-=Begin Transmission=-

+Blessed is the Mind Too Small For Doubt+

Citizens of the Imperium Be Warned! Unauthorized Viewing of this document is considered Tech-Heresy, punishable by summary execution. Possession of this document by any citizen that is not a Tech-Priest, Astartes, or member of the Imperial Inquisition is forbidden. Possession is defined as any contact with this document whatsoever. May the God-Emperor have mercy upon your soul.

Original Document Follows:

++++++++Initiate Build Protocol++++++++

Standard Template Construct Pattern: Grimdark Chainsword Mk.3

Origin: Terra

Date of File Recovery: M2.026.01.25

Author: Techpriest Level 4 - Ratjob

Abstract:

Greetings Battle Brethren! This Techpriest lives to serve! This One has recently finished decrypting and repairing the STC files of one of The Emperor's most Holy Creations! A relic from the Golden Age, this STC has been scrubbed free of warp entities and Xenos filth. Sanctified by the Magos, it is finally ready to be released to your Armorers and Techpriests. But be warned! There are a few things every acolyte tasked with this holy assembly should know and be aware of. Consider the Littanies of assembly:

"The model shown in this assembly guide was printed on a BambuLabs P1S with AMS system attached. It was printed with BambuLabs PLA Tough + and BambuLabs PETG HF that was dried in a Hamilton Beach food dehydrator according to manufacturer suggestions. The build plate was a BambuLabs Smooth PEI and/or Bambu Labs Textured PEI plate that was washed with dish soap frequently and handled carefully.

If you choose to change filament type, build plate type, or even printer type then make sure that you have carefully considered all of the factors that can affect print quality. If warp demons interfere with your prints, refer to the Littanies of STC Generator maintenance:

"Dry Your Filament! Clean Your Build Plate! Calibrate your Flows!"

Prepare your Cyanoacrylate adhesive polymer, razor knife, soldering iron, clippers and forceps! For it is time to assemble the “ Grimdark Chainsword Mk.3 !!

Key Features of the Mk.3 Chainsword Compared to Mk.2

*Aesthetic changes to the blade made to accommodate a ¼ inch round channel down the spine so a dowel or threaded rod may be added if desired.

*Aesthetic Changes made to grip - now more grippier!

*Blade Sections are provided in clamshell design to facilitate faster printing and have the “print grain” in a direction consistent with the mechanical motion, reducing chain friction and noise.

*Mechanical attachments for blade halves with M3 screws and threaded inserts.

*Blade stabilizing blocks for internal stiffening of the blade sections, making this model easier to wield, sweep, strike and move without fear of parts separating.

*Blade hole covers to hide screw holes.

*Bottom blade section has two additional slots in it for additional blade anchors to the Motor hub.

*Bottom blade section now has “bowtie” tabs that are to be glued on in order to slot the bottom blade section into the motor shroud/battery pack. This was necessary to facilitate the clamshell design.

*Removal of the Top Tensioner as a recommended part. This part was causing binding in the chain and is not necessary in the build.

*Updated chain linkages. These new linkages have a greater degree of freedom and motion than previous links. The original chain and linkages should work in this build without issue, but this new design makes for a faster and smoother motion of the chain.

*New Toothier Teeth - a dual tooth design makes for a more sinister looking blade, while avoiding too much heresy.

*New Motor Housings - It was found that a very well hidden Warp Gremlin was still living within the STC files for the Mk.2 Chainsword. This gremlin offset the drive gear in one of the housings by about 2.25mm. This minor shift was enough to untrue the drive gear and cause the chain to bind as it went around the drive gear. This gremlin has been purified from the STC files. The new Motor Housings are co-axial and the drive gear will sit in its channel true. There are also additional M3 Threaded inserts installed in the new motor housings so a “gore grille” can be installed to bridge the housing halves, hide a seam, and offer an easy point of customization for armorers. Two additional parts are provided as well, these are anchors for the front of the blade, providing an easy point of customization as well as stiffening the forward/backward motion of the blade,

*New Drive Gear - the original Mk.2 drive gear had 4 sprockets, this has 5 sprockets. That’s 25% more sprocket! In addition, the sprockets have been thinned and lengthened while the hub has been lightened and narrowed. All of these changes are to provide less opportunity for mechanical jams around the drive gear and the hub.

Anyone struggling with motorizing the Mk.2 chainsword should first try to print the two new motor housings and drive gear. These three parts can fix the issues many have noted with the drive gears jamming.

Bill of Materials Not Found on Bambu Lab Maker Space. These are Links to Amazon Items:

Description	Link	Purpose
608ZZ ball bearings	608 ZZ Ball Bearings(10PCS), 608ZZ Metal Double Shielded Miniature Deep Groove Skateboard Ball Bearings (8mm x 22mm x 7mm): Amazon.com: Industrial & Scientific	For bottom drive gear on the powertrain to ensure smoothness.
M3 x 6mm Phillips head screws	https://a.co/d/hrxyNy0	Used all over the build to fasten parts
M3 Screw Set	https://a.co/d/ghMxMv2	M3 screws of various lengths. includes bolts for M3 screws. you will need some M3 nuts and a few longer M3 screws in the 20 to 35mm lengths for a few locations. This is a good set, but it's Allen headed
12V 250Rpm Worm Geared High-torque motor	Amazon.com: Greartisan DC 12V 250RPM Turbo Worm Geared Motor High Torque Turbine Worm Gear Box Reduction Motor 6mm Shaft JSX40-370 : Industrial & Scientific	A motor to drive the chain in the model. Generally speaking, the lower the RPM, the higher the torque, which is required to drive the chain (overcoming friction in linkages, etc.) higher RPMs may work if you really smooth and polish out your parts.
KW3A Long arm Roller Lever Momentary switch	Yoiilnz 6Pcs Limit Switch Long Hinge Roller Lever Arm, SPDT Momentary Snap Action Micro Switch KW3A	Trigger switch, the roller lever and long arm provide enough return spring pressure for the trigger.

	16A 125/250V: Amazon.com: Industrial & Scientific	

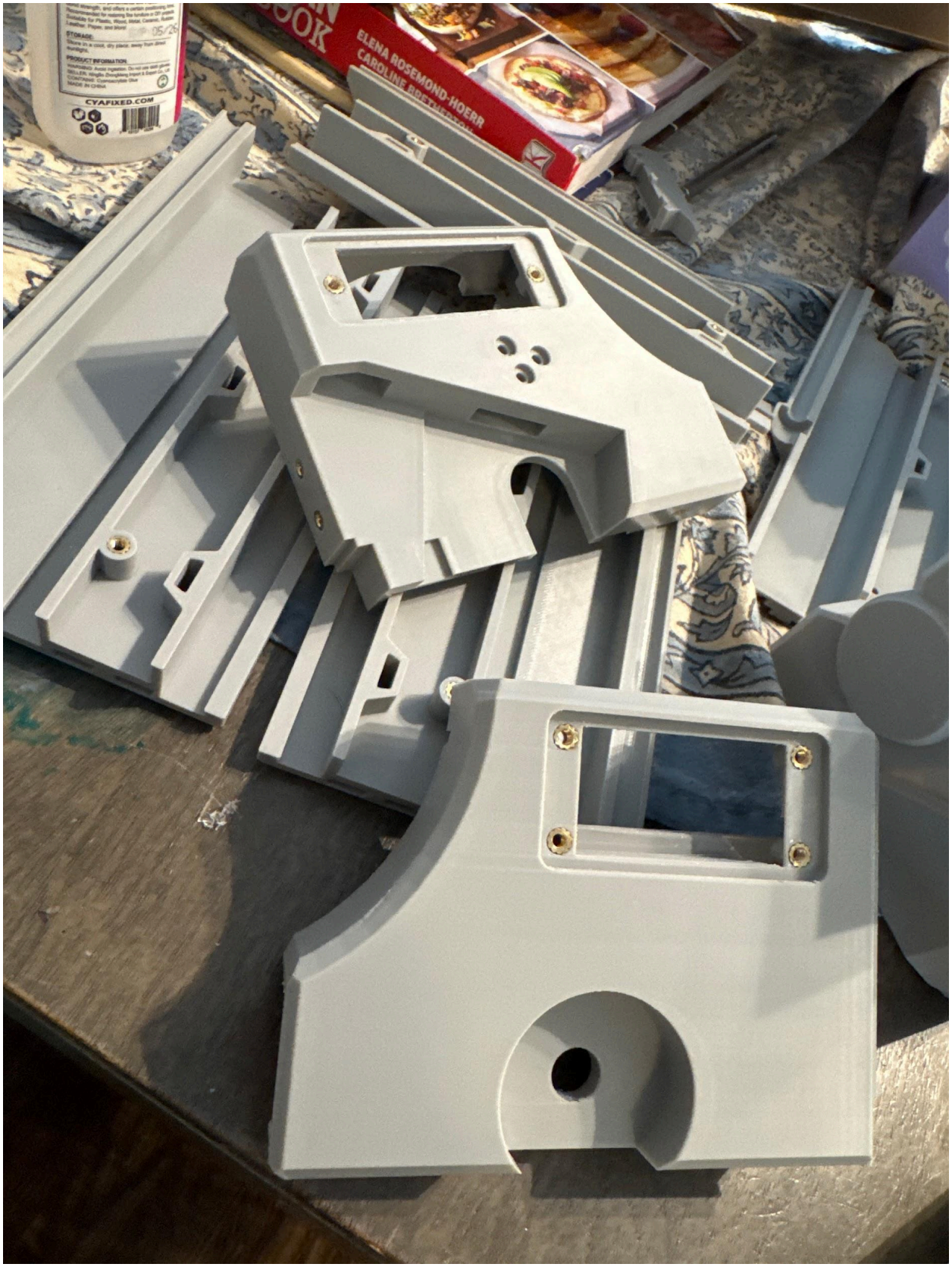
Description	Link	Purpose
M3 threaded brass inserts	https://a.co/d/avw800L	Used all over the build to provide good threaded connections for M3 screws
Power management module	BOJACK Low Voltage DC Motor Speed Controller PWM 1.8v 3v 5v 6v 12v 2A 30W Adjustable Driver Switch 1803BK 1803B (Pack of 2 Pcs) - Amazon.com	Multiple options are available.
Recommended Power Source: Raptor 12V Rechargeable battery.	https://a.co/d/5hXXbpq	Power source. Very easy to use, rechargeable. Protected circuit.
Optional Power Source 8 x 1.5V “AA” battery harness:	Amazon.com: JWISLAND (Pack of 4) 8 AA Battery Holder Case Box, 12V Volt Total 8 AA Battery Holder w/Wires-Double Layers (Each Layer Loads Four aa Batteries) : Electronics	Used to power the unit. Life of Alkaline batteries cannot be verified in this device.
Optional: LiPO battery charge level indicator	https://a.co/d/dwoV1by	Acts as an “on” indicator as well as a charge level indicator.
Wago wire connector	WAGO 221-412 Lever-Nuts - 2-Conductor Compact Splicing Connectors (Pack of 10): Amazon.com: Industrial & Scientific	Easy connections for internal wiring

Master On/Off latching push button switch	https://a.co/d/bi4lRjB	Easy to wire in, but no light up Leds.

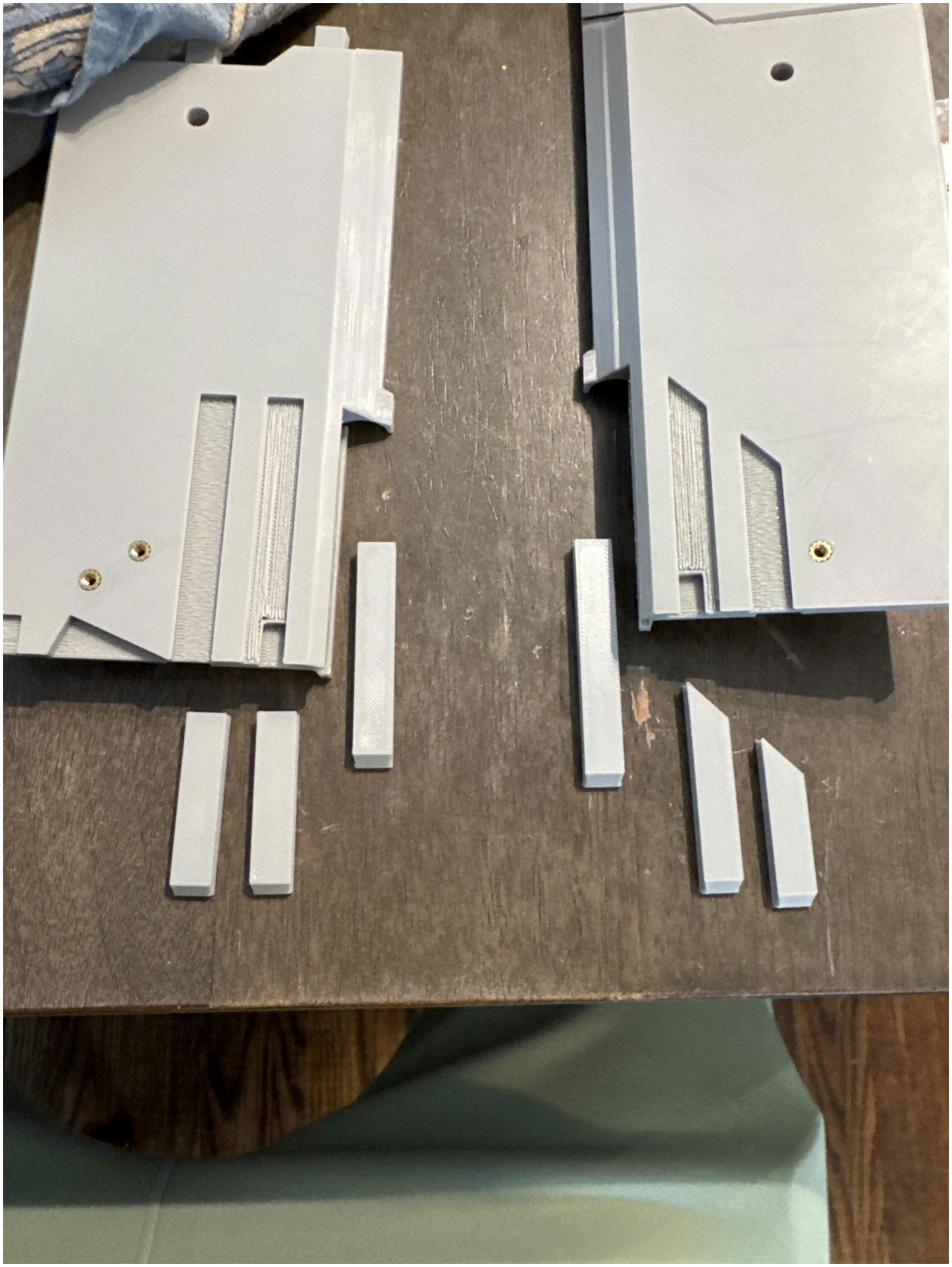
Remove all supports and clean parts.

install M3 threaded inserts into all applicable parts:

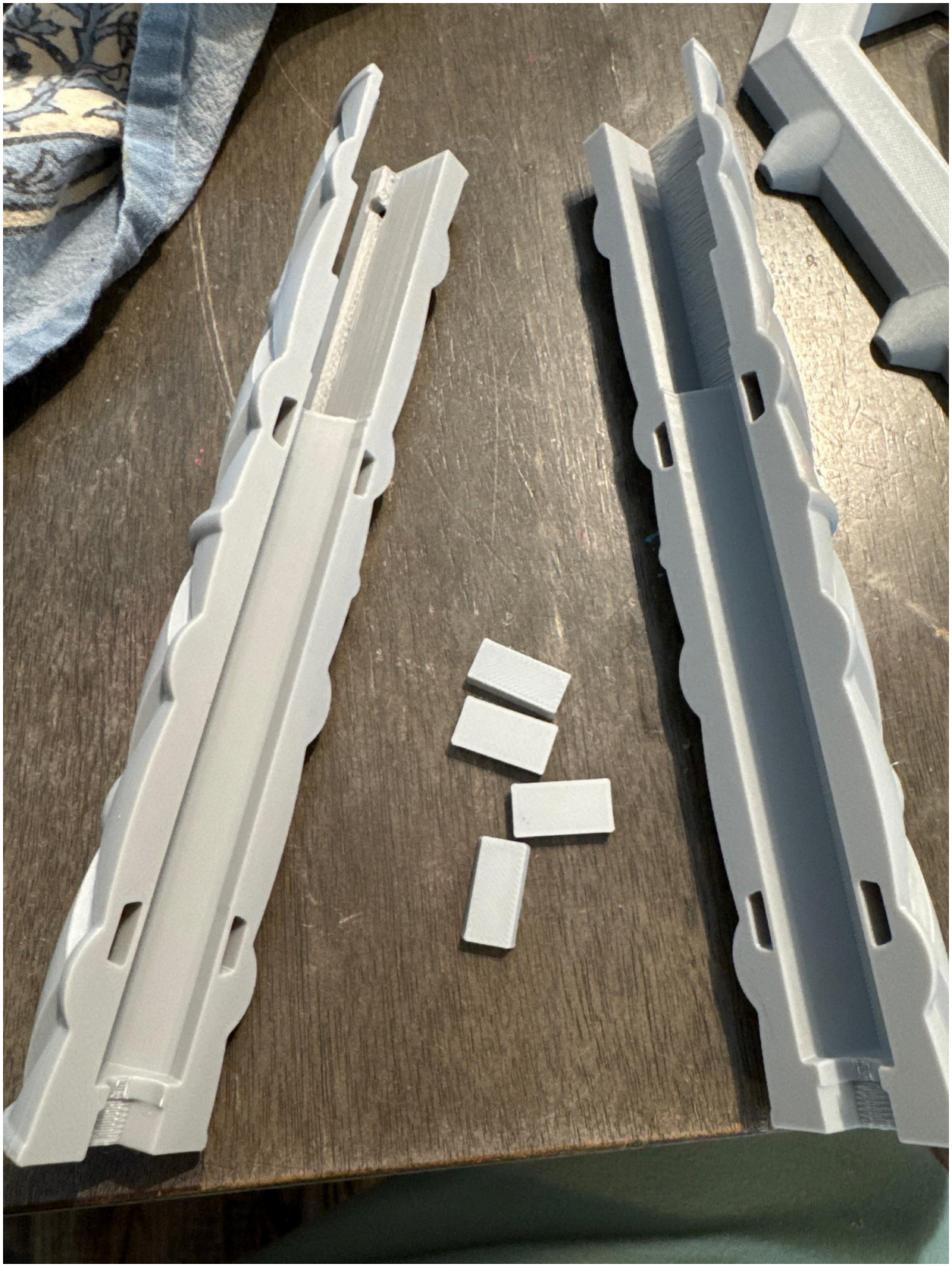
Blade sections- 2 in each midsection blade, 3 in each bottom section
Motor housings - 10-13 in each
Motor housing shroud - 7
Motor mounting bracket - 3

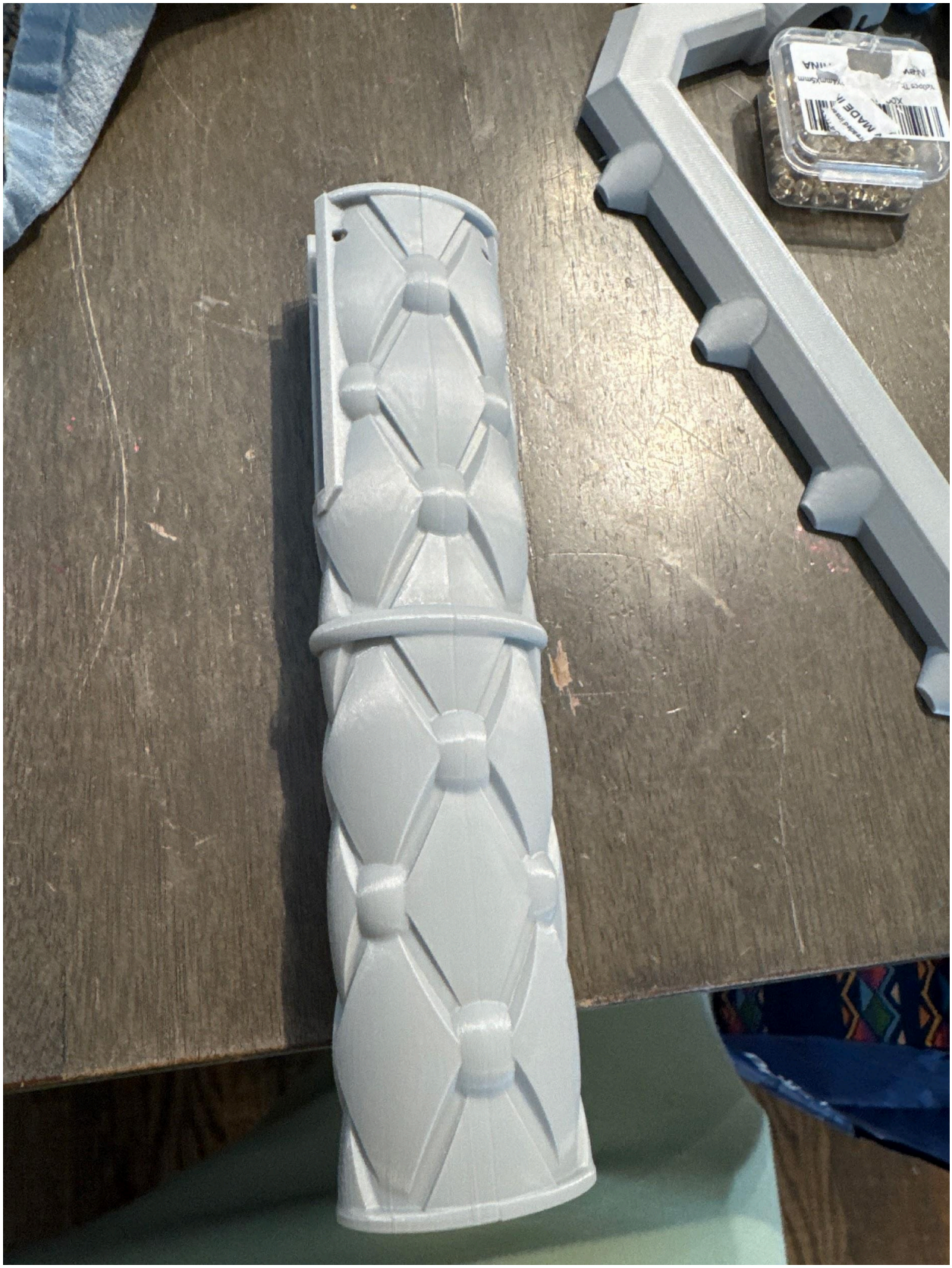

CYAFIXED.COM
ELENA ROSEMOND-HOERR

The two bottom blade sections must have their “bow tie” connectors glued in Each gets three.



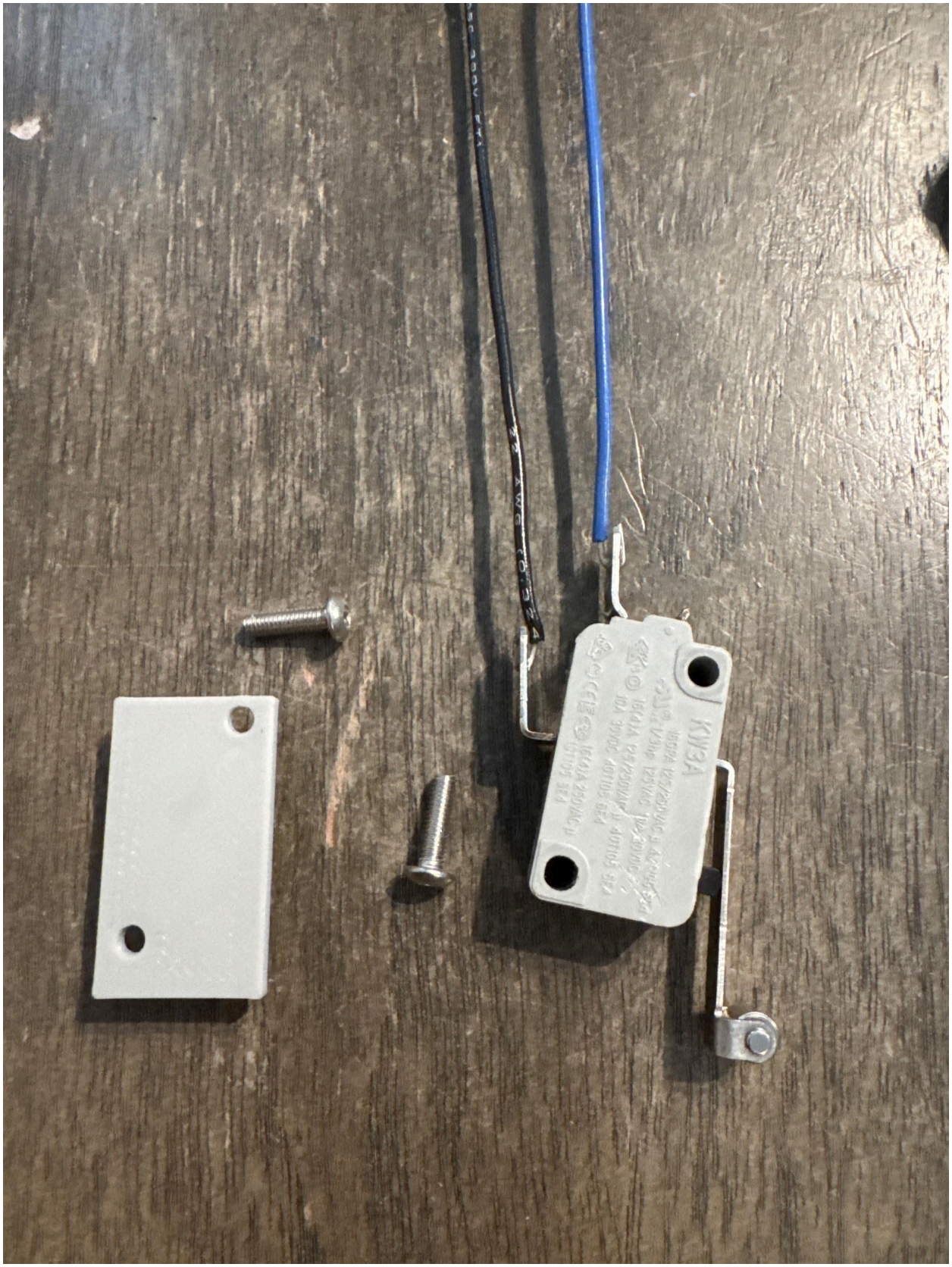
Assemble the grip with four tabs:

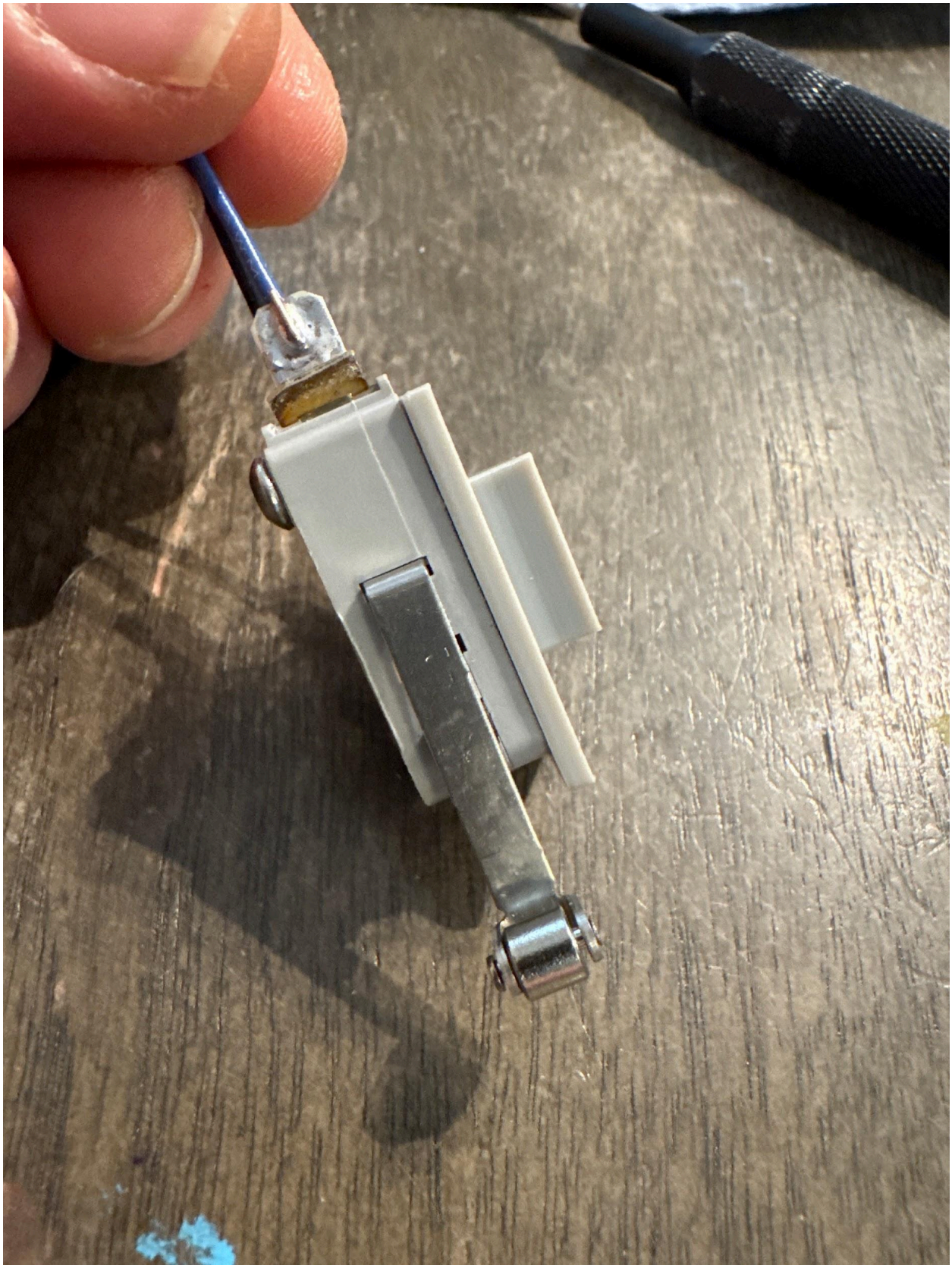




Prepare your 12V trigger switch. The KW3A model used here has had its “NC” tab cut off with snips. This build will use two colors of wires to denote “Common” (also seen as “-“) terminals and “Live” (also seen as “+”).

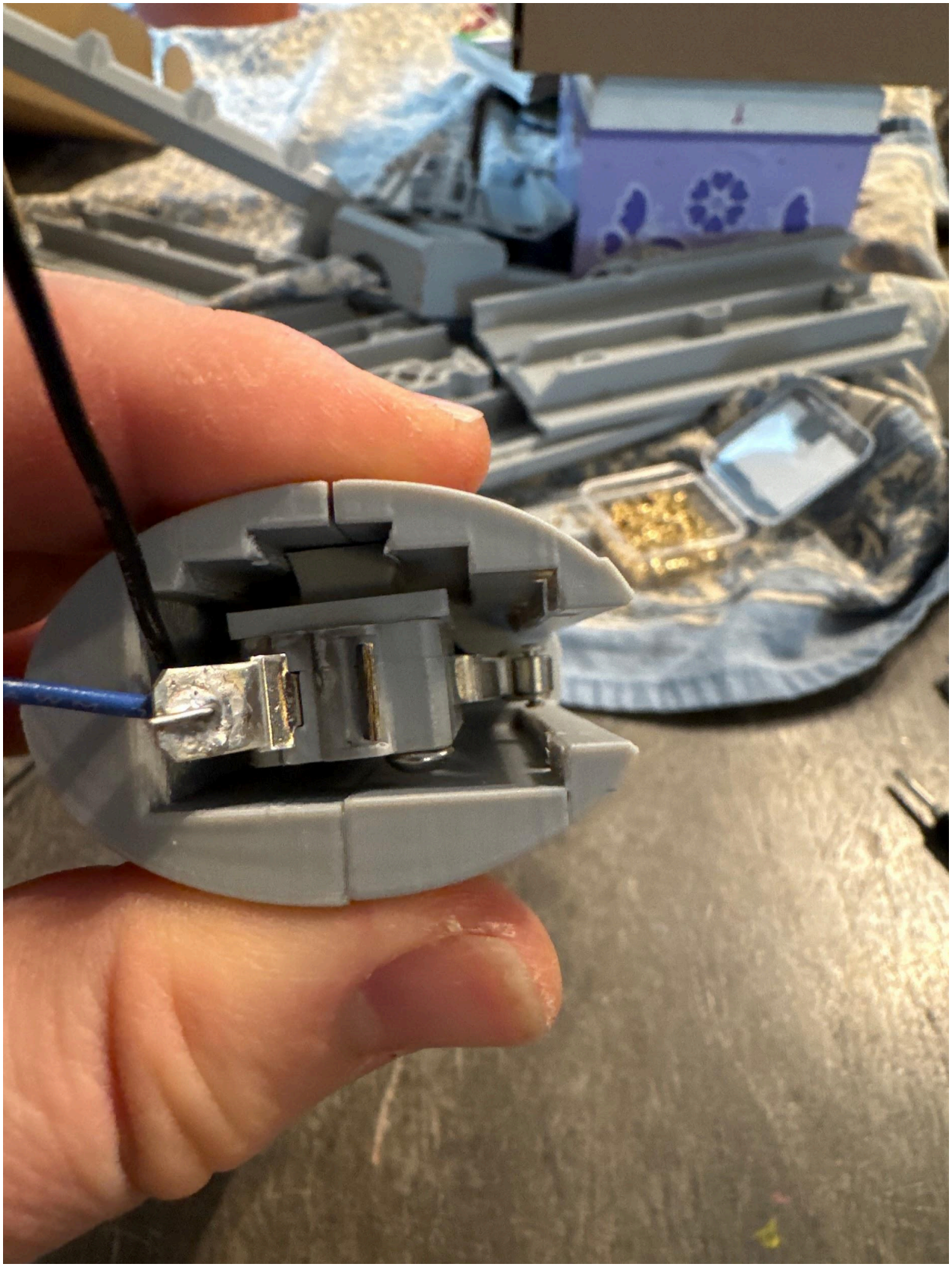
This Techpriest uses black wire for common (-), and blue wire for live (+). The wire used here is a solid core (non-stranded) 22 AWG (thickness of wire).


KW3A

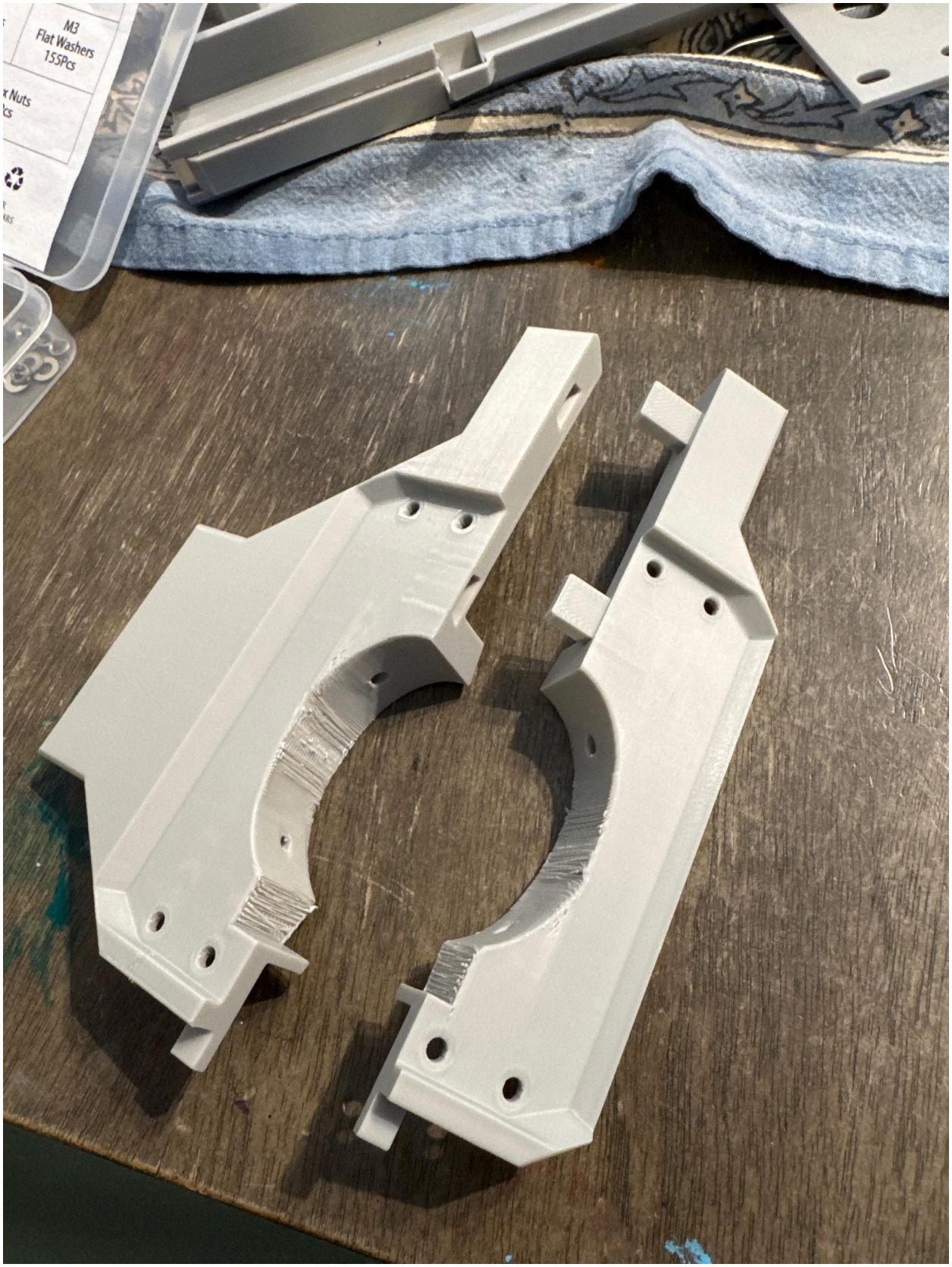


The lever arm of the switch may be bent gently in Order to engage with the printed trigger once it is assembled.

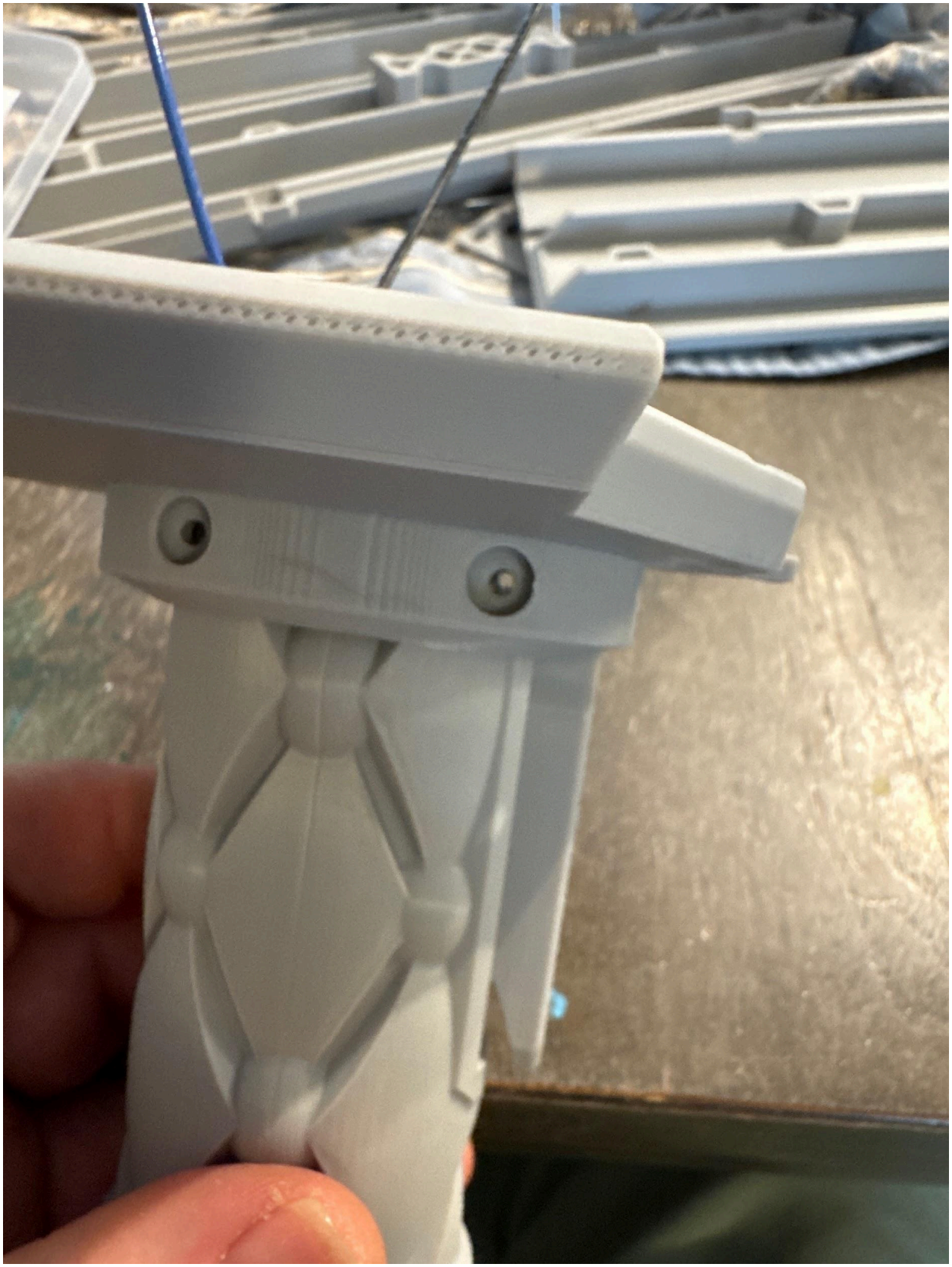
Slot the trigger switch and mount into the grip:



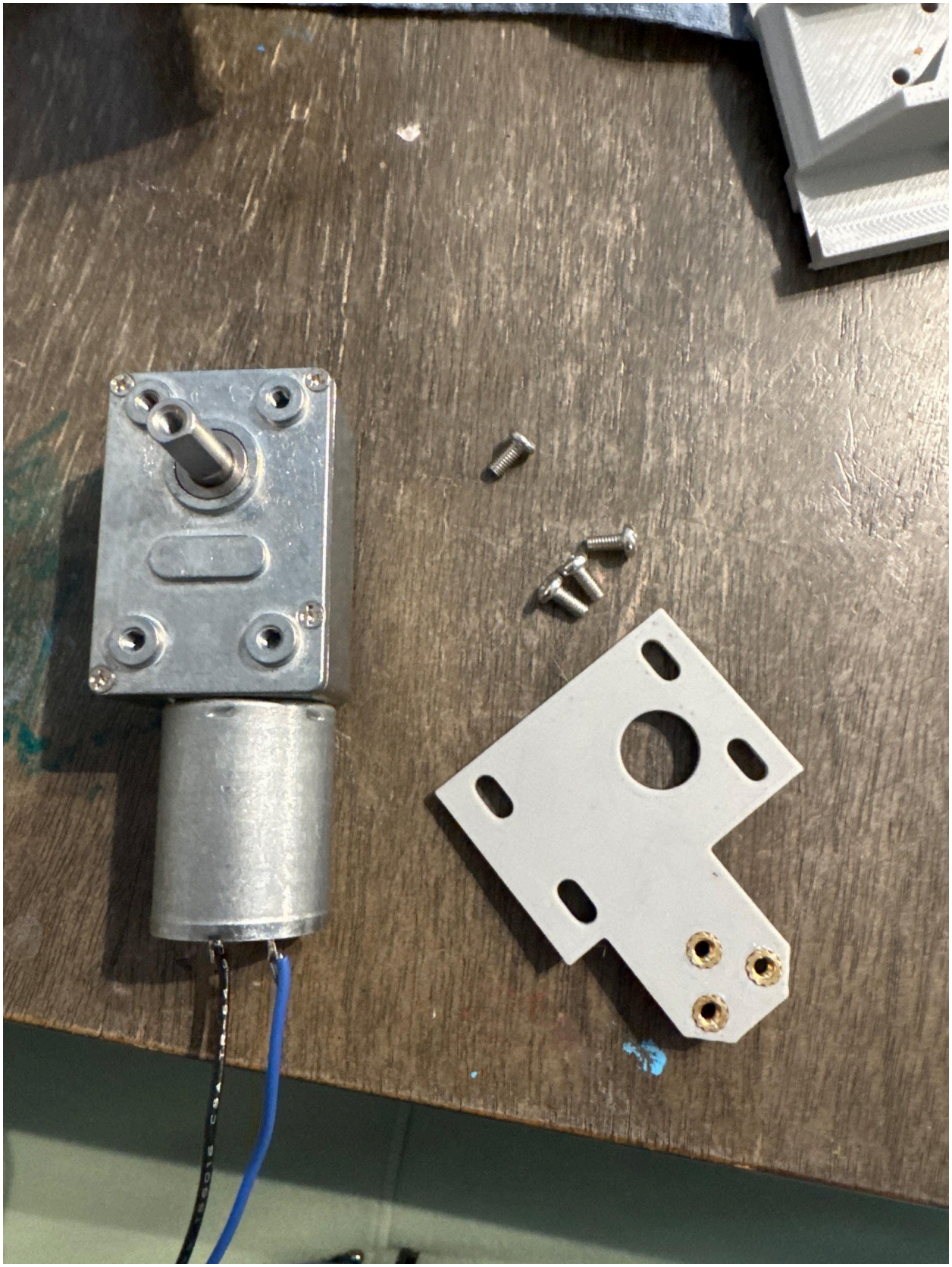
Assemble the hand guard:

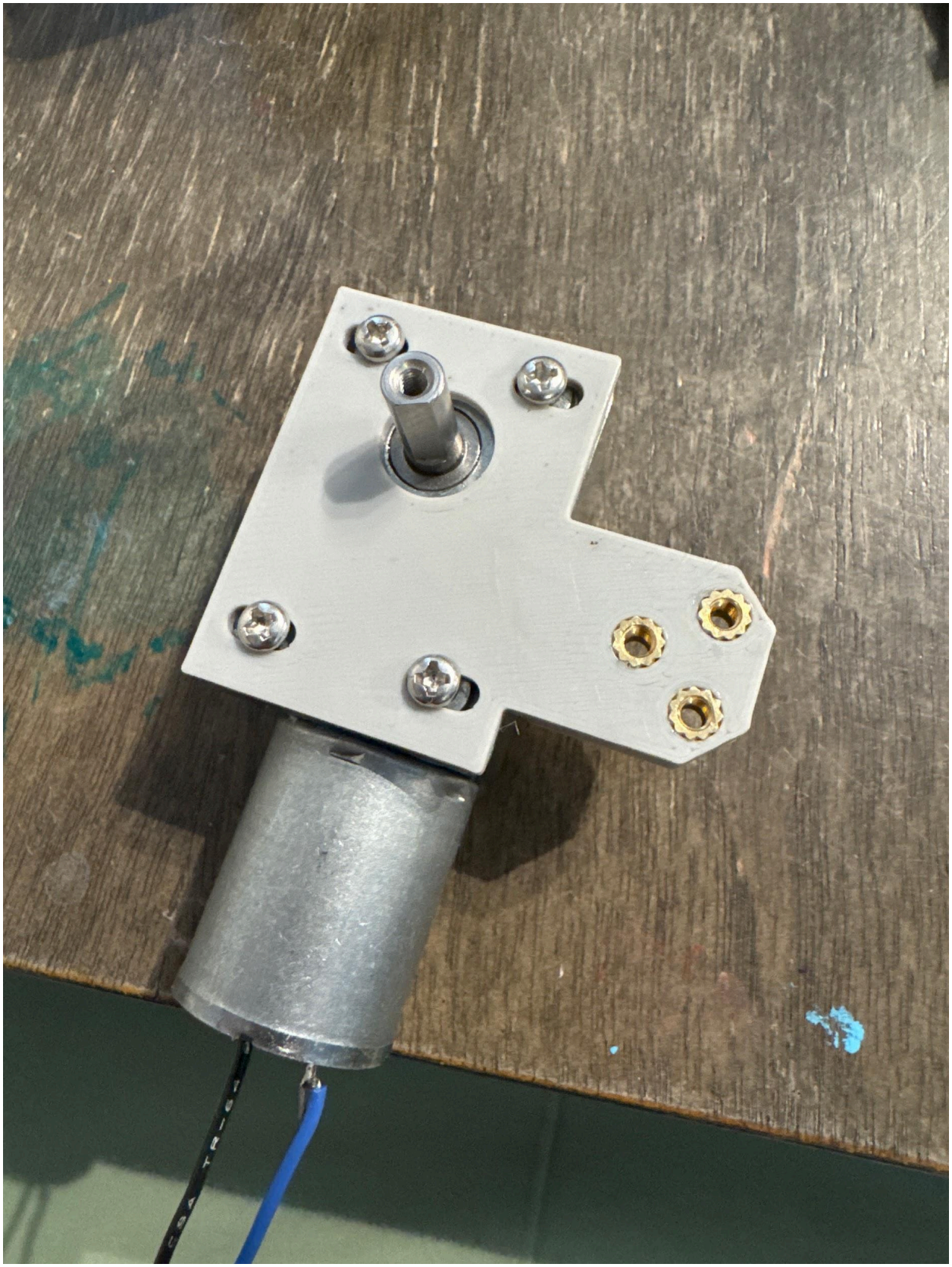

M3
Flat Washers
155Pcs

slot the hand guard over the grip, and then slide the trigger down into its slot. You will use two long M3 screws to attach the grip to the guard. One of those two screws is also the trigger hinge pin. Make sure your trigger is nice and clicky once your screws are installed. Make sure to allow free movement of the trigger. Sometimes tighter screws prevent this.



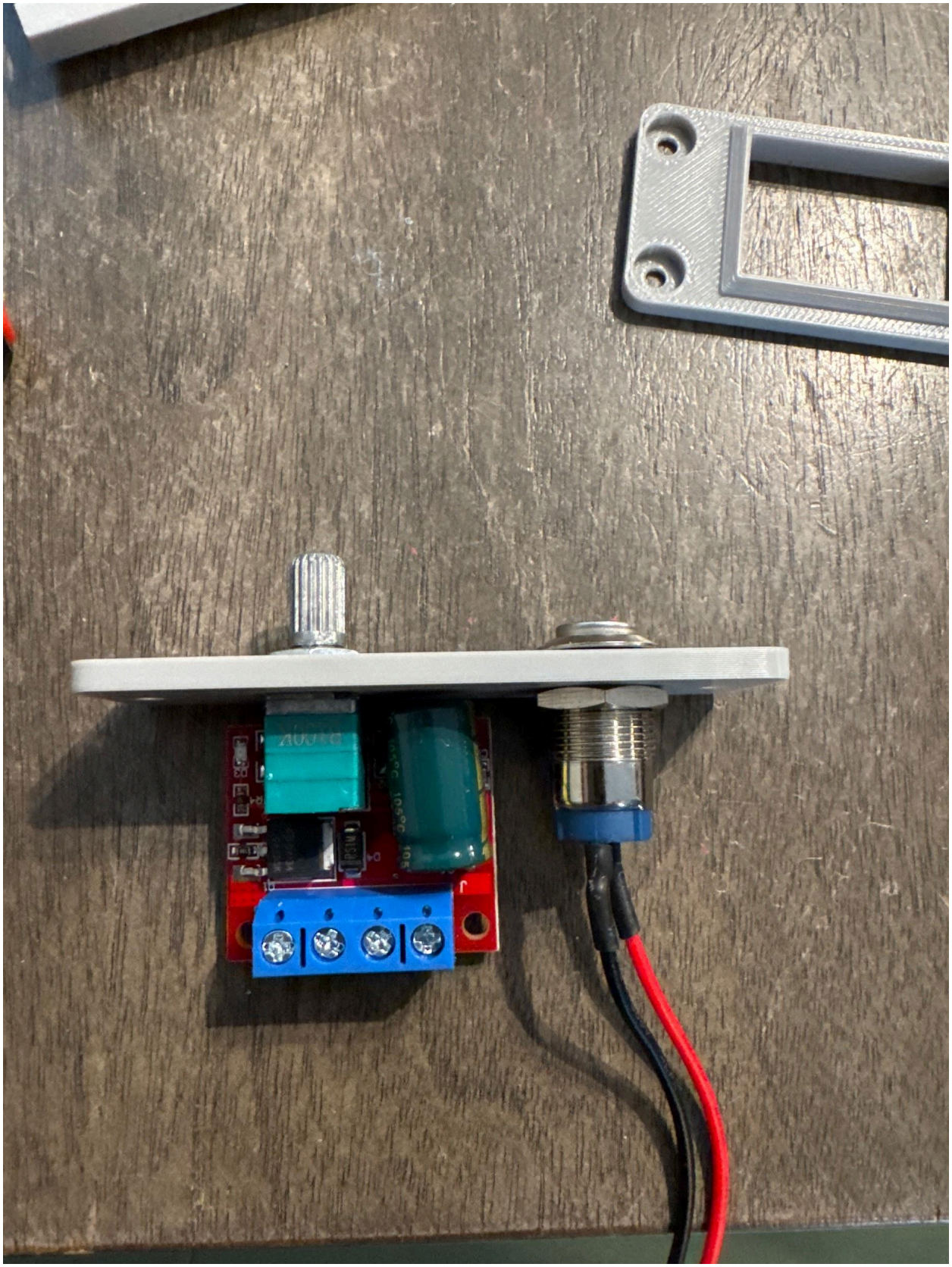
Attach the motor to its mounting bracket with four M3 screws.



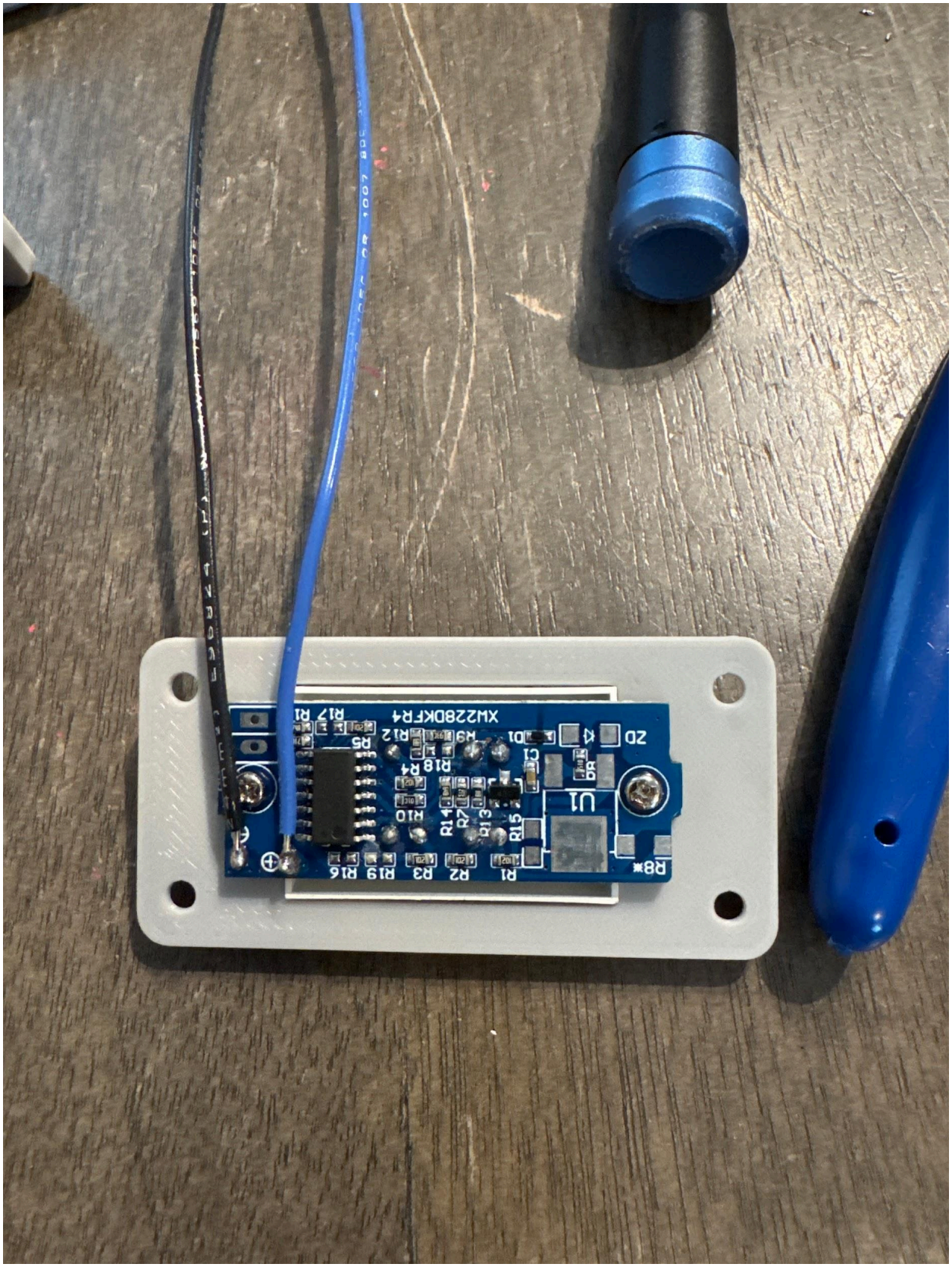


Slot the motor assembly into the motor housing, secure with three M3 screws:

Assemble the power panel with the master on/off and power control board:

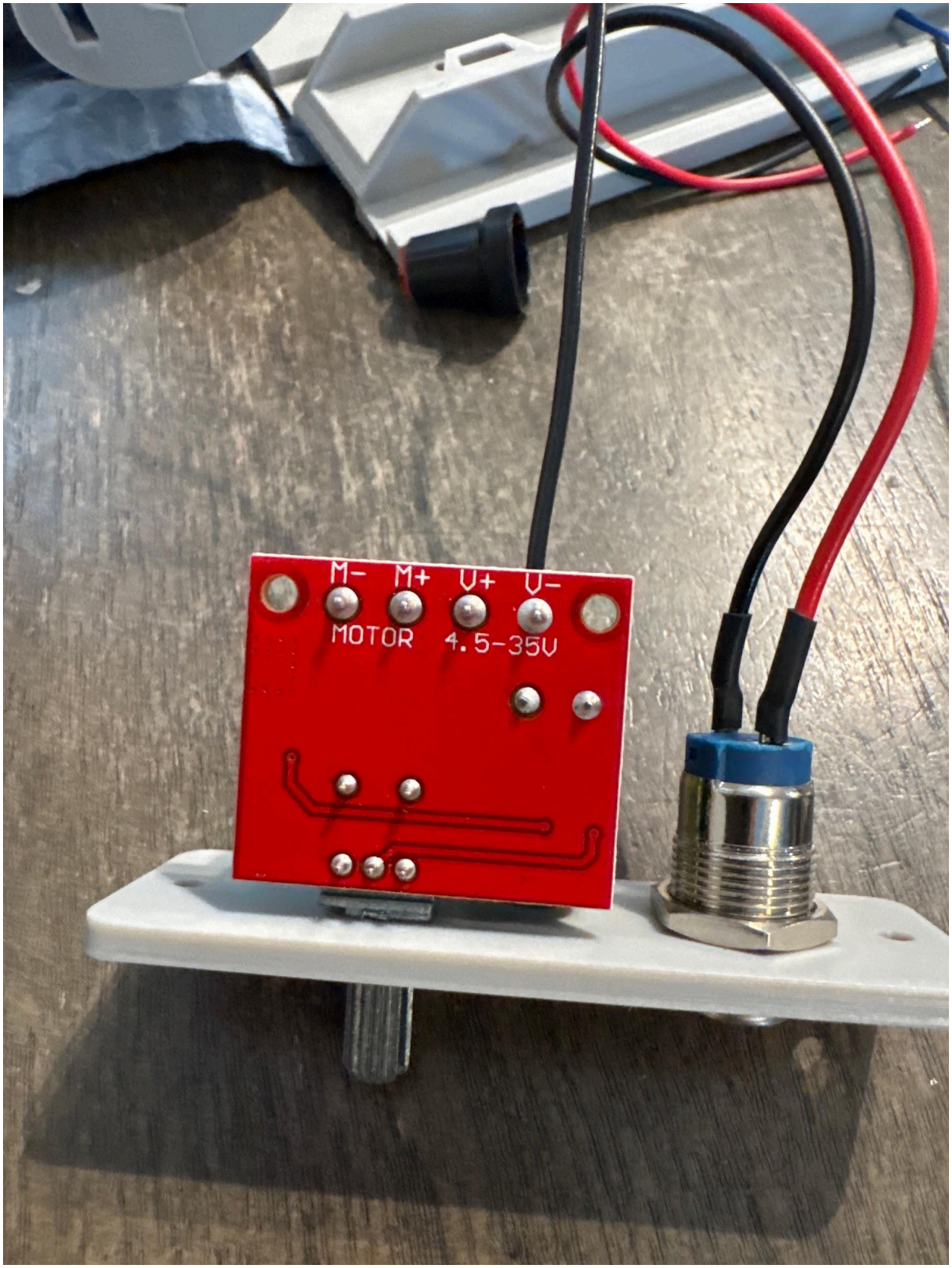


And the battery monitor:

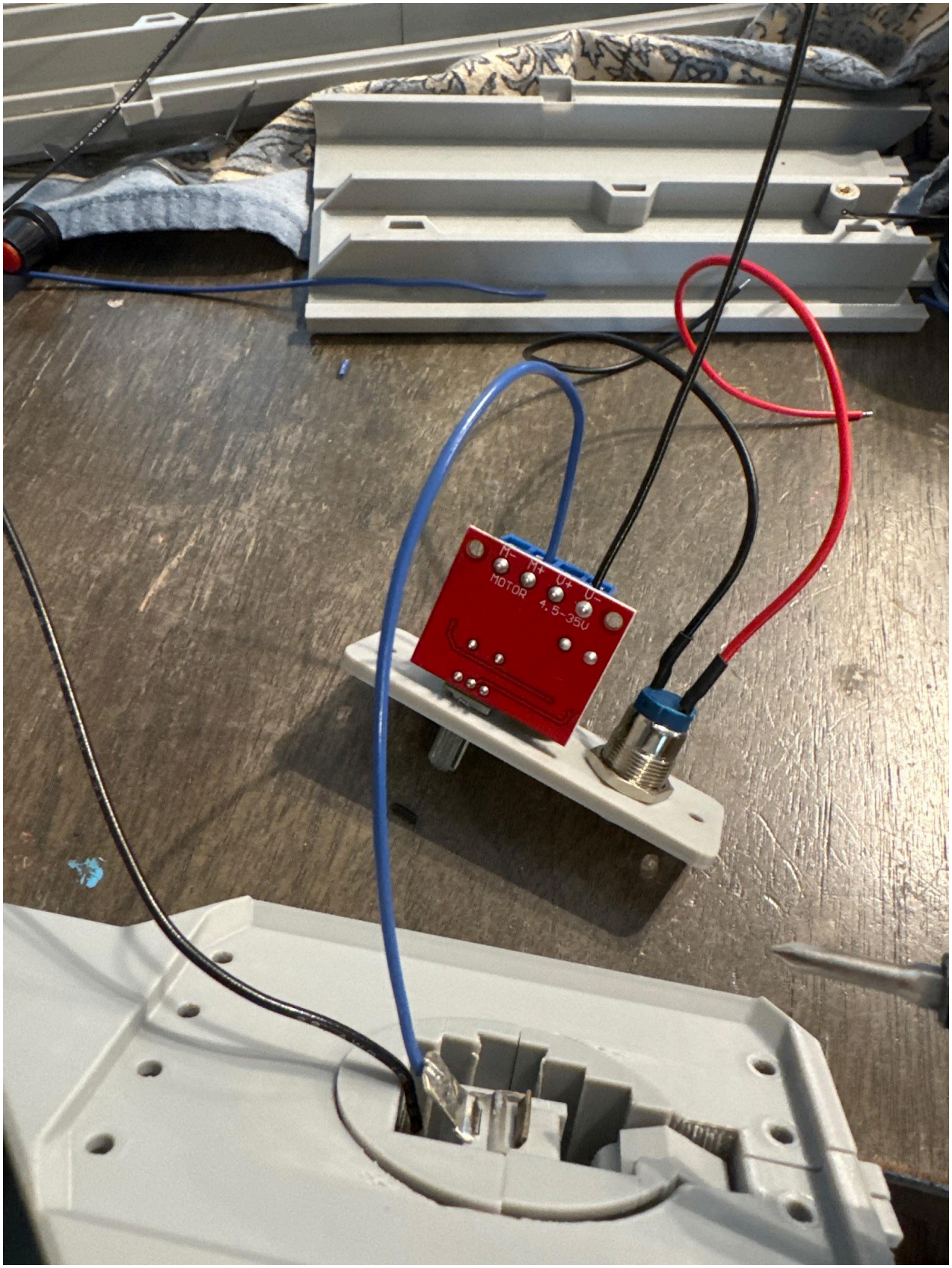

XW228DKFR4
U1

If using the suggested LiPO battery pack, attach + and - leads to the power plug adapter that comes in the box:

And attach a - lead to the motor control board:


M-
M+
V+
V-
MOTOR
4.5-35V

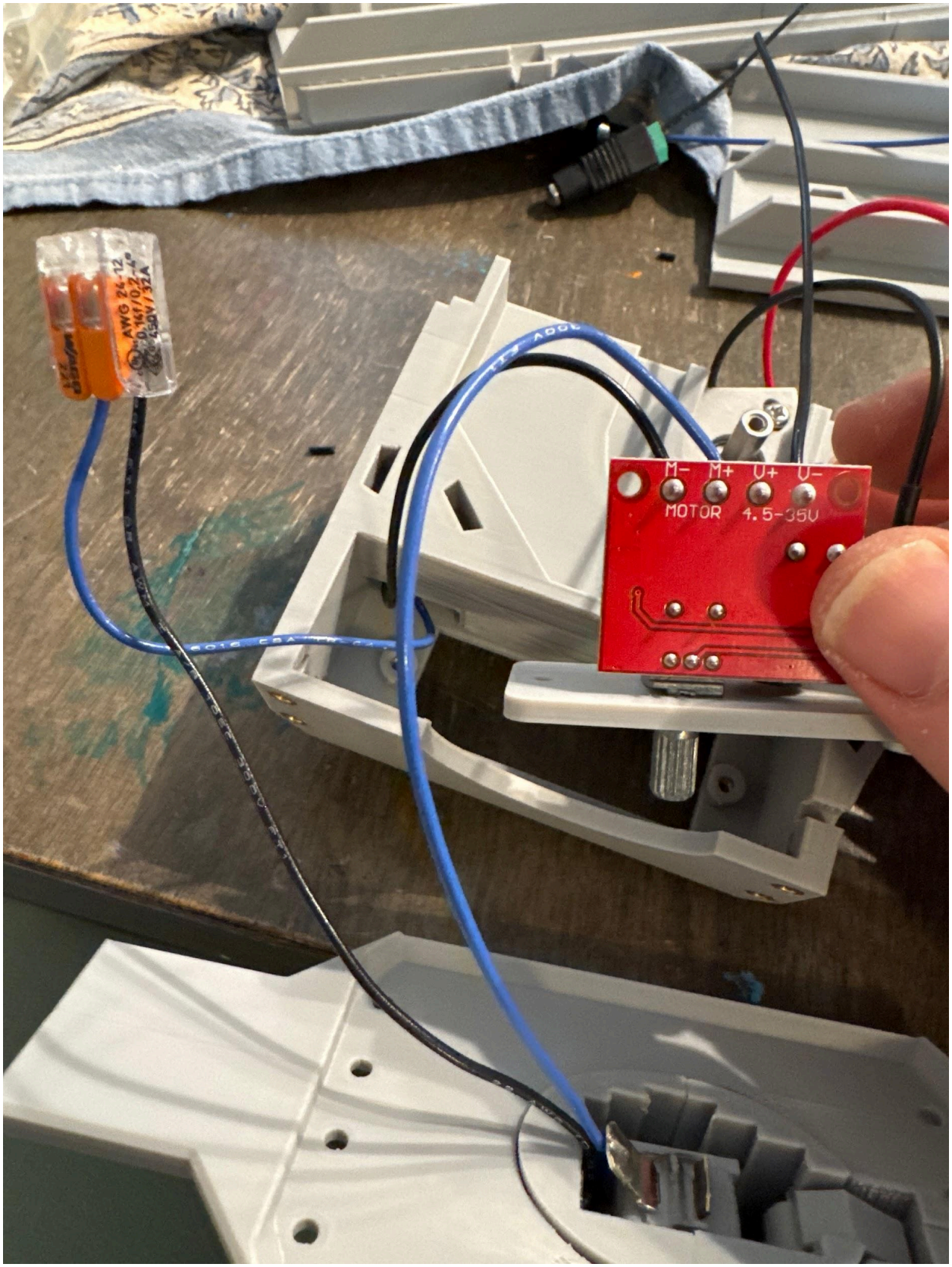
Connect the blue lead from the trigger switch to the lead for the M+ (motor power):



To complete the firing trigger circuit, you will connect the common (-) coming off the trigger switch to the + (blue wire) going into the motor, then connect the common from the motor (-) back to the power control board.

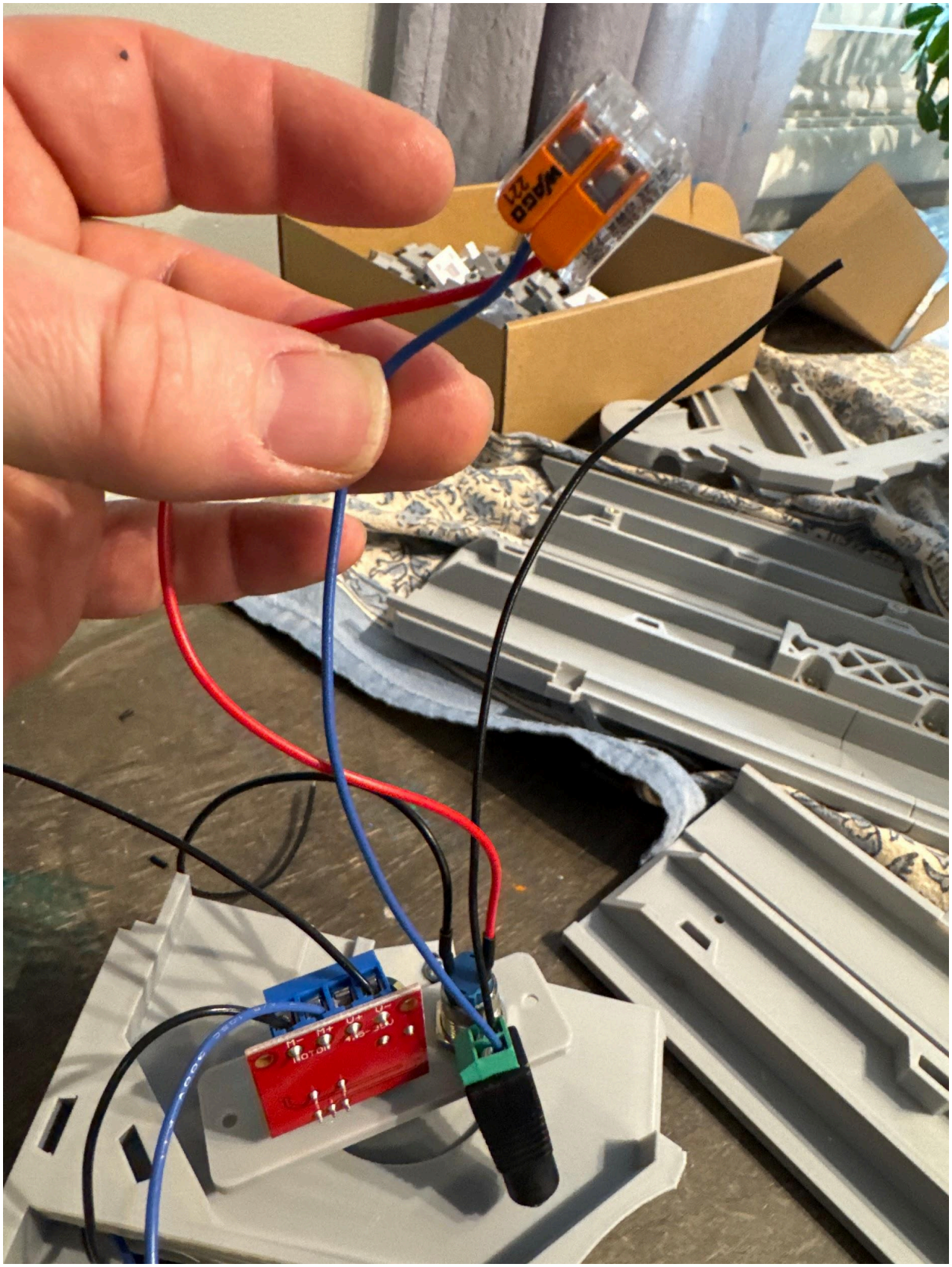
The lever connectors used here are great for this build because it requires less soldering and the connection can be broken if needed.

Also, the wires here are overly long and being used for illustrative purposes. They will be trimmed down to size in the final assembly.

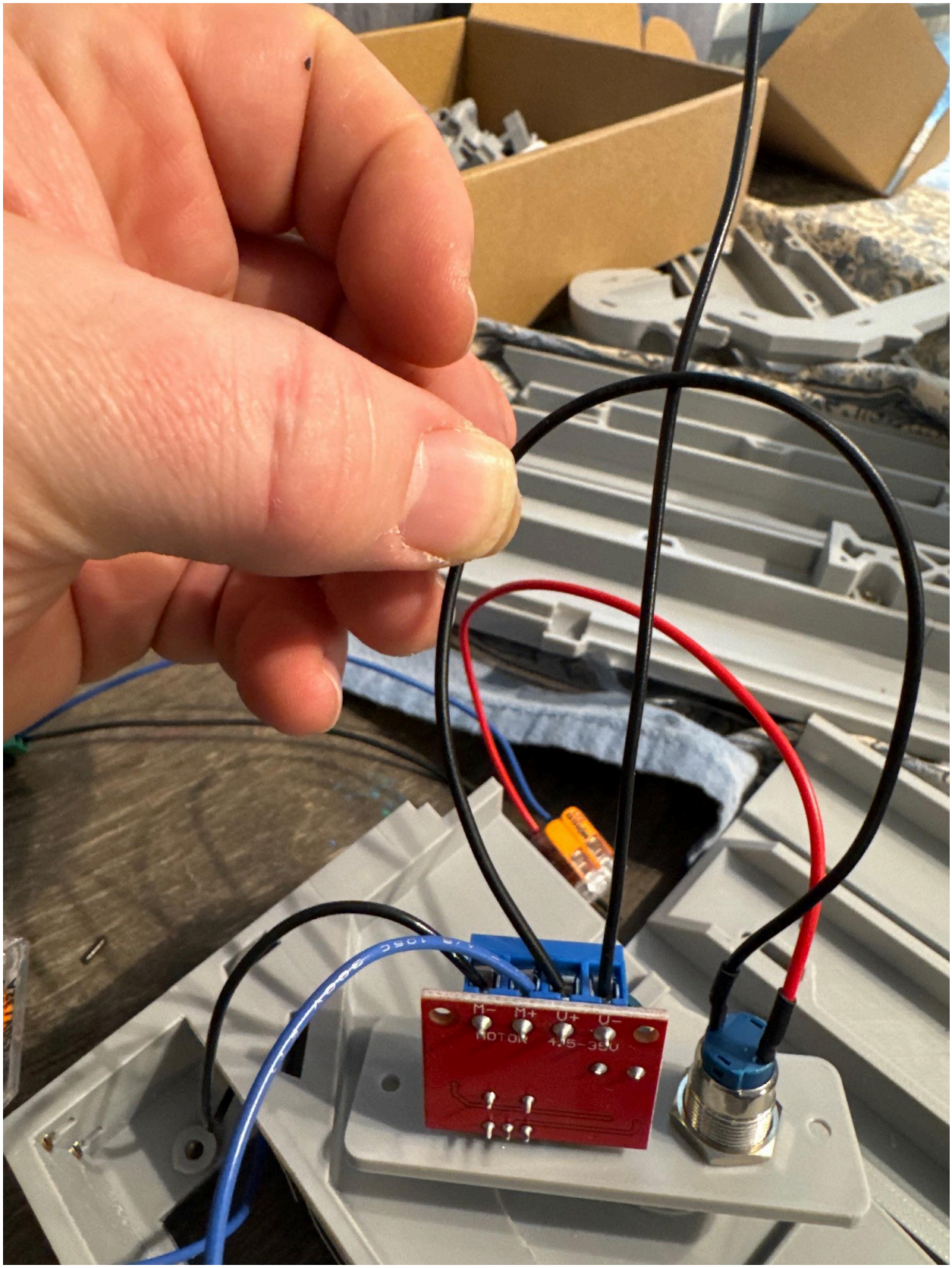

M-
M+
V+
V-
MOTOR 4.5-35V

This circuit will work when the power control board is powered up, the energy being sent to the motor (M+) will go to the trigger, when the trigger is pulled the circuit will close, allowing the energy to go to the motor, then return to the board (M-), completing the circuit. If for some reason the motor spins in the wrong direction, just swap the M+ and M - leads on the control board. It will send the electricity in the “other direction” and make the motor spin in the other direction.

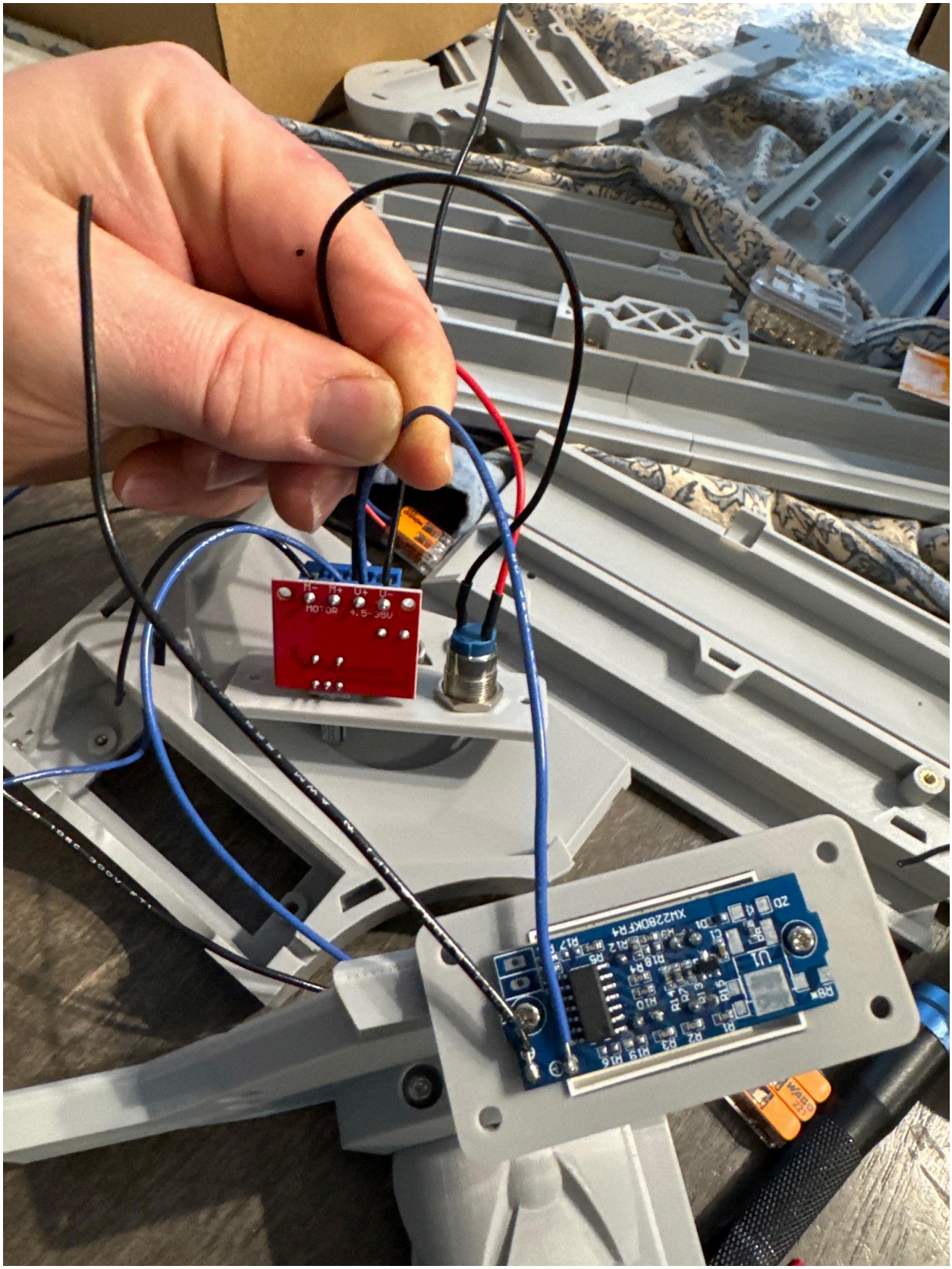
The master power control switch is wired by running the + lead from the battery to the + lead on the master switch (red wire in this example). Note that there are many different types of on/off switches so pay attention to your wiring diagrams that come with your switches.


wago
221

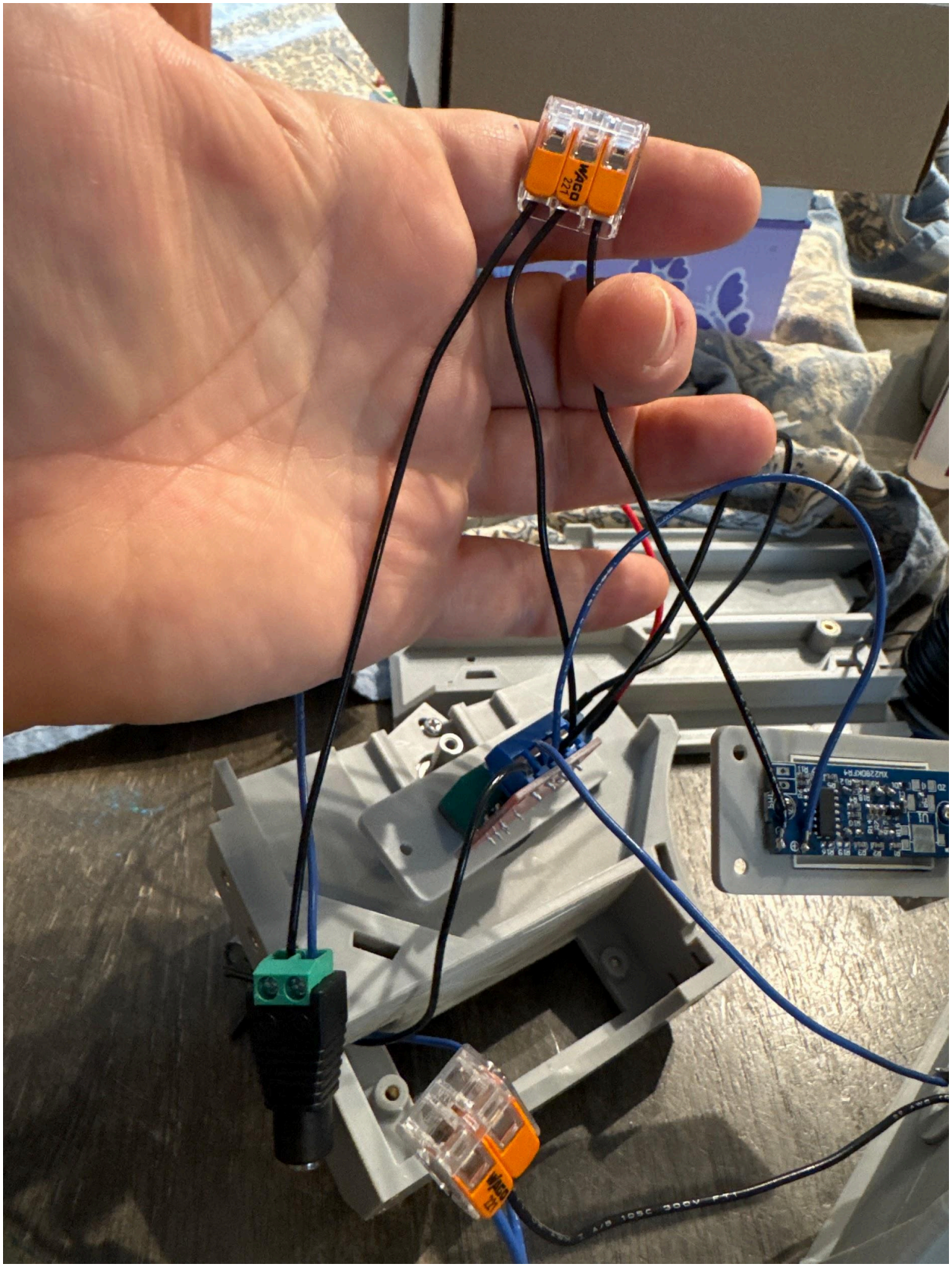
The black wire from the master on/off switch will go into the V+ on the control board:


M-
M+
V+
V-
MOTOR
4.5-35V

The + lead from the battery monitor should also go into this slot:

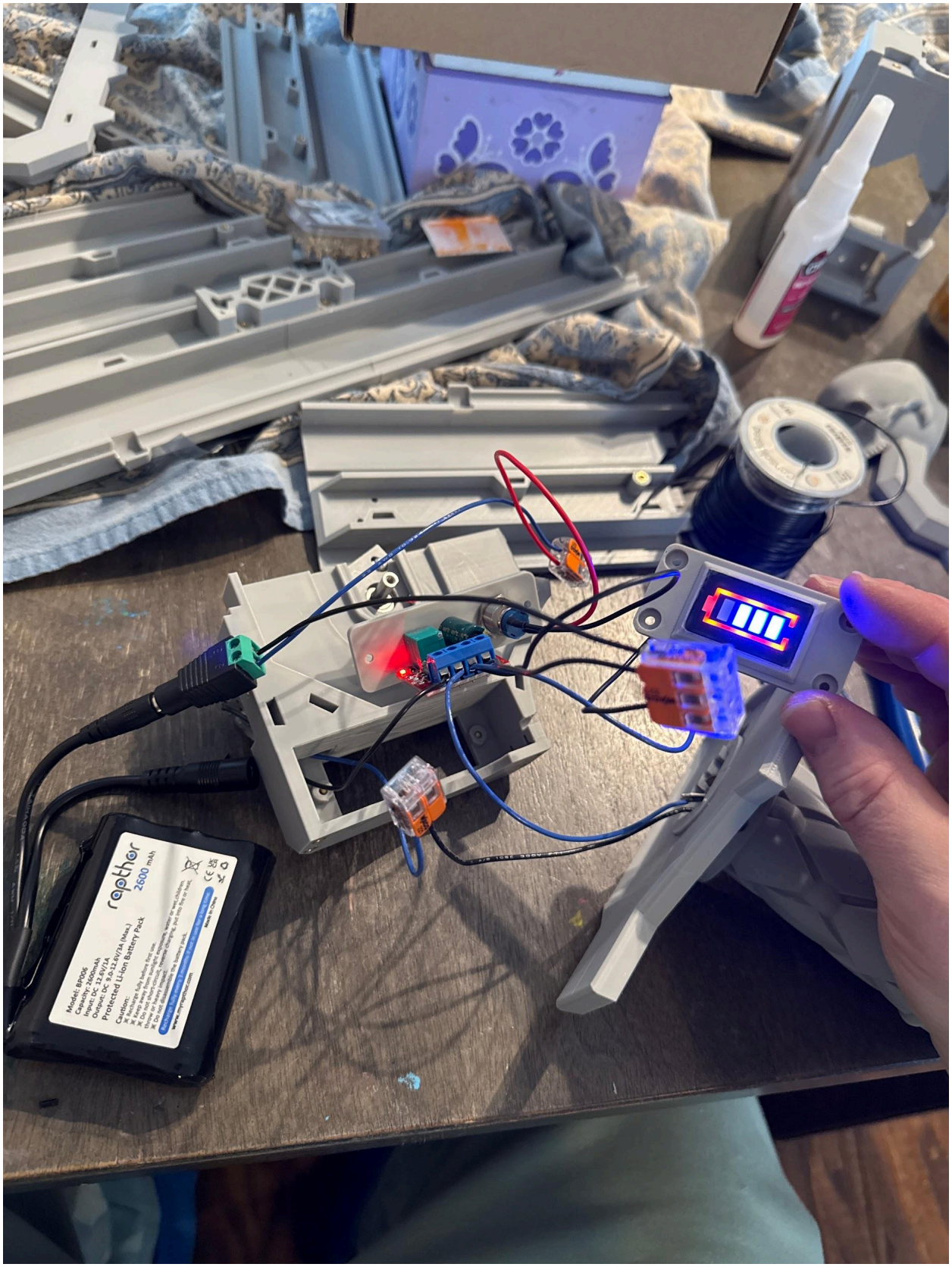


Now, the V- from the power control board, the battery monitor and the power supply all need to be joined:


WAGO
221

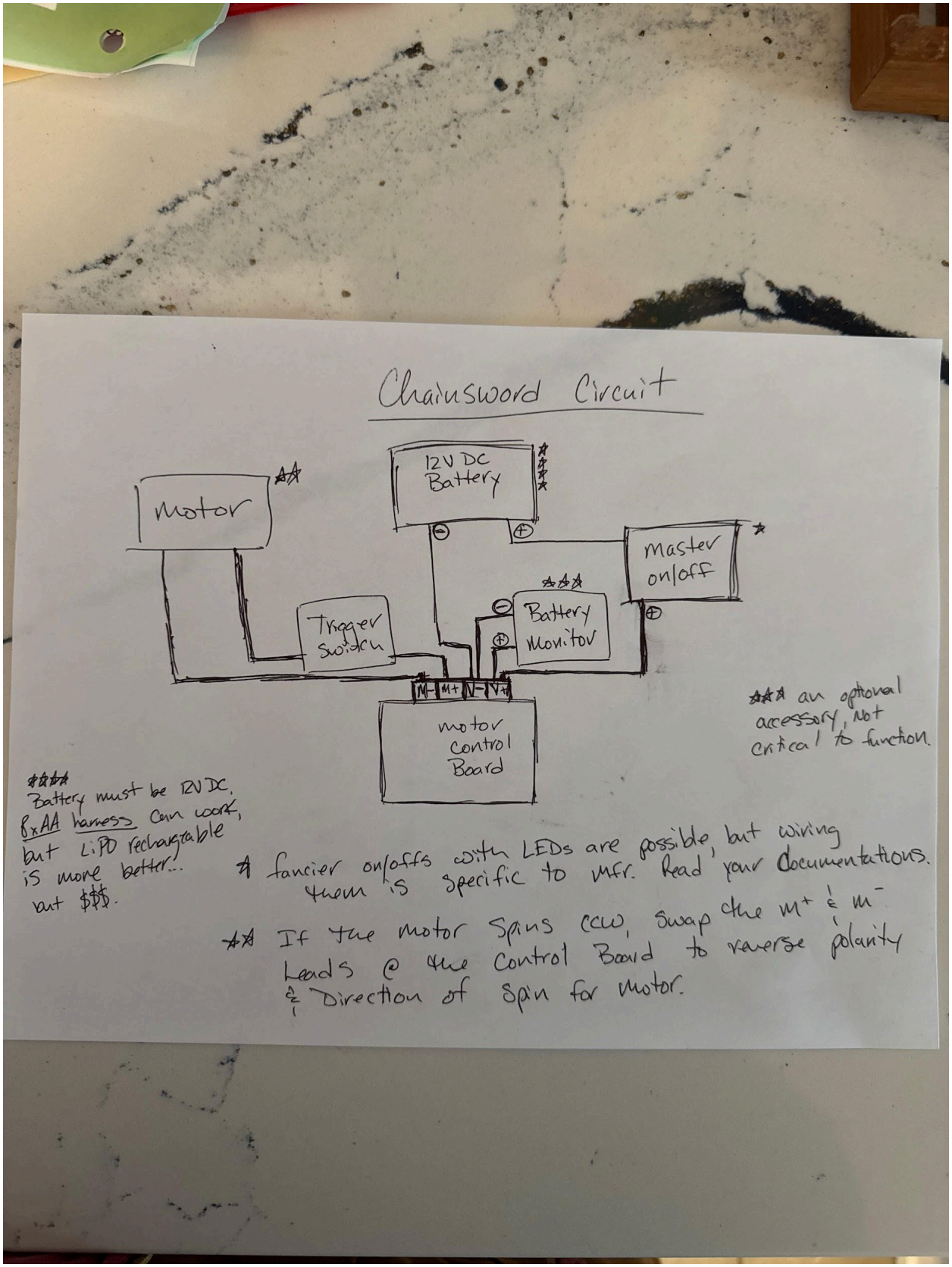
A circuit diagram is provided:

Attach your power supply and make sure it all works as desired:


raptor
2600 mAh
Protected Li-Ion Battery Pack

When the trigger is pulled, you should have the motor spinning clockwise. When it's released, it should stop.

Here is a basic line drawing of the functioning circuit:


Chainsword Circuit
12V DC Battery
Motor
Master on/off
Trigger Switch
Battery Monitor
M- M+ V- V+
motor control Board
**** Battery must be 12V DC. 8xAA harness can work, but LiPO rechargable is more better... but $$$.
* fancier on/offs with LEDs are possible, but wiring them is specific to Mfr. Read your documentations.
** If the motor spins CCW, swap the M+ & M- Leads @ the Control Board to reverse polarity & Direction of Spin for motor.
*** an optional accessory, not critical to function.

Notes:

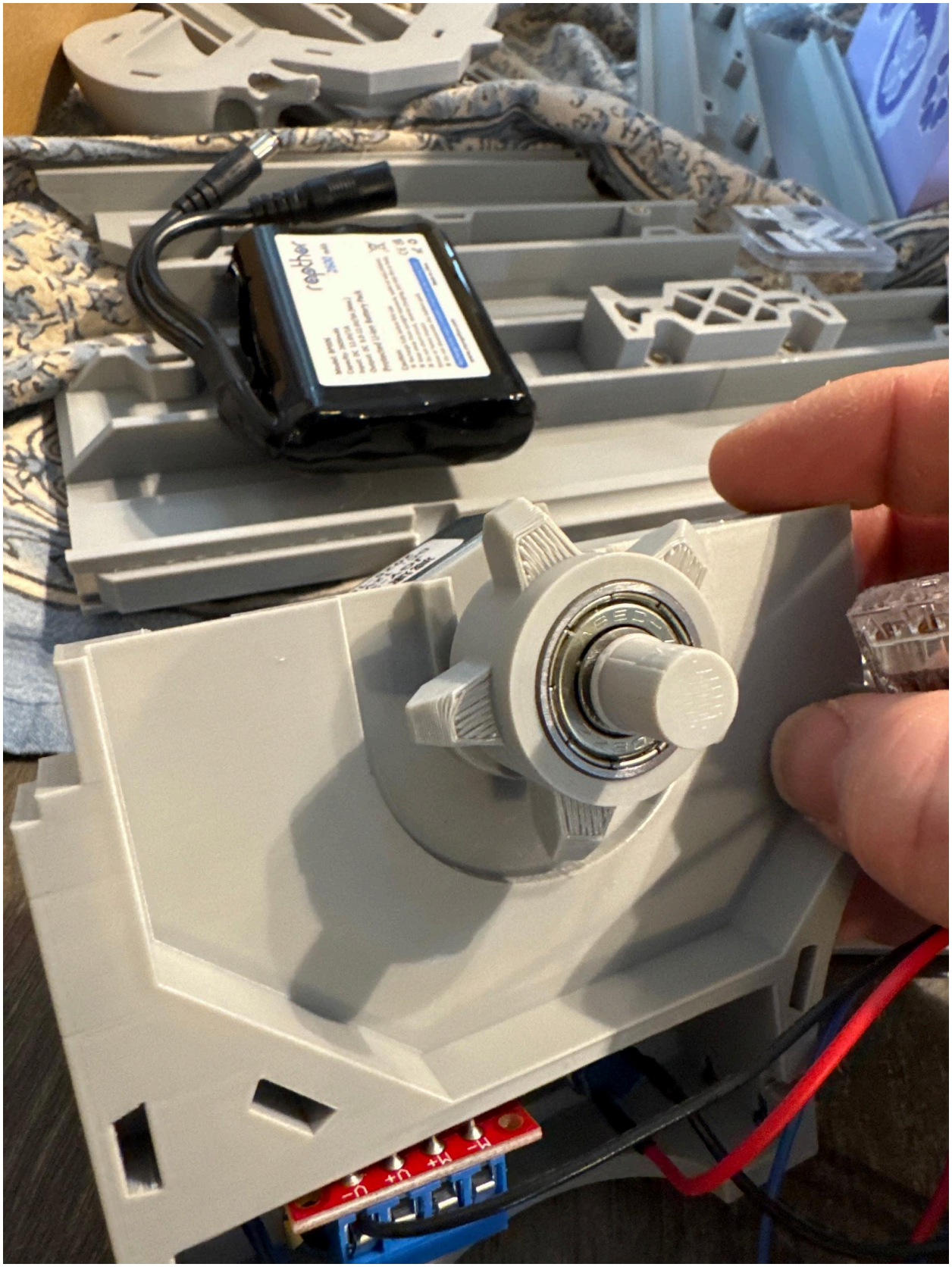
* 12mm hole for on/off in presented part. Other master on/off options are available (rocker switches, LED latching push bottoms, etc…but you have to figure out how to wire those and mod the panel into the circuit yourself as each manufacturer uses different wiring colors and setups, so read their documentation if using something other than the one used in this BoM.)

** if your motor spins in the wrong direction when you first power this circuit, just swap the M+ and M- leads at the control board. This reverses the polarity of that portion of the circuit and will cause the motor to spin in the other direction.

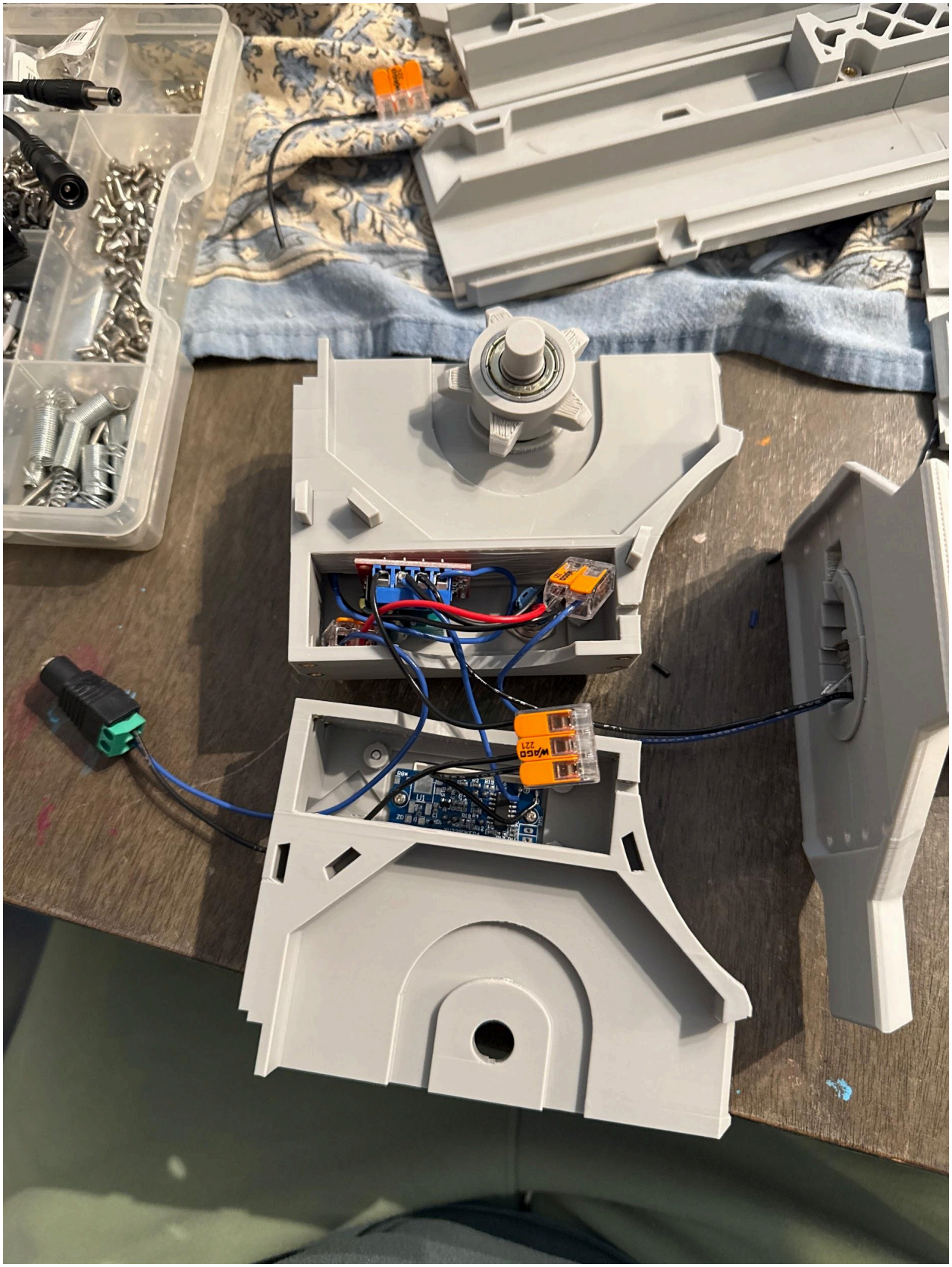
*** The Battery monitor circuit board is optional, as it does not affect the function of the motor circuit, but serves as a visual for the chainsword's on/off and battery level. It is designed for LiPO batteries, it will register readings when using 8xAA battery pack, but it is unclear if it actually reads the charge level on alkaline batteries.

**** The suggested LiPO battery is superior to 8xAA battery harness, but is more pricy. 8xAA harness will power and drive the unit, but the longevity of the batteries is questionable.

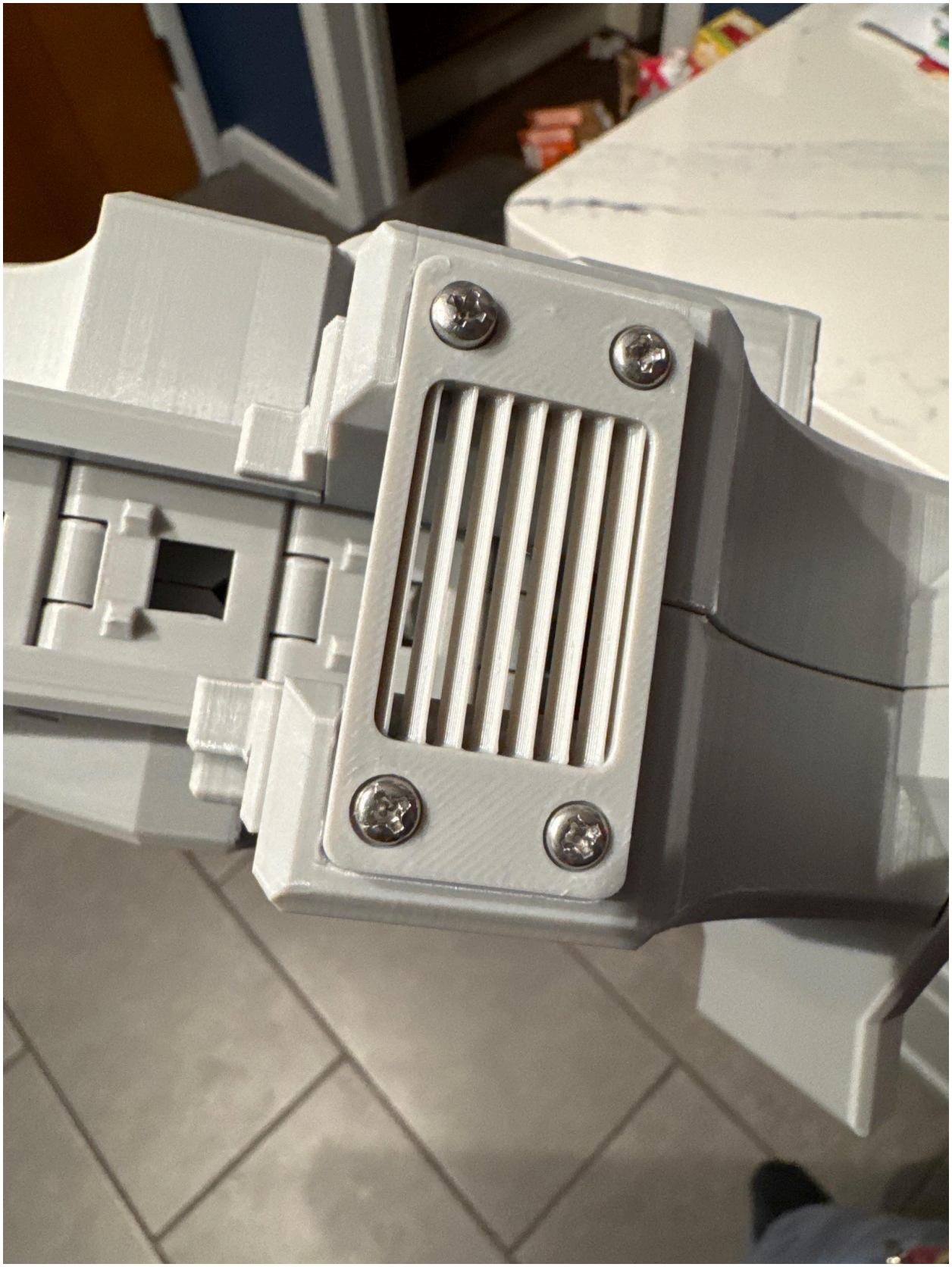
With the circuit complete, you can assemble the motor housing and trim your wires down to fit nicely. Make sure to install the bearing in the drive gear and put the drive gear on the motor shaft:


M-
M+
U+
U-

Trimmed and cable managed circuit that is ready to close:



Connect the two motor housing halves with three tabs, and then attach the front “gore grille”:



Attach the grip and guard to the motor housing with eight M3 screws.

Slide the motor shroud and blade mount down onto the motor housings, attach with screws:

Install the battery and battery cover:


rapthor
Model: BP006
Capacity: 2600mAh
Input: DC 12.6V/1A
Output: DC 9.0-12.6V/3A (Max.)
Protected Li-Ion Battery Pack
Caution:
www.myrapthor.com

There is a bottom shroud section as well

Assemble and attach the knuckle guard/pommel using the tabs and glue. It is suggested that you do not fully glue this part on until you have had a chance to add counterbalance to the hollow sections of the grip and pommel if you choose to.

Assemble the blade sections using the tabs and the blade stiffening blocks:

Consolidated

Join the clamshell halves and use screws to secure the connections. Space is left in the bottom section if you want to install a nut for a threaded rod that can run the length of the blade in the outer channel:

Wooden dowels are also a possibility, but the addition of the blade section stiffeners has minimized this need.

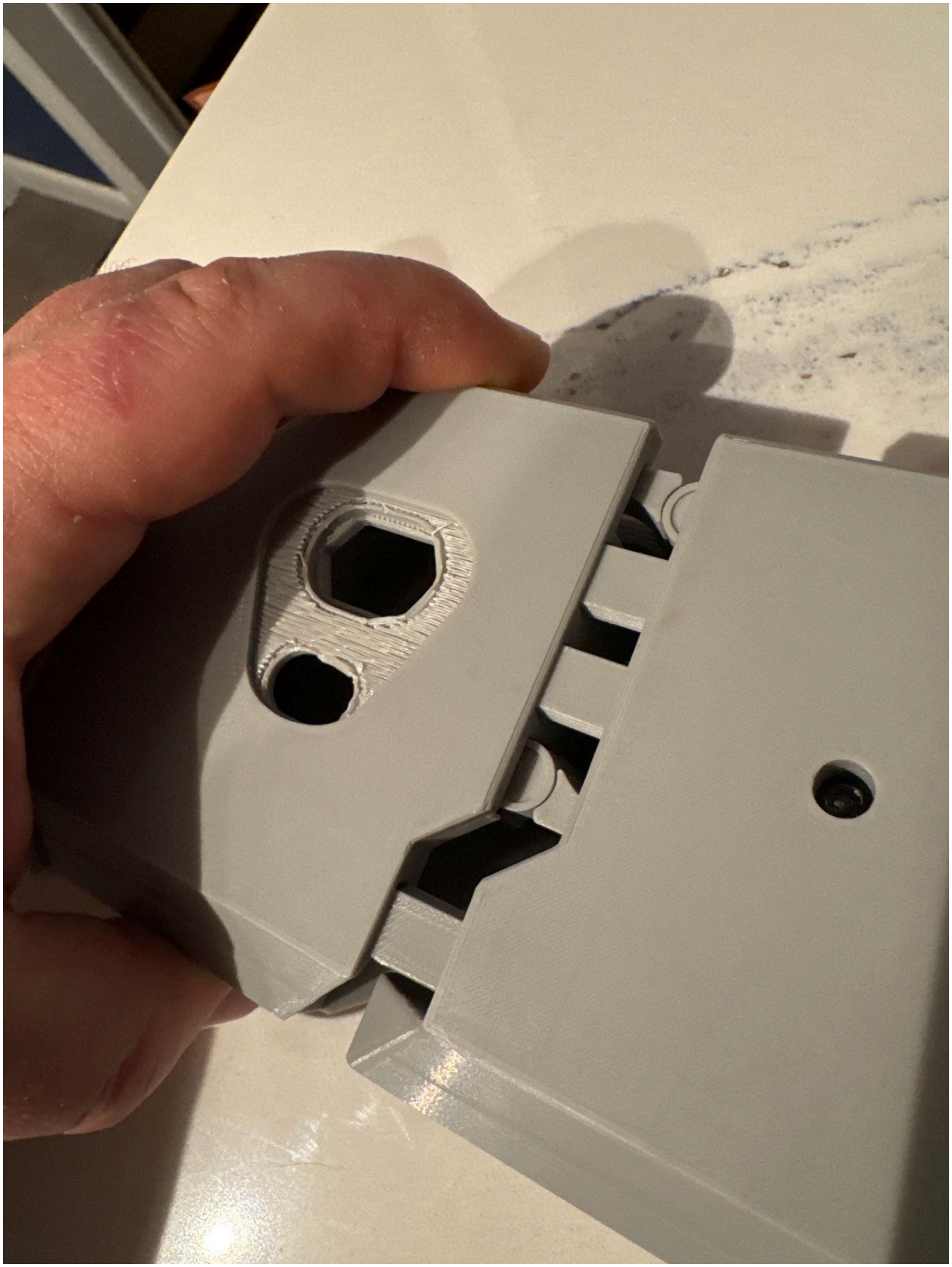
With the blade halves assembled, slide them down the motor shroud and into place, there are two tab connectors at the bottom rear of the blade and the forward blade stabilizers also get installed.

Attach blade to the shroud with three m3 screws in the recesses on each side of the Chainsword once it is secure in its slots and stabilizers. The recessed sections have covers that can be applied as well.

With ¾ of the blade attached, it is time to build the chain. Connect each link with a pin. 46 links in the chain. With the Chainsword on, the chain is fed down the front track, and then use the trigger to drive the feed and load the chain until it returns out the top of the blade.

BE SURE TO FEED THE CHAIN IN THE CORRECT DIRECTION!

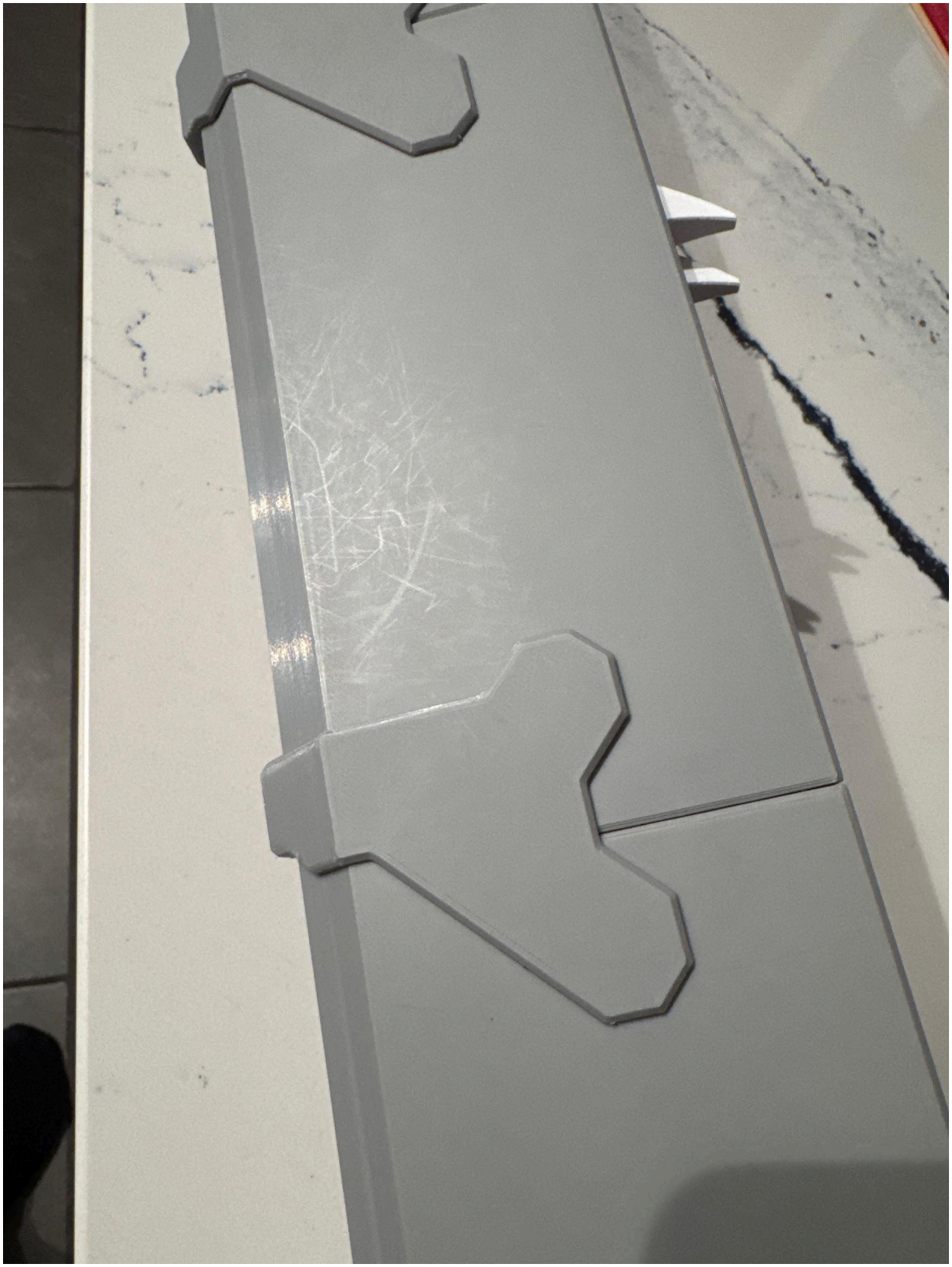
Assemble the blade tip, then install it on the blade. feed the chain ends into the track and pin it, completing the chain loop.



With the blade assembled and the chain looped and in its track, the Chainsword should function as desired when powered on and trigger pulled. Remember the power management board has its own on/off and LED built in to the board and knob. The knob clicks on, and turns clockwise to increase speed to maximum. Turning it all the way counterclockwise and it clicks off.

Glue each tooth in place:

Build the blade panels and attach them, they are intended to cover the holes where the screws were used to connect the clamshell halves of the blade.



The top section has a modified blade panel that covers the holes on the blade tip that allow you to connect/disconnect the chain.

Assemble this section with glue and then snap it on:

The blade shroud has two additional parts to attach.

Glue the Vents into the correct spot. And the circular axle hub cover press fits on to the protruding axle hub:


YI LIN
SUPER SOLDER
WIRE

Now you have a working Chainsword Mk.3!

I would like to dedicate this build to the 3D printing community members who have helped me make my designs better. I was able to make the Mk.2 Chainsword work as it was presented, which is why I published it online, but those of you who built it and ran into warp gremlins let me know about the small heresy hiding within helped me be a better Techpriest by purging this demon and creating the Mk.3 Chainsword. Maybe someday the Magos will promote me to Level 5 Techpriest.

-Ratjob

++Blessed Is The Mind Too Small For Doubt++

-=END TRANSMISSION=-