475/switching-between-two-power-sources . Want a LTC4412 to use for switching circuit, with figure 4, but need to figure out how to set up the circuit and pick the right MOSFETS. Need help choosing mosfet https://www.digikey.com/en/products/detail/analog-devices-inc/LTC4412ES6-TRMPBF/1116052. I also need help selecting a relay/MOSFET to switch on the camera and motor to feed.

2/24/25 - 2 hours

Look for parts in self-service and research linear regulators. Place PO for motors. Need to look and find a hall effect sensor. Try linear regs we have and test diodes on simulation for switching circuit. Need to find a transistor. Get diodes and diodes work for the project.



2/26/25 - 5 hours

Work on PCB design and research the charge IC. Try to get the camera working

2/27/25 - 2 hours

Design and route PCB traces. Need to add switches, power LED, camera connectors, motor connector, hall effect connector. NEED TO ADD MANUAL FEED BUTTON FACK. Check buttons in ESHOP

3/2/25 - 2 hours

update resistors to 0805 layout, bridge connector connected, motor and hall effect V1 connector, Will add power switch in rev 2 if cant find layout, add manual feed button (needs fixed rev 2), added power LED, Power Switch to be added. Added switch dunno if right layout will fix camera connector in V2 also if functioning correctly. Need to finish routing wires tomorrow

3/5/25 - 2 hour

Test hall effect sensor. Reads 1.66 volts no field, and goes down to 1.57 and 1.75 with smaller magnet. Test motor and perfect rpm for project, work on design document

3/6/25 - 1 hour

Work on design doc and order 3D printer filament for maybe clear canister

3/7/25 - 1 hour

Make rotating canister design and deliver design to machine shop

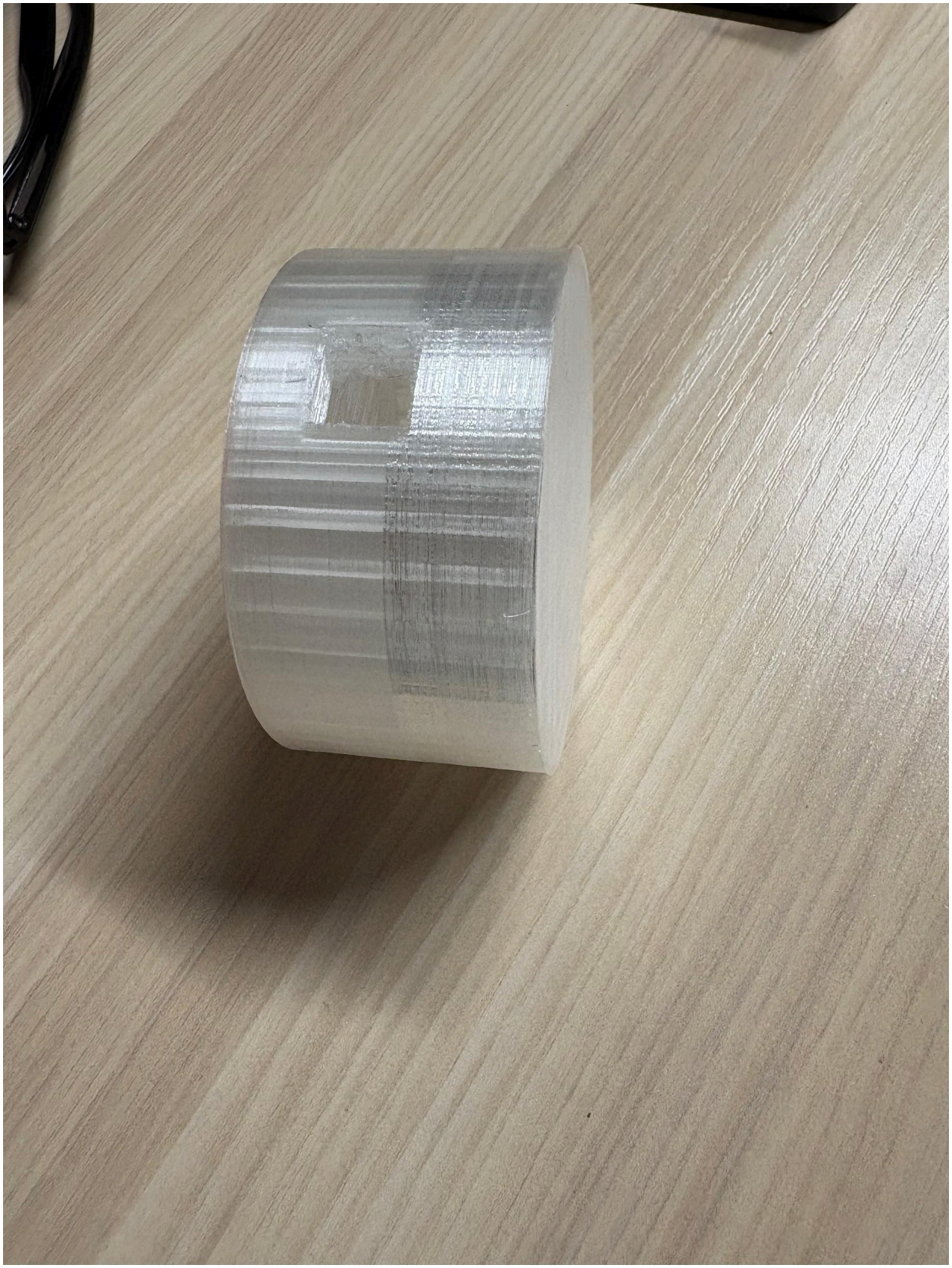
3/8/25 - 1.5 hours

Test amazon motors and transistor. Amazon motors do not work, transistor does. Work with team to get motor and hall sensor working with code

3/10/25 - 2.5 hours

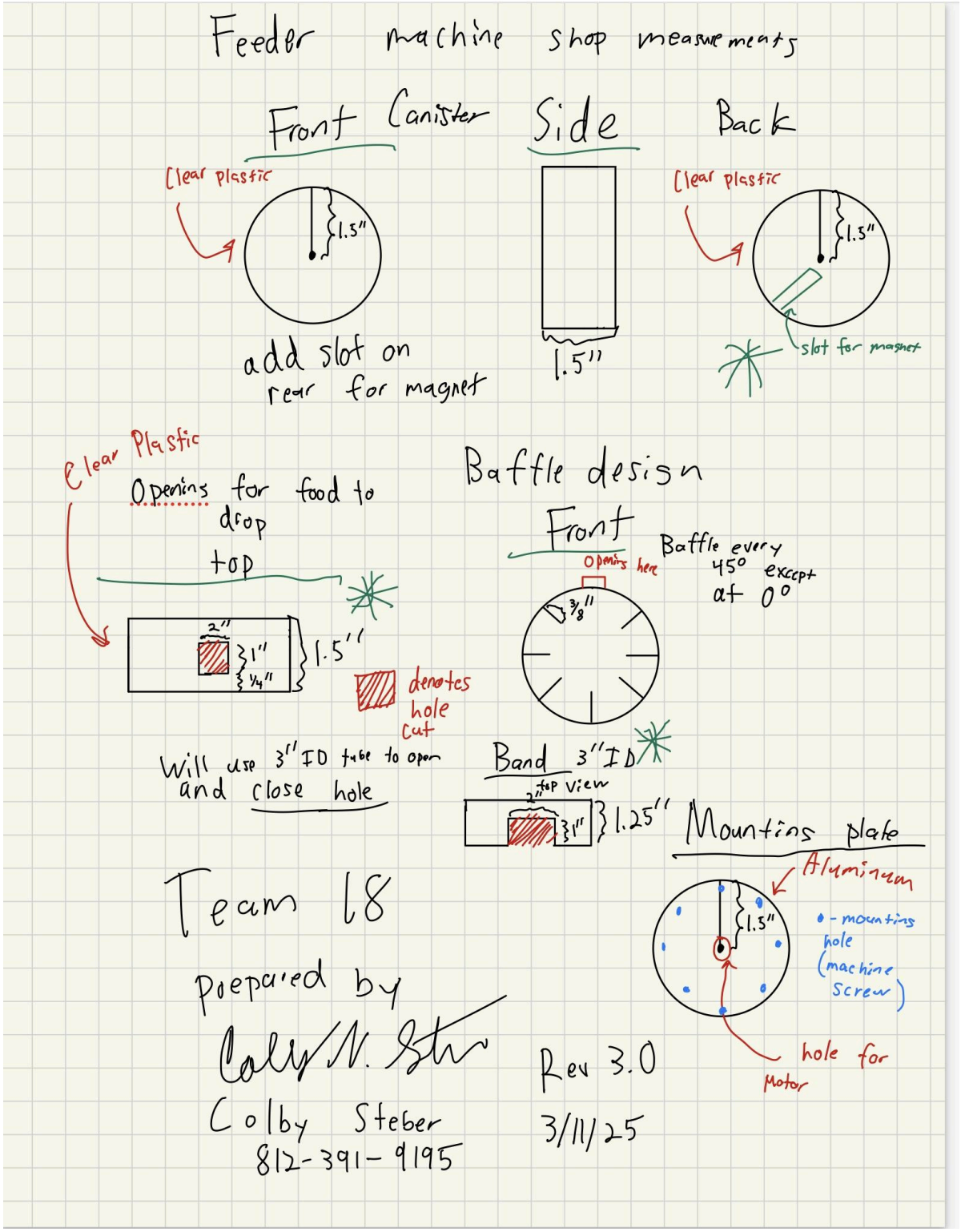
Adjust PCB design to correct connectors. Will still need to possibly change switches and need to change camera connector still. Get machine shop motors and will be adding a slot to hold the

magnet. NEED TO ADD MOUNTING HOLES Print a trial rotating canister



3/11/25 - 1 hour

Find connector layouts for camera and talk to machine shop to change the design a little. Need to add new connectors to PCB and add mounting holes.



3/24/25 - 0.5 hours

Pick up rotating canister from machine shop

3/28/25 - 4 hours

Solder PCB. Did not work

3/29/25 - 1 hour

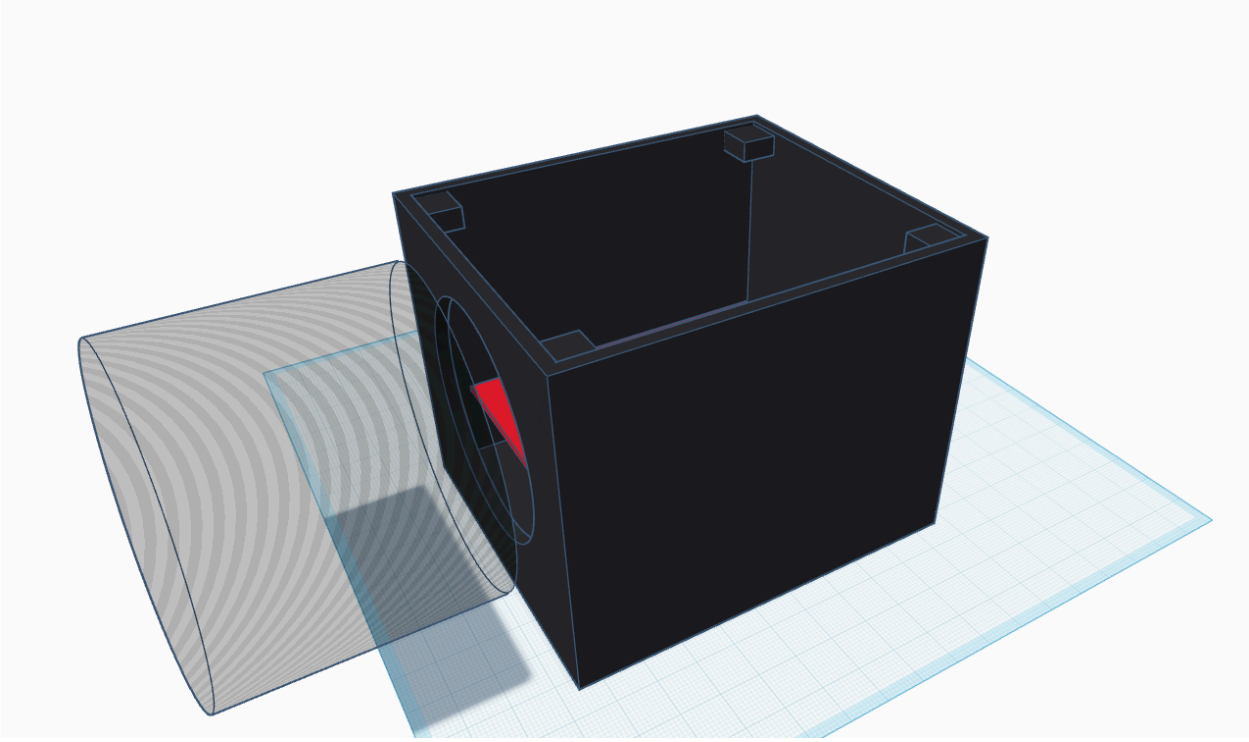
Jeremy informed me that we may need resistors on empty pins. This was the case as these were the control channels on the usb. Fixed PCB to incorporate these. Looked more into PMOS as a switch

3/30/25 - 3.5 hours

Try to get the esp to program and would not work

4/8/25 - 1.5 Hours

Work on PCB Enclosure. Progress so far



4/10/25 - 2 hours

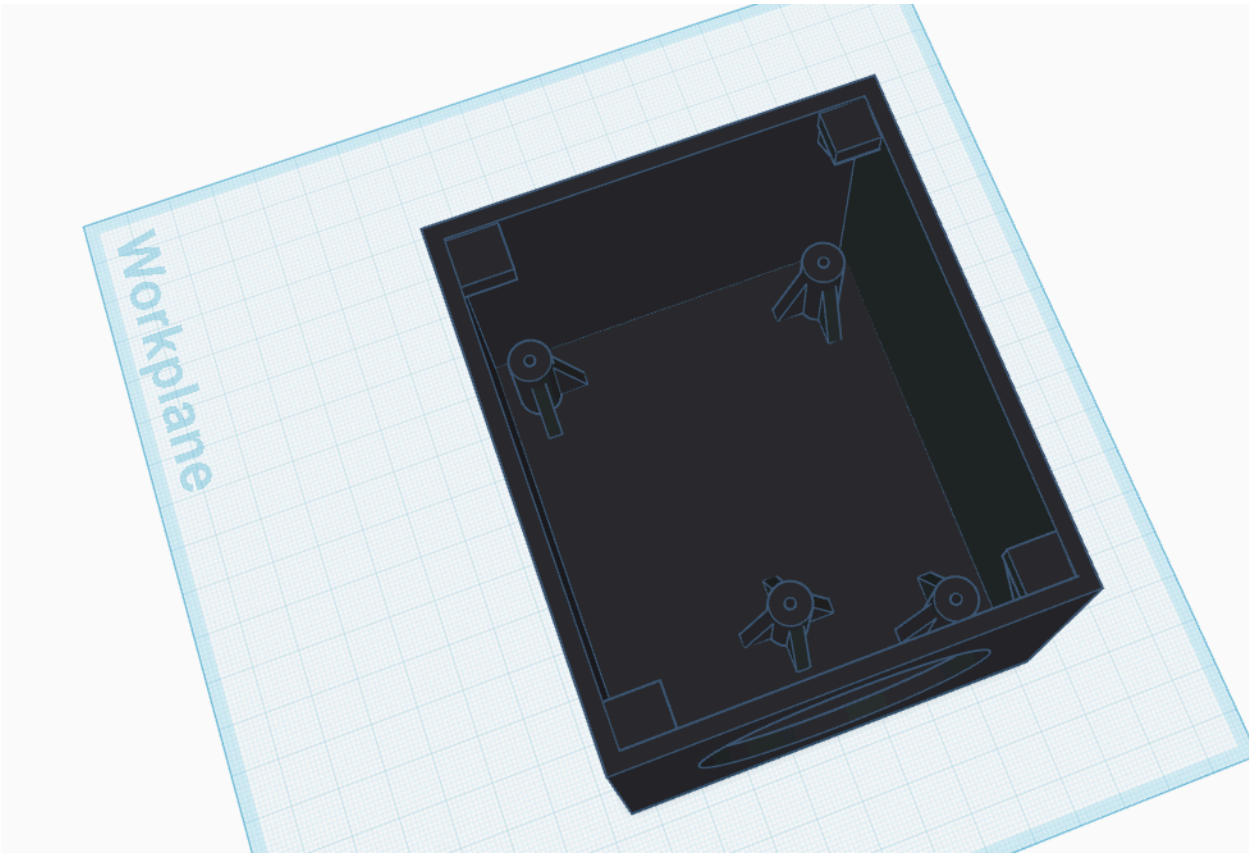
Continue to work on Enclosure and work on wiring harness for camera

4/11/25 - 1 hour

Finish Enclosure and print first enclosure

4/14/25 - 3 hours

Test printed enclosure and mount motor plate. Finish design 2 of enclosure shown here



4/15/25 - 2 hours

Start print of enclosure above along with the lid. Find a design for clamps and camera enclosure and modify them to work in our situation. Also begin to print these

4/16/25 - 0.5 hours

Finish printing the final pieces for the project. All plastic pieces for the project are shown here. Solder on switches to board along with make terminal block adapter for motor. Tap the holes for

the screws in all plastic pieces and make cutouts for USBC and camera connector

4/17/25 - 1 hour

Begin soldering wires for manual feed and hall sensor onto the board. Finish battery connection.

4/21/25 - 2.5 Hours

Mount clamp to main enclosure and discover that we need a resistor on the gates of the mosfets. Also crimp camera ends on camera cable and put heat shrink on it. DO NOT RECCOMMEND

4/24/25 - 2 hours

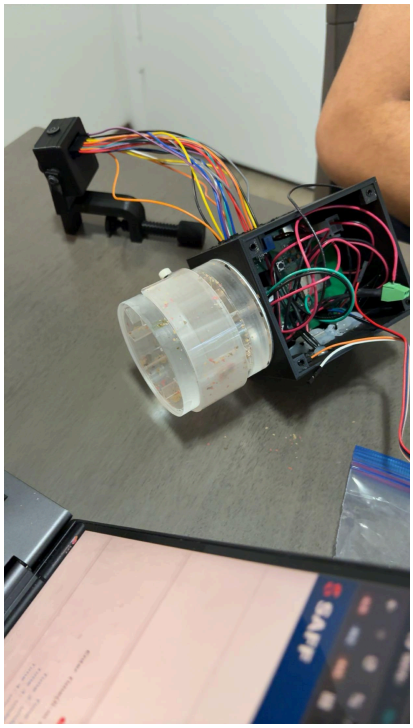
Work on housing some more and create a new camera housing for the OV2640 and print it.

4/25/25 - 1 hour

Crimp ends and connectors onto other side of camera wire so that it had a nice connection. Continuity tested and it tested fine.

4/27/25 - 4 hours

Shorten camera cable because it was not working. Still did not work, so just using jumpers. Assemble housing completely by gluing components down and do the first test run on the finished product. Basic functions working minus some app functions


SHARP