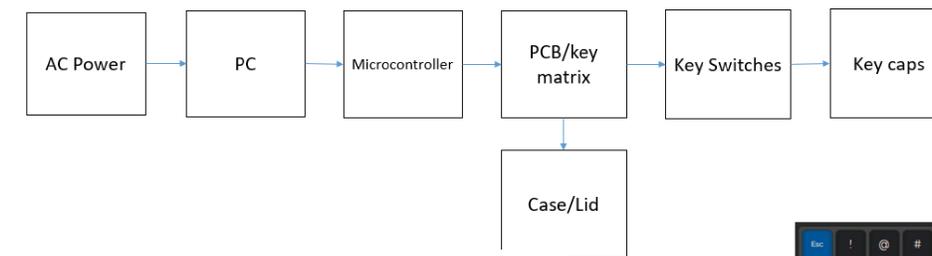


Ortholinear Keyboard

Project

The ortholinear keyboard is laid out in a grid instead of arranging the keys in a traditional staggered fashion. This layout aligns with the natural forward-backward mechanics of the finger joints, making typing more comfortable and efficient. The ortholinear keyboard is also 40% smaller than a traditional keyboard, so each finger is closer to every other key. Functional layers such as a keypad can also be mapped to the keys, creating an easier typing experience overall.

System



Methods

- Designing the PCB layout in Altium Designer
Each switch was placed in series with a diode, then formed into a 5x12 key matrix. The rows and columns were mapped to GPIO pins on an ATMEGA32U4 microcontroller. A USB-C connector was routed to the microcontroller as the source of power
- Using a CNC Mill and solidworks to house the PCB, switches, and keycaps
Using careful measurements of the PCB, switch, and keycap height, a case and lid were drafted in solidworks and later milled out of maple wood. Mounting holes were added to the design to secure the PCB/switch/keycap sandwich in place.
- Soldering components to the PCB
The components, including 60 switches, 60 diodes, capacitors, resistors, buttons, connectors and the microcontroller were hand-soldered onto the PCB with great care.

Conclusion

A 5x12 ortholinear keyboard was completed with a fully customizable keymap using QMK configurator. This keyboard poses a learning curve to those who have never used one. The ortholinear keyboard breaks the familiar staggered layout introduced in the 1870s that originally prevented typewriters from jamming up.