

SquidBox Team 2

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Project Writeup

GitHub Repo link: <https://github.com/JJcool1128/SquidBox2-C24-Final>

Our group worked on designing an ergonomic squidbox casing including an acrylic front face with screen and button cutouts (Figure 1) along with a custom pla button board (Figure 2). We used Solidworks to design these pieces and used the laser cutter and 3D printer to fabricate them. The CAD files are located in Github. Our group also worked on adding to the Arduino UI screen design. The previous group created a startup screen animation and home page. We implemented additional code to print a new section displaying a piano keyboard and highlighting the notes of the chord being played. The screen also prints out the chord's name and type (major/minor/diminished), the key the chord is in, and volume (Figure 3) When a key is selected, each button is mapped to the major diatonic chord scale of that key for example- the key of C will have the buttons mapped to C major (I chord), D minor (ii chord), and E minor (iii chord), etc. Lastly, our group worked on implementing a working volume knob. We wired a volume potentiometer to the Arduino (Figure 5) and used the map() function to map the analog values we get from the potentiometer which range from 0 to 1023 and change this range to 0-100. For our case assembly we screwed in the screen, volume knob and custom breadboard to the front face. We also superglued the button pads to the back of the front face. We then secured the buttons to the button board and soldered the appropriate wires to the buttons (Figures 6). After soldering we taped (we could not find long enough screws) another 3D printed breadboard support piece to allow for wire room. Finally we attached the wires to the appropriate pins on the arduino. Only the potentiometer, up, down, left buttons and four chord buttons are wired because the arduino only has 8 pins. The bottom four chord buttons still need to be soldered as well.

Appendix 1:

Figure 1: Case Face Solidworks Design

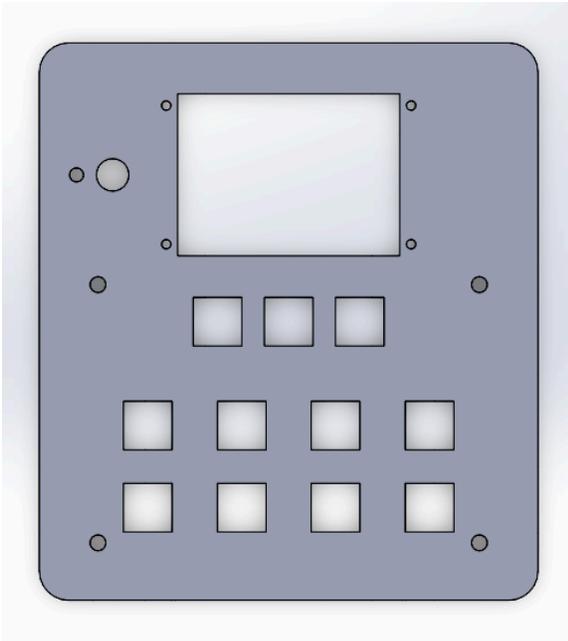


Figure 2: Button board SolidWorks Design

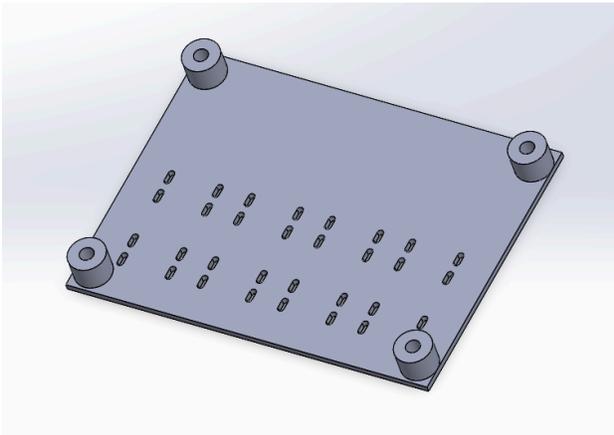


Figure 3: Arduino Screen Piano Screen

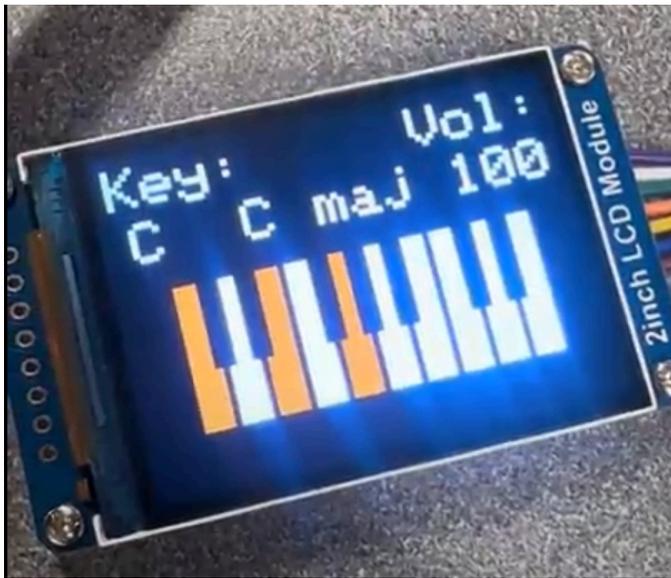


Figure 4: Button Wiring

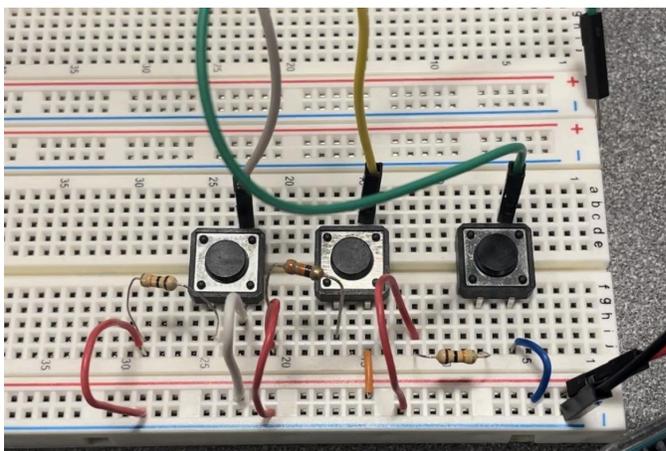


Figure 5: Volume potentiometer wiring

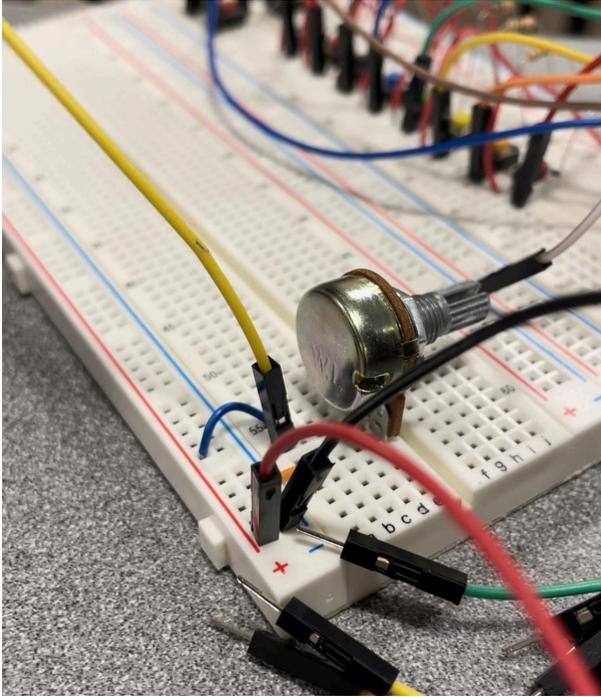


Figure 6: Button wire soldering

