

Polaris Build Guide

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Part 1 - Begin here



POLARIS
by Kevinplus and ai03

Thank you for your purchase!

We've done our best to make the best keyboard possible at the price point.

To get the best out of it, it is important to assemble it correctly.

This build guide outlines the exact steps to take to get it built.

Warning: Damage, imperfections, etc. due to disregarding the build guide instructions cannot be accounted for. We won't be able to refund or replace parts if you decide to build it by gut instinct and mess up somewhere.

What's in the box

- The Polaris case, plate, and PCB,
- A set of long gaskets,
- A set of small gaskets,
- The foam layers, one for below and one for above the PCB,

- A wafer of stabilizer shims (break apart as necessary),
- A set of extra weight screws to suit your color preferences,
- A large hex key and a small hex key (2.0mm and 1.5mm respectively),
- Some rubber feet,
- A lot of custom cut foam,
- The piece of paper warning everyone to read the build guide.

Parts and tools necessary for building

- Enough switches to cover your preferred layout, likely lubed and tuned,
- Stabilizers for all the larger keys of your preferred layout,
- Keycaps of your choice,
- A USB-C cable,
- Soldering equipment - iron and solder at minimum.

Tools that aren't required but are useful

- A pair of tweezers,
- Some sort of desoldering equipment in case mistakes happen,
- Possibly a pair of flush/wire cutters if necessary,
- Some electrical tape or similar (see the very bottom acoustic tuning section later).

Before we begin

Just a few quick heads up regarding some things you should know.

- Refrain from wiping down the board with strong chemicals such as isopropyl alcohol, especially for the brass parts. This will ruin the matte coat and leave you with a semi-

tarnishing, semi-glossy tacky mess.

- Shocking the board with an ESD discharge may permanently damage the circuitry inside. Always make sure you discharge built-up static before using the board, especially so before handling the bare PCB.
- For polycarbonate case buyers: Poly is an absolute scratch magnet. It's simply impossible for it to not get scratched, but do be careful about nearby objects if you ordered this variant. Also, be extra careful to not overtighten the screws.
- Read through the build guide once before actually carrying through with it, so you have a good idea of what's upcoming at the next step. You can navigate the book using the panel on the left (large screens) or in the info tab (mobile), or use the link at the end of each part.
- The custom cut foam and perfectly sized box is useful for storing and/or reselling the board. We recommend that you keep it; otherwise please recycle the box for the sake of our planet.

Ready?

[Let's begin.](#)

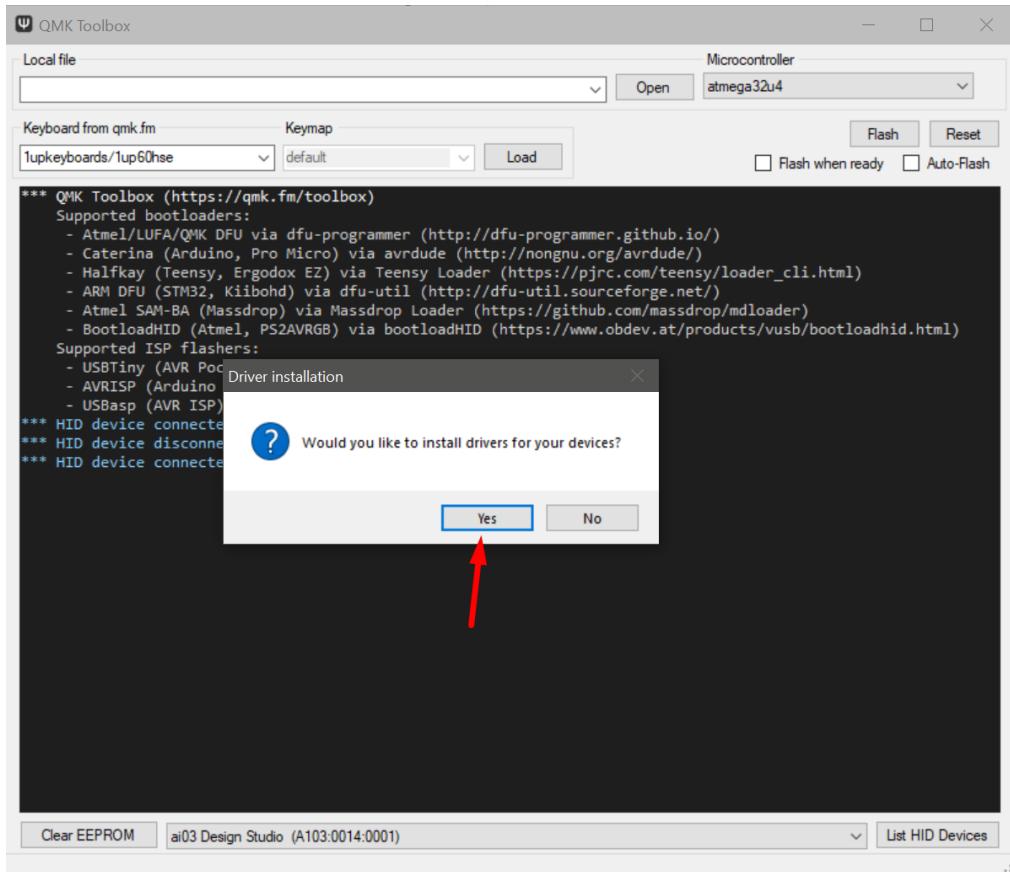
Part 2 - Preparing the PCB

The PCB comes with a basic keymap that types, but likely isn't ideal for your use case.

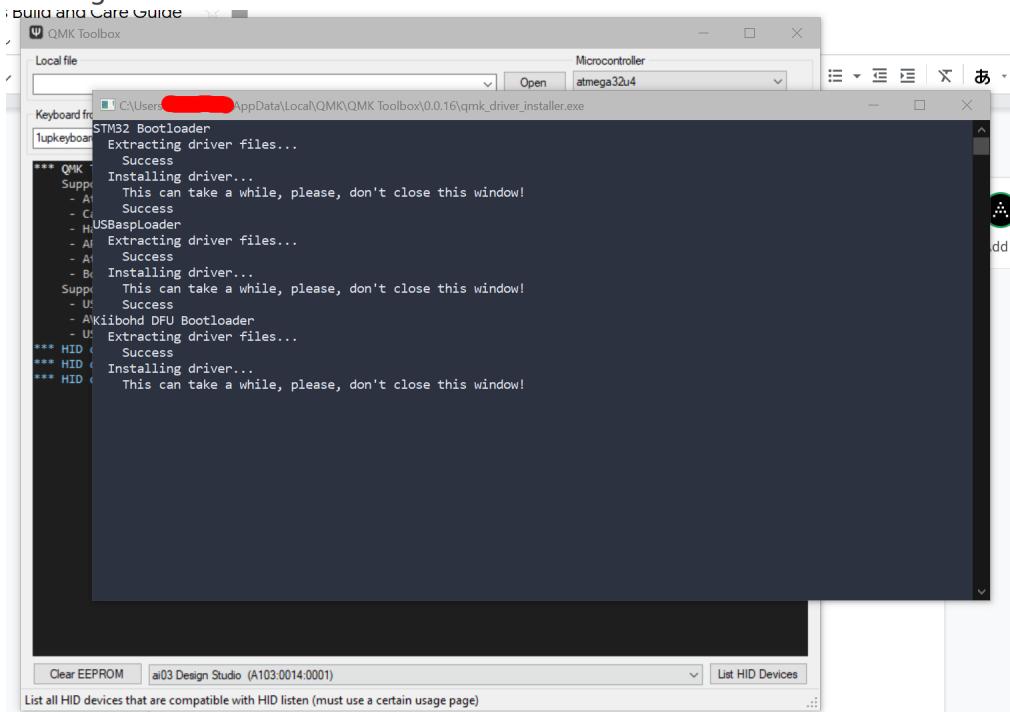
To get it functioning well, it's necessary to install a more recent copy of the firmware that's compatible with Via Configurator.

1. Unbox the PCB if not already done.
2. Download the via-compatible firmware hex file ai03_polaris_via.hex from [here](#).
3. If you haven't installed QMK Toolbox, Atmel FLIP, or a similar firmware flashing program before, do the following:
 1. Grab the latest QMK Toolbox here.
 2. Run QMK Toolbox (or install and run if you grabbed the installer variant). It will

ask you if you wish to install drivers; select yes.

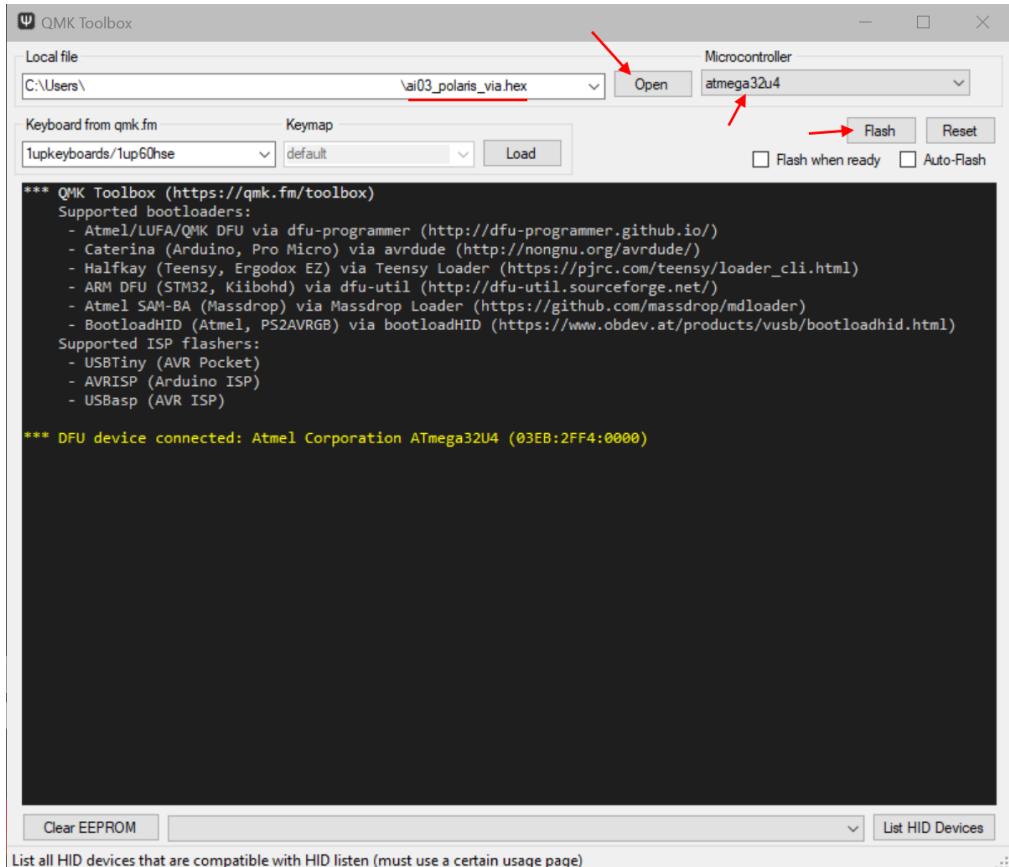


3. The drivers will install slowly, then exit. After this, you may need to restart your PC to get the drivers loaded.



4. Flash the firmware. For QMK Toolbox users, do the following:

1. Launch QMK Toolbox. For the Local File field, press the Open button, and select the hex file that you downloaded at step 1.
2. Plug in your PCB, and press the reset button located near the left Win/Alt key location on the bottom. If the drivers are installed, you should see an ATMega32u4 Bootloader device show up.
3. Make sure that the option selected for Microcontroller is the atmega32u4, then press flash. The log should show the firmware being written successfully.



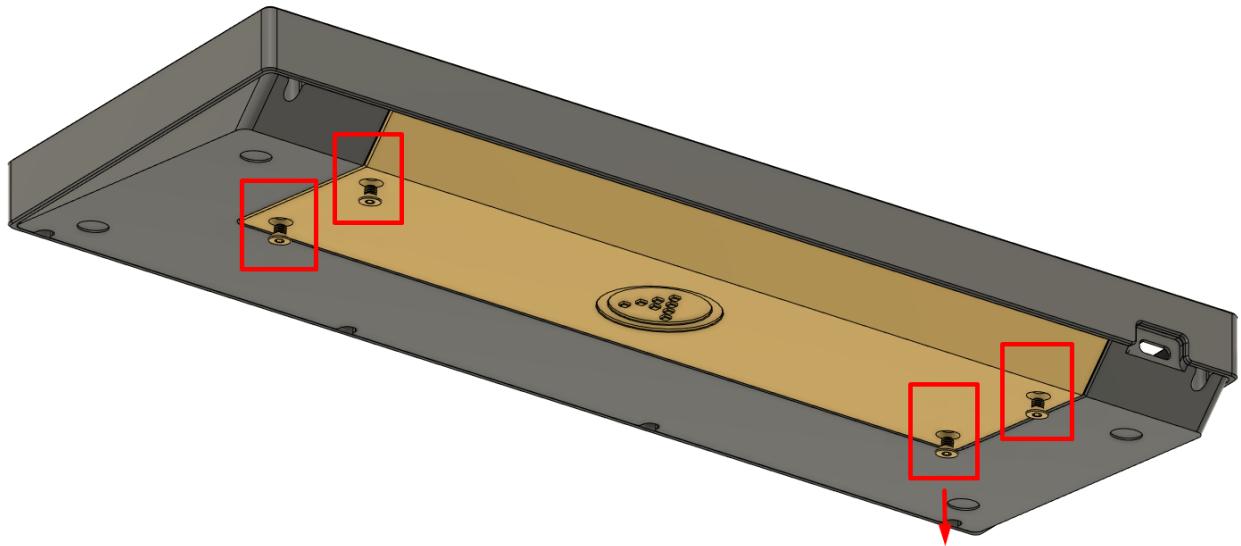
5. Replug the PCB once it's done. It should now register as a functional keyboard and show up as Polaris in device manager or similar.

Next, we will [prepare the case for assembly](#).

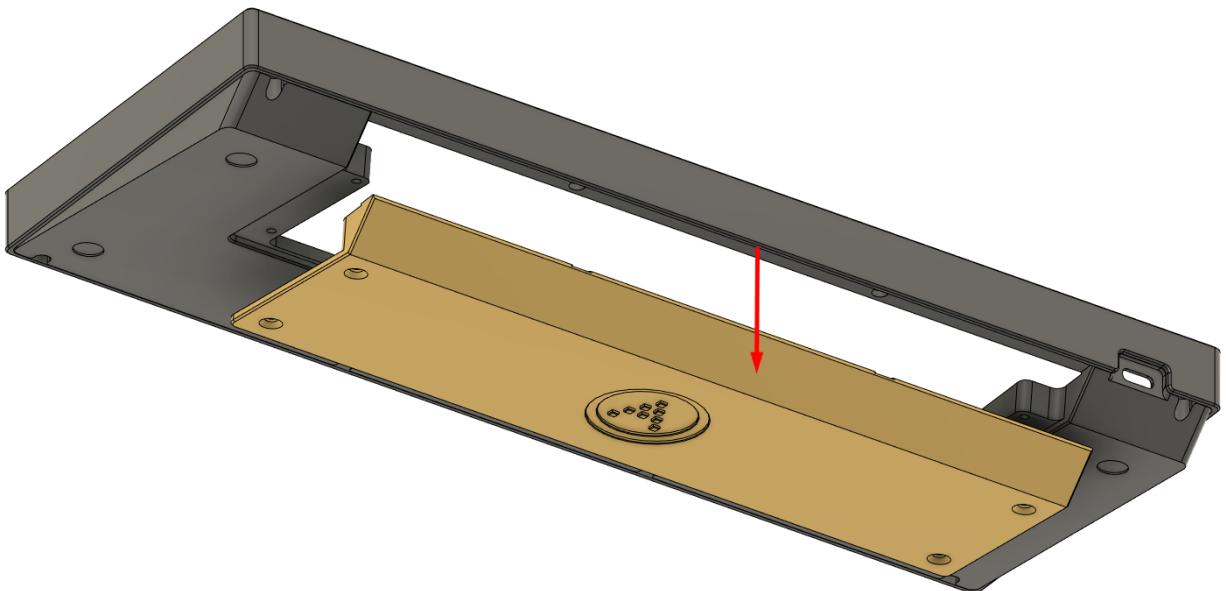
Part 3 - Preparing the case

Let's begin with the case.

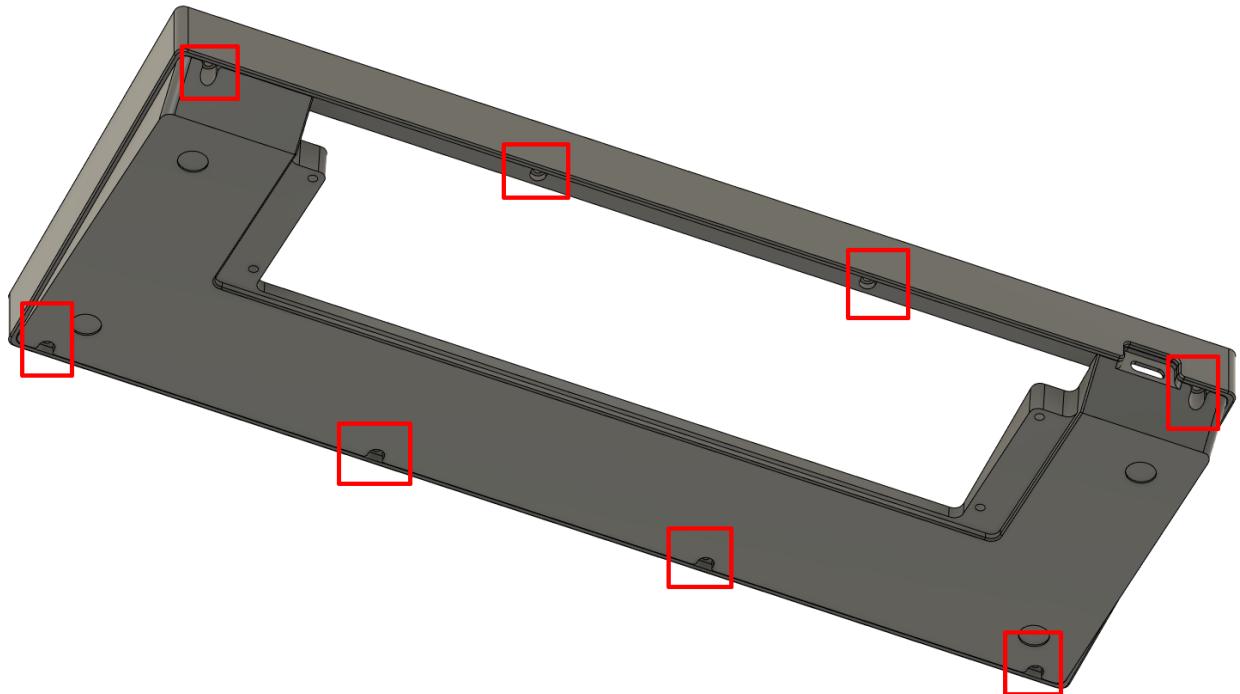
1. Unbox the keyboard and all related parts if not already done.
2. Of the two supplied hex keys, use the larger one to unscrew the four weight screws.



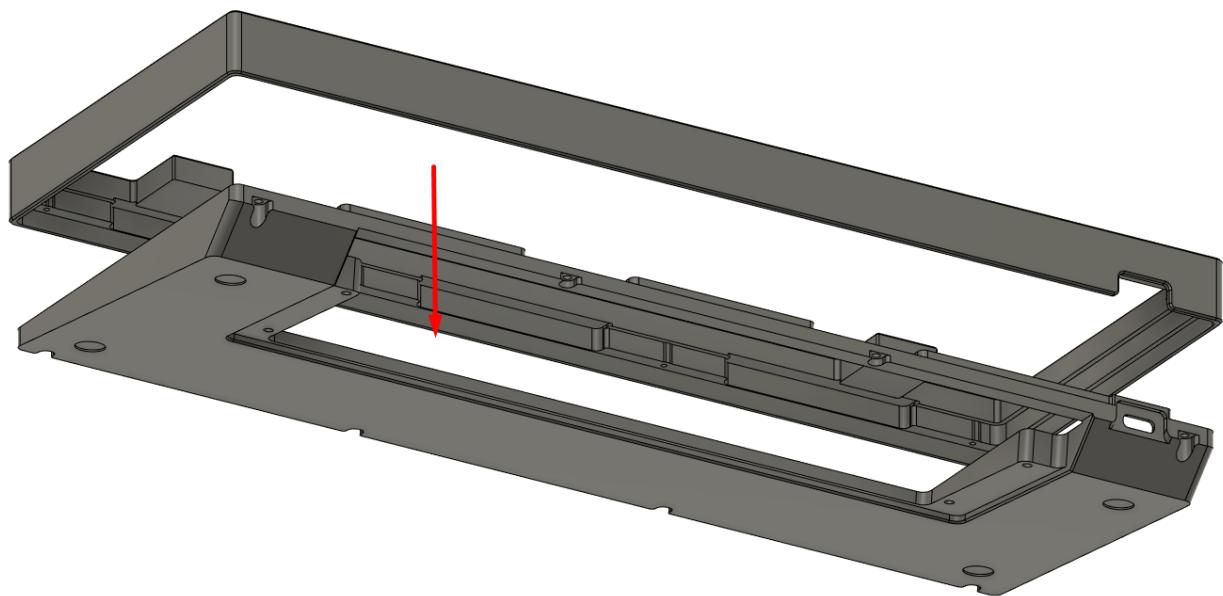
3. Carefully remove the weight, and set aside.



4. Use the smaller of the two hex keys to unscrew the eight case screws.

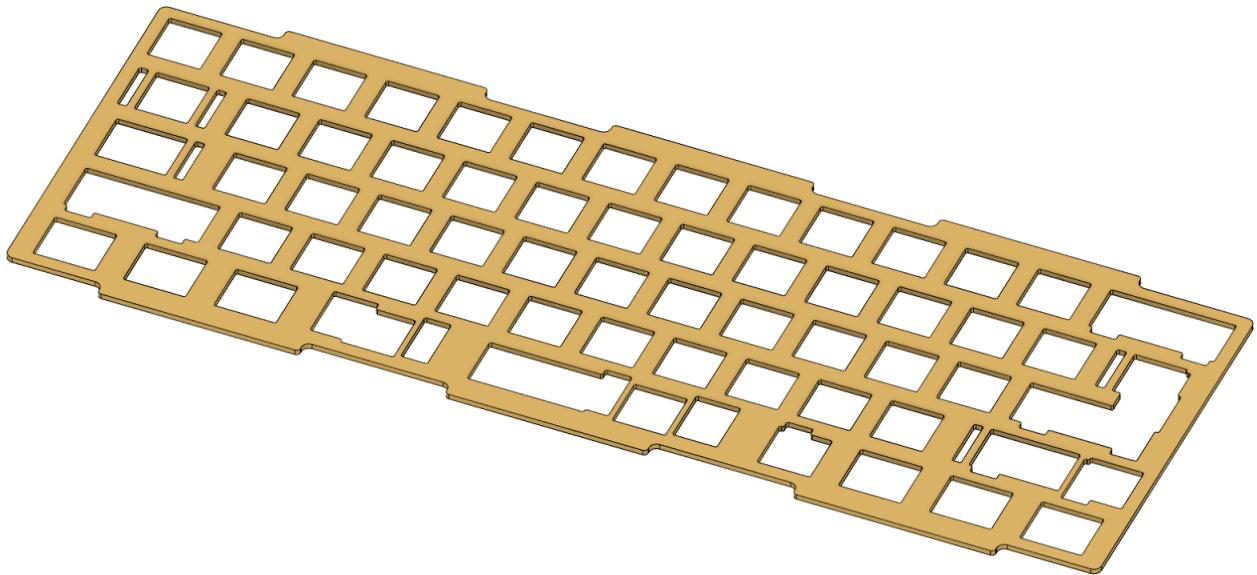


5. Carefully remove the bottom case half, and set aside.



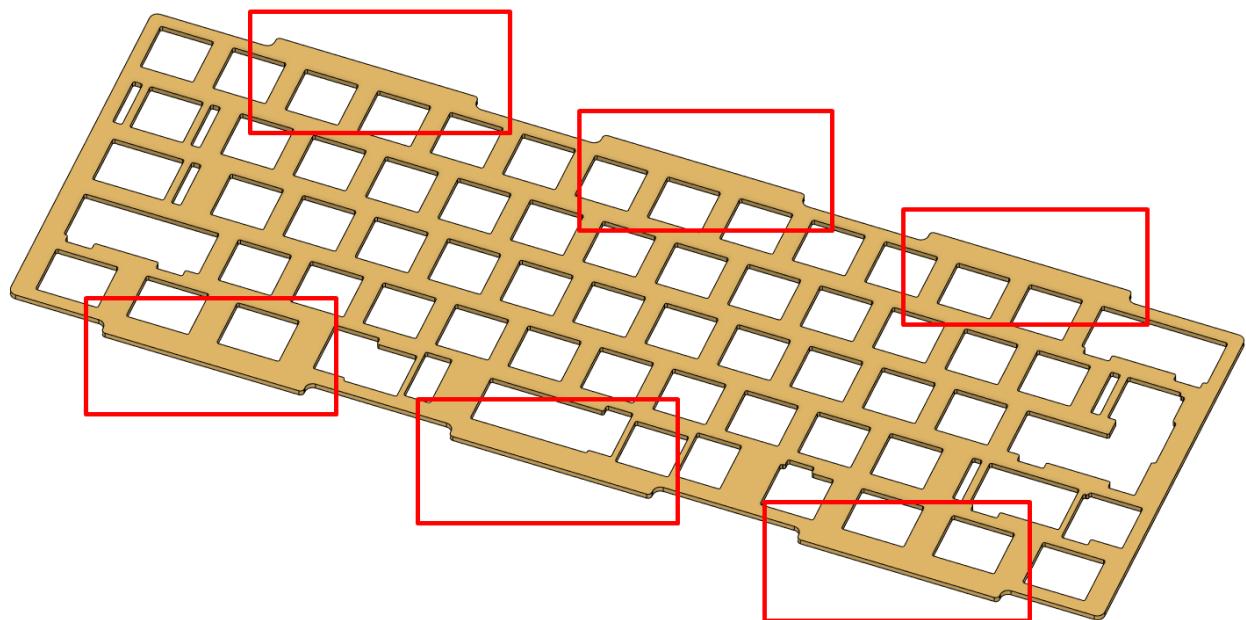
6. At this point, the case should be fully disassembled.

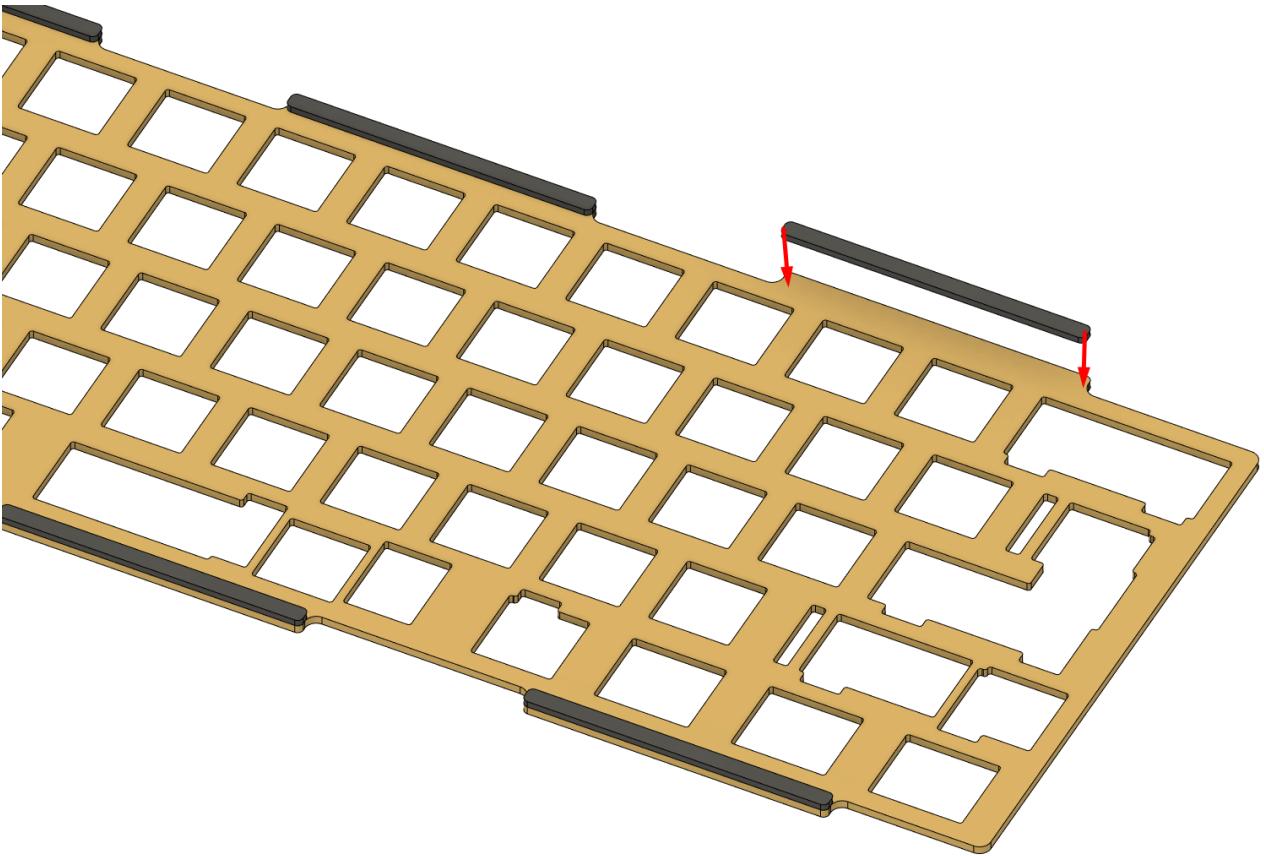
Prepare the plate and adhesive gaskets.



7. Carefully place 6 of the long gaskets onto the plate, one per tab.

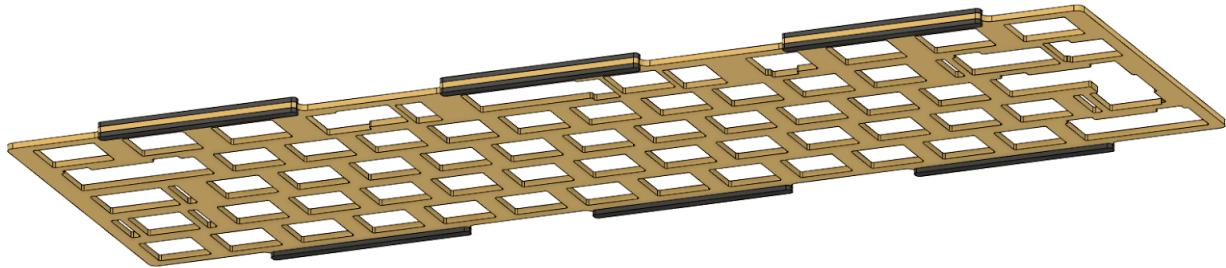
Note: For the minority who are planning on using aftermarket custom plates, install these gaskets on the case top area where the plate tabs overlap. For specific warnings and instructions, see [here](#).





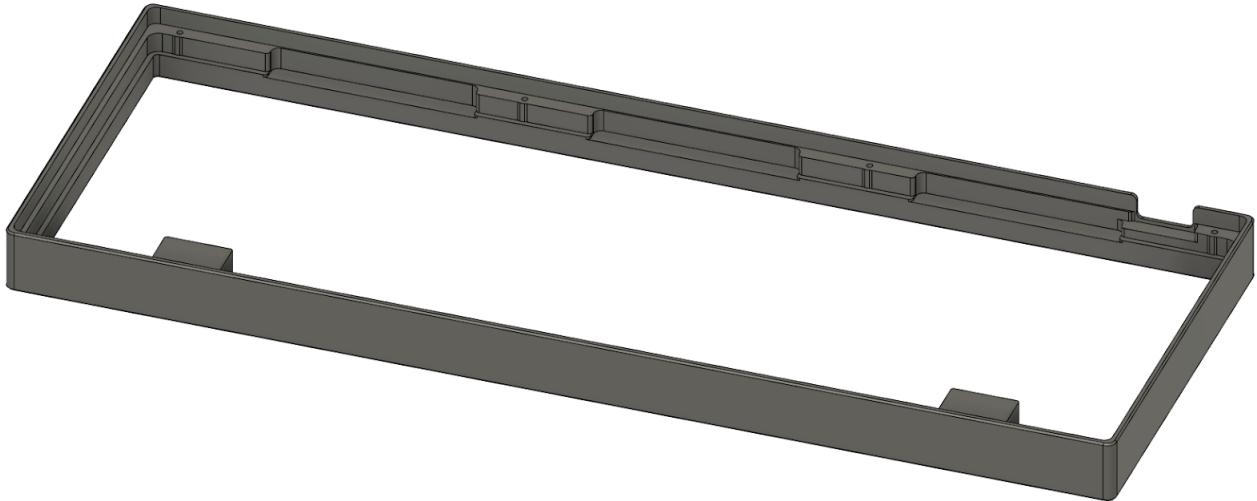
8. Repeat on the underside; there should be 12 gaskets installed at the end of this step.

Note: As per the previous step, if you are planning on using aftermarket custom plates, place the gaskets on the bottom case half where the plate tabs overlap.

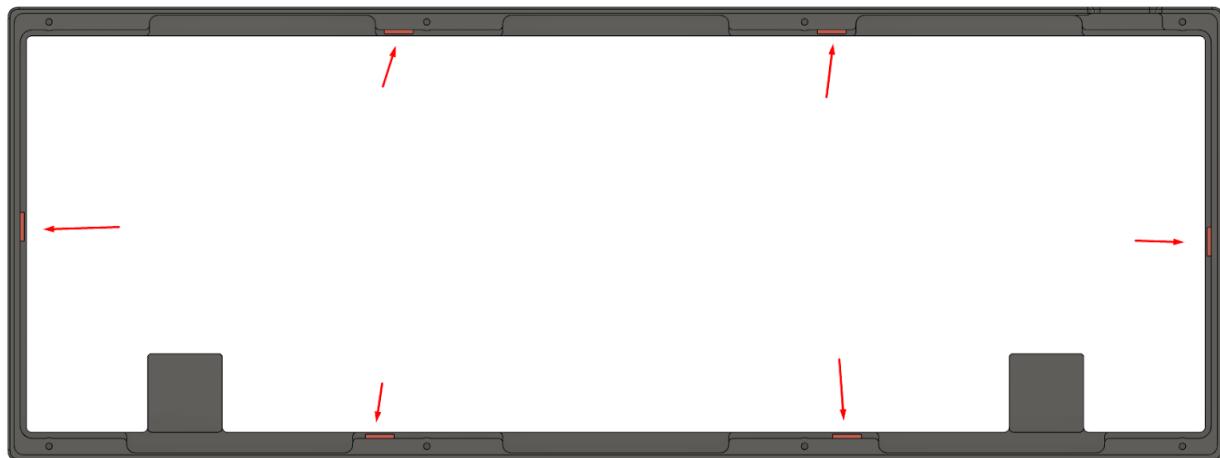


9. Set the completed plate aside.

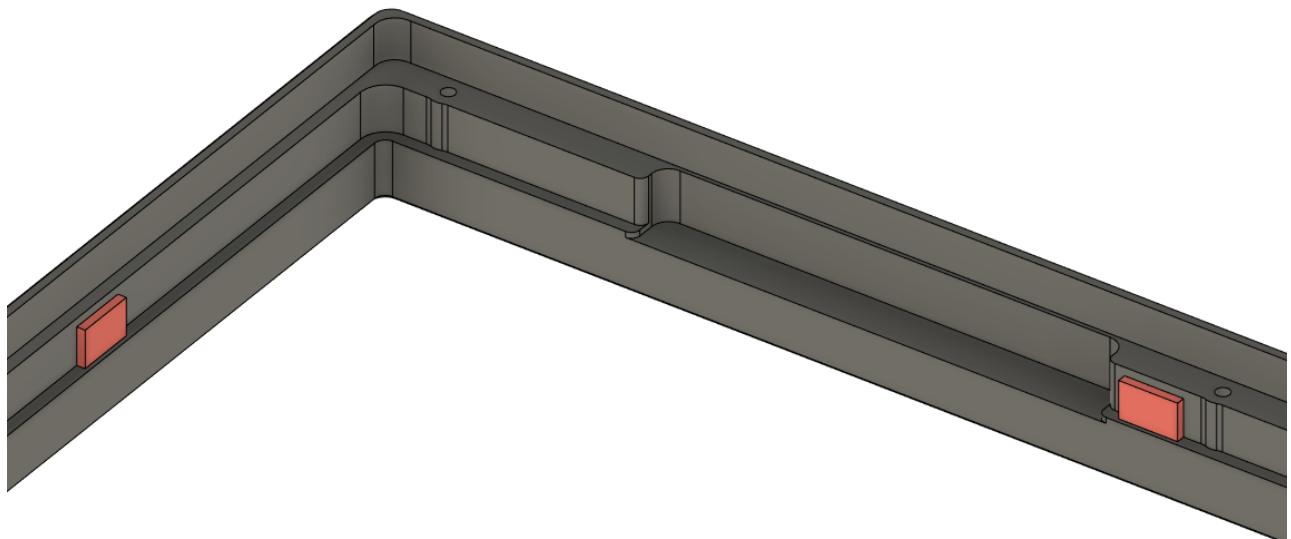
Prepare the case top half and the small rectangular gaskets.



10. Place the small gaskets horizontally at roughly the points indicated, on the inner wall of the case.

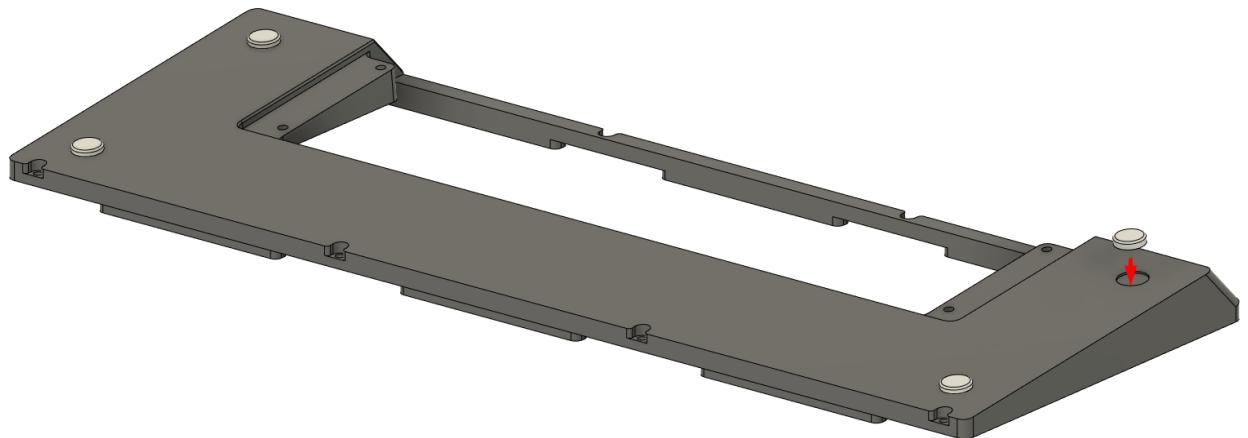


They should be placed at “plate-height” on the center band, flush to the lower edge as shown.



11. Set the completed top case half aside. Prepare the case bottom half.

Install the provided rubber feet into the insets.

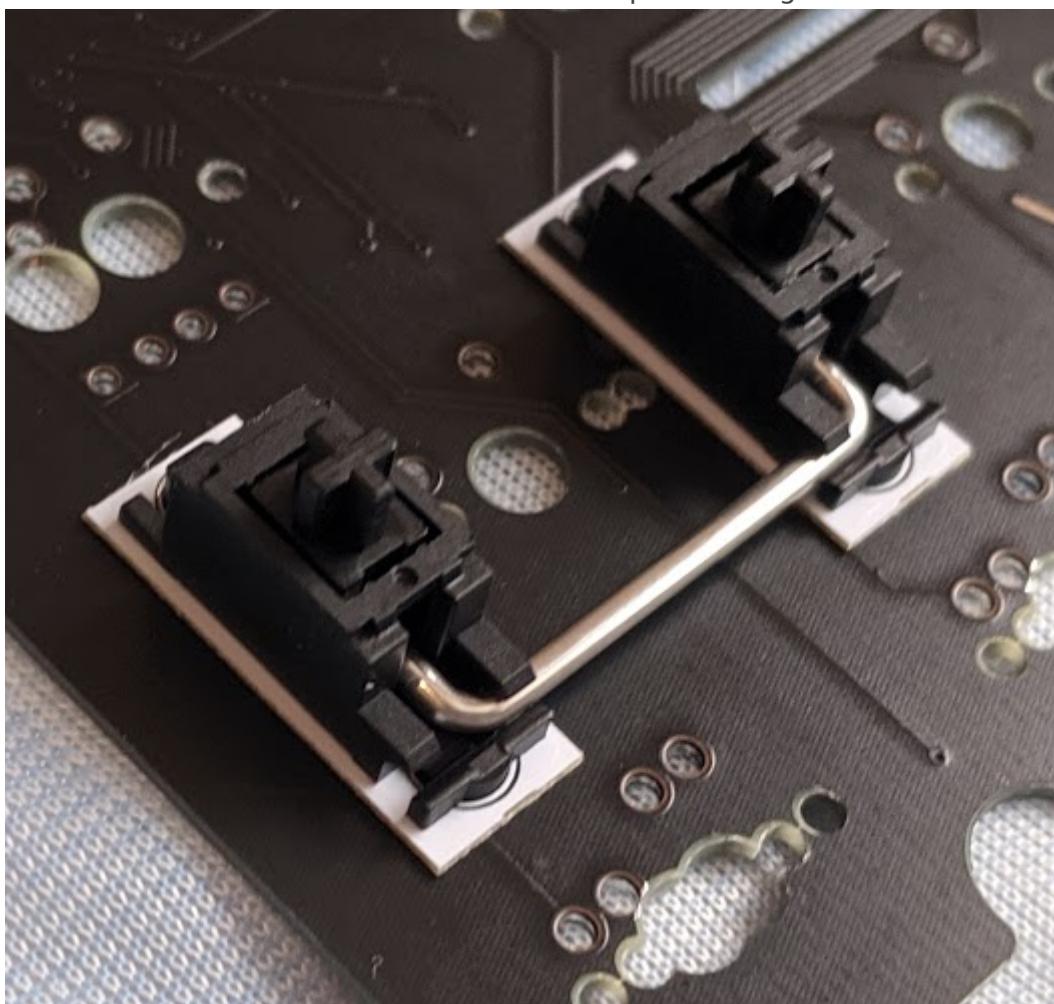


The case is now ready for assembly.

Now it is time to [solder the switches](#).

Part 4 - Installing switches and stabilizers

1. Prepare and tune the stabilizers you need for your planned layout.
Prepare and lube the switches as well.
2. For stabilizers that sit loosely such as Cherry clip-in or GMK screw-in, insert the provided stabilizer shims onto the stabilizers, with the side having the shiny rectangle facing up.
For firmer sitting stabilizers such as Durock and Everglide, this is not necessary.
3. Install the stabilizers onto the PCB. An example showing the shim use is shown.

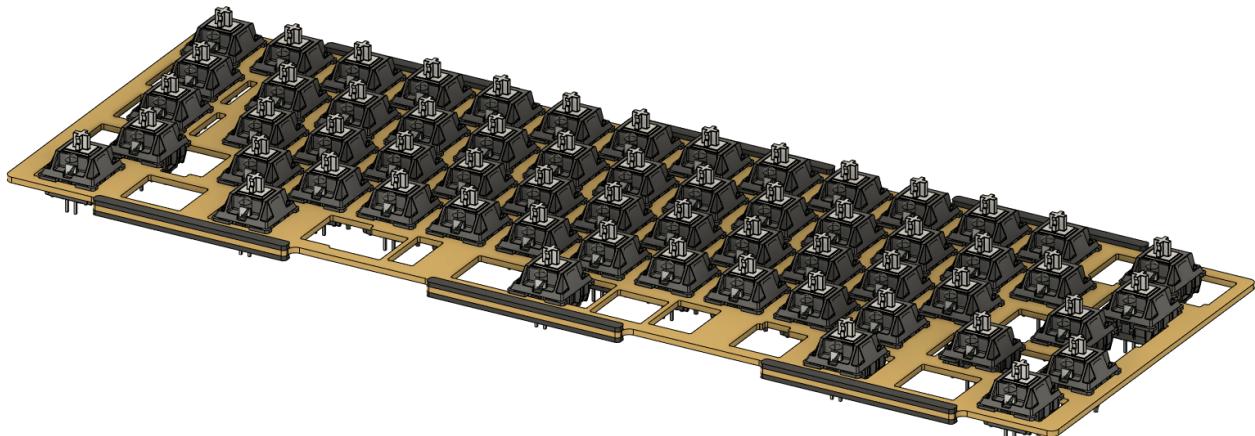


Note: Due to a mistake on our end, when using 2.75U shift and 2.25U enter, the inserts may collide. In this case, clip the overlapping bits with a wire cutter or similar. This should

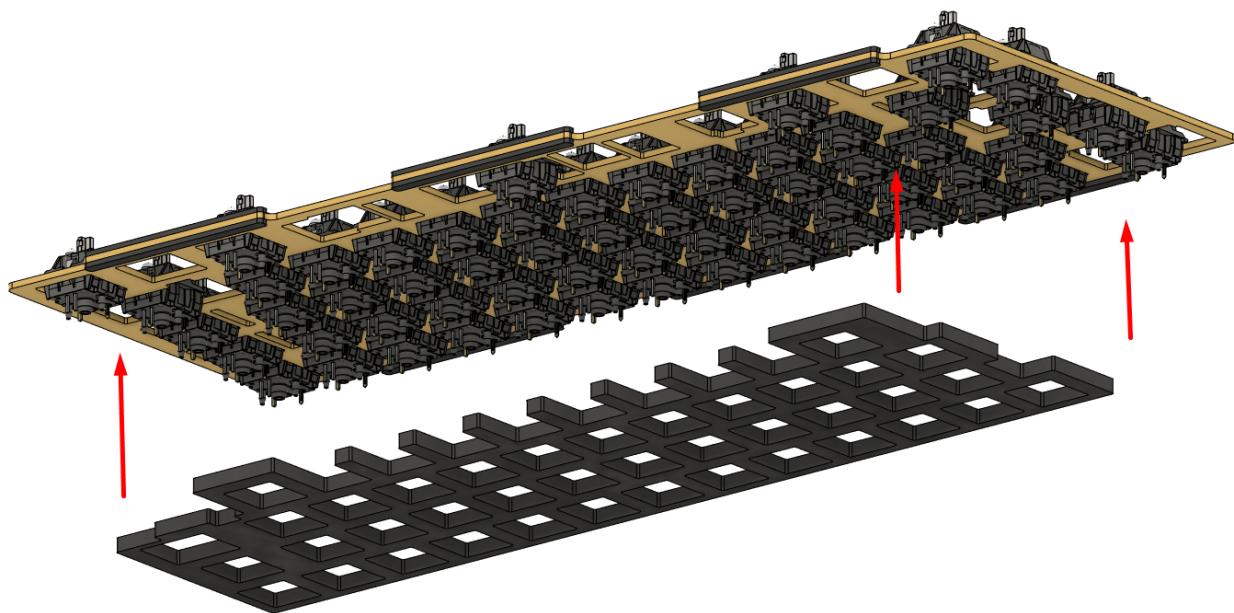
have no negative effect on the shims actually doing their job.

Note 2: Some extras batch 2 units supposedly shipped with KBDfans' stabilizer gasket shims. Although one is flexible and the other is rigid, there should be no difference in functionality or feel. Apply them in the same location (under the stabilizer) as the rigid shims.

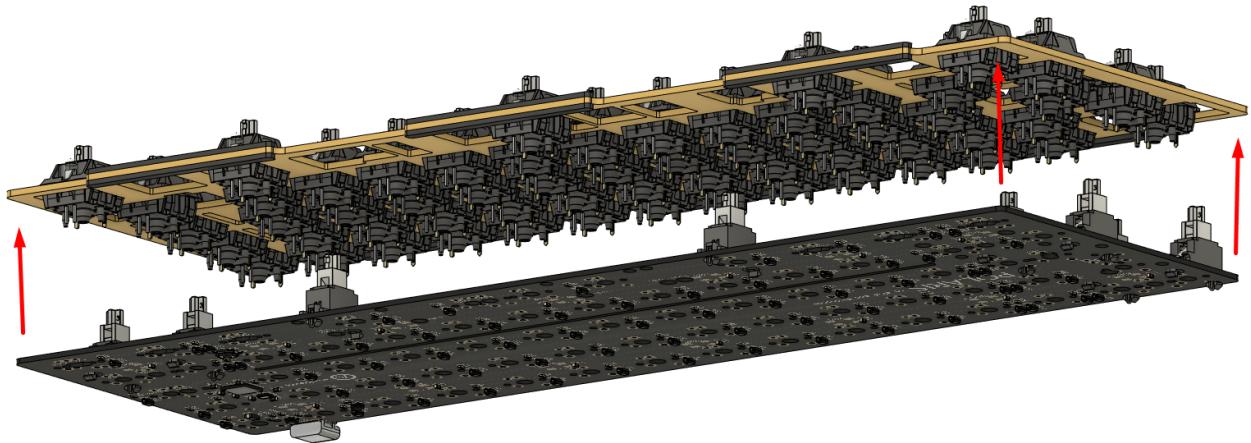
4. Snap in the switches to the plate.



5. Try a “test-fit” by inserting the PCBs against the switches and pushing so all switches make firm contact against the PCB surface. Throw on some keycaps and type a bit, then repeat with the PCB-plate foam layer inserted. Depending on which sound you like better, either leave in or leave out the mid-foam.



6. Make sure all switches are making firm contact against the PCB, and solder the the switches in. Insert and solder LEDs if you prefer, with the longer of the two leads going through the circular pad on the PCB.



7. At the end of this step, you should have a completed assembly of switches, stabilizers, plate, and PCB joined together.

The image below shows an example completed assembly.



8. Open a keyboard tester ([this](#) works well) to check that the switches send keystrokes when pushed down.

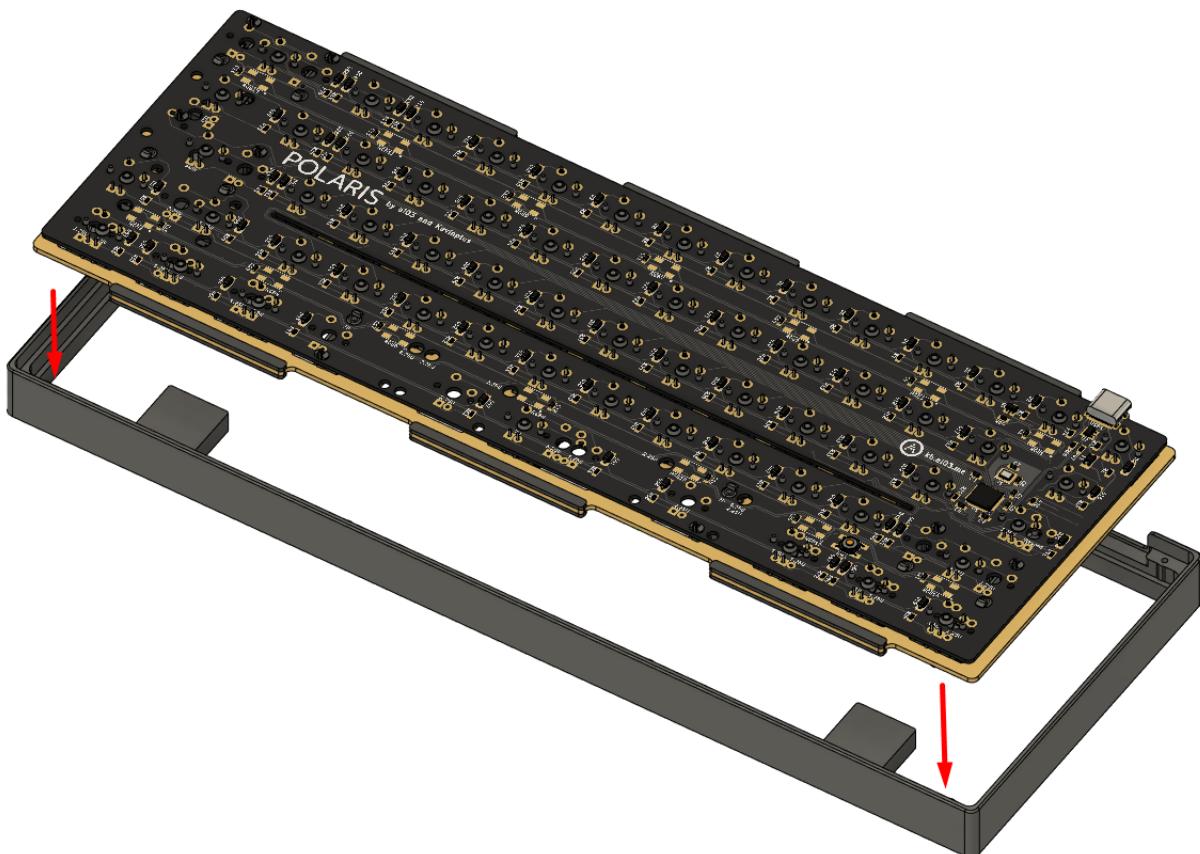
Repair any missed or faulty joints as needed.

Note: By default, the key at the caps lock position is set as a function key, so it will not send a keystroke on its own. Holding caps and pressing 1 should send F1.

The structure is now ready for [installation into the case](#).

Part 5 - Putting it all together

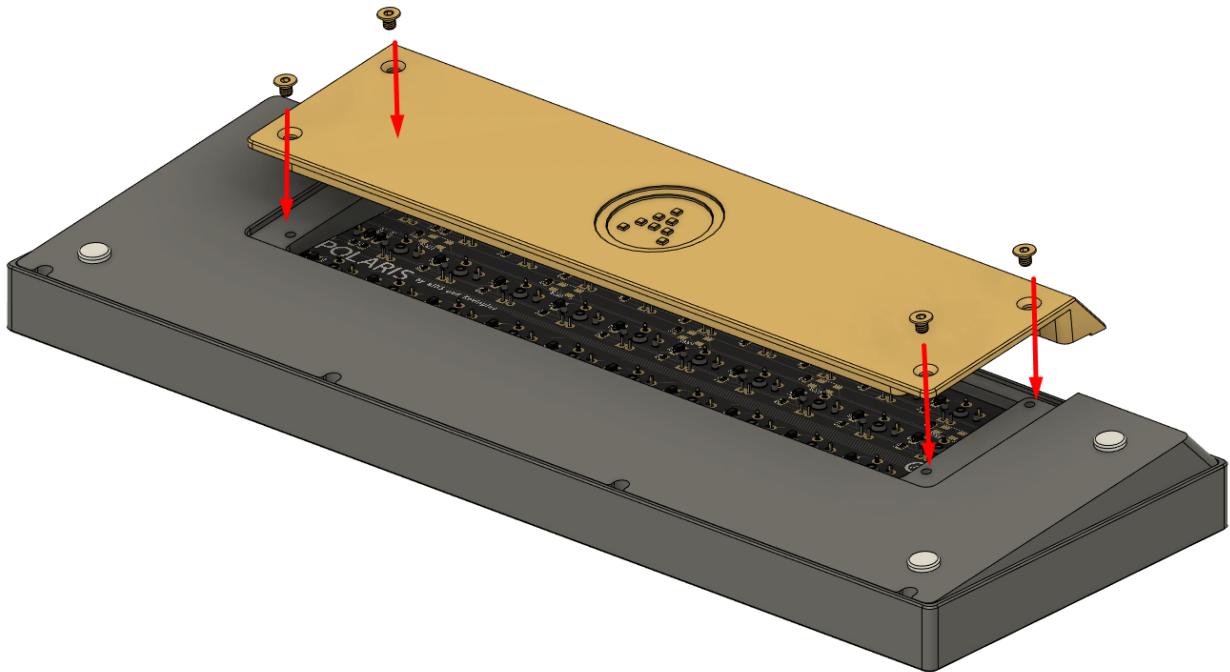
1. Insert the switch-plate-PCB assembly into the upper case half, so that the vertical gaskets installed onto the upper case half hold the plate in place from the sides.
Be careful not to force the assembly in, for this can tear the vertical gaskets off the top case half.



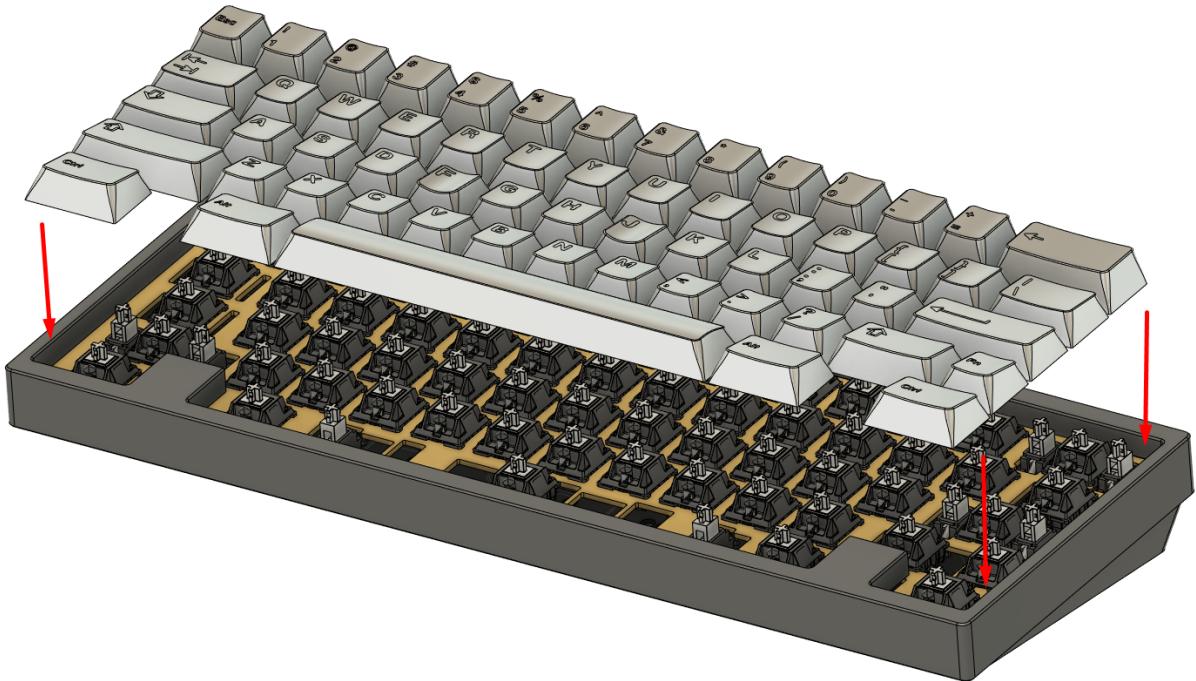
2. Carefully insert the bottom case half. Screw the case halves together with the eight small case screws using the smaller hex key.



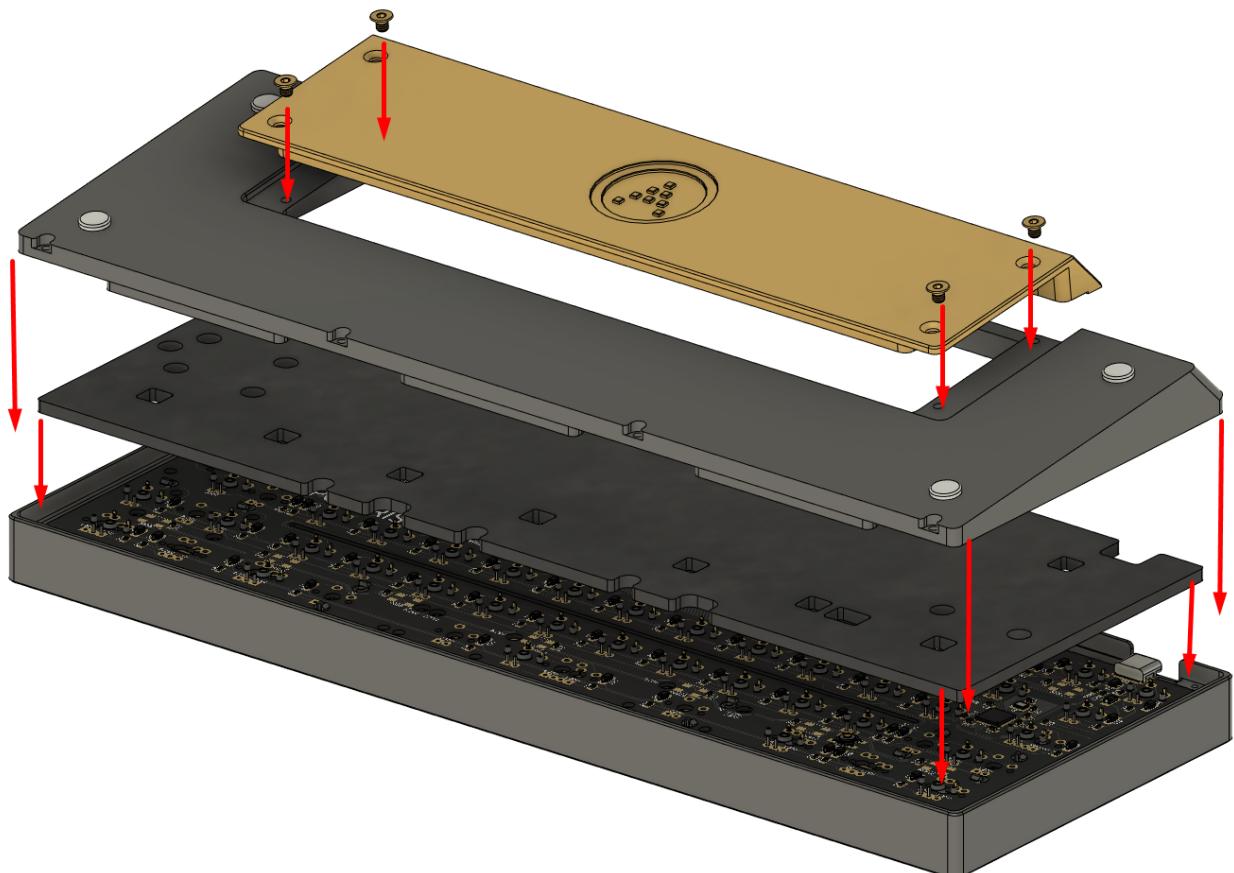
3. Carefully insert the weight. Screw the weight into place with the four weight screws of your preferred color using the larger hex key.



4. Set the keyboard upright, and verify that everything is in place. Install keycaps.



5. Give it a quick typing. Take the weight and lid off again, and this time insert the sub-PCB foam layer and reassemble. Go with whichever configuration you prefer for feel and sound.



6. Connect the board to a PC via USB-C cable, and verify that keystrokes are sent.

You've now assembled a Polaris. Congratulations!

The board is now ready for [keymap editing](#).

Part 6 - Configuring the keymap

The key to getting the most out of your Polaris is to tune the keymap to your liking.

Thankfully, this can be done in a few clicks.

Plan A: Using VIA Configurator

This is the fail-safe option, but requires installing software to your PC.

1. Download and install [Via Configurator](#) if not already done.
If the installation is from a while ago, install the latest copy.
2. Launch Via Configurator, and plug in the Polaris if not done already.
3. The board should detect automatically provided the keymap was flashed correctly during assembly.
4. Switch the layout options so it matches the layout you are using.
5. Click the key location to change, and click a key from the list below to write the new keycode in. This can be done for all layers as needed.

Plan B: Using Remap Configurator

If you have a browser that supports WebHID (Latest versions of Chrome and MS Edge), you can configure your keymap straight from the browser without any additional software.

1. Visit the Remap site at <https://remap-keys.app/>.
2. Click "Start Remap for your keyboard", and follow the prompts as necessary to connect your keyboard and to allow access.

3. Switch the layout options so it matches the layout you are using.

The button to change layouts should be to the right of the visual keyboard diagram.

4. Click the key location to change, and select a new key to map to its location. This can be done for all layers as needed.

5. Once done, click "Flash" at the top right to write the changes to the board.

For a reference of basic keycodes, see [here](#).

For layer switching, see [here](#).

The new keycodes are changed and saved instantaneously. No further firmware flashing is required.

If you didn't flash the new firmware during the build process, you can go through the same steps as needed. Plug in the board while holding the top left key (Esc by default) to boot the board into bootloader, removing the need to disassemble to press the reset button.

For those who wish to compile QMK from source for more advanced tuning, please see [the official QMK documentation](#) for in-depth info. The keyboard folder is located at `ai03/polaris`.

Once satisfied with the keymap, continue on to the [final part](#).

Part 7 - Further tuning, support, and feedback

Further acoustic tuning

We found some new acoustic info after starting production, so we weren't able to get these changes into the final product.

Here's what we suggest:

- Tape the PCB flex slot that cuts across the middle shut with electrical tape or similar so that it is completely sealed.
- Similarly, do the same for the flex cuts in the plate, along with any switch positions that are unused.

Support

For when things are not going well, reach out to the following places.

- For **logistical** issues such as damage/loss during transit, incorrect order contents, etc., contact KBDfans.
- For **assembly** help regarding building, flashing, etc., the best way is to check the [FAQ](#) and to drop by [ai03's Discord server](#) for live community support. I won't always be there to respond, but usually someone will know the answer to the question.
- If it gets to the point where nobody knows the solution, either ping @ai03#2725 in the Discord server, or DM after sending a friend request. Emailing admin@ai03.com will also work, but I may miss the email or be very slow to respond in comparison to Discord.

Feedback

How did we do overall?

We will appreciate any feedback you have about the board, and we'll take it into account for future projects. To submit your thoughts, please use [this form](#).

Note: This is a feedback form, not a support form. For support requests, please see the above section.