Members in Attendance

- Josh Mendex (Sponsor/Advisor
- Nathan Truong
- Felix Moss
- Annika Boyd
- Eisa Alsharifi

Agenda

- Josh Questions
- BOM Updates for Josh

Notes

- MAX1032 does not want to respond to code
    - Coding in C using the Arduino IDE
    - Only getting all high or all low
    - If it does not work by 4/17, switch to circuit python
        - After talking with Josh, we found that not all of the proper commands were being given
            - First set mode control byte, then analog config byte (tell it to use C2 to C0 and set them as single ended), and then set the range values you need to use (Table 3 in data sheet)
            - To get valid data, send conversion byte
            - To set to C0, set all conversion start bytes to zero (Table 4 in data sheet)
            - Only valid data happens during conversion start byte command (whatever comes back on the SPI)
        - Also may be an issue have to send 4 bytes to get one single conversion (Figure 2)
            - CS goes low, send mode conversion, CS goes hight to write it, CS goes low for analog, CS high again
                - TO read, CS goes low, issue command for C0, then send another 32 clock cycles (Figure 2)
                - In code, issue SPI transfer first with command, then 3 other SPI transfers with zeros, and data from adc should come in (high and low byte) during the third and 4th SPI transfer
- Tube questions
    - Charge and size correlation
        - Size is basically a scalar for charge (not 100% but can be assumed in our case)
    - Electric field not needed

        - Only need mesh for the tube
        - Will use 100 micron particles for testing
        - Solder wires to mesh
            - One goes to input, another is grounded
            - Use this mesh: Link
- Going to keep the full ESP32 for the PCB
- Coding updates
    - MAX1032 is blocking all progress
- Josh PCB changes
    - C17 should be closer to the input pin
    - C16 should be between the input of the battery and the 5V
    - Don't want 9V power line traces overlapping
        - Make traces cross at right angle rather than having them directly on top of each other
            - Prevents current induction
            - Bring ground plane cut near 9V battery input lower
    - Extend the dust sensor hole out
        - Makes floating solder jobs easier to execute
        - It now extends 19.795mm from the base PCB
    - Remove the solder mask from sensitive components
        - All analog parts, especially U4, R3, and the 100pF cap near R3
        - The mask can potentially store charge and mess with measurements taken

Deliverables

- Felix updates PCB box to reflect new changes
- Eisa continues work on MAX 1032
- Annika continues to PCB work
- Nathan continues PCB testing