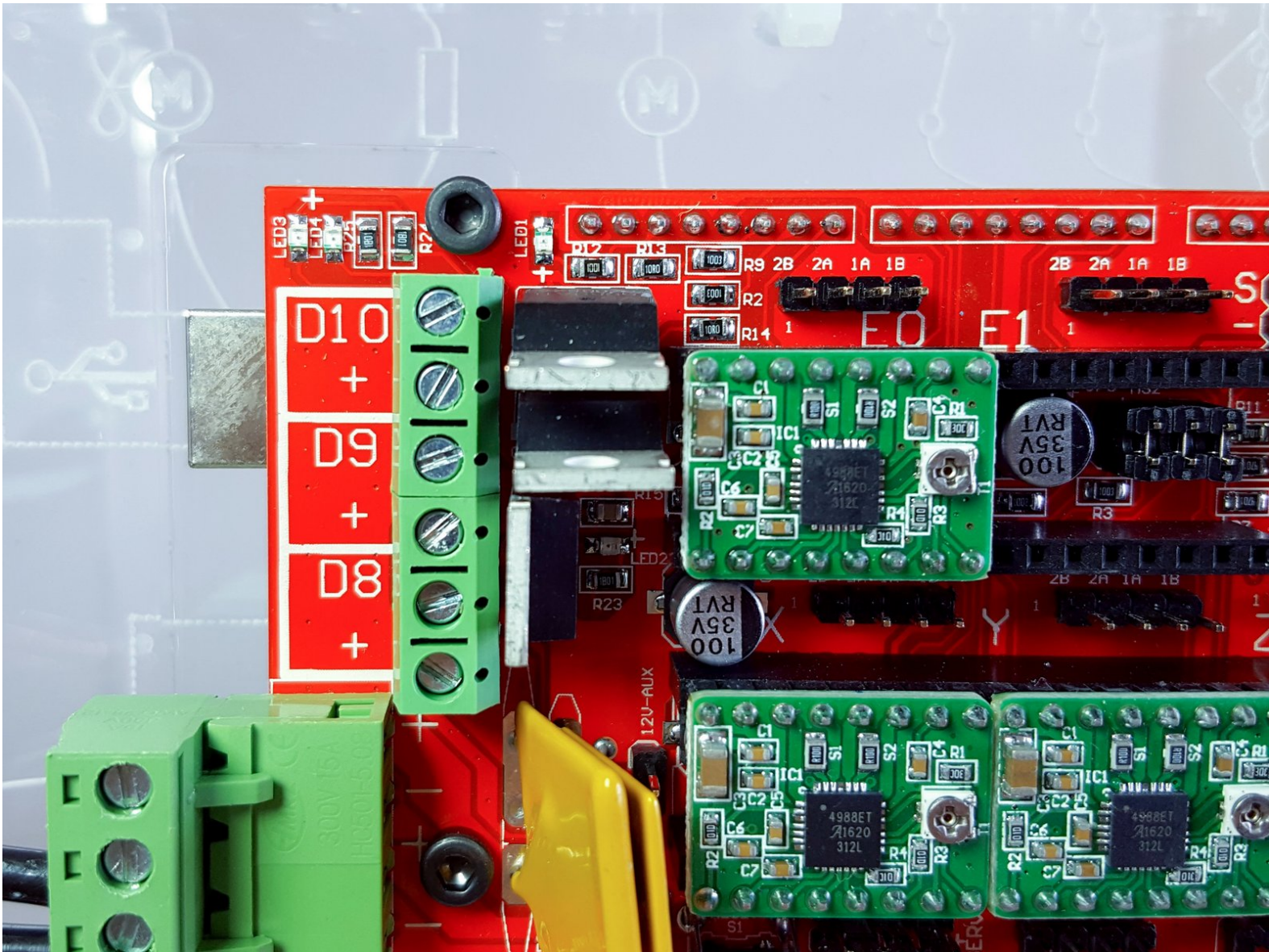




Electronics

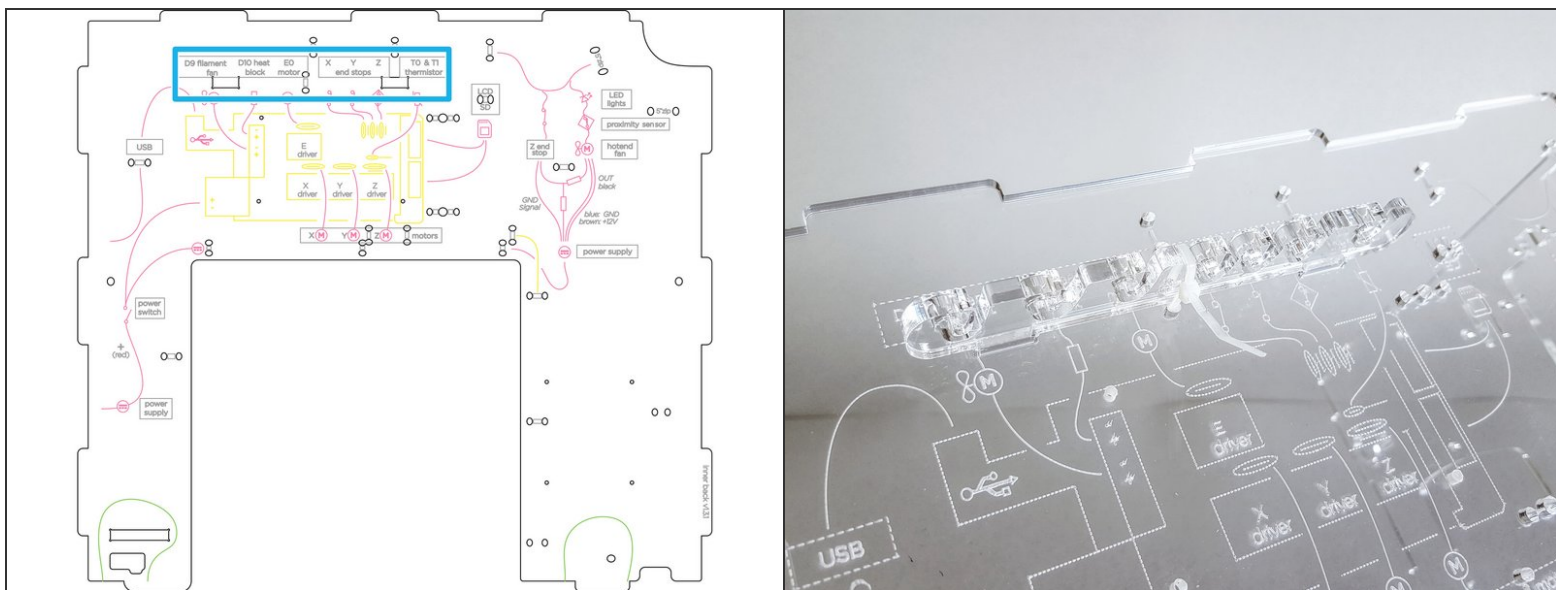


Step 1 — Wire Comb



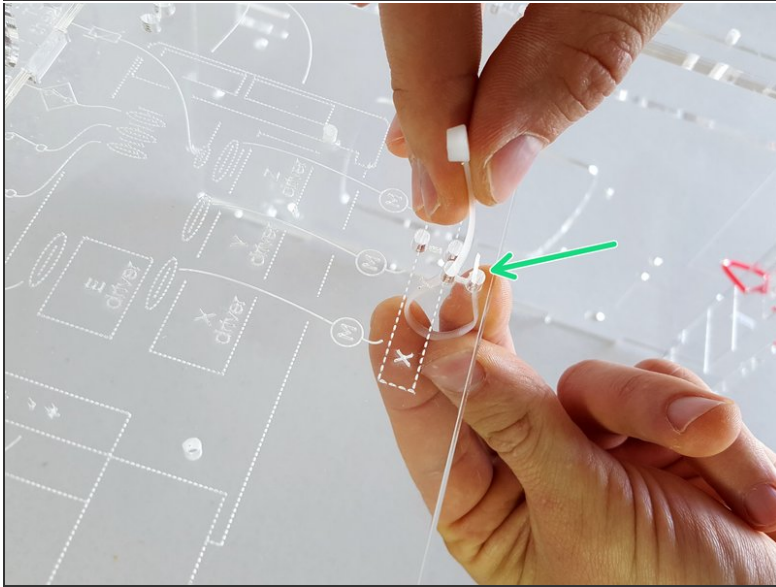
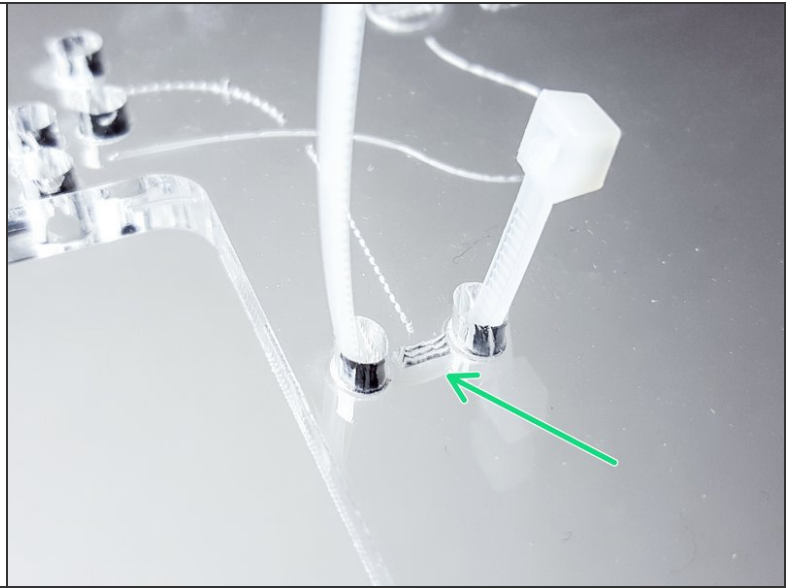
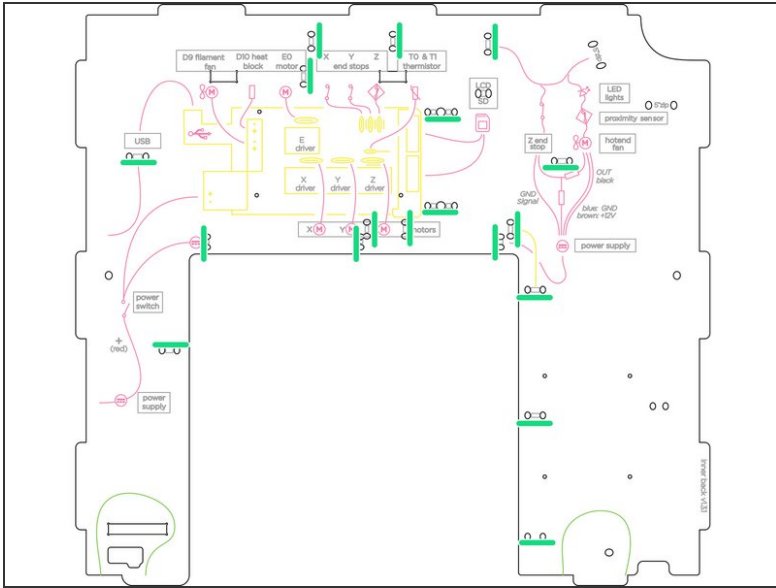
- 4" zip ties
- Wire comb

Step 2



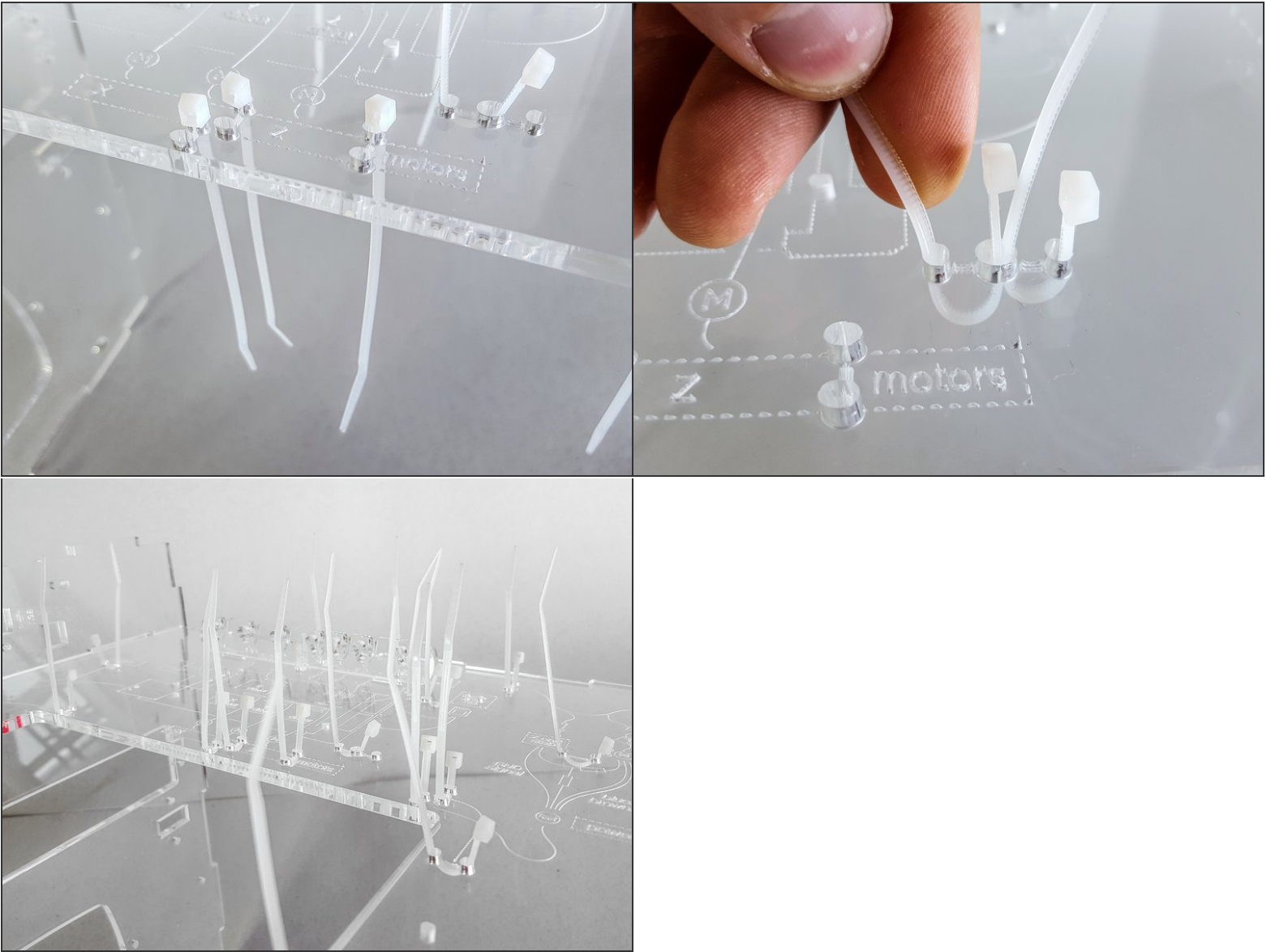
- Align the wire comb with the corresponding annotations (ie. filament fan, heat block, etc.), and secure it with a zip tie.

Step 3



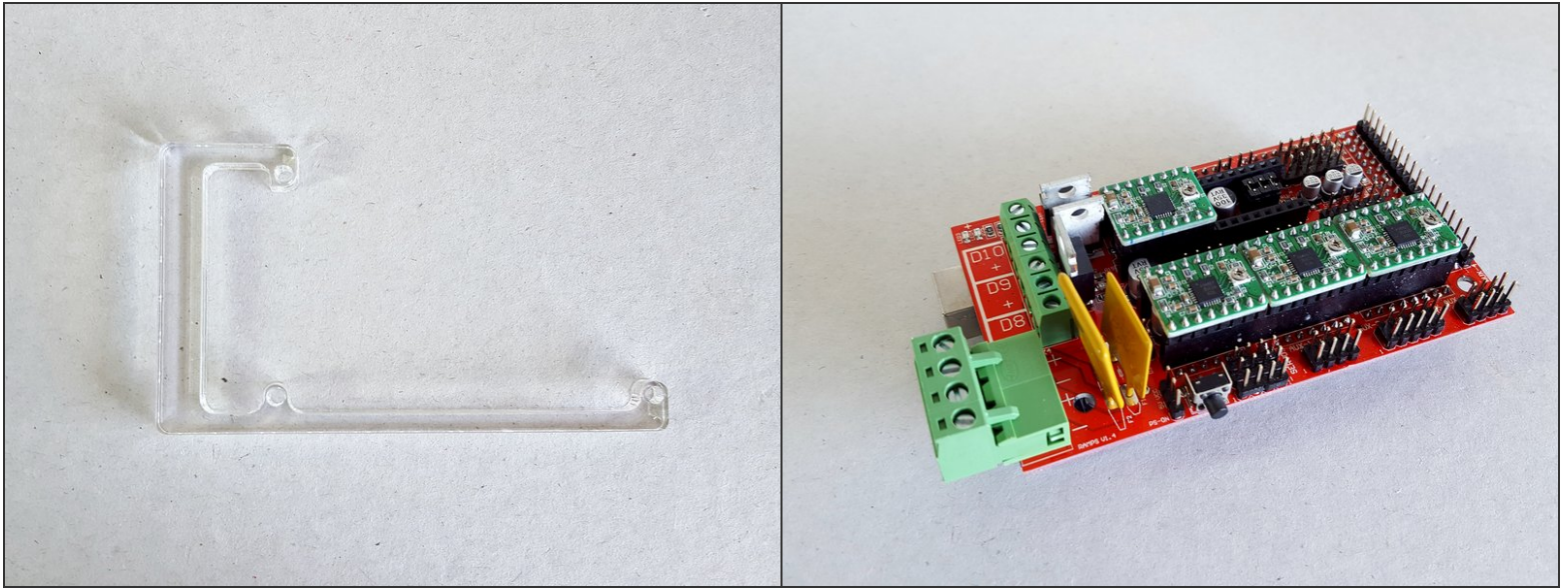
- Goal: pre-install a 4" zip tie into every pair of holes that is 'connected' with an etching.
 - (Your etching may look more like a RECTANGLE rather than lines.)
 - That's 18 zip ties :-)
- ⓘ You should know that the record time to install all 18 (!) zip ties is under 3 minutes by Shawn and Stephanie from Baltimore.

Step 4



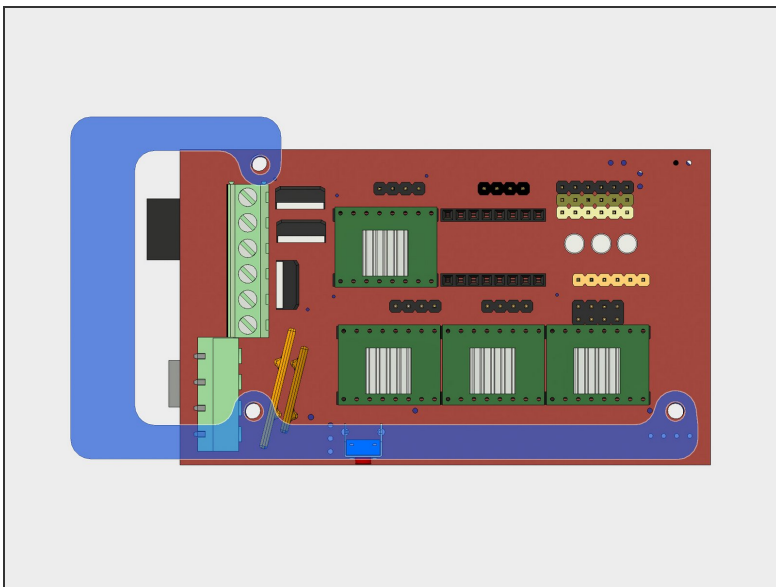
- ☒ Tip: It is more efficient to first drop all the zip ties in all the holes, and then pull them all back at once! Energize.
- ☒ Tip: There are two groups of 3 holes around the middle that fit two zip ties - the middle hole is shared.

Step 5 — ↳ Arduino + RAMPS



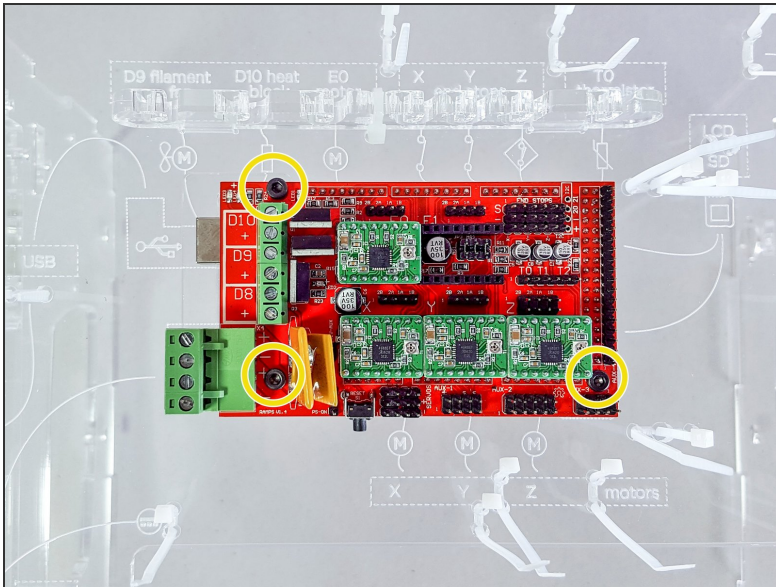
- Acrylic Arduino spacer
- Arduino + RAMPS combo (affectionately known as sandwich)

Step 6



- Put the arduino on top of the arduino spacer.
- There are three holes that will align.

Step 7



- Attach the arduino with the arduino spacer to the inner back.

⚠ Gently tighten the screws to avoid damaging the board.

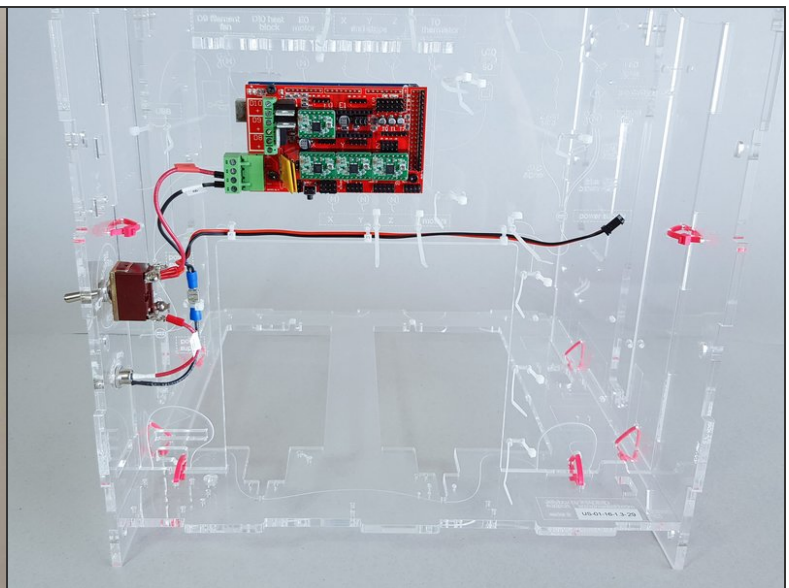
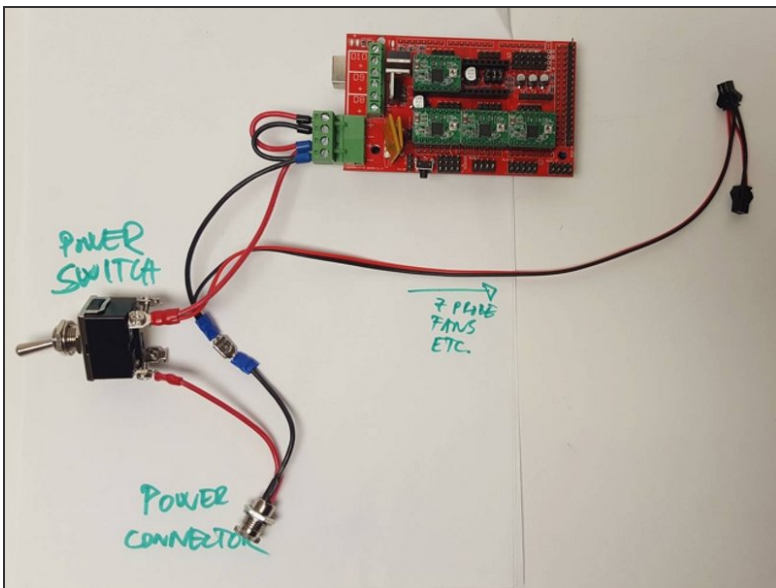
- The holes are tapped so you do not need much force. You only need to hold it in place against gravity. No stresses here.

- M3x25 socket head screws

- Here's an animation of the process if you desire more guidance

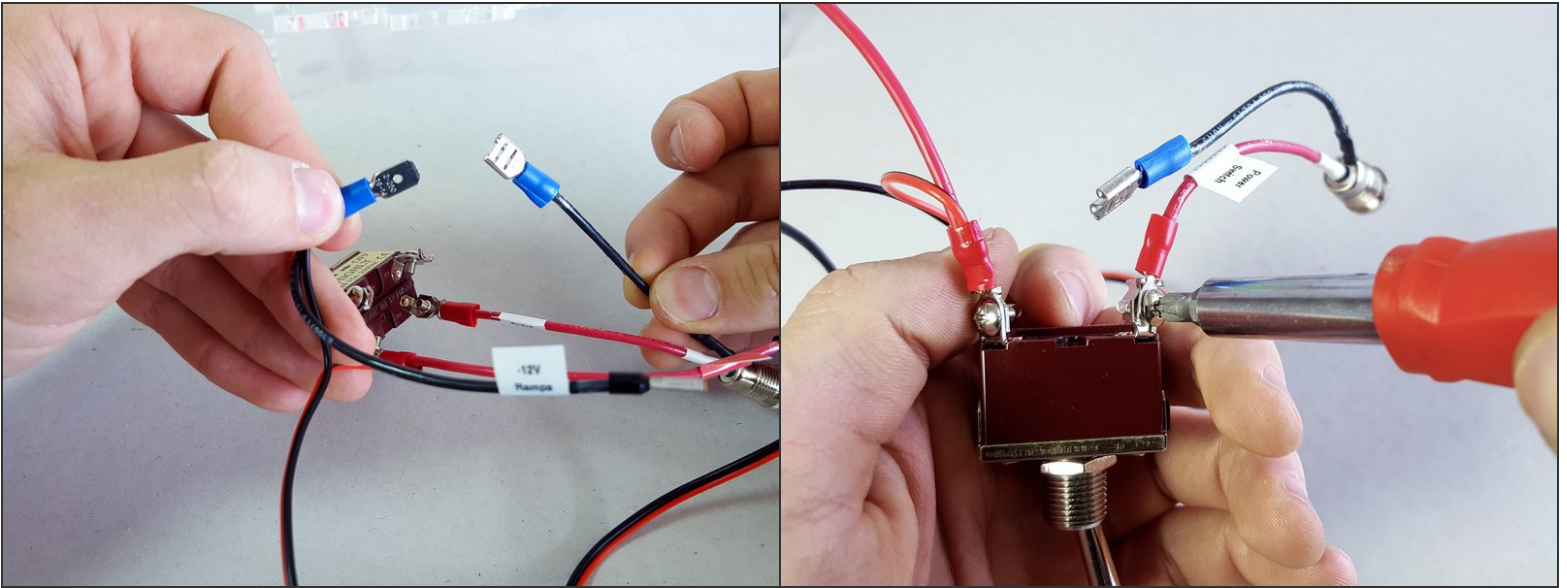
https://youtu.be/ohM_tJHCBXM

Step 8 — ↳ Power Wiring



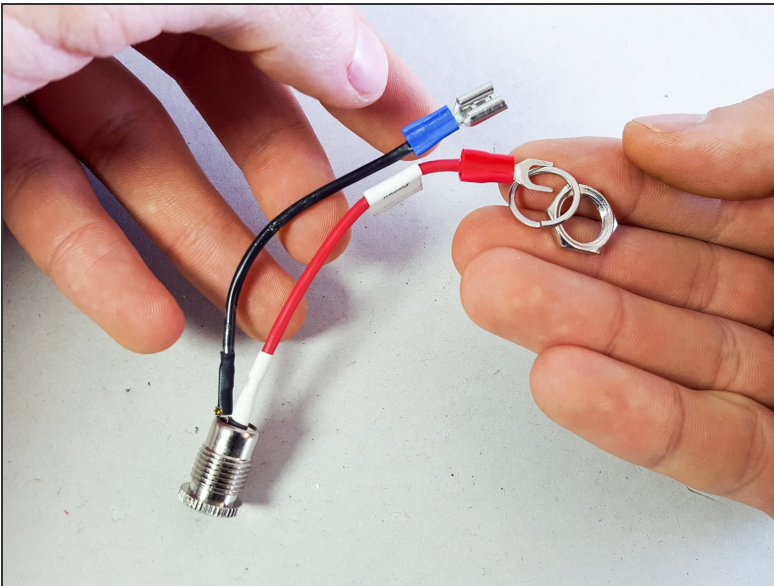
- The Goal.

Step 9 — Power Connector



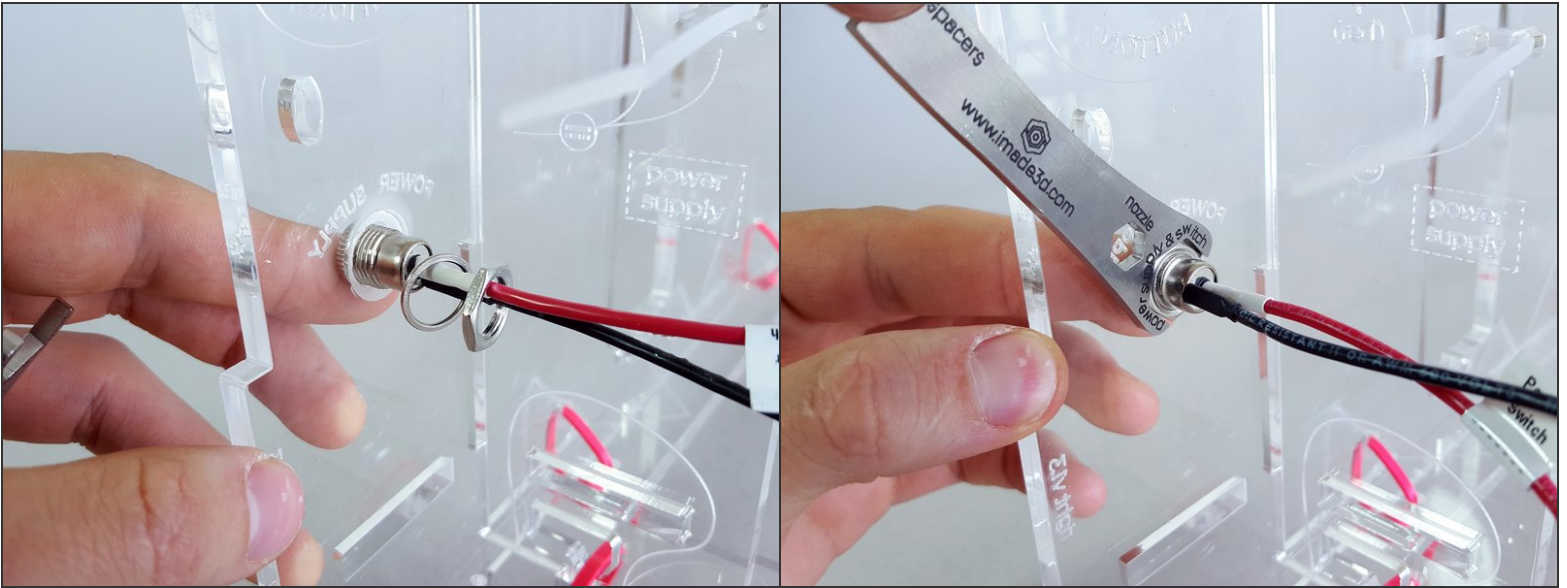
- Disconnect the power supply *connector* from the rest of the power wire harness.

Step 10



- Remove the nut and spring washer from the connector.

Step 11



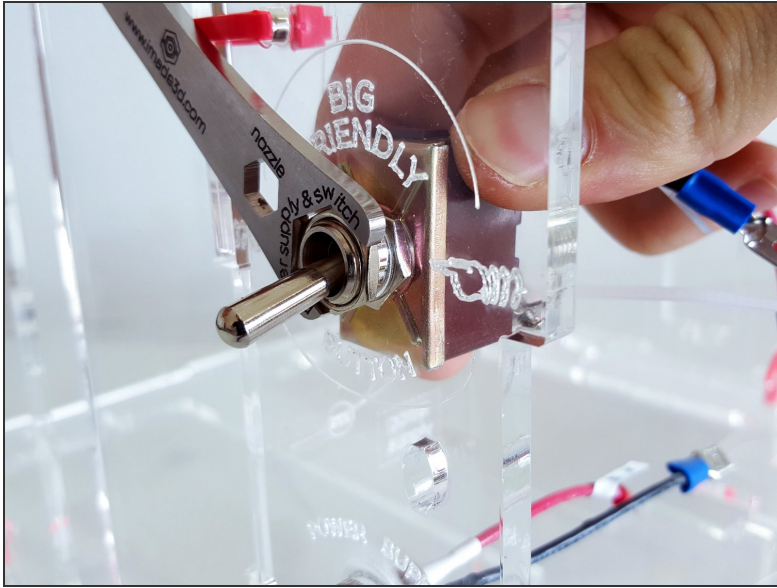
- Insert the connector into the frame from the outside.
- Secure with the spring washer and the nut.

Step 12 — Power Switch



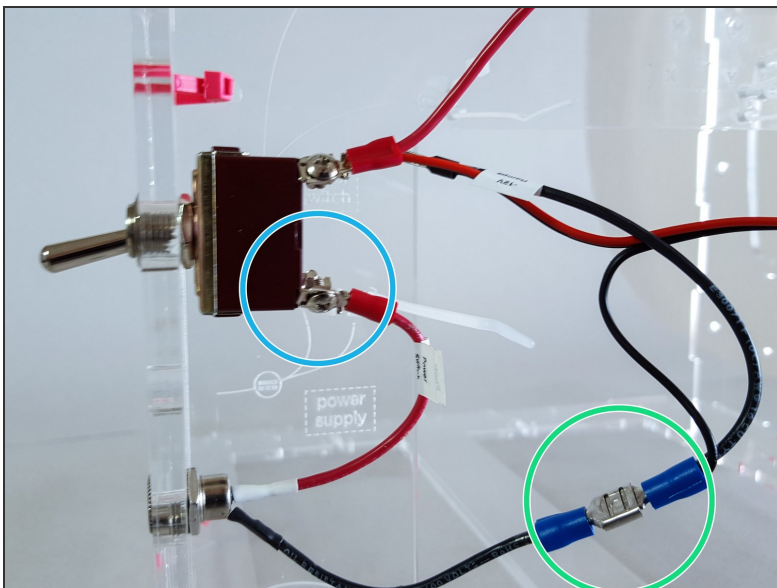
- Remove one nut from the front of the power switch.

Step 13



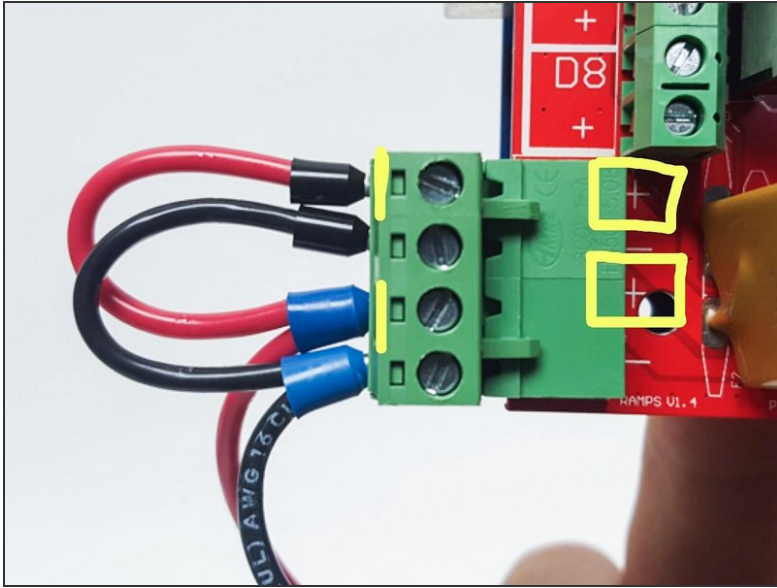
- Place the switch into the "Big Friendly Button" hole from the inside.
- Secure with the nut.
- ① Commonly, switches are installed so that
 - bottom position = off
 - top position = on

Step 14



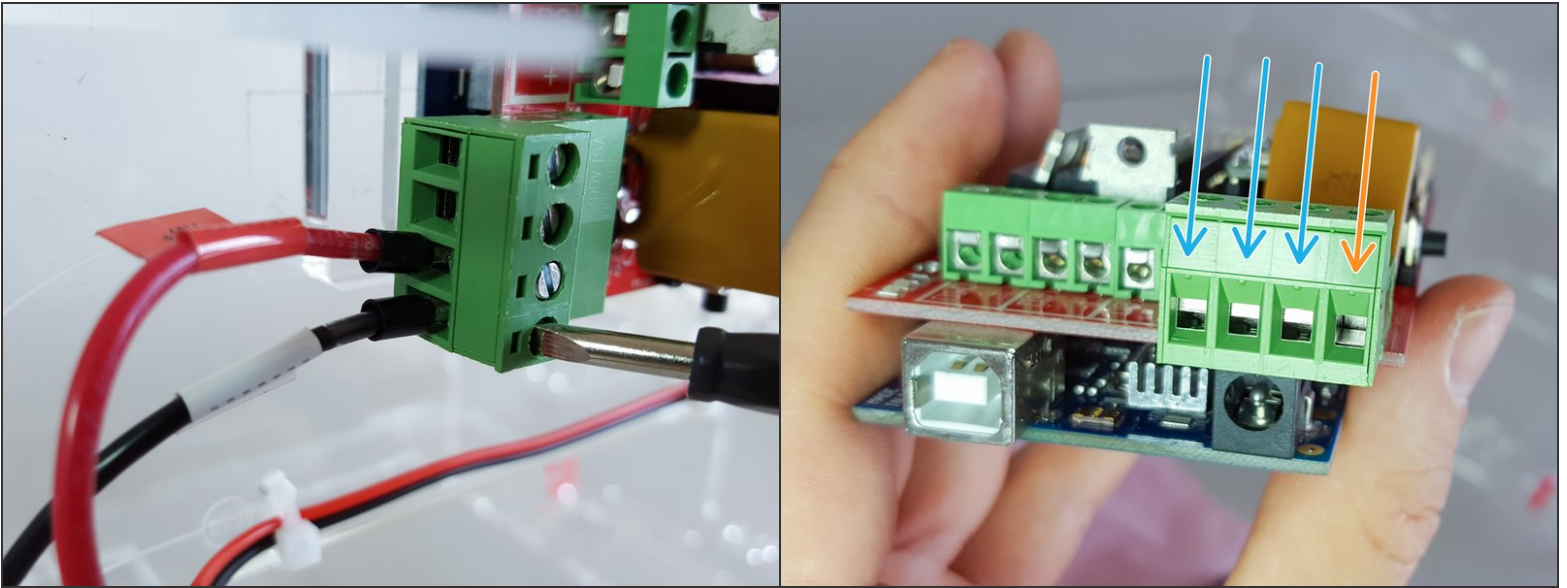
- Re-attach the positive terminal to the switch.
- Re-connect the negative spade connector.

Step 15 — Wire up the Arduino



- ⚠ Minus **MUST** connect to minus and plus **MUST** connect to plus or you **WILL** destroy your board and will need to buy a replacement.
- ⚠ Read the wire labels. Red wire is always plus. Black wire is always minus.
- ⓘ You can find little pluses and minuses on the RAMPS board next to the connector.

Step 16

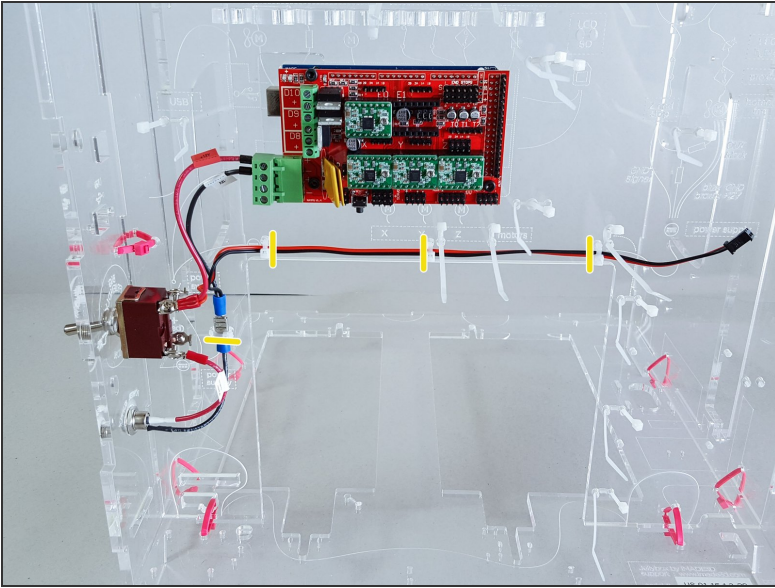


⚠ Make sure to properly insert the power wires into the green RAMPS power connector, and tighten them very well. If you leave this connection loose, it may lead to excessive contact oxidation, excessive resistance, and eventually to a melted connector or fire.

⚠ The wire ends (crimps, ferrules) are thick; you need to fully open the connector.

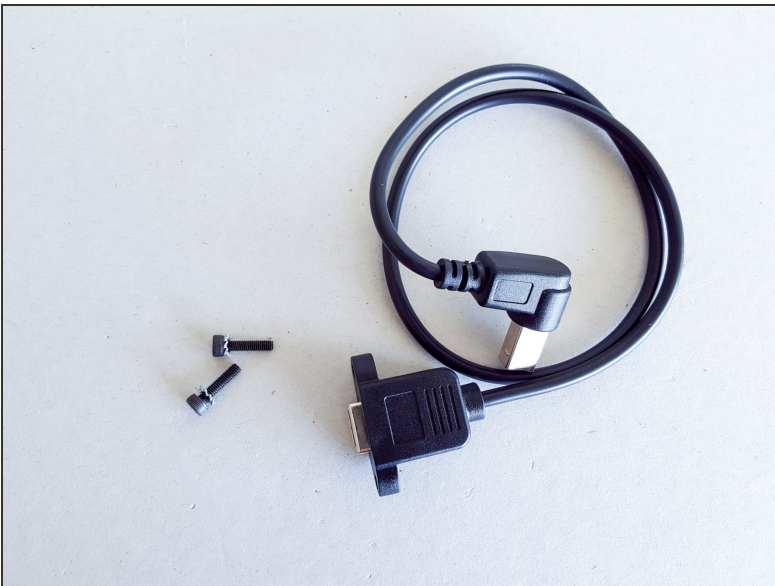
- fully open :-)
- not fully open :-(-

Step 17 — Tidy Up



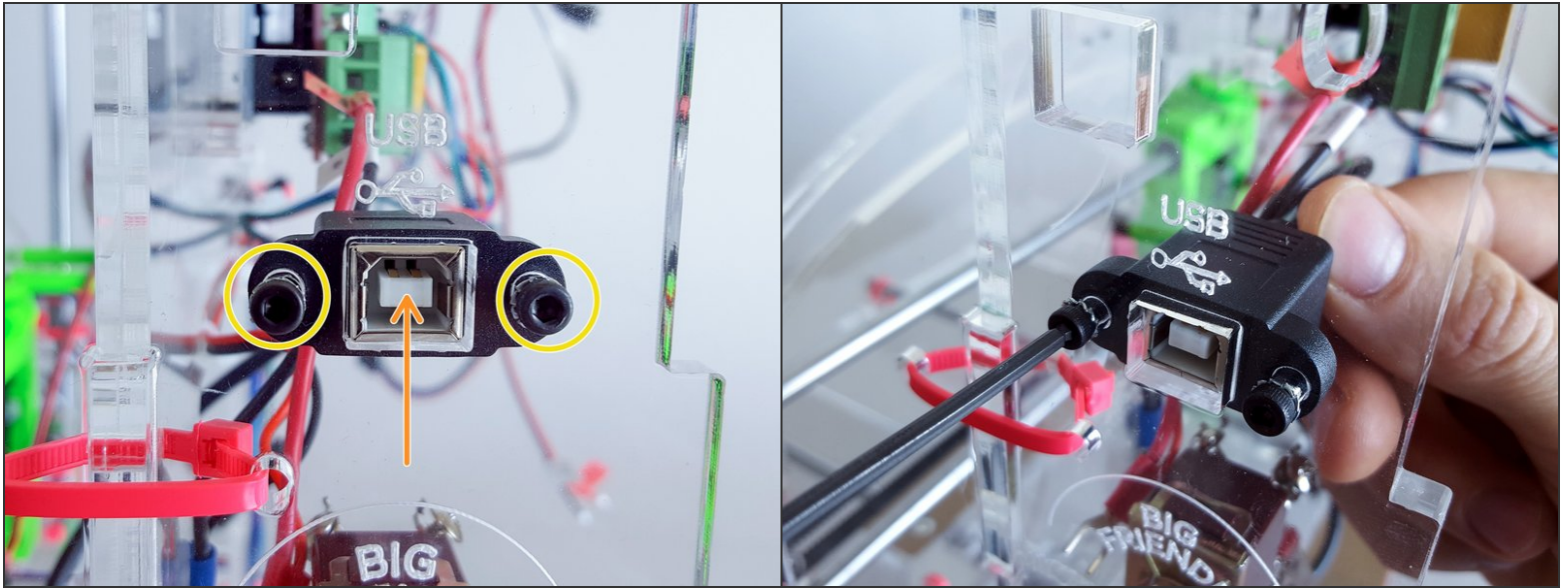
- Tidy up with 4" zip ties.
- You can tighten these only lightly by hand.

Step 18 — ↳ USB Extension



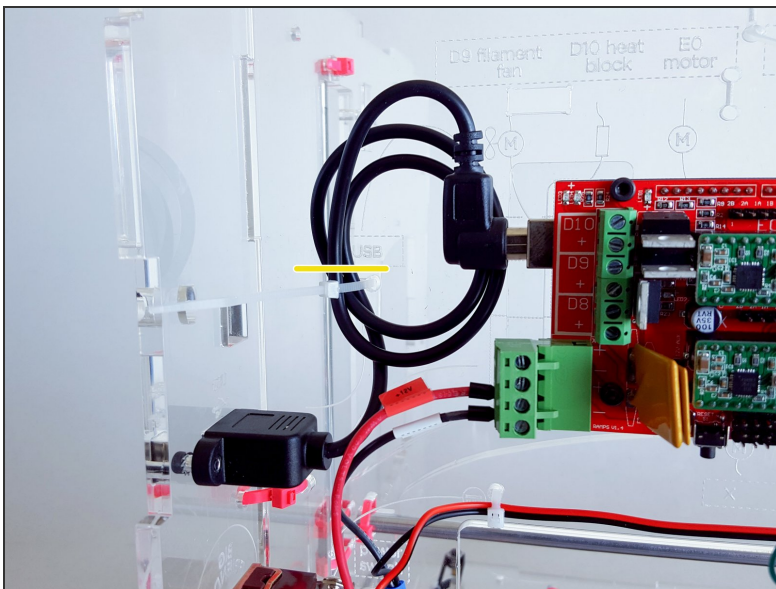
- USB extension cable
- M3x12 bolts (2)
- M3 serrated washers (2)

Step 19



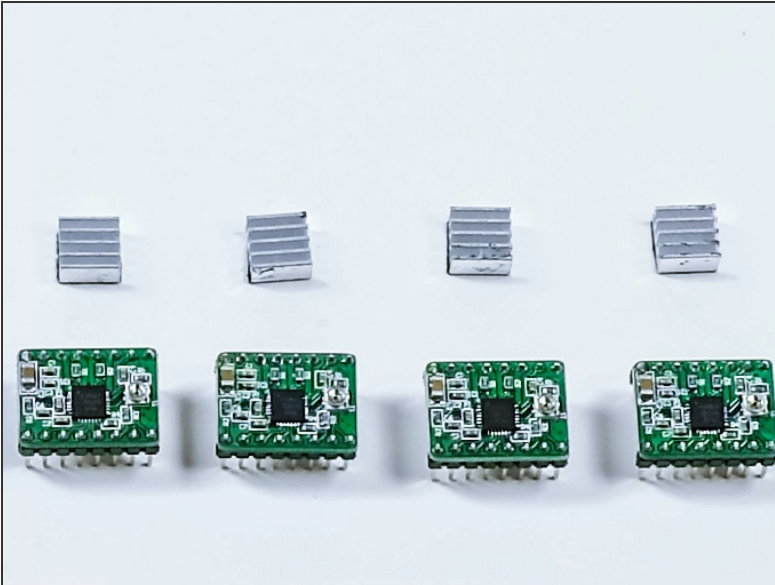
- M3x12 screws and serrated washers
- Commonly, USB connectors (type B) are installed facing upwards.

Step 20



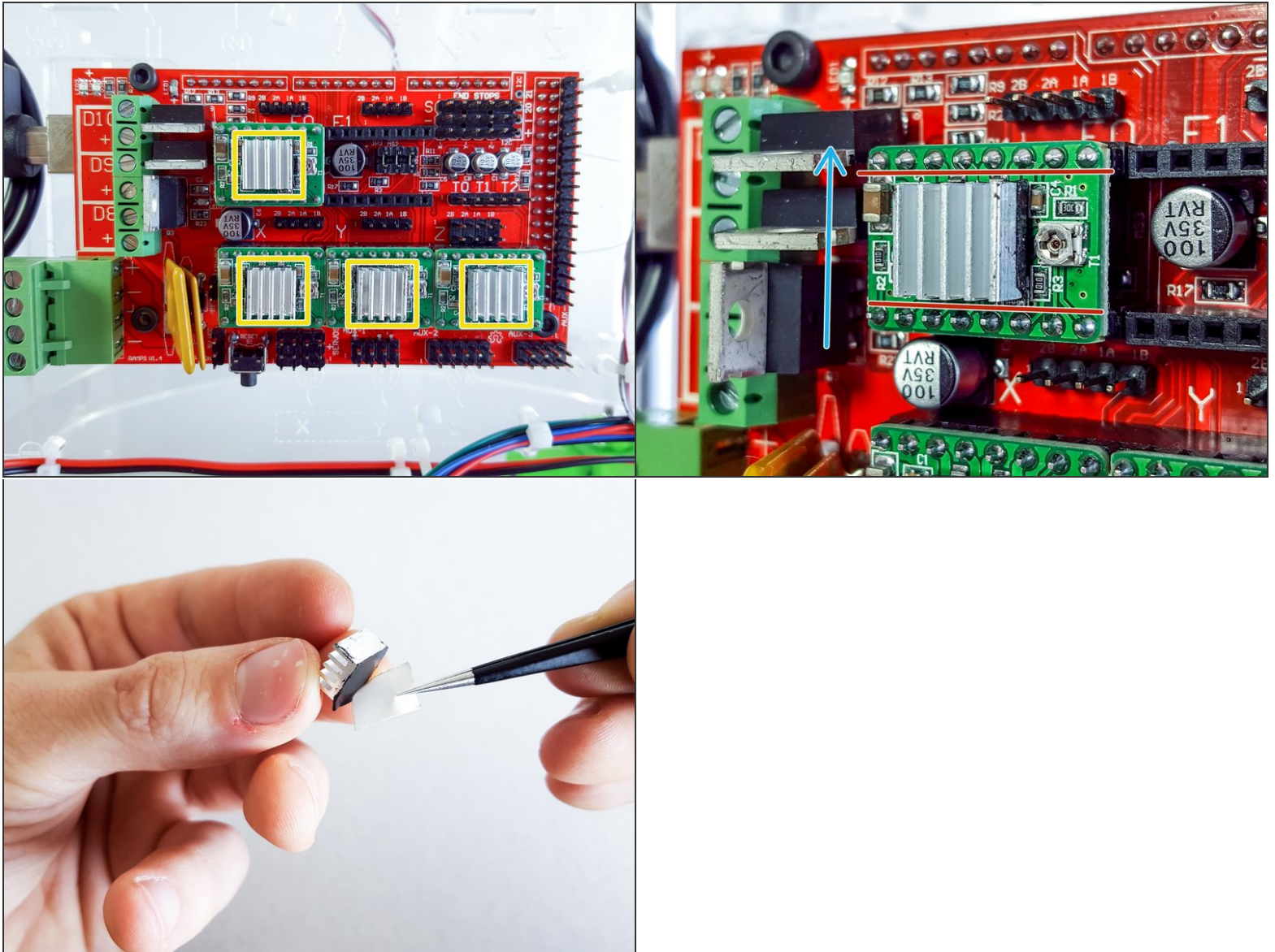
- Yes, the USB cable is too long. Deal with it. Make a tidy loop and attach it to the inner back.
- 4" zip tie

Step 21 — ↳ Heatsinks



- Small aluminum heat sinks (4)
- Stepper drivers (4)
- The drivers come pre-installed on the RAMPS board, you don't need to do anything.

Step 22 — Stick the Heatsinks onto the Drivers



- Attach the heatsinks onto the black square chips on each driver.
- The heatsink ribs should be vertical. This way the heat can escape upward more efficiently.
- ⚠ The heat sinks **must not touch** any of the **contacts** around the drivers. Or you may **burn your drivers**.
- ⓘ The heatsinks are optional but will increase the longevity of the printer. Drivers like to keep their cool.
- ⓘ Note: there was a limited edition of JellyBOX experimenting with 32 bit drivers; these do not require heat sinks. Thus, if you haven't got any heat sinks, do not despair and simply move on.