

Log Book

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ECE 3760 A01

January 28, 2025

1 Log Entries

Lab 1 Entry

January 20, 2025

Received the board, soldered pins to the board and ensured that the board was working and no short circuits were present.

Installed platformio on VSCode and ensured the extension was working correctly by running a simple serial print program on the board.

The program was first built and then uploaded to the board, and got a successful message in the console as seen in Figure 1.

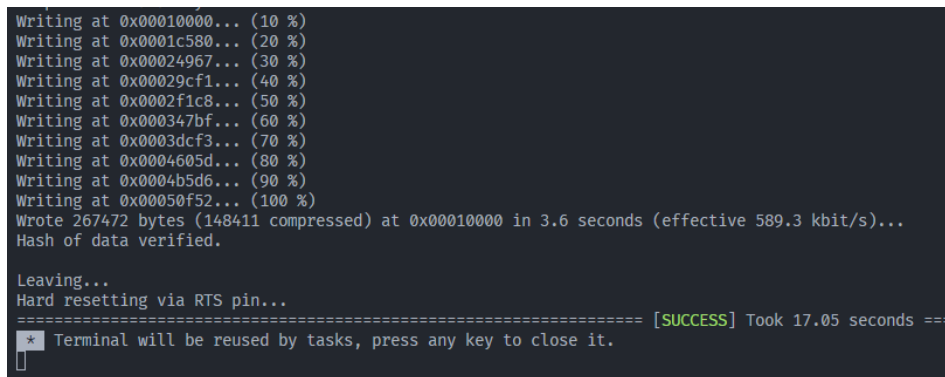
A screenshot of a terminal window with a dark background and light-colored text. The text shows the progress of writing data to a memory address, followed by a confirmation message. The messages are: 'Writing at 0x00010000... (10 %)', 'Writing at 0x0001c580... (20 %)', 'Writing at 0x00024967... (30 %)', 'Writing at 0x00029cf1... (40 %)', 'Writing at 0x0002f1c8... (50 %)', 'Writing at 0x000347bf... (60 %)', 'Writing at 0x0003dcf3... (70 %)', 'Writing at 0x0004605d... (80 %)', 'Writing at 0x0004b5d6... (90 %)', 'Writing at 0x00050f52... (100 %)', 'Wrote 267472 bytes (148411 compressed) at 0x00010000 in 3.6 seconds (effective 589.3 kbit/s)...', 'Hash of data verified.', 'Leaving...', 'Hard resetting via RTS pin...', and '=====[SUCCESS] Took 17.05 seconds===='. At the bottom, there is a prompt 'Terminal will be reused by tasks, press any key to close it.' with a cursor icon.

Figure 1: Successful upload message in console

Design Ideas

January 20, 2025

During the lab, discussed some ideas for the project. Talked about the basic requirements, what potential ways we can meet the requirements. Need to do more research on how curling actually works to get a better idea of what someone would need to communicate with their team members to ensure a successful game.

Currently thinking of the skip having a device that can communicate with the two sweepers, having a speed up and slow down button for the sweepers to adjust their speed. The skip would also have a button to indicate when to stop sweeping. On the sweepers side, they would have an LED or a speedometer esque led display to show them how fast they should be sweeping. Since different players might need to sweep at different rates, need to differentiate somehow between the two sweepers. Maybe have two of the same device, but with different colored LEDs or something to indicate which sweeper the skip is talking to. For example, a left and right sweeper device, that connects to the respective sweeper.

Individual Design Brainstorming

January 26, 2025

A rough sketch of the design I had come up with is provided below. Essentially two sets of controls will be present on the skip's device, one for each sweeper. Along with a display made of LED lights, or other visual indicators to reflect what the sweepers are seeing on there device. 3 buttons will be present, speed up, slow down and an immediate stop button. On the sweeper's device, a line of LED lights or other visual indicators to show a level for the sweeper to sweep at. The skip will be able to adjust the level of the sweeper, and the sweeper will be able to see the level they should be sweeping at.

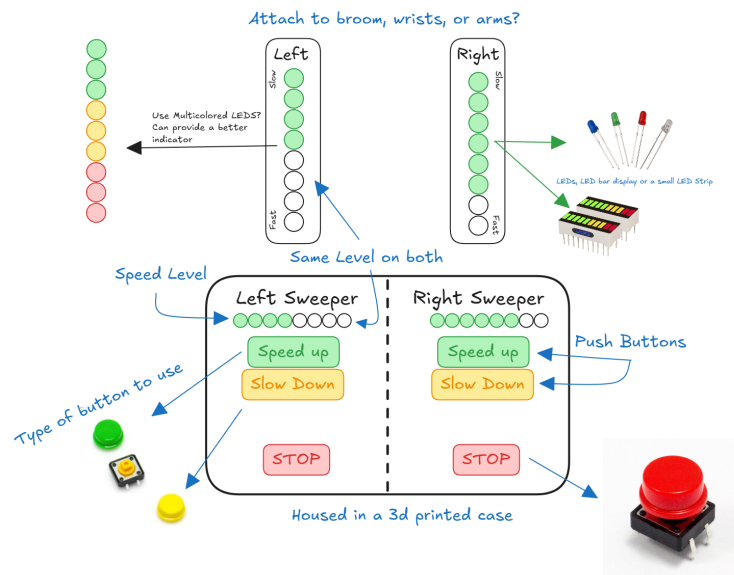


Figure 2: Rough sketch of the design

The communication between the devices can be done via WiFi as it would have sufficient range to cover the play area. A packet/message structure will need to be defined to ensure the messages are read correctly and by the proper device. A simple message structure could be as follows:

```
<sweeper_id, message_data>
```

Where **sweeper_id** can be a 1 bit for which sweeper, if more than 2 sweepers are present, then we could use 2, 3, 4 bits to represent the sweeper. The message data for each message can be as simple as the level of speed to set the sweeper to, and the sweeper would reply back with an ACK message of the current level they are at to ensure proper synchronization. A simple message-communication diagram is shown below.

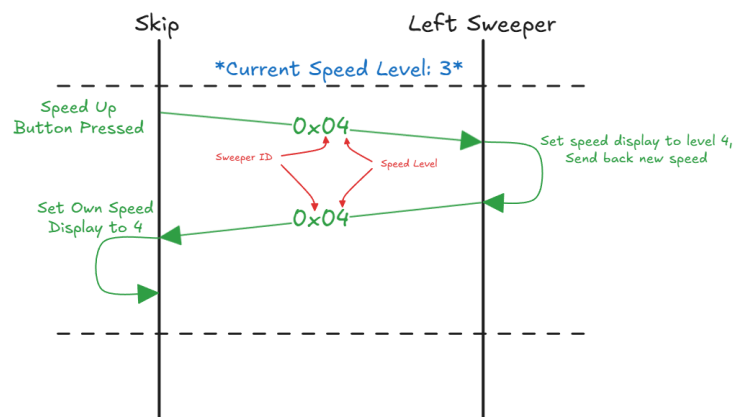


Figure 3: Message communication diagram

Both sweepers will actively listen to all messages and only act when the **sweeper_id** matches their own. This will ensure that the skip can communicate with both sweepers at the same time.

A Compact Design

January 28, 2025

A more compact device for the skip could be used, where a switch can be used to toggle between the two sweepers. This would reduce the size of the device, and essentially reduces the number of components to just half. On the sweepers device a small vibration motor can be used to indicate a message has just arrived. A rough sketch is shown below for the more compact design.

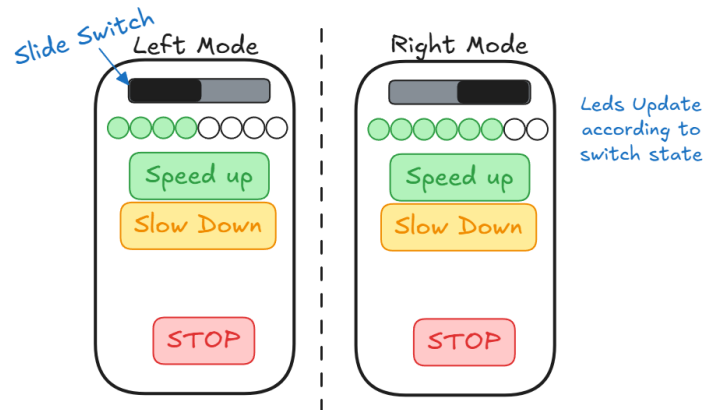


Figure 4: More compact design idea

The downside I can see with this is that the skip would need to swap between the two sweepers, which could be a bit cumbersome at times. However, the size reduction could be worth it, and reduced cost of the device. It also will have less LEDs so power consumption could be reduced as well.