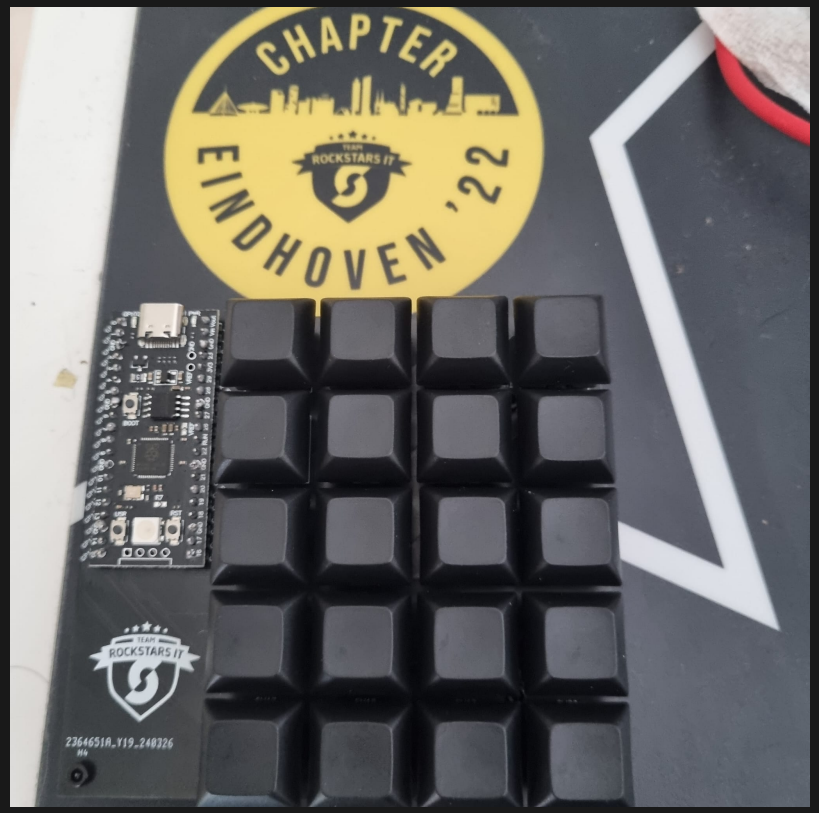
Rockstars Macropad

Let's build a keeb



QR Code

https://slides.dweik.xyz/rockstars_macropad.html

Links

- KMK
- Circuitpython
- RSMP Github
- Firmware/Software bundle

Index

- How keyboards work
- Soldering
- Build guide

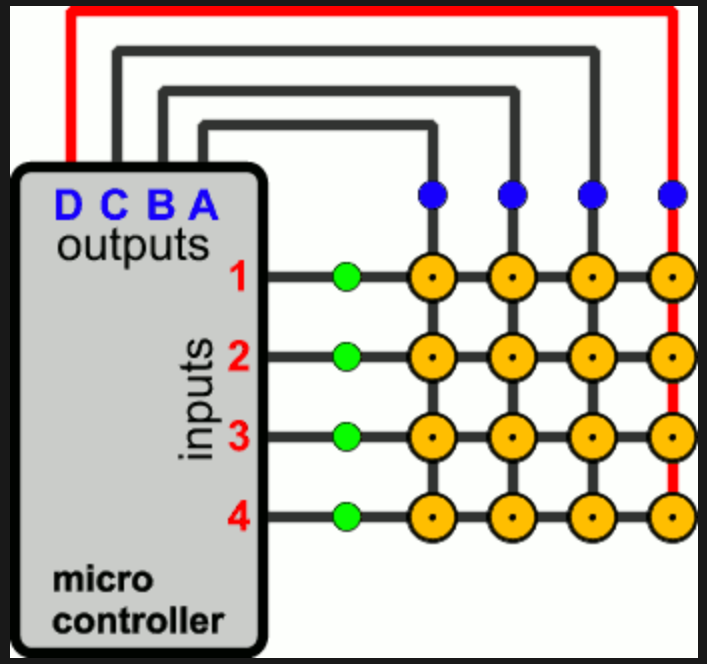
How keyboards work

- A microcontroller that supports USB HID is connected to a computer
- Essentially, you press a button, this closes a circuit, the microcontroller knows which button is pressed
- Microcontroller looks up which keycode matches the button
- Microcontroller sends button (e.g. A) to PC

Keyboard matrices

- Most keyboards use a matrix divided in rows and columns
- One column is pulled to high at a time, then the row is read
- This way you can get rows*columns buttons (100 with 10x10 = 20 pins)

Matrix animation



This setup requires diodes, otherwise you get ghosting. Direct pin doesn't

From: https://pcbheaven.com/wikipages/How_Key_Matrices_Works/

A note on switches

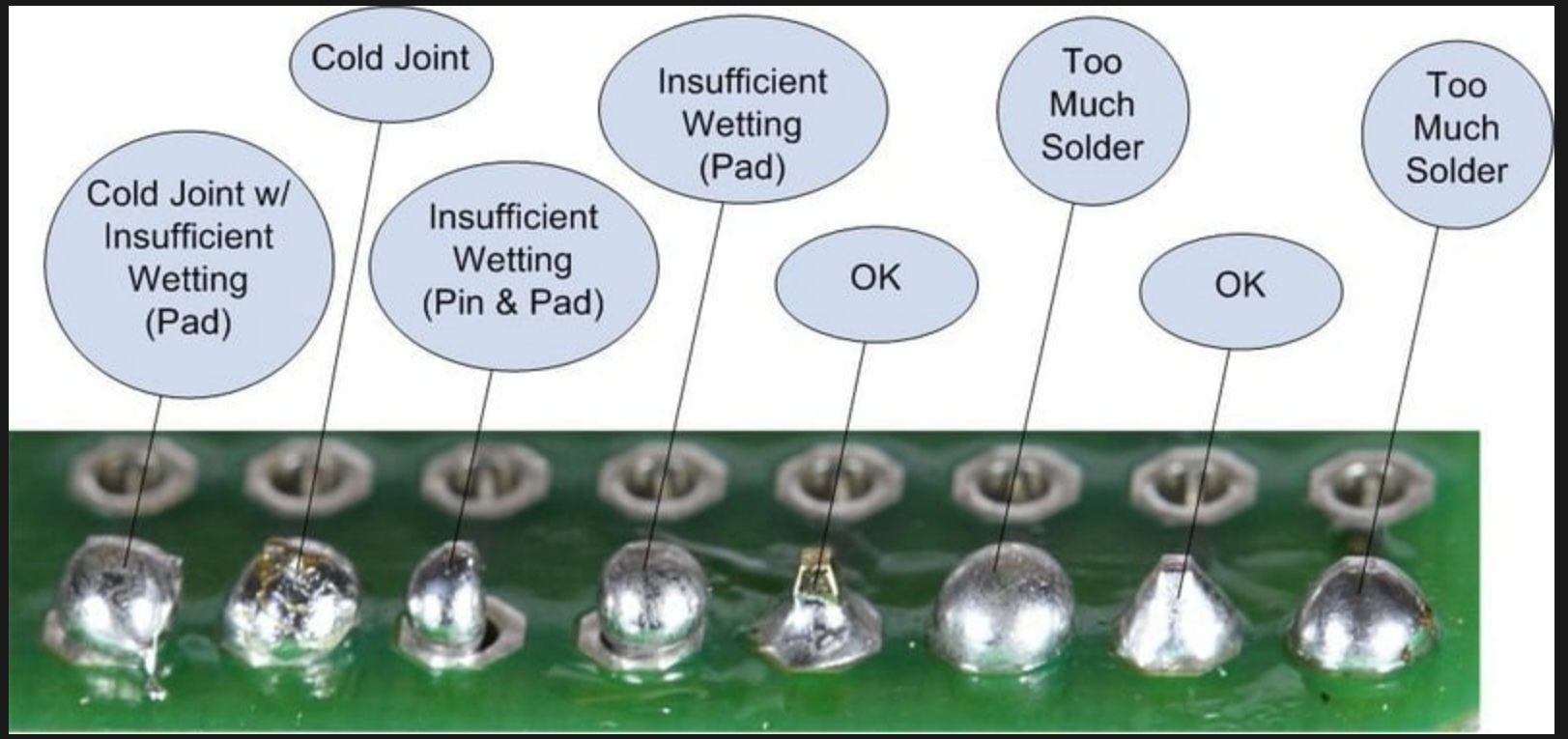
Broadly 3 types

- Linear - Red - No feedback, silent
- Tactile - Brown - 'Bump' when pressed. Silent-ish
- Clicky - Blue - Sharp 'bump'. Loud *click*

Soldering

- We're not working with very fine components, it doesn't need to be perfect
- Watch out, the iron is HOT :)
- Touch the tip to BOTH the pad and the pin you're soldering
  - In other words, heat everything you're trying to connect
- Poke it all with some solder and let it melt into place

Solder joints



From: https://learn.adafruit.com/adafruit-guide-excellent-soldering/common-problems

RSMP

- 20 Key (4x5) Macropad
- Runs CircuitPython
- KMK Based
- Github Repo
- Direct Pin (aka no diodes/matrix)

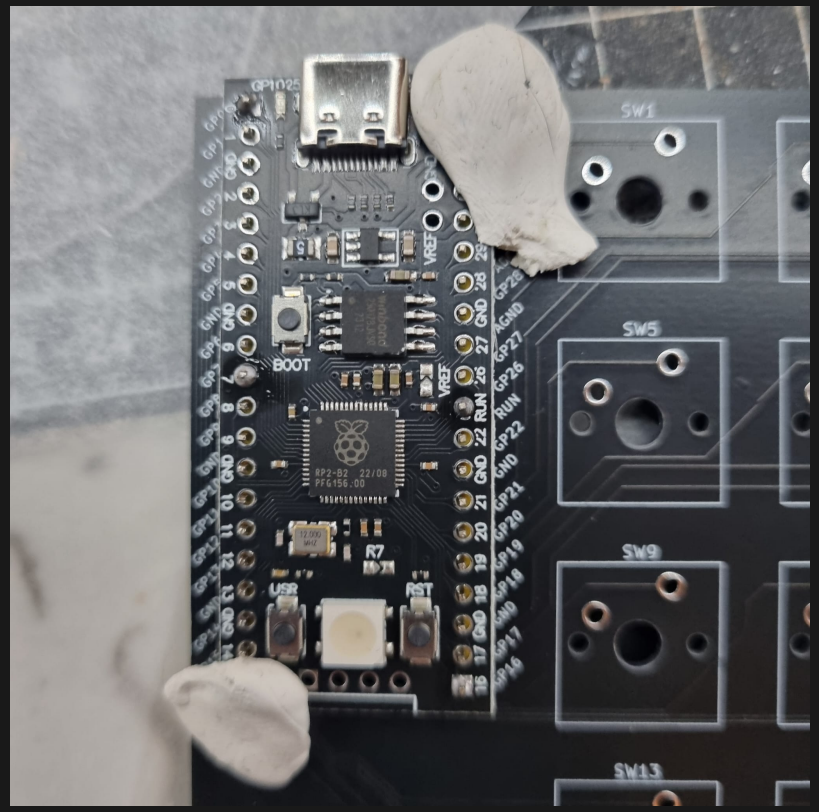
Broad build guide

- Solder header pins to microcontroller
- Solder microcontroller to board
- Solder switches to board
- Install spacers and screw the board sides together
- Add bumpy rubbery things

Tips

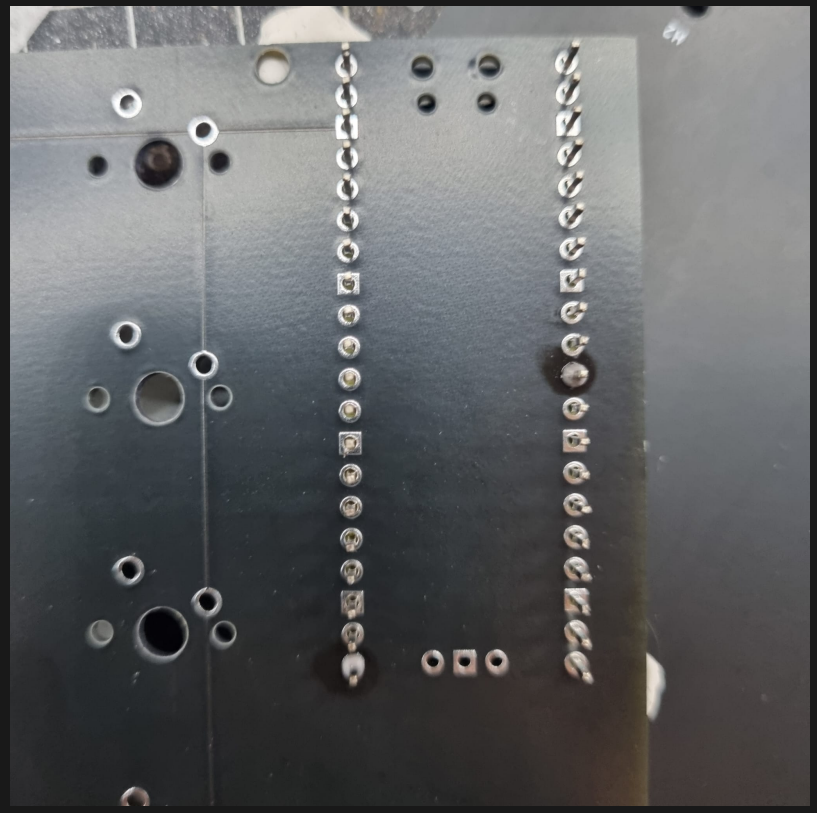
- If you've never soldered before, start with a few switches to get a feel for it.
  - If you do, don't solder the switches closest to the microcontroller. They might get in the way
- Use poster-tack to keep stuff in place while soldering
- Don't overheat pins. Move to something else if it's giving you trouble

Solder the microcontroller

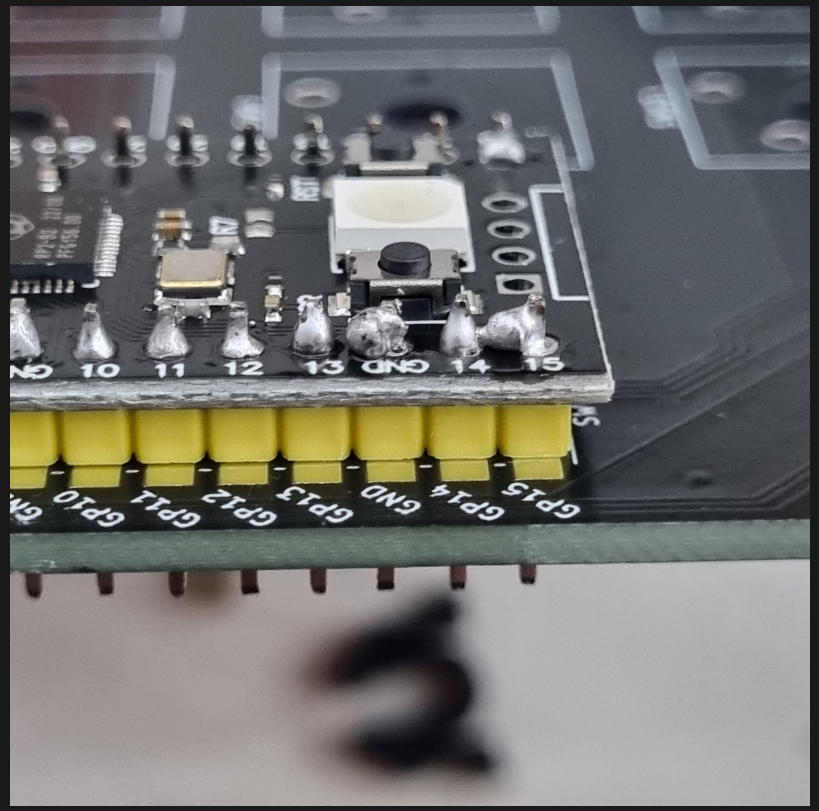


Maybe put the longer side of the header pins at the top, haven't tried it ;)

Solder the bottom



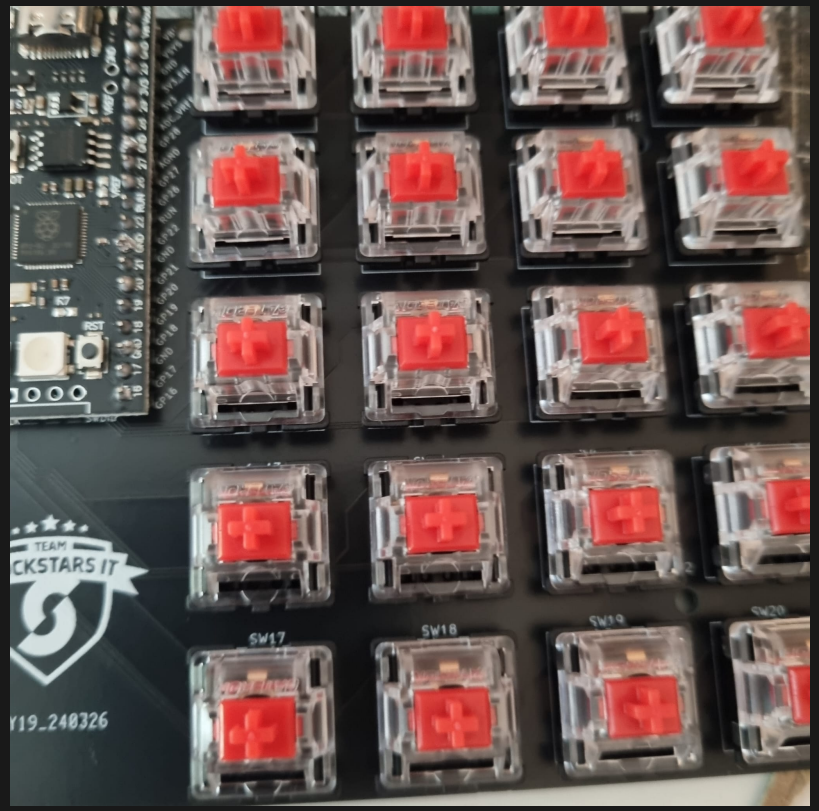
Check for shorts



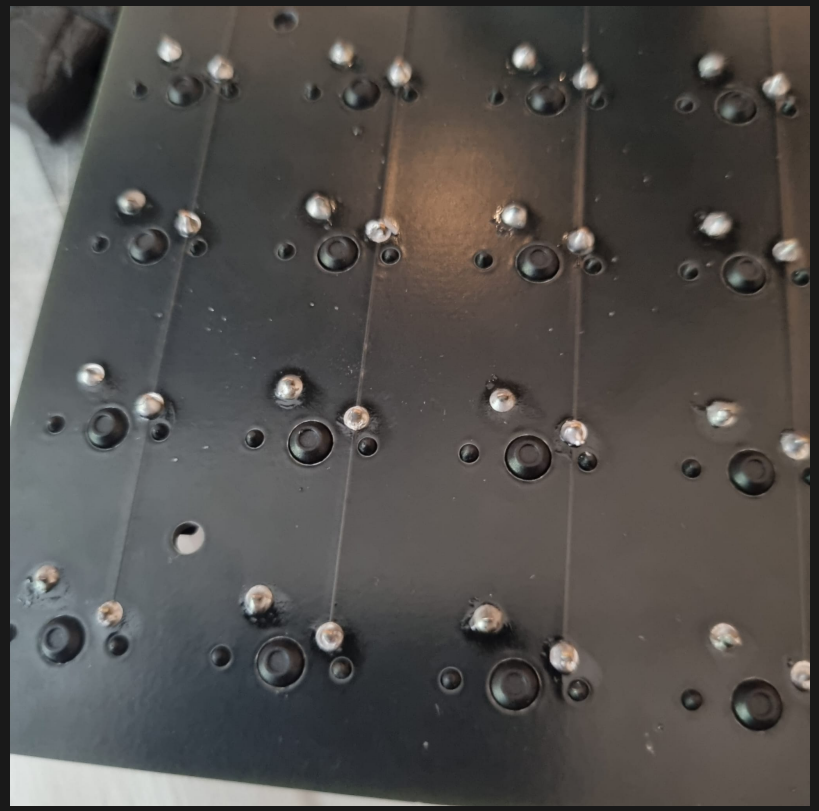
Optional but recommended

- Setup software/firmware
  - See firmware slide
- Test keys before soldering switches

Add switches

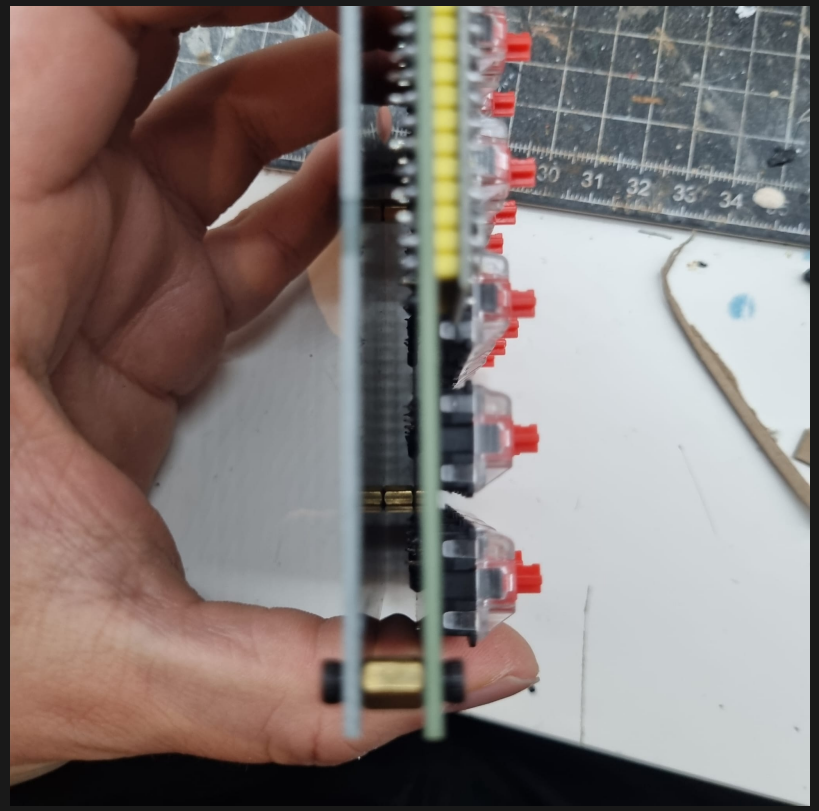


Solder switches



Add spacers and screws

Also, clip the microcontroller header pins



Add bumpy things

Firmware setup

- Get the Firmware/Software bundle
- Plug the controller in while holding the boot button
- Drop the .uf2 file in the root of the storage device
- Once it has restarted, drop the files in `firmware` in the root of the Circuitpy device
- Remove the `code.py` file
- Replug the controller

Mapping keys

- We use KMK for the firmware
- You make can the keys do almost anything you want
- The key mapping is in `main.py`
- If you change the file, it should reload and apply immediately

Done :)

Enjoy your macropad