Parula Build Guide

Before You Get Started

Take your time.

Read a little ahead in the guide or read the whole thing first.

Do not start desoldering parts if something goes wrong. Instead contact me through tindie or get help on discord.

Parula Parts List

1x Parula PCB 67x 4 x 4 x 2mm SMD buttons 1x Pro Micro

Flashing the Pro Micro

Before soldering the Pro Micro to the Parula PCB, we need to make sure it's all working correctly by flashing the .hex file to it.

You will need:

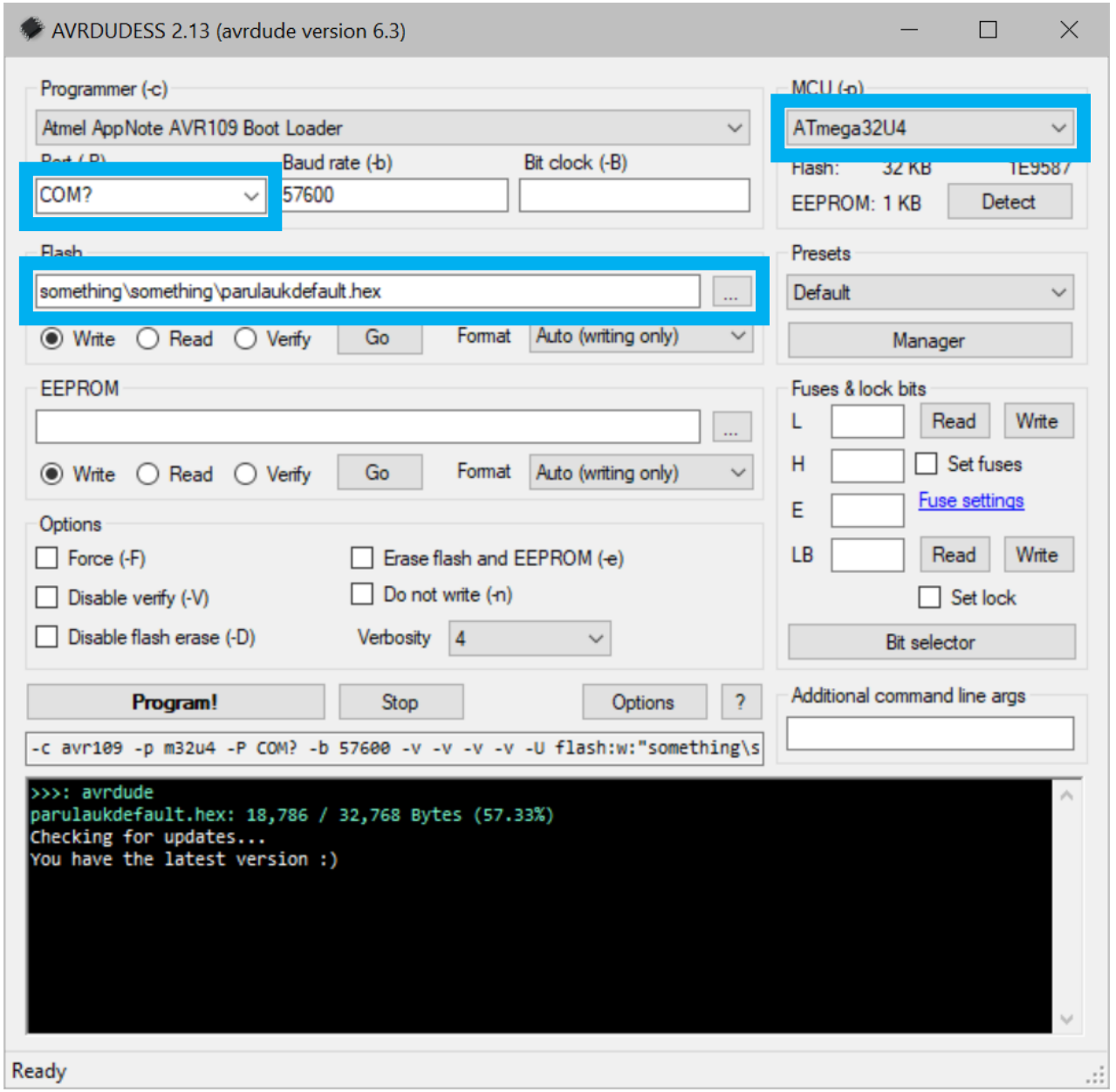
AVRDUDESS
(the portable version will do)

The parulaukdefault.hex file from the store page
(the “Source Code" button near the bottom of the store page)

Make sure your programmer is “Atmel AppNote AVR109 Boot Loader" and that the MCU is set to “ATmega32U4".

You need to find the COM port being used by the Pro Micro (by plugging it in).

You also need to open the .hex file in the “Flash" section.

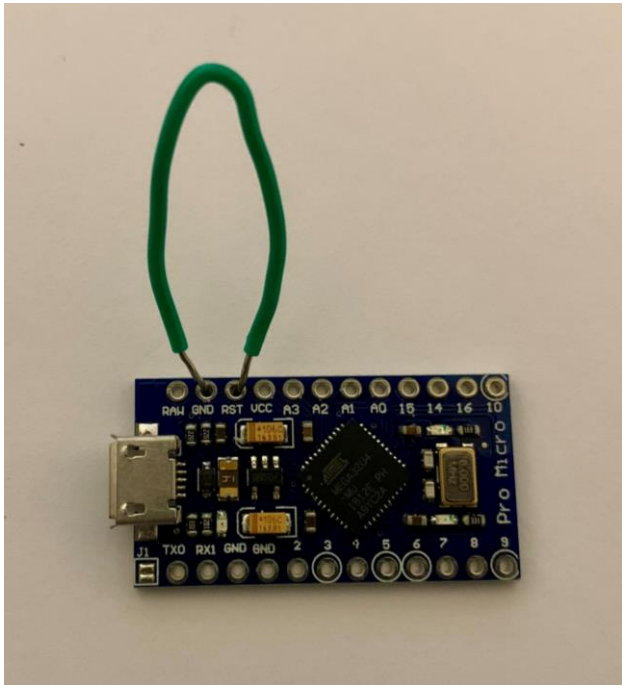


The trickiest part is getting the Pro Micro into bootloader mode and clicking “Program!" at the right time. This can take a few attempts.

Different Pro Micros seem to have different methods for entering bootloader mode.

First method:
Unplug the Pro Micro, use a piece of wire to connect the “RST" (reset) and “GND" (ground) pins together. Now with them still connected, plug the Pro Micro in, wait a second, remove your wire to disconnect them, it may now be in bootloader mode. In AVRDUDESS, click the drop down menu for “Port" to select the COM again, quickly click “Program!".

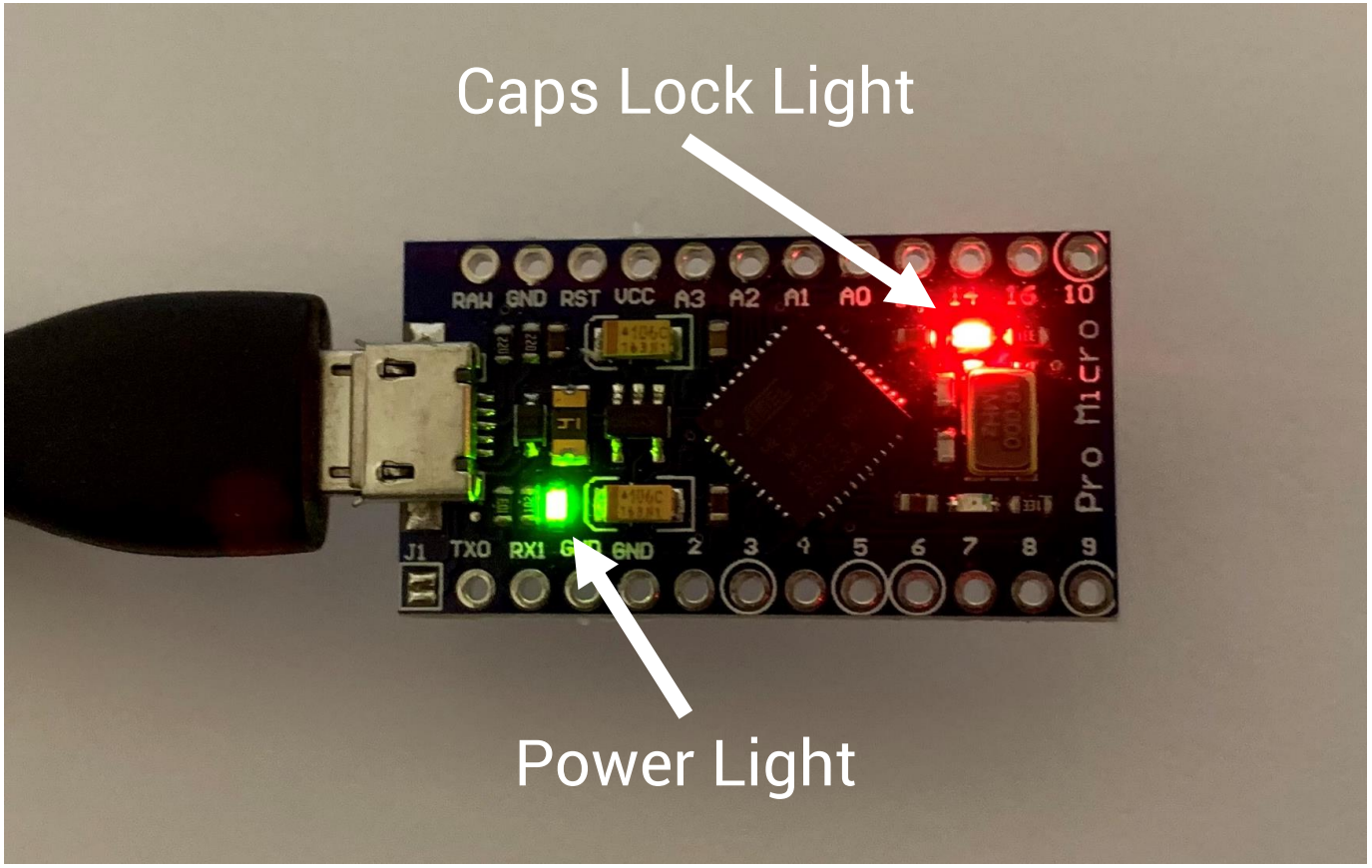
Second method:
With the Pro Micro plugged in, use a piece of wire to connect the “RST" (reset) and “GND" (ground) pins together. Now quickly connect and disconnect these two pins a few times. With the wire disconnected, check the Port in AVRDUDESS, if it's showing a **different** COM, then it's worked, so quickly click “Program!".



AVRDUDESS should start showing messages and eventually say “avrdude.exe done. Thank you."

Now you can test that the .hex file is on the Pro Micro. Unplug it and plug it in again, then press the “Caps Lock" key on your PC. This should cause an LED on the Pro Micro to light up (it's the Caps Lock indicator).

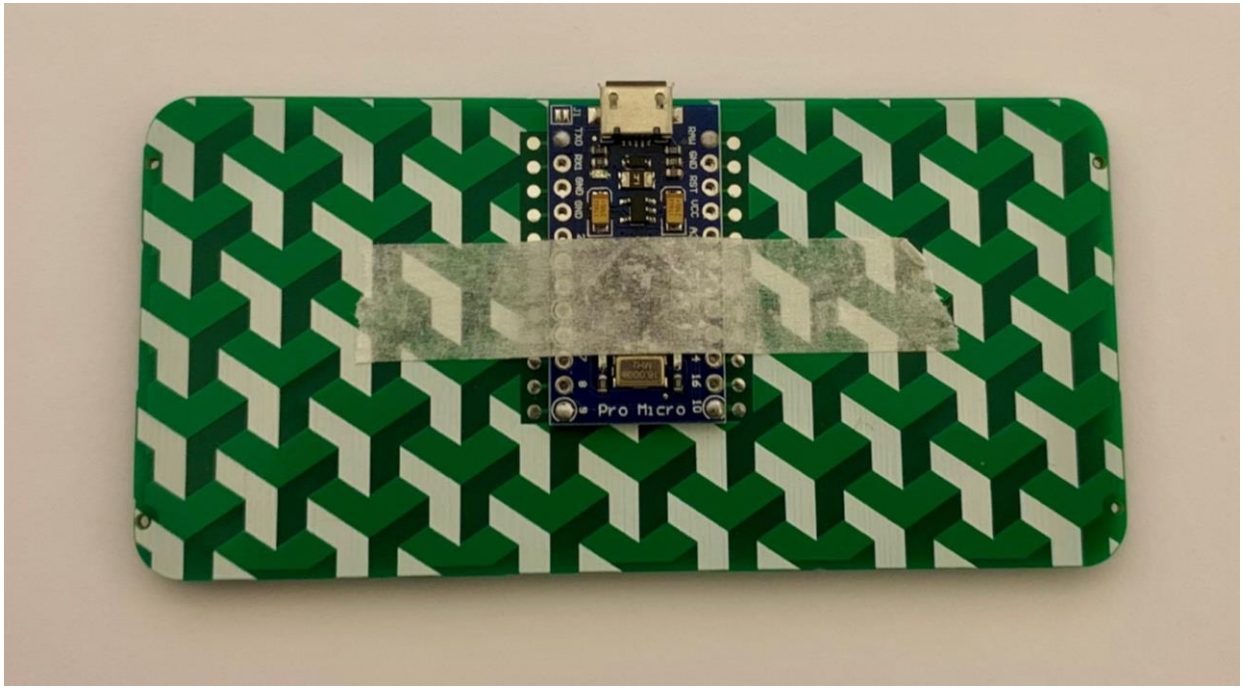
Now that you know your Pro Micro is flashed and working, you can start soldering.

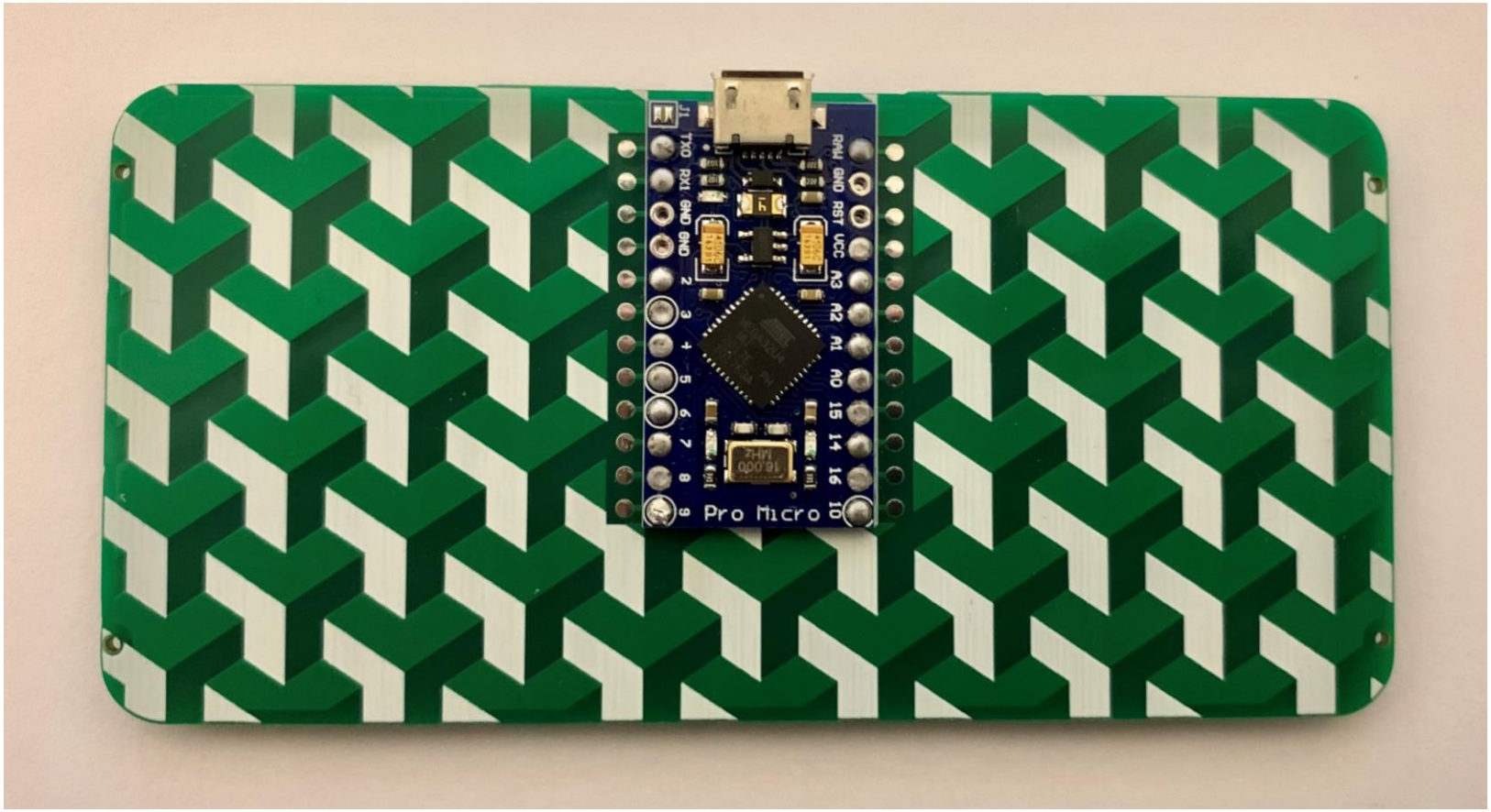


Soldering

Soldering the buttons on first is recommended so that everything lays flat. Use a soldering iron or a PCB oven, whatever you have/are comfortable with.

For soldering the Pro Micro flush against the PCB, you will need a thin soldering tip that can fit through the holes of the Pro Micro.
Start by taping down the Pro Micro in the outline, then solder the four corners using the method shown in **this video**.



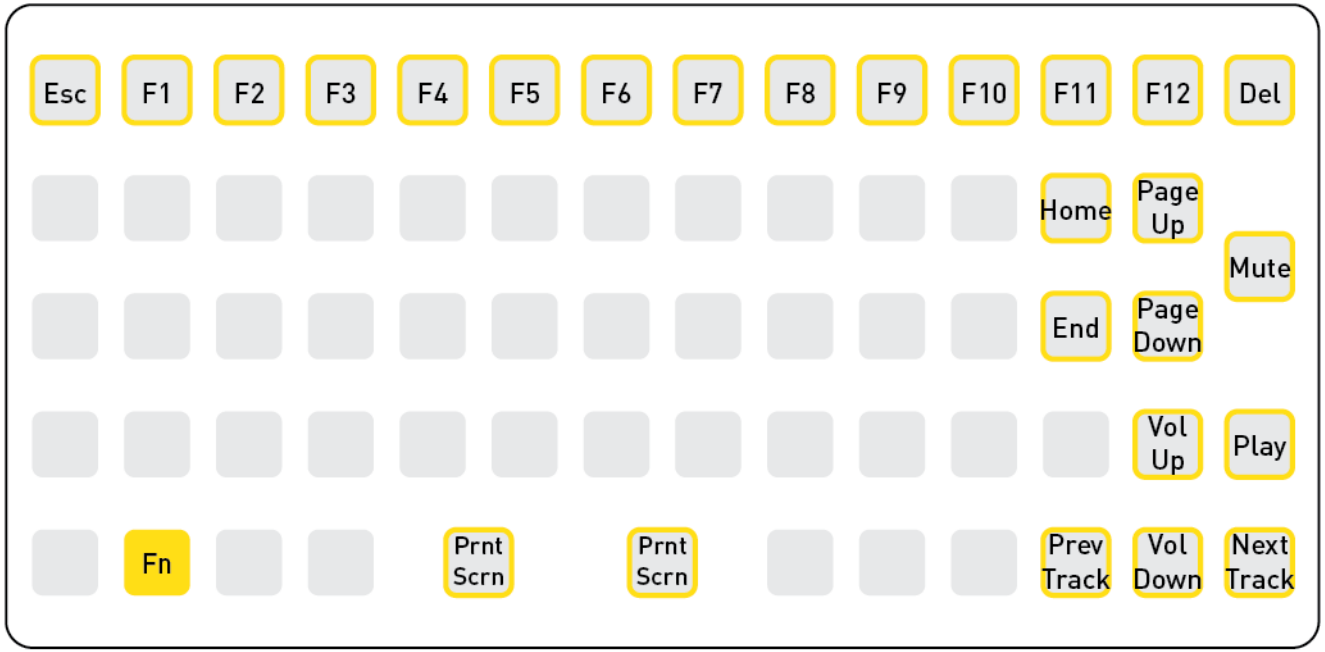


Solder the remaining pads using the same method. The “GND”, “RST”, and “VCC” connections aren't needed so you can skip them. You can test your connections with a multimeter by placing the probes on a pad for the Pro Micro and the test pad directly beside it, or you can turn the page to check each button works.

Go to https://config.qmk.fm/#/test and set it to ISO. You should be able to activate all of the buttons shown in green here. Turn the page to see the default keymap.
If anything isn't working, go to the back of this guide for the troubleshooting section.

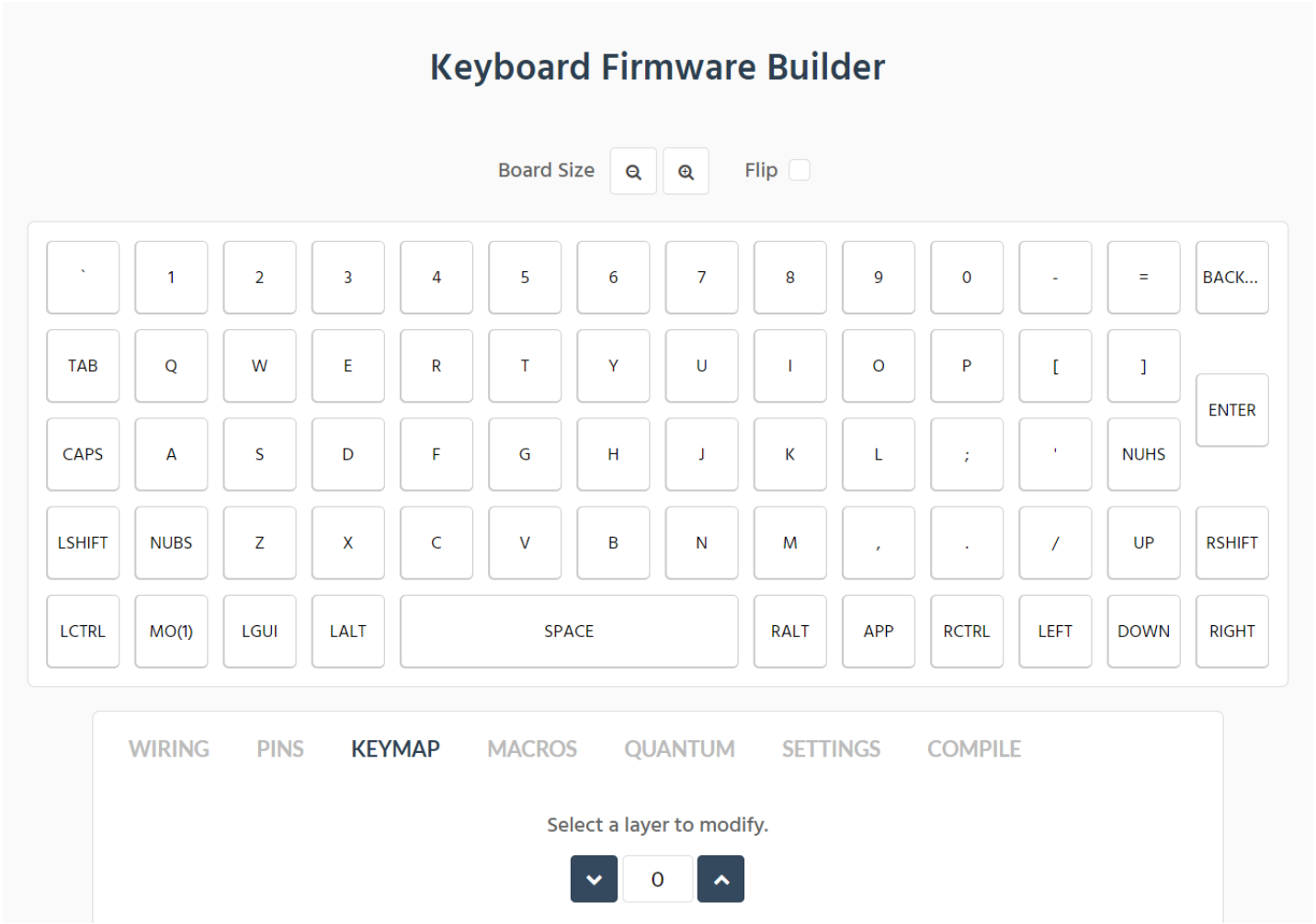
Default Keymap (UK)

Fn Keymap



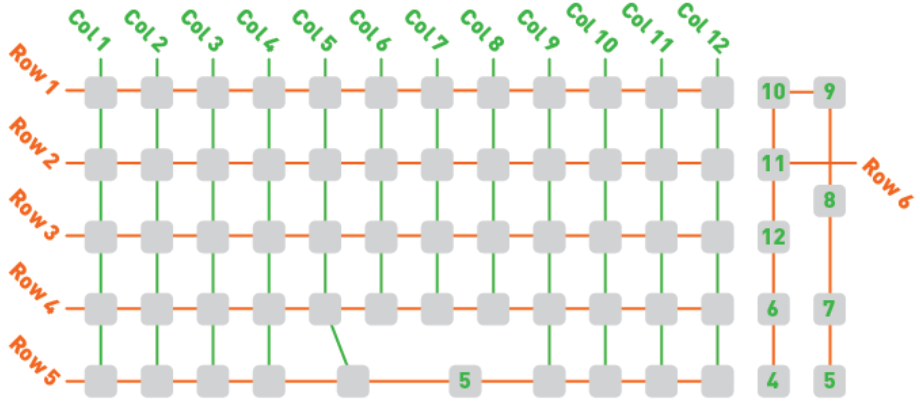
How to Change the Keymap

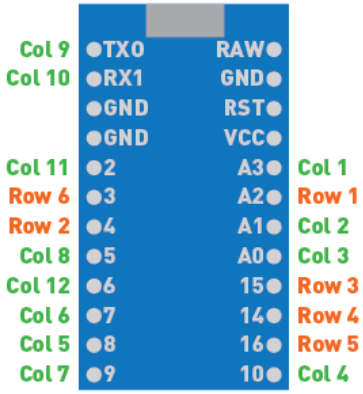
Go to https://kbfirmware.com/ and click the button at the top to upload the “parulaukdefault.json” file that is included with the .hex file.
From here, you can change what all the buttons do. Don't change anything on the “Wiring” and “Pins” tabs. When you're done, go to the “Compile” tab and download your new .hex file.



Troubleshooting

Some of my buttons aren't working.
If you have a whole column or row of buttons that aren't working, it's likely a soldering issue on the Pro Micro, refer to the diagrams below to find the appropriate connection to fix.
Note: the last two columns are actually Row 6 because of the limited number of connections available on the Pro Micro.





If some buttons in a row/column are working but some aren't, it's likely a soldering issue on one of the buttons in that row/column. Every button connects to its row via its upper or lower left legs, so if it's an issue with a row of buttons, you only need to check the left side of each button. If it's an issue with a column, you only need to check the connections on the right side of the buttons.

I can't flash my Pro Micro.
Keep trying the second method mentioned before until you see the COM change. If that really won't work, it's possible that your Pro Micro is a dud (this is why you check it works before soldering it to the PCB), buy a new Pro Micro from a different supplier and try again.

Don't hesitate to contact me if you need further help with any part of the project.