KNOB GOBLIN

BUILD GUIDE

MrT1ddl3s | knob-goblin.com | GitHub

This document contains instructions for how to solder and assemble the Knob Goblin macropad. It also contains assembly instructions for the acrylic case.

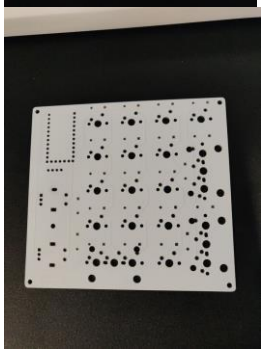
Materials Needed (not included)

- Soldering Iron
- Solder (Sn63/Pb37 0.6mm Rosin Core Solder works well)
- Flush cutters (or nail clippers)
- 17-20 MX Style switches (plate mount or pcb mount will work)
- Keycaps
- USB cable (USB Micro for Pro Micro controllers, USB C for Elite Cs)
- Electrical tape
- 2mm alen key (for knob set screw)

Materials Included

Top Plate

PCB

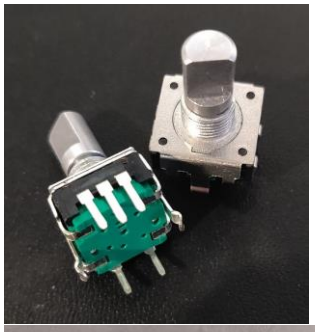


Peel-a-way sockets

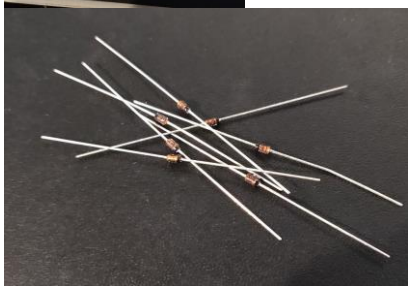
Mill Max Sockets

Bottom Plate

Encoders



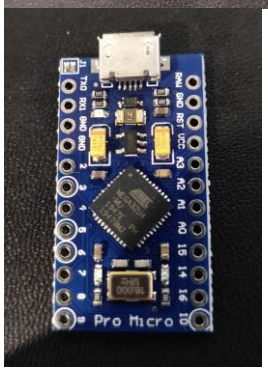
Diodes



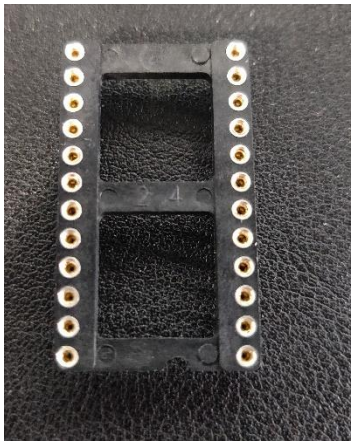
Knobs

Standoffs & Screws

Controller (Pro Micro Shown)

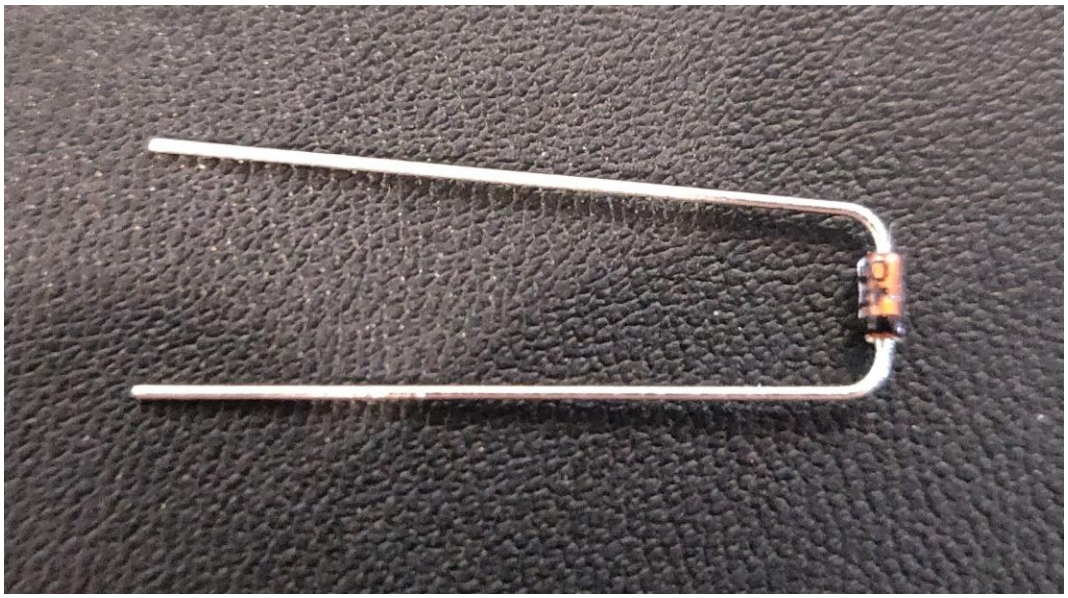


Mill Max Controller Socket (R2 Only)



Step 1: Diodes

First, bend the legs of all of the diodes as shown:



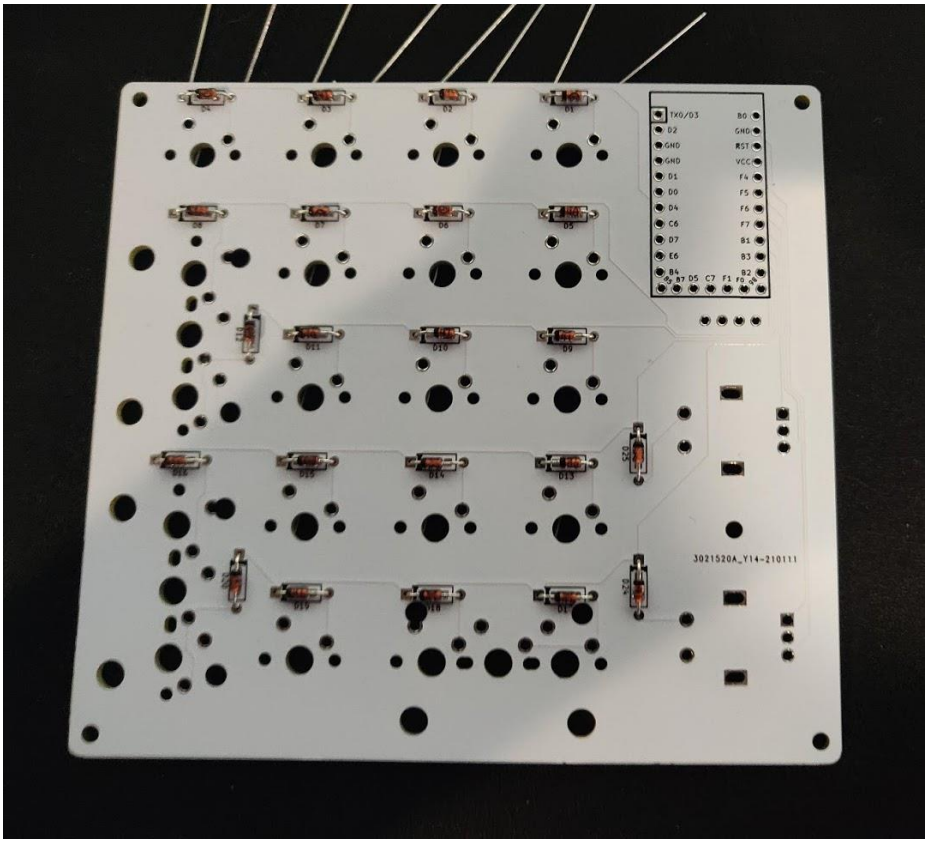
Diode with bent legs

You can bend the legs with your hands or pliers. These won't be visible, so don't worry if they're not all perfect.

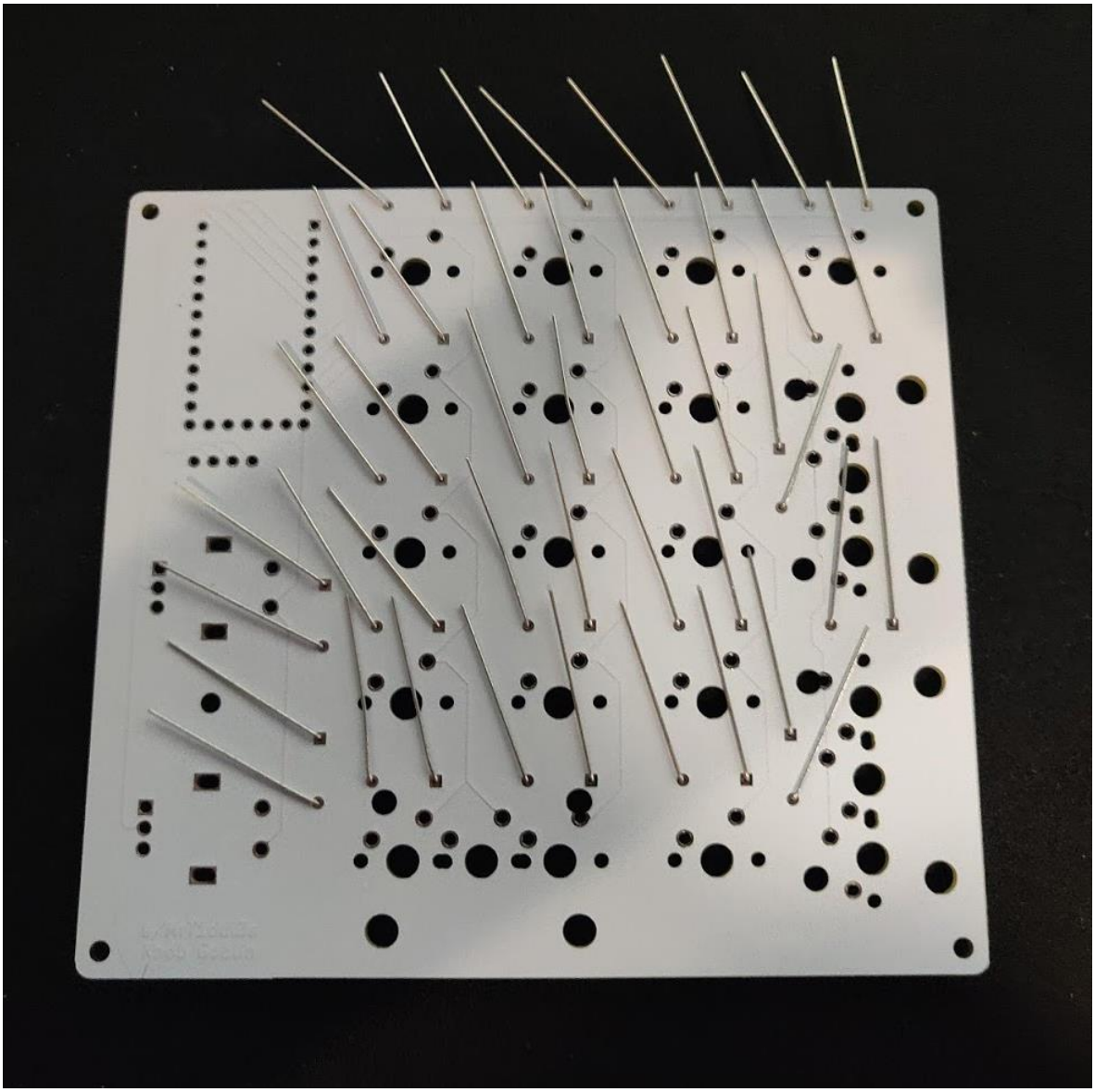
Next, install the diodes to the UNDERSIDE of the PCB, and bend the legs on the top side to hold the diodes in place.

NOTE THAT THE BLACK SIDE OF THE DIODE SHOULD BE NEXT TO THE SQUARE HOLE. Diodes act as a check valve for the circuit. **If you install a diode the wrong way, your board will not work correctly.**

Correctly placed diode. Black diode bar facing square hole.



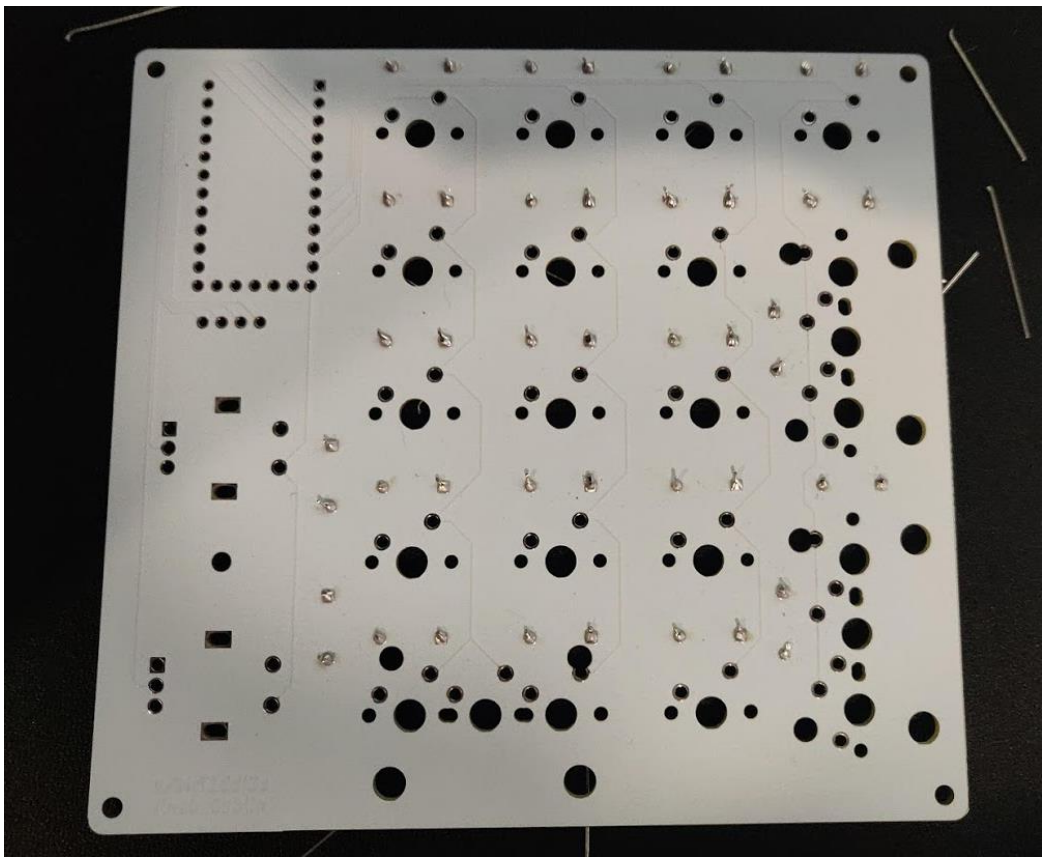
All diodes placed on underside of PCB.



PCB Topside. Legs bent to keep diodes in place.

Now solder all the diode legs to the board and clip off the legs with flush cutters or nail clippers. You can get a closer cut if you bend the legs out straight again before clipping.

DON'T THROW AWAY THE CLIPPED DIODE LEGS, WE'LL NEED THEM LATER FOR THE CONTROLLER AND OLED PINS.



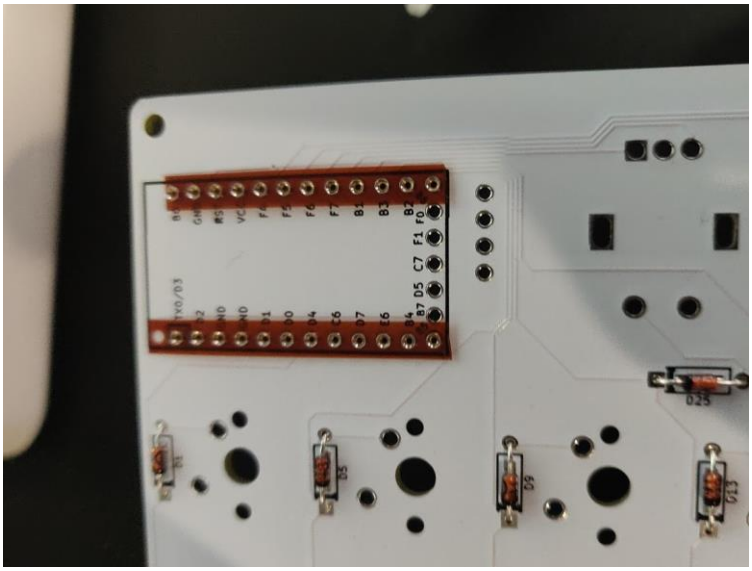
Top side of PCB - All diodes soldered and legs clipped.

STEP 2 – Controller Sockets

With the diodes installed, let's move onto the sockets. We'll start with the controller.

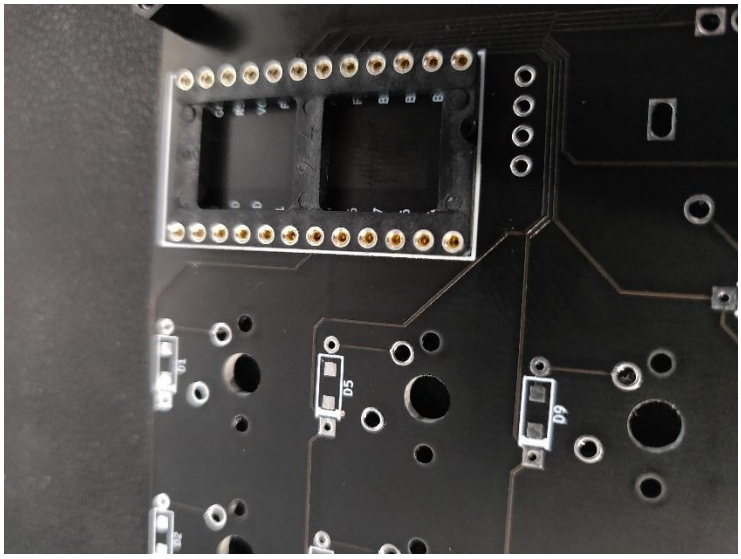
THE CONTROLLER MOUNTS TO THE UNDERSIDE OF THE PCB. R1 and R2 kits come with different controller sockets.

For R1 Kits:
Place Peel-a-way sockets onto the underside of the PCB as shown below.



*Peel-a-way sockets placed for the controller. Socket openings on the **BOTTOM** of the PCB.*

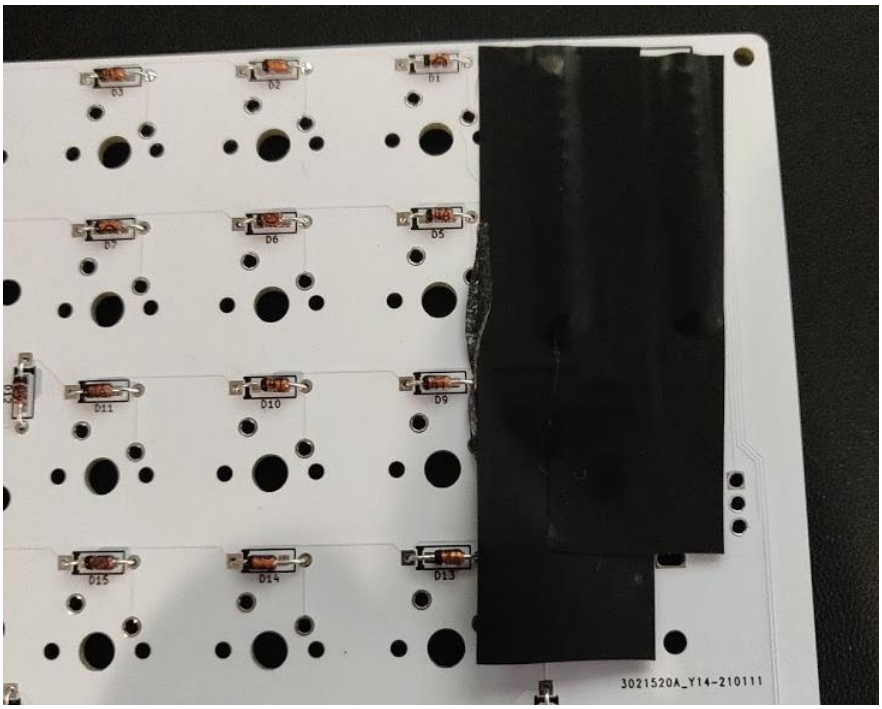
For R2 Kits:
Place the Mill Max Controller Socket onto the underside of the PCB as shown below:



*Mill Max controller socket in place. Socket openings on the **BOTTOM** of the PCB.*

Continuing forward, the process is the same for both R1 and R2 kits.

Place electrical tape over the sockets. Press the tape down around the sockets to make sure they are held firmly in place.



Controller sockets taped down.

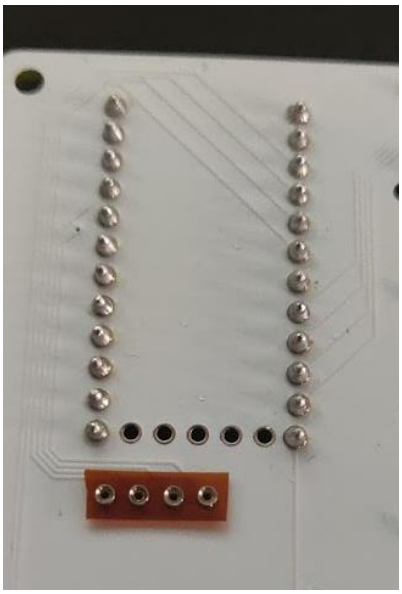
Flip the PCB over and solder the sockets. The bottom row of 5 will not have anything soldered to them.

Controller sockets soldered.

Step 3 – OLED, Encoder, and Switch Sockets

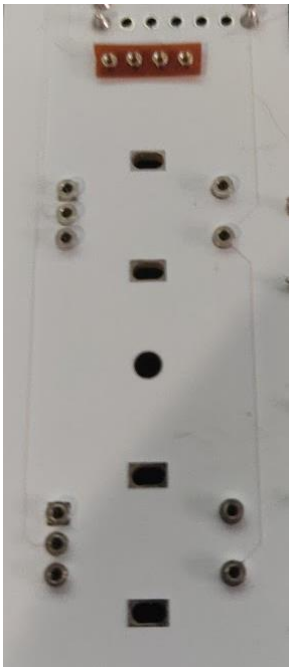
With the controller sockets soldered to the underside of the PCB, we'll now install all of the topside sockets.

Place Peel-a-Way sockets into the OLED holes.



Peel-a-way sockets in place for the OLED

Place Mill Max sockets into the encoder holes.

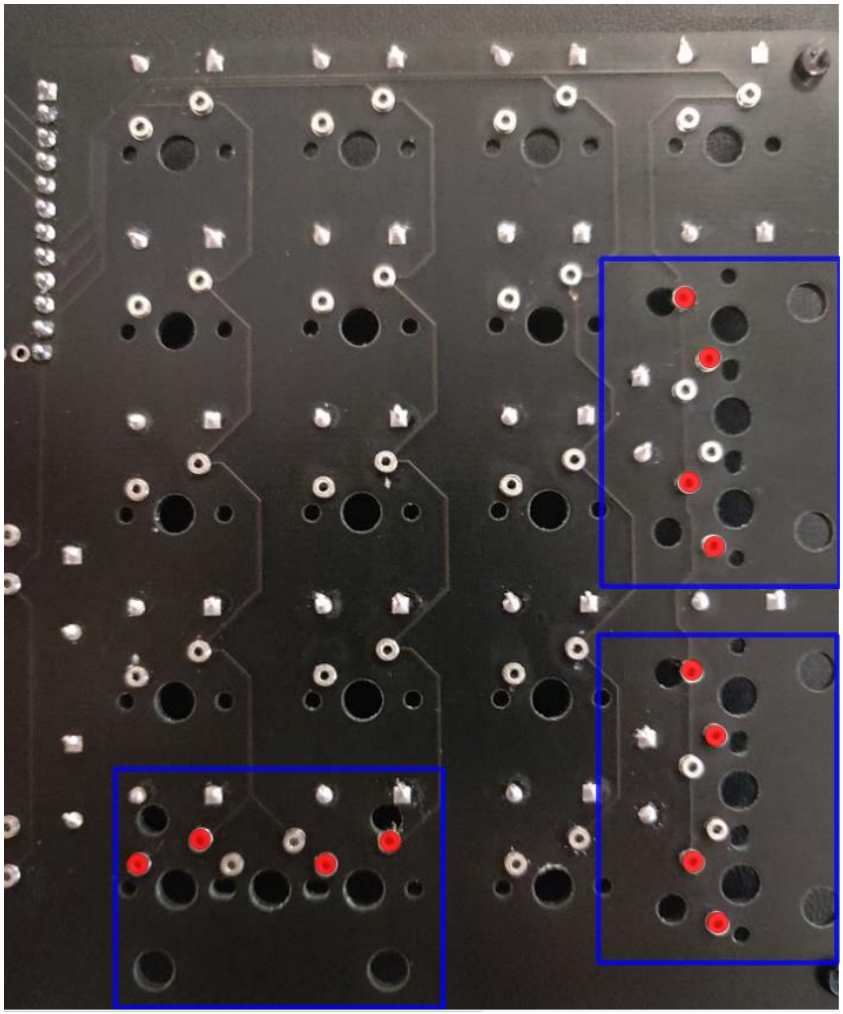


Mill Max sockets in encoder holes.

Install Mill Max Sockets into the switch pin holes.

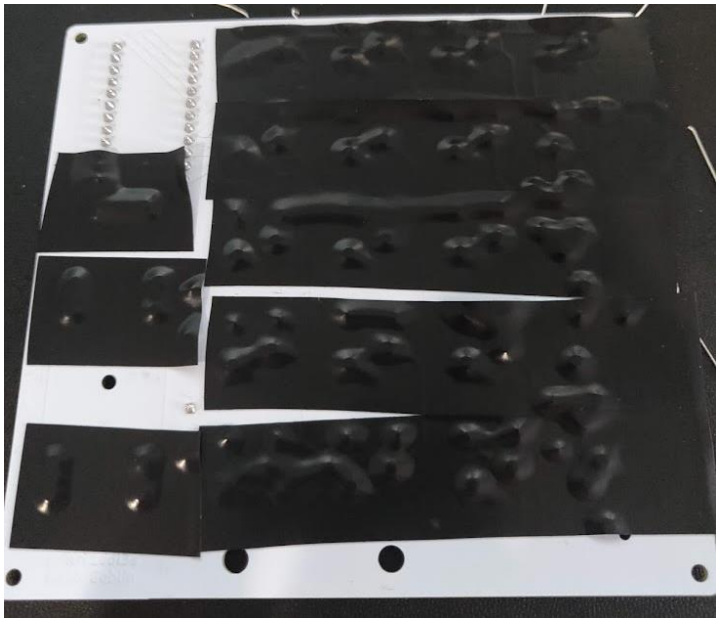
NOTE – IF YOU WILL BE USING A LAYOUT THAT USES ANY OF THE 2U BUTTONS AND YOU WANT TO USE STABS, DO NOT INSTALL MILL MAX SOCKETS IN THE LOCATIONS INDICATED BELOW. THE SOCKETS WILL PREVENT STABS FROM BEING INSTALLED.

My personal preference for this board is to not use any stabs to keep a consistent feel across all switches.

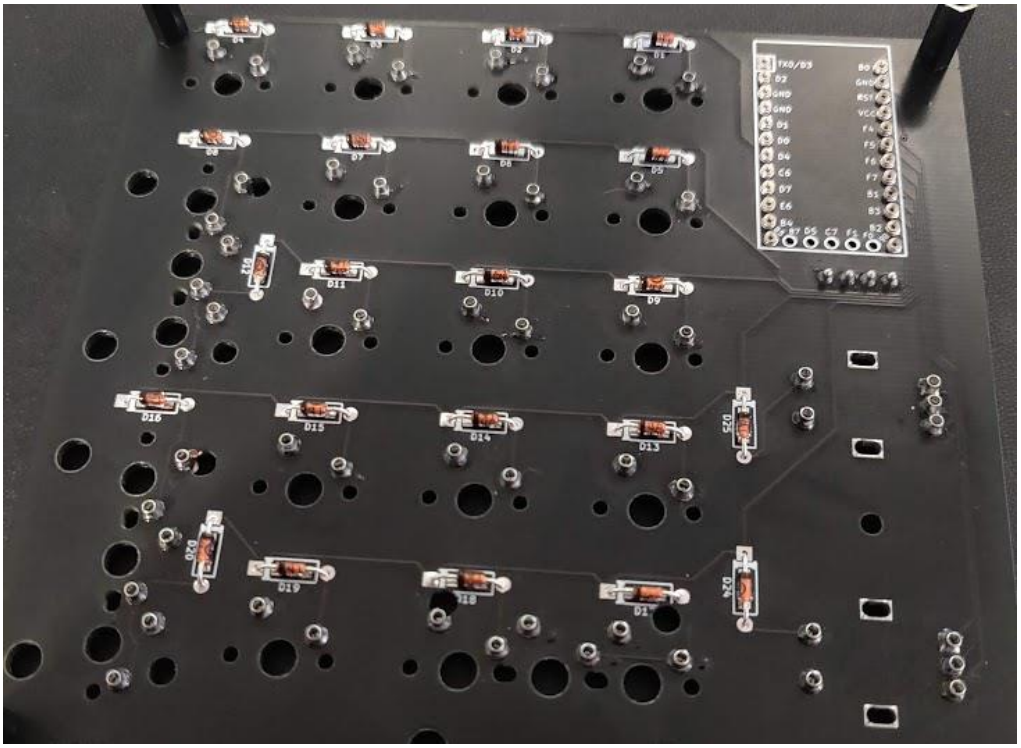


Switch sockets in place. Sockets to not install if stabs will be used marked in red.

Place electrical tape over the sockets. Press the tape down around the sockets to make sure they are held firmly in place.



Tape placed over sockets. Ready for soldering.

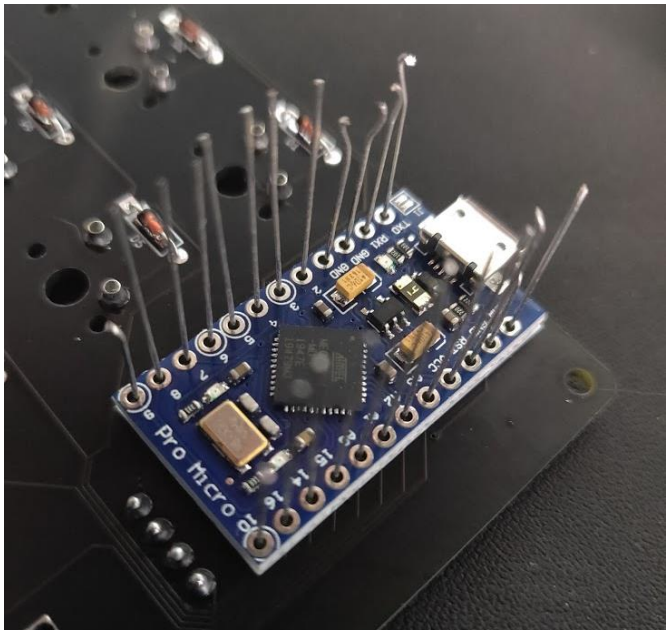


All sockets soldered.

Step 4 – Controller Pins

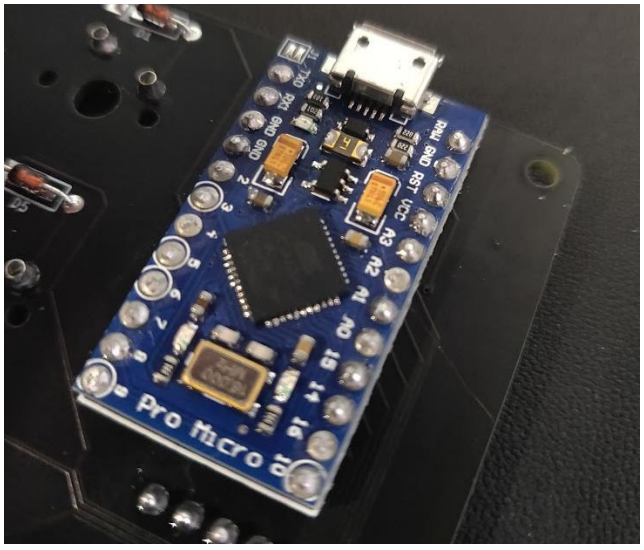
We're on the home stretch now! Let's get the pins soldered to the controller.

Place your controller over the controller sockets and push clipped diode legs in through the controller holes and into the sockets.



Clipped diode legs holding controller in place.

Solder the diode legs to the controller. Clip the excess wires.



Controller soldered and pins clipped.

Step 5 – OLED Pins

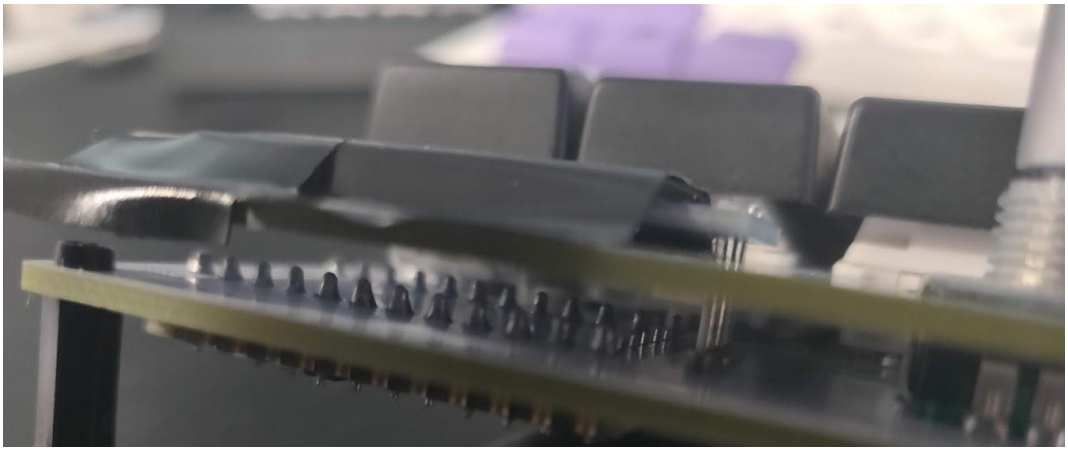
The last piece to solder!

Press your encoders into their sockets. Install your switches into the top plate. Press the switches into their sockets.

Place the holes in the OLED over the 4 holes on the top plate. Push clipped diode legs through the OLED holes and into the OLED sockets on the PCB.

Tape the OLED in place. Solder and clip the diode pins.

OLED taped to top plate. Diode pins inserted, soldered, and clipped.



Profile view. Diode pins passing through OLED and top plate. Inserted into OLED sockets.

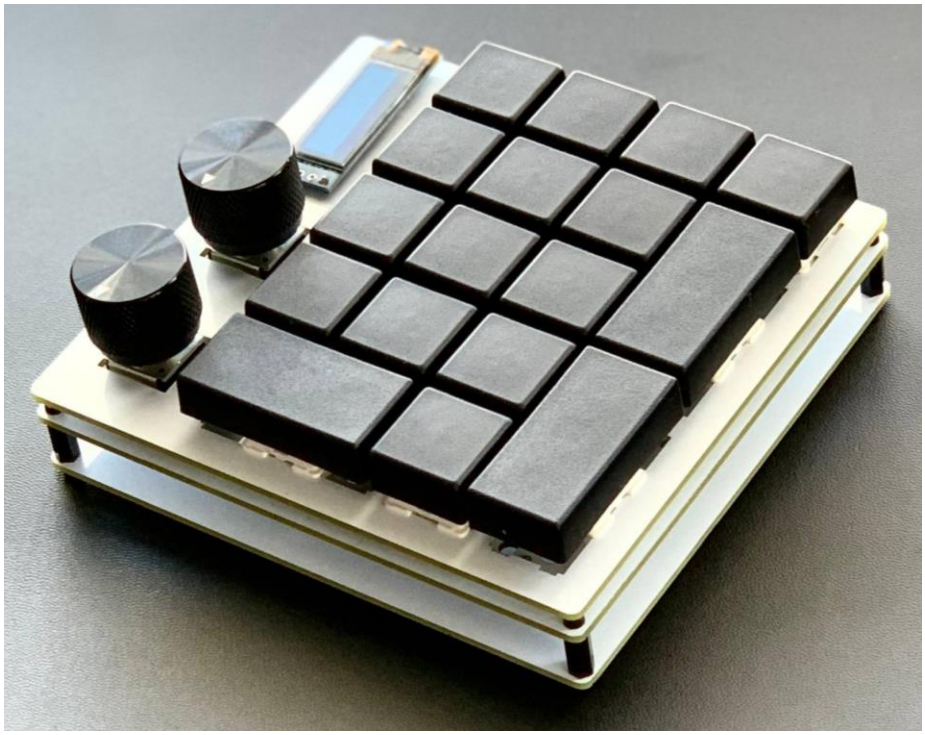
Step 6 – Wrap-Up Assembly

Slide the knobs onto the encoder shaft. Tighten the set screws.

Attach the bottom plate to the PCB with the standoffs and bolts.

YOU'RE DONE!!!

Hope you enjoyed the build!



Firmware

The Knob Goblin comes pre-flashed with the default layout:

Default layout

If you want to change the layout or re-assign any of the buttons, you can do so using the QMK Configurator and flash with the QMK Toolbox.

If you prefer to make more custom changes, or edit the OLED or function of the knobs, the source files are available here.

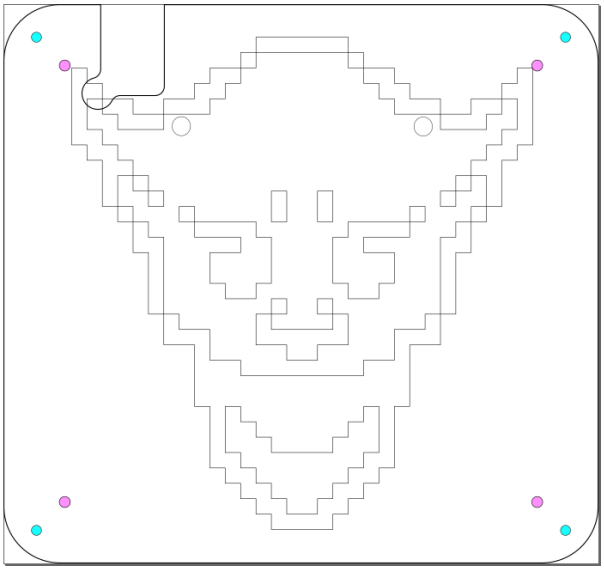
Continue this document for acrylic case install instructions.

Acrylic Case

Remove the protective paper from the acrylic pieces.

Attach standoffs to the bottom plate as shown:

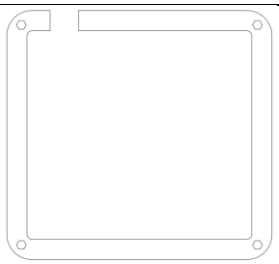
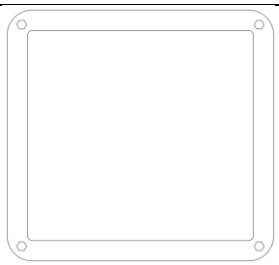
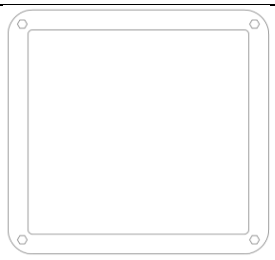
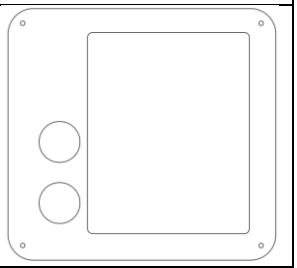
- 15mm Standoff. 6mm Screw
- 6mm Standoff. 6mm Screw



Place your PCB over the standoffs in the pink hole locations shown above. Attach the PCB to the standoffs with **4mm** screws.

Install your switch plate, switches, encoders, and OLED.

Slide the rest of the acrylic pieces over the 15mm standoffs in this order:

1.	2.	3.	4.
			
Qty (2)	Qty (1)	Qty (1)	Qty (1)
4.5mm thk	4.5mm thk	3mm thk	1.5mm thk

With the acrylic pieces in place, attach 6mm screws to the tops of the 15mm standoffs to secure everything into place.

Finished! Enjoy your goblin!