ECE 411
Andrew Greenberg
11/19/2024

Team 5 Design Review

Bucanan Howard, Daniyil Kashkan, Demetrius Van Sickle, Mohammed Alreshoud, and Wallace McKenzie

First Design Review with Team 2 - 8:00 pm - 9:08 pm - Meeting Notes:

> Little to no negative feedback. PCB Traces look good. Everything looks straightforward.
> Positive feedback on the schematic design, with inquiries about its size and potential improvements.
> Overall comment: “Good job!”
> Suggested to add switch main power rail.
> Should have 1uF labeled on decoupling cap on ESP32S3.
> Should add a note about having onboard USB on dev board.

Second Design Review with Team 7 - 9:30 pm - 10:11 pm - Meeting Notes:

> Voltage threshold 1.2 volts.
> Suggested labeling screen dimensions directly on the schematic for clarity and reference.
> Suggested labeling buttons on the schematic; e.g., |_ Adding "boxes" (label above buttons)
> Add test points to the schematic??

Feedback for Team 5 (us) from Team 2

- GND should be labeled with 1.5 Farad (note for Bucanan).
- Label onboard USB for the PCB (also note for Bucanan).
- Overall no negative feedback, keep up the good work.
- Everything is straightforward, nothing extra or unnecessary.
- The on/off switch can be added directly to the PCB.
    - However, Daniyil will stick with designing a separate circuit for testing purposes.

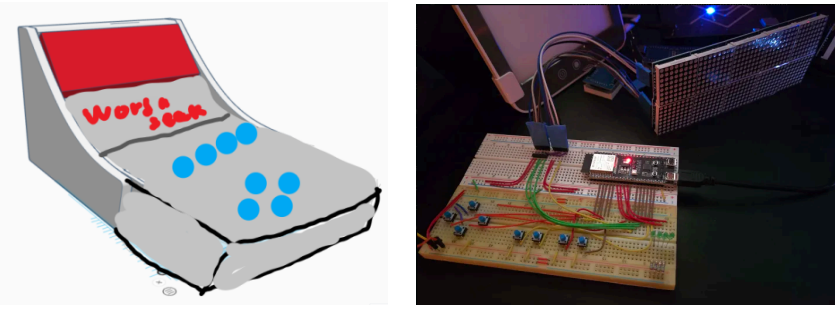

Figure 1. Figures shared by Team 5.

Feedback for Team 2 (from us to them)

- Pretty clear schematic to look at and ready.
- Specific roles defined. Every member seems caught up on the design and their own parts.
- The team also ran into plenty of problems, like proper power distribution.
    - Resolved everything properly.
- Safeguards put into place like a power-off state in case of current issues.
- OLED ground makes sense, something else Bucanan found does not.
    - Another OLED bit referenced questionably (NOT AN ISSUE).
- The battery can only be charged twice or three times.
    - Systems are put into place to check fresh batteries against garbage batteries.
- Bucanan recommended adding fuses or Zener diodes to ensure proper 12 Volt flow (??)
- Last note: the buck converter handles most of the voltage regulation.
- The fan is always on. As long as the master switch is closed, the fan is on (always).
- It takes a couple hours to charge a battery (estimated 2 hours).
    - You cannot push a battery too much while charging it, as it might break.
- Active high input. For safety, if the ESP32 fails, the active high input goes down.
    - Recommendation by Bucanan: Implement a hardware failsafe.
        - (exclusively software failsafes implemented now).
- List V_{TN} for the transistors. Rename schematic ports for clarity.
- Add a current limiting diode between VCC and sensitive components.

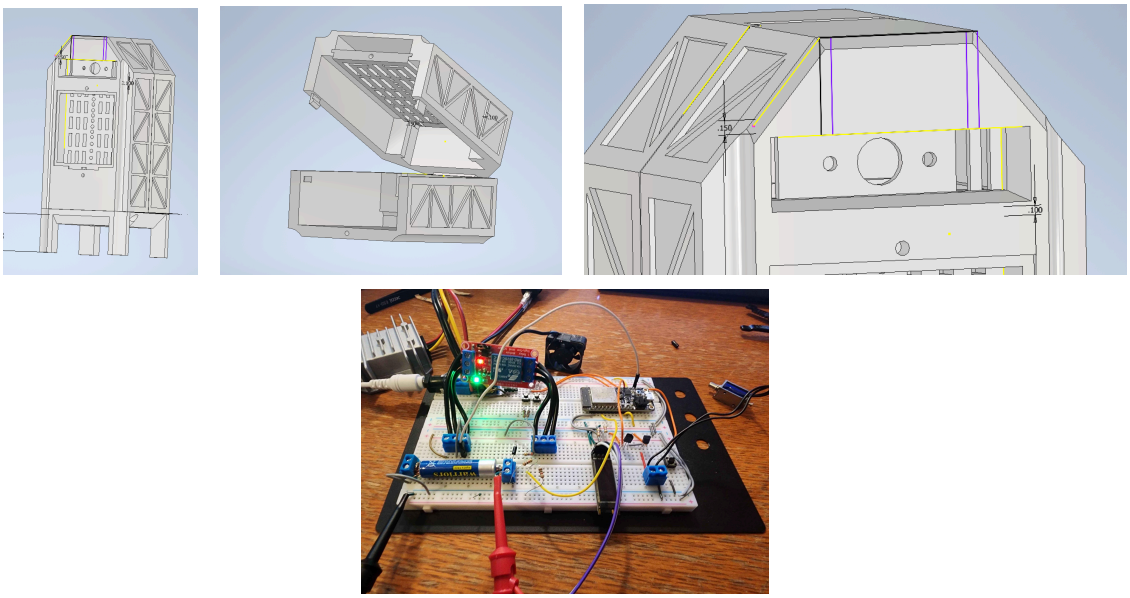

Figure 2. Figures shared by Team 2

Feedback for Team 5 (us) from Team 7

- Power distribution needs more defining.
- The threshold is 1.5V.
- Add a label above the buttons (recommended by Annika).