

FT-6

Assembly Guide v1.1 Official



Folger
Technologies LLC

www.folgertech.com

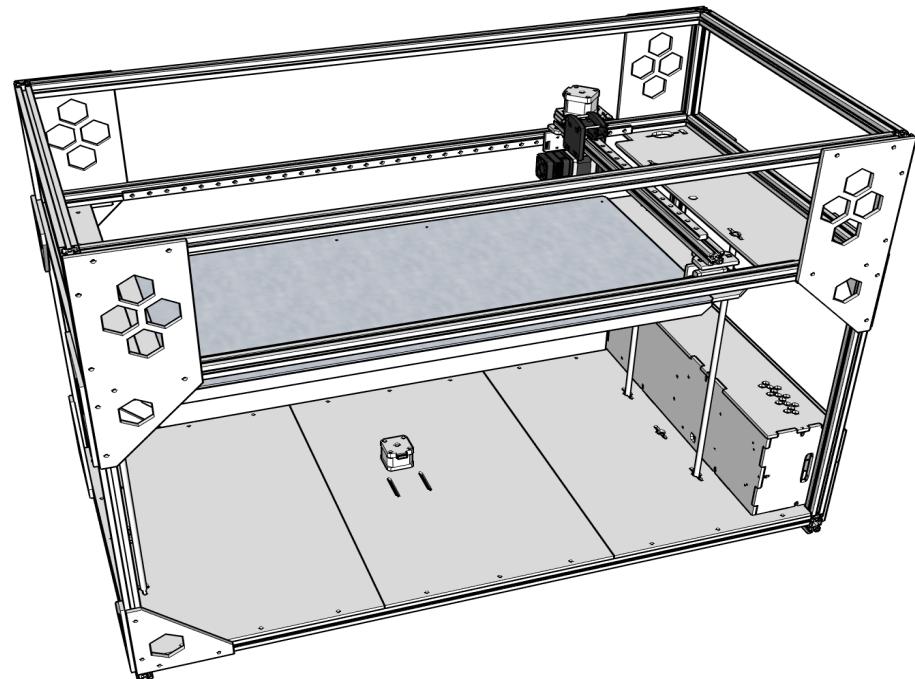


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GUIDE NOTICES

This is an official version of the assembly guide. It is considered complete and should contain very few if any errors.

If you have any questions, find an error, or if anything is unclear, please [contact us](#) to let us know. Your feedback will help us improve this guide for future customers.

Feel free to contact Folger Tech or use the community and official resources listed at the end of this guide if you run into an issue.

Please note, we make updates to parts of the kit due to customer feedback. These changes will not always be noted in the guide, but the build will go the same way.

Due to fluctuating inventories and supply limitations, some hardware may look a little different than what is shown in the guide. This mostly effects the head type of the bolts.

Introduction

Congratulations! If you are looking over this guide it means that you are the proud owner of a Folger Tech FT-6 3D printer.

Our goal as a company is to provide affordable 3D printers to consumers worldwide. On top of this, we want everyone's first printing experience to be a great one. This guide was assembled to provide guidance in assembling and understanding common procedures while using this printer. It covers everything from assembly to the maintenance required to keep the printer performing like new.

Contacting Folger Tech

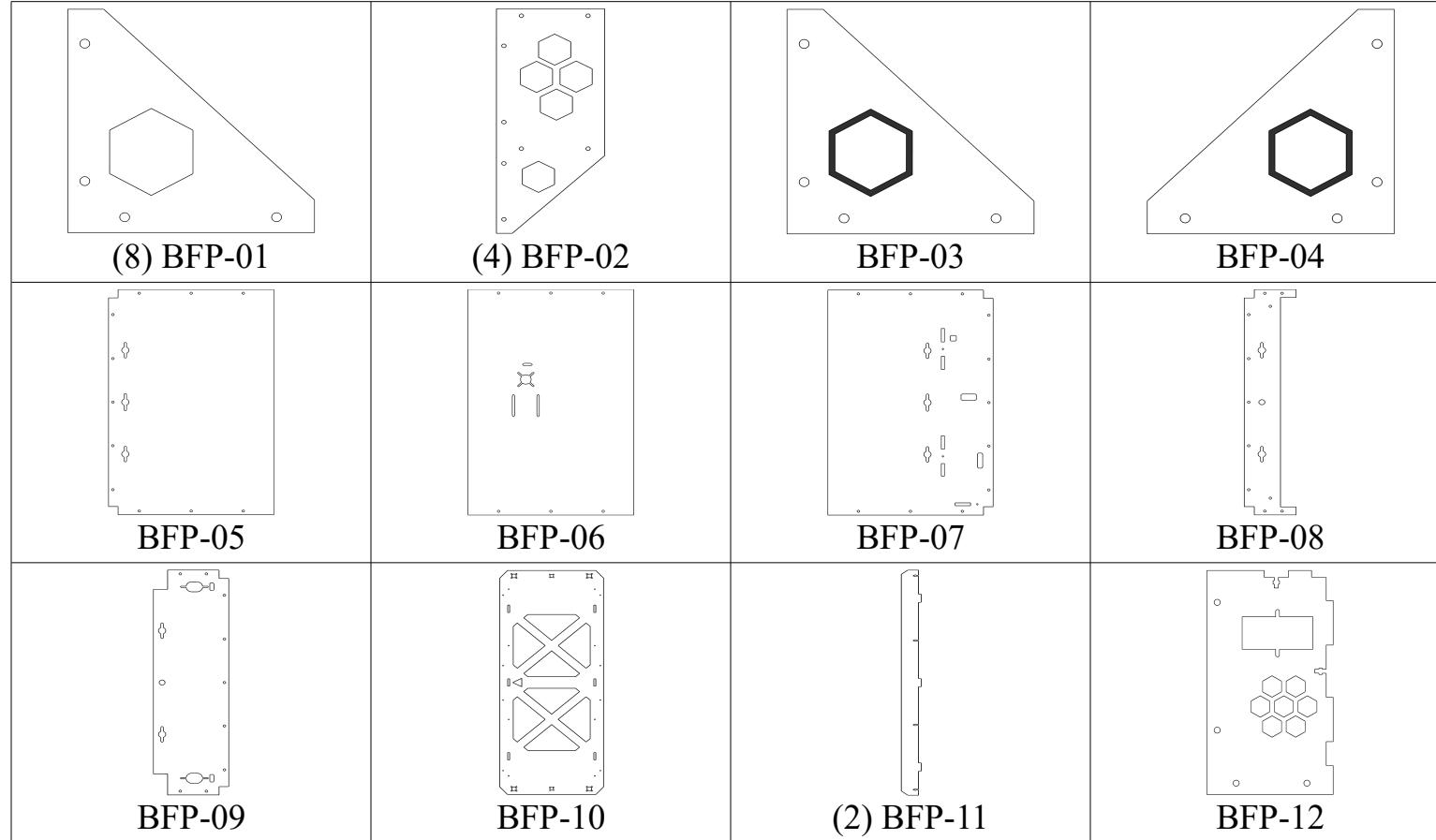
We understand that this guide only covers the basics of your Folger Tech kit. If at any time you need more assistance, visit our support page at Folger Tech Support to send us a message or give us a call at (888) 397–8160 and we will be happy to address your question or concern.

DISCLAIMER OF LIABILITY: FOLGER TECHNOLOGIES LLC specifically DISCLAIMS LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES and assumes no responsibility or liability for any loss or damage suffered by any person as a result of the use or misuse of any of the provided information or product. FOLGER TECHNOLOGIES LLC assumes or undertakes NO LIABILITY for any loss or damage suffered as a result of the use, misuse or reliance on the information and or product. **USE AT YOUR OWN RISK:** Never leave your printer unattended.

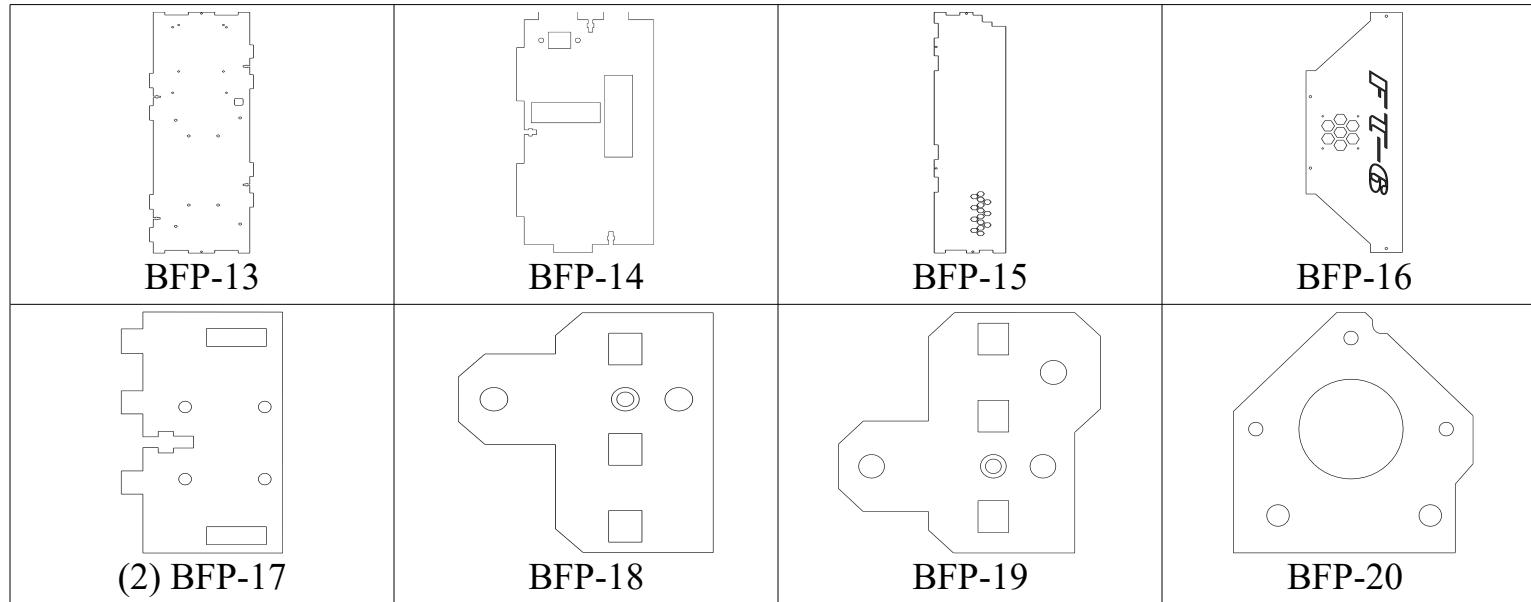
Preparation and Tips

- Unwrap and lay out all of the parts in the box.
- Pull off all of the protective film on the ACM parts and verify with the list on the next page.
- Verify that all of the hardware listed on the hardware bags are included (there will be extras).
- We recommend sorting the hardware into containers to make identification faster during the build.
(egg cartons can be useful for this)
- Pull off the film and remove all of the cutting particles from the 2020 and 2040 beams.
- Make sure you have a large, clear, and flat surface to build on.
- Go slow and check your work, rushing could cause issues in print quality and operation.
- Make sure there is no damage on any parts and report any issues to us right away.
- Be careful when handling the ACM parts, the edges are sharp.
- A deburring tool works great for knocking down the sharp edges of the ACM.
- Gather the parts called out in each step and read through all of the text before performing the step.
- Pay close attention to the images in each step, orientation is very important.
- Printing out the ACM parts list makes it quick and easy to reference during assembly.
- To help with orientation: **X** is side to side, **Y** is front to back, and **Z** is up and down.

ACM Parts List



ACM Parts List (continued)



**LCD, carriage, and extruder ACM parts
are listed in their separate sections.**

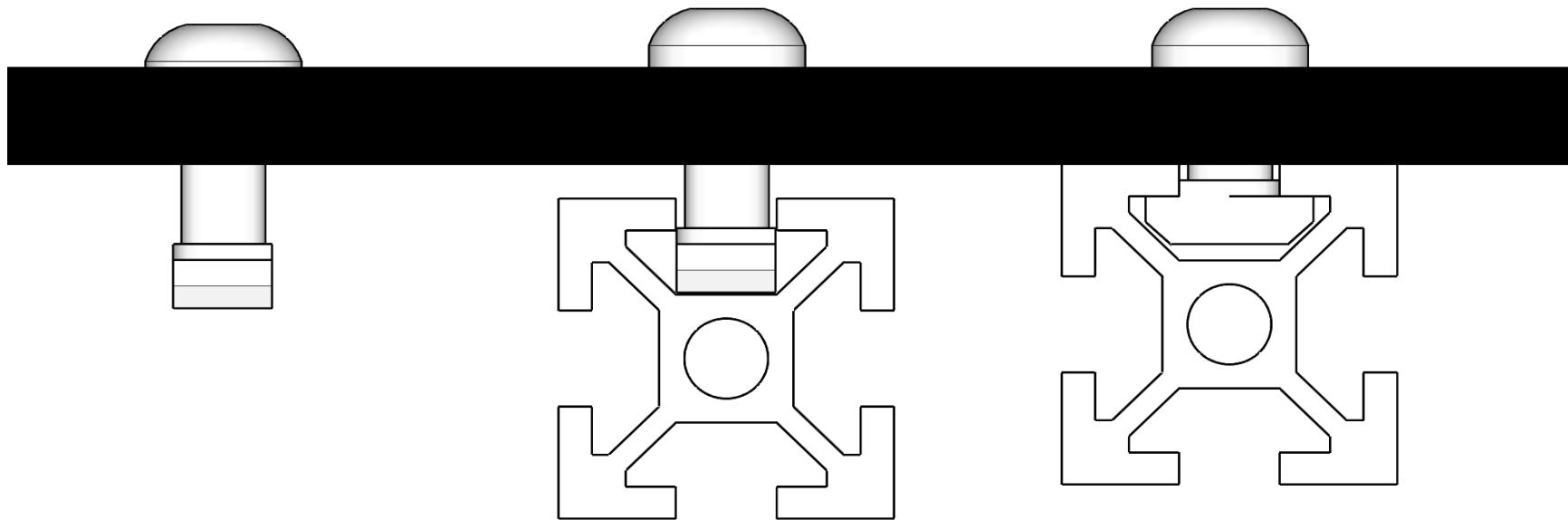
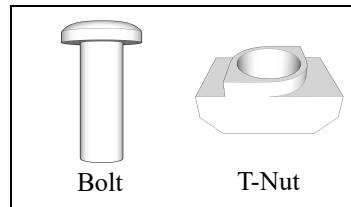
Please go through the ACM parts list above and the labels on the hardware packages to check your kit's contents.

If anything is missing or damaged, contact [Folger Tech](#) within (14) days of delivery for replacements.

Now let's get this kit built!

T-Nut Usage

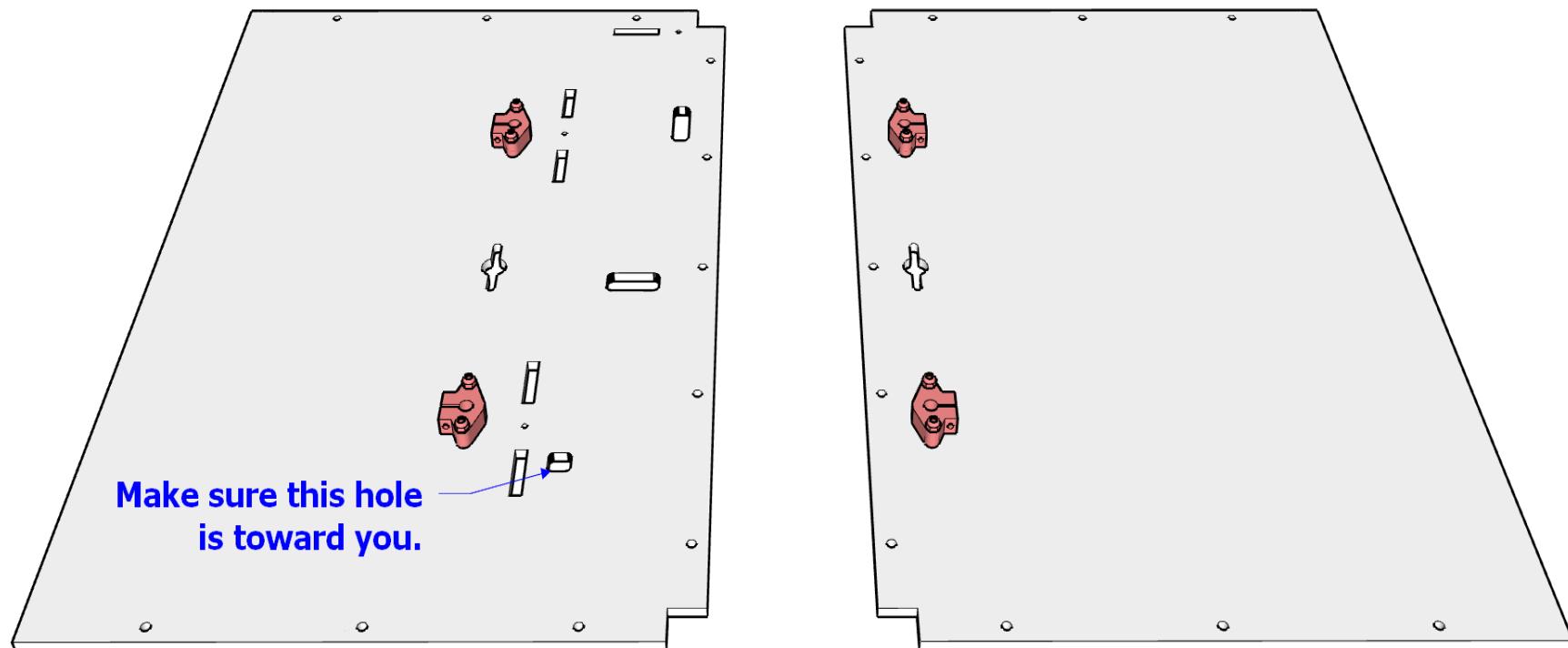
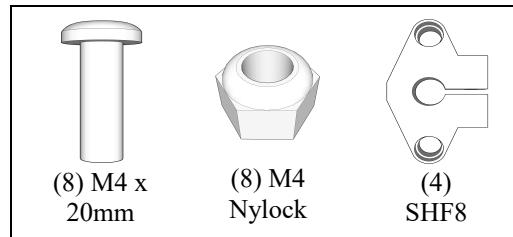
(example)



- 1) Insert the bolt through the hole in the panel then turn the t-nut on a few turns.
- 2) Insert the t-nut into the slot of the extrusion making sure it is centered.
- 3) Tighten down the bolt making sure the t-nut turns to lock into the slot.

Z Assembly

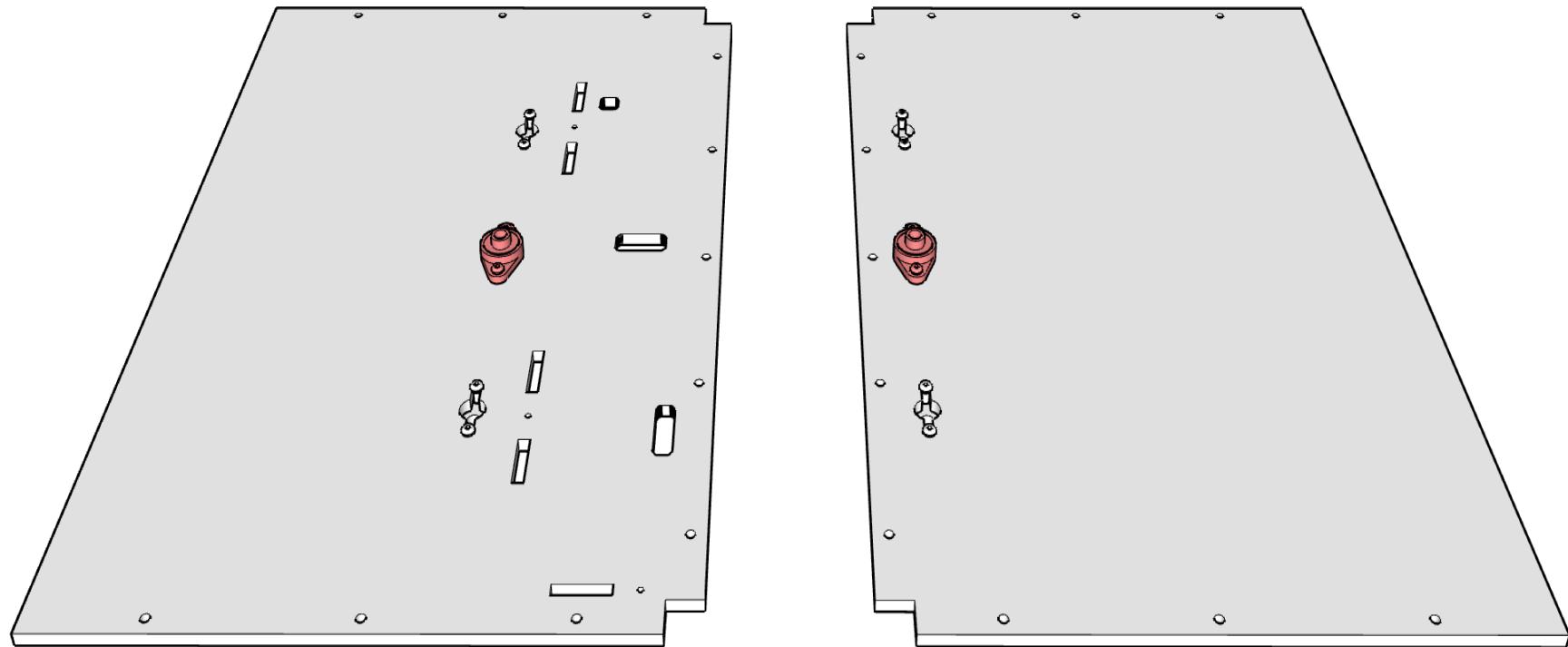
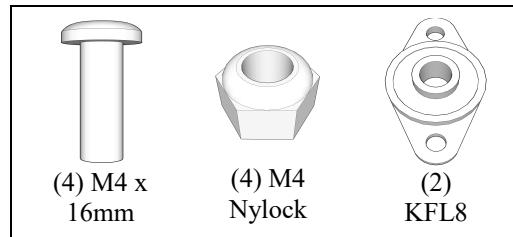
Step 1



Mount the (4) SHF8s to BFP-05 and BFP-07. The bolts go on the bottom with the nut on top.

Z Assembly

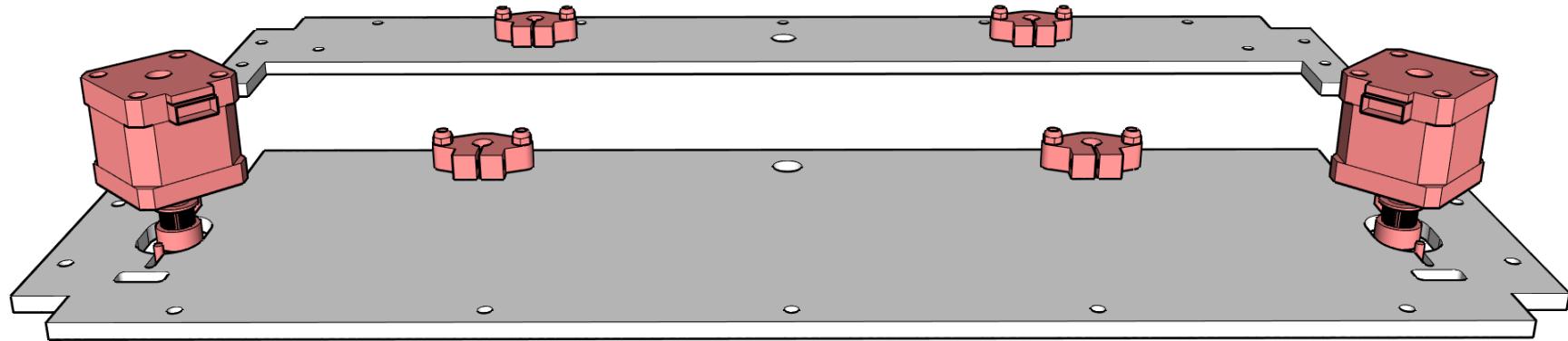
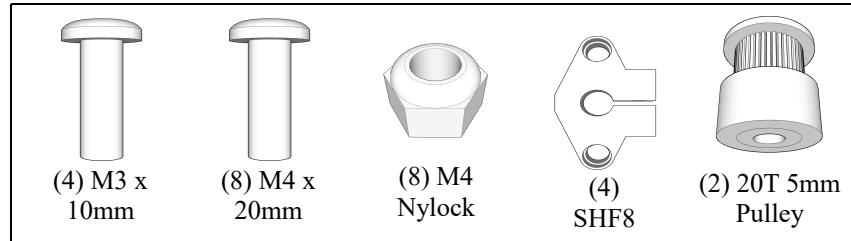
Step 2



Flip the panels over and mount the (2) KFL8s. The bolts go on the top. Make sure the center of the KFL8s swivel in the socket. You may need to add some oil and work them a bit.

Z Assembly

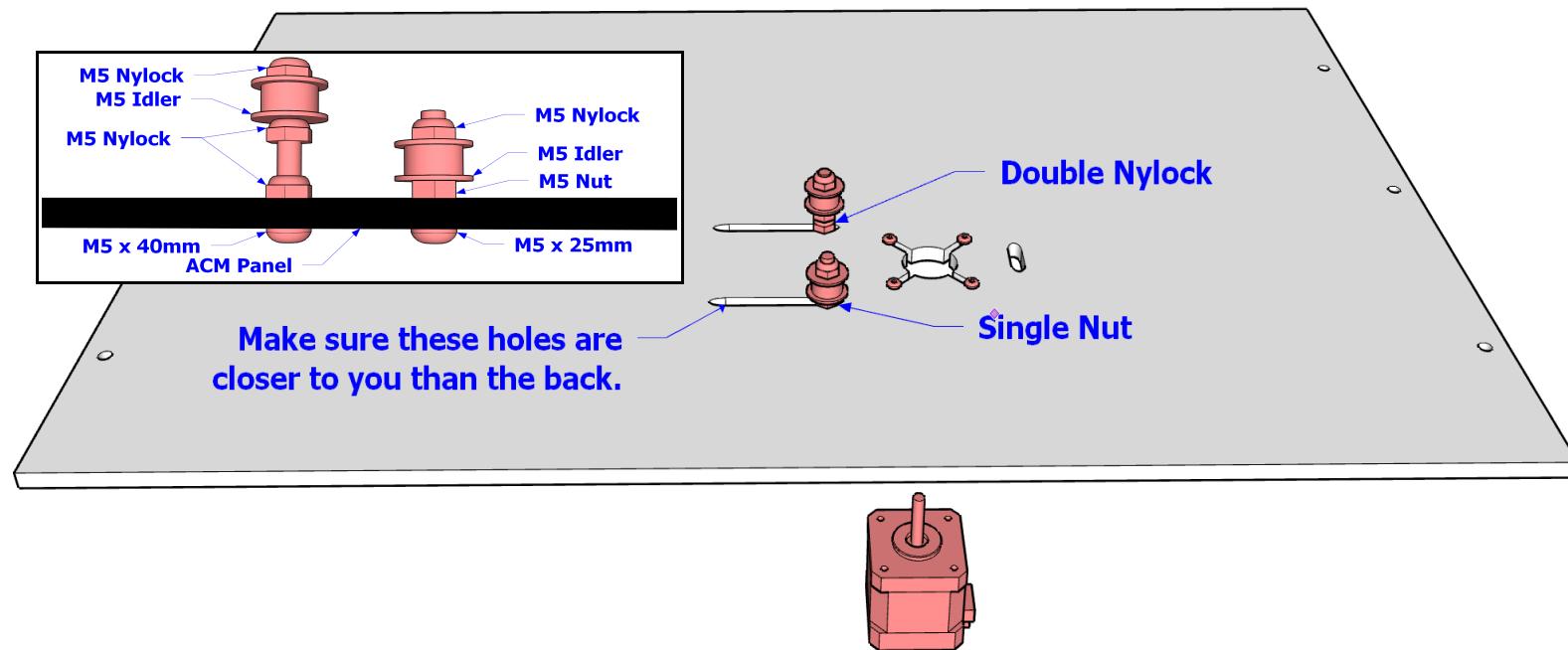
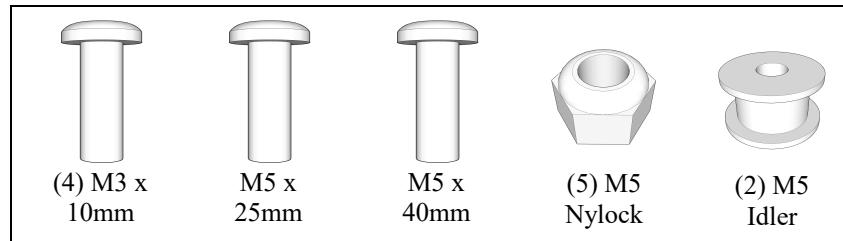
Step 3



Mount the (4) KFL8s to BFP-08 and BFP-09 using the M4 hardware. Mount a pulley upside-down to each stepper, flush with the end. Mount the steppers using the M3 hardware. All of the bolts go on the bottom. Make sure you face the stepper plugs the correct direction and slide the steppers away from you as oriented in the image above.

Z Assembly

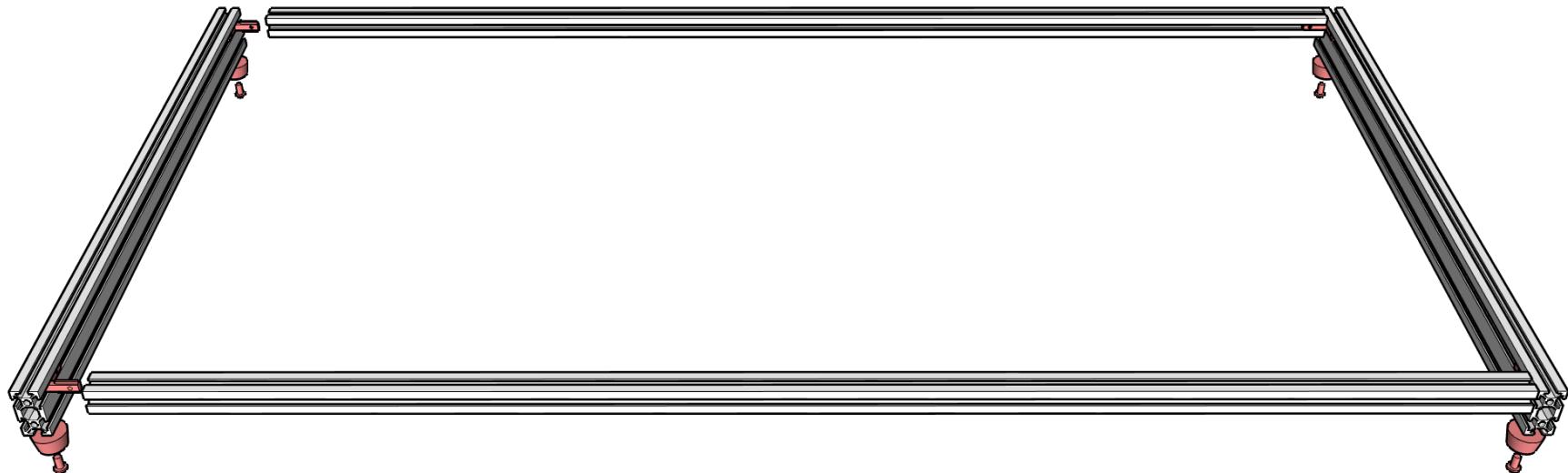
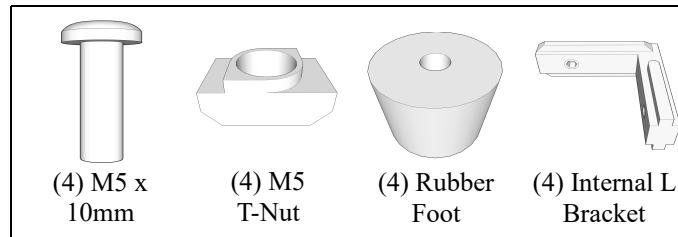
Step 4



Mount the stepper to BFP-06 using the M3 hardware. Assemble and mount the (2) idlers as shown using the M5 hardware. Make sure the idlers spin free.

Frame Assembly

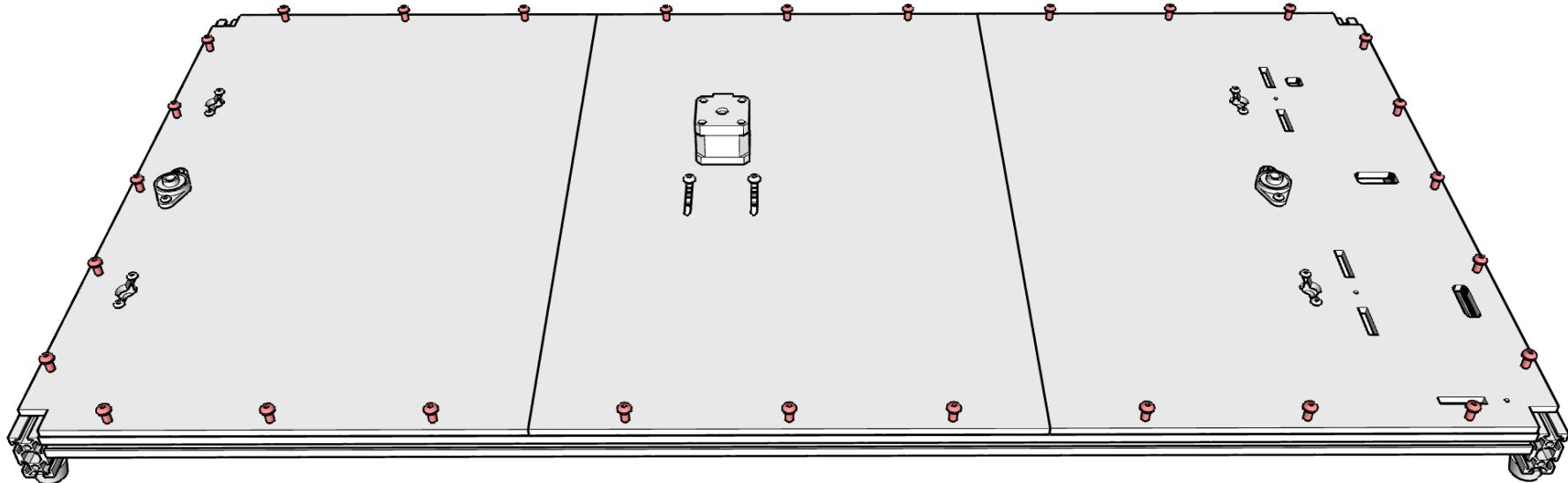
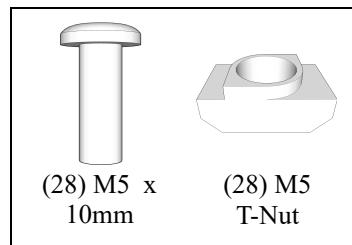
Step 1



Assemble the lower frame with (2) 1000mm 2020 and (2) 540mm 2040 using the internal L brackets and set screws. Mount (4) rubber feet using the M5 hardware. **Make sure the joins are square and flush.**

Frame Assembly

Step 2

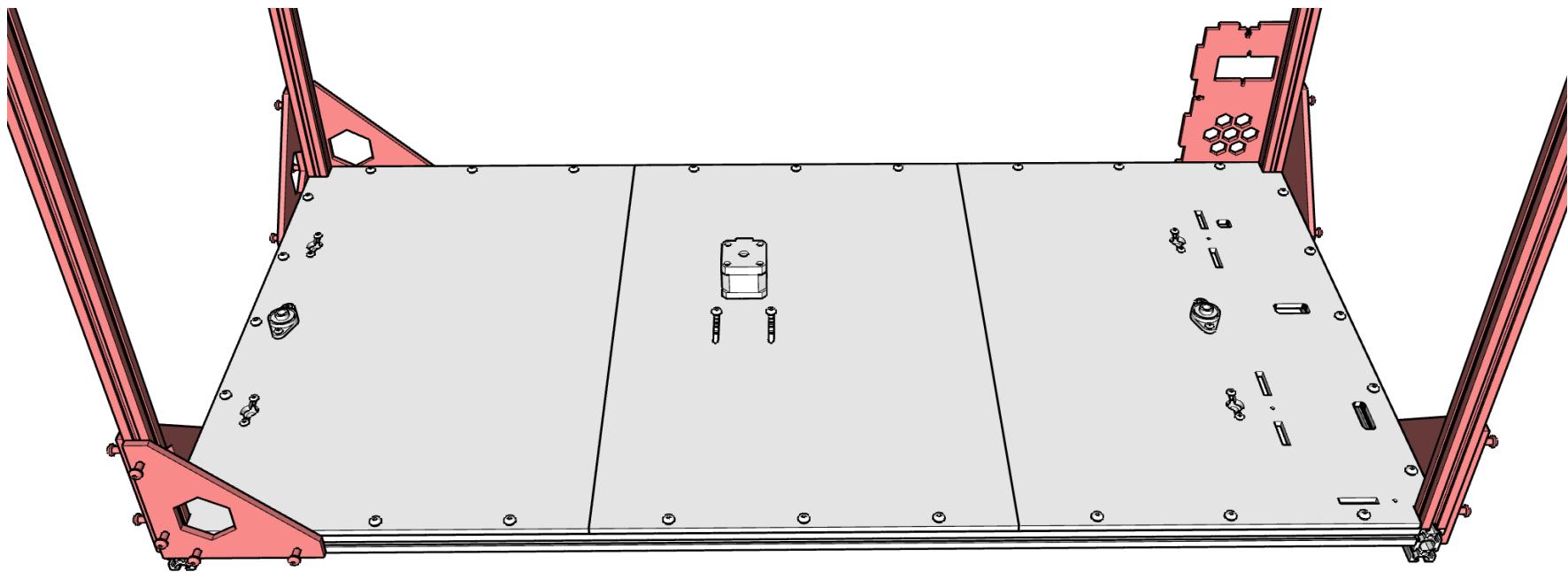
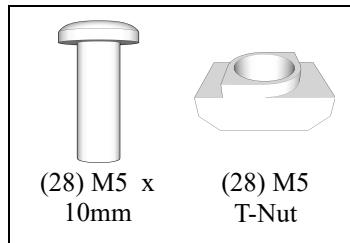


Mount the (3) lower panels using the M5 hardware. Make sure the orientation is correct.

The side facing toward you in this image is the front.

Frame Assembly

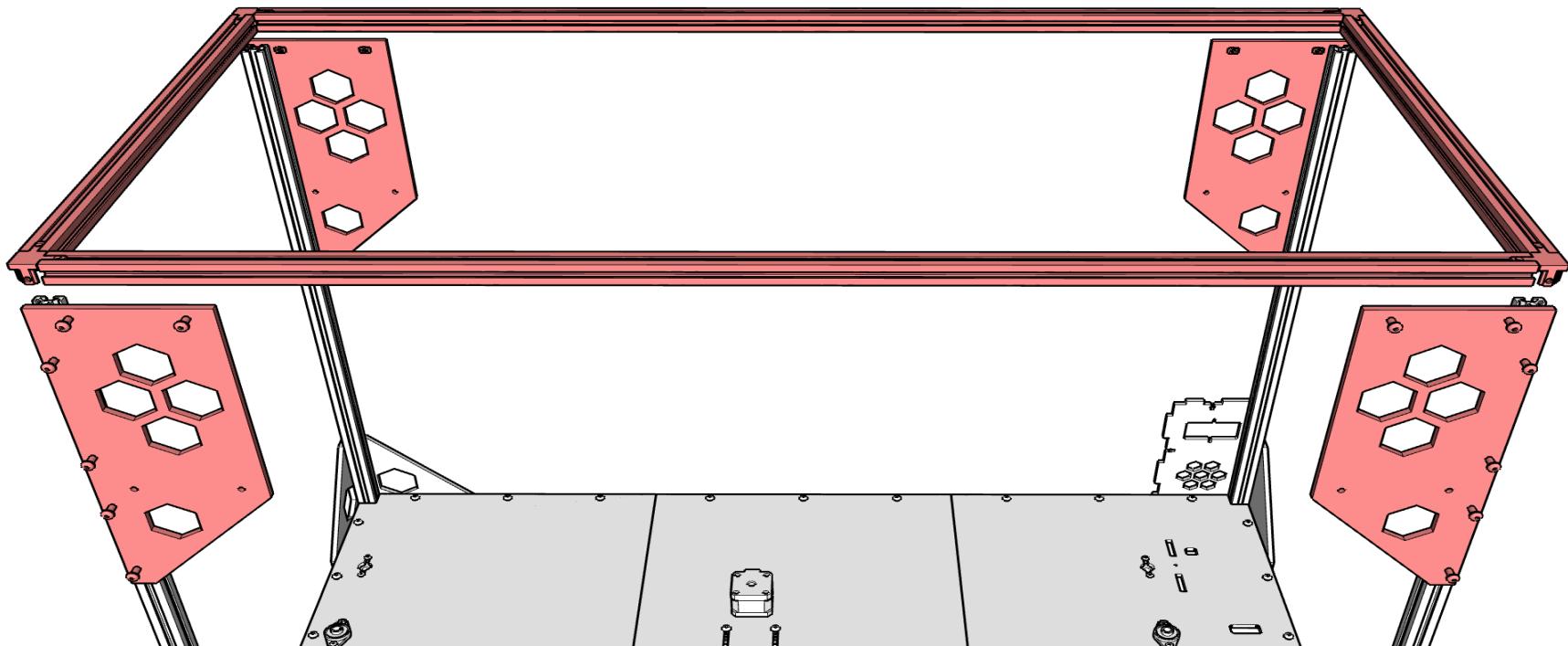
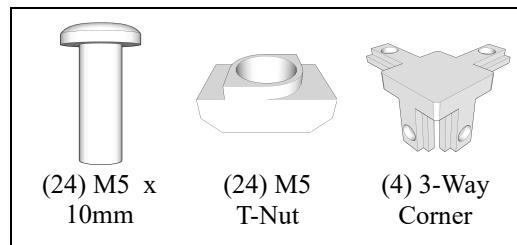
Step 3



Mount (2) 700mm 2020s on the left with BFP-01s. Mount (2) 700mm 2020s on the right with BFP-03, BFP-04, and BFP-12. Flip the brackets so that the points are facing upward. **Make sure the joins are square and flush against the lower frame.**

Frame Assembly

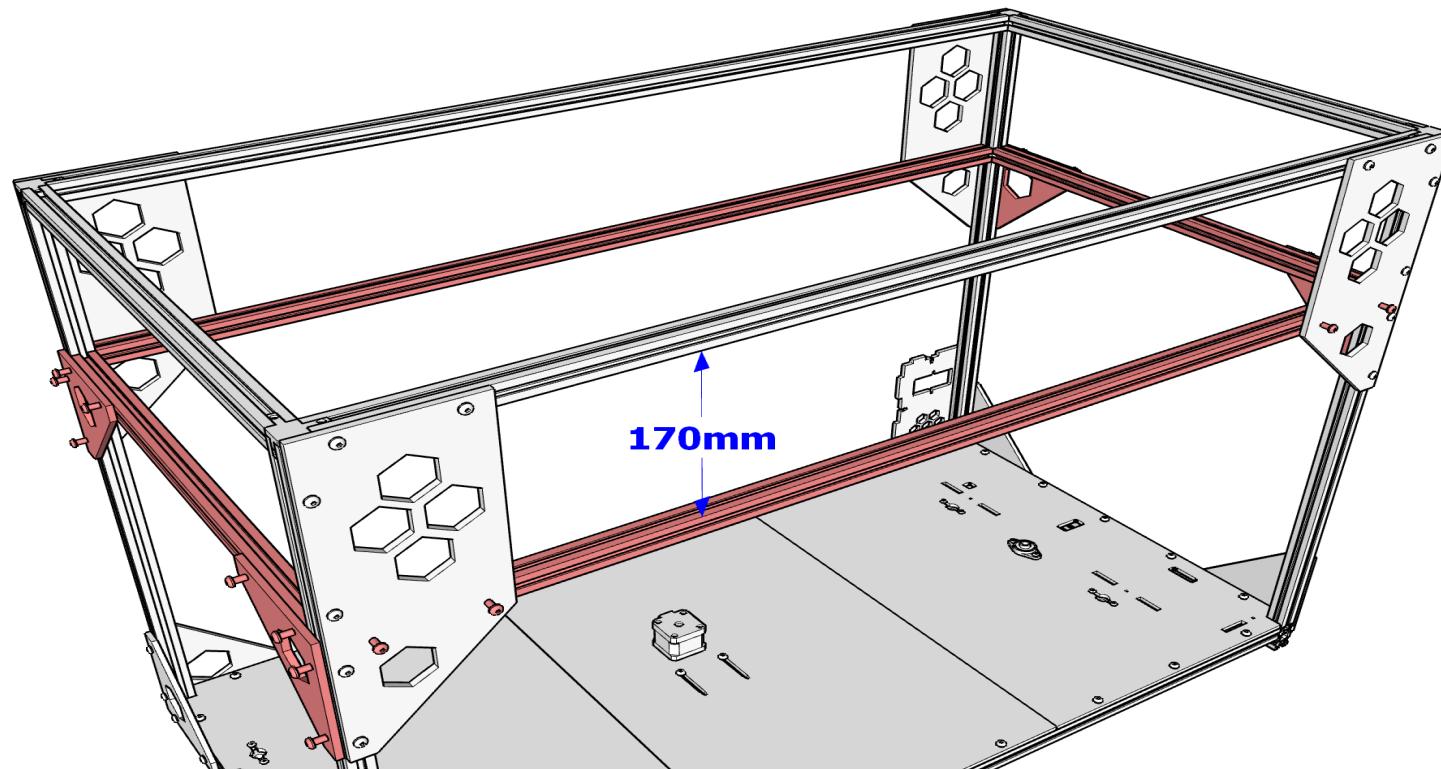
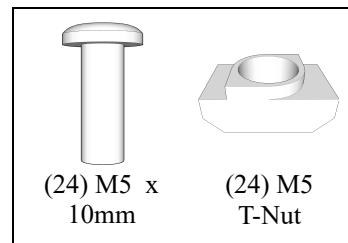
Step 4



Assemble the top frame with (2) 1000mm 2020 and (2) 500mm 2020 using (4) 3-way corners and set screws. Mount the top frame to the uprights using BFP-02s and M5 hardware. **Make sure the joins are square and flush.**

Frame Assembly

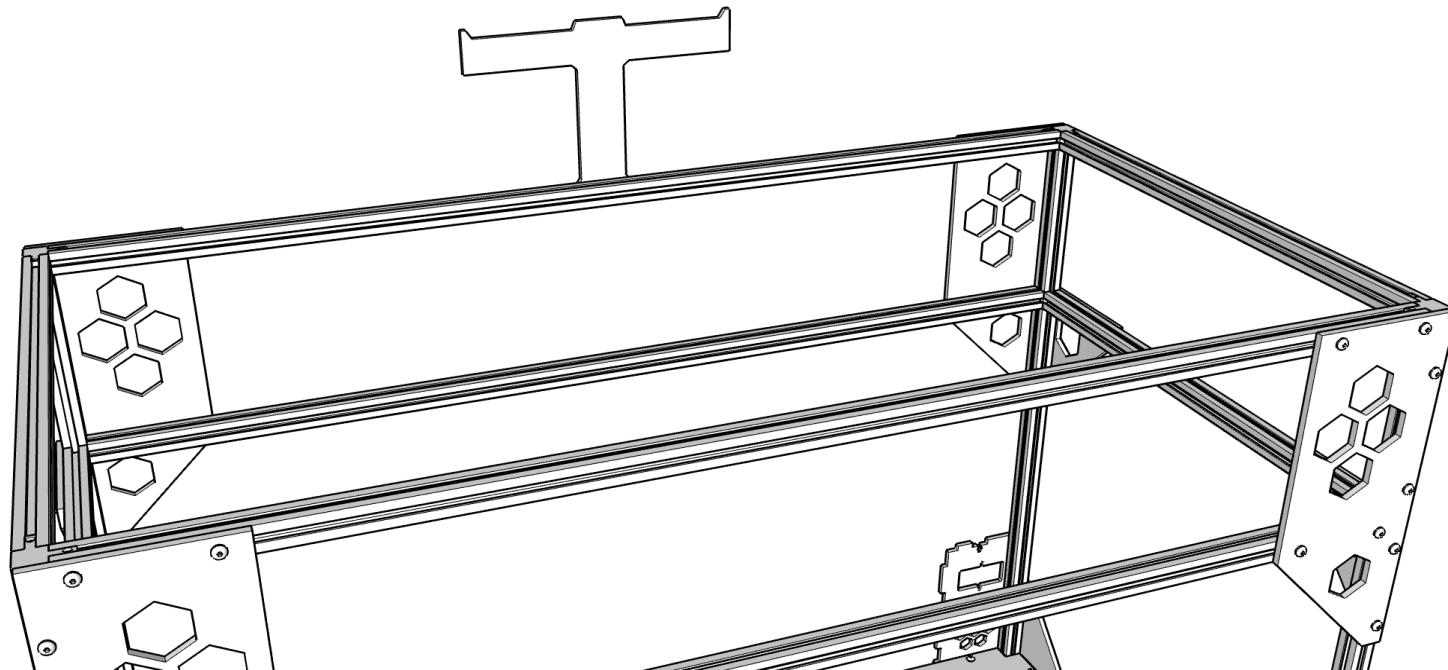
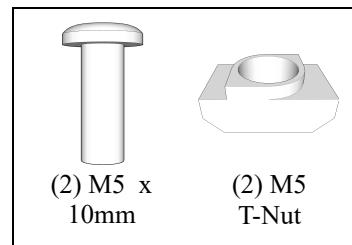
Step 5



Mount (2) 1000mm 2020 and (2) 500mm 2020 using BFP-02s and M5 hardware. **Verify the top 2020 to middle 2020 spacing is 170mm all the way around.**

Frame Assembly

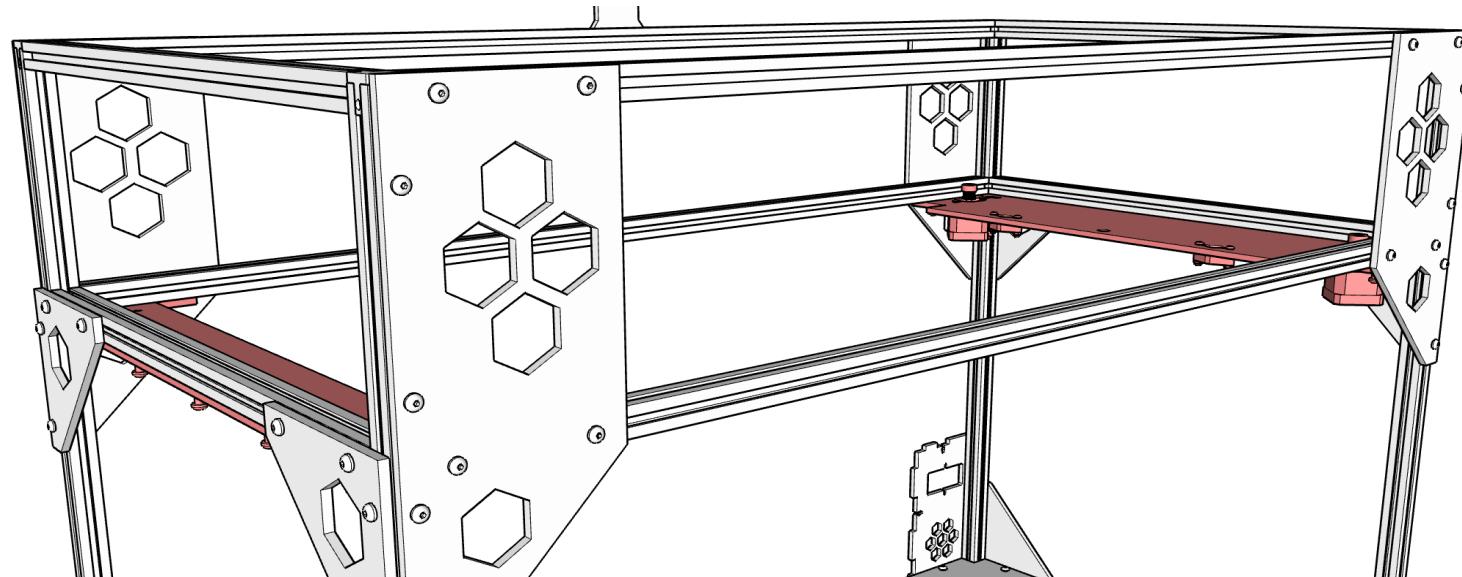
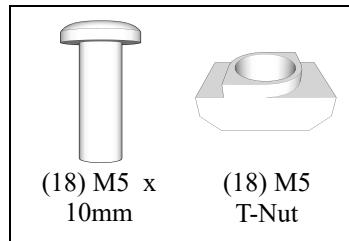
Step 6



Mount the spool holder (BFP-21) to the center rear of the frame. *Due to some customers having issues with it being in the way later on, you may want to instead mount it at the end of the build.*

X Assembly

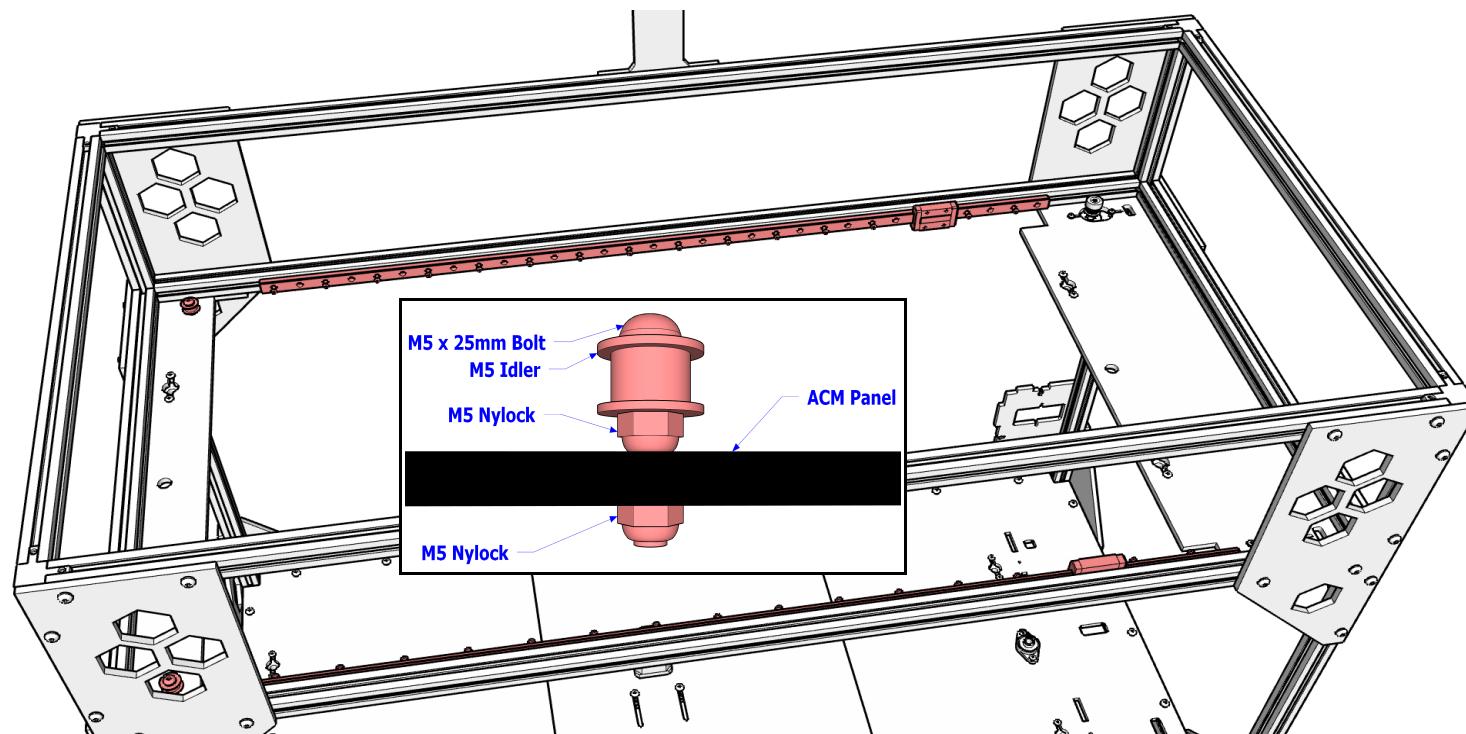
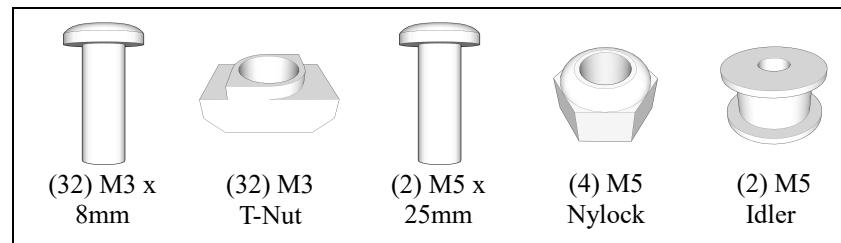
Step 1



Mount the assembled BFP-08 and BFP-09 to the underside of the middle 2020 using the M5 hardware.

X Assembly

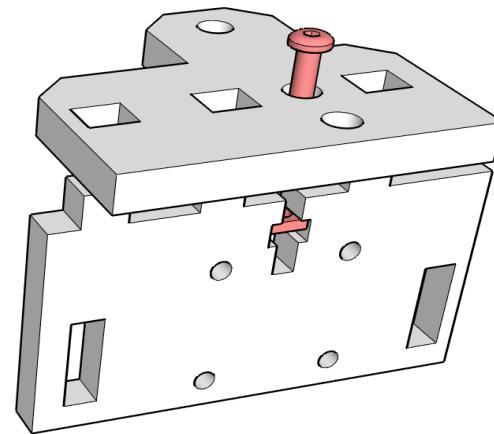
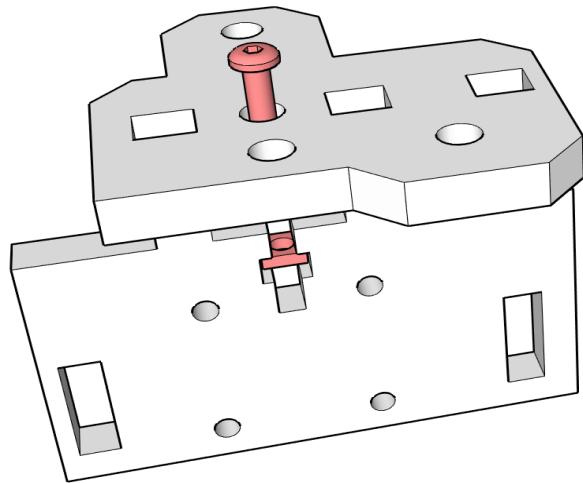
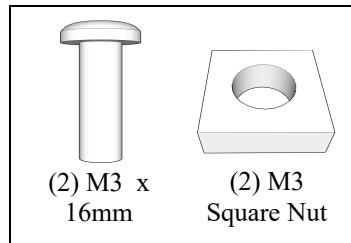
Step 2



Mount the (2) idlers using the M5 hardware. Make sure the idlers spin free. Mount the (2) 800mm linear rails centered between the upper plates using the M3 hardware in every other hole.

Y Assembly

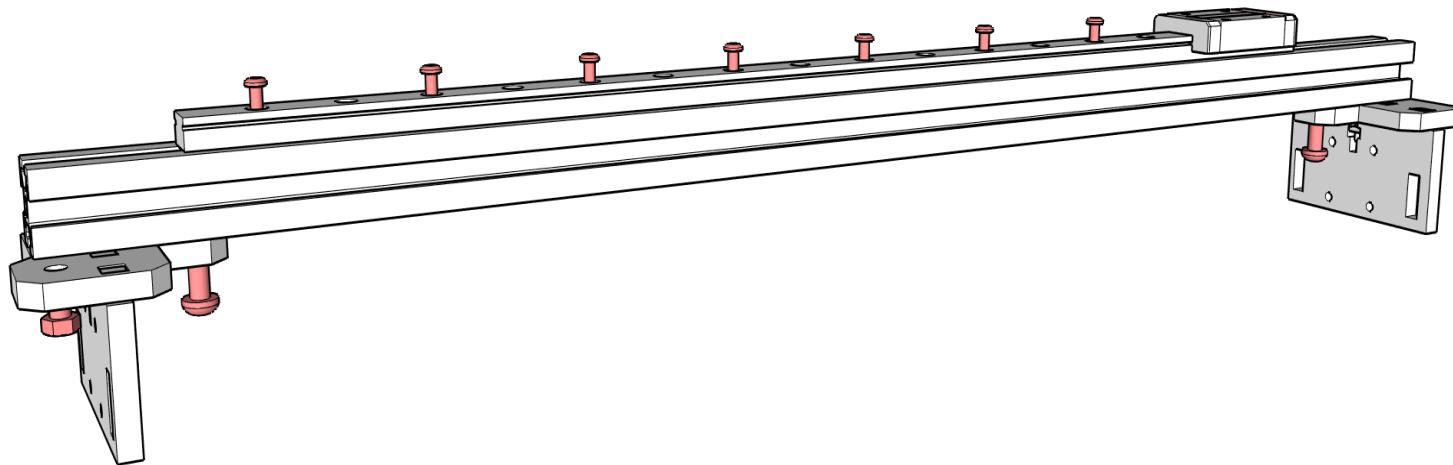
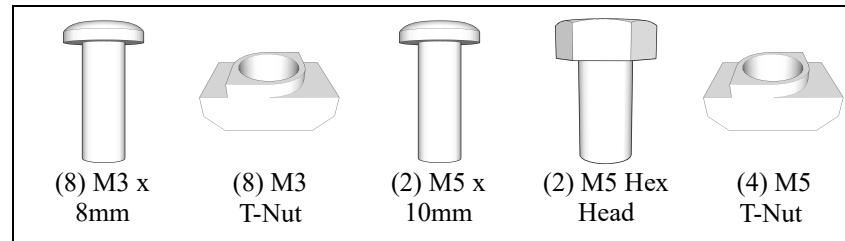
Step 1



Mount BFP-18 and BFP-19 to the (2) BFP-17s.

Y Assembly

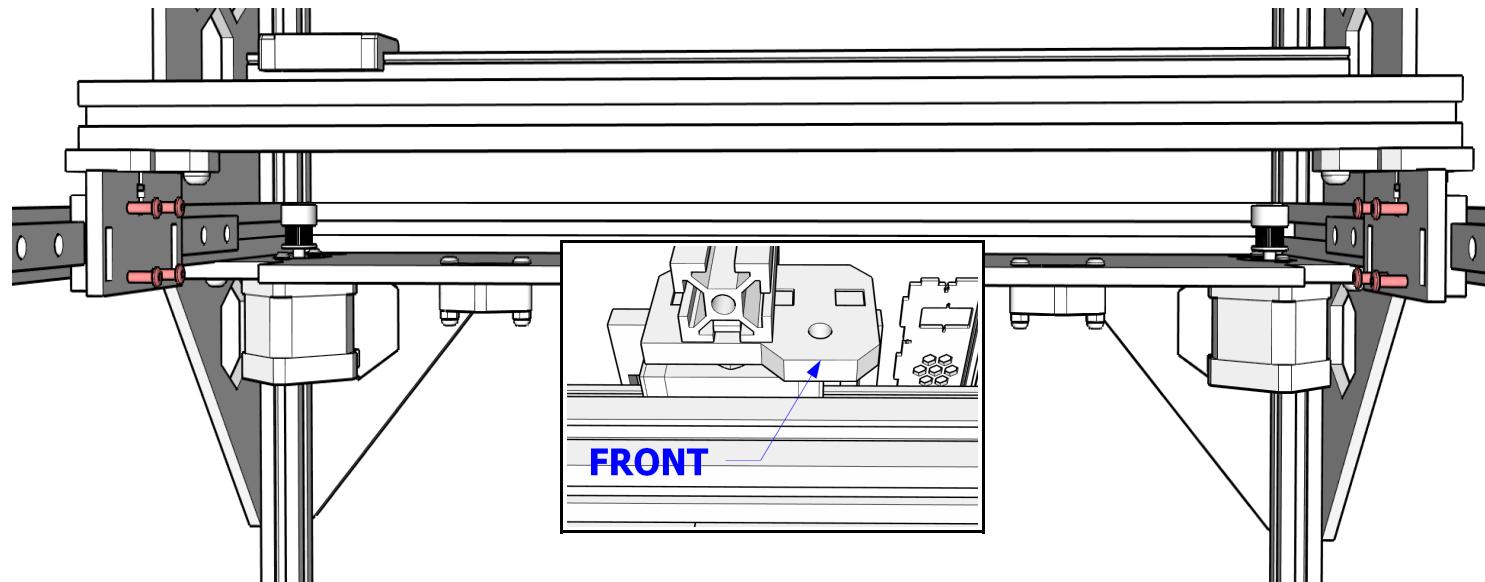
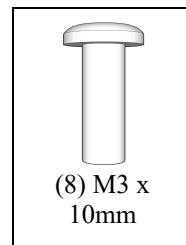
Step 2



Mount the assemblies from the last step to the ends of the 500mm 2020 using the M5 hardware. **Make sure the hex head bolts are on the ends.** Mount the 400mm linear rail 50mm from either end of the 2020 using the M3 hardware in every other hole.

Y Assembly

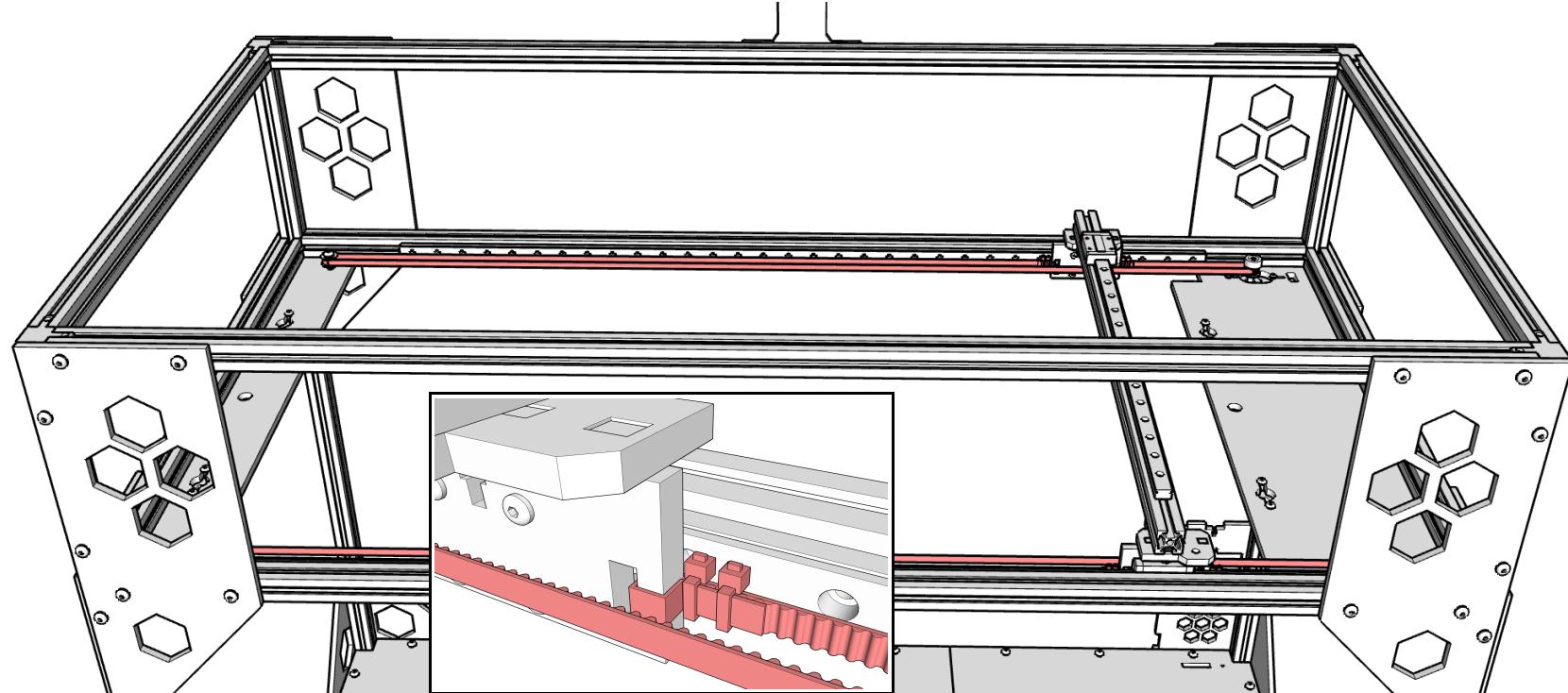
Step 3



Mount the part we assembled in the last step to the blocks on the linear rails using the M3 hardware. Adjust to sit flush on the blocks with no tension. **Make sure BFP-19 is on the front end.**

Y Assembly

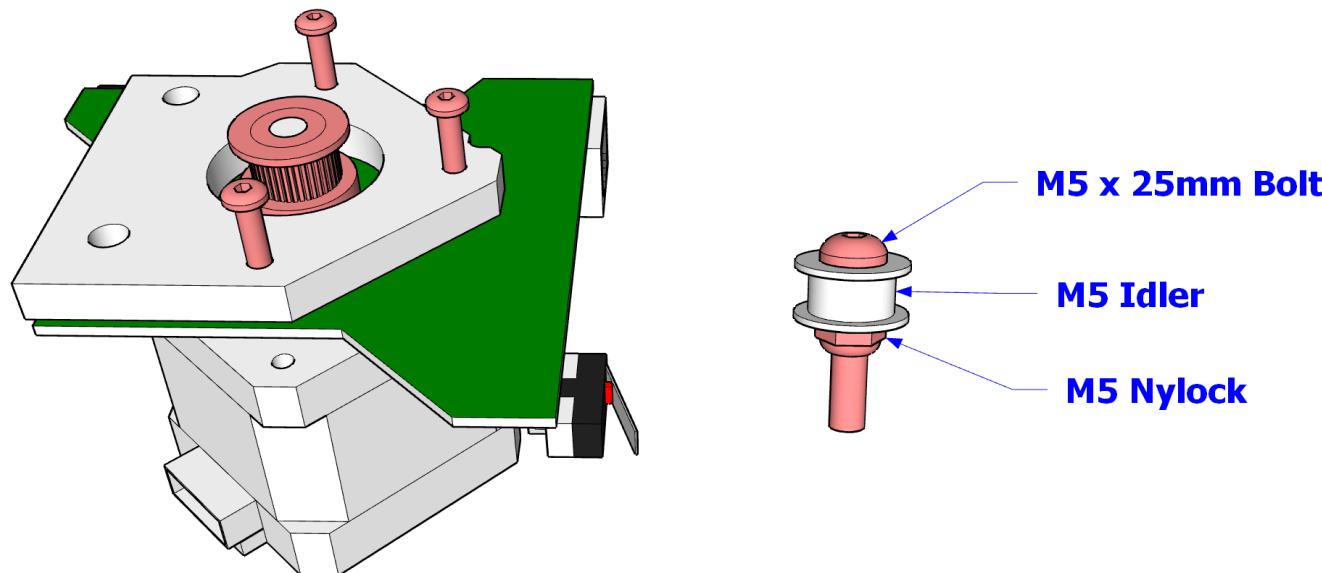
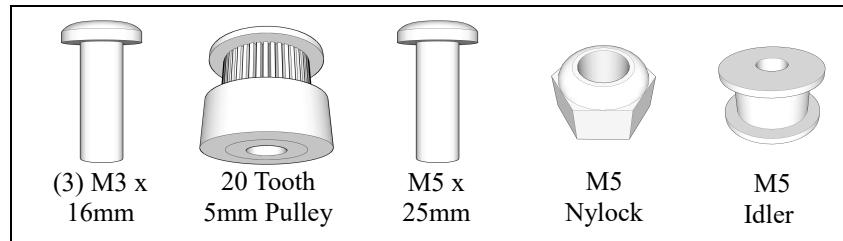
Step 4



Install the X belts with the teeth against the pulleys. Trim and secure to the tabs with cable ties as shown. Tighten them by adjusting the steppers.

Y Assembly

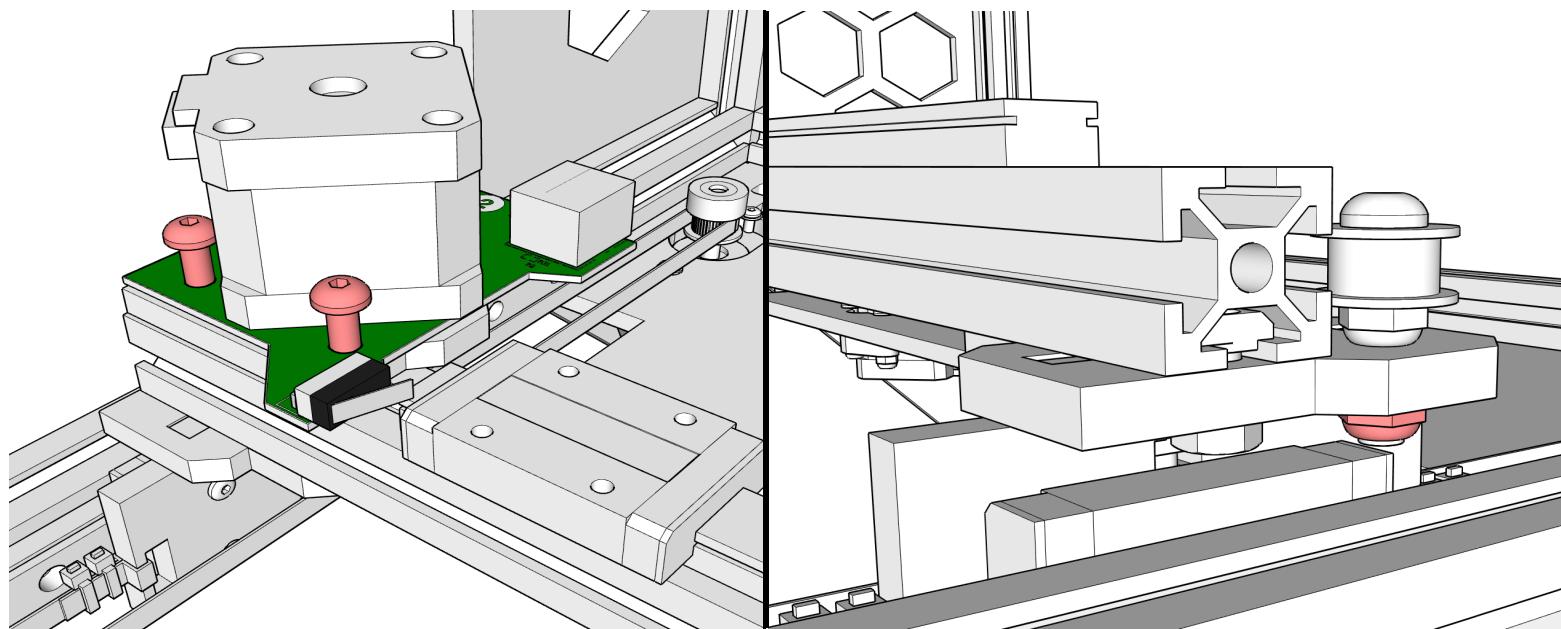
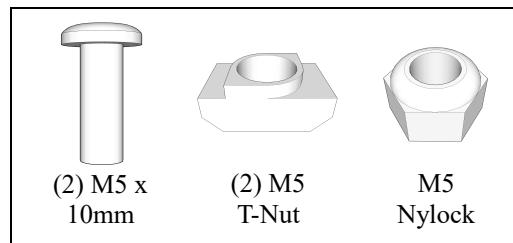
Step 5



Mount the pulley to the stepper flush with the end. Stack BFP-20 on top of the gantry board and mount to the stepper using the M3 hardware. Assemble the Y idler using the M5 hardware.

Y Assembly

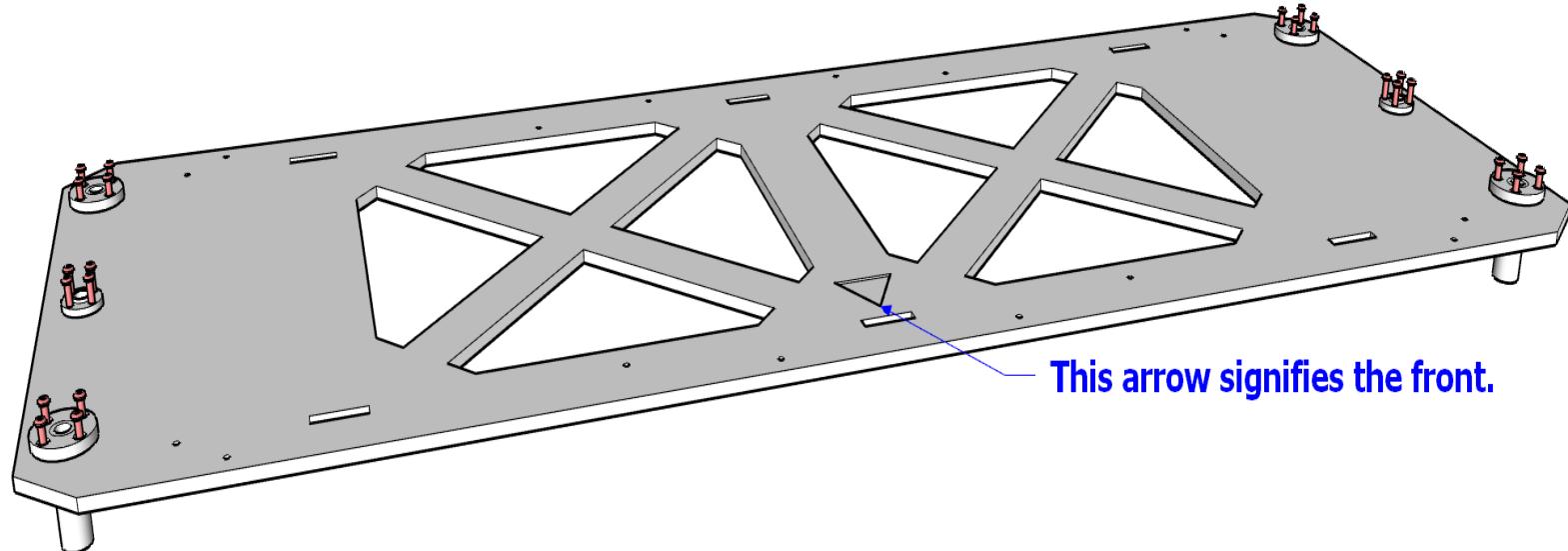
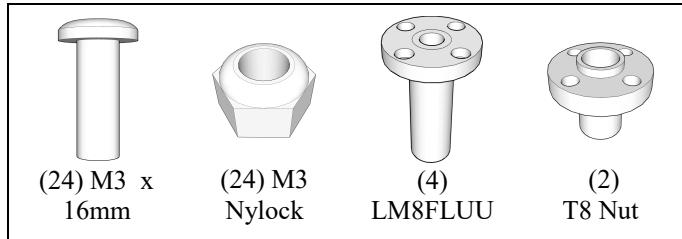
Step 6



Mount the Y stepper assembly to the rear end of the gantry using M5 hardware. Mount the Y idler to the hole in BFP-19 using the M5 nylock.

Bed Assembly

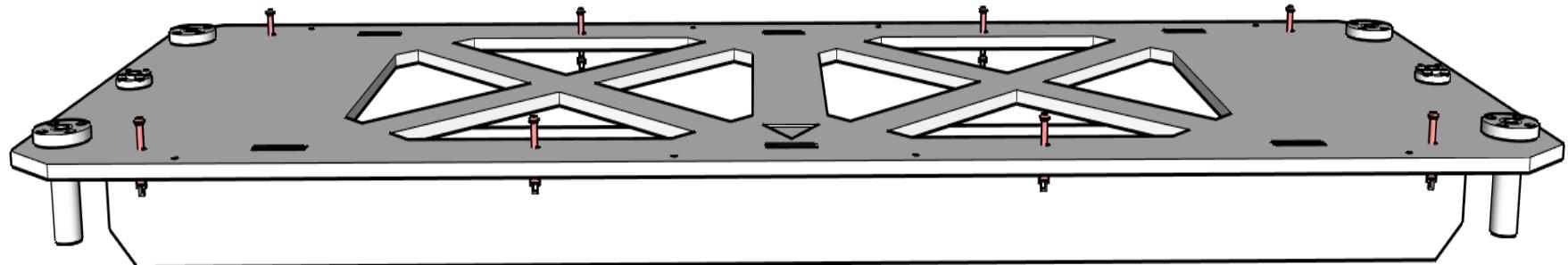
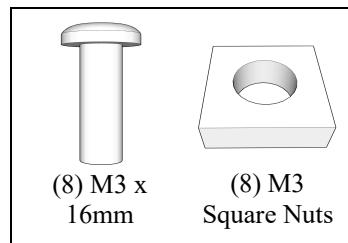
Step 1



Mount the (4) LM8FLUUs through the corners of BFP-10. Mount the T8 nuts through the middle holes.
Make sure the arrow is facing you and on top.

Bed Assembly

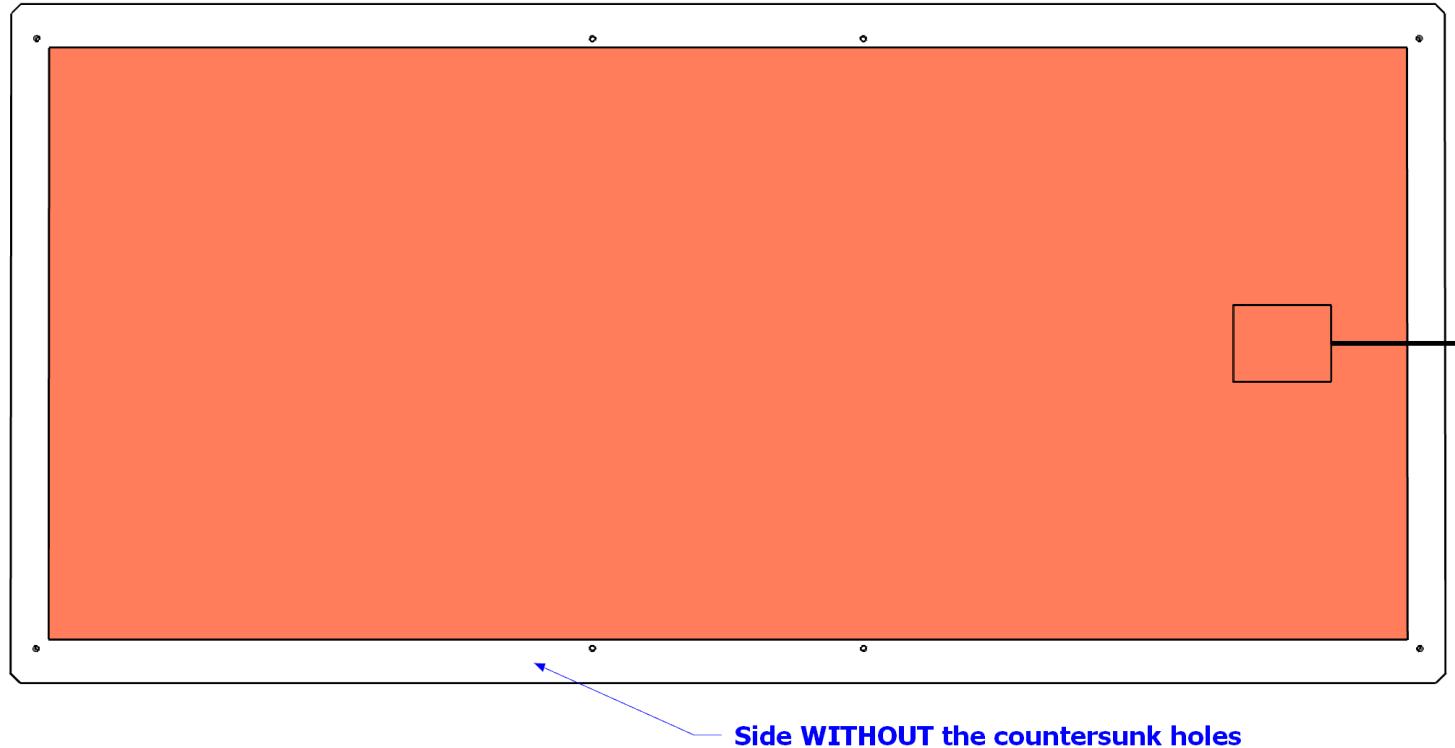
Step 2



Mount the BFP-11s to BFP-10 using the M3 hardware.

Bed Assembly

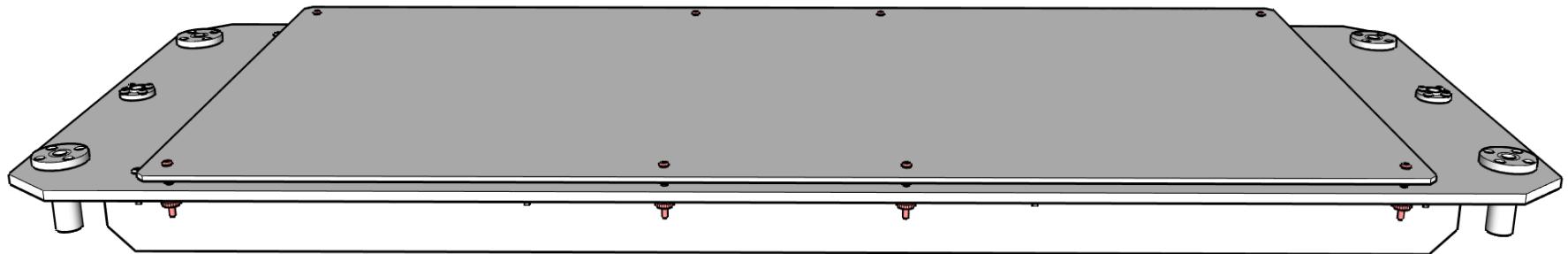
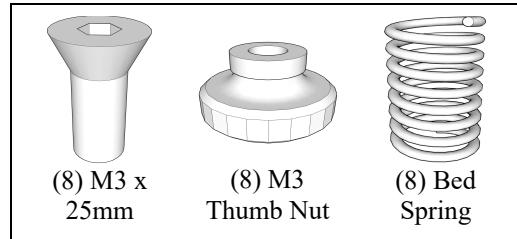
Step 3



Lay the bed plate on the work surface with the **countersunk holes FACED DOWN**. Peel the protective film from the bed heater and apply it to the bed plate as centered as possible. Avoid getting too close to the holes in the bed plate.

Bed Assembly

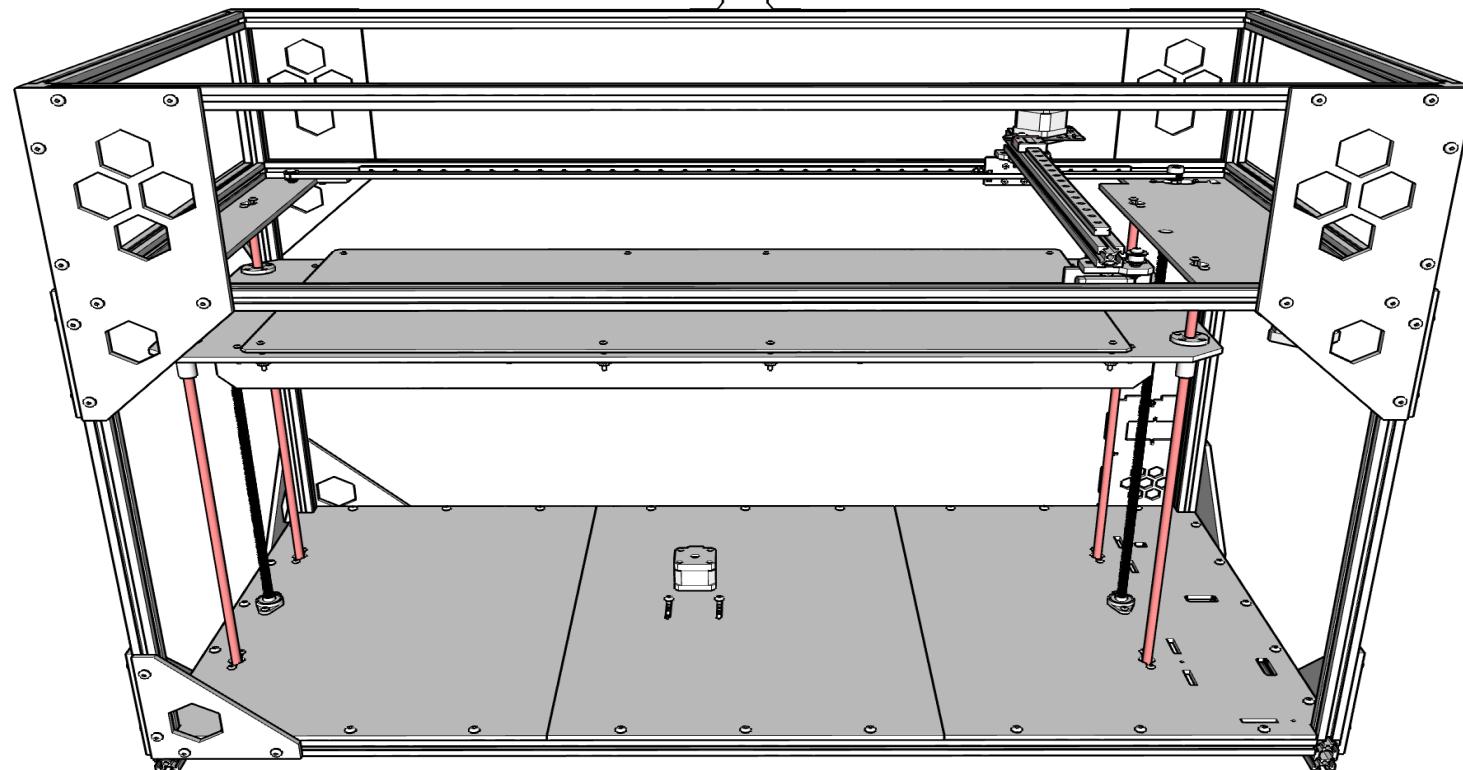
Step 4



Mount the bed to BFP-10 using the M3 hardware and bed springs. **Make sure the bed heater wires are on the right.**

Bed Assembly

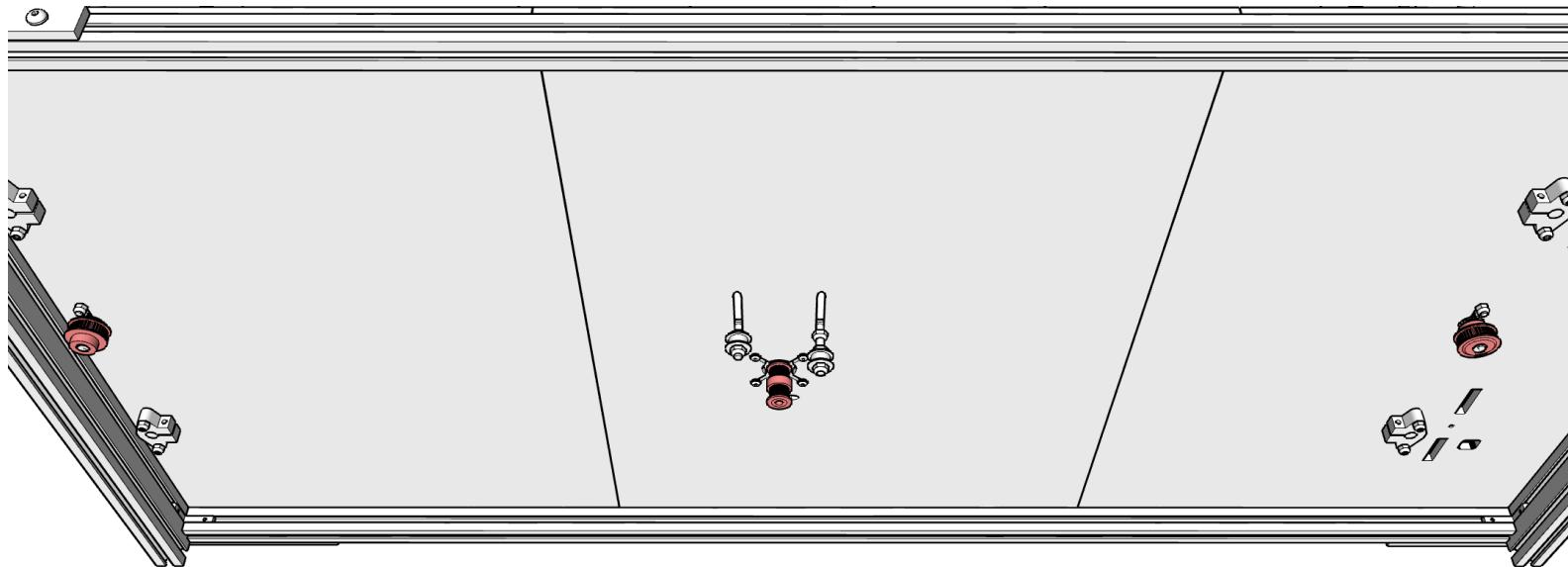
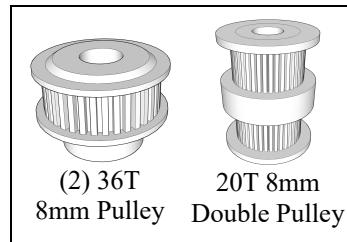
Step 5



Mount the bed assembly to the printer by sliding (4) 500mm PCRs into the corners and thread (2) M8 lead screws into the middle. Tighten the SHF8s to hold the PCRs in place. Tighten the set screws on the KFL8s to hold the lead screws in place.

Bed Assembly

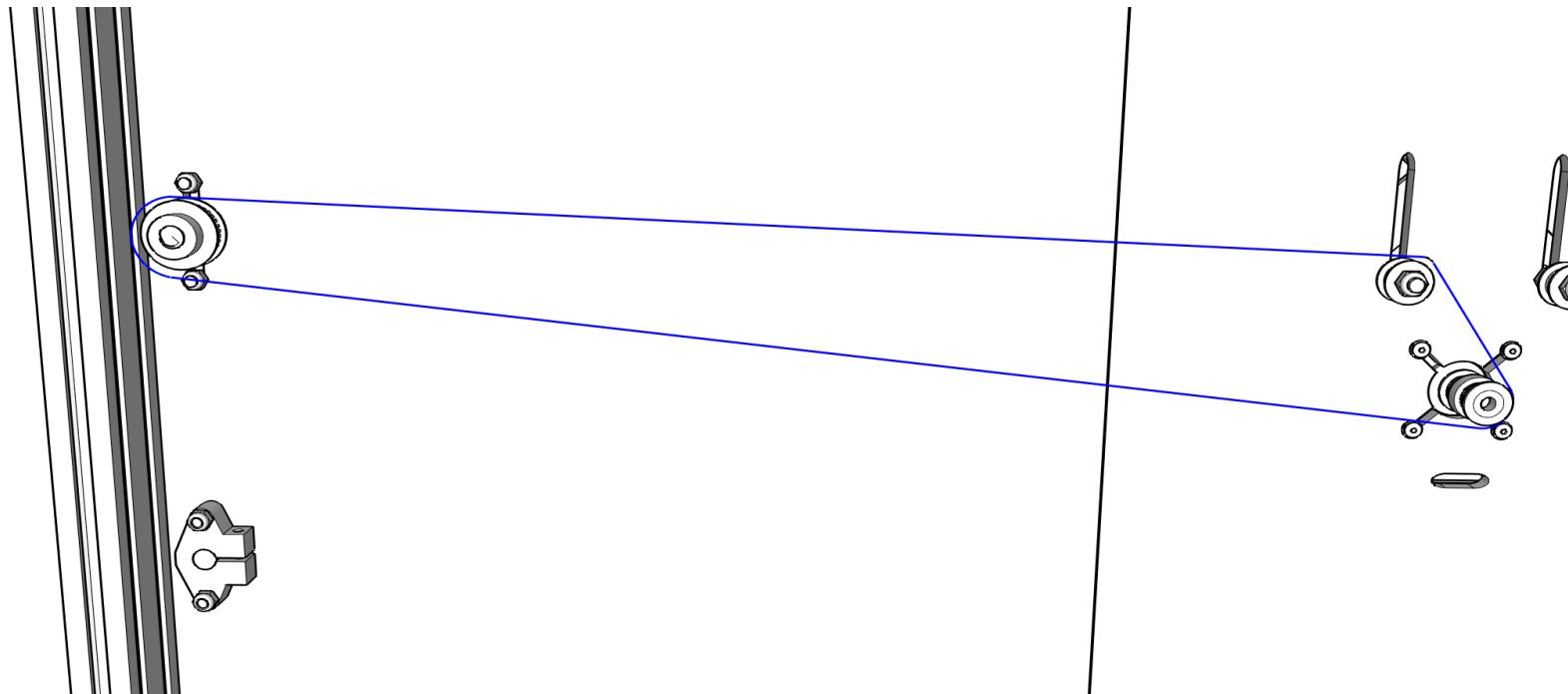
Step 6



Flip the printer onto it's back or prop it up and mount the pulleys as shown. **Make sure the left one is upside-down.** You may need to adjust the T8 lead screws.

Bed Assembly

Step 7



Route a belt loop as shown. Tighten by moving the idler. Repeat for other side. Adjust pulleys as needed.

Bed Assembly

Alignment

- 1) Make sure all joins are flush and square. Adjust if necessary.
- 2) Make sure the gantry slides left to right and is square with the frame. Adjust the M5 hardware in *Y Assembly – Step 2* if necessary. The hex heads were used to provide access to the bolts once assembled.
- 3) Make sure the PCRs are square with the lower plate. Move the bed up and down. If any binding is found, adjust the SHF8s installed in *Z Assembly – Step 1* and *Z Assembly – Step 3*.
- 4) Make sure all joins are still flush and square. If adjustment is needed, repeat steps 2 and 3 after making the adjustments.

The following sections are divided by kit options.

Choose the sections depending on the options in your kit.

No Extruder

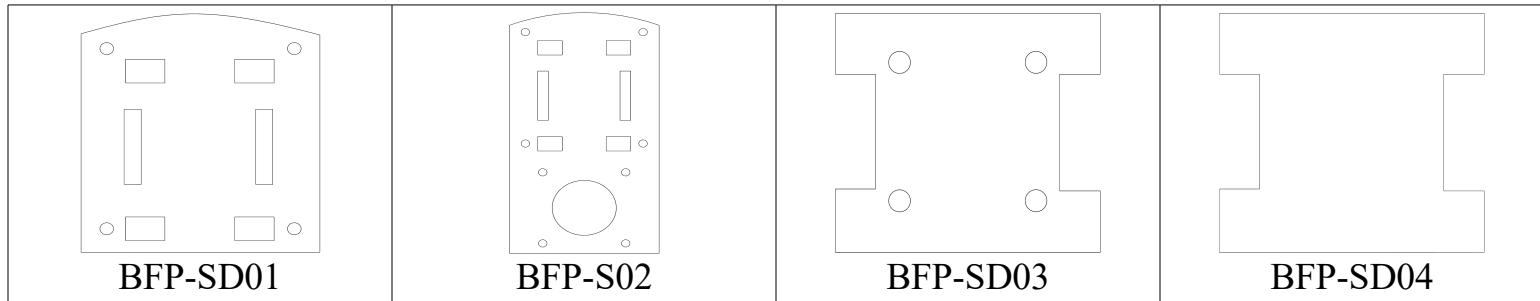
We have included parts to assist you in installing your own extruder(s) and hotend(s). Use the following sections as a guide as to how these parts go together.

We do not provide support for installing these end user provided parts.

Single Extruder

For dual extruder, skip to the next section.

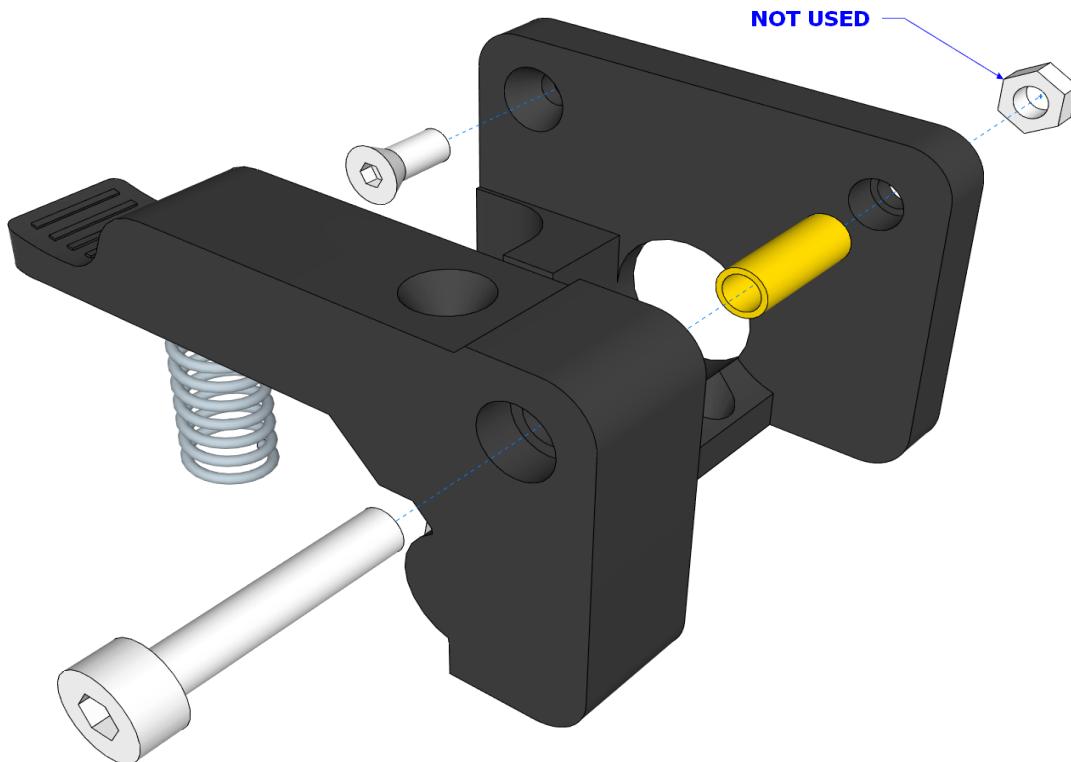
Additional ACM parts used in this section:



Extruder

Single Extruder

Step 1

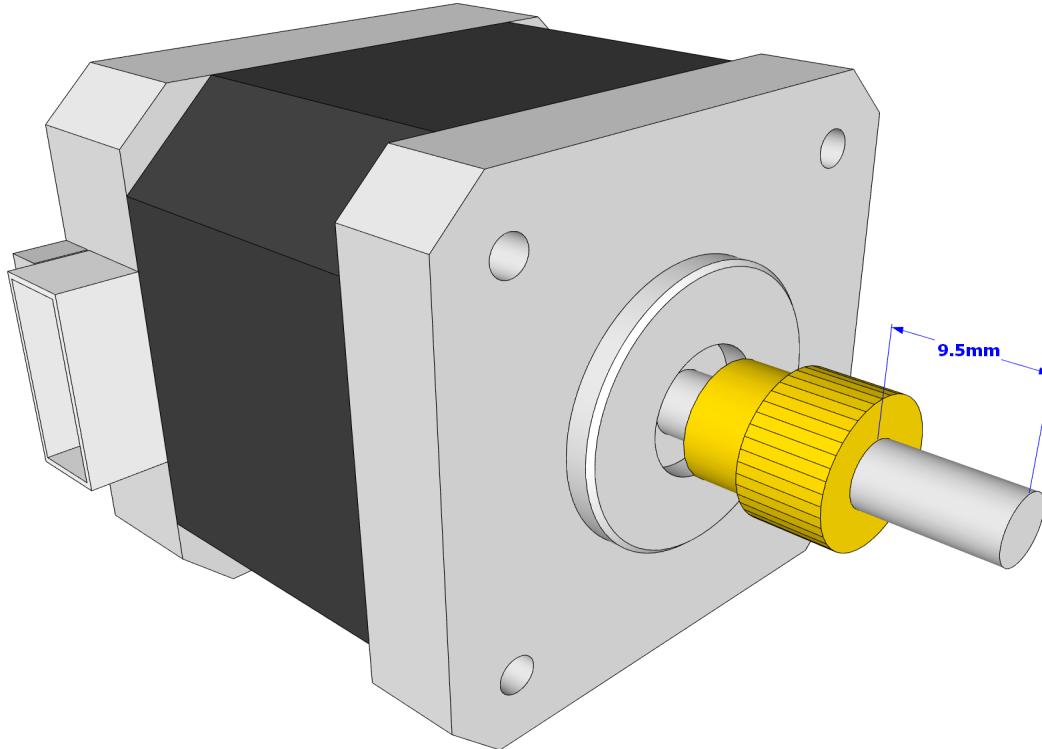


Disassemble the MK9 extruder as shown. Set the drive gear to the side for the next step. The M3 nut on the back is for shipping and will not be used.

Extruder

Single Extruder

Step 2

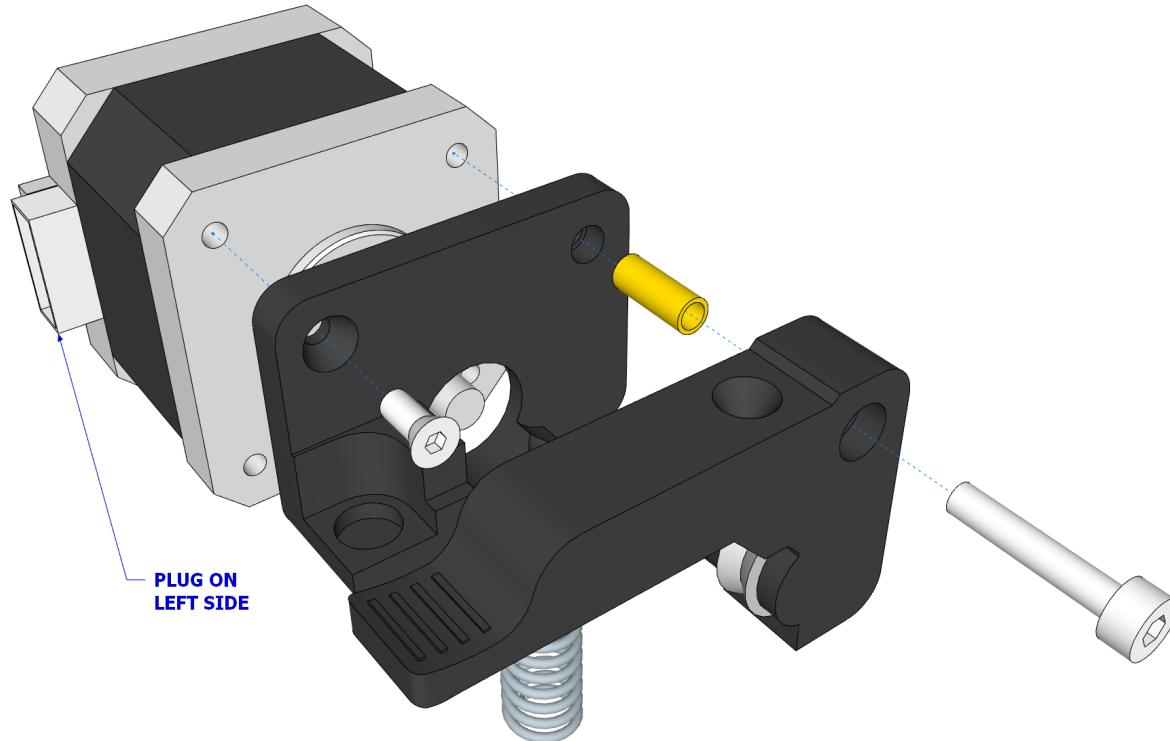


Slide the drive gear from the last step onto the shaft of a stepper. Locate it 9.5mm from the end of the shaft and tighten the set screw against the flat face of the shaft.

Extruder

Single Extruder

Step 3

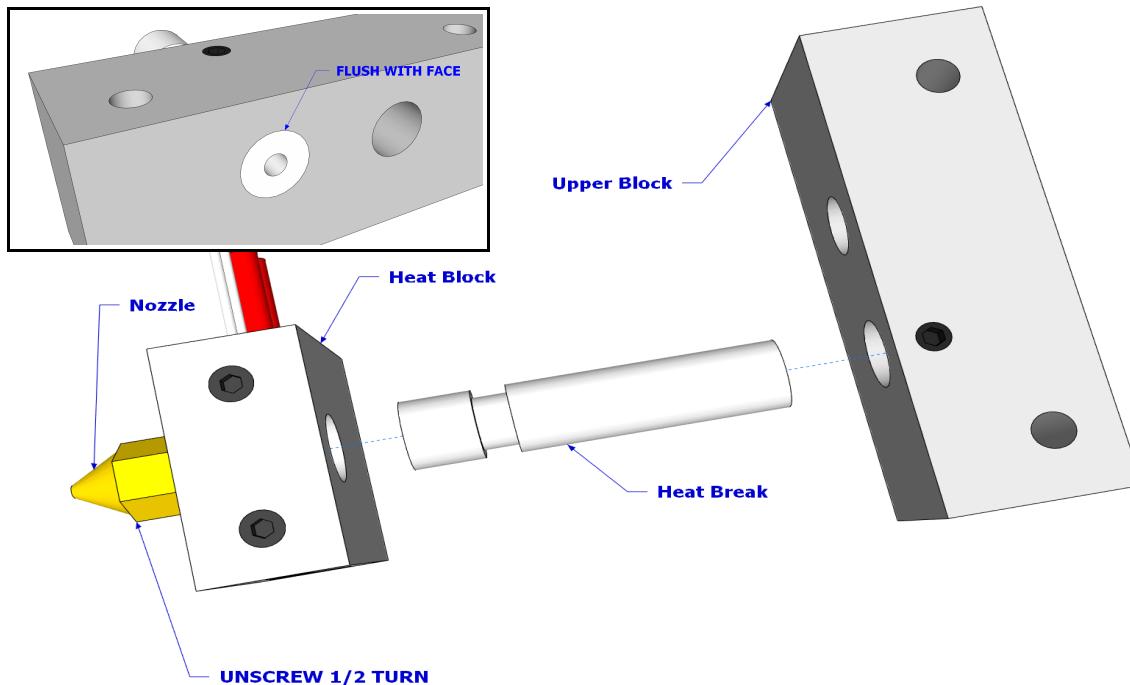


With the plug of the stepper on the left side, re-assemble the MK9 extruder onto the stepper.

Extruder

Single Extruder

Step 4

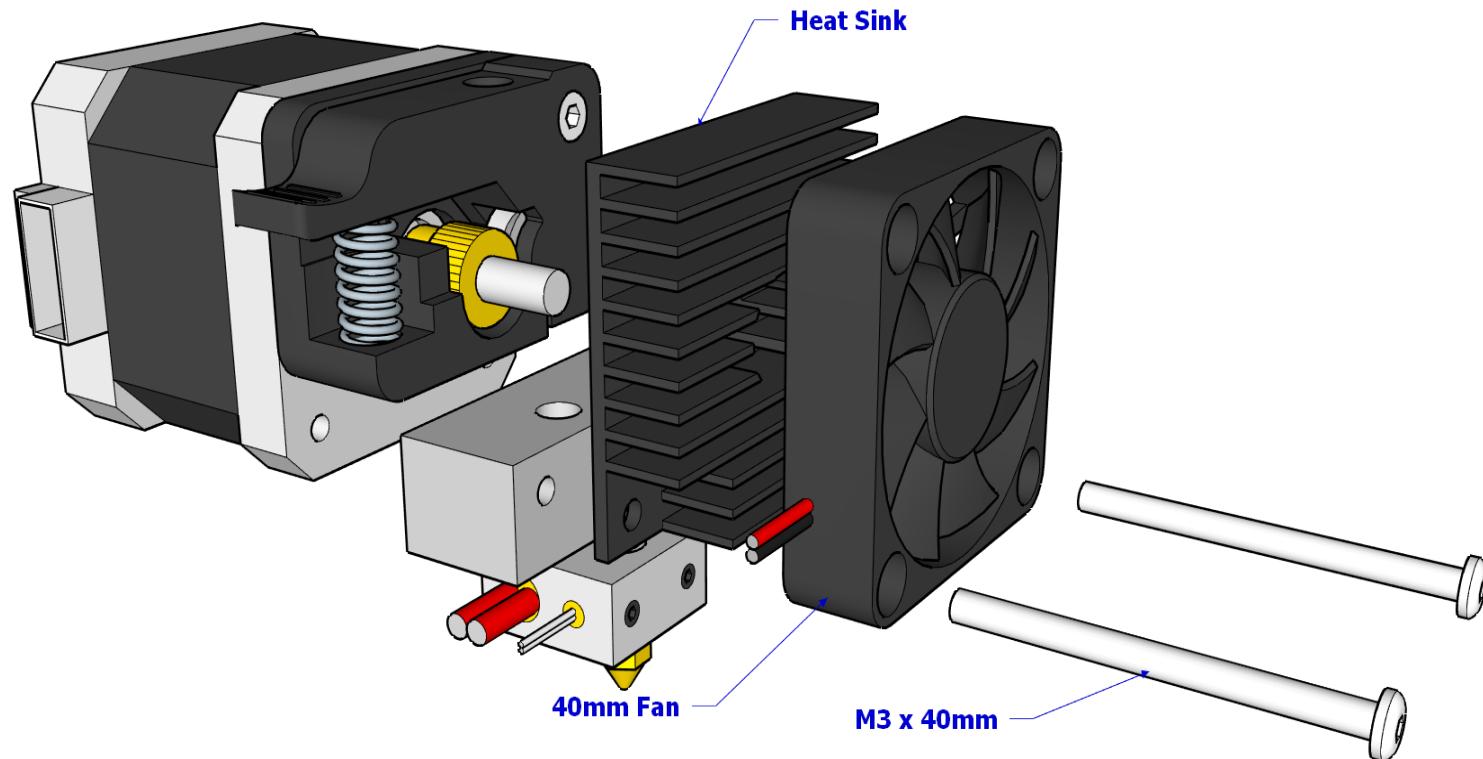
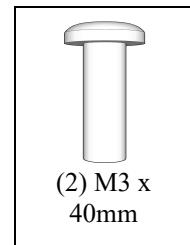


Make sure the nozzle is screwed all the way into the heat block then unscrew $\frac{1}{2}$ a turn. Thread the heat break into the heat block until tight. Holding the heat block, tighten the nozzle. Paying attention to the orientation of the holes in the upper block and the wires on the heat block, insert the other end of the heat break until the end of the heat break is flush with the upper face of the upper block. Tighten the set screw enough to keep the hotend from shifting.

Extruder

Single Extruder

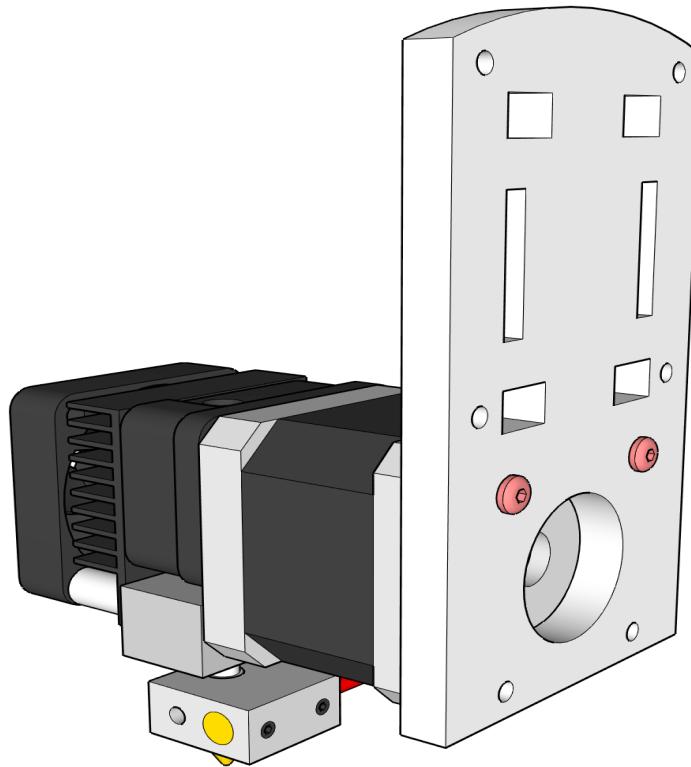
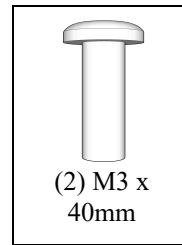
Step 5



Assemble the rest of the assembly as shown. Make sure all of the wires are facing the left side.

Carriage Single Extruder

Step 1

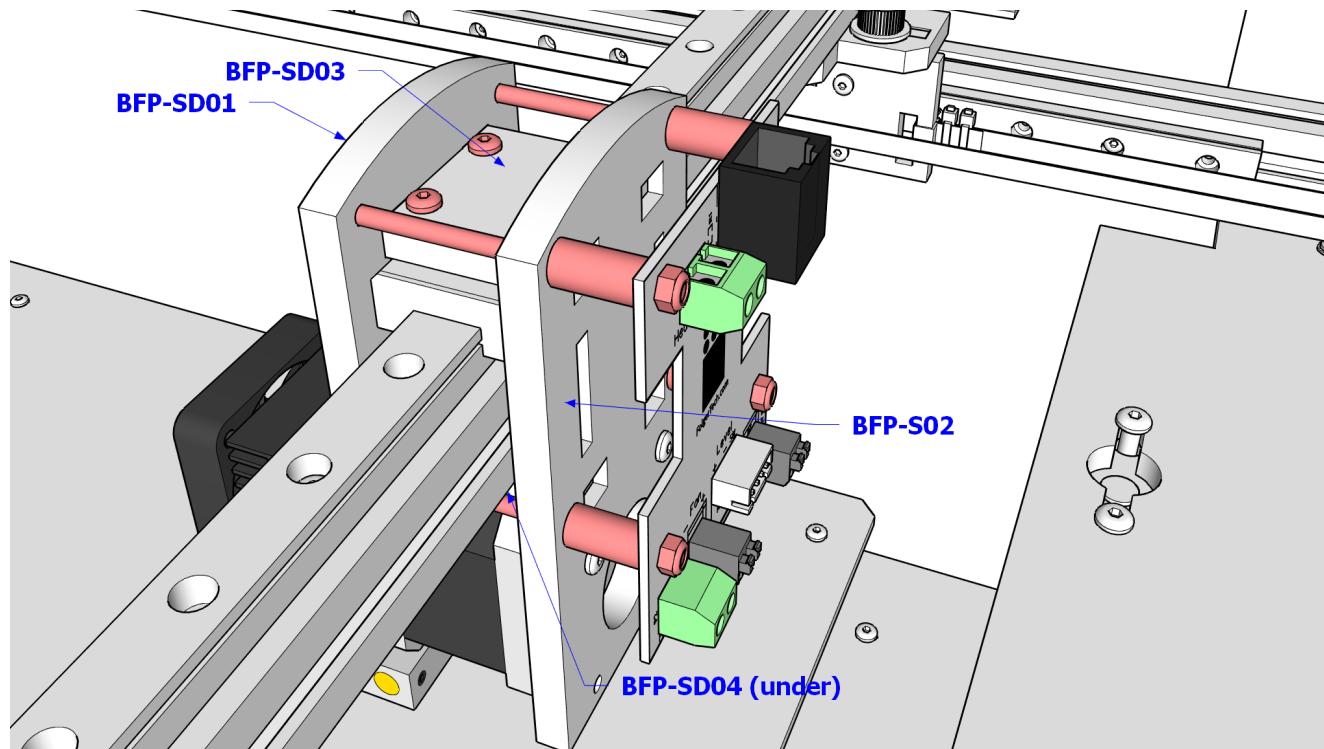
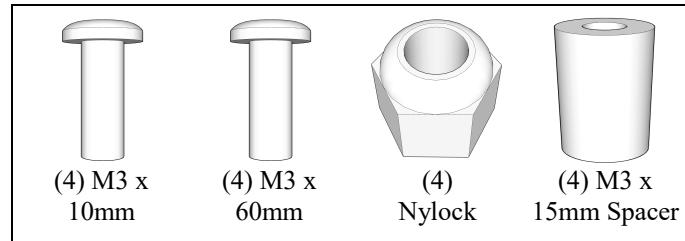


Remove the top 2 bolts on the back of the stepper. Mount the stepper to BFP-SD02.

Carriage

Single Extruder

Step 2

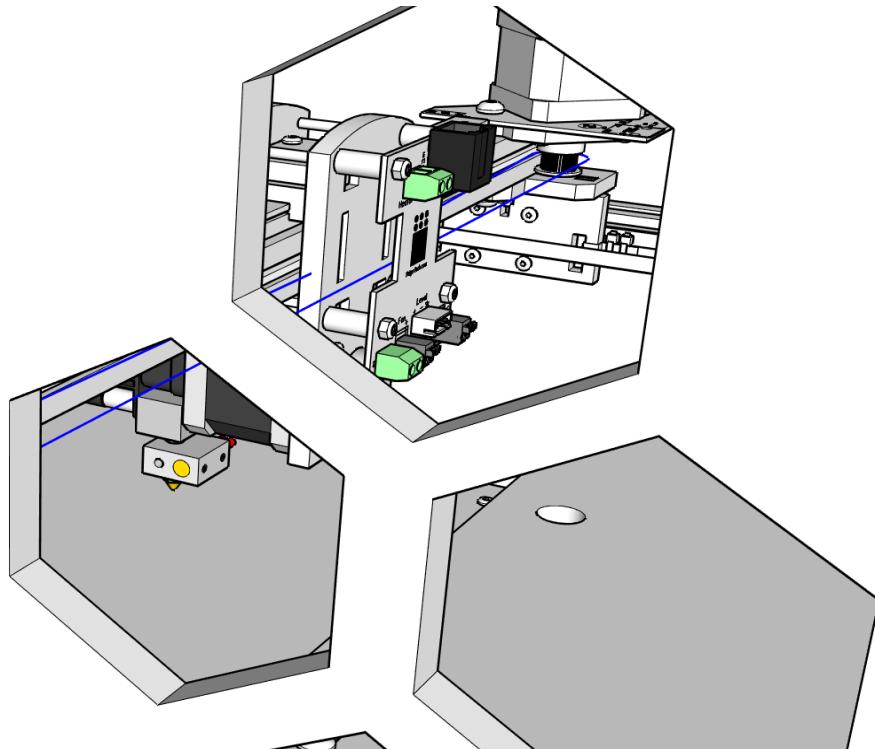
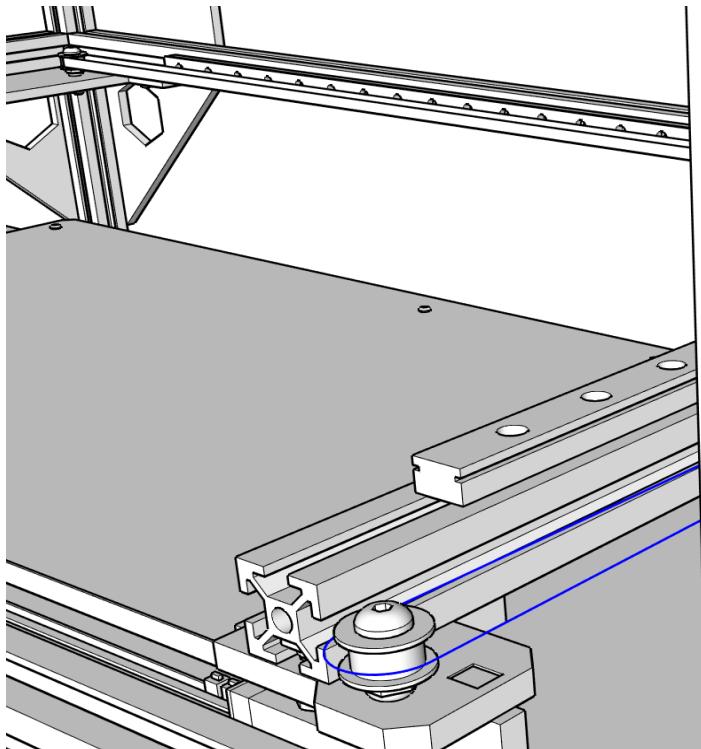


Mount BFP-SD03 to the linear block. Assemble BFP-SD01, BFP-S02, BFP-SD04, and the carriage PCB using M3 hardware and spacers. The PCB is on the right hand side of the gantry.

Carriage

Single Extruder

Step 3

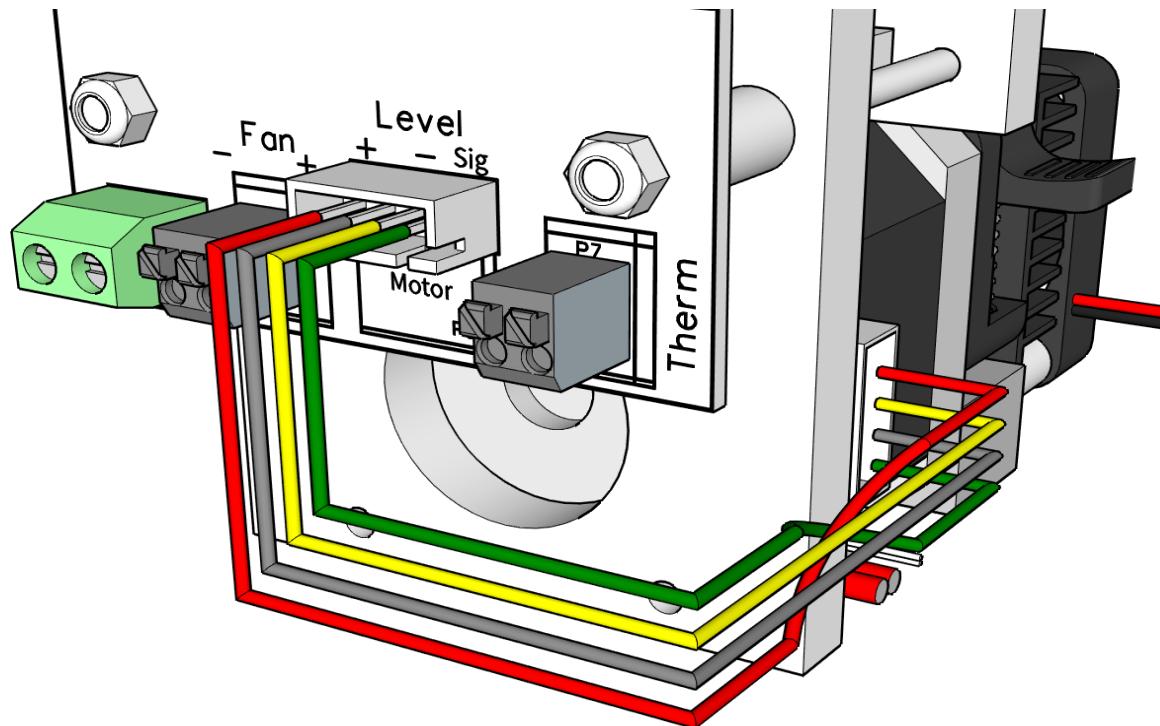


Tightly install the Y belt as we did earlier with the X belts. Attach the left side of the loop to the carriage with the right side of the loop behind the PCB. Adjust tension by moving the Y stepper assembly.

Carriage

Single Extruder

Step 4

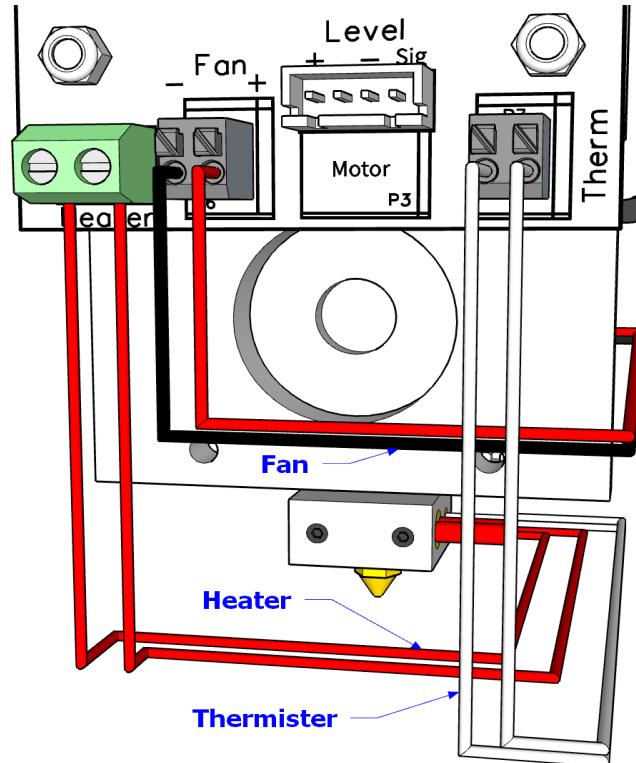


Using a short stepper cable, plug the extruder stepper into the carriage PCB.

Carriage

Single Extruder

Step 5

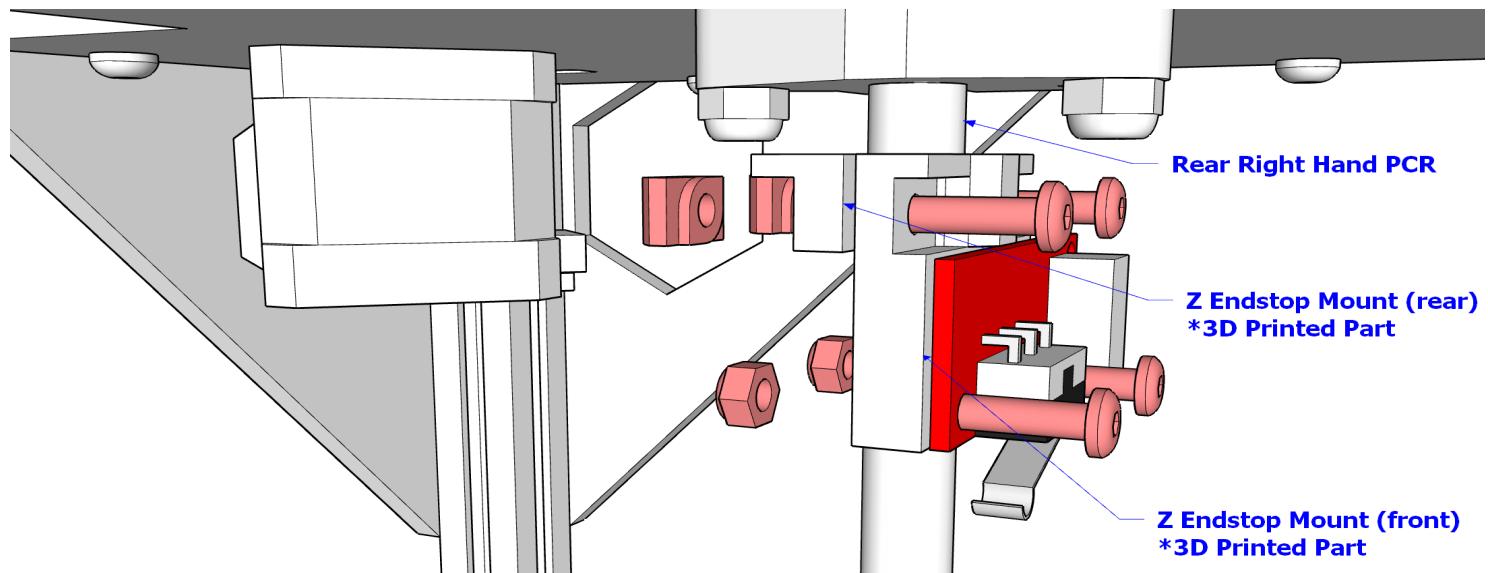
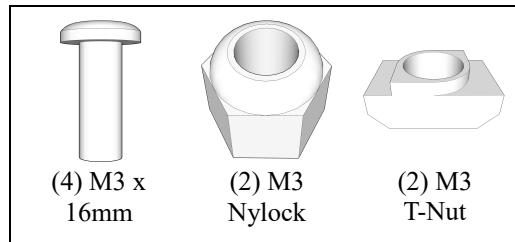


Connect the heater, fan, and thermister to the carriage PCB as shown. Make sure you route the wires away from any moving parts.

Endstop

Single Extruder

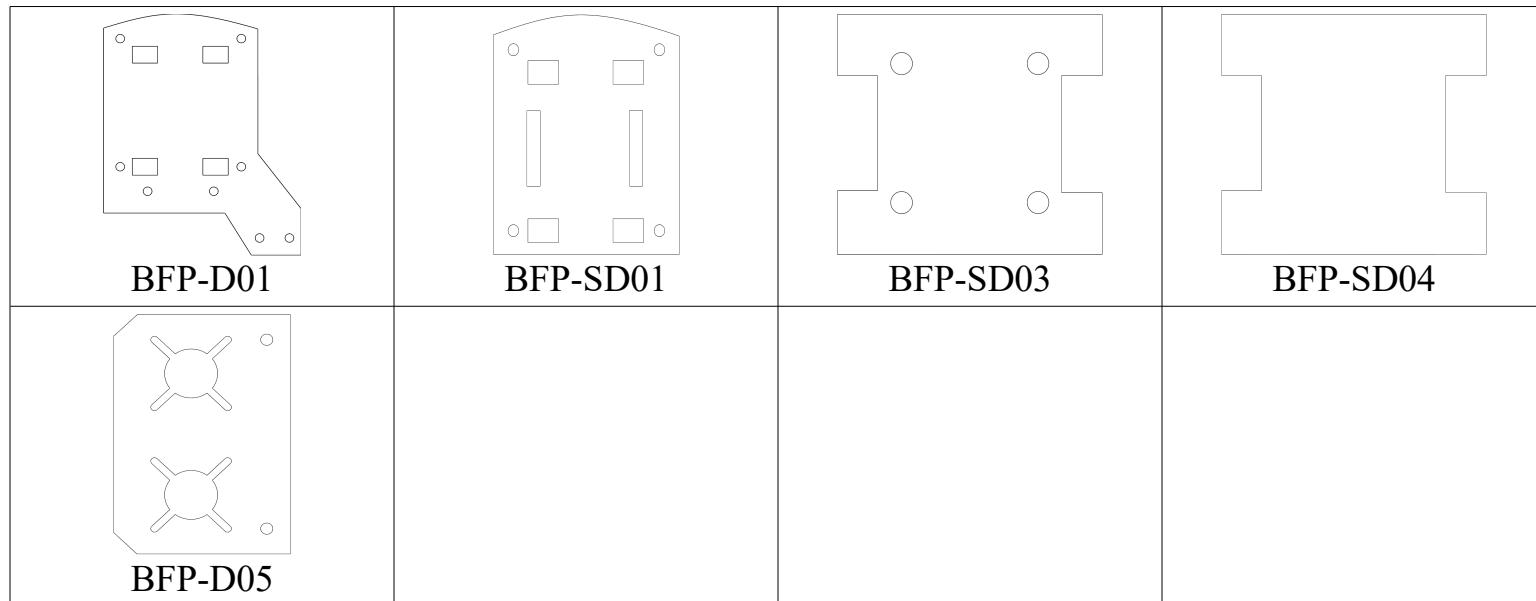
Step 1



Mount an endstop to the front half on the 3D printed Z endstop mount using M3 hardware. Mount the assembly to the rear right-hand PCR using the rear half of the mount and M3 hardware. Adjust so that it will click just before the hotend nozzle hits the bed.

Dual Extruder

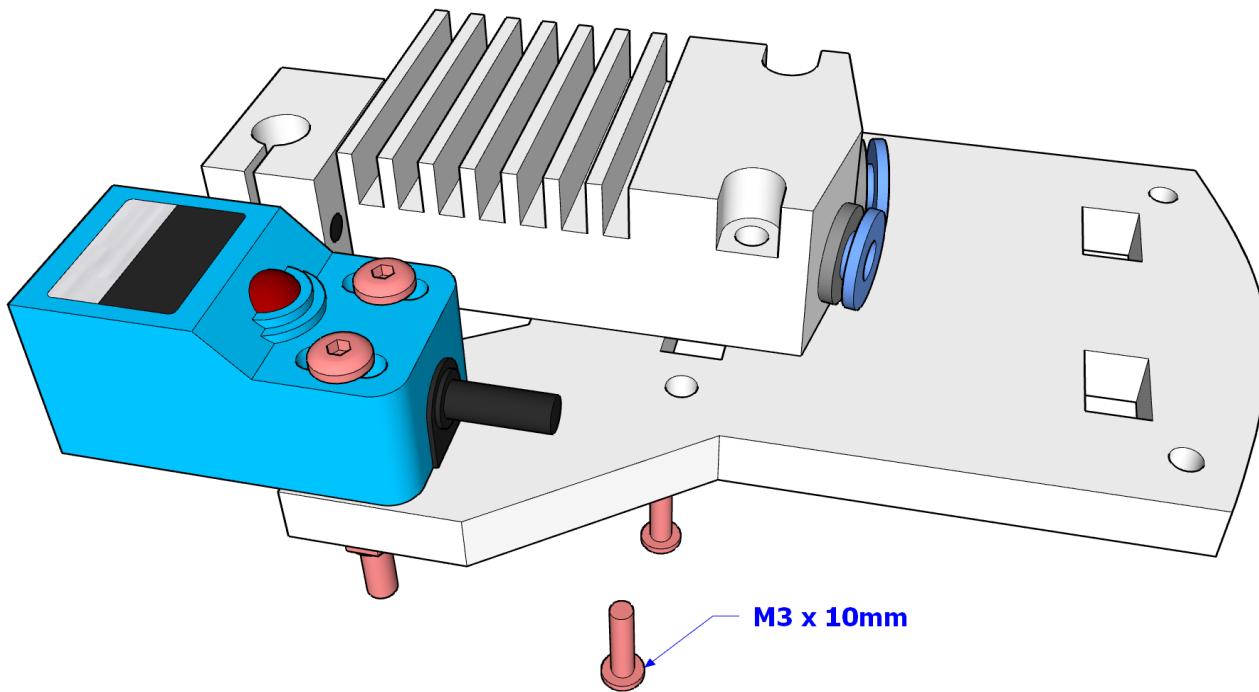
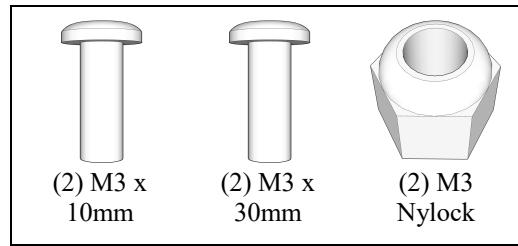
Additional ACM parts used in this section:



Carriage

Dual Extruder

Step 1

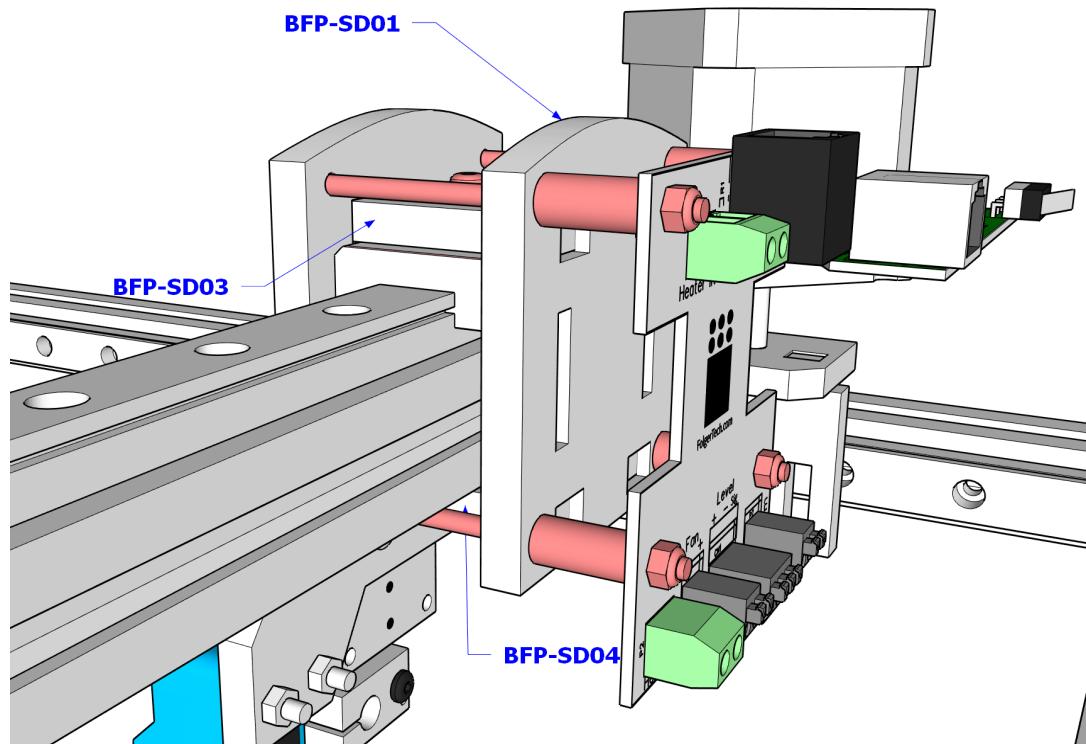
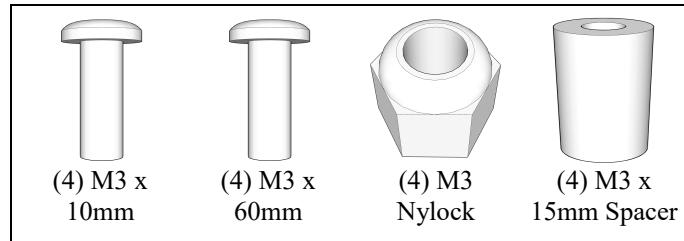


Mount the sensor in the center of the slots using the supplied hardware. Mount the dual hotend using the top set of holes that don't go through. ***Fan is not shown.***

Carriage

Dual Extruder

Step 2

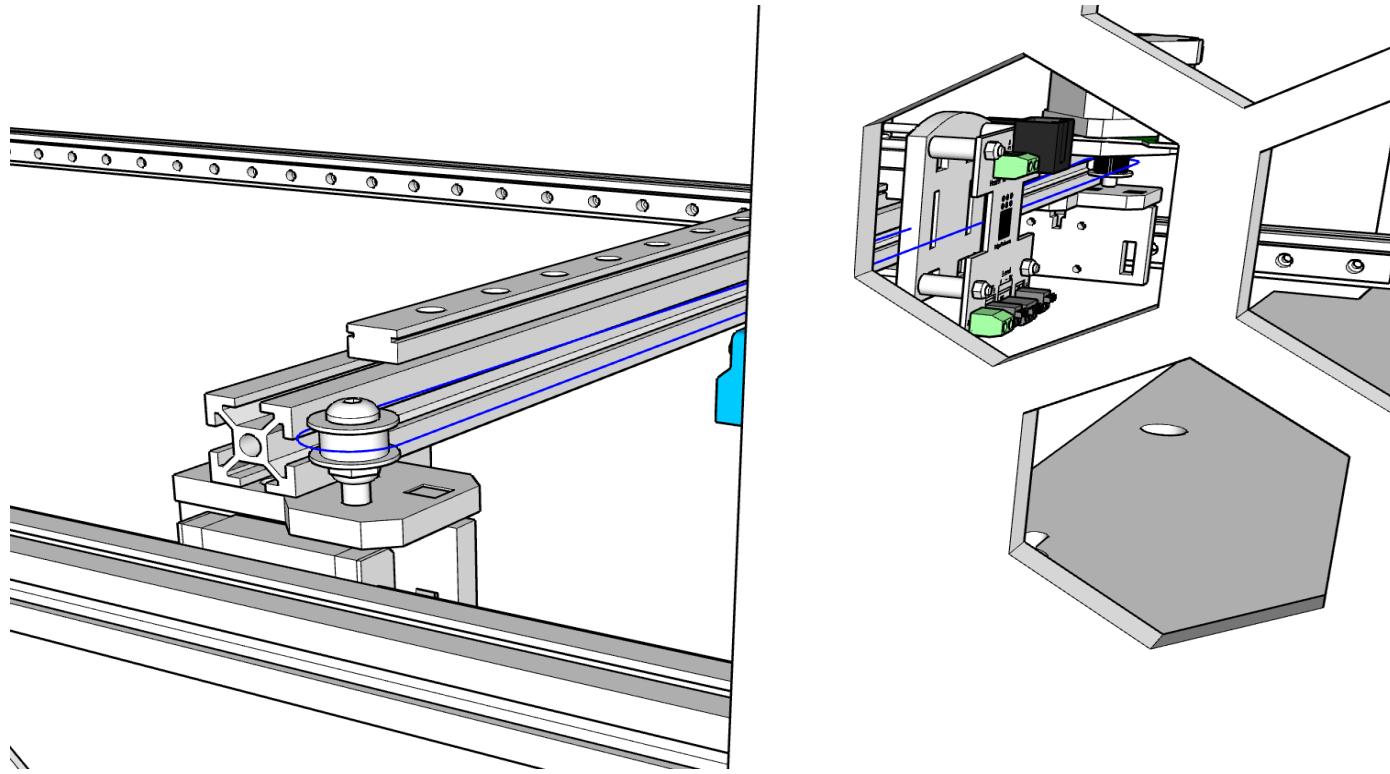


Mount BFP-SD03 to the linear block. Assemble BFP-D01, BFP-SD01, BFP-SD04, and the carriage PCB using M3 hardware and spacers. The PCB is on the right hand side of the gantry.

Carriage

Dual Extruder

Step 3

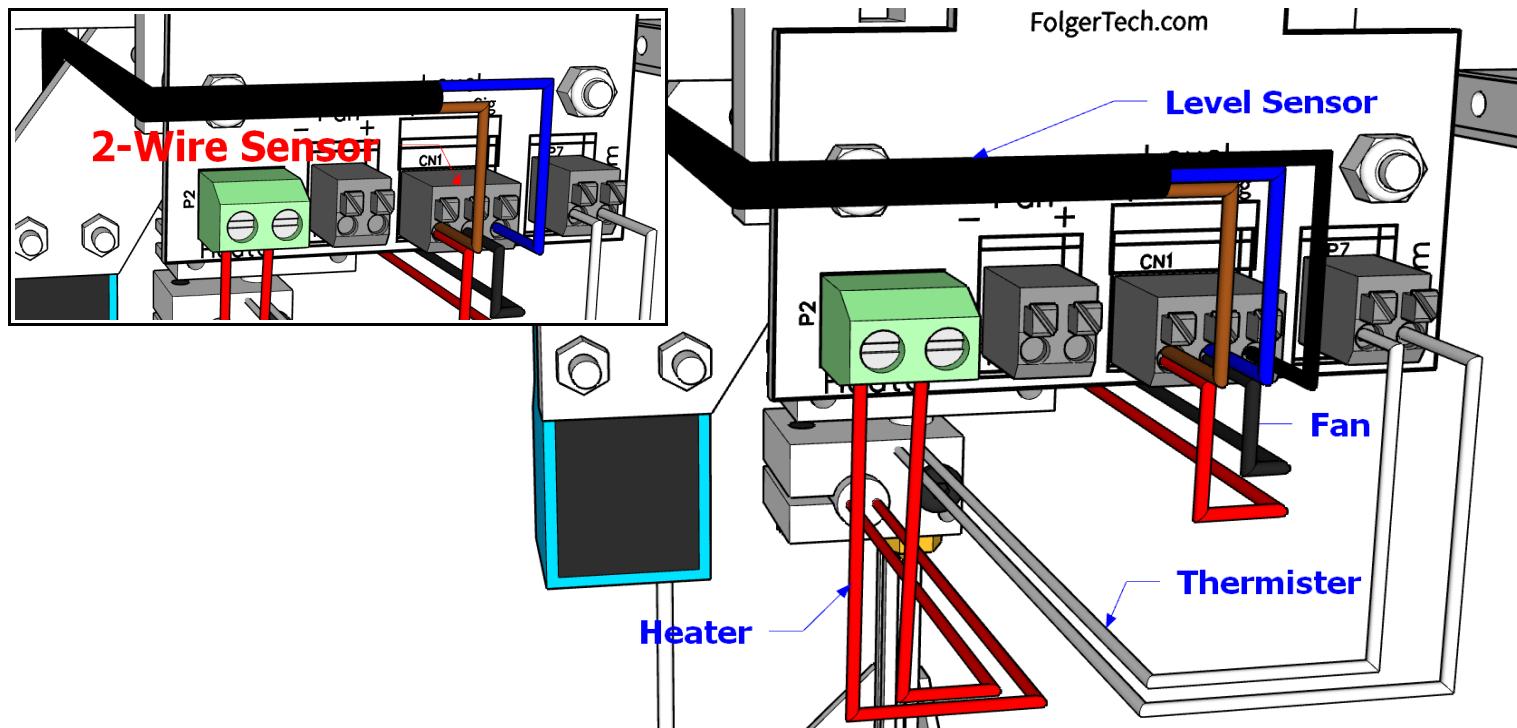


Tightly install the Y belt as we did earlier with the X belts. Attach the left side of the loop to the carriage with the right side of the loop behind the PCB. Adjust tension by moving the Y stepper assembly.

Carriage

Dual Extruder

Step 4

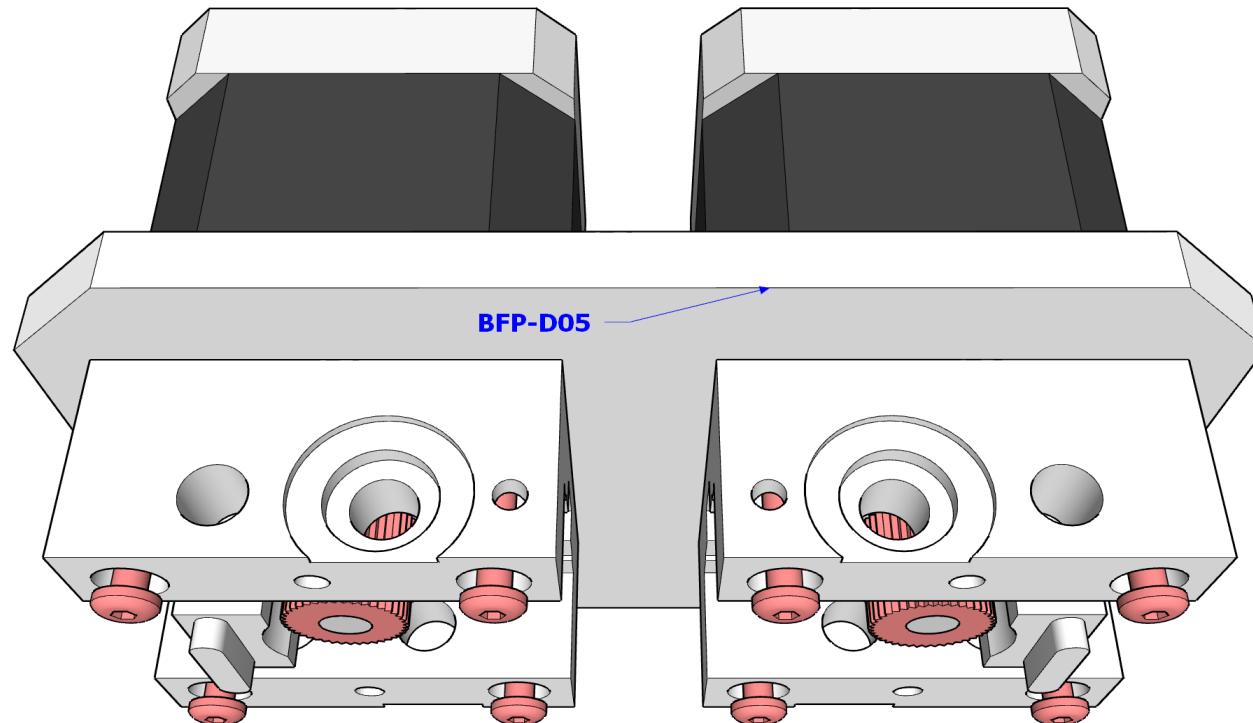
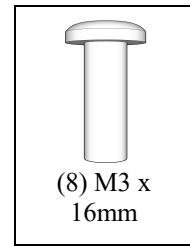


Connect components to the carriage PCB as shown. Make sure you route the wires away from any moving parts. **Note: The power for the fan and level sensor both connect to the level sensor power connections. This leaves the “fan” connections at both ends open for a layer fan.**

Extruders

Dual Extruder

Step 1

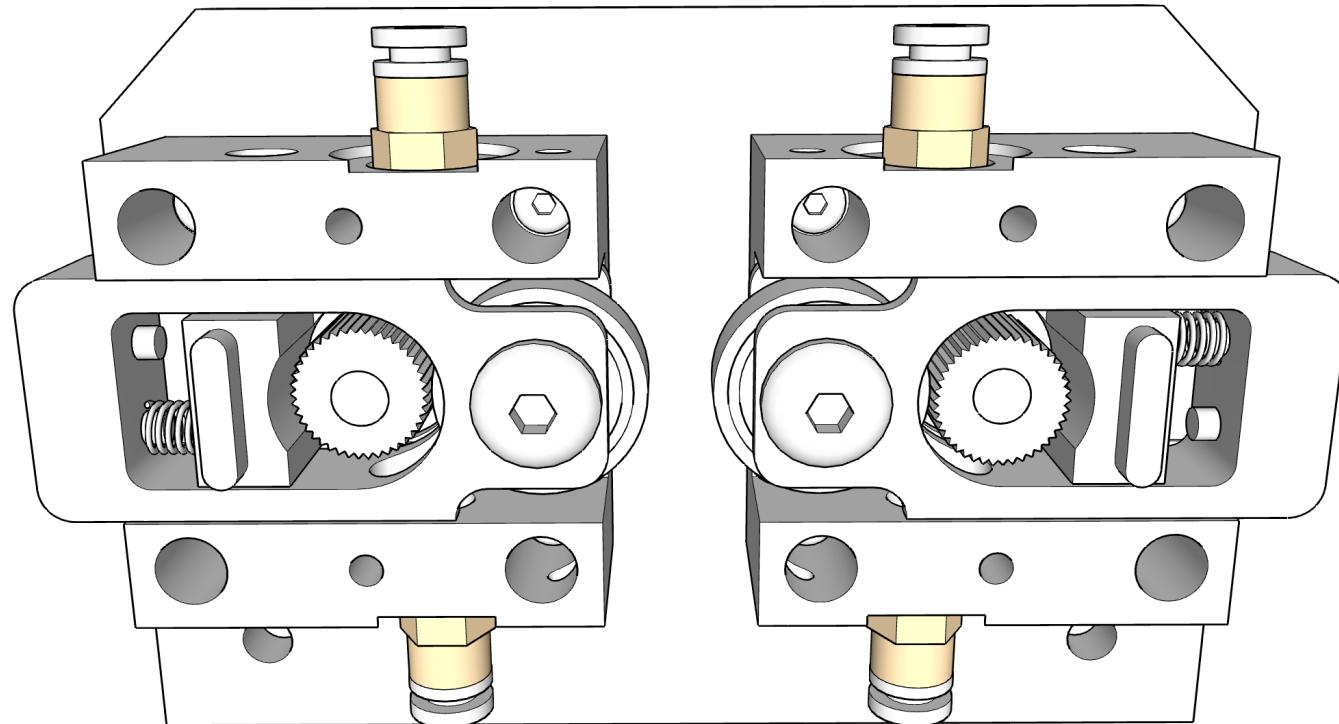


Mount the drive gears to the steppers flush with the end. Mount the extruder bodies to the steppers through BFP-D05. Make sure they are mirrored as shown. Stepper plugs go to the rear.

Extruders

Dual Extruder

Step 2

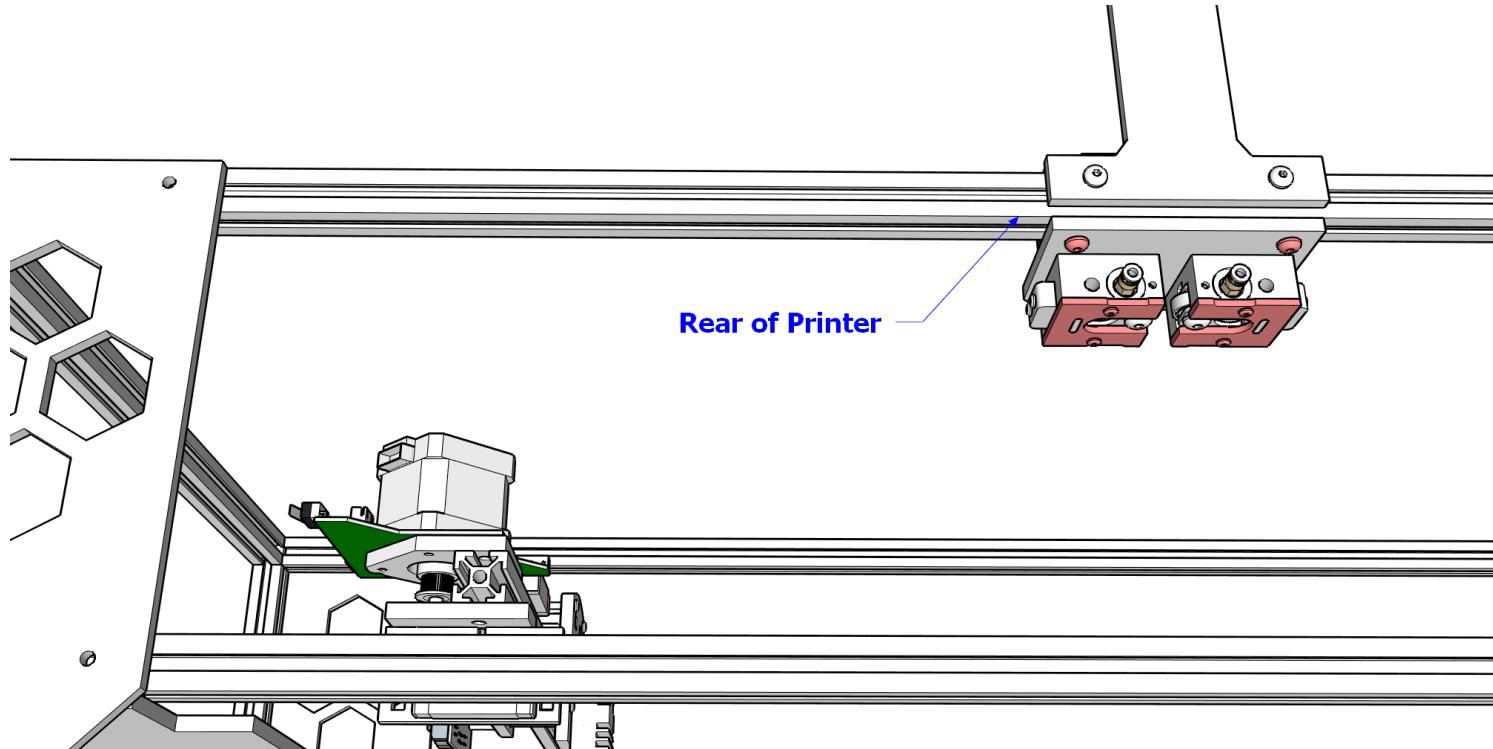
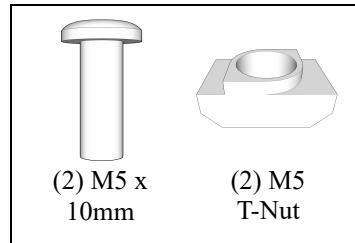


Assemble the internal extruder parts as shown. ***Make sure to use only (1) spring per extruder.*** Install the pneumatic fittings on both sides of each extruder.

Extruders

Dual Extruder

Step 3

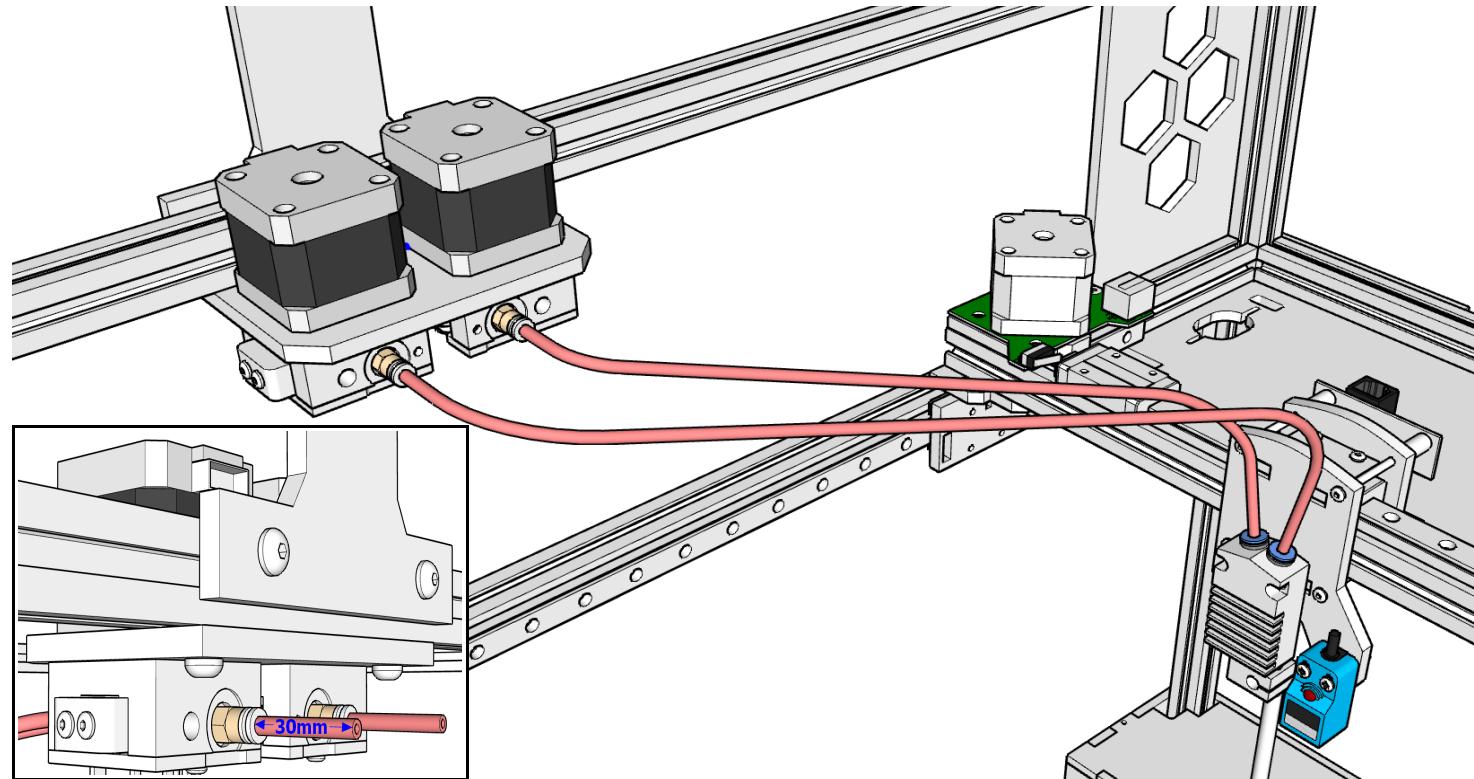


Mount the cover plates onto the extruders. Mount the dual extruder assembly to the rear of the frame under the spool holder.

Extruders

Dual Extruder

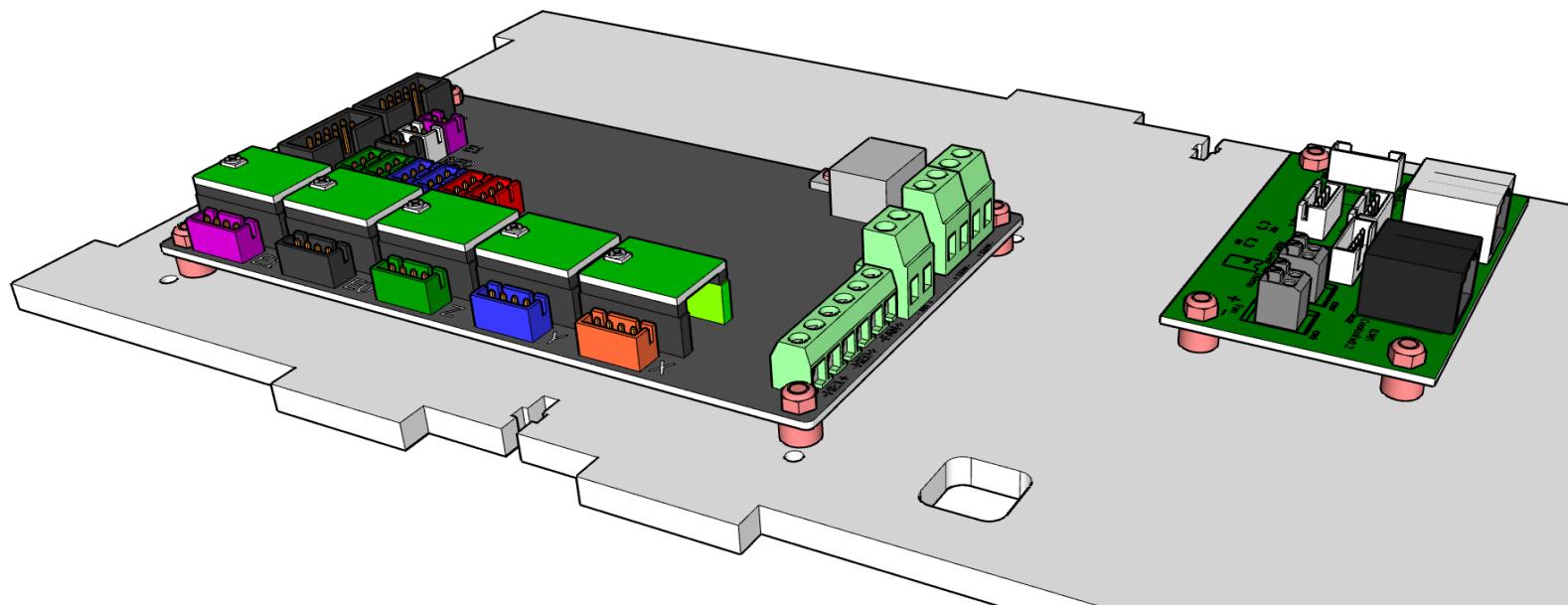
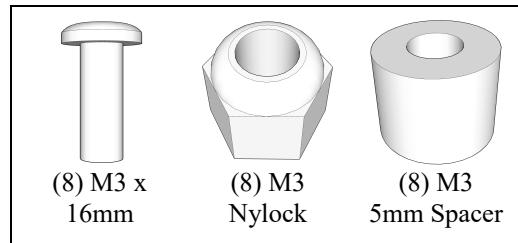
Step 4



Cut and install the (2) bowden tubes from the extruders to the hotend. ***Make sure they will reach every corner of the carriage's movement.*** Install a 30mm piece into the rear side of both extruders.

Electronics

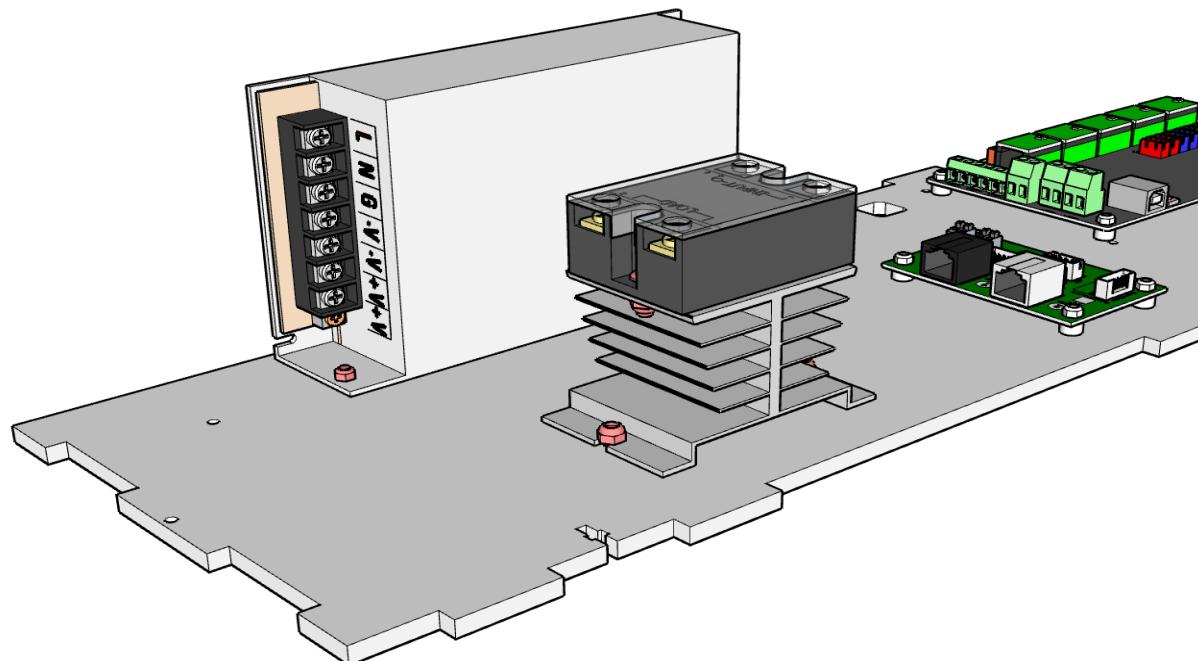
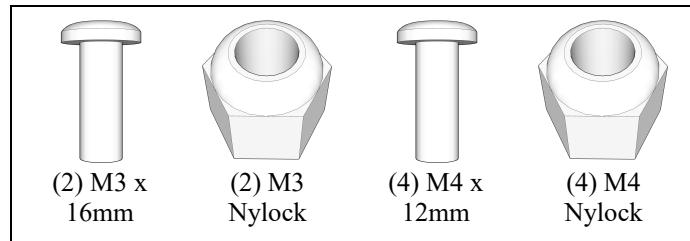
Step 1



Mount the controller and controller PCB to BFP-13.

Electronics

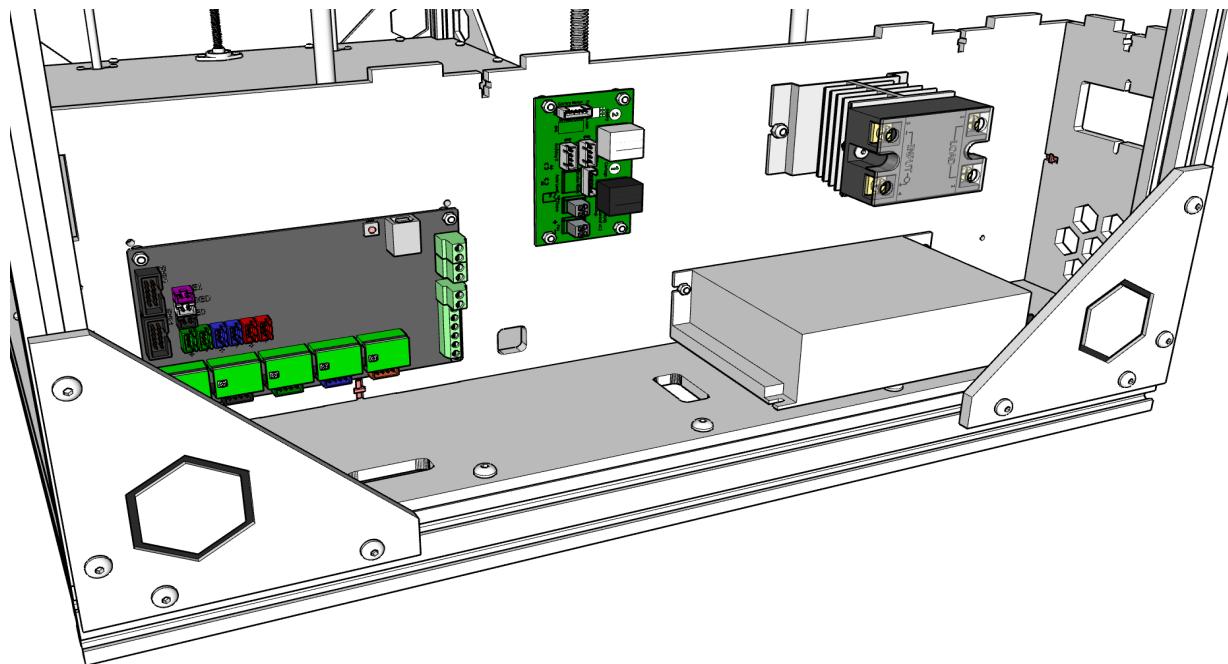
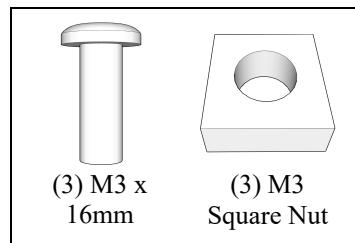
Step 2



Mount the PSU using the M3 hardware. Mount the SSR to the heatsink and then to BFP-13 using the M4 hardware. **Make sure the end labeled “LOAD” on the SSR is on the left as shown.**

Electronics

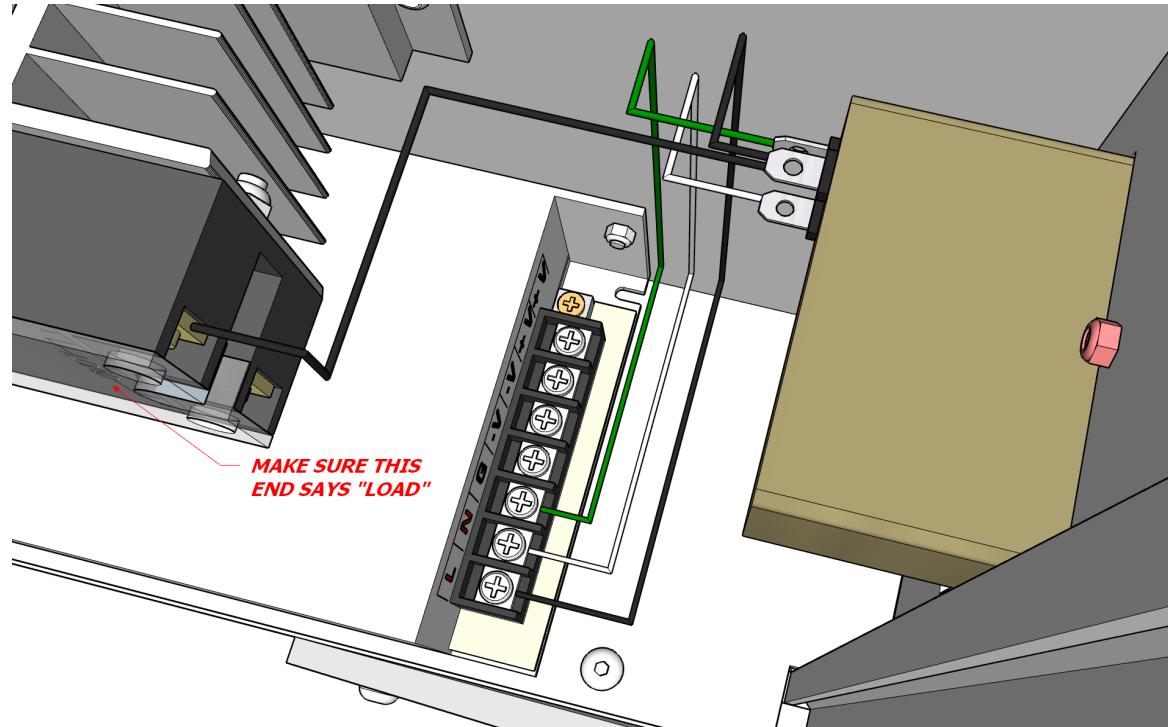
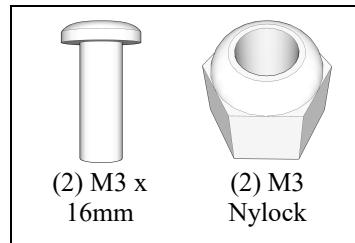
Step 3



Mount the assembly to the printer using the M3 hardware. The 3rd bolt and nut is behind the PSU.

Electronics

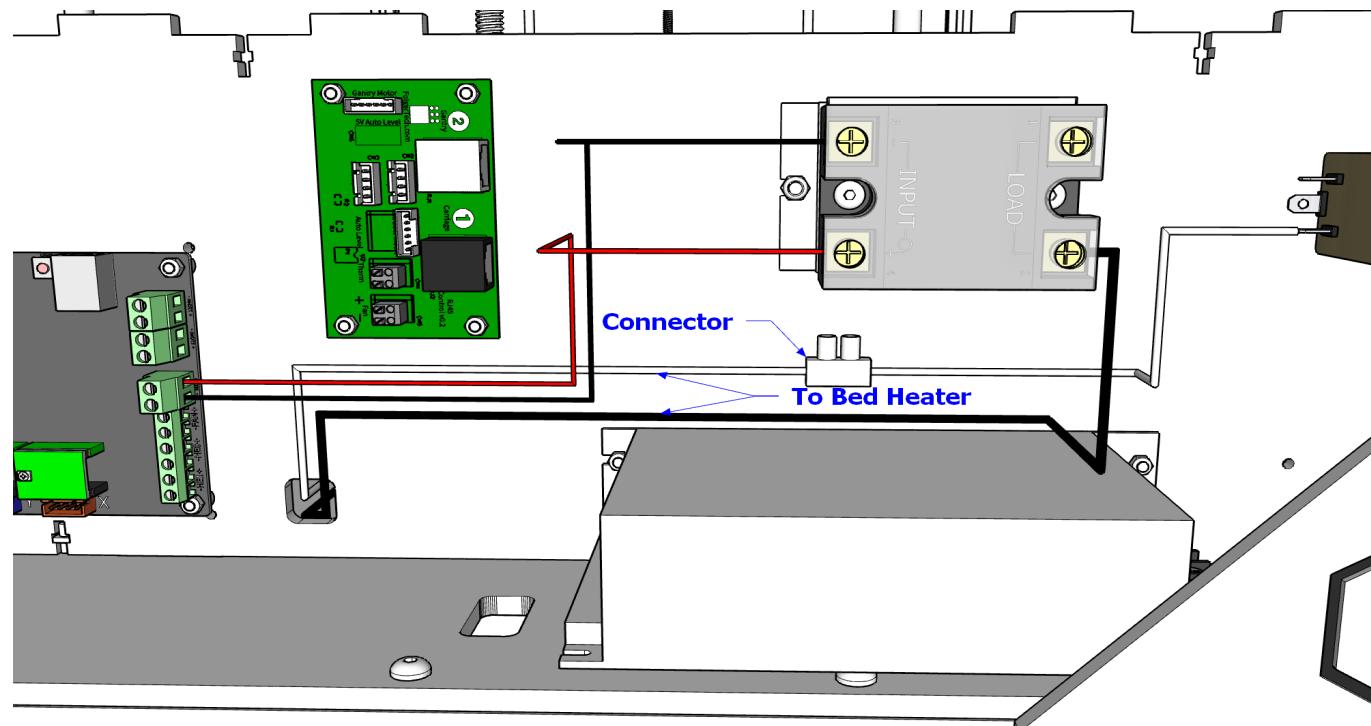
Step 4



Mount the power jack using the M3 hardware. Connect the pre-installed wires as shown. You will have an extra white wire left over.

Electronics

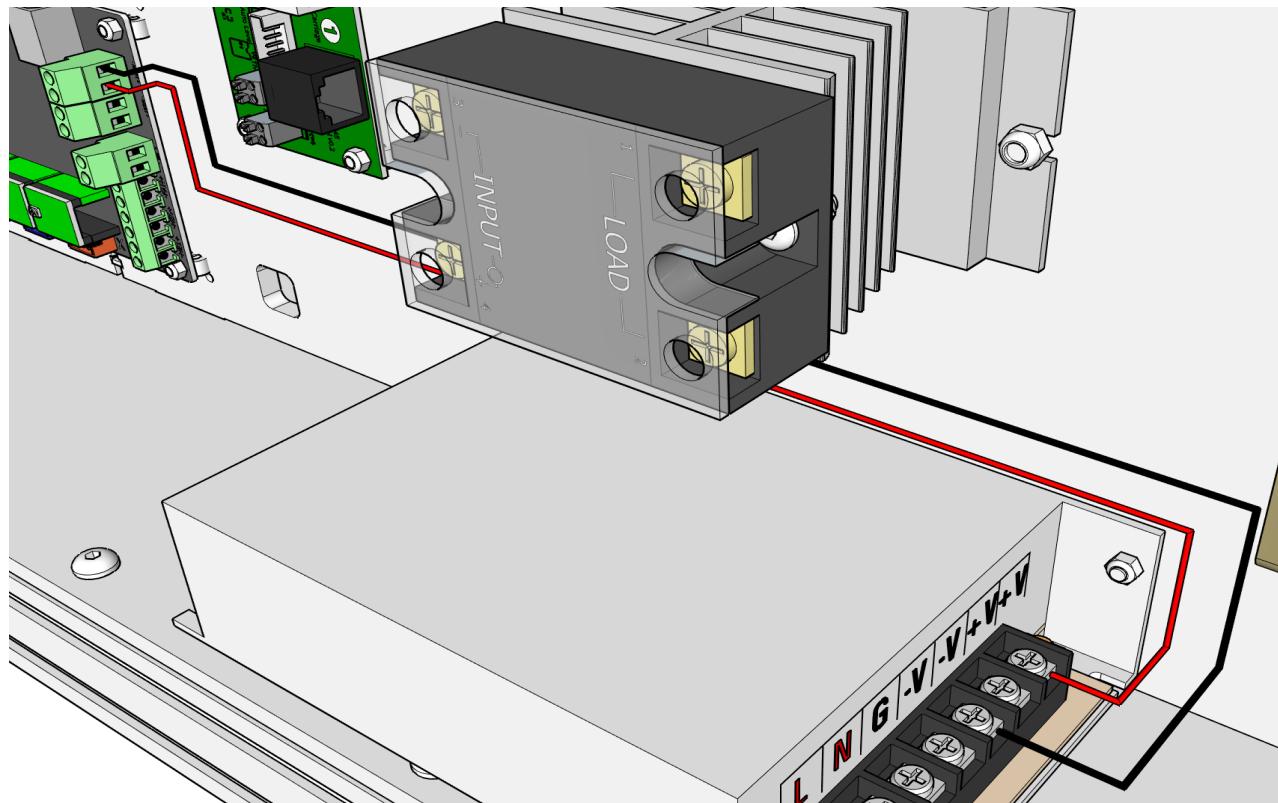
Step 5



Connect the bed heater to the SSR load and the left over white wire using the connector as shown. Connect the SSR input to the heater connection on the controller. **Make sure you leave enough bed heater wire to allow the bed to reach the top.**

Electronics

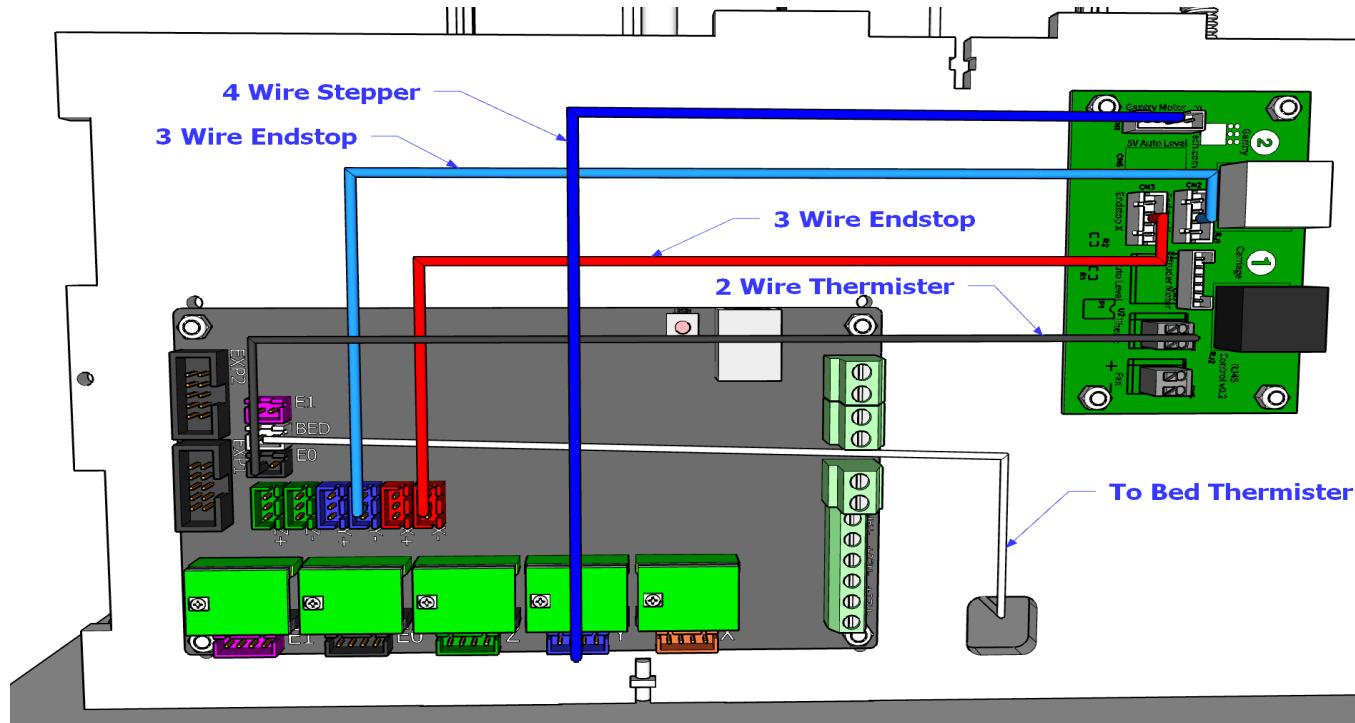
Step 6



Connect the controller power to the PSU.

Electronics

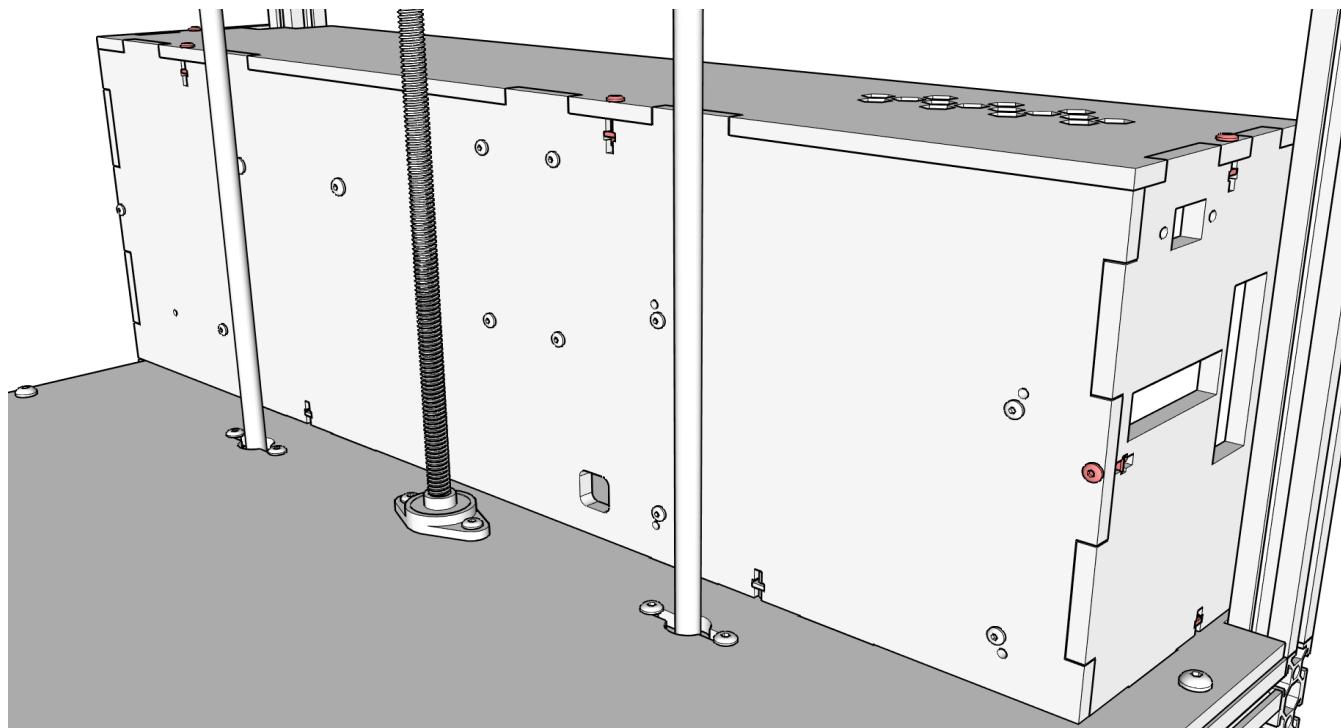
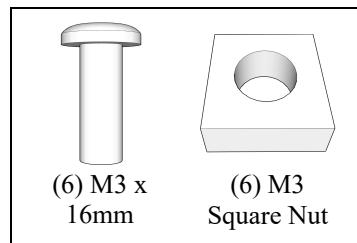
Step 7



Connect the wires from the controller to the controller PCB as shown. The E0 thermister wire is the part we cut off from the hot end. Connect the bed thermister. Make sure the endstops are plugged into (-).

Electronics

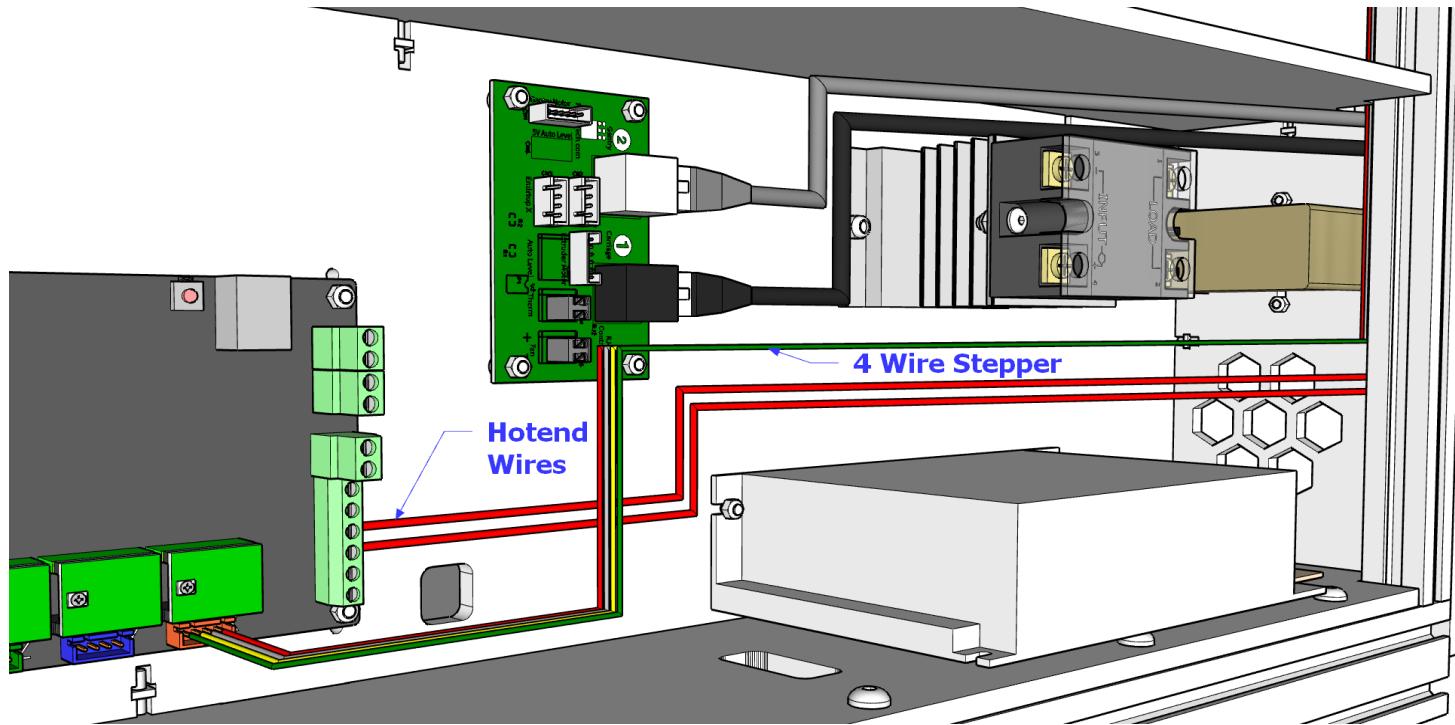
Step 8



Mount BFP-14 and BFP-15 to the top and front end of the electronics enclosure.

Electronics

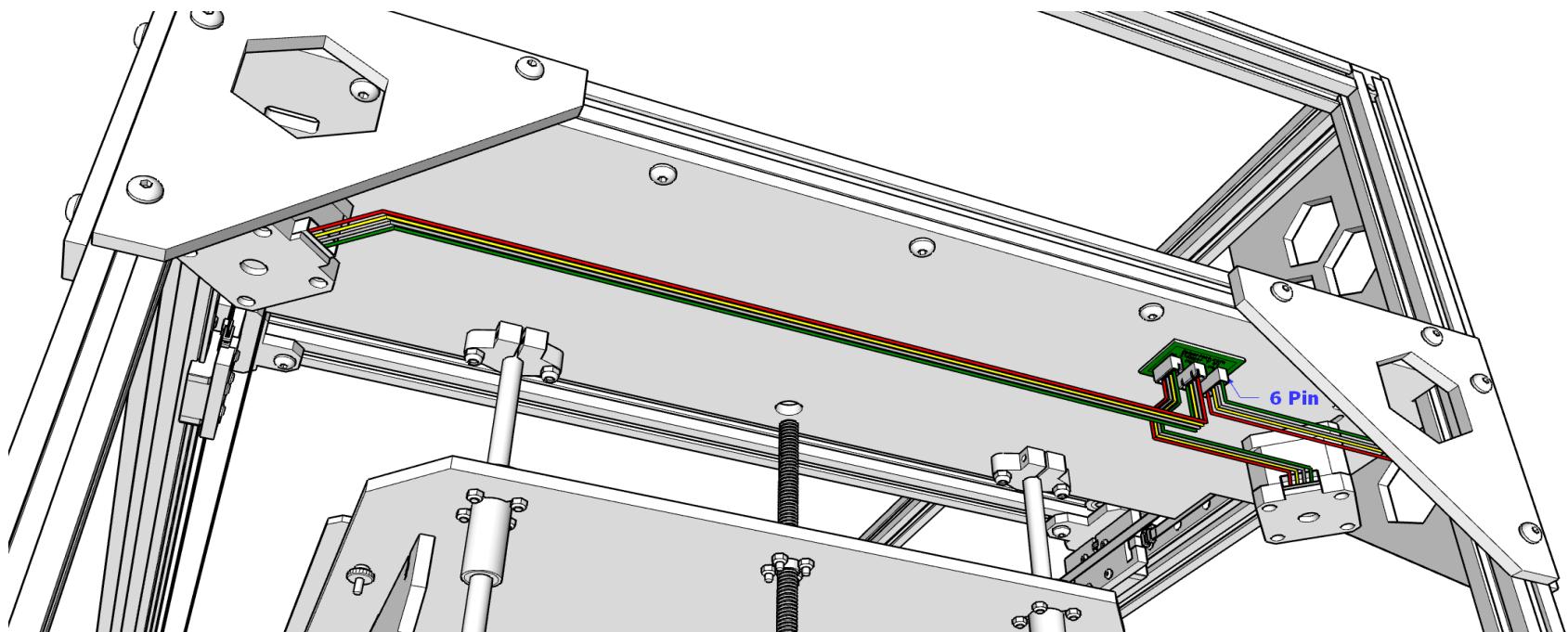
Step 9



Plug the gray Ethernet cable into the silver jack and the black Ethernet cable into the black jack. Plug a long stepper wire into the X connector and connect the hotend wires into the HE0 connection. Run the wires up through the hole in the corner.

Electronics

Step 10



Mount the Stepper Y PCB with the 6 pin socket to the rear using mounting tape. Plug the X stepper wire we ran in the last step to the 6 pin socket. Plug the steppers in as shown. Rear stepper to the front socket, front stepper to the middle socket.

Electronics

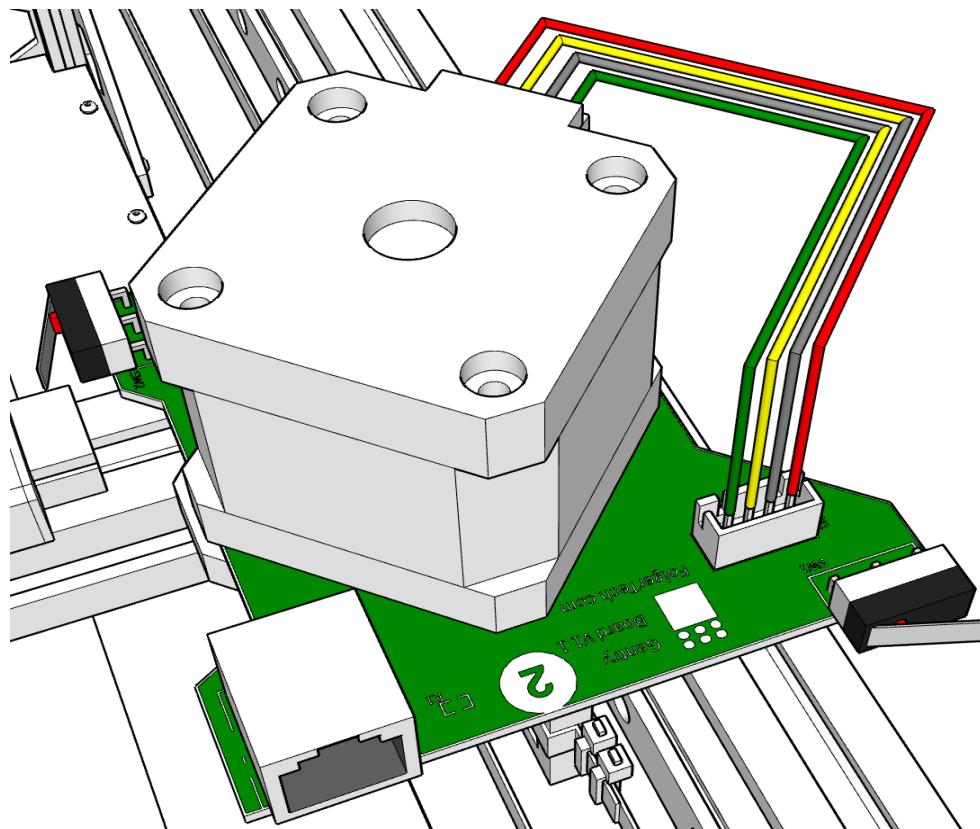
Step 11



Run a stepper cable from the Z socket on the controller under the printer to the Z stepper. Secure it to the bottom of the printer using tape.

Electronics

Step 12



Plug the Y stepper into the gantry PCB.

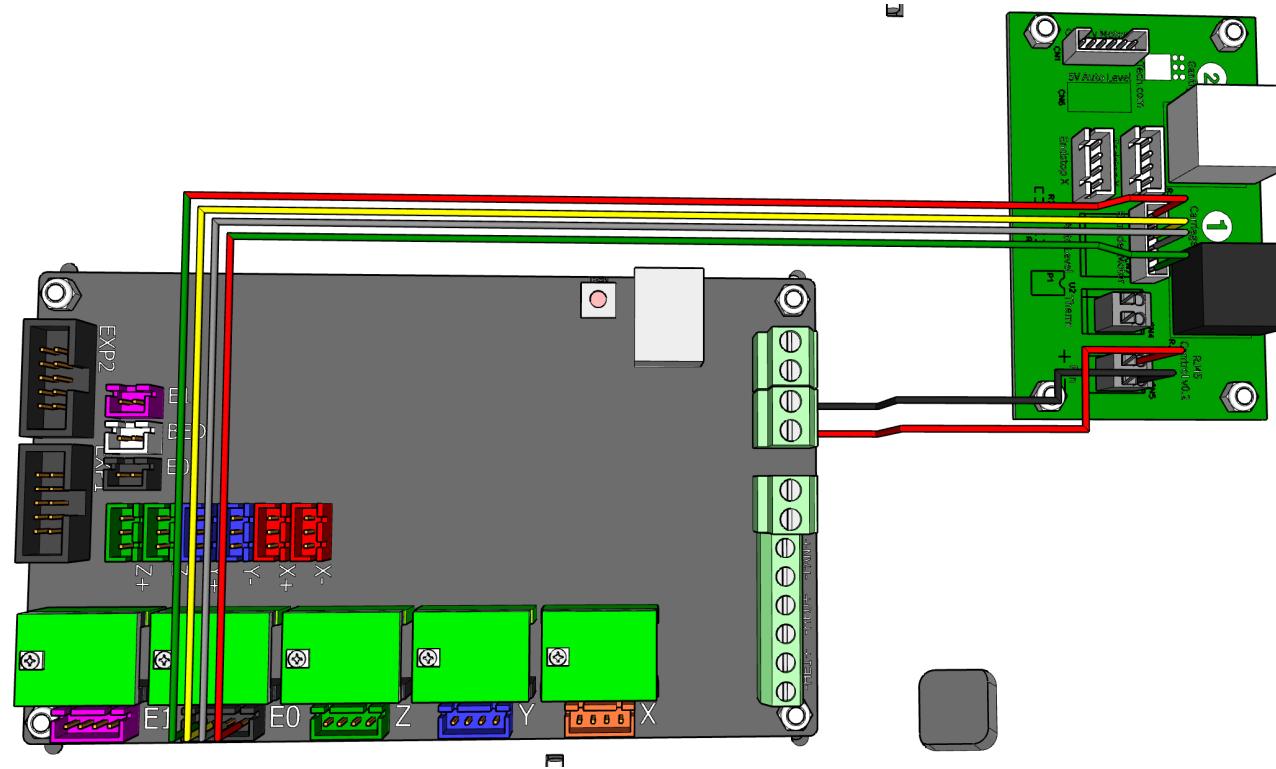
**The following sections are divided
by option.**

**Go through each section that matches
the options in your kit.**

Electronics

Single Extruder

Step 1

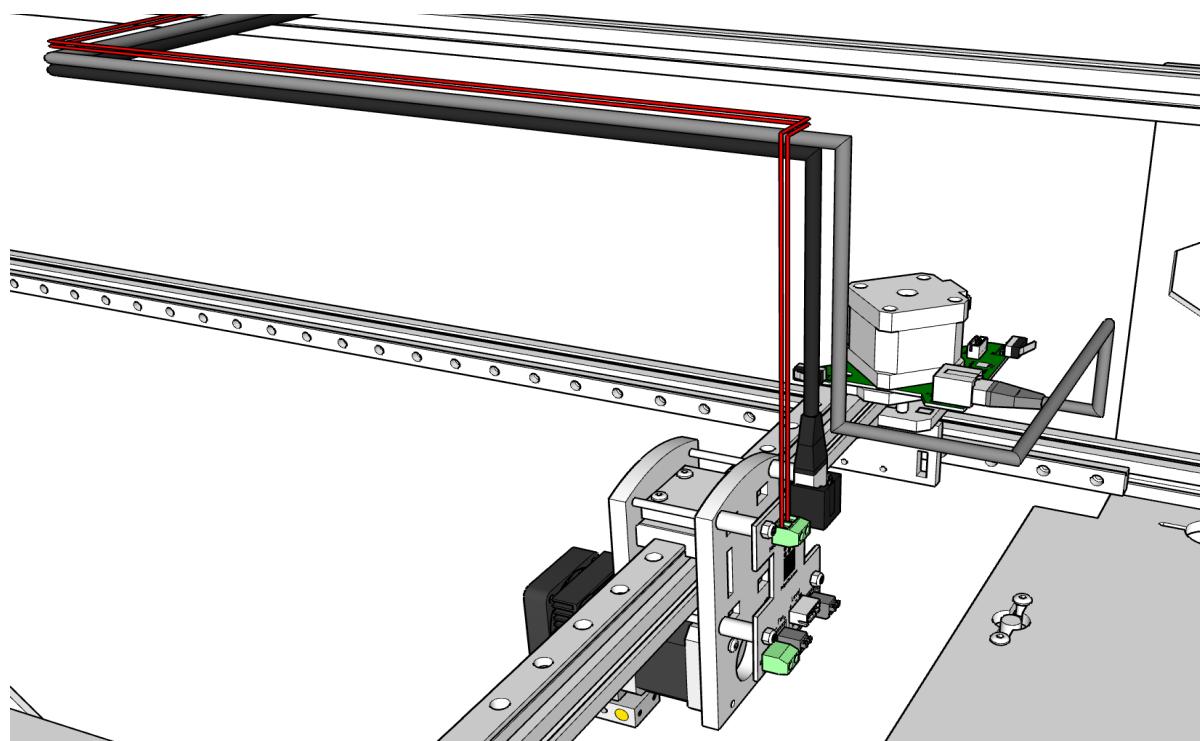


Plug a stepper cable from E0 on the controller to Extruder Motor on the controller PCB. Run wires from the unused power connections on the controller to the fan connections on the controller PCB.

Electronics

Single Extruder

Step 2

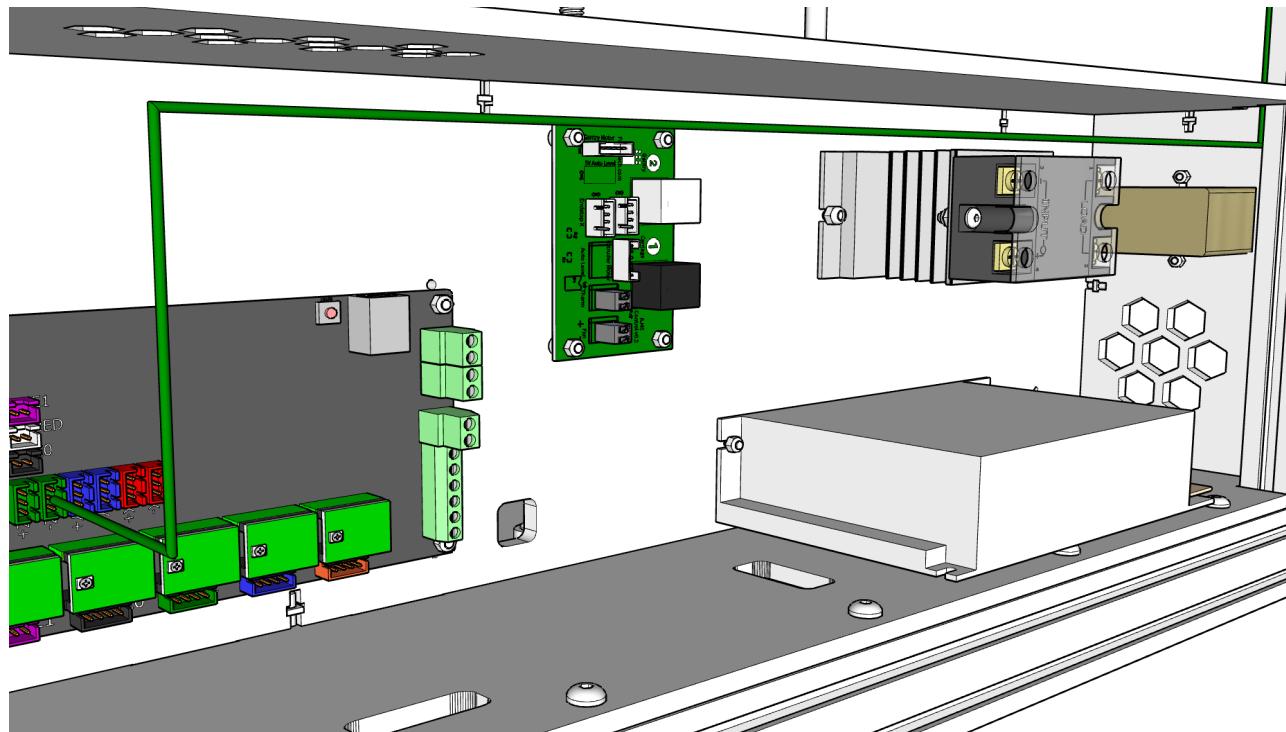


Run the ethernet cables and heater wires we ran earlier to the base of the spool holder. Plug the ethernet cables into the jacks. Connect the hotend wires to the carriage PCB. Make sure the gray and black cables have enough slack for full movement. Bundle the cables together using cable ties.

Electronics

Single Extruder

Step 3

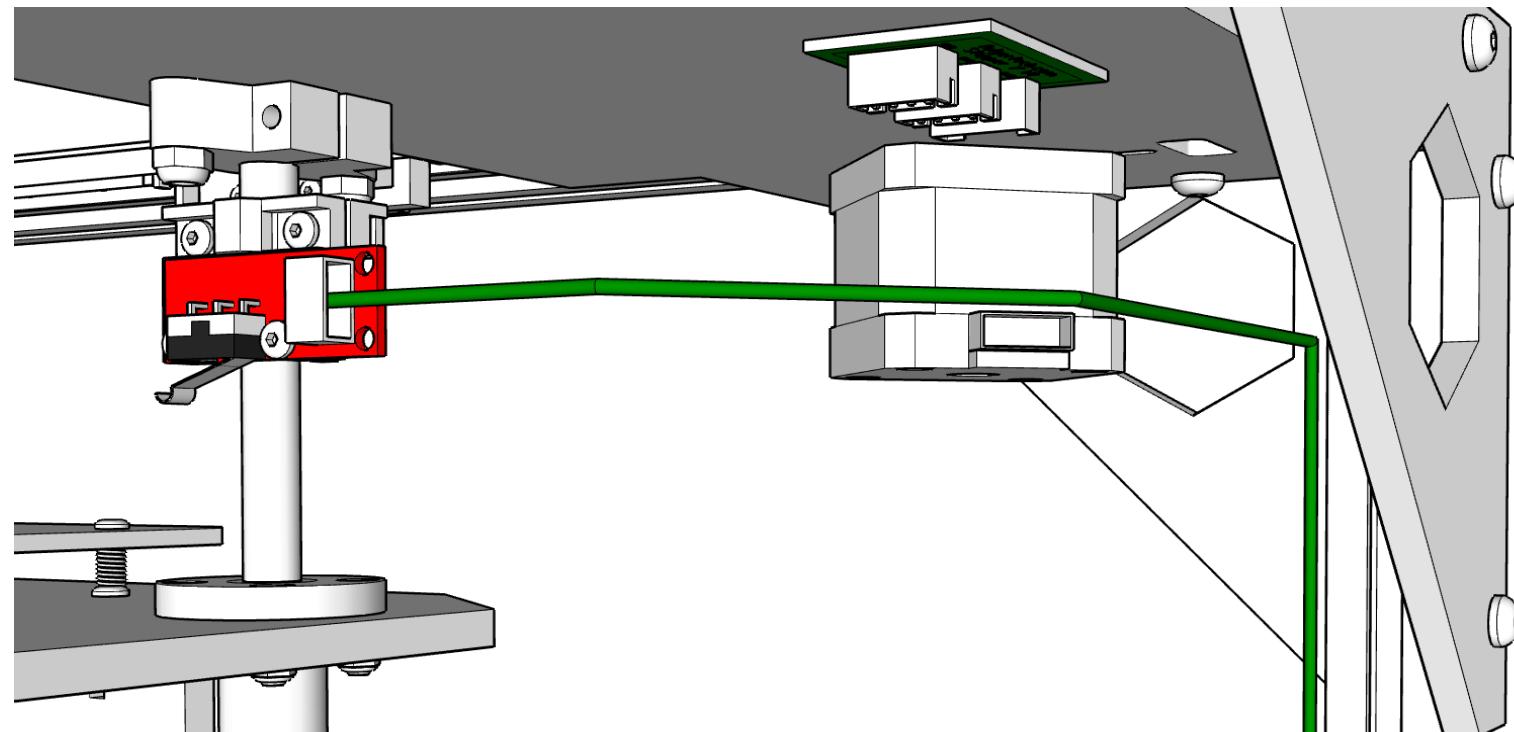


Plug an endstop wire into Z- on the controller and run it up through the hole in the rear.

Electronics

Single Extruder

Step 4

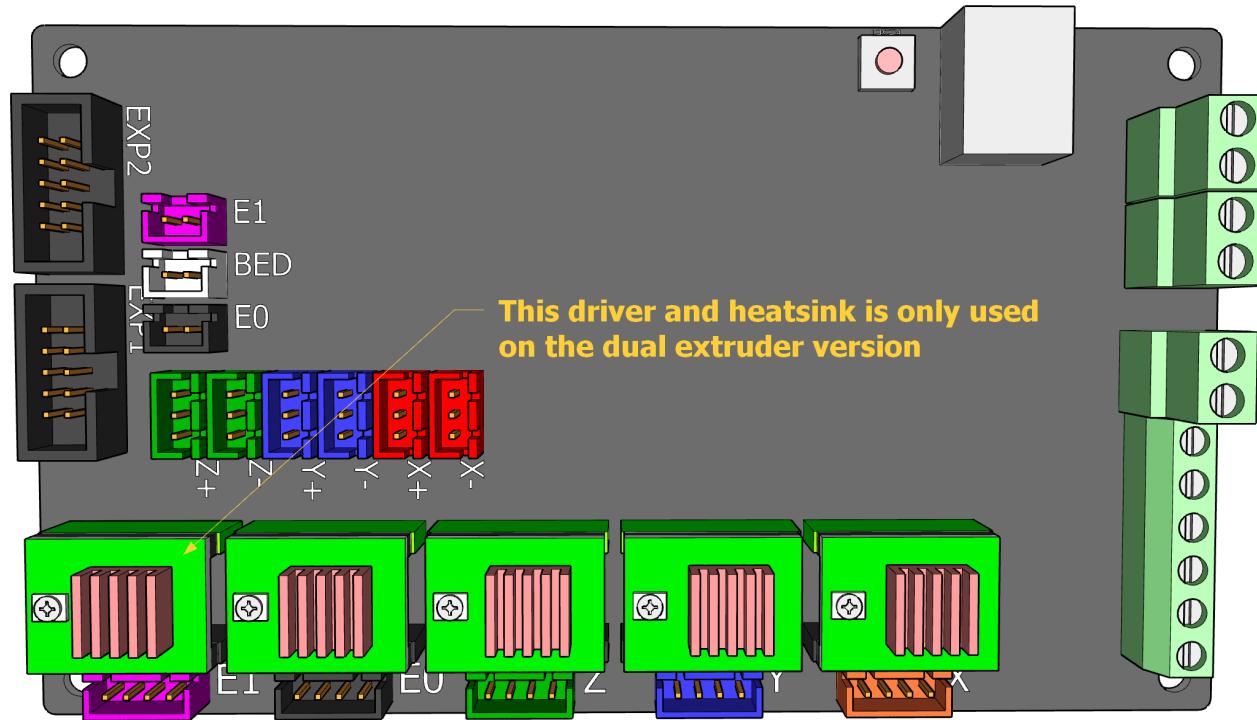


Plug the endstop wire into the Z endstop.

Electronics

Single Extruder

Step 5

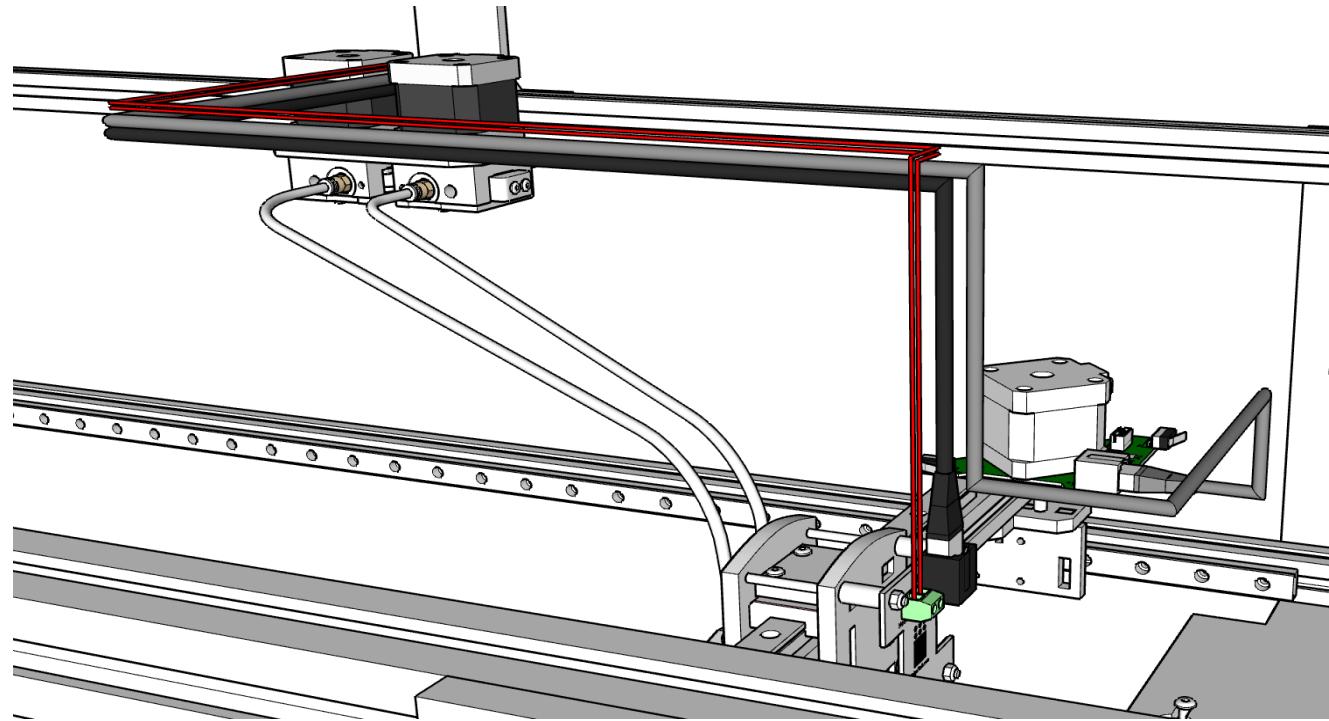


Remove the protective film from the underside of the stepper driver heatsinks and mount them to the drivers with the fins oriented as shown. **You will not be using the E1 driver and heatsink on the left.**

Electronics

Dual Extruder

Step 1

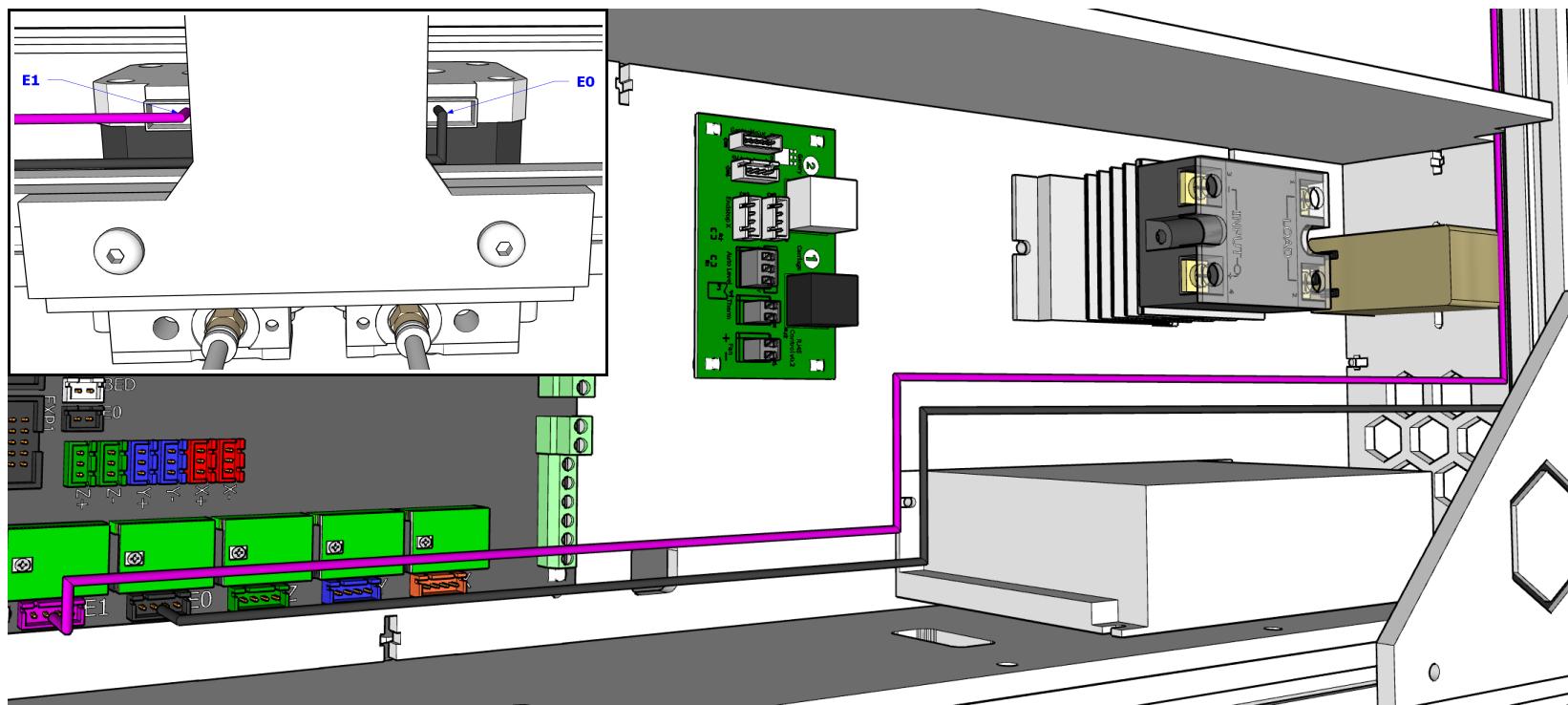


Run the cables you ran earlier between the extruder steppers and along the bowdens. Plug the ethernet cables into the jacks. Connect the hotend wires to the carriage PCB. Make sure the gray cable has enough slack for full movement. Secure the cables to the bowdens using cable ties.

Electronics

Dual Extruder

Step 2

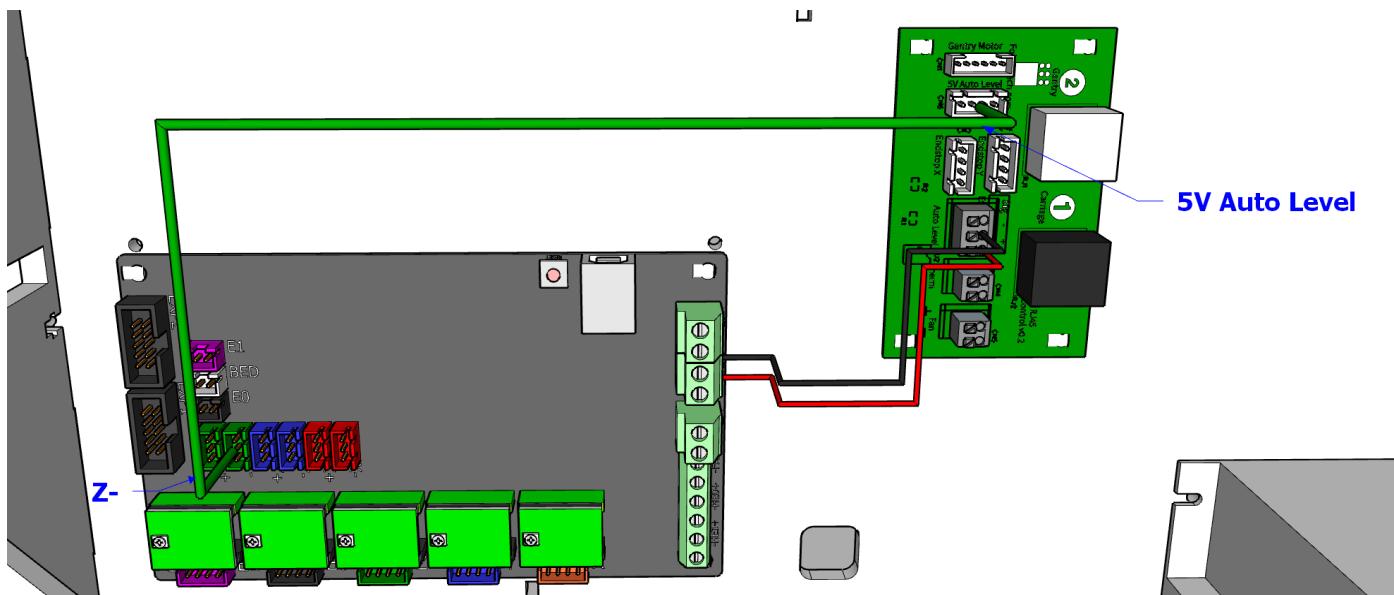


Plug a stepper cable wire into E0 and E1. Run them up to the extruders and plug into the extruder steppers. Note which wire goes into which stepper.

Electronics

Dual Extruder

Step 3

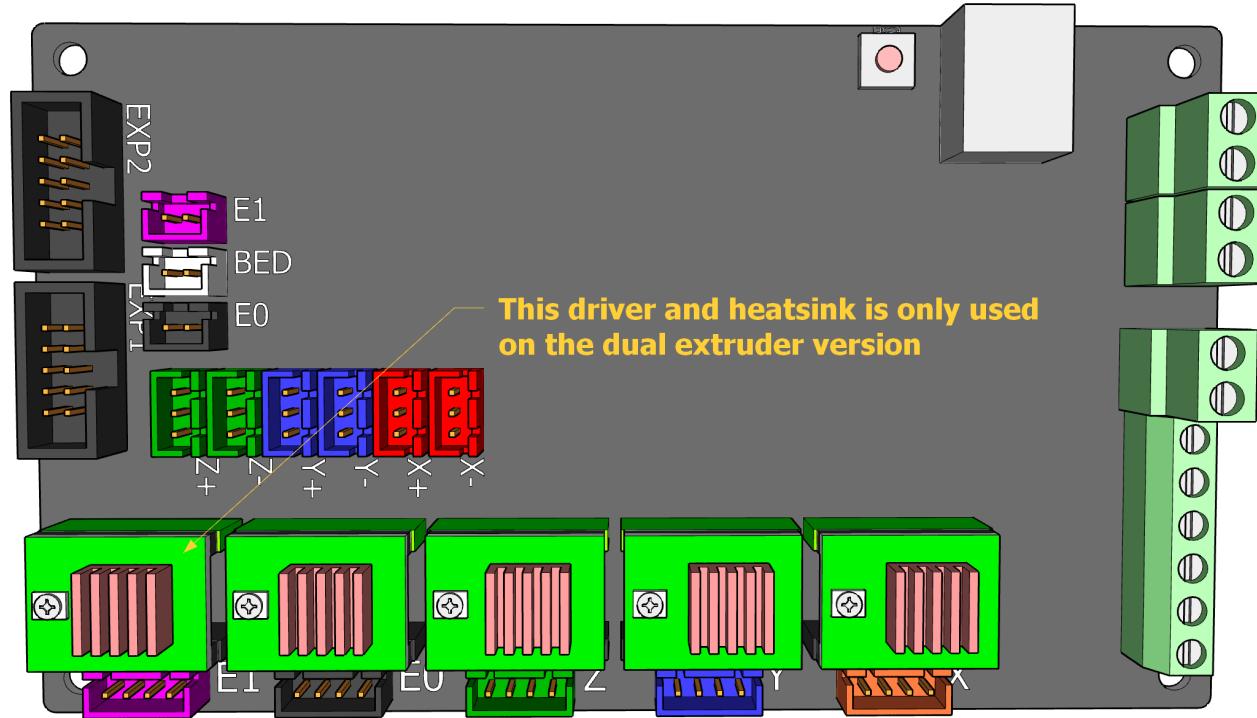


Plug an endstop wire into Z- on the controller then into 5V Auto Level on the controller PCB. Run some thin wires from the unused power connections on the controller to the + and – auto level connections on the controller PCB.

Electronics

Dual Extruder

Step 4

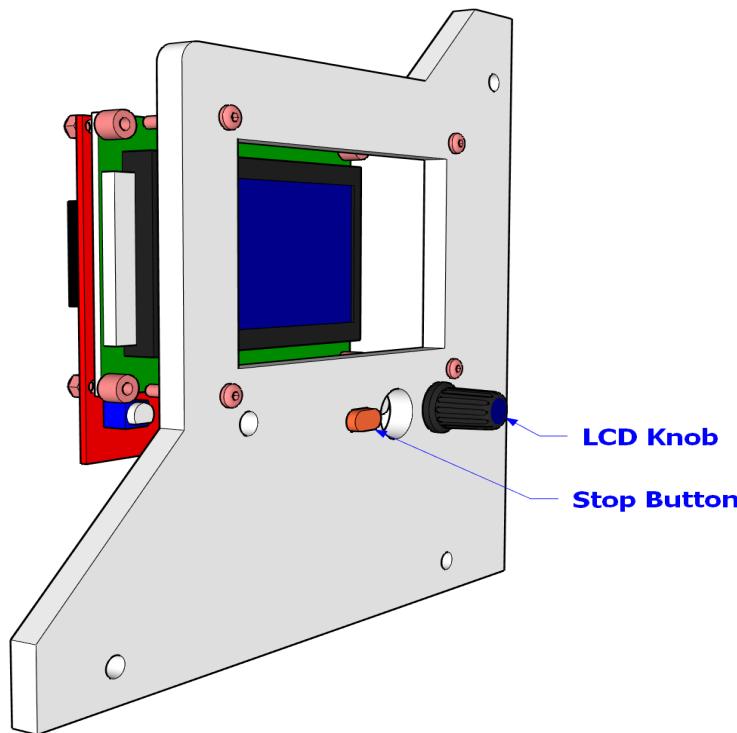
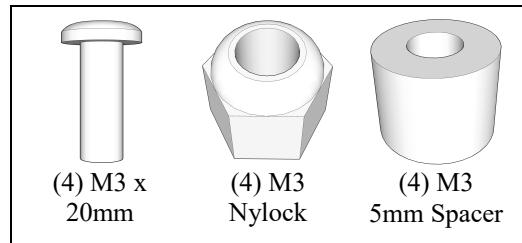


Remove the protective film from the underside of the stepper driver heatsinks and mount them to the drivers with the fins oriented as shown. **You will be using all 5.**

Electronics

12864 GLCD

Step 1

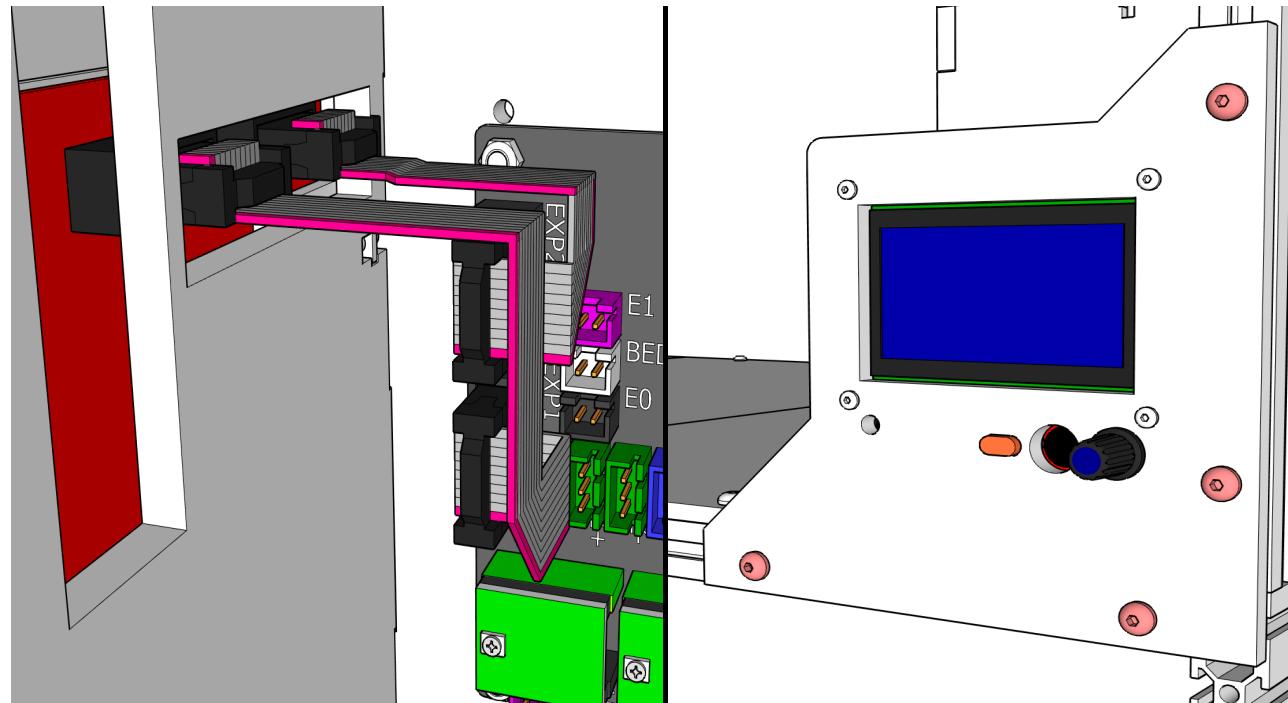
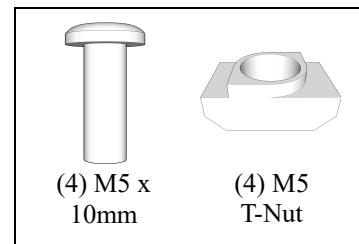


Insert the stop button into the 12864 GLCD panel (BFP-22) then mount the 12864 GLCD to the panel using the M3 hardware and spacers. Push on the LCD knob.

Electronics

12864 GLCD

Step 2

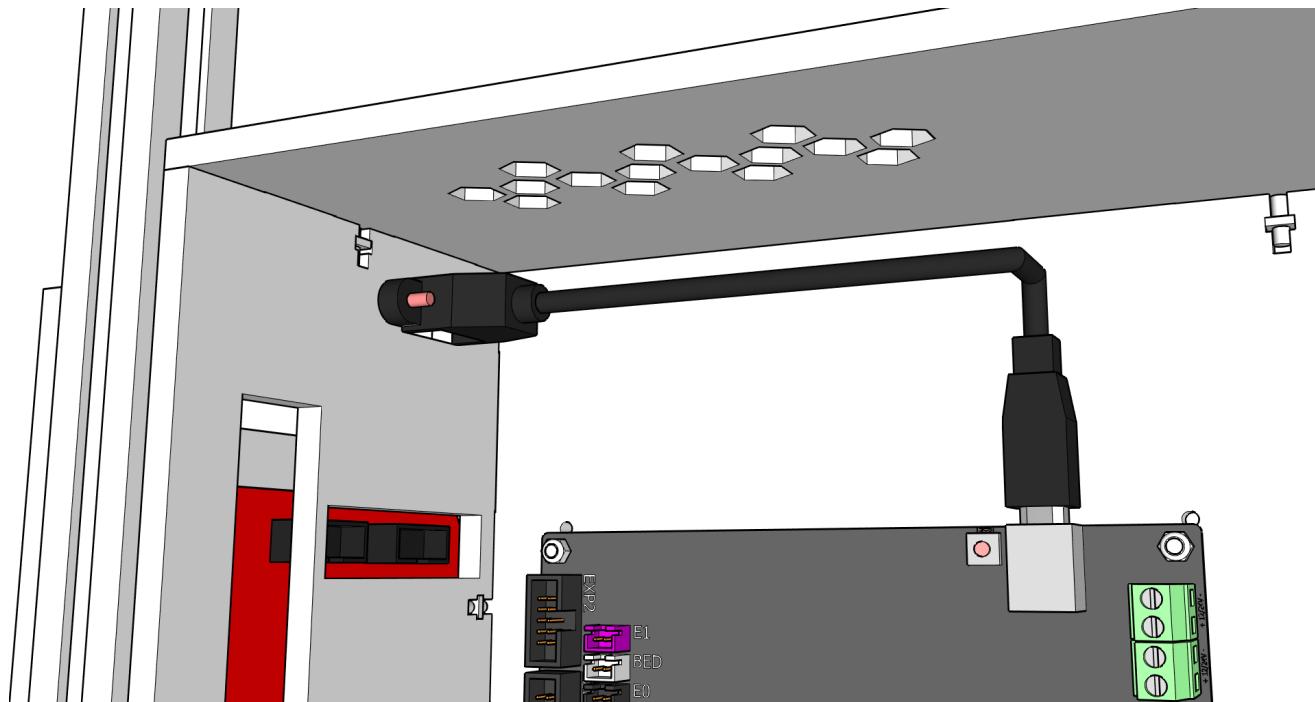
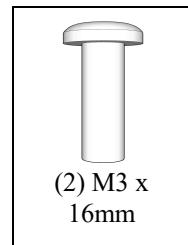


Plug the ribbons into the 12864 GLCD. Run the cables through the slot in the front of the electronics enclosure and plug into the controller matching EXP1 and EXP2. Mount the 12964 GLCD assembly to the frame.

Electronics

12864 GLCD

Step 3

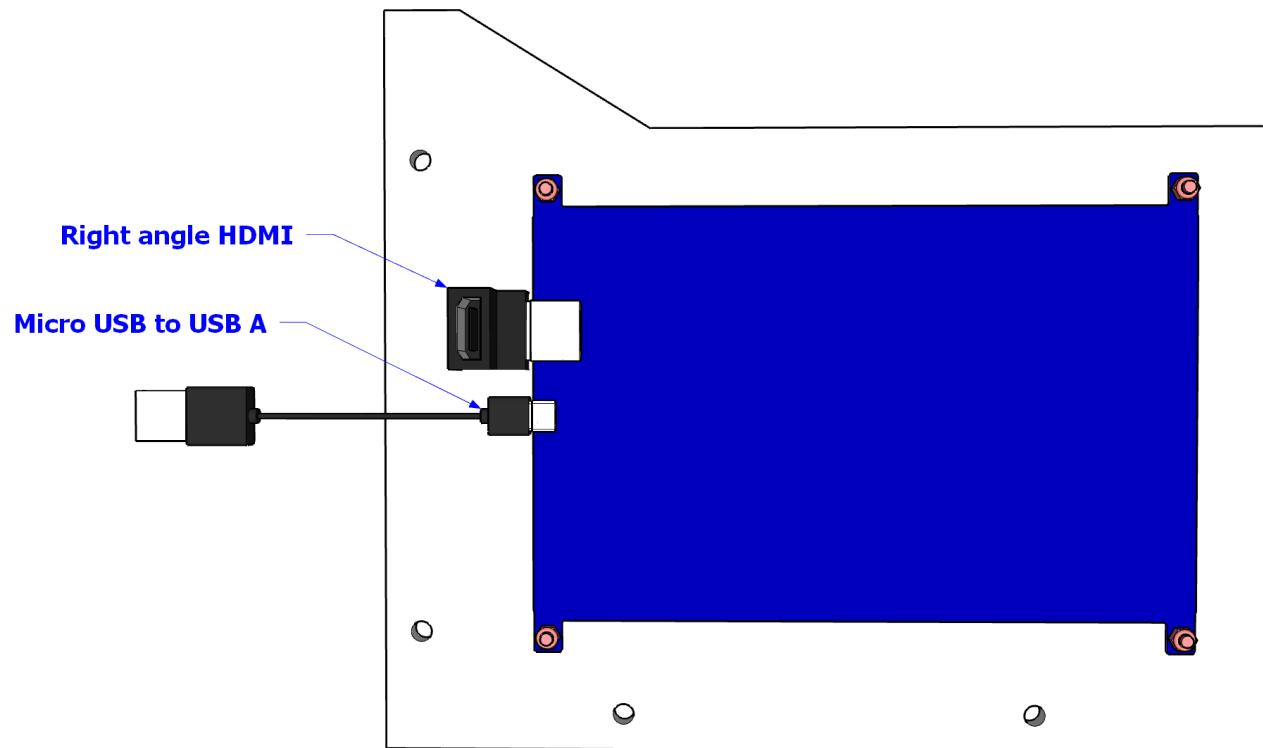
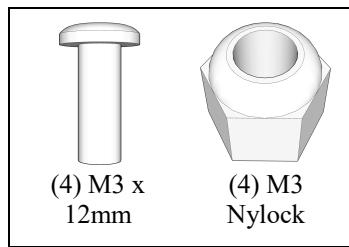


Mount the USB panel mount cable to the front of the electronics enclosure. Plug it into the controller.

Electronics

RPi Touch

Step 1

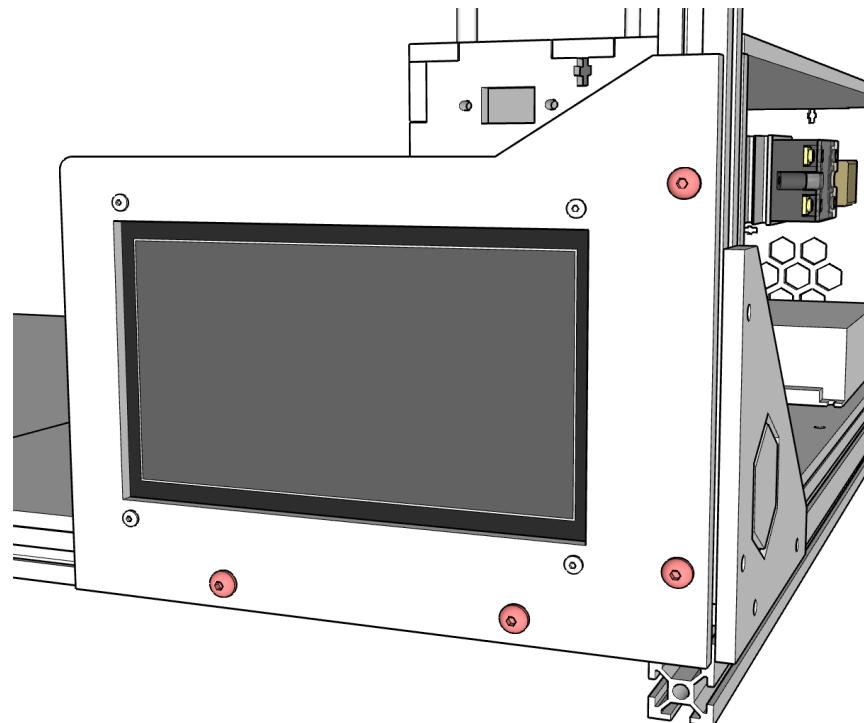
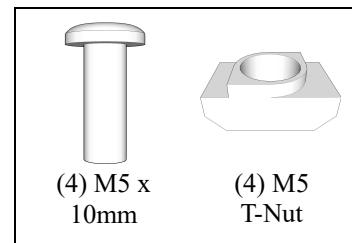


Mount the 7" LCD to the 7" LCD panel (BFP-23) using M3 hardware. Plug the right angle HDMI adapter and micro USB to USB cable into the LCD.

Electronics

RPi Touch

Step 2

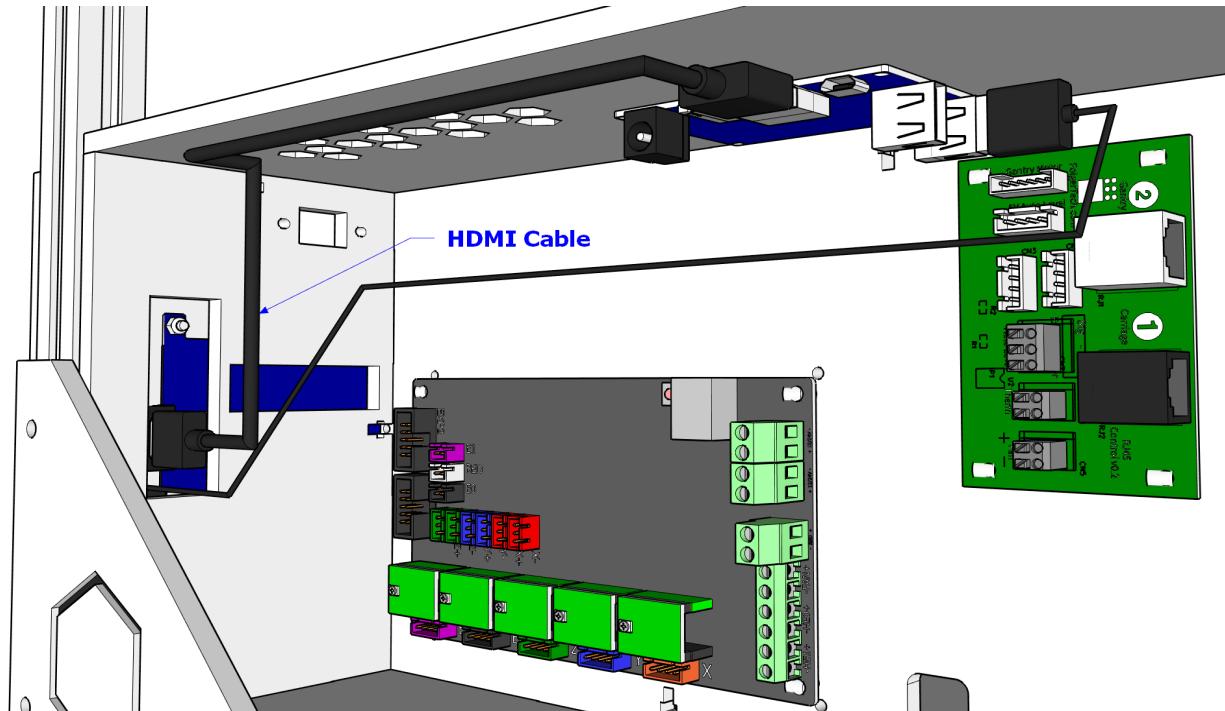


Mount the LCD assembly to the frame.

Electronics

RPi Touch

Step 3

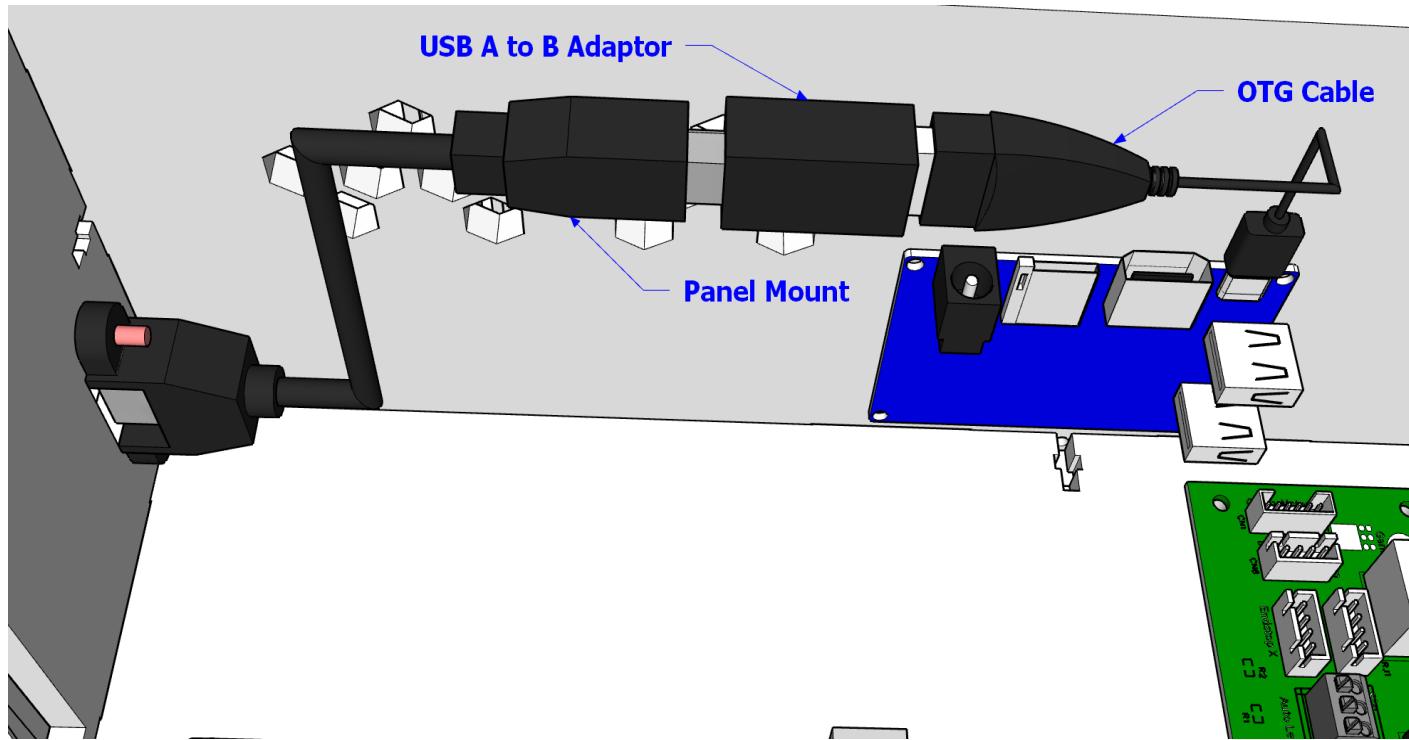
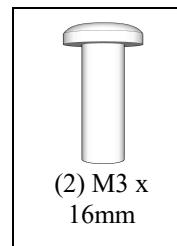


Plug the USB cable into the Pi. Run the HDMI cable from the LCD to the Pi. Mount the Pi to the top of the enclosure using one piece of mounting tape as shown. Make sure there is clearance to get to all of the ports.

Electronics

RPi Touch

Step 4

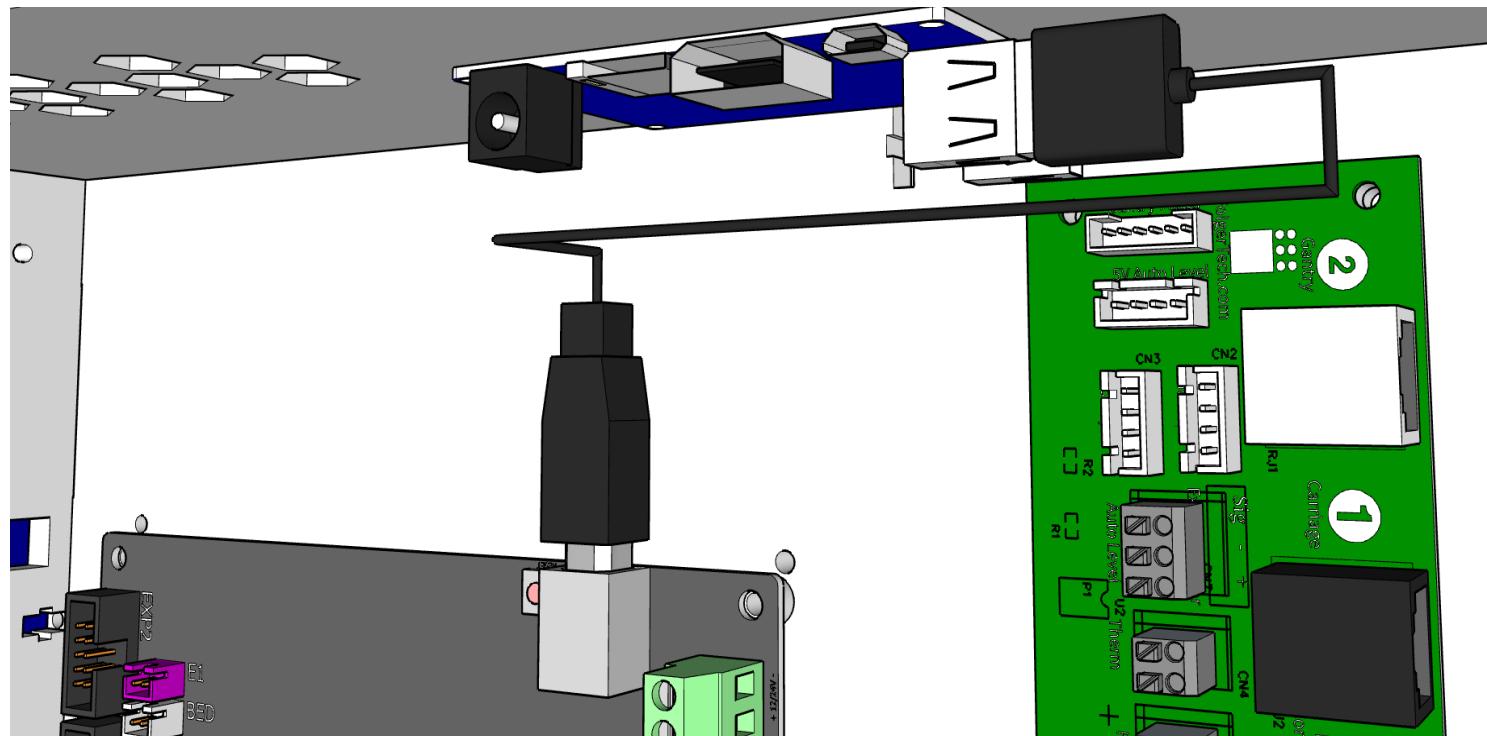


Connect the panel mount cable to the OTG cable using the USB A to B adapter. Mount the panel mount cable to the front of the enclosure and plug the OTG cable into the Pi.

Electronics

RPi Touch

Step 5

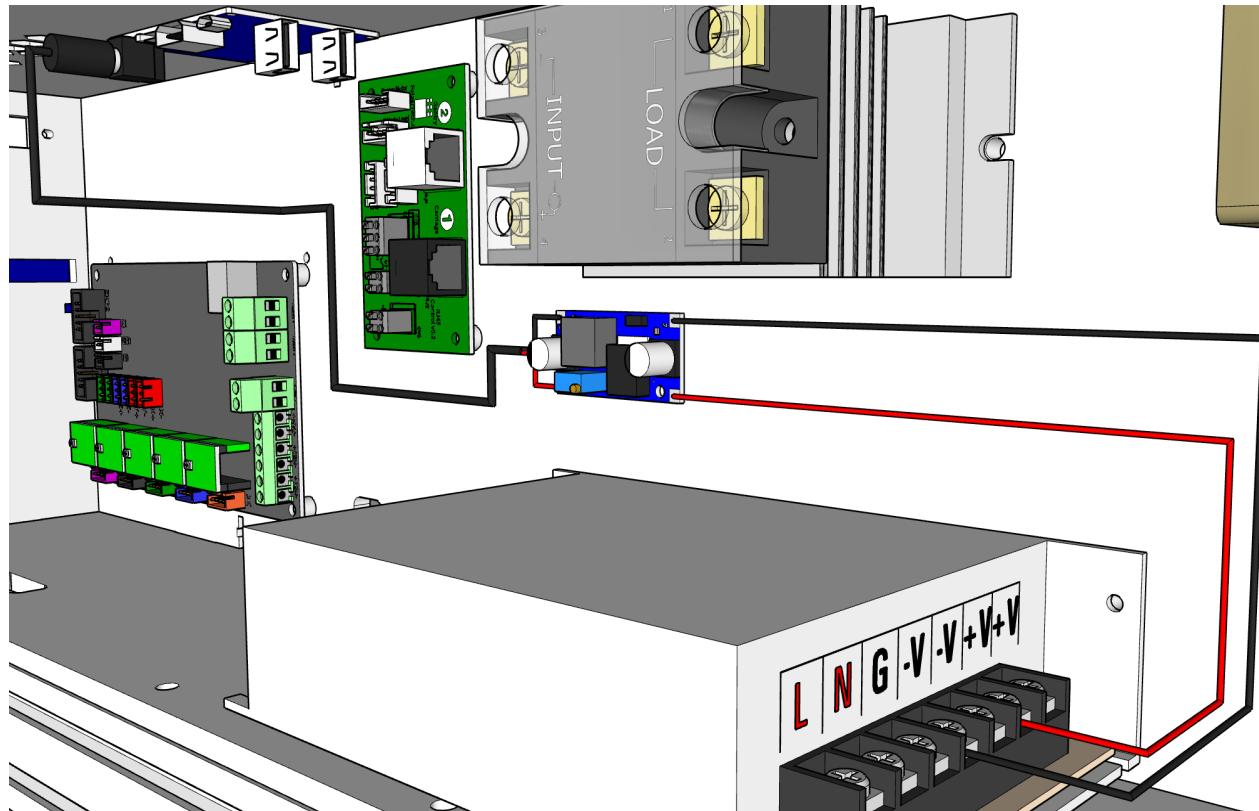


Plug the USB A to B cable into the Pi and controller.

Electronics

RPi Touch

Step 6



Connect the input leads of the buck converter to the unused terminals on the PSU. Plug the barrel plug into the Pi. Mount the buck converter using mounting tape as shown.

Configuration

You are now ready to setup and configure your printer. The setup guide can be found at the google drive link and will walk you though the steps of installing the PC software and the firmware. It will also cover configuration and setup of the printer.

Community ran resources (unofficial)

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[Forum](#)

[Reddit](#)

[Thingiverse](#)

Official resources

Facebook

Blog

Written and illustrated by Chris Sorrows.