

# Micron

R1

## ASSEMBLY MANUAL

Everything is smaller but the price.



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## INTRODUCTION

### STL FILE KEY

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The STL naming convention used for Micron is the same as that used for VORON printers:

PRIMARY COLOR	ACCENT COLOR 	QUANTITY REQUIRED
<p><b>Example</b> <b>z_drive_main_a_x2.stl</b> These files will have nothing at the start of the filename.</p>	<p><b>Example</b> <b>[a]_z_drive_baseplate_a_x2.stl</b> These files will have “[a]” to the front to mention that they are intended to be printed with an accent color.</p>	<p><b>Example</b> <b>[a]_z_drive_baseplate_a_x2.stl</b> If a file ends with “_x#”, that is telling you the quantity of that part required to build this system..</p>

### PRINT GUIDELINES

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The recommended print settings are also those used for VORON printers:

#### FDM MATERIAL

Micron was designed for ABS.  
Use other plastics at your own discretion.

#### LAYER HEIGHT

Recommended : 0.2mm

#### EXTRUSION WIDTH

Recommended : Forced 0.4mm

#### INFILL PERCENTAGE

Recommended : 40%

#### INFILL TYPE

Grid, Gyroid, Honeycomb, Triangle, Cubic, Adaptive Cubic.

#### WALL COUNT

Recommended : 4

#### SOLID TOP/BOTTOM LAYERS

Recommended : 5

#### SUPPORTS REQUIRED

If the part needs supports, they are built into the model.

## HOW TO GET HELP

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If you need assistance with your build you can head over the DOOMCUBE Discord server and post your questions ( typically in the **#micron\_build\_questions** channel ). It is the primary help channel for the Micron! You can also check the Github page for the latest releases.

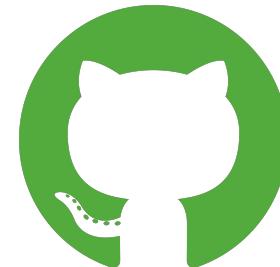
### DISCO? OH ...DISCORD

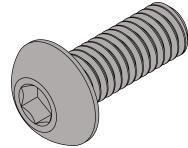
If you need assistance with your build you can head over the DOOMCUBE Discord server and post your questions (typically in the **#micron\_build\_questions** channel ). It is the primary help channel for the Micron!



### GIT GUD

If you want to stay up to date on the latest files for Micron. The github page is the only source for the latest files.

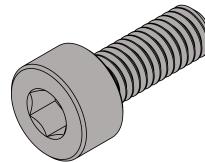




#### BUTTON HEAD CAP SCREW (BHCS)

Metric fastener with a domed shaped head and hex drive. Most commonly found in locations where M3 fasteners are used.

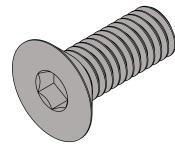
ISO 7380-1



#### SOCKET HEAD CAP SCREW (SHCS)

Metric fastener with a cylindrical head and hex drive. The most common fastener used on the Voron.

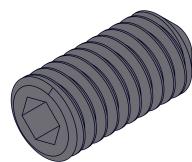
ISO 4762 / DIN 912



#### FLAT HEAD CAP SCREW (FHCS)

Metric fastener with a cone shaped head and a flat top.

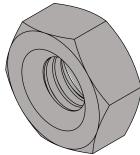
ISO 10642



#### GRUB SCREW (GS)

Metric Socket Cup Point Set Screws (also called Hollow Point Grub Screws) are fitted with a concave cup point, which allows them to fit closely against a rounded surface such as a motor shaft.

ISO 4029/ DIN 916



#### HEX NUT

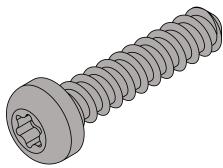
Hex nuts couple with bolts to create a tight, secure joint. You'll see these used in both M2 and M3 variants throughout this guide.

ISO 4032 / DIN 934

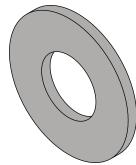


#### HEAT SET INSERT

Heat the inserts with a soldering iron so that they melt the plastic when installed. As the plastic cools, it solidifies around the knurls and ridges on the insert for excellent resistance to both torque and pull-out.

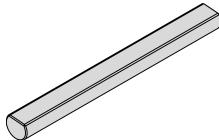


**SELF TAPPING SCREW**  
Fastener with a pronounced thread profile that is screwed directly into plastic.

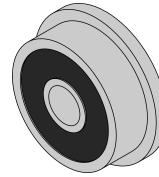


**M3 SHIMS**  
Not to be confused with stamped washers. These are used in all M3 call-out locations in this manual.

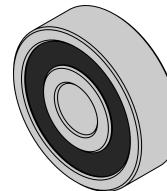
**3x6x0.5 DIN 988**



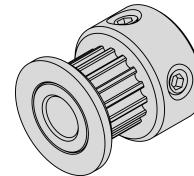
**5mm x 47mm Shaft**  
Steel shaft, 5mm in diameter, 47mm long with a flat ground on it used in the Z drive gear box assembly



**F623 BEARING**  
A ball bearing with a flange used in various gantry locations.



**625 BEARING**  
A ball bearing with used in the Z drive.



**PULLEY**  
GT2 pulley used on the motion system of the Micron.



#### ATTENTION BUBBLE

This logo denotes steps that are common areas that mistakes can occur.

(5) Bottom – **180**

Look for the **BLACK** call outs to mention the preloaded M3 nuts, **NOTE:** some of them are specific to the size of printer and will be in bold at the end

(3) outside

Look for the **GRAY** call outs to mention the preloaded M3 nuts that are optional. Some of the printed parts have a printed twist lock version to attach to the frame OR a screwed-on version. If you choose to use the twist lock then you can ignore the gray nut call outs

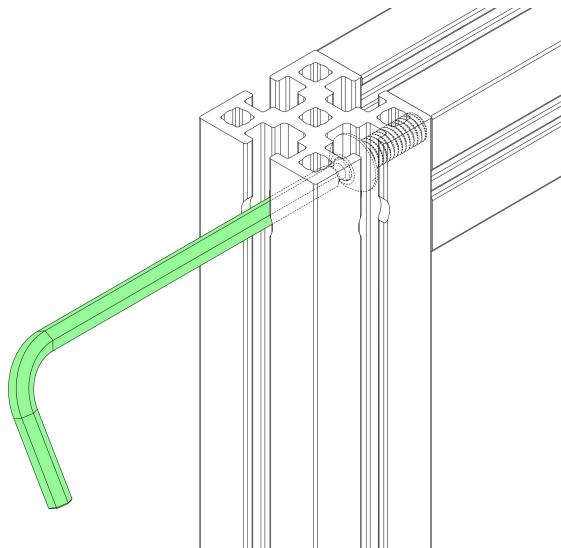
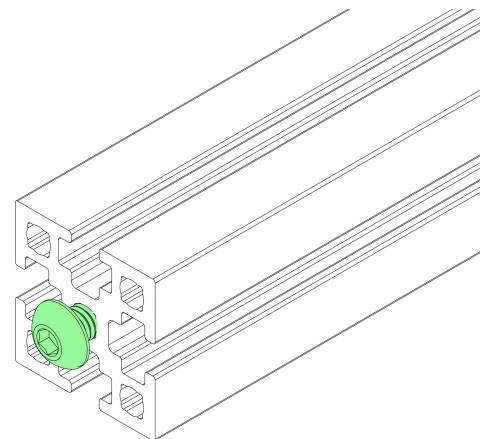


#### MICRON Logo

Look for Micron Logo next to the printed part, this is a direct link to the file on the github repo.

M3x8 SHCS

Look for the **GREEN** call outs to mention the various hardware used

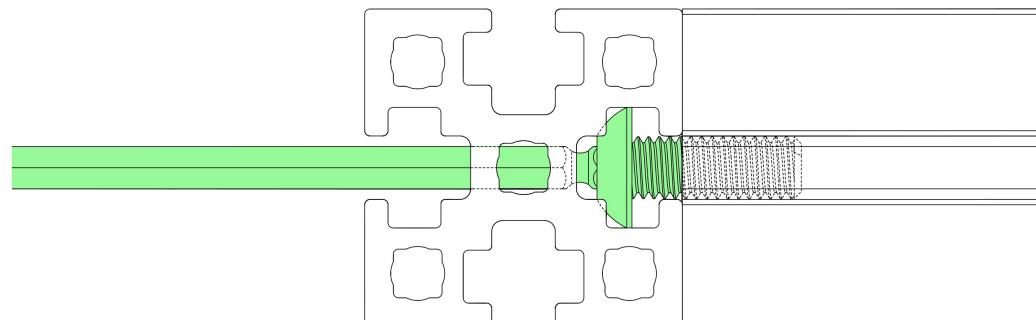
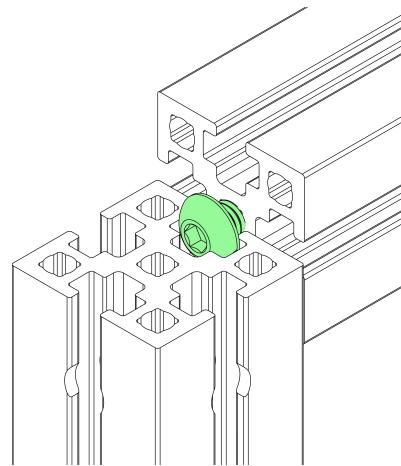


### BLIND JOINT BASICS

Blind Joints provide a cost-effective and rigid assembly method.

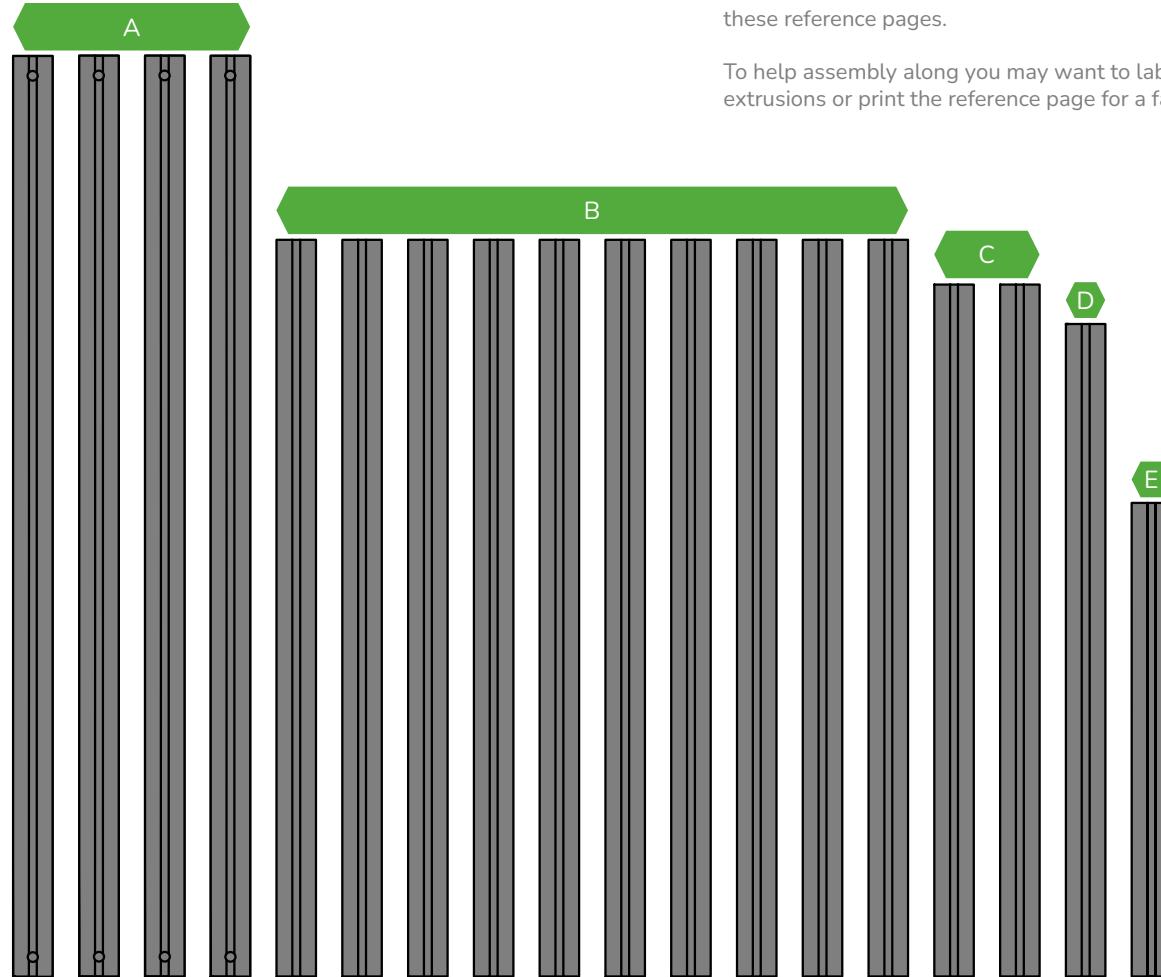
The head of the BHCS is slid into the channel of another extrusion and securely fastened through a small access hole in the extrusion.

If you've never assembled one before we recommend you watch the linked guide.



### SORT EXTRUSIONS

Collect your extrusions and sort them by length. We will highlight the extrusions used in each step and label them as shown on this page.

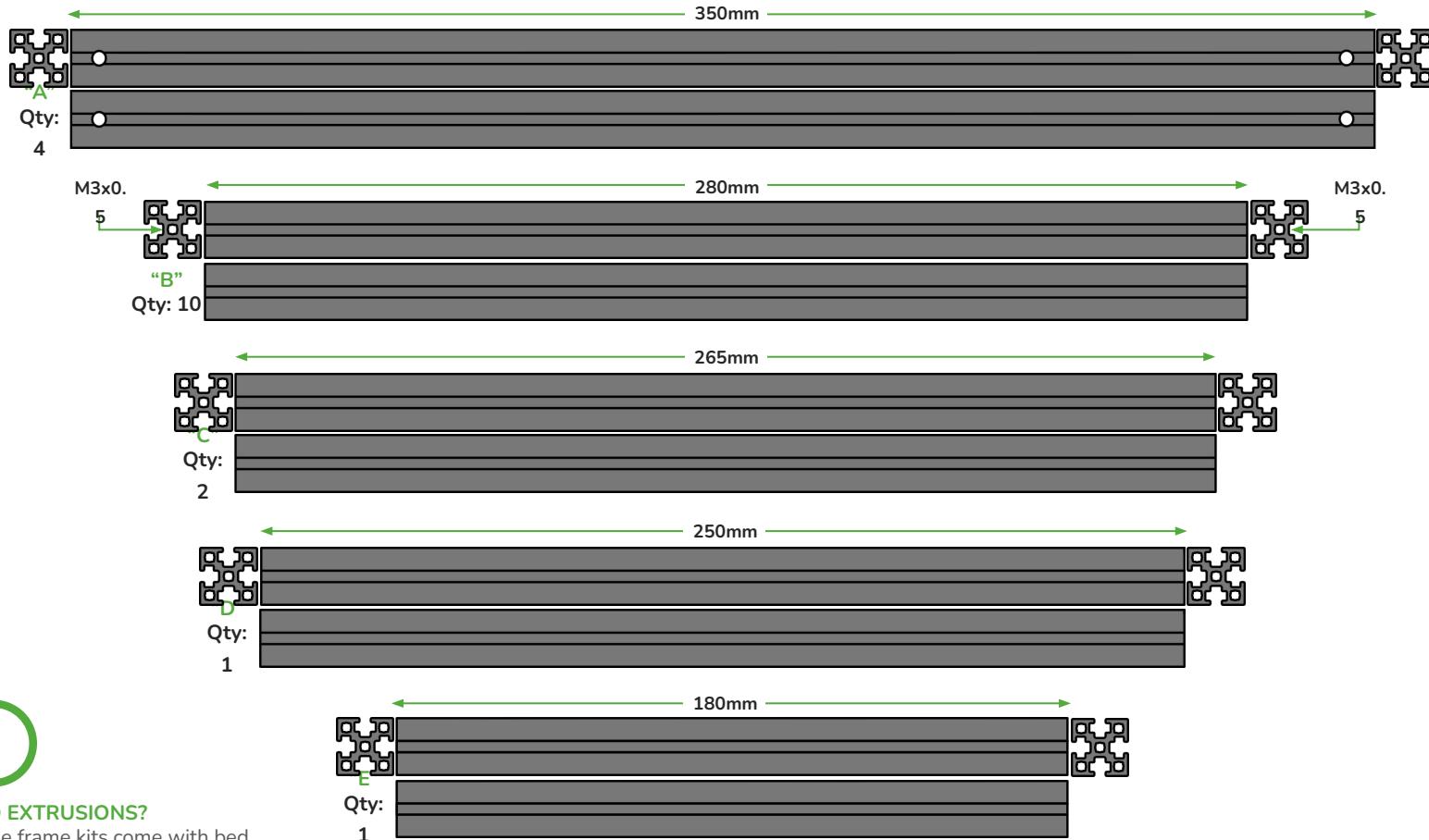


### EXTRUSION CALL-OUTS

To avoid confusion, we will call out the extrusions by the names shown on these reference pages.

To help assembly along you may want to label the extrusions or print the reference page for a faster lookup.

## EXTRUSION PREP | Reference – 180x180



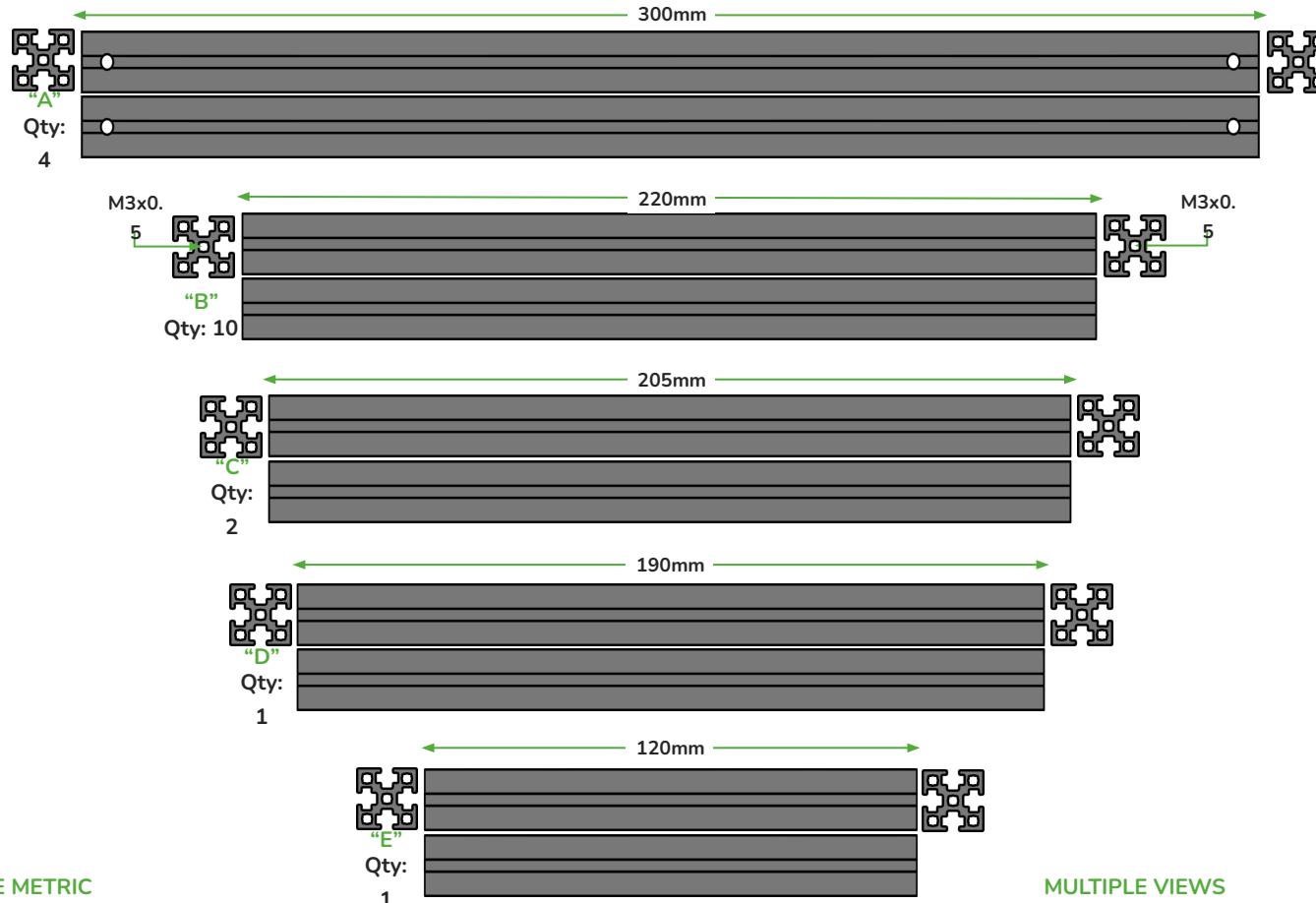
### BED EXTRUSIONS?

Some frame kits come with bed extrusions that are mounted using blind joints. These will end up being 2 longer extrusions and 8 **B** extrusions.

### MULTIPLE VIEWS

The views shown are the left, front, right, and bottom views of each extrusion.

## EXTRUSION PREP | Reference – 120x120



**ALL UNITS ARE METRIC**  
If a unit is not specified  
assume it's metric.

**MULTIPLE VIEWS**  
The views shown are the left, front, right, and bottom views of each extrusion.



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## SUB ASSEMBLIES

### SUB ASSEMBLIES

To make building the printer slightly easier, we're first going to install all required heatset inserts, then build each sub assembly independently.

Once complete, we'll move on to installing them in the frame.

#### Steps

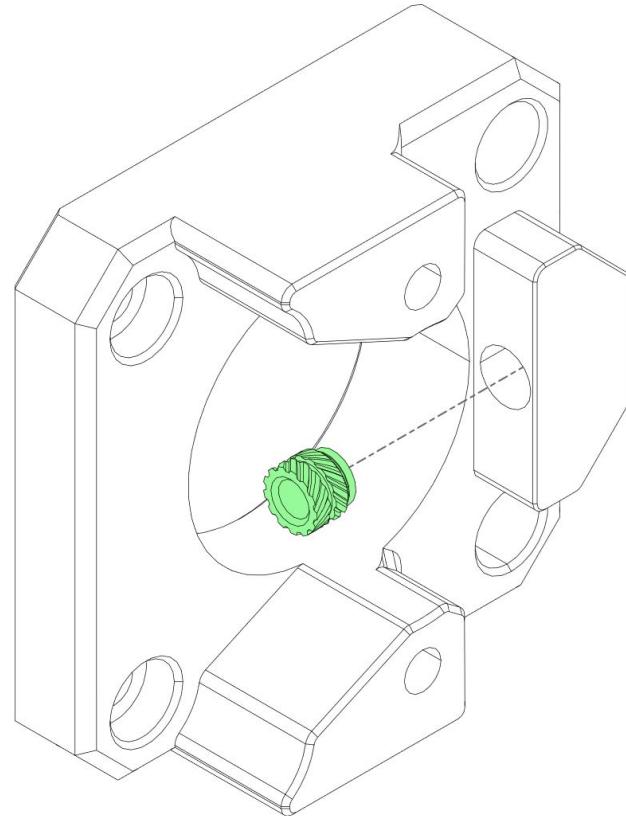
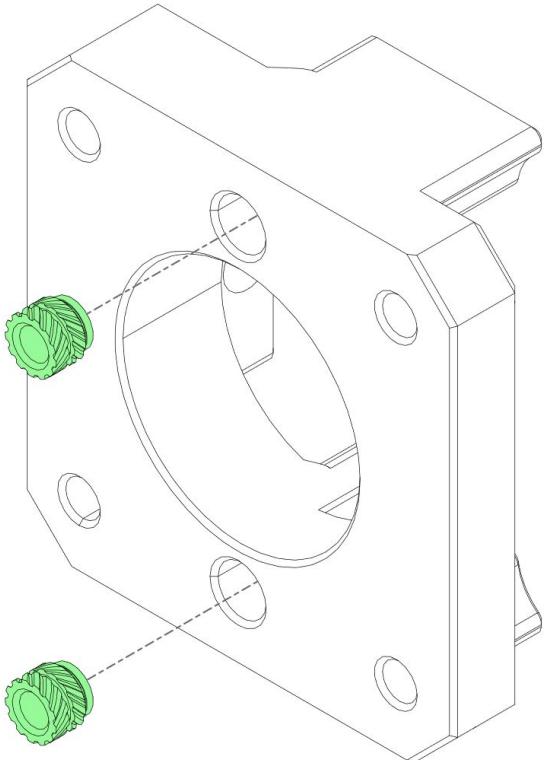
- Heatset Inserts
- Frame
- Belted Z Drives
- A / B Motor Mounts
- X / Y Joints
- Front Idlers
- Filter

#### DEFAULT DECISION

Micron gives you more build options than your favourite questionable takeaway — and more ways to overthink them. ‘Default Decision’ is your shortcut to a working printer with minimal head scratching. Want to flex your engineering muscles and make all the choices? Crack on, but pack snacks — it’s a longer ride.

Unless you have purchased a kit with all the gucci options, then the decisions have already been made for you. Easy.

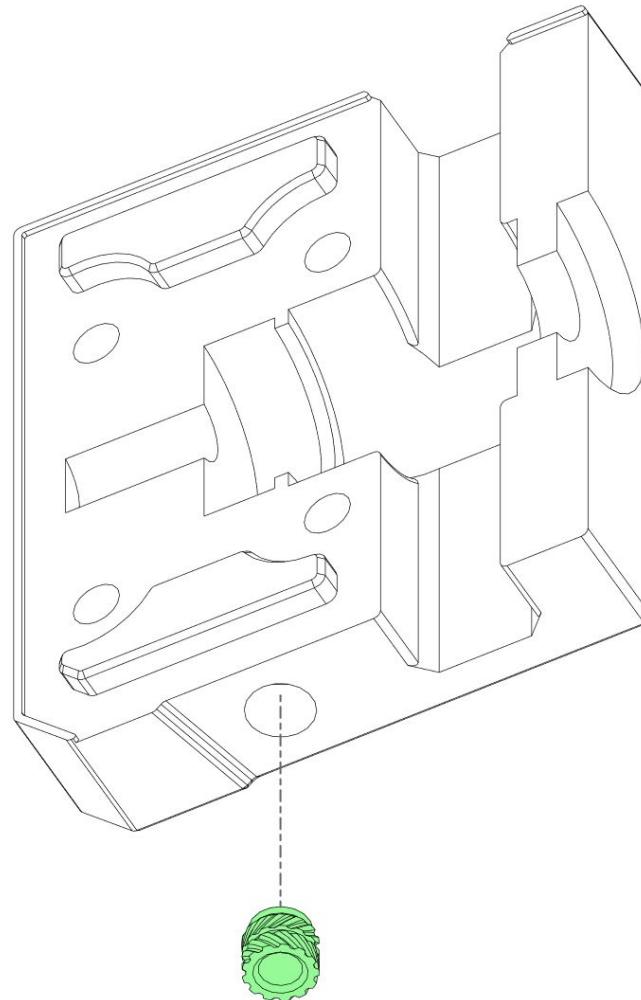
HEATSET INSERTS | Z-DRIVE - Motor mount - x4



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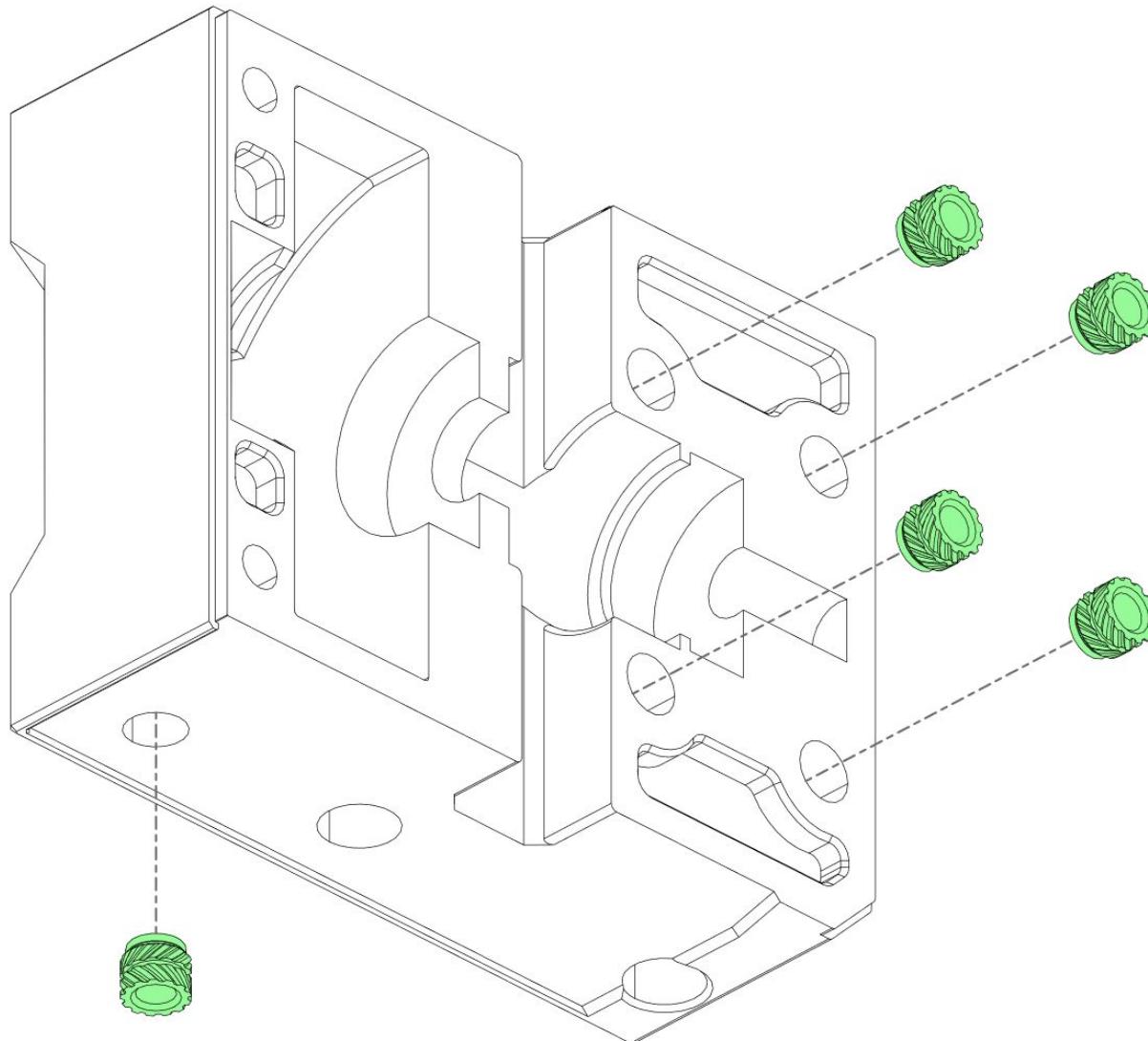
HEATSET INSERTS | Z-DRIVE - Main body - x4



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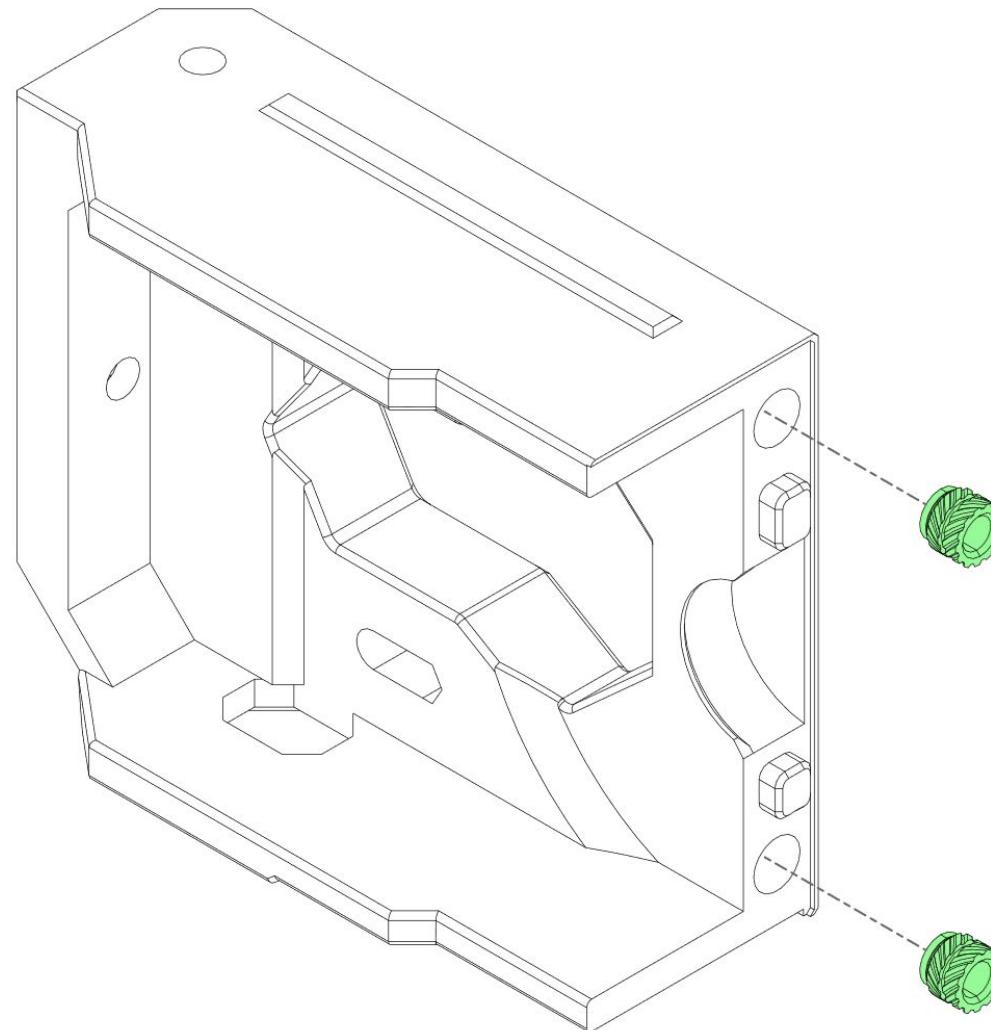
HEATSET INSERTS | Z-DRIVE - Main body - x4 (continued)



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HEATSET INSERTS | Z-DRIVE - Tensioner housing - x4

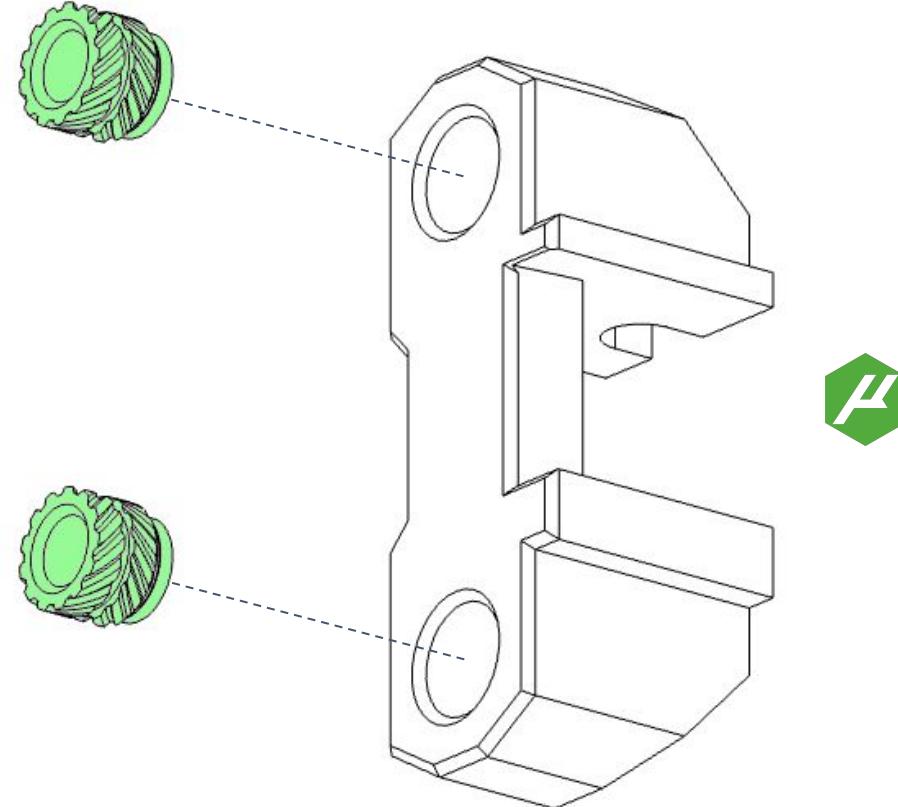
 x2  
 x2



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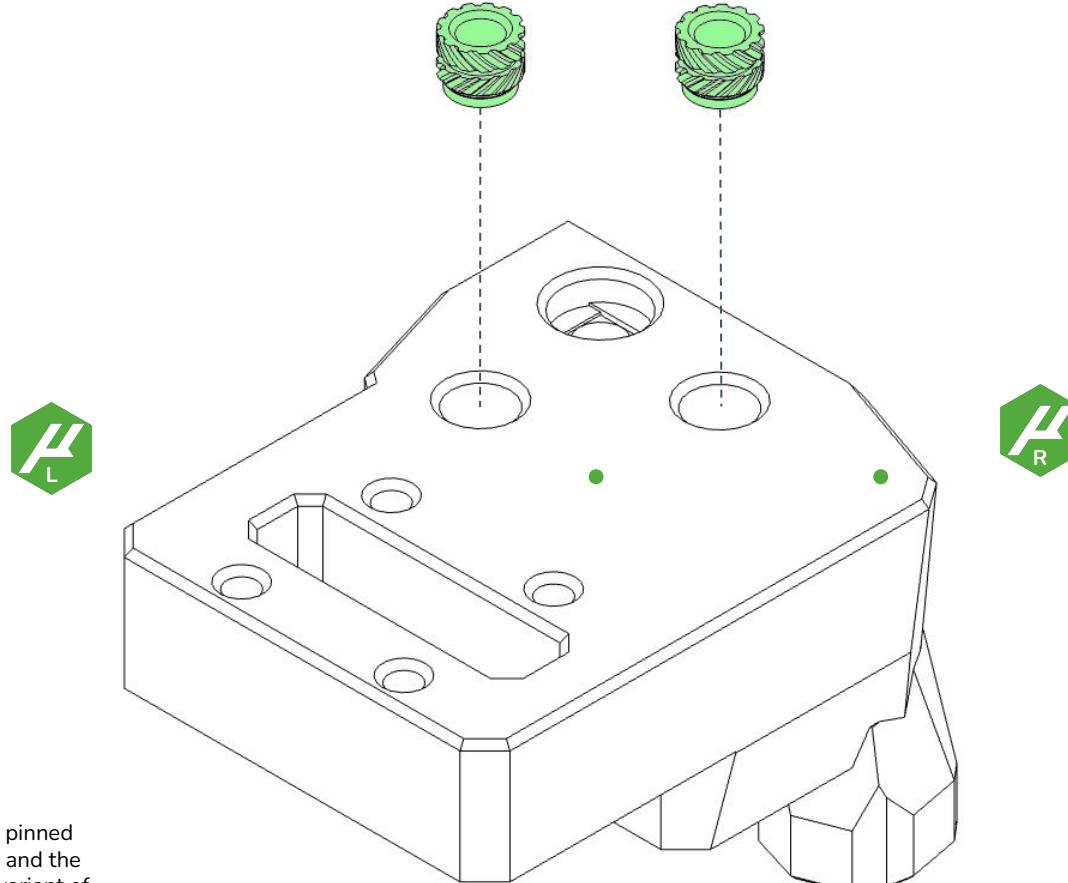
HEATSET INSERTS | FRONT IDLER - Idler carrier - x2



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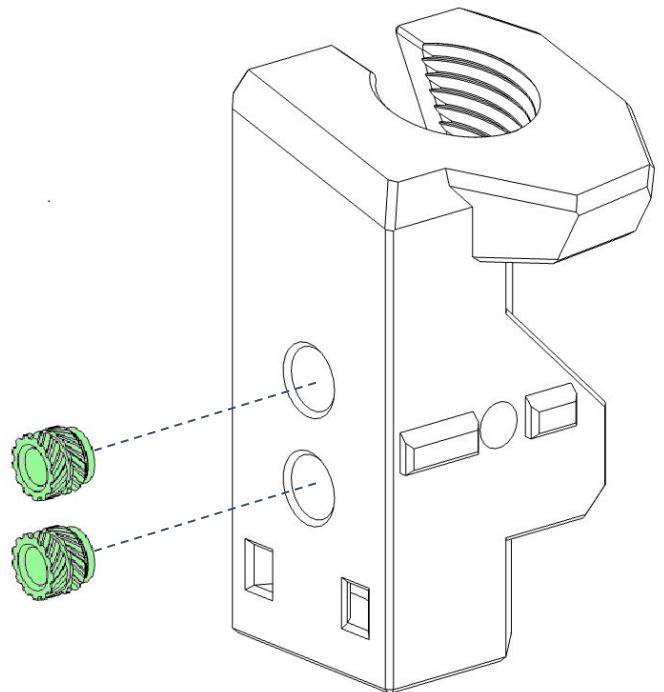
## HEATSET INSERTS | GANTRY - X/Y Joint lower - x2



### SCREWS OR PINS

The image across shows the pinned variant of the XY Joint lower, and the links take you to the pinned variant of the STL. If you are using screws in place of pins, your part will look slightly different with 2 additional smaller holes marked with the green dot ●.

## HEATSET INSERTS | GANTRY - Z Chain mounts



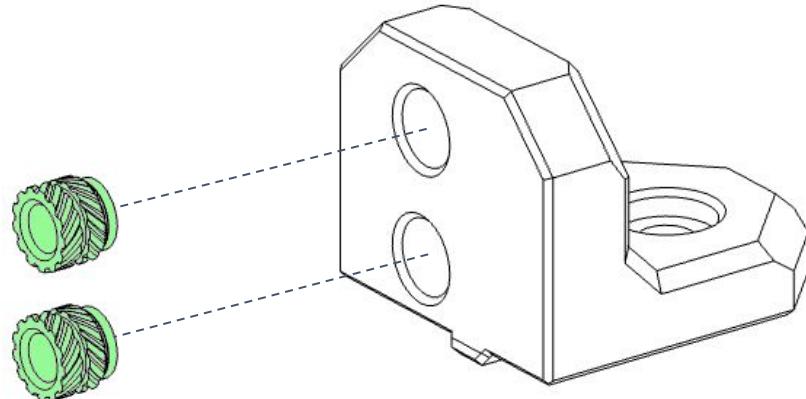
### CHECK YOUR PARTS

There are several variants of these 2 parts, in an attempt to accommodate all manufacturers and suppliers. They consist of 2 hole and 3 hole variants that correspond to how many mounting screws your Z-Chain uses.

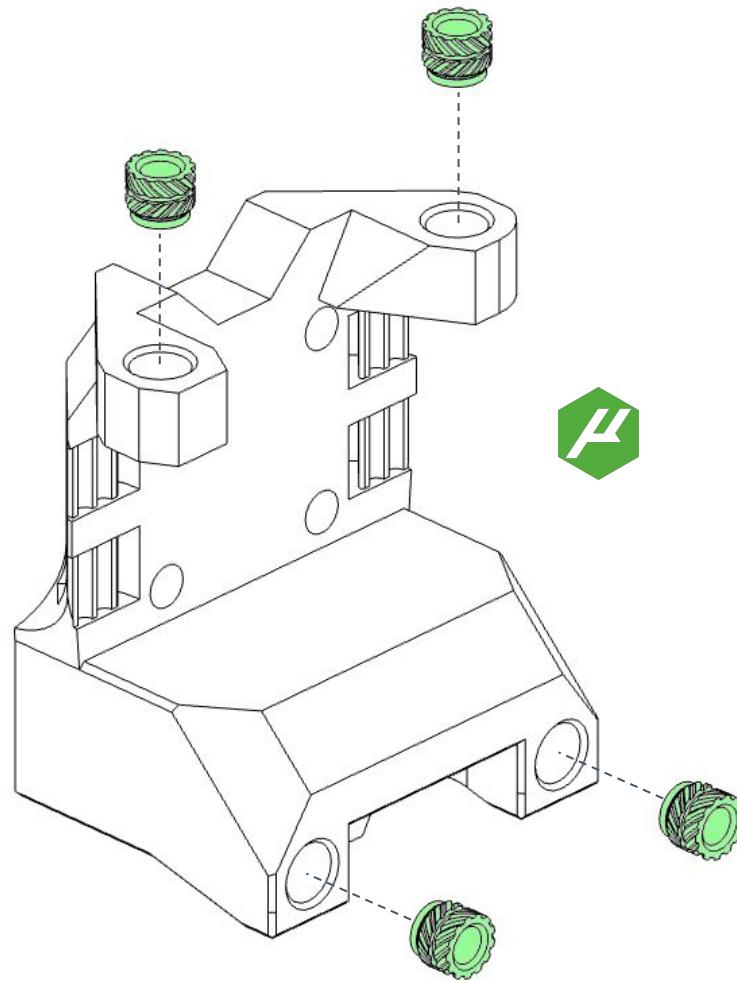
The upper mount then has several threads for different cable glands.

Ensure you've printed the correct versions before inserting any threaded inserts.

**DEFAULT DECISION:** 2-hole mounts are the go to — unless your Z chain supplier got creative. When in doubt, count the holes. The chain ones, not your emotional ones.



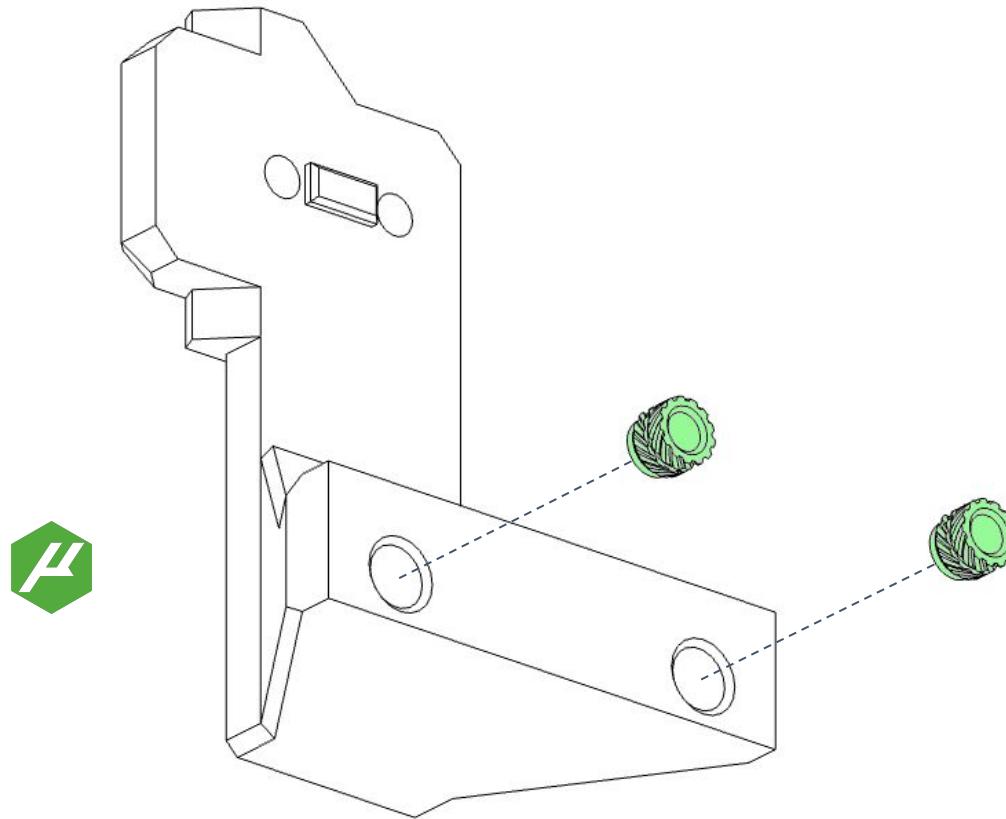
HEATSET INSERTS | GANTRY - X Carriage



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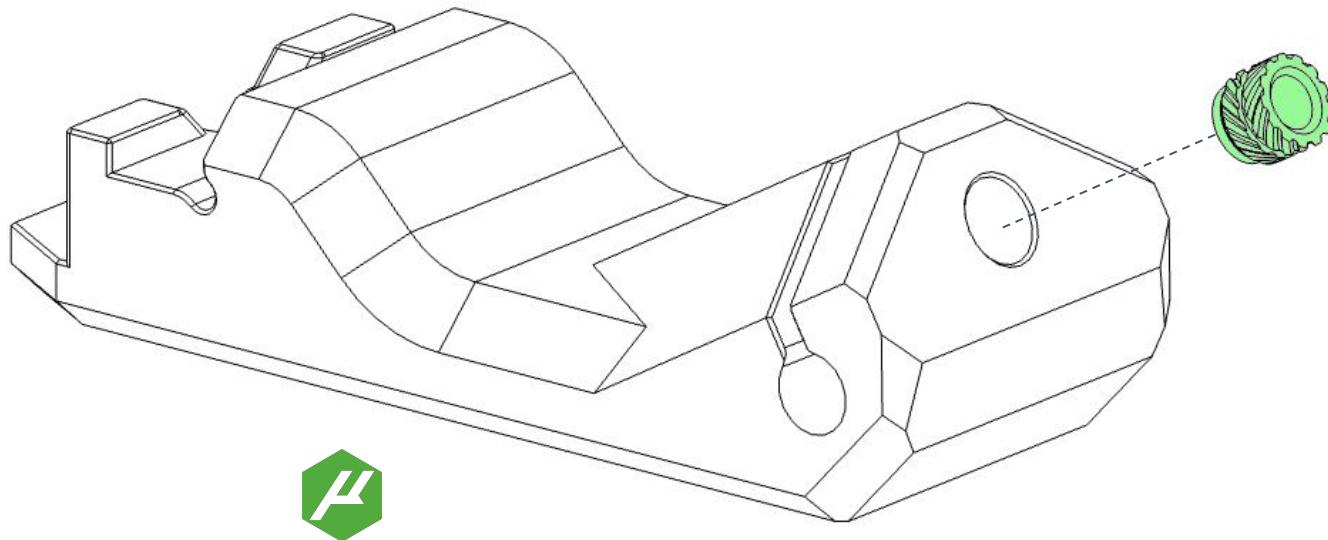
HEATSET INSERTS | GANTRY - Klicky dock



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HEATSET INSERTS | PANELS - Bowden Tube Holder x2



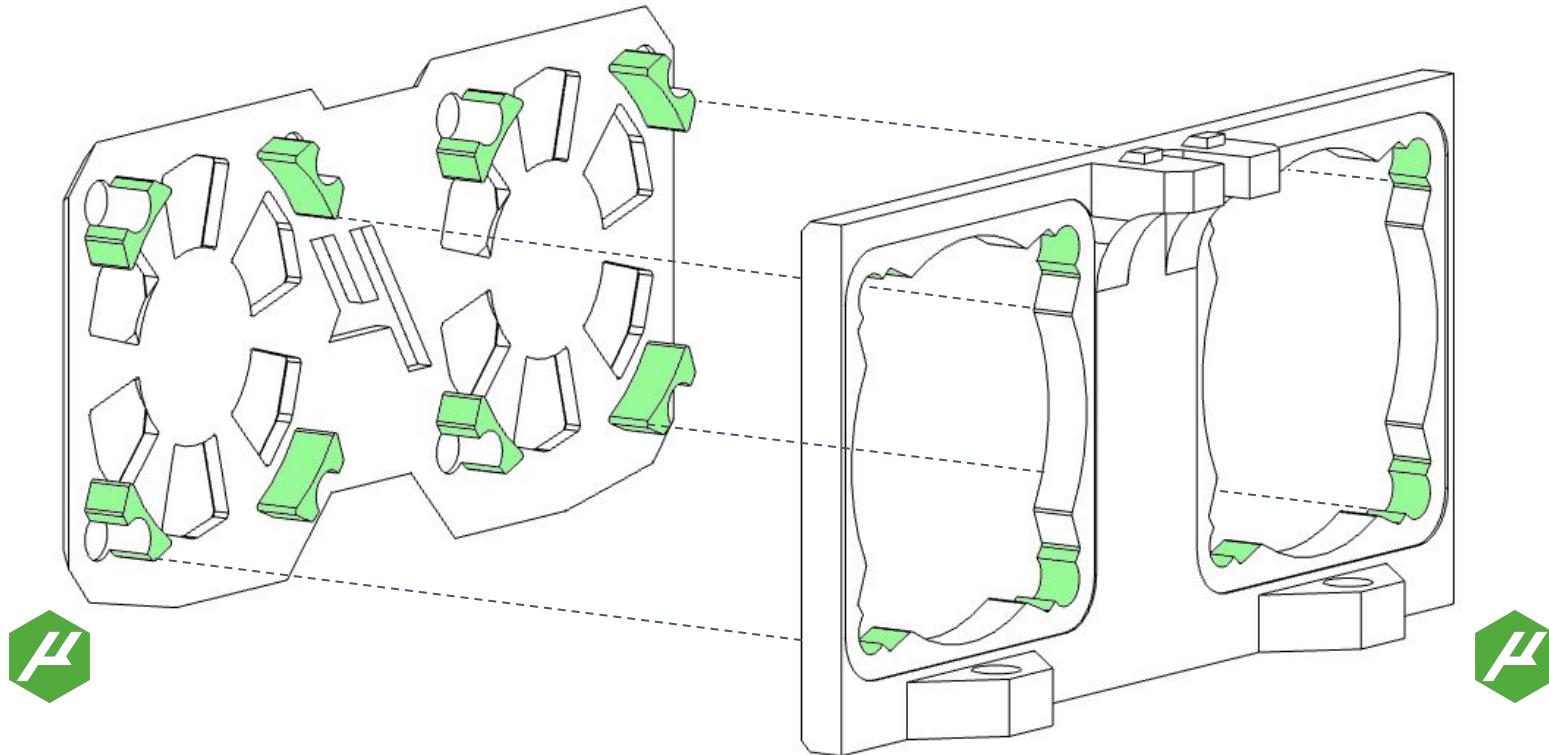
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MICRON

## HEATSET INSERTS | SKIRTS - Centre fan mount x2

### THE 90'S CALLED, THEY WANT THEIR VISIBLE HARDWARE BACK

Before we can add the threaded inserts to the fan mounts, we need to bring the **[a]\_fan\_grill** and **fan mount** pieces together. They threaded inserts will then be used to fuse the 2x pieces together, for that stealthy, no hardware, aesthetic on the outside.



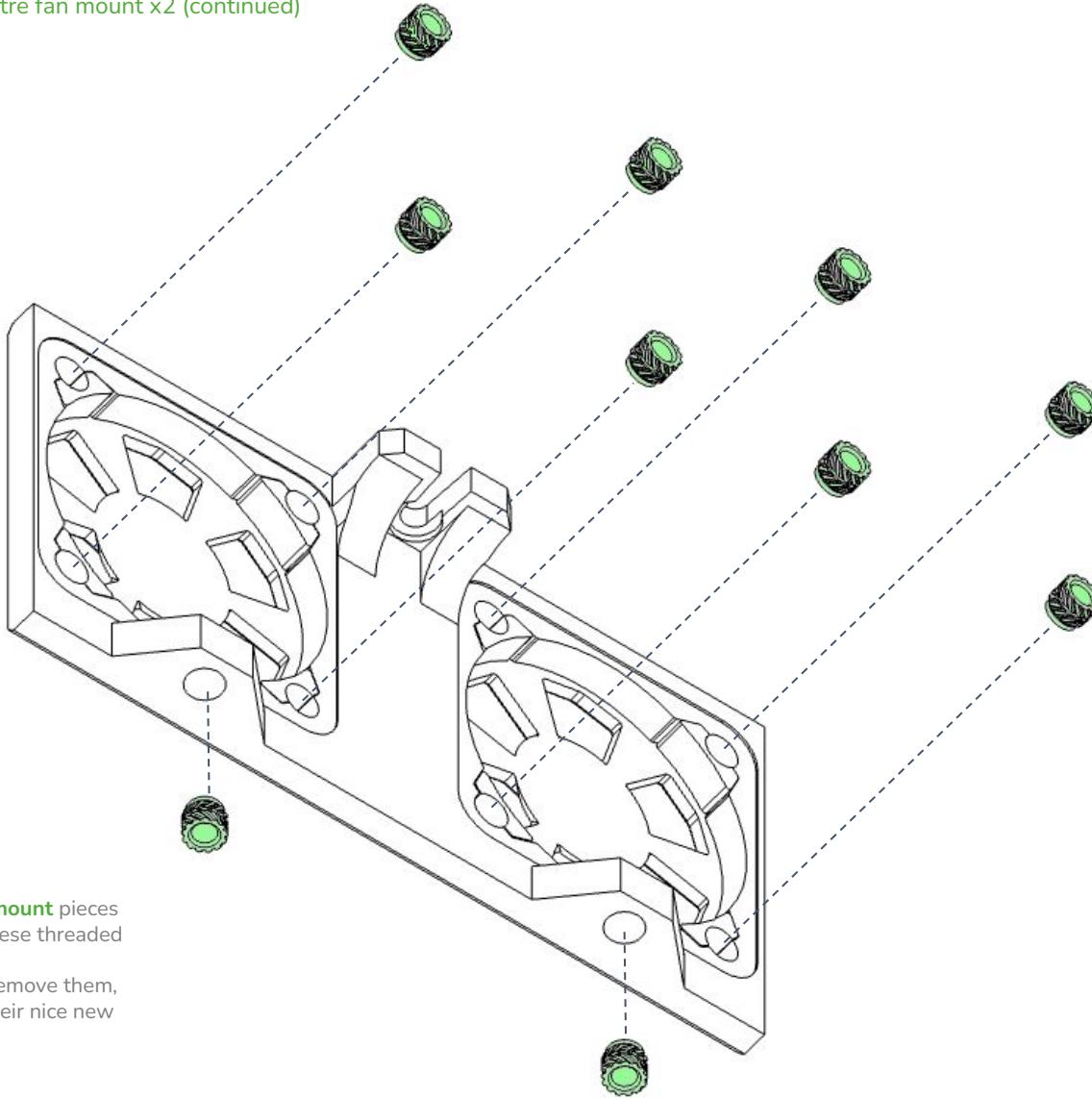
## HEATSET INSERTS | SKIRTS - Centre fan mount x2 (continued)



### NO PRESSURE...

Make sure the [a]\_fan\_grill and **fan mount** pieces are nice and flush. Once you insert these threaded inserts, there's no going back!

(Well technically, you could try and remove them, but who wants that gooey mess in their nice new printer?)



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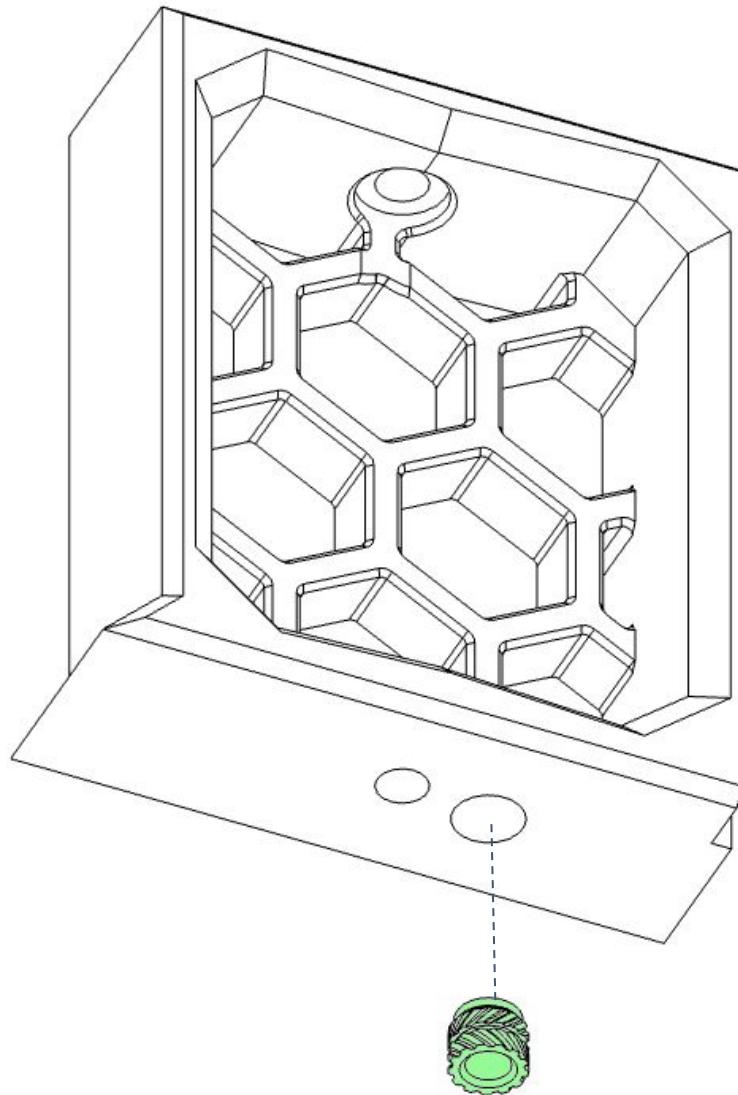
HEATSET INSERTS | SKIRTS - Side skirts x4



x2



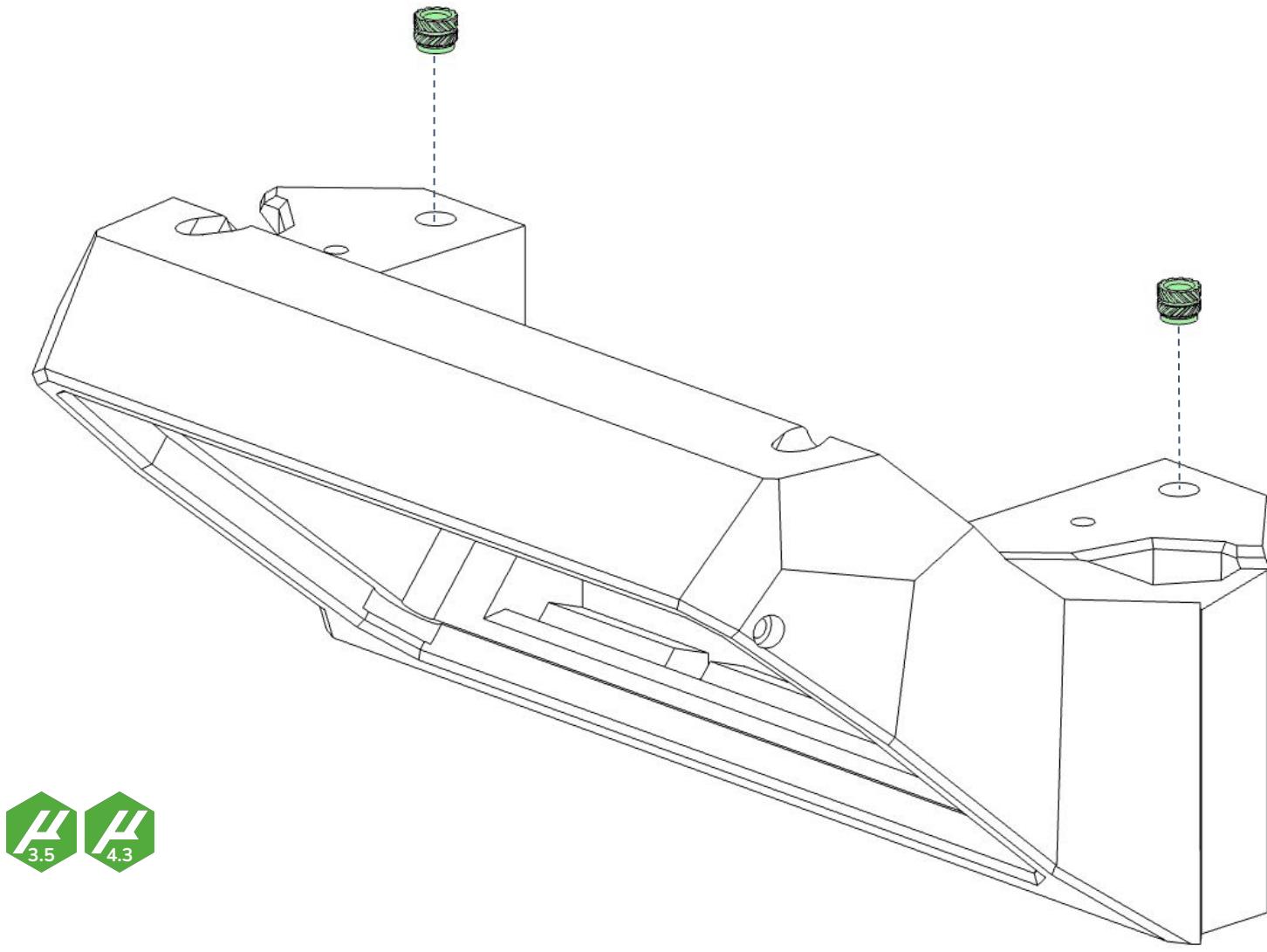
x2



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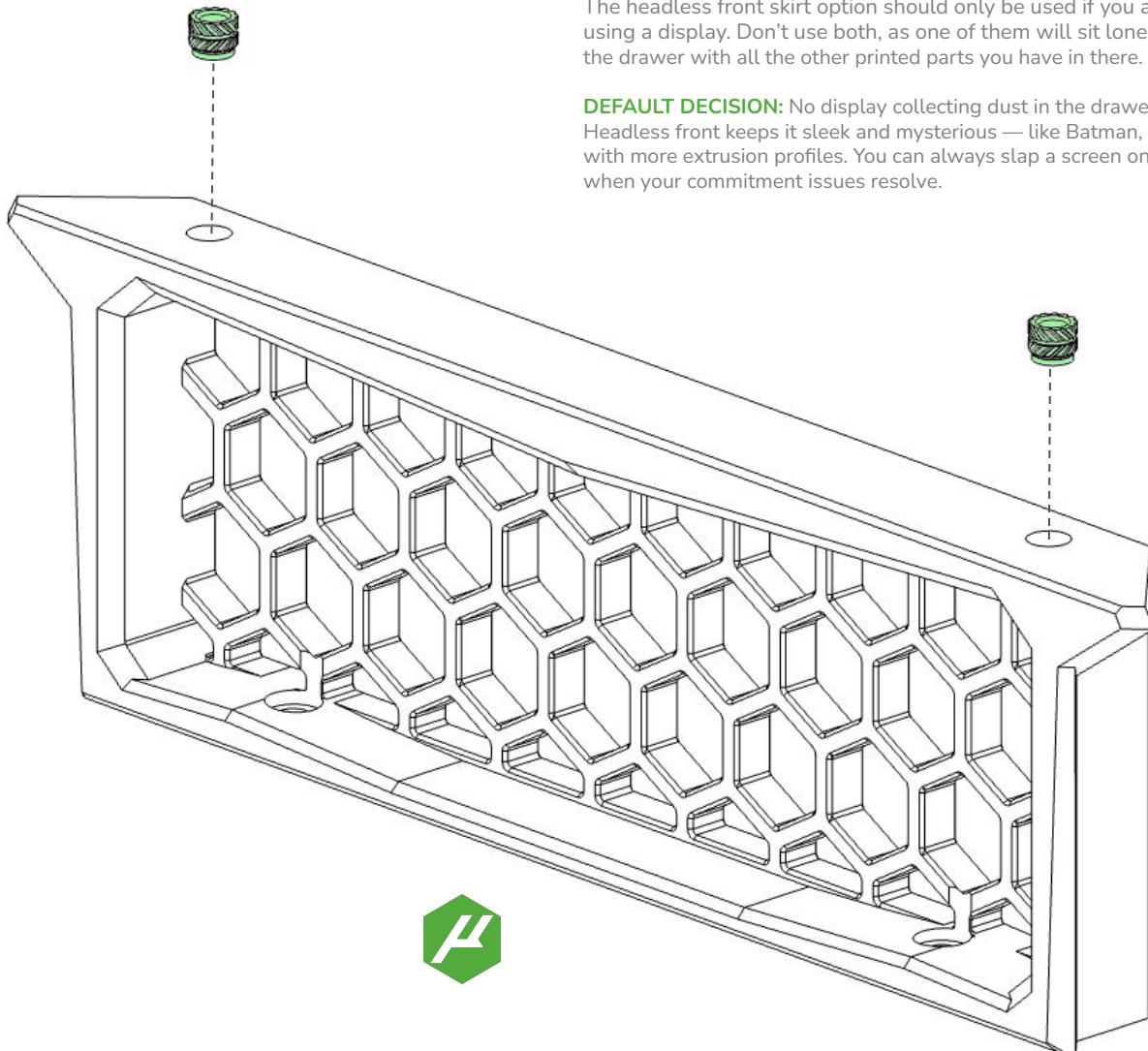
MICRON

HEATSET INSERTS | SKIRTS - Front display mount



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## HEATSET INSERTS | SKIRTS - Front headless

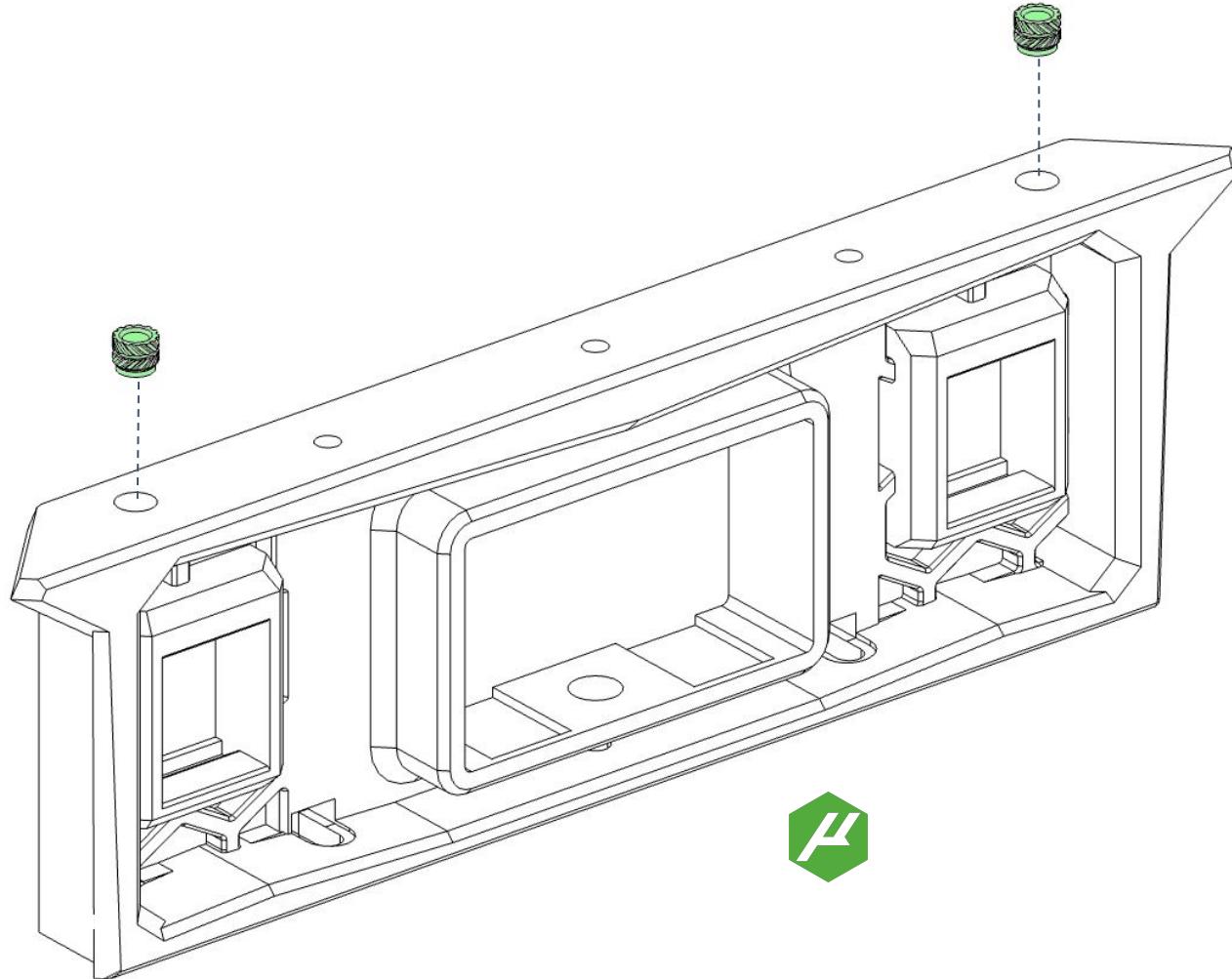


### PICK ONE, DON'T BE GREEDY

The headless front skirt option should only be used if you aren't using a display. Don't use both, as one of them will sit lonely in the drawer with all the other printed parts you have in there.

**DEFAULT DECISION:** No display collecting dust in the drawer?? Headless front keeps it sleek and mysterious — like Batman, but with more extrusion profiles. You can always slap a screen on later when your commitment issues resolve.

HEATSET INSERTS | SKIRTS - Rear Skirt



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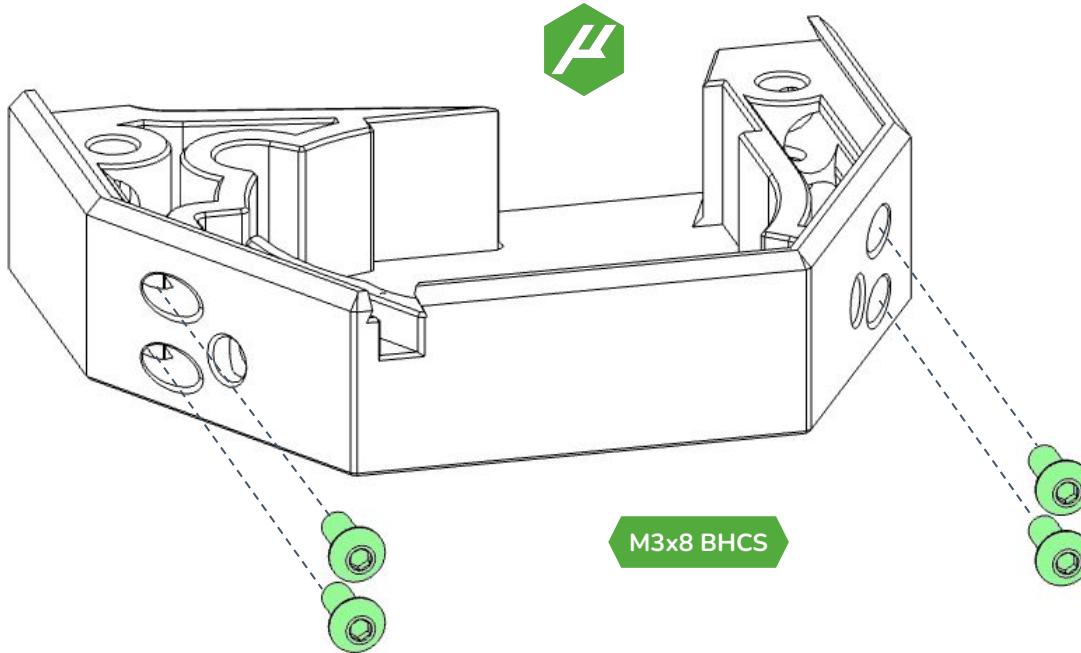
## HEATSET INSERTS | FILTER - Plenum

Erm, these aren't threaded inserts...?

You're absolutely right! 10 points for observation!

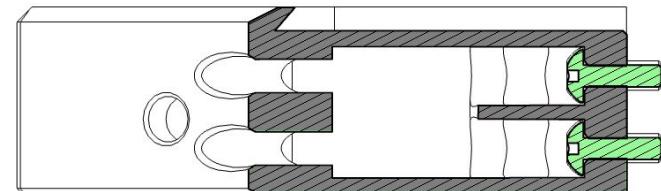
Before we can put in the threaded inserts, we need to install these **4x M3x8 BHCS** first, otherwise we won't be able to install them once the threaded inserts are in place.

Insert the screws through the holes on the rear of the [Plenum.stl](#), thread them through the part so they stick out the front. (As demonstrated in the cross section image below)



**MAGNETS...YEAH, SCIENCE!**

These 4x **M3x8 BHCS** need to be magnetic as the chamber connects to them. Please check with a magnet to prevent any future disappointment.



## HEATSET INSERTS | FILTER - Plenum (continued)

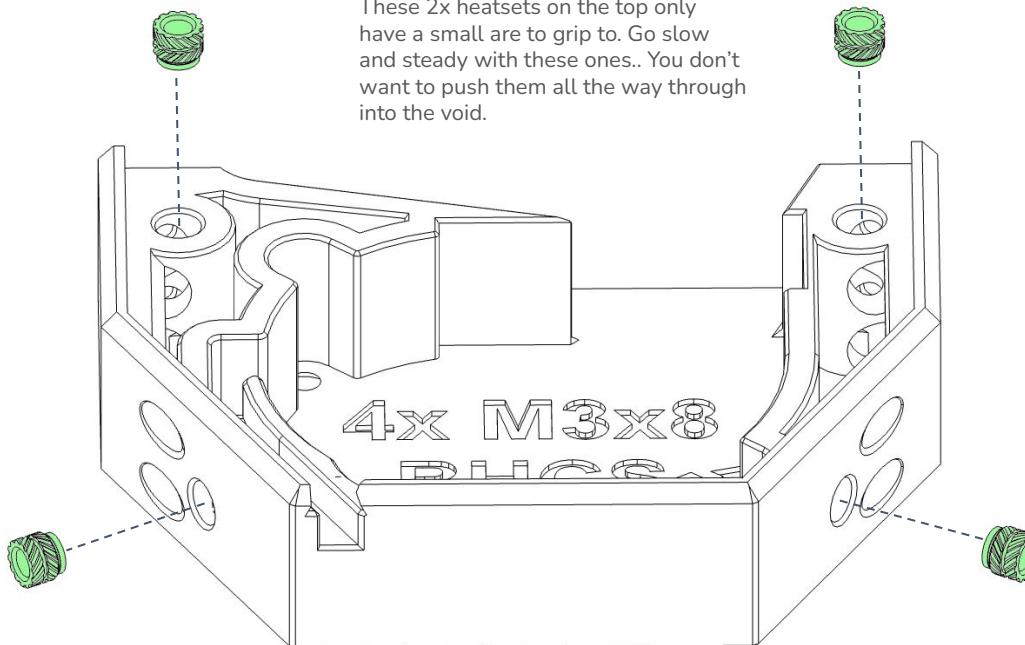
### FINAL WARNING

Did you read the previous page? We all know we're guilty of skipping steps because we know what to do... make sure your **M3x8 BHCS** are installed before interesting these threaded inserts.



#### SLOW & STEADY WINS THE RACE

These 2x heatsets on the top only have a small are to grip to. Go slow and steady with these ones.. You don't want to push them all the way through into the void.



## FRAME

### Hardware Qty.

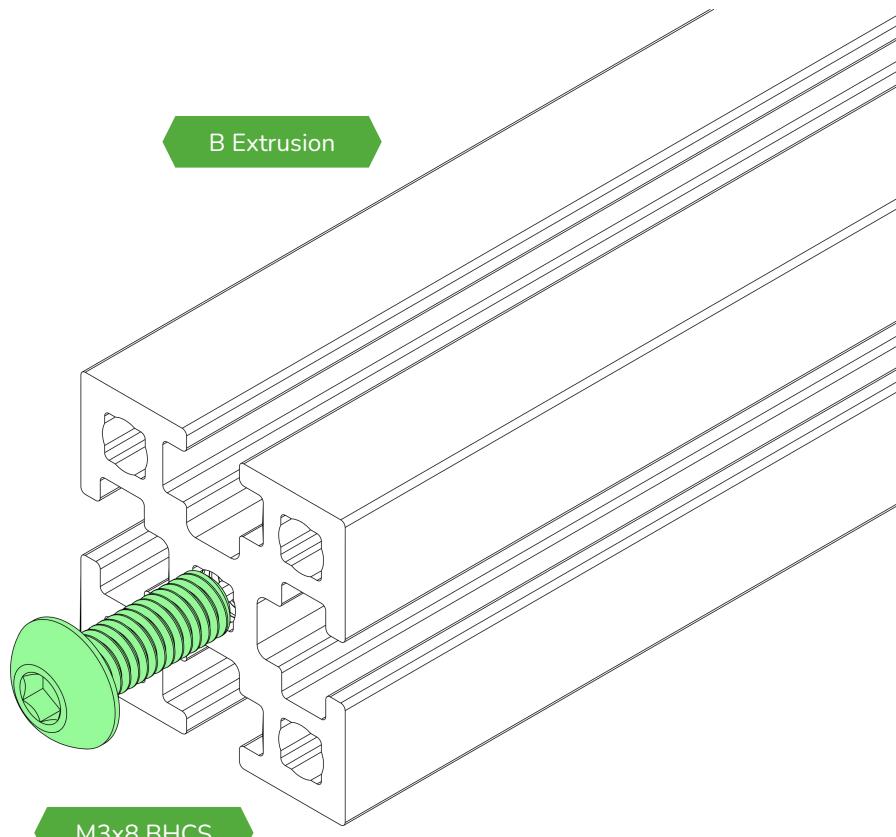
M2x12 SHCS	x8
M3x8 BHCS	x4
M3x20 BHCS	x2
M3x25 BHCS	x4
M3x35 SHCS	x4
M3 Heatset	x4
GT2 16T Idler	x2
F623RS Bearing	x4
M3x7x0.5 Shim	x4

### Optional Hardware

F623RS Bearing	x4
Live Idler 16T Pulley	x2
M3x25 Pin	x6
M3x7x0.5 Shim	x4

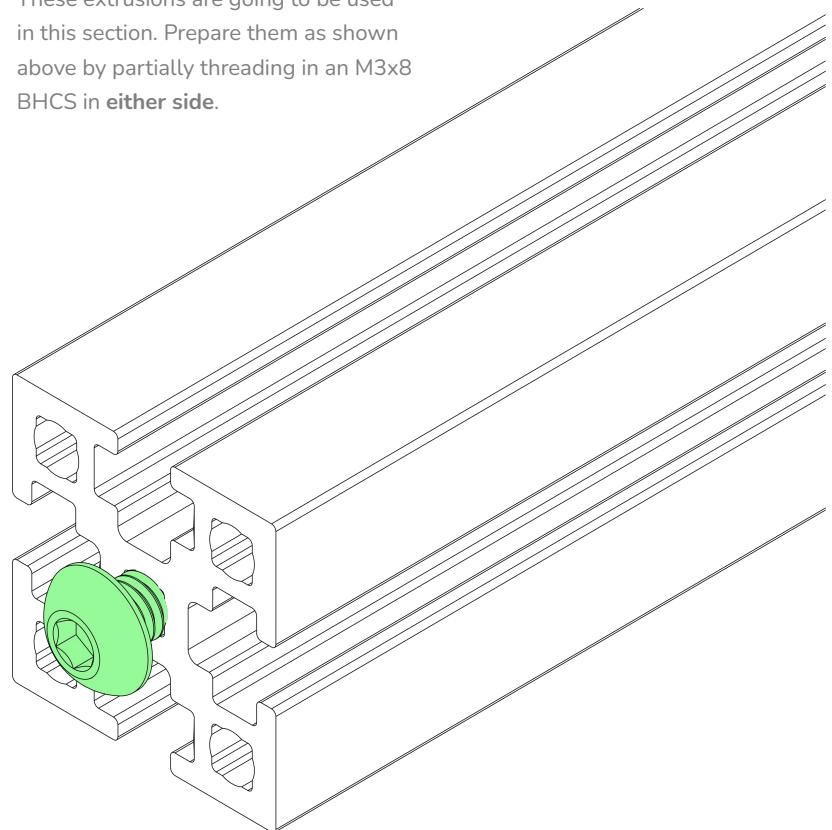


## FRAME | Blind joints



### PREPARE 8 EXTRUSIONS

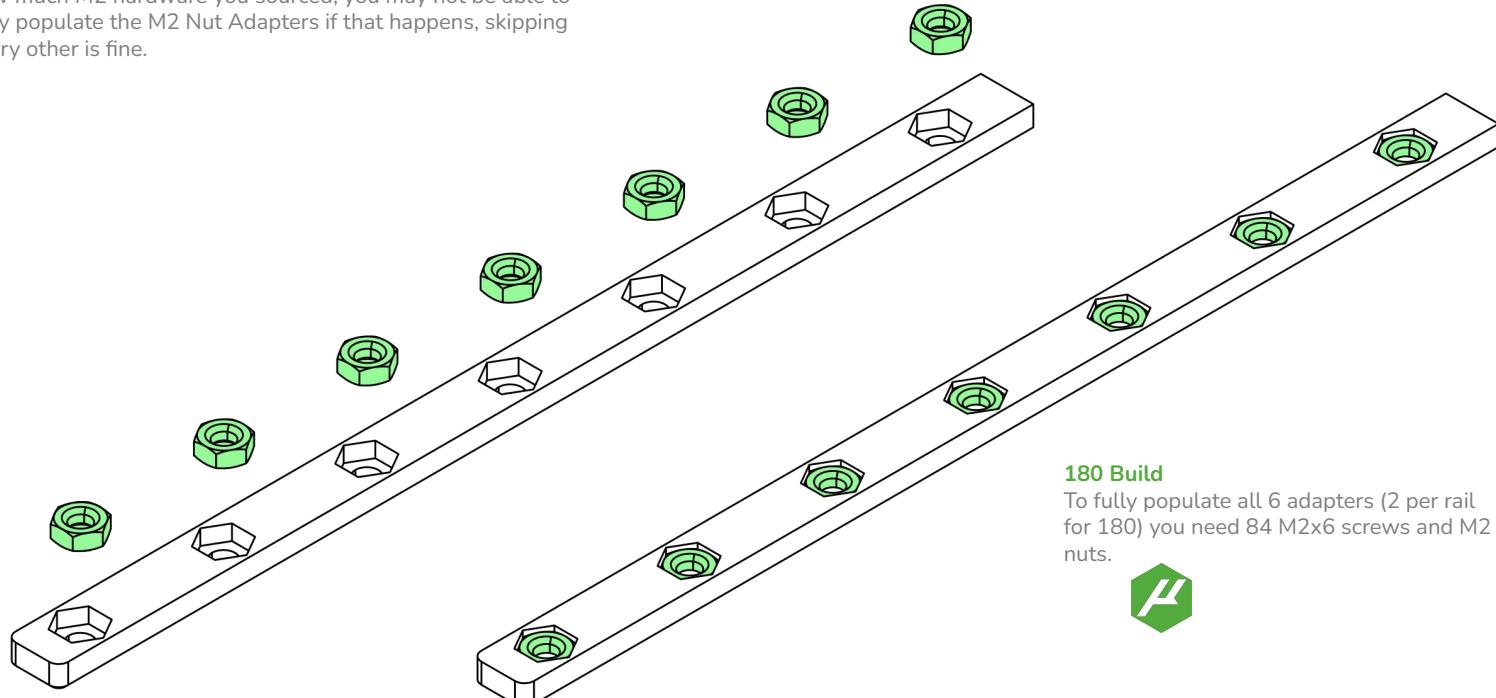
These extrusions are going to be used in this section. Prepare them as shown above by partially threading in an M3x8 BHCS in either side.



## FRAME | Z rails

### POPULATING NUT CARRIERS

Pictured shows all the m2 nuts populated, but depending on how much M2 hardware you sourced, you may not be able to fully populate the M2 Nut Adapters if that happens, skipping every other is fine.



### 120 Build

To fully populate all 6 adapters (1 per rail for 120) you need 60 M2x6 screws and M2 nuts.

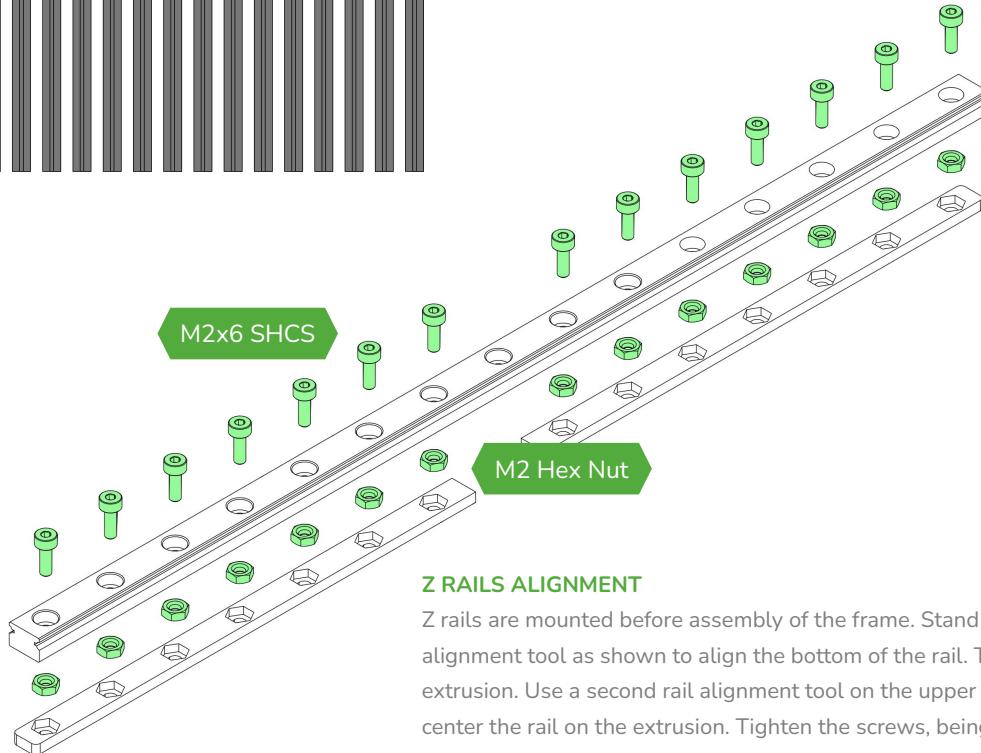
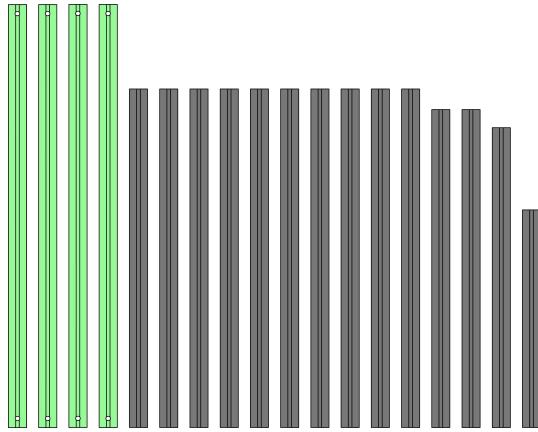


### 180 Build

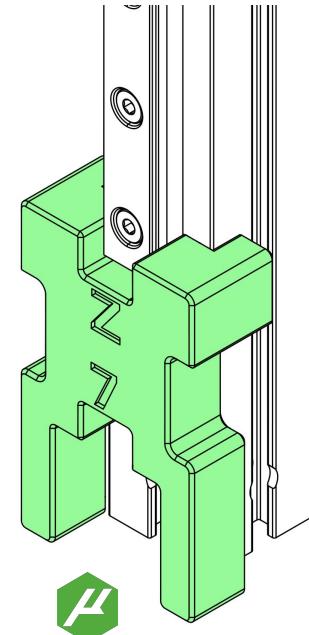
To fully populate all 6 adapters (2 per rail for 180) you need 84 M2x6 screws and M2 nuts.



## FRAME | Z rails (continued)



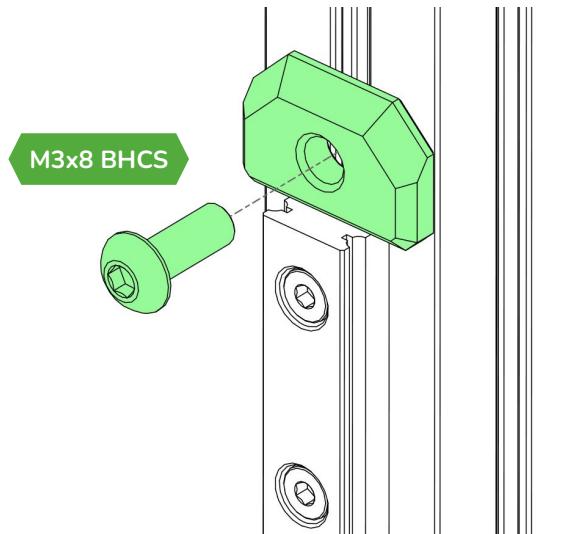
**Z RAILS ALIGNMENT**  
Z rails are mounted before assembly of the frame. Stand up one of the **A** extrusions and use the printed rail alignment tool as shown to align the bottom of the rail. The rail end should be **36mm** from the bottom of the extrusion. Use a second rail alignment tool on the upper half of the rail, using the section marked '7', to properly center the rail on the extrusion. Tighten the screws, being careful to maintain the alignment provided by the printed tools. Repeat this process for all 4 **A** extrusions and their rails.



## FRAME | Z rails (continued)

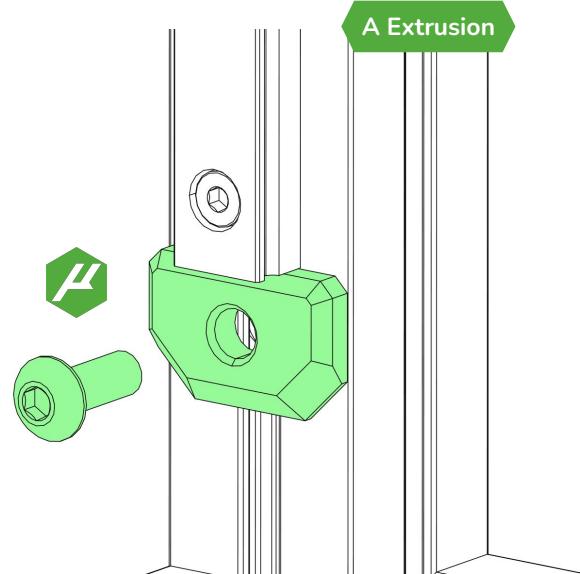
### WHERE'S THE NUT!?

The instructions won't call out nuts that were inserted in a previous step, nor nuts that can be easily inserted in the current step. If a screw does NOT thread into a nut we will explicitly state this. **You can assume that all** screws that enter extrusion slots **thread into a nut.**



### RAIL STOPS

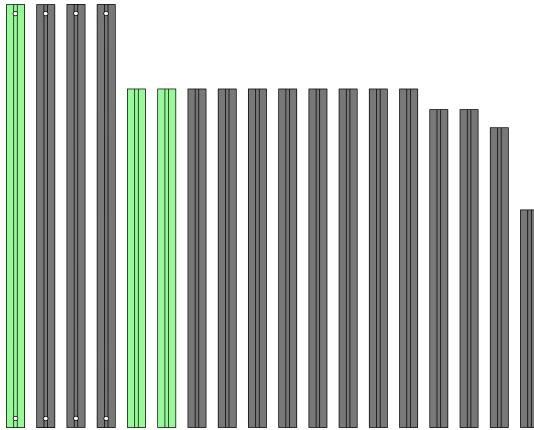
With the Z rails installed, the rail stops can now be added to both ends. Loosely screw an M3x8 BHCS. Repeat for both ends of all 4 Z rails. Now you can work on the build without risking a Z carriage flying off its rail.



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MICRON

## FRAME | Z Rails – Corner 1

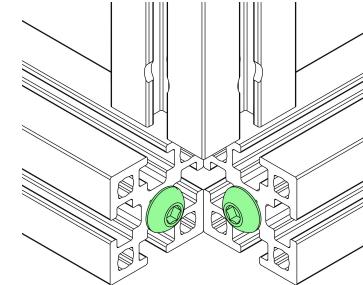


Corner 1



### CORNER #1 ASSEMBLY

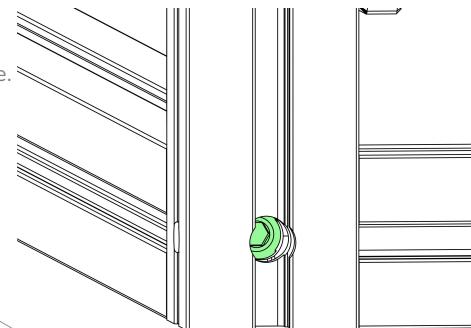
Start with one of our preassembled **A** extrusions, and two of the **B** extrusions. Note the direction the linear rail is facing. Slide one of the **A** extrusions on forming the first corner with two **B** extrusions. While using your assembly surface to hold things flush and square, tighten the two screws to make the first corner secure. This **Corner 1** will be the left rear corner of the printer.



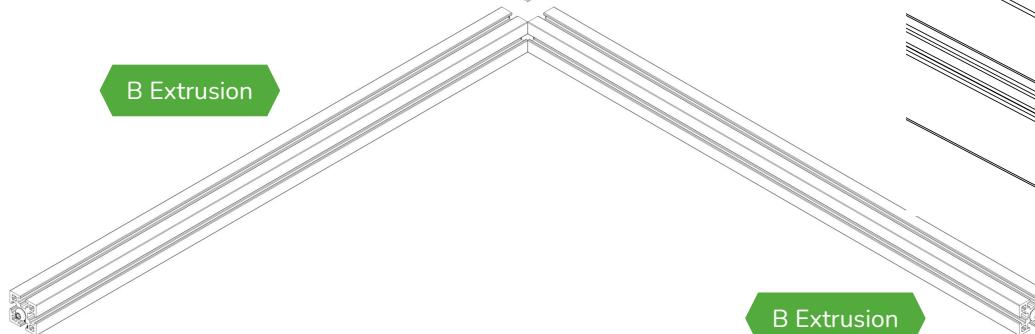
A Extrusion

### BUILD ON A FLAT SURFACE

Build the frame on a glass or granite surface to ensure you can get it as square as possible.



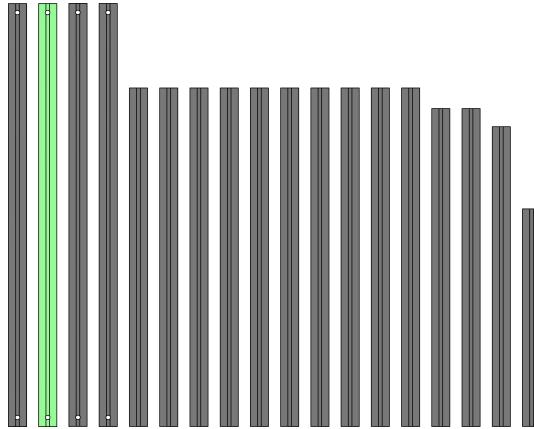
B Extrusion



B Extrusion

MICRON

## FRAME | Z Rails – Corner 2



Corner 2

### CORNER #2 ASSEMBLY

Before adding the next **A** extrusion, preload nuts into the **B** extrusion that is about to be enclosed, as shown. It receives. Corner extrusion **#2** will install the same as the first, using an M3x8 BHCS for the blind joint. The linear rail should face the same direction as the rail on Corner **#1**. Keep things as square and flush as possible as you tighten the screw to snug up the corner.

Corner 1

Corner 1

Corner 2

(3) outside

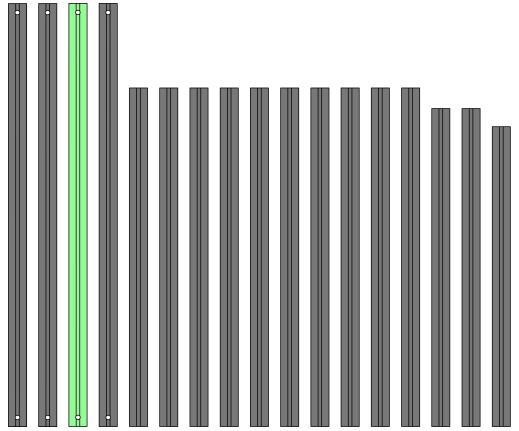
(2) inside

(5) top

(5) bottom

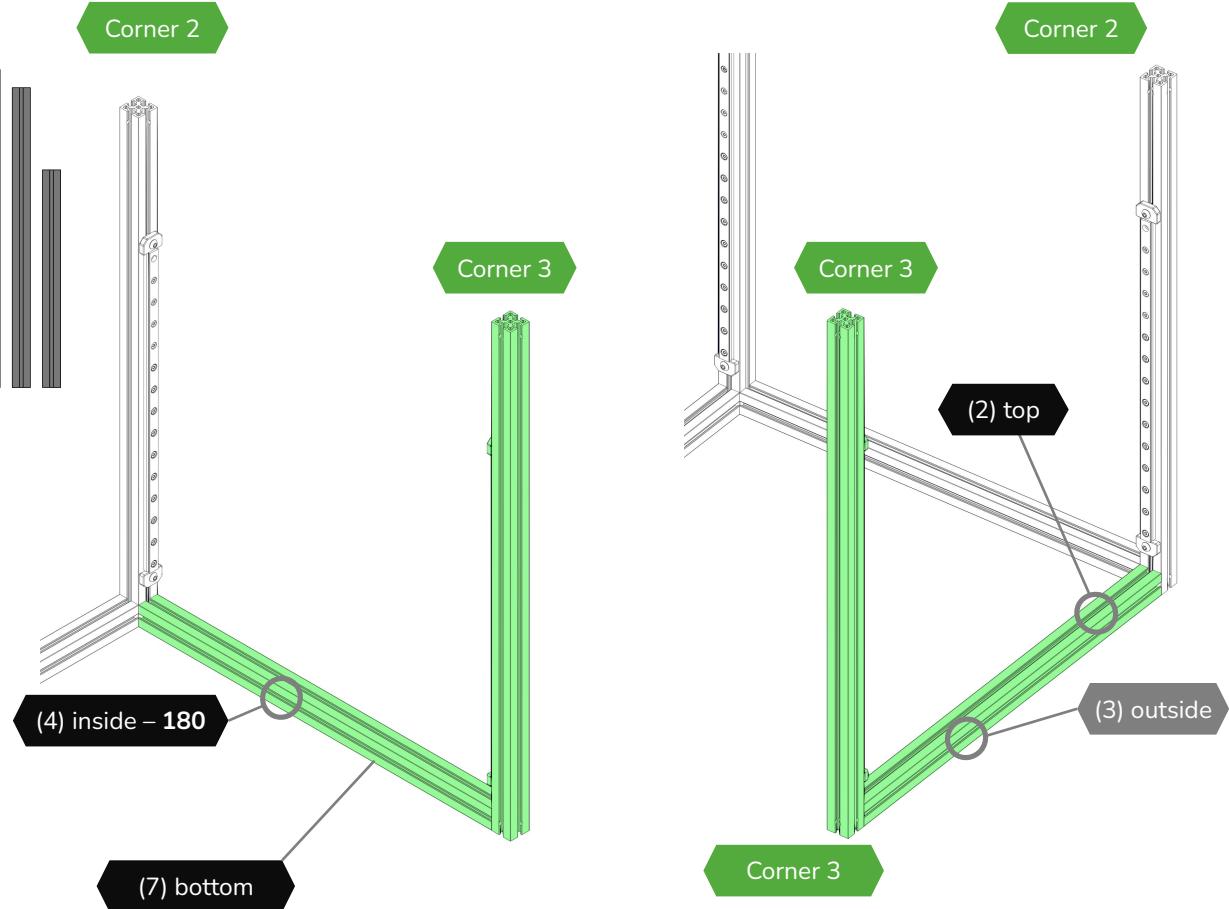
MICRON

## FRAME | Z Rails – Corner 3

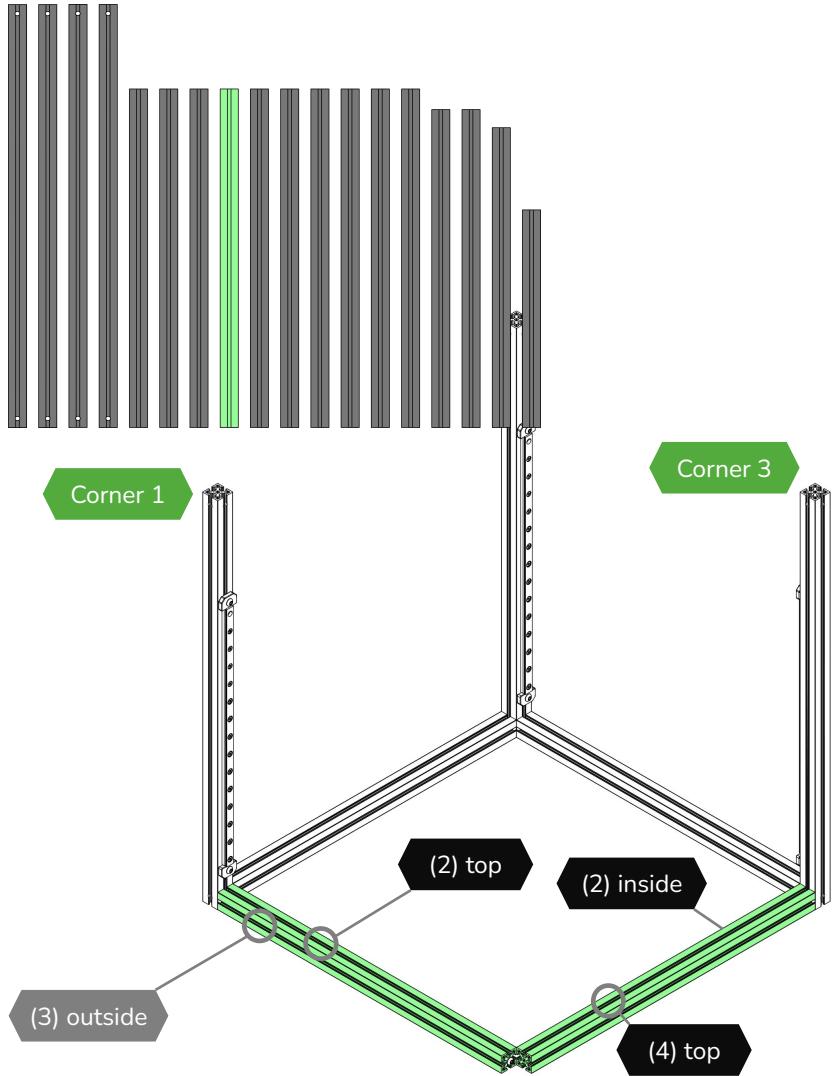


### CORNER #3 ASSEMBLY

Before adding the next **A** extrusion, preload M3 nuts into the **B** extrusion that is about to be enclosed, as shown. It receives. Corner extrusion **#3** will install the same as the others, using an M3x8 BHCS for the blind joint. Note that the linear rail should face Corner **#2**. Keep things as square and flush as possible as you tighten the screw to snug up the corner.



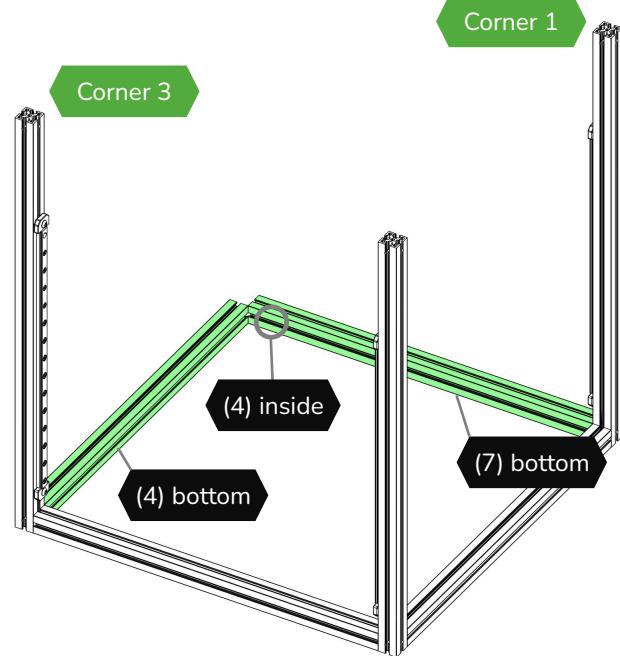
## FRAME | Z Rails – Corner 4



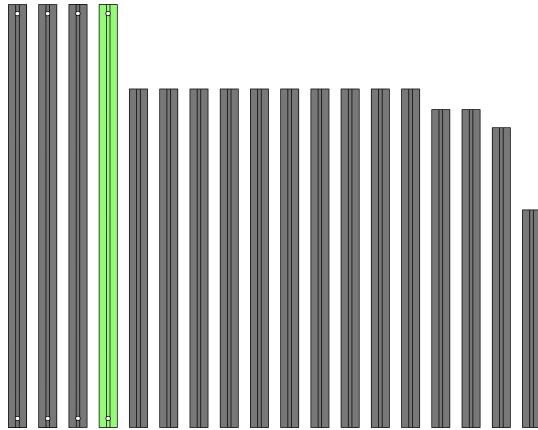
### FINAL LOWER EXTRUSION

Before adding Corner #4, there are 2 **B** extrusions that need to be secured to both Corner #3 and Corner #1 with a blind joint. Then preload all nuts into the as shown in both **B** extrusion before proceeding to the next page.

MICRON

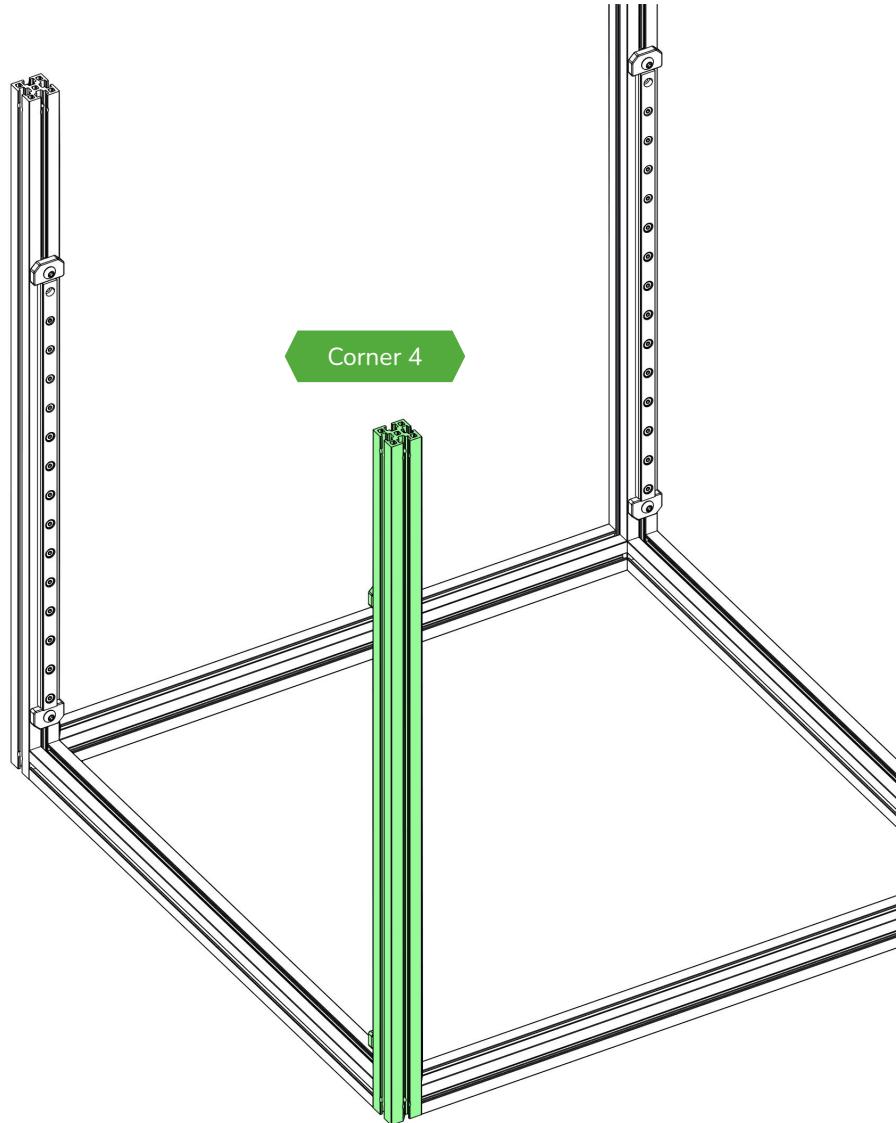


## FRAME | Z Rails – Corner 4 (continued)

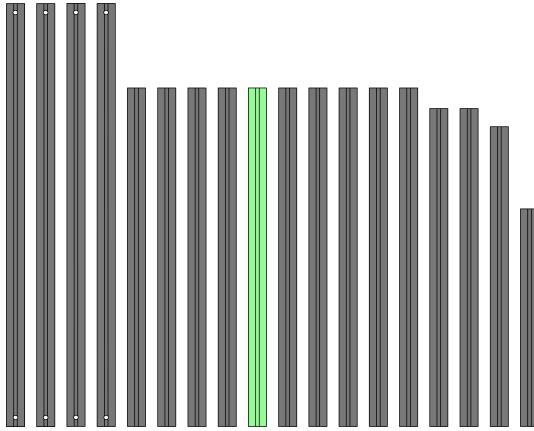


### CORNER #4 ASSEMBLY

Now add the last **A** extrusion, being sure the linear rail faces Corner **#1**. Use blind joints to secure it to the **B** extrusions as we did with the other corners. The bottom half of the frame is complete. Great job! Did you get all the preloads in place? This would be a great time to make a visual count, and double check.

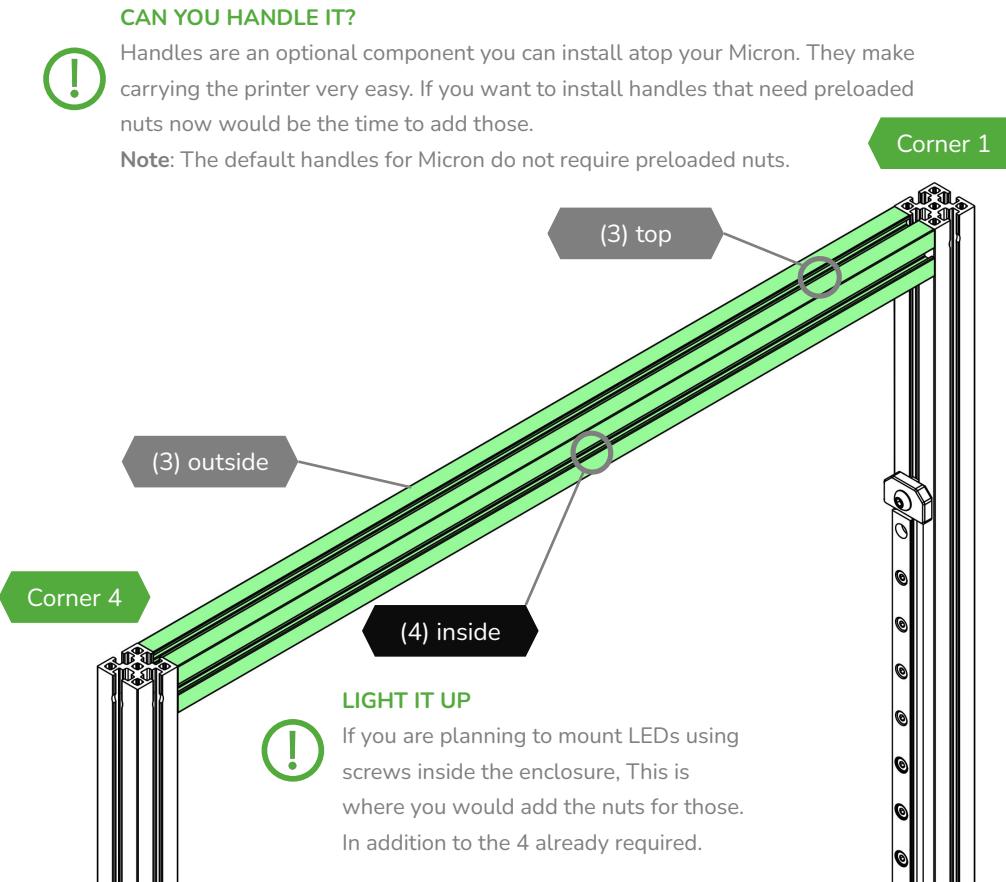


## FRAME | Top Extrusions - 1

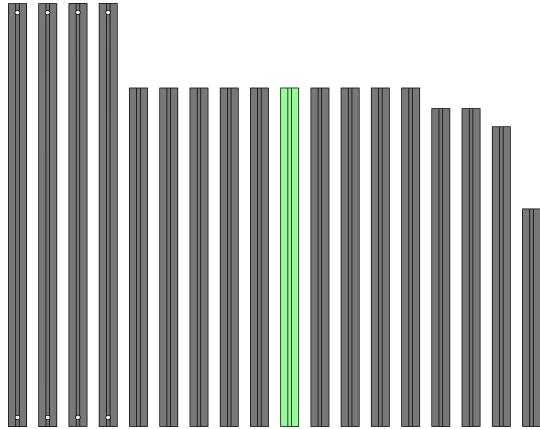


### UPPER FRAME ASSEMBLY

The remaining four **B** extrusions will install using blind joints, the same way the lower ones were assembled. The following pages will detail the preloads for these extrusions, including preloads for the optional handles. Start with the extrusion that connects Corners #1 and #4.



## FRAME | Top Extrusions – 2

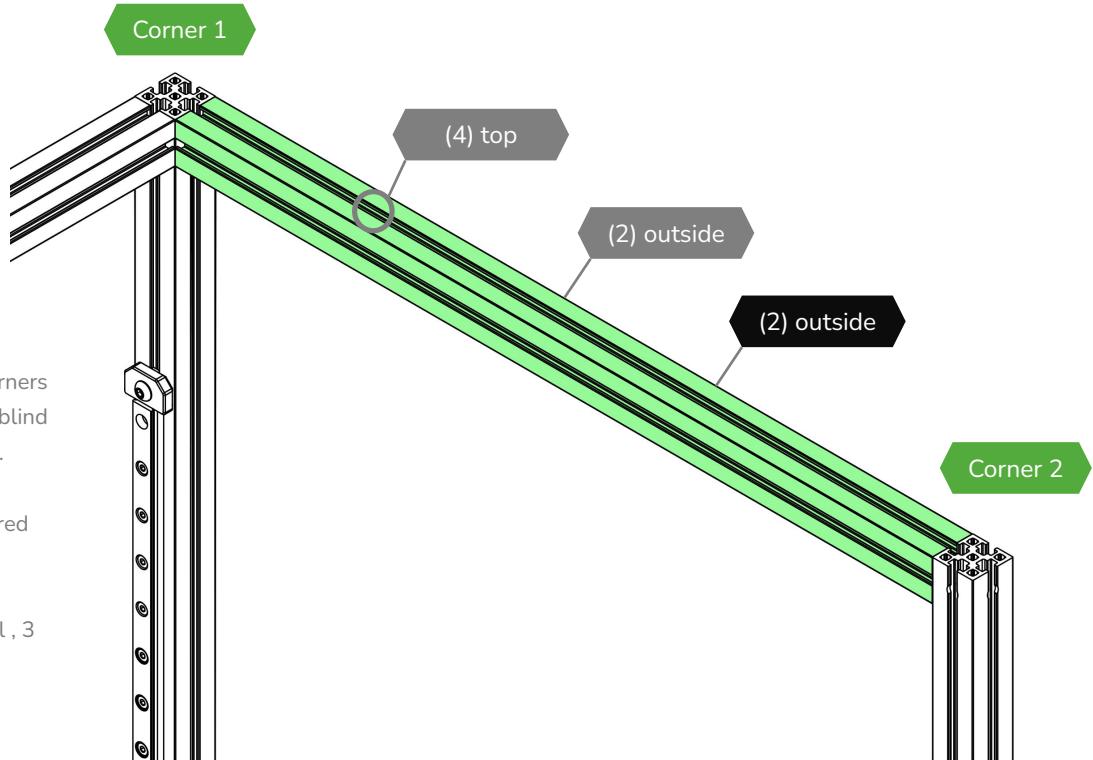


### TOP OF FRAME

The **B** extrusion that connects Corners #1 and #2 receives. Attach using blind joints as with previous extrusions.

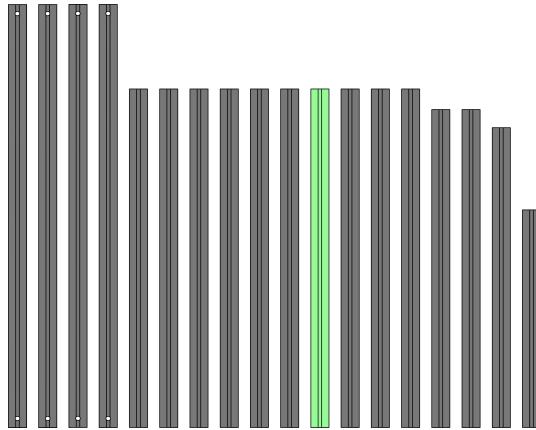
The rear side has 2 that are required and 2 that are optional

The top has all 4 that are optional , 3 for panel clips and 1 for ptfe tube retainer



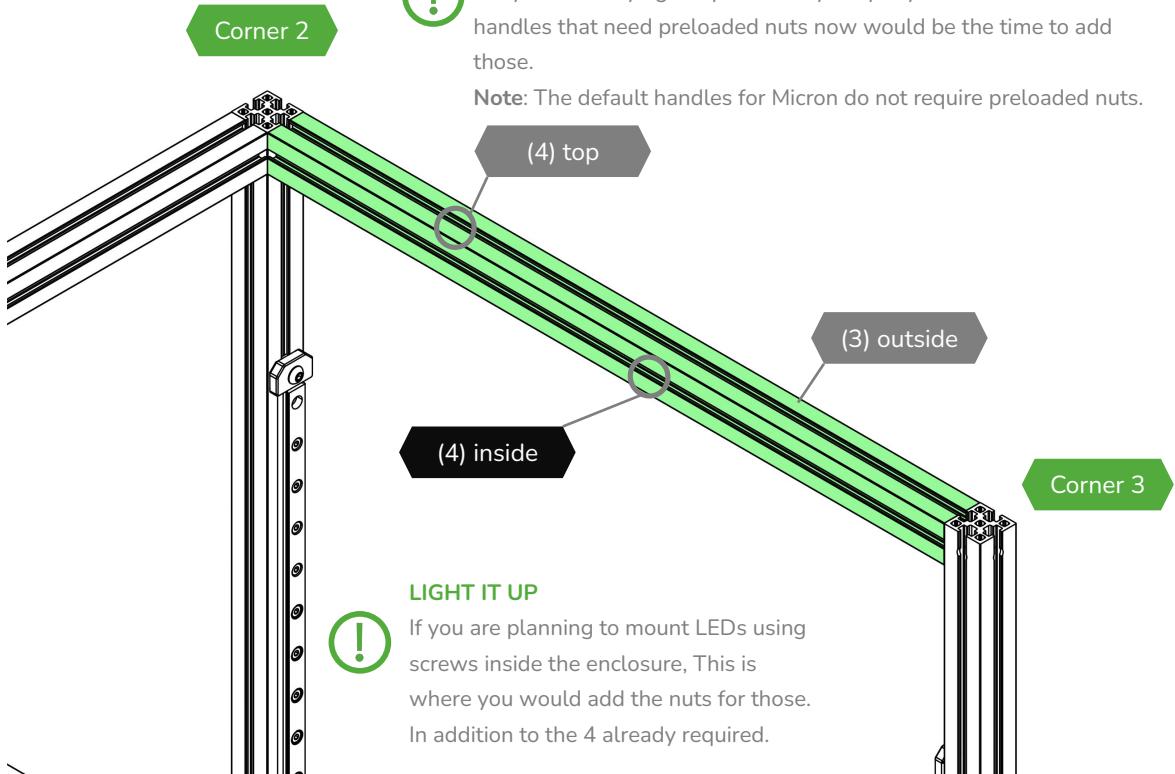
MICRON

## FRAME | Top Extrusions – 3



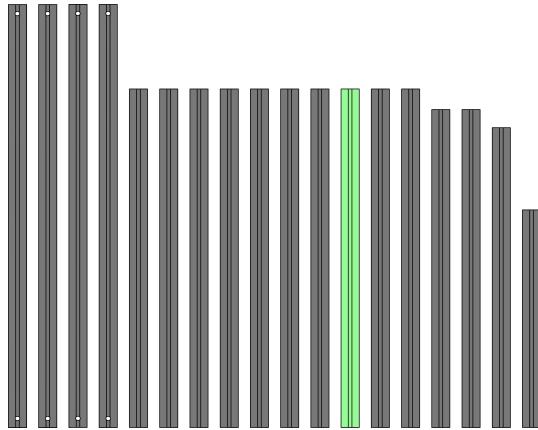
### TOP OF FRAME #3

The **B** extrusion that connects Corners #2 and #3 receives: 4 nuts on top for handles(3 for no handles), 4 nuts inside, and 3 nuts outside. Attach using blind joints as with previous beams.



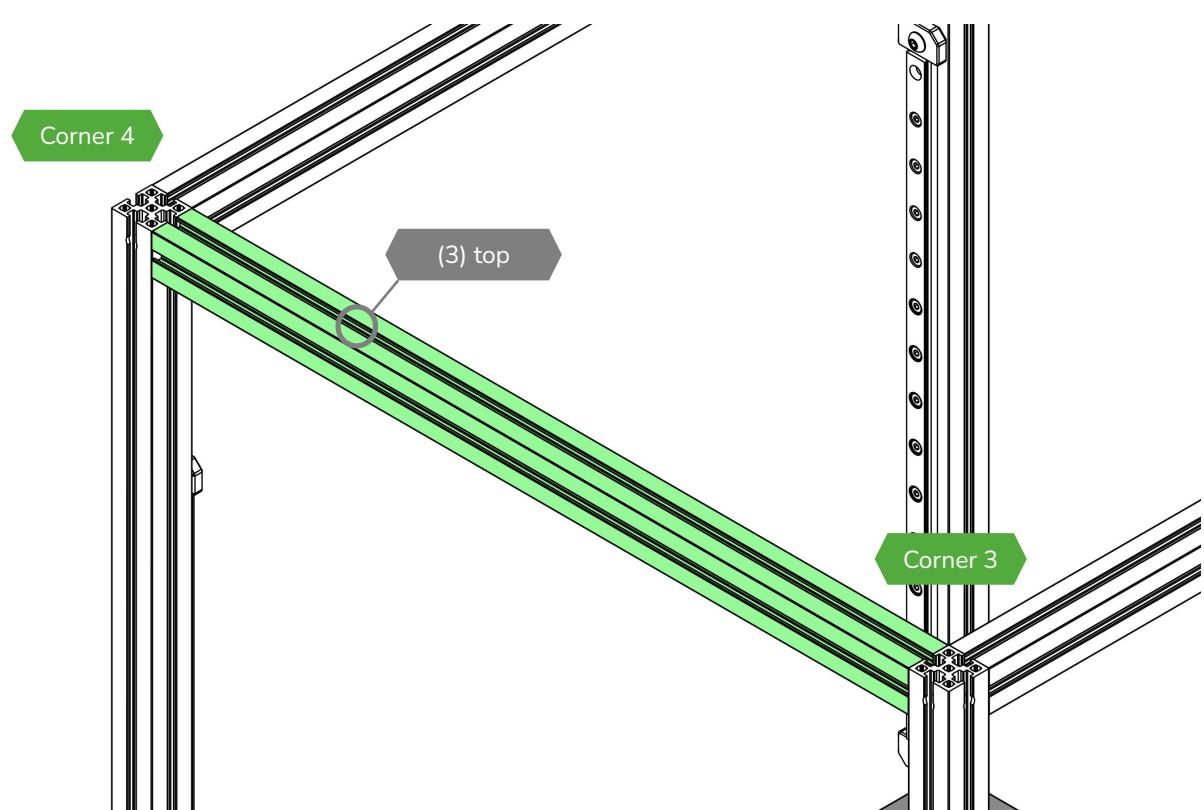
MICRON

## FRAME | Top Extrusions – 4



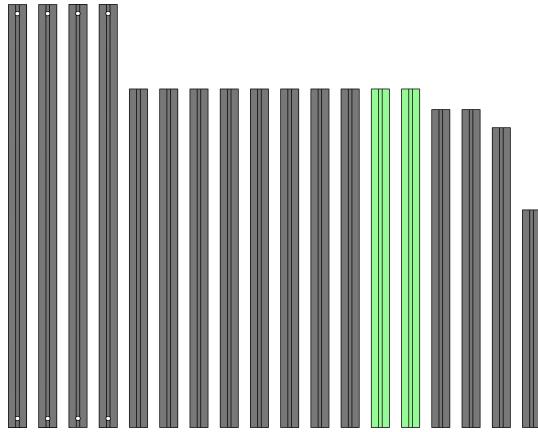
### TOP OF FRAME #4

Before placing the final **B** extrusion,  
The final **B** extrusion itself receives an  
optional 3 nuts on top.



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## FRAME | Bed Extrusions – 1



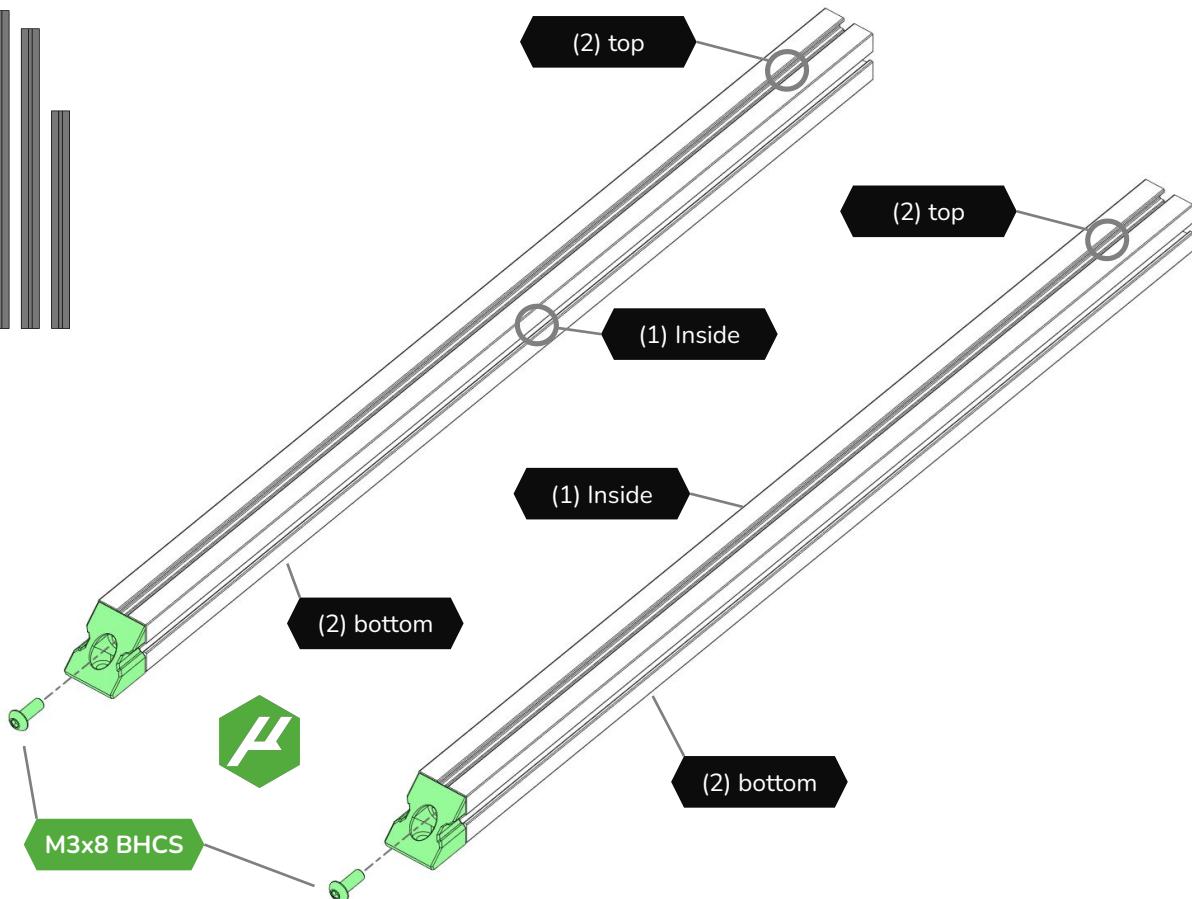
### BED EXTRUSIONS

Attach 2 corner brackets to the end of the last two **B** extrusions



### BLIND JOINTS

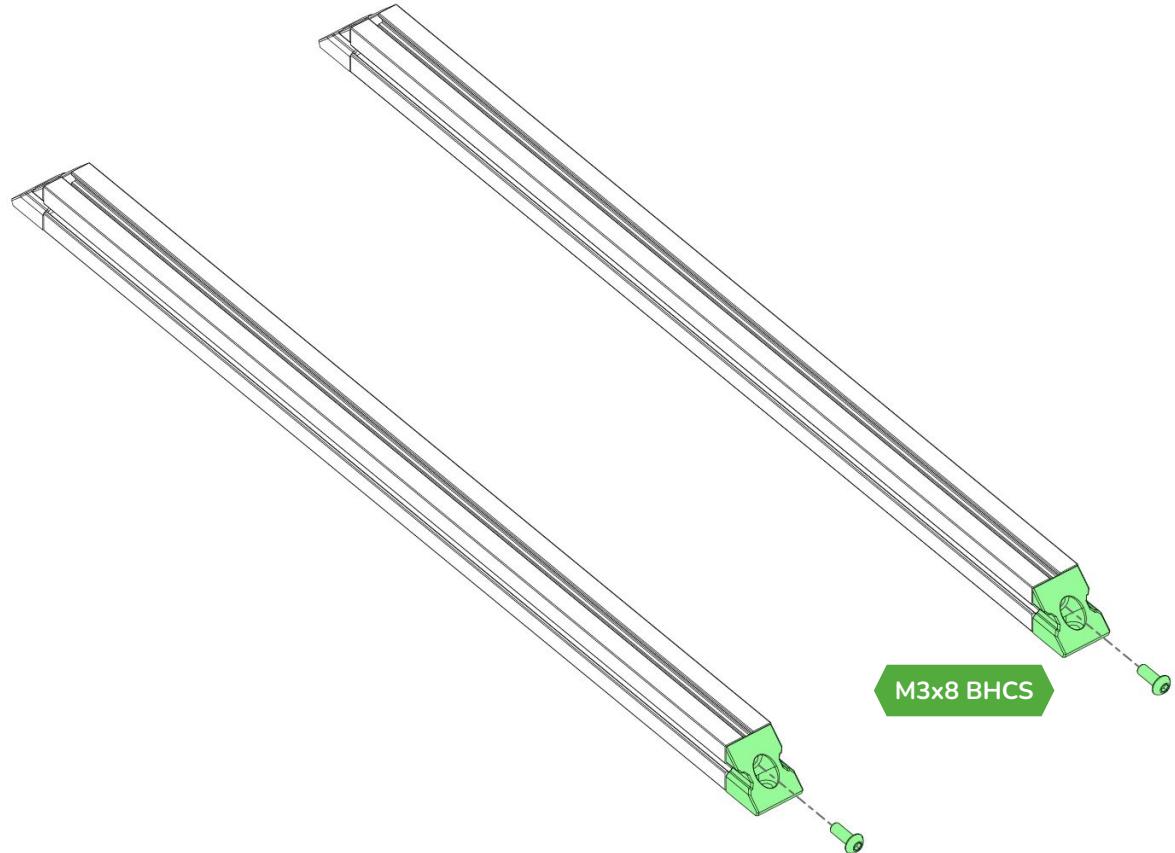
Some kits use blind joints for this instead of the printed brackets. If yours does you can skip these printed parts and the next page



## FRAME | Bed Extrusions – 2

### BED EXTRUSIONS

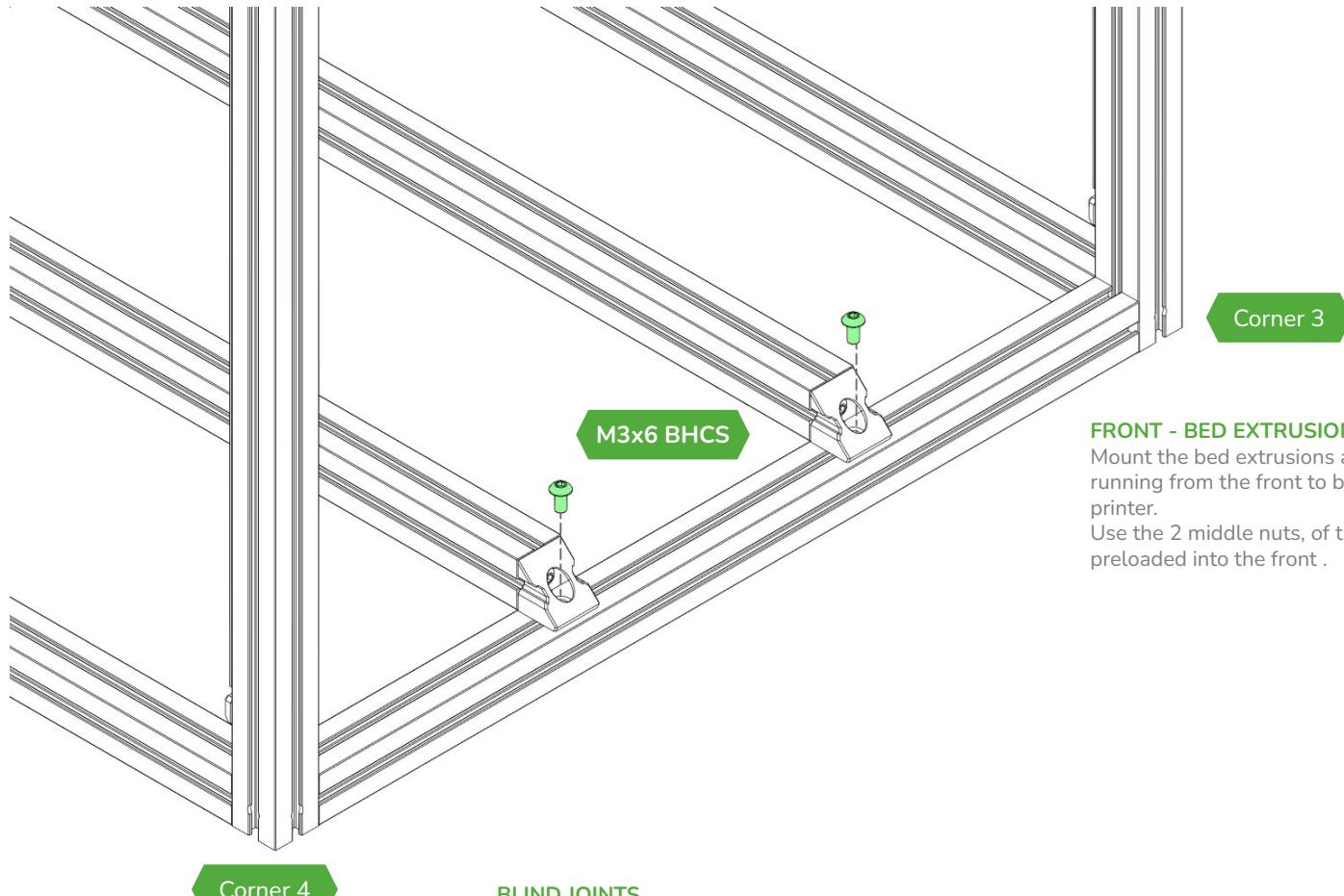
Attach the last 2 corner brackets to the end of the last two **B** extrusions while making sure not to lose any of the preloaded nuts



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## FRAME | Bed Extrusions – 3



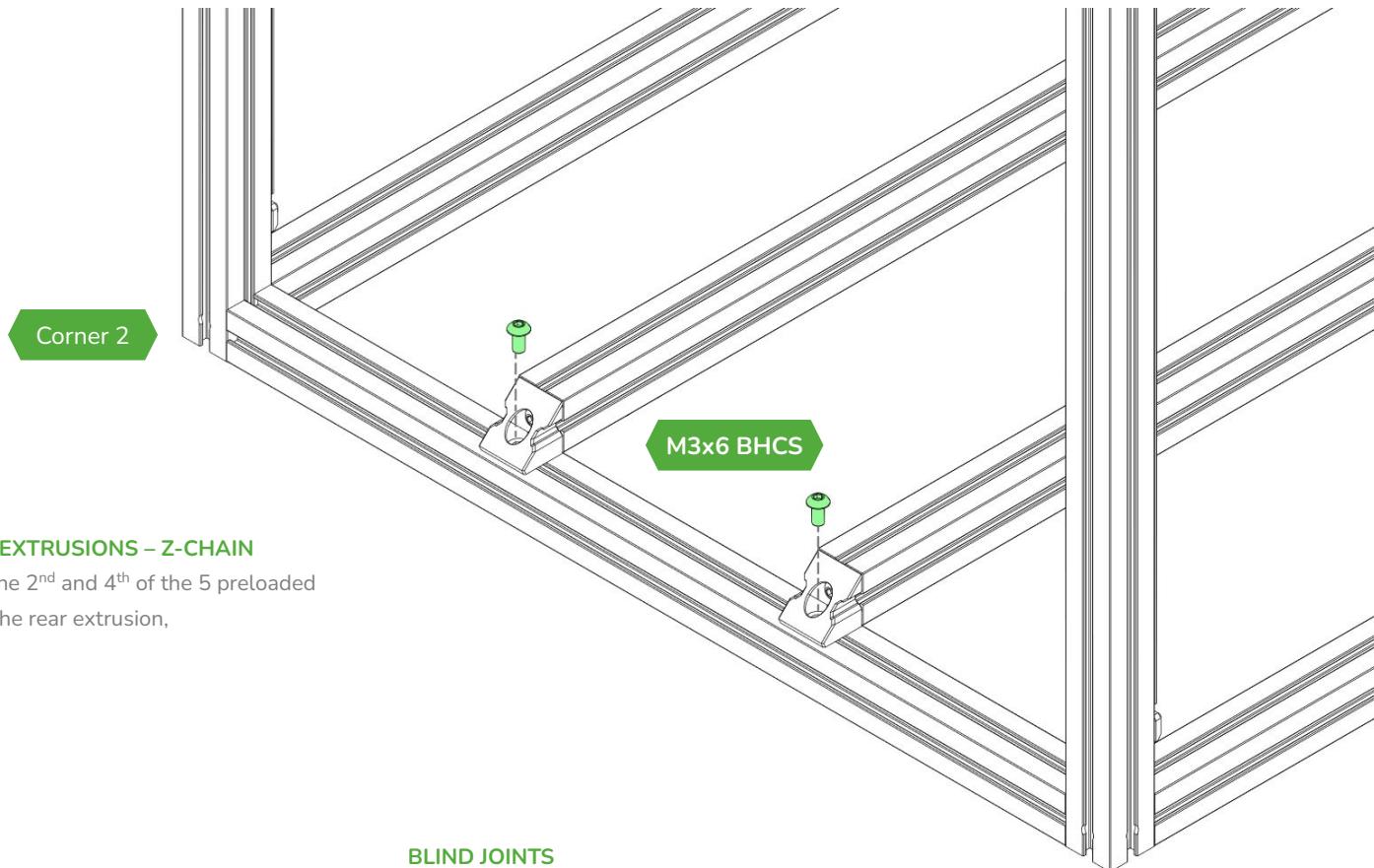
### BLIND JOINTS

Some kits use blind joints for this instead of the printed brackets. The same hardware is used for blind joints as well. Start by threading the screws into the nuts and sliding the extrusions over the screw head

## FRONT - BED EXTRUSIONS

Mount the bed extrusions as shown, running from the front to back in the printer.  
Use the 2 middle nuts, of the 4 preloaded into the front .

## FRAME | Bed Extrusions – 4



### BED EXTRUSIONS – Z-CHAIN

use the 2<sup>nd</sup> and 4<sup>th</sup> of the 5 preloaded  
into the rear extrusion,



### BLIND JOINTS

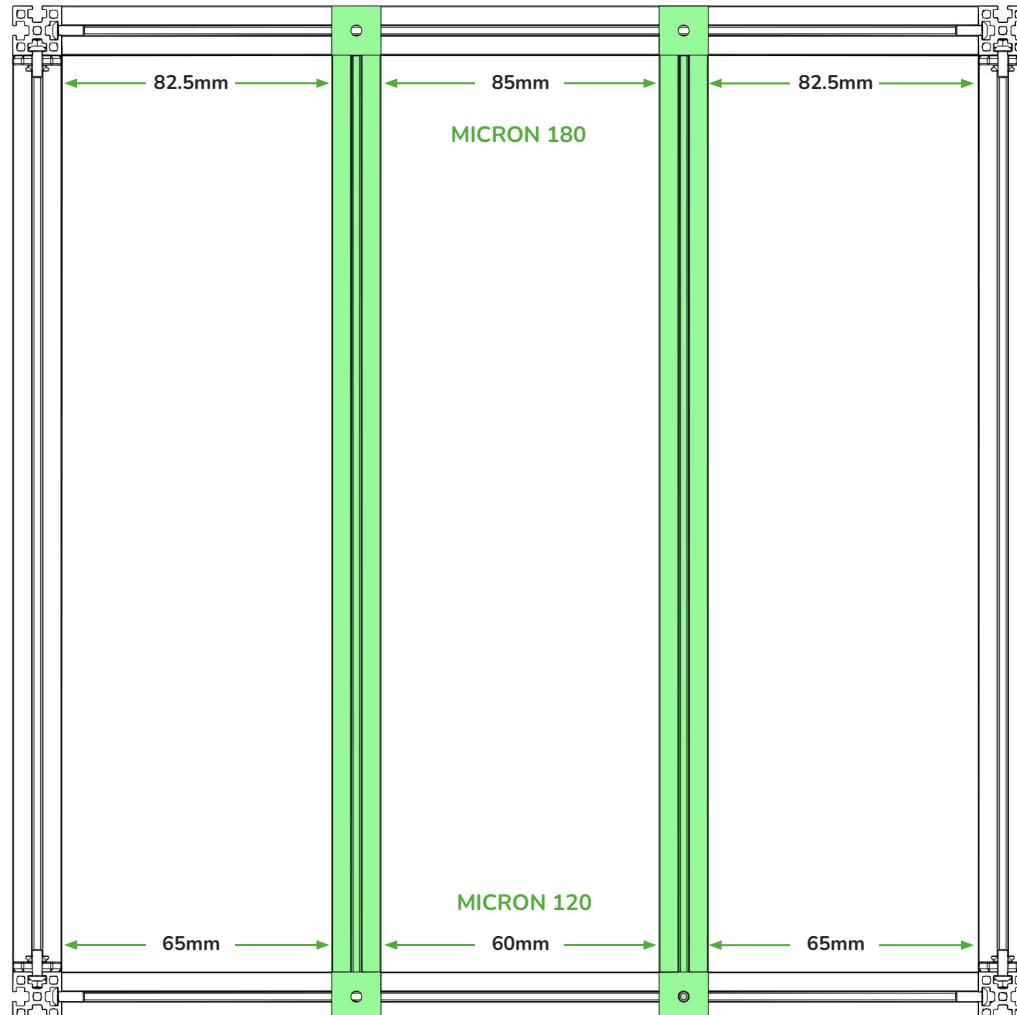
Some kits use blind joints for this  
instead of the printed brackets. The  
same hardware is used for blind joints  
as well

Corner 1

MICRON

### BED EXTRUSIONS

Mount the bed extrusion as shown, making sure to center the extrusions on the frame with the correct amount of space between them for your build. After they are aligned properly, you can then tighten the 4 **M3x6 BHCS** to secure the bed frame.

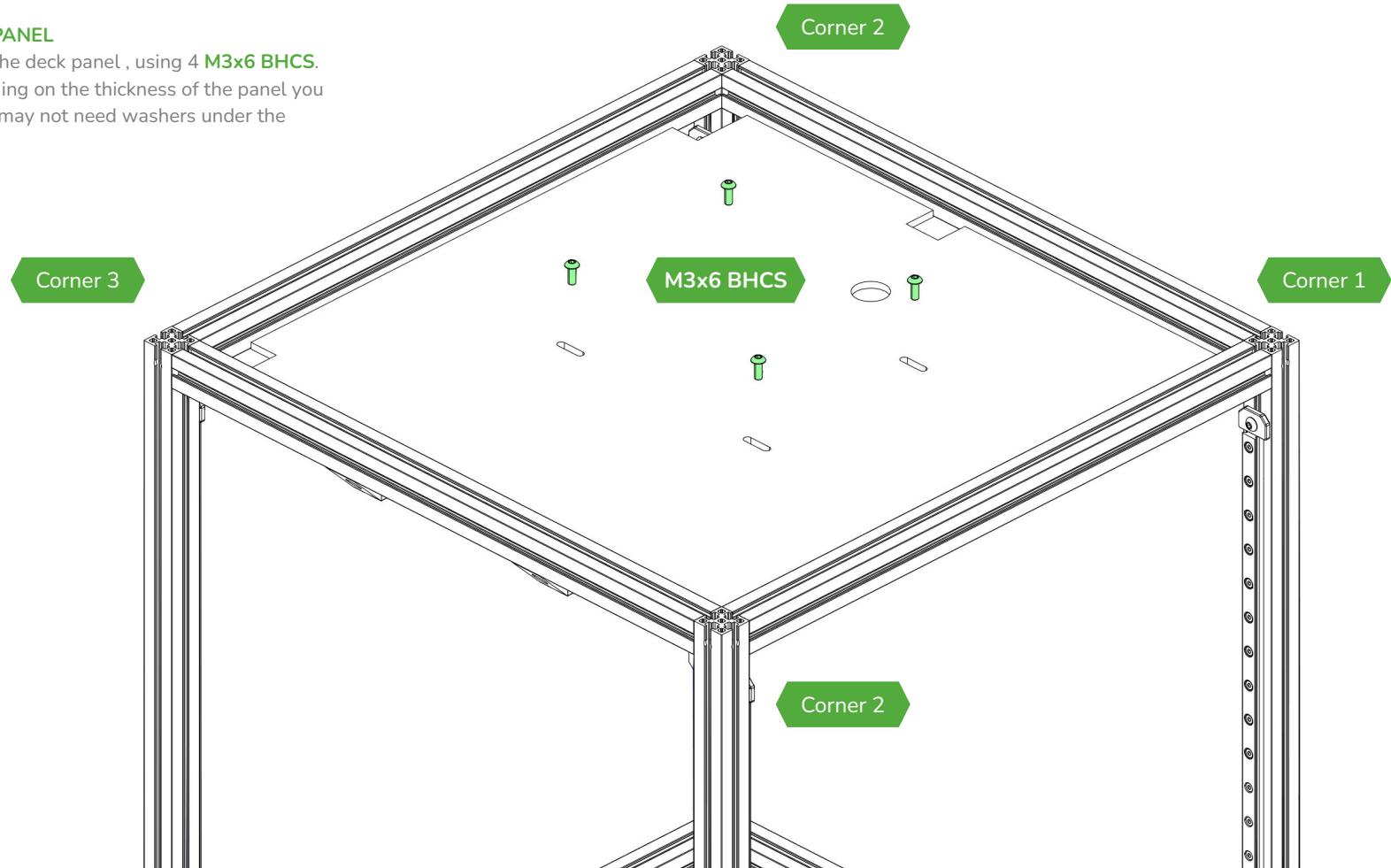


## FRAME | DECK PANEL

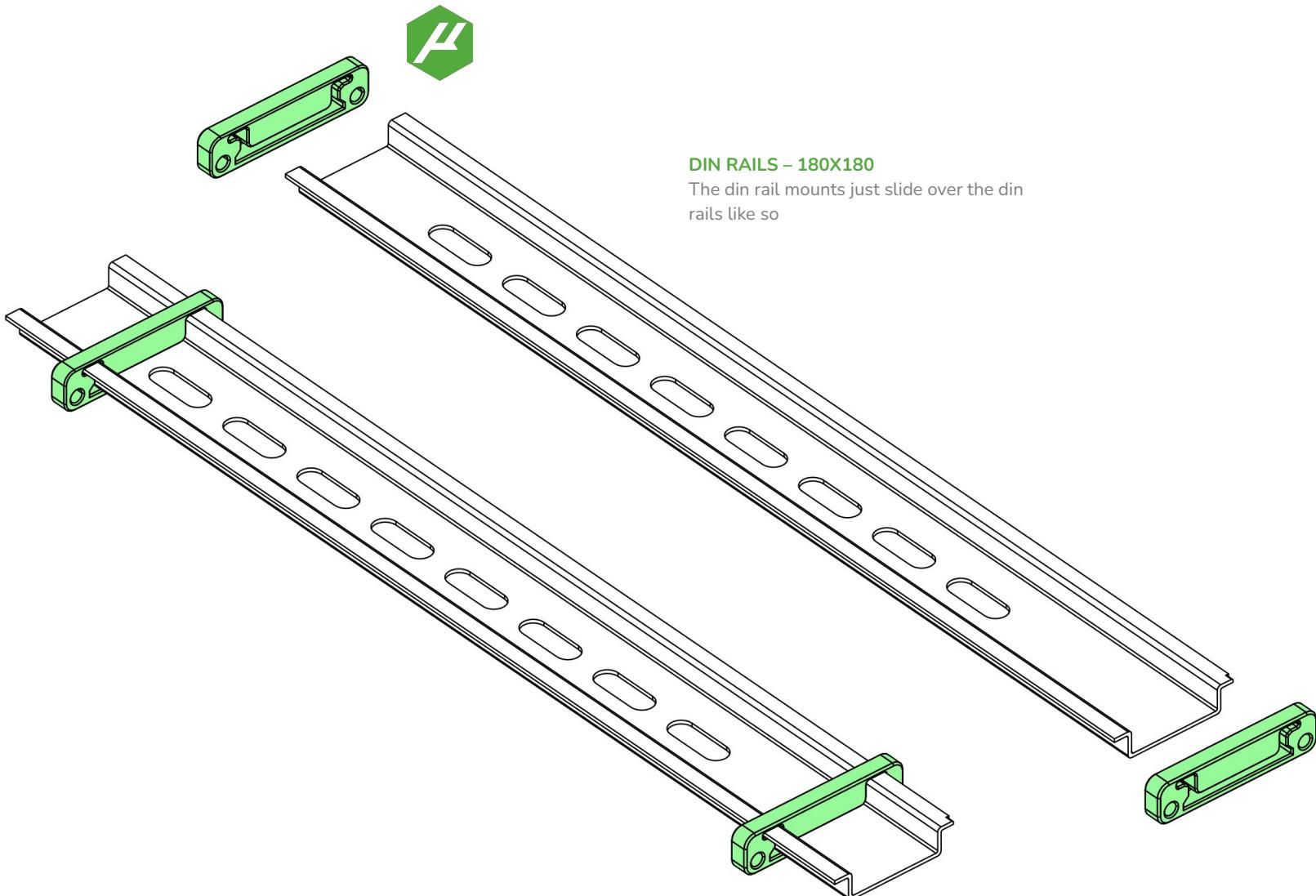
### DECK PANEL

Install the deck panel , using 4 **M3x6 BHCS**.

Depending on the thickness of the panel you may or may not need washers under the screws

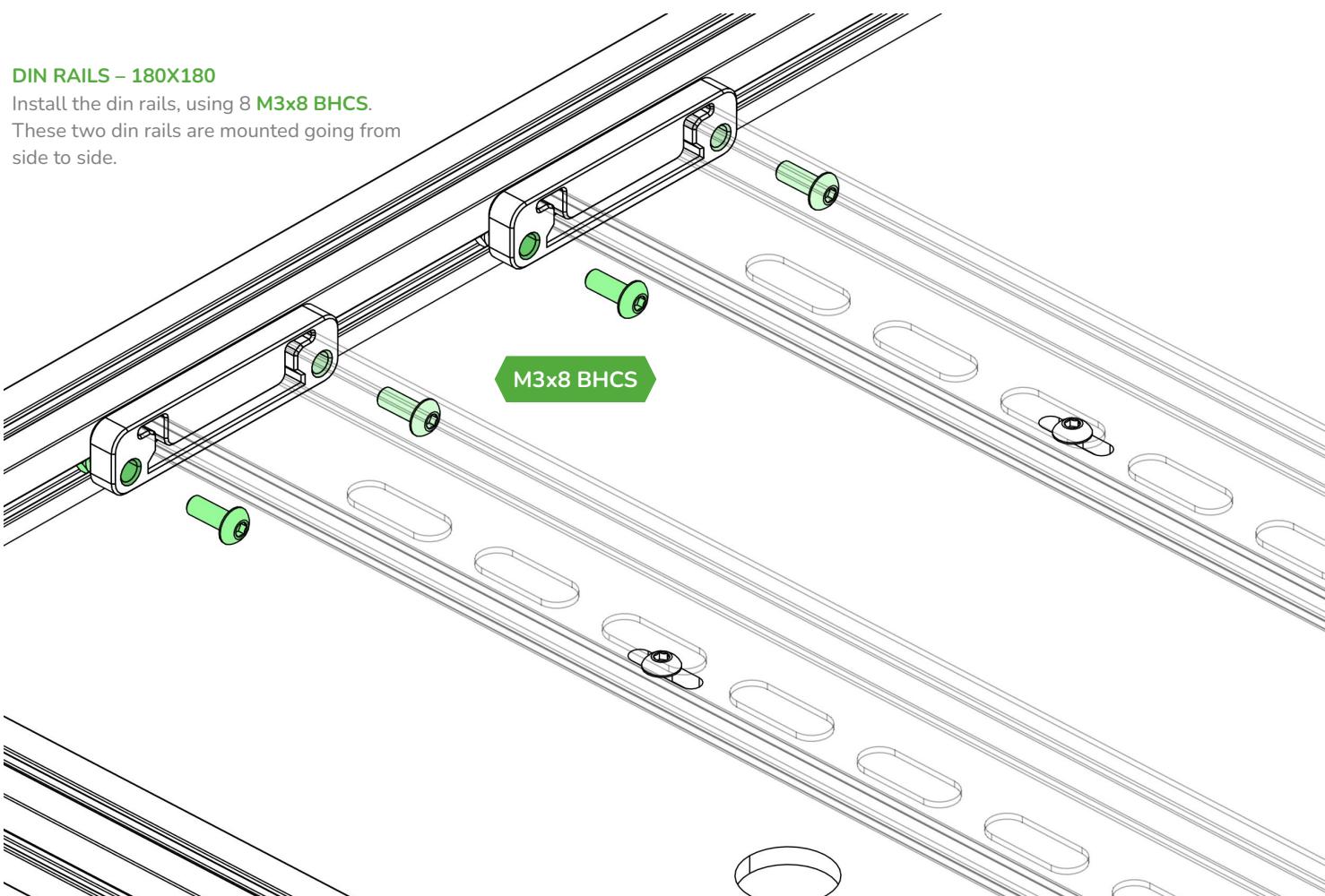


## FRAME | DIN rails



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## FRAME | DIN rails (continued)



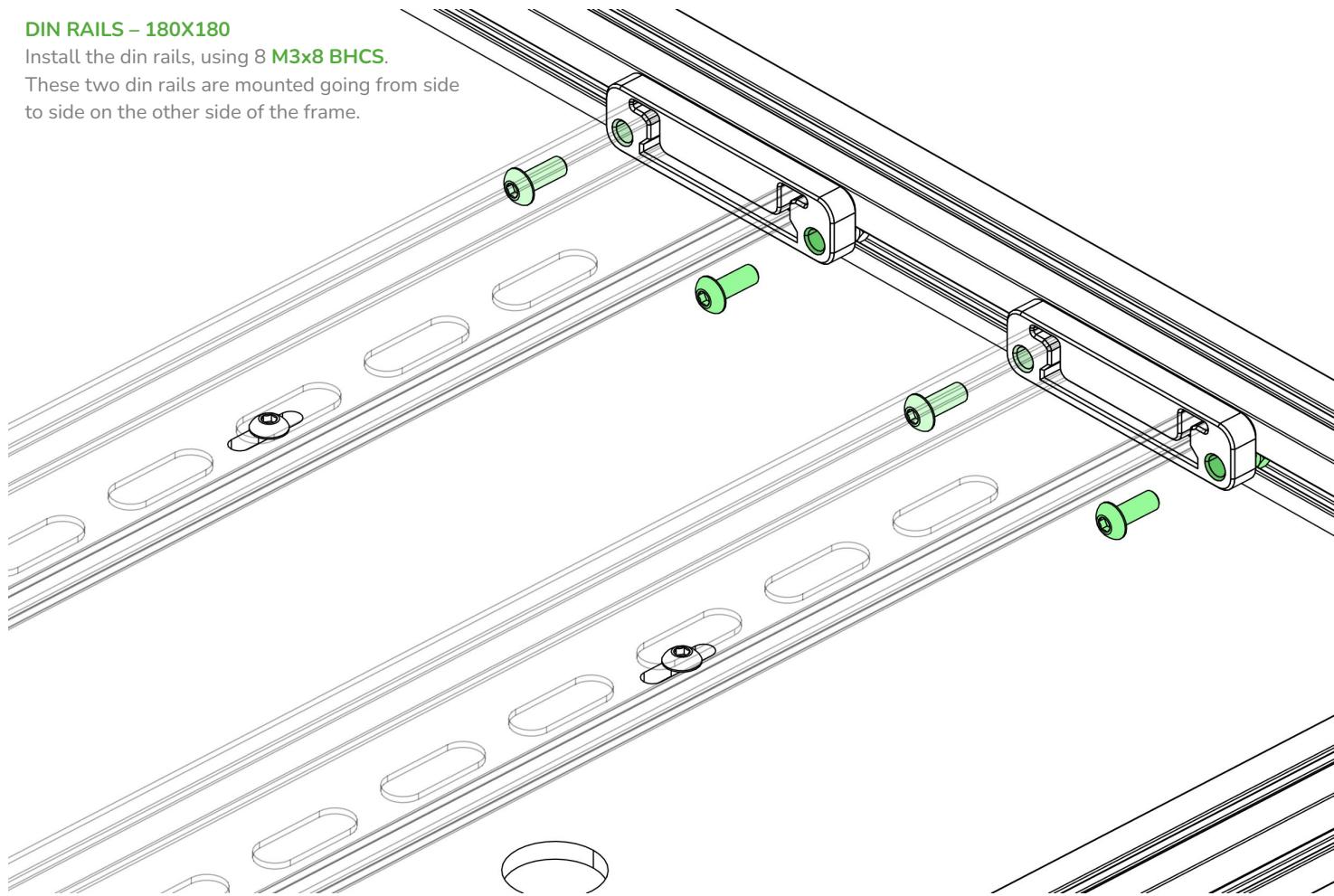
MICRON

## FRAME | DIN rails (continued)

### DIN RAILS – 180X180

Install the din rails, using 8 **M3x8 BHCS**.

These two din rails are mounted going from side to side on the other side of the frame.



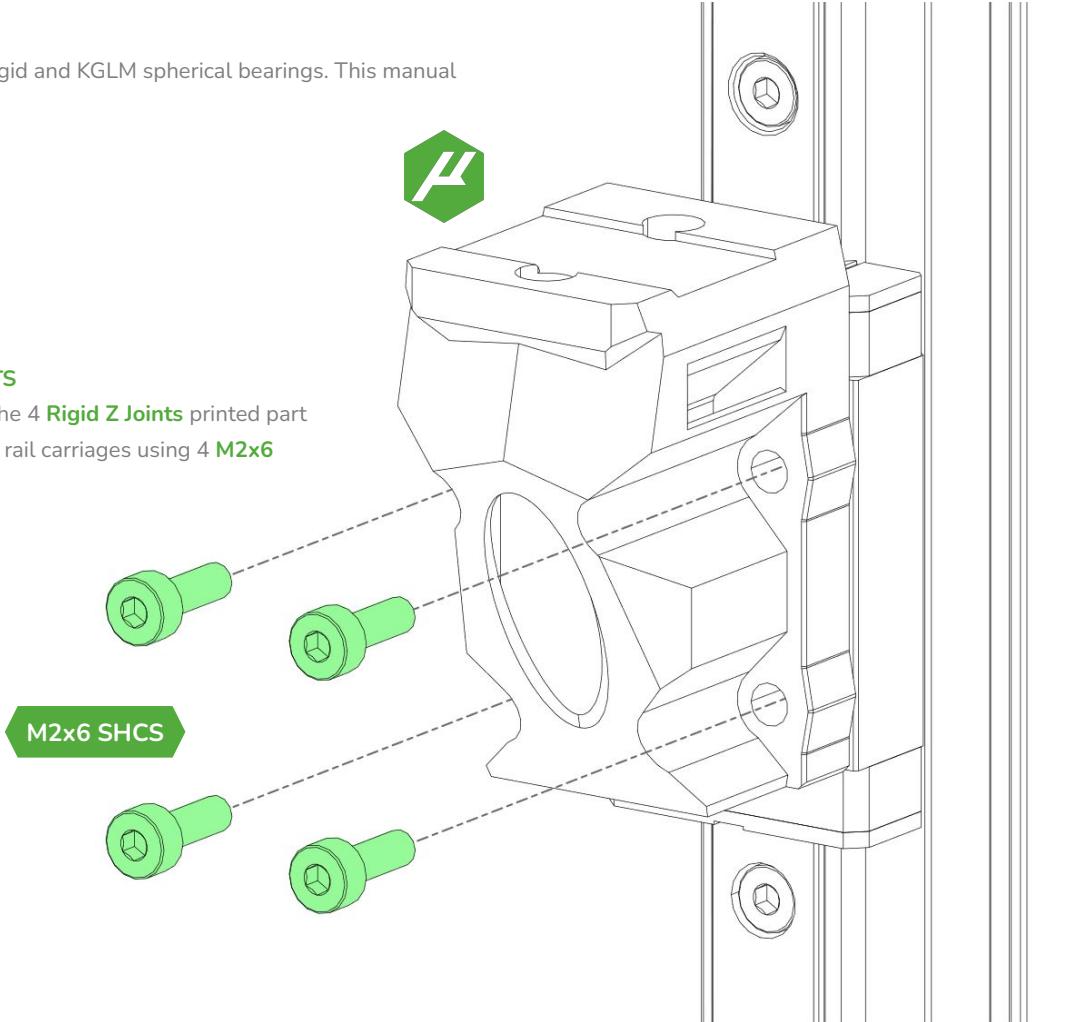
## FRAME | Z JOINTS

### Z JOINTS - Decisions, decisions....

There are 2x options for the Z Joints, Rigid and KGLM spherical bearings. This manual will only cover the Rigid version

#### Z JOINTS

Install the 4 **Rigid Z Joints** printed part to the Z rail carriages using 4 **M2x6 SHCS**



## BELTED Z DRIVES

Hardware	Qty
152mm Closed Loop Belt	x4
625_2RS Bearing	x8
GT2 16t Pulley	x8
M3 Washer	x8
M3x16 SHCS	x4
M3x20 SHCS	x8
M3x25 SHCS	x8
M3x6mm Grub Screw	x16
M3x8 BHCS	x32
M5x8 x 1mm Washer	x12



## BELTED Z DRIVES | Preparing GT2 16T Pulleys

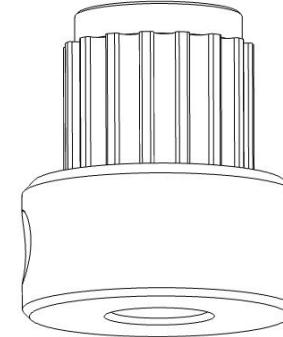
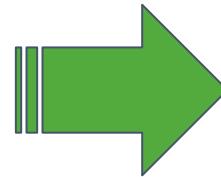
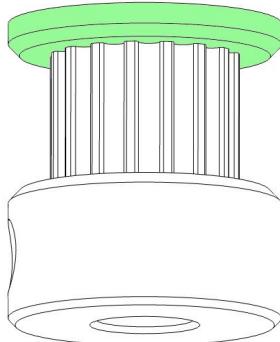
### Removing the upper flange from the pulley

Take a pair of pliers or grips and firmly pull the top flange off of the **GT2 16t Pulley**.

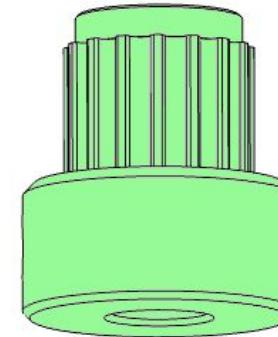
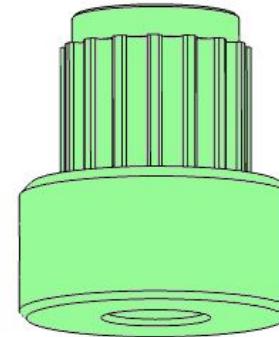
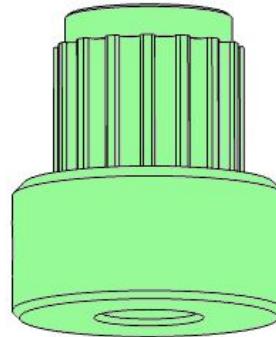
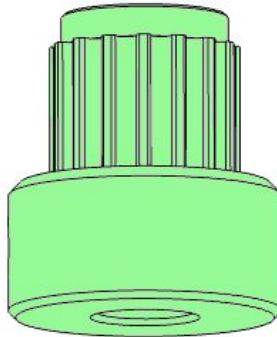


### TO DO, OR NOT TO DO. THAT IS THE QUESTION

If you are building an LDO kit, or using metal 64T Pulleys, you can skip this step and the next 2 steps. Move onto Shaft Assembly.



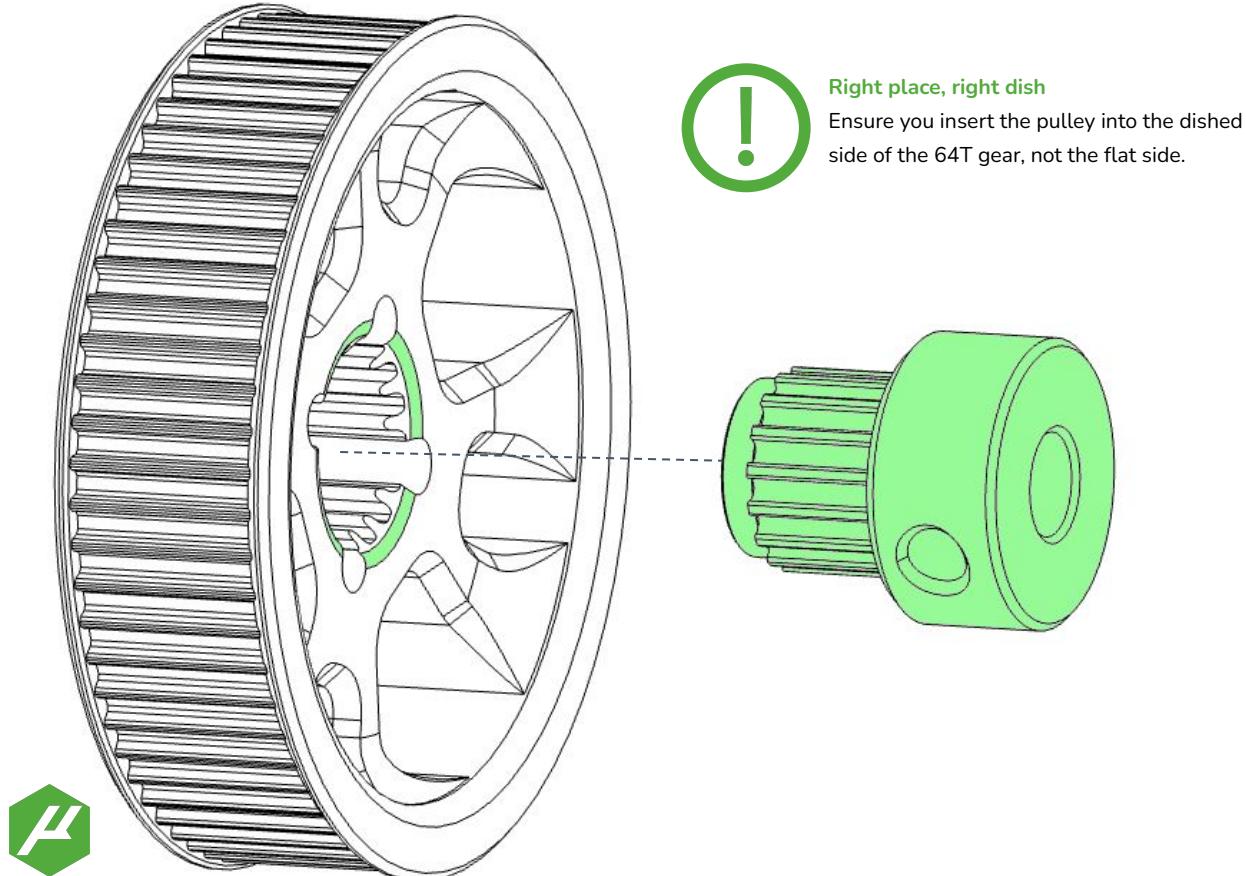
Do this **FOUR** times, so you end up with the below:



## BELTED Z DRIVES | 64T Pulley assembly

### When two become one....

Insert one of the previously de-flanged GT2 16T Pulleys into the centre of the [\[a\]\\_64t\\_hubbed\\_gear\\_x4.stl](#).



## BELTED Z DRIVES | 64T Pulley assembly (continued)

### Grub Screws Engage: Pulley Secured, Captain

Flip the 64T Gear / Pulley combo and slowly insert

4x **M3x6mm Grub Screw (GS)**, to secure the pulley in place.

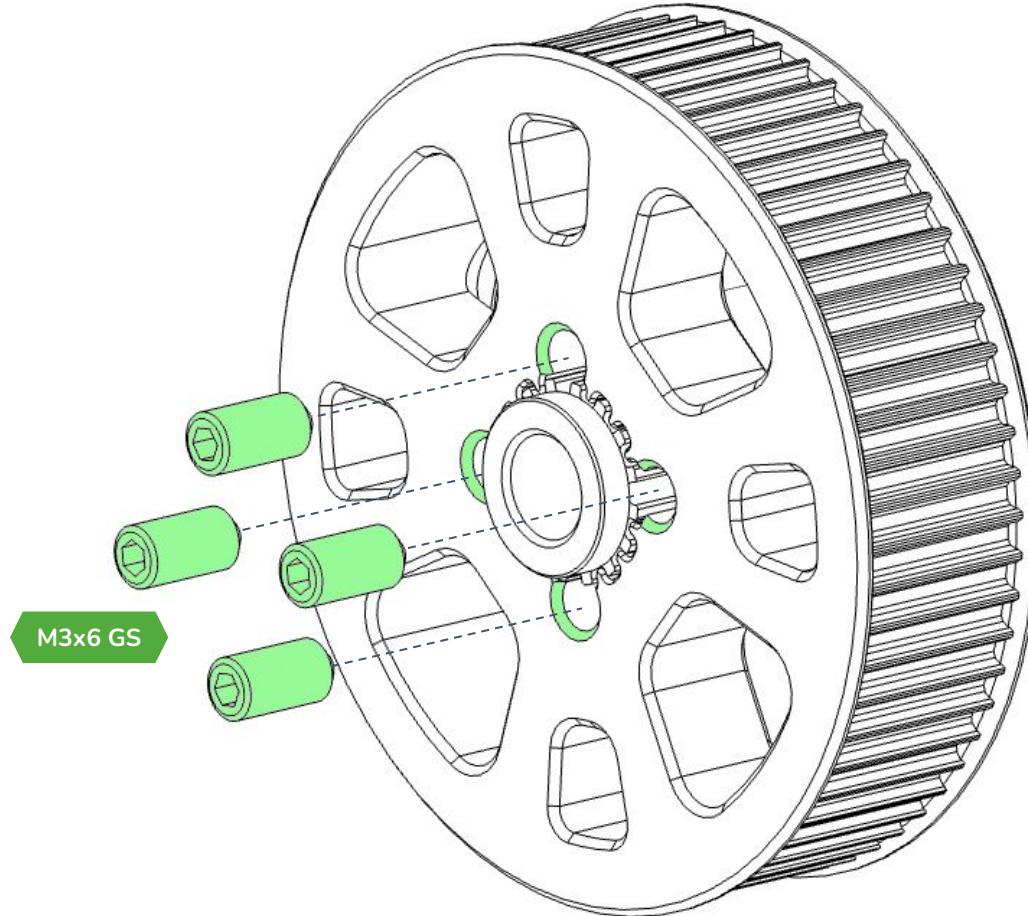


### Balance in all things, even Grub Screws!

Follow the below pattern when screwing in the Grub Screws, a few threads/turns at a time.

This will ensure the two don't become skewed. If you don't, a wonky pulley is... inevitable.

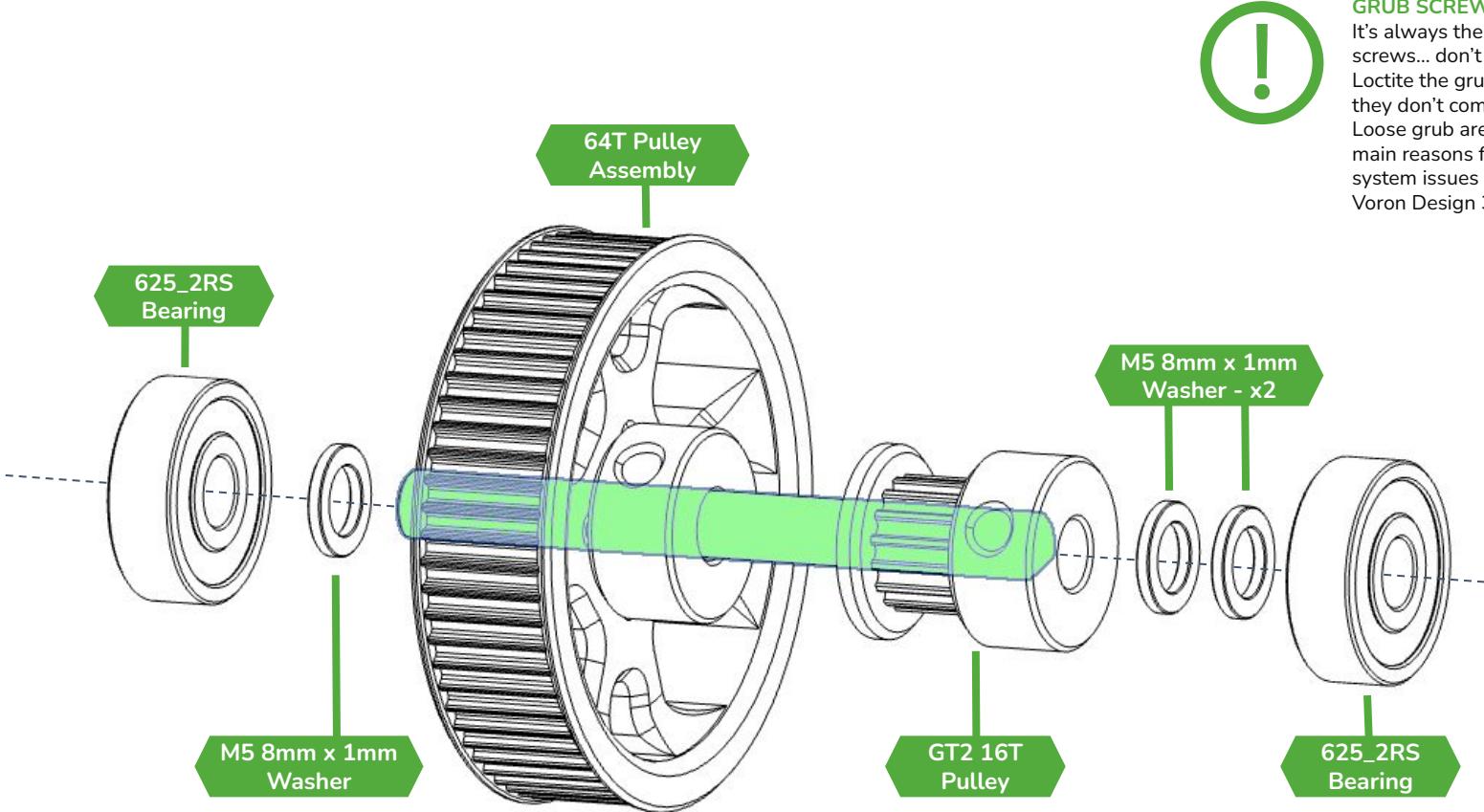
1  
3    4  
2



## BELTED Z DRIVES | Shaft assembly

**STACK IT LIKE IT'S HOT..**

Grab your **5mmx47mm D-Shaft** and put the following components onto it, in the following order.



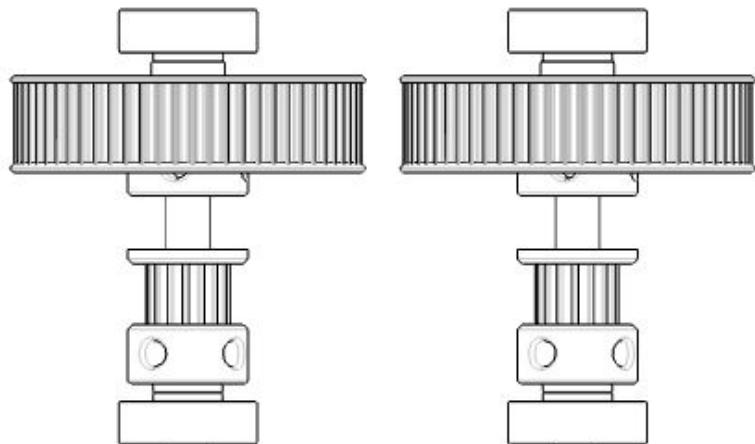
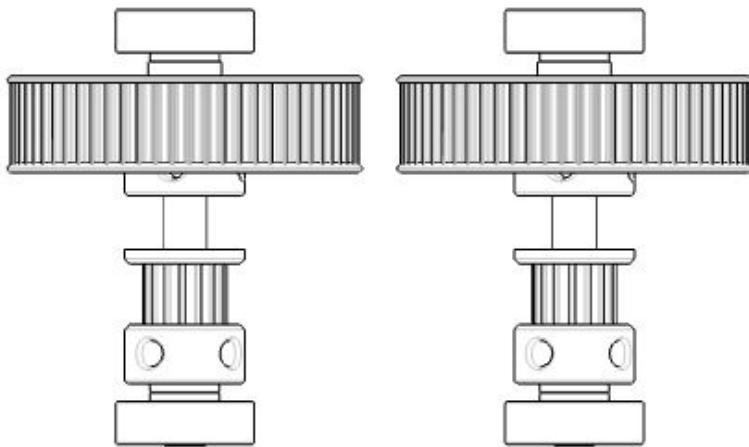
### GRUB SCREWS?

It's always the grub screws... don't forget to Loctite the grub screws so they don't come loose. Loose grub are one of the main reasons for motion system issues on PFA & Voron Design 3D Printers.

## BELTED Z DRIVES | Shaft assembly (continued)

**REPEAT, REPEAT, REPEAT...**

Assemble 3x more Drive Shaft Assemblies, and you should have a pile of well structured parts that look a little something like this...



## BELTED Z DRIVES | Main assembly

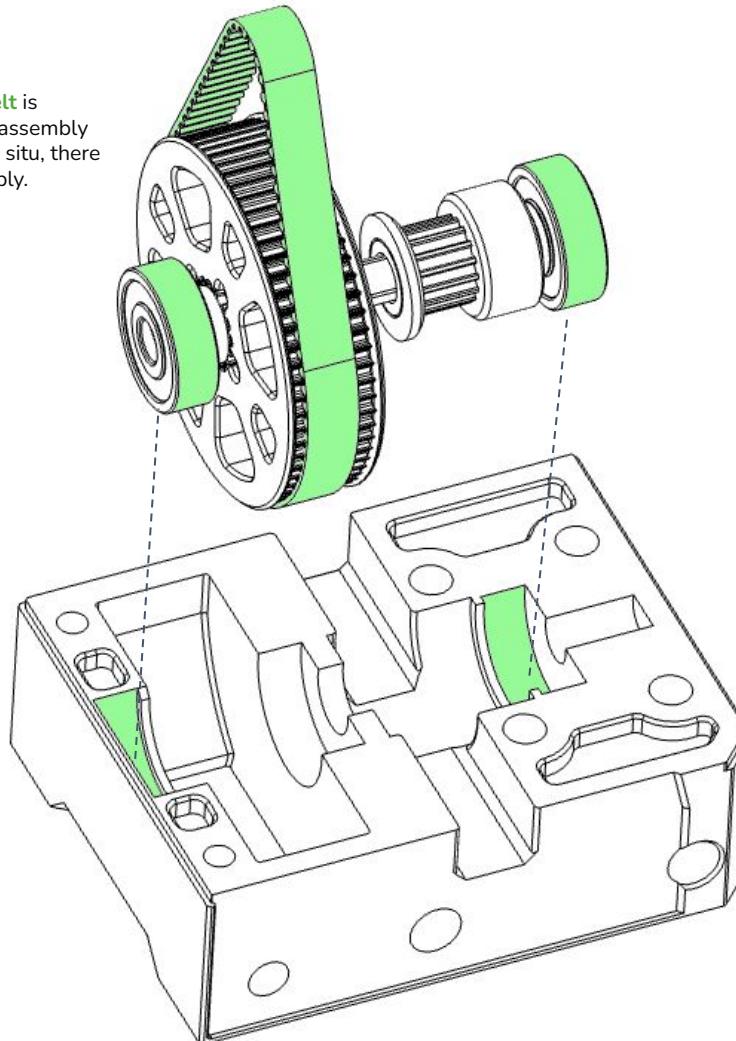
### PRIOR PREPARATION AND BELT PLACEMENT

For this step, ensure the **152mm Closed Loop Belt** is wrapped around the 64T Pulley before the shaft assembly is placed into the **main\_body\_x\_x2.stl**, as once in situ, there is no way to add the belt after, without disassembly.



#### SEAT HAPPENS

Check the **625\_2RS Bearings** are seated correctly in their recess to prevent any misalignment issues or skew.



#### A, B? I THOUGHT THIS WAS THE Z DRIVE?

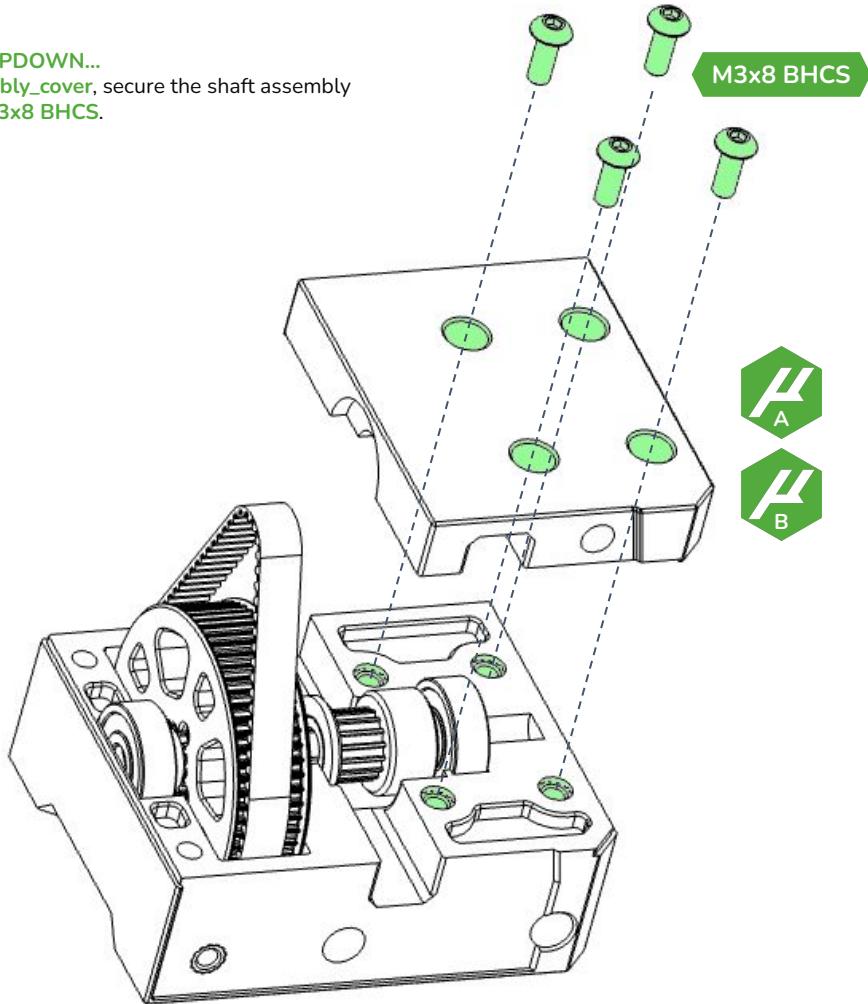
It is, but there are 2x versions to assemble for opposing corners.

- 2x - A Assemblies
- 2x - B Assemblies

## BELTED Z DRIVES | Main assembly (continued)

IT'S THE FINAL CLAMPDOWN...

Using [a].shaft\_assembly\_cover, secure the shaft assembly into position with 4x M3x8 BHCS.



ARE YOU GOING TO OWN IT?

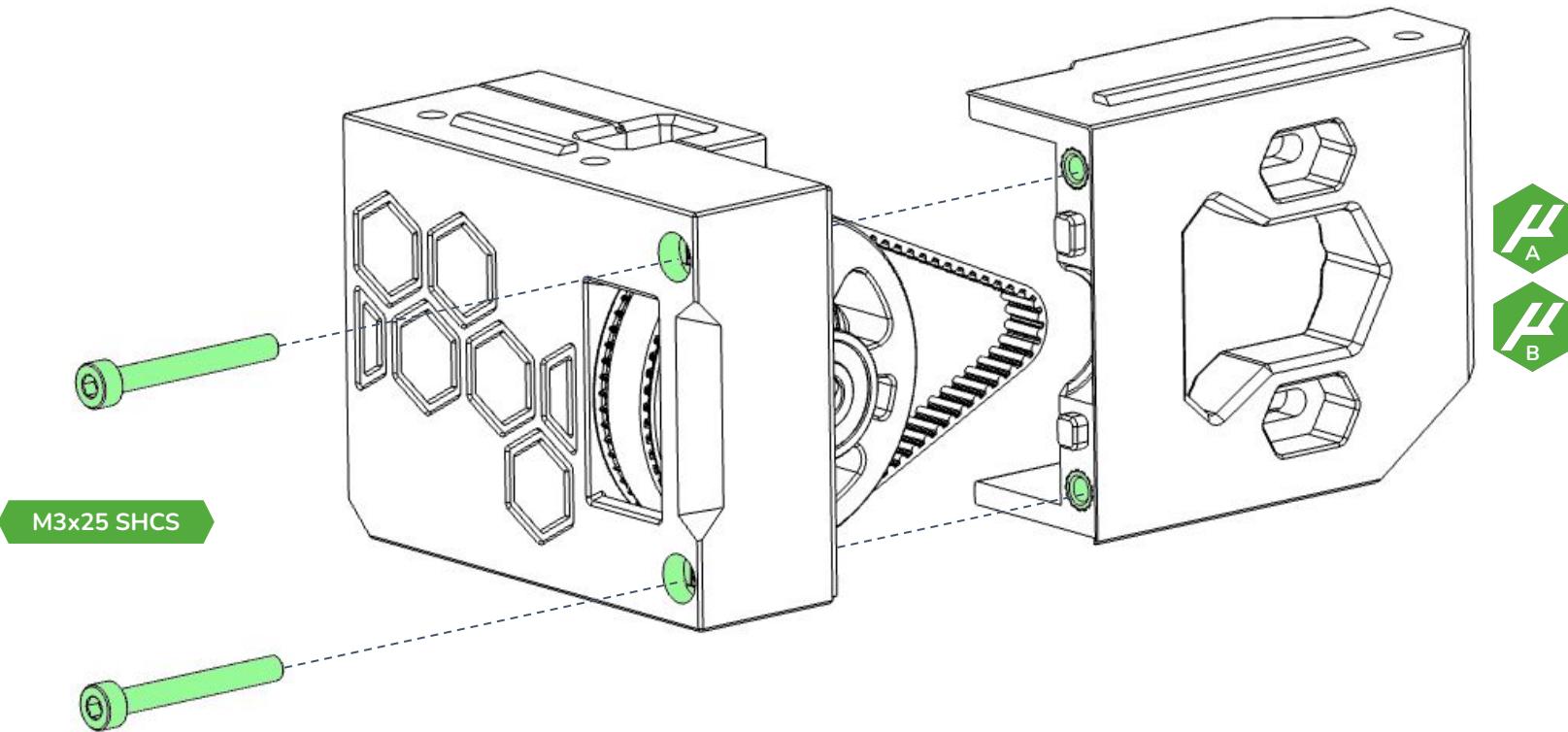
We know you sang the title of the description on this page, in your head at the very least..

The important question is are you going to make your way to the DoomCube Discord and confess to your inner Europe impression? Or not?...

## BELTED Z DRIVES | Main assembly (continued)

THIS CORNER HOLDS IT ALL TOGETHER.

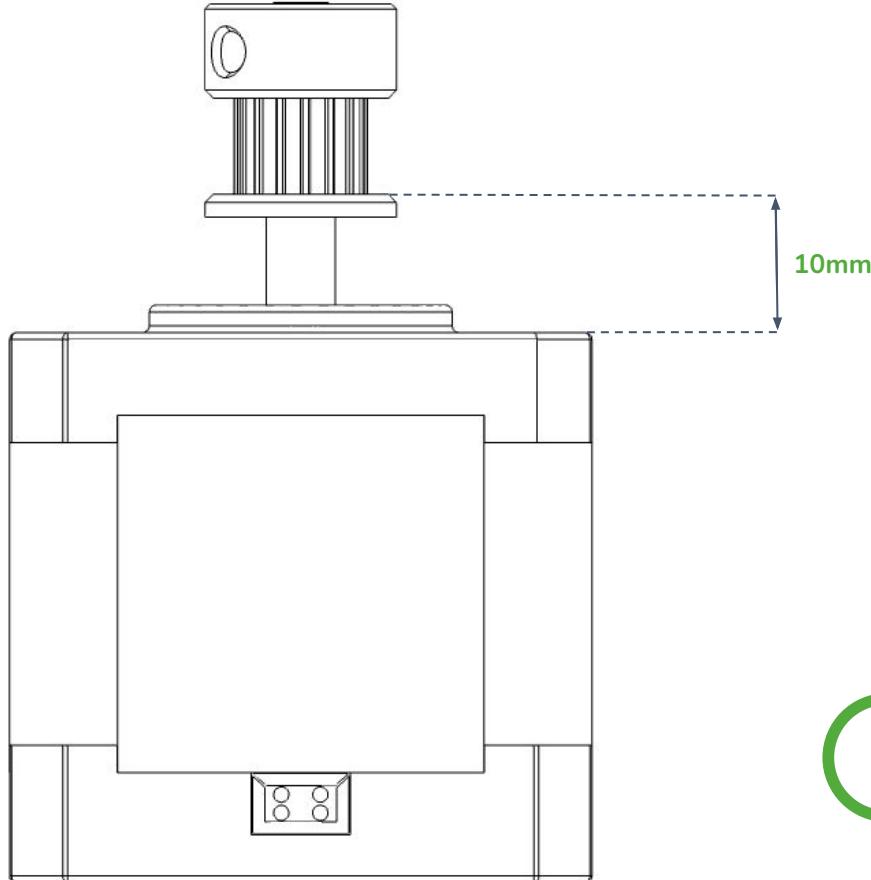
No pressure. Just perfect execution. Find your [tensioner\\_housing](#) printed part, and mount it to the previously assembled component using **x2 M3x25 SHCS**.



## BELTED Z DRIVES | Motor prep.

ONE SMALL PULLEY FOR MAN, ONE GIANT LEAP FOR Z-AXIS FUNCTIONALITY.

Now it's time to add the [GT2 16t Pulley](#) to the Z motor shaft. Again, don't forget the Loctite!



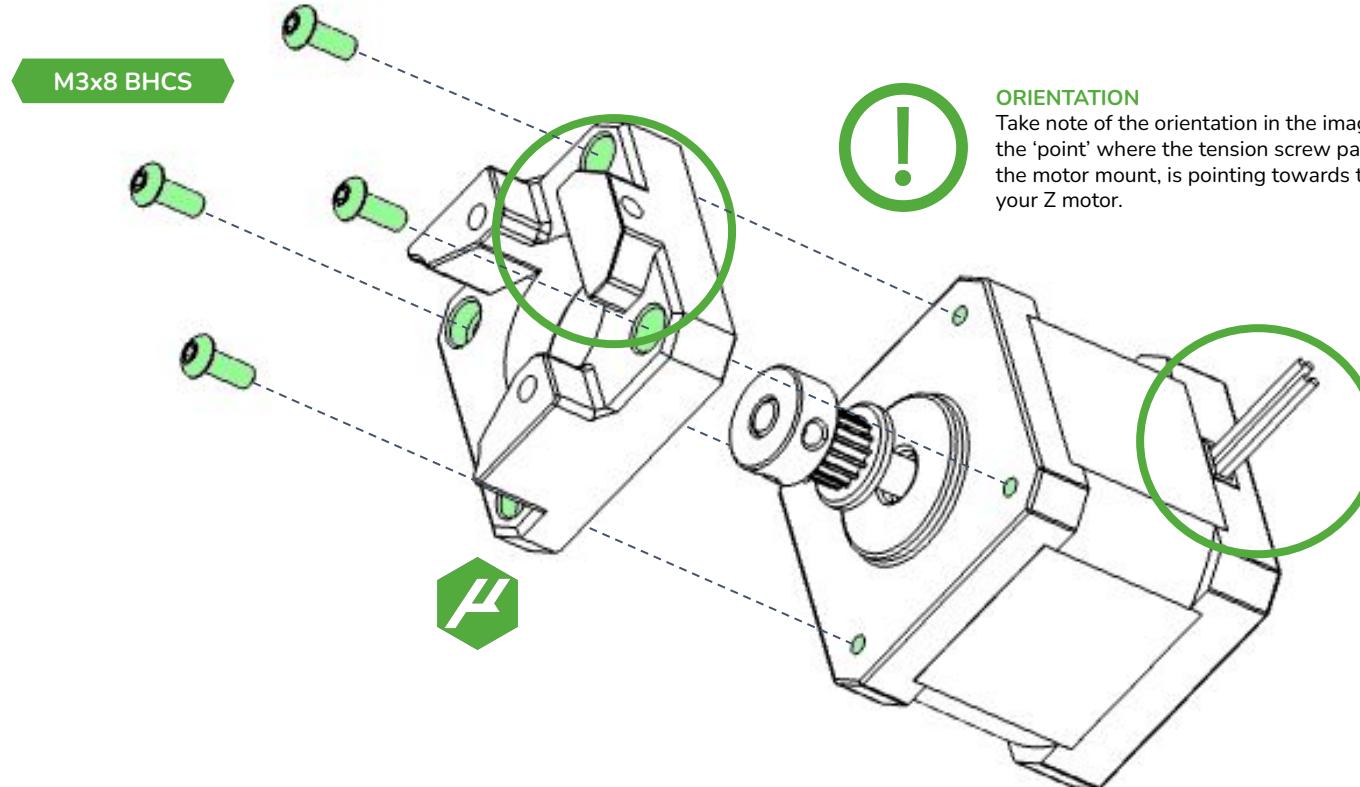
### Z Motor Options

Micron supports 2x different Z Motors; Nema 17, and Nema 14. This manual shows Nema 17, but the process for Nema 14 is exactly the same.

## BELTED Z DRIVES | Motor prep. (continued)

### FIRST YOU MOUNT, THEN YOU CONQUER..

Grab one of your 4x [nema\\_xx\\_motor\\_mount](#). and secure it to the Z motor using [4x M3x8 BHCS](#).



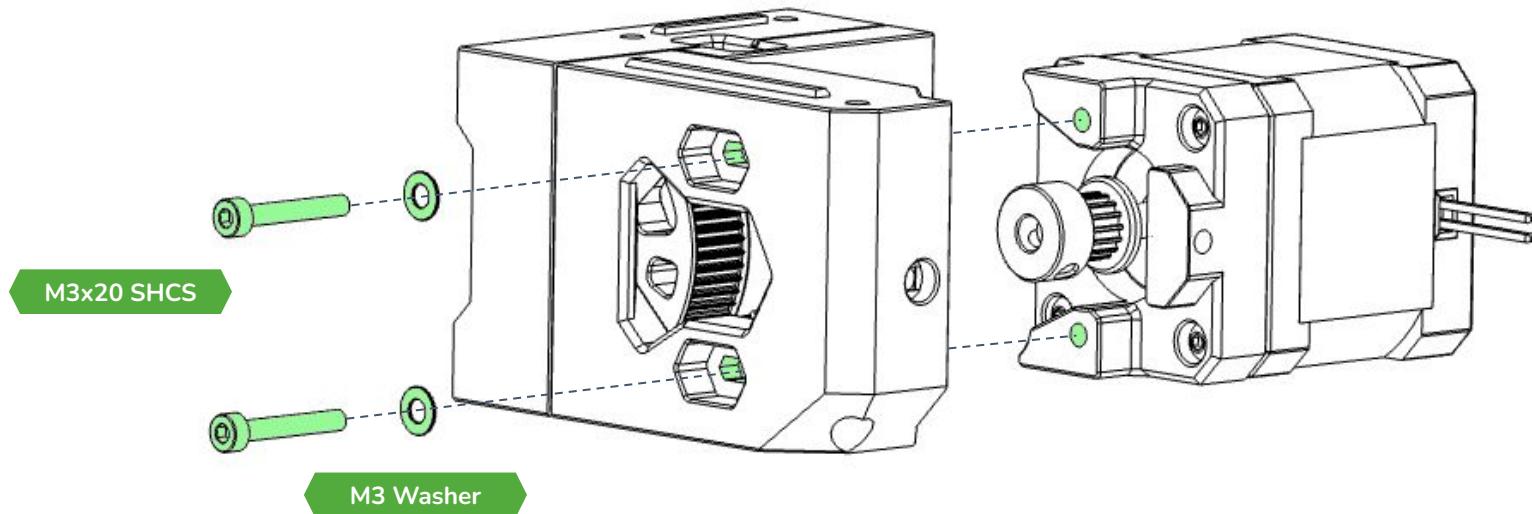
### ORIENTATION

Take note of the orientation in the image below. Ensure the 'point' where the tension screw passes through on the motor mount, is pointing towards the cable exit of your Z motor.

## BELTED Z DRIVES | Motor mounting

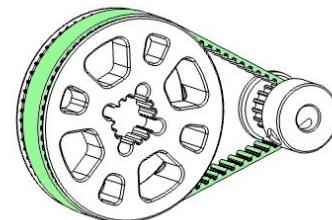
### PREPARE FOR FINAL APPROACH..

Now we're going to mount the Z Motor to the assembly, imagine Gemini VIII docking to the ISS.. NASA would be proud. Using **2x M3x20 SHCS & 2x M3 Washers** secure the motor in place, not too tight, as we're going to adjust tension later. Just tight enough to hold the whole thing together securely whilst you continue to build.



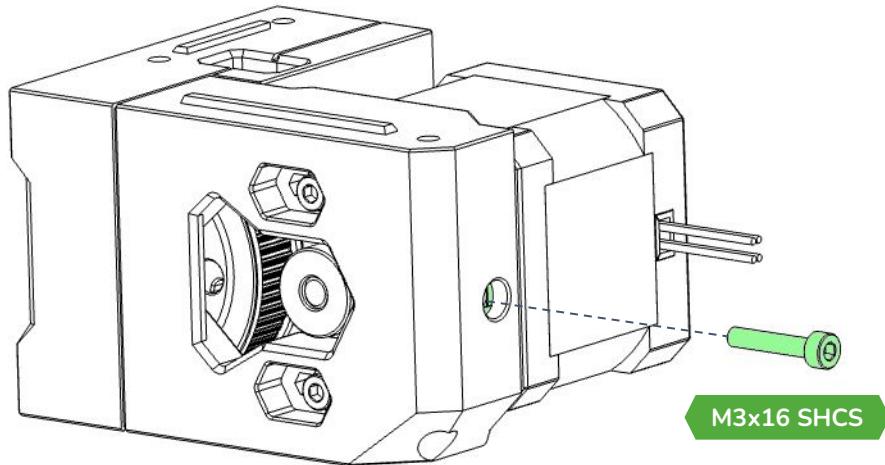
### CLOSED LOOP BELT

As you're bringing the 2x assemblies together, make sure the **GT2 16t Pulley** on the motor shaft is passed through the **152mm closed loop belt** in the main assembly.



**CREATING TENSION, ONE TURN AT A TIME..**

Double check your **152mm closed loop belt** is able to move freely, and the shaft assembly turns as expected. Then insert an **M3x16 SHCS**, this will be used to adjust tension in the Z drive; now, and as the printer is used and the belt naturally stretches and finds its home.



**WITH GREAT TENSION, COMES GREAT RESPONSIBILITY..**

Make sure the **2x M3x16 SHCS** that mount the motor to the assembly aren't tight, and the motor can slide freely side to side.

Slowly apply tension to the belt using the **tension screw**. Once the desired tension is achieved, tighten the **2x M3x16 SHCS** to lock the motor in place.

**LEFTY LOOSEY, RIGHTY TIGHTY**

As with most things, applying or reducing tension to the belt is done by turning the tension screw; either, clockwise, or anti-clockwise.  
*(This applies to all belts on the Micron, a link to this section will be provided throughout the manual where belt tensioning is required)*



**CLOCKWISE**

Turn the tension screw clockwise to apply more tension to the belt.



**ANTI-CLOCKWISE**

Turn the tension screw anti-clockwise to reduce the tension on the belt.



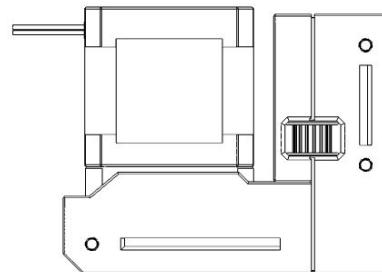
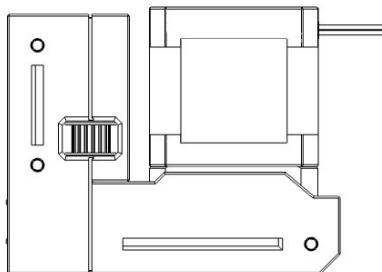
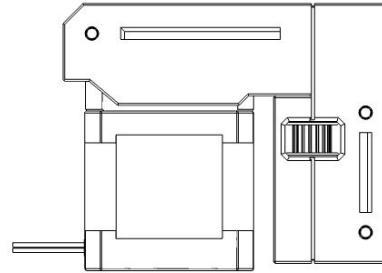
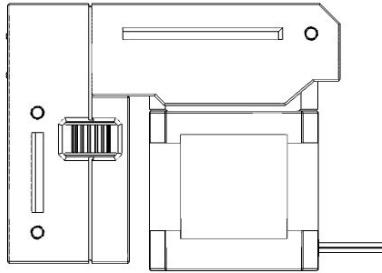
**TAKE IT EASY**

A little is a lot when it comes to tensioning belts. Don't over do it, little and often is best practice.

## BELTED Z DRIVES | Double checking

### ONE, TWO, THREE, AND TO THE FOUR...

Repeat the steps to assemble another 3x [Z Drive Assemblies](#), you should end up with something resembling the below. Take a second to go over all the steps and ensure everything is nice and snug, and your belts are tensioned.



### ADMIRE YOUR WORK

Now is the perfect opportunity to step back, and admire your work. Look at it, it's awesome! [Well done you!](#)

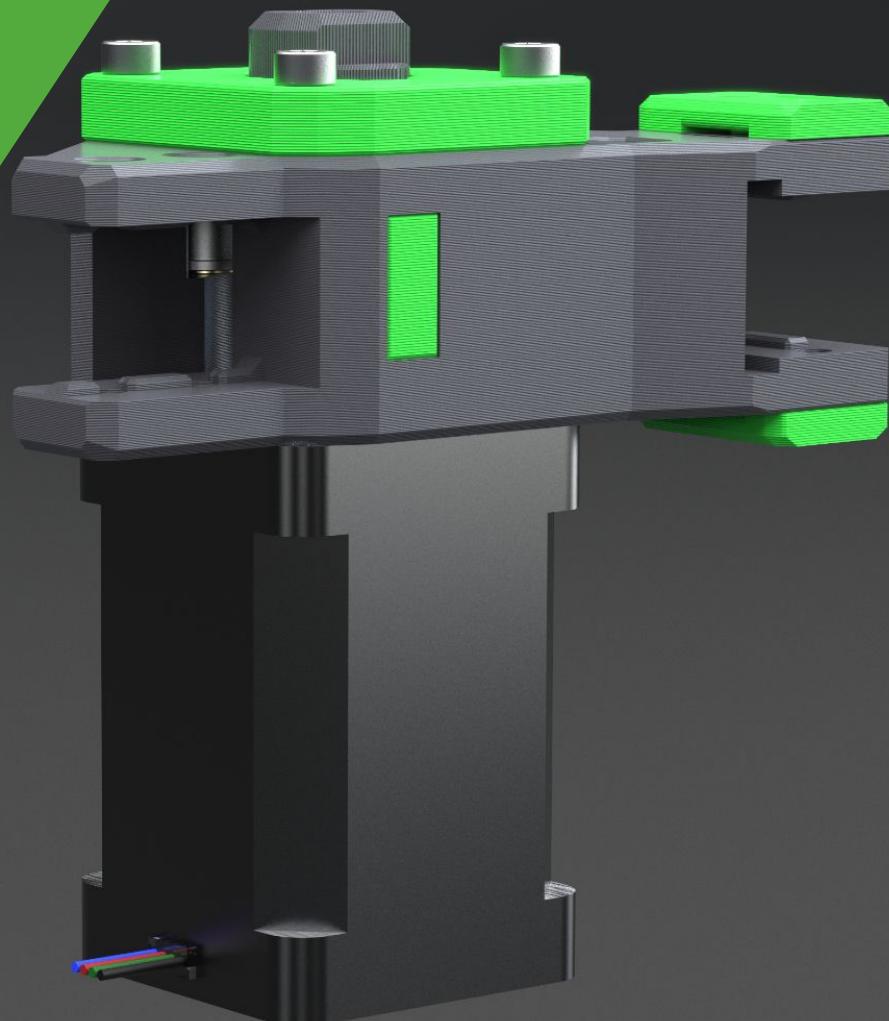
Grab a drink, and show off your new Micron Z drives to your significant other, dog, cat, goldfish, tarantula etc. whilst you're at it.

## A / B MOTOR MOUNTS

Hardware	Qty.
M3x25 BHCS	x4
M3x7x0.5 Shim	x12
F623RS Bearing	x12
GT2 16t Pulley	x2
F623RS Bearing	x12
GT2 16t Pulley	x2
M3x6 BHCS	x2
M3x30 SHCS	x6

### Optional Hardware

D2F-L Microswitch	x1
F625 Bearing	x2
M3x35 SHCS	x6
M3x25 Pin	x4



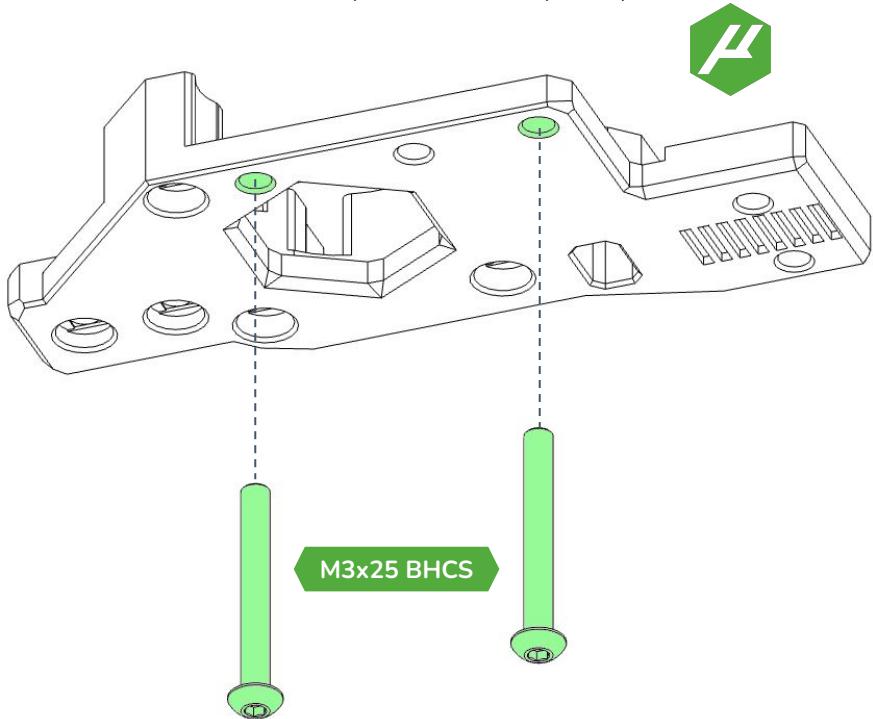
## A / B MOTOR MOUNTS | A Drive - Preparation

### MORE OPTIONS THAN A BRAND NEW CAR

As Micron is as awesome as it is, there are two options for the A / B motor mounts.

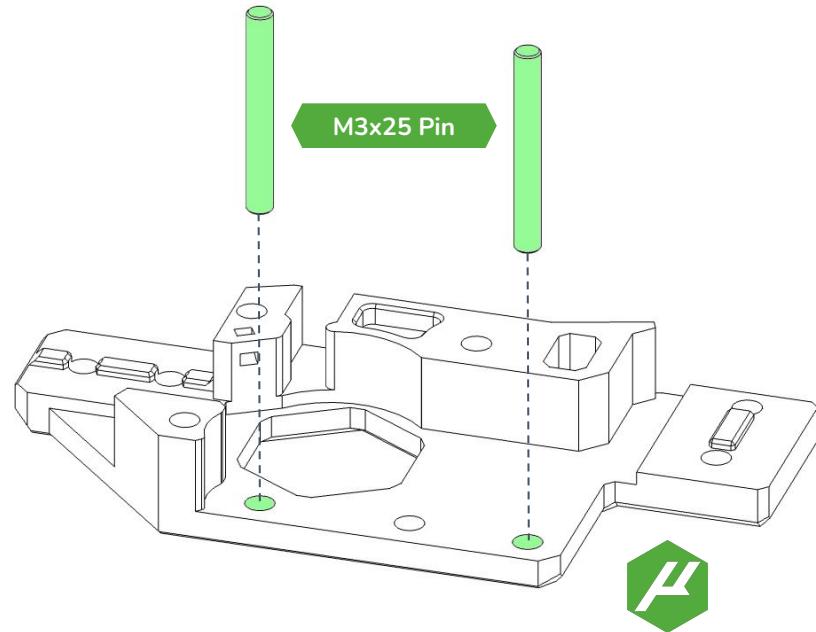
You can have a 'screwed' variant (no it isn't broken), or you can have a pinned variant. The former uses screws to house the various components in the bearing stacks, the latter uses pins. We're going to attempt to be clever here and show you both options as the process is very similar.

**DEFAULT DECISION:**Screws. Sweet, simple, and as low-effort as you can get — perfect for the 'just wanna build and question life less' crowd. Pins? That's for when you wanna feel fancy... or superior.



### SCREWED

For the screwed variant, flip the **A Drive Frame Upper** upside down and insert 2x **M3x25 BHCS** into the top face of the part, or what is now the underside.



### PINNED

For the pinned variant, place the **A Drive Frame Upper** upside down and insert 2x **M3x25 Pins** into the inside the part.

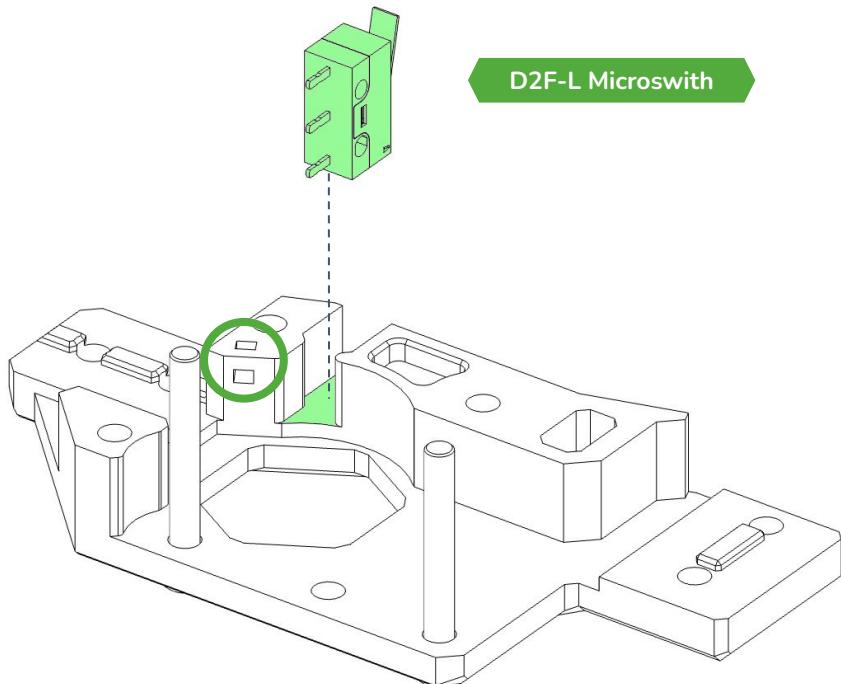
## A / B MOTOR MOUNTS | A Drive - Endstops

### STILL MORE OPTIONS THAN A BRAND NEW CAR.....

Yes, more options. We spoil you.

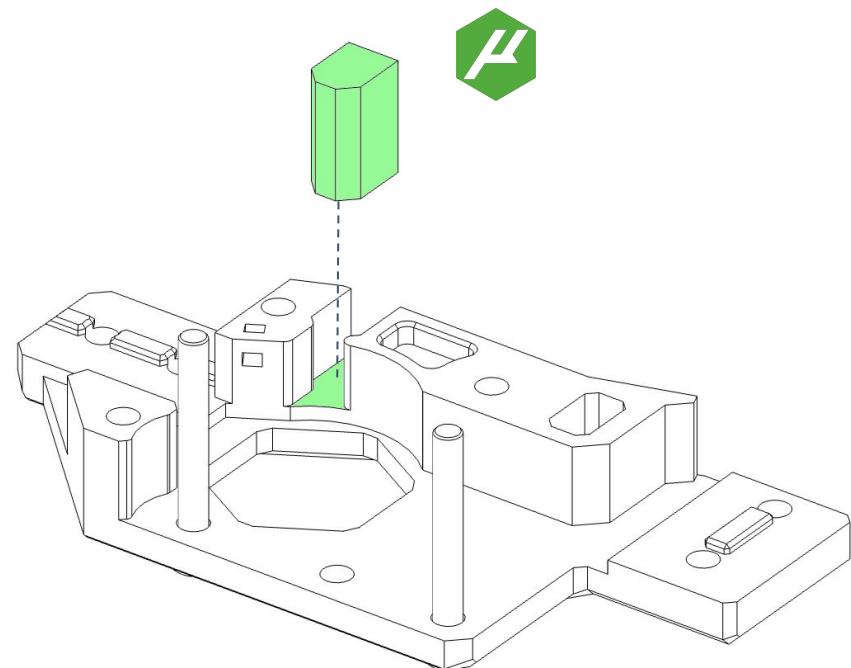
Now you have the choice of end stop switches or sensorless for homing the gantry in the Y direction. If using sensorless there is a piece that replaces the switch.

**DEFAULT DECISION:** Screws. Sweet, simple, and as low-effort as you can get — perfect for the 'just wanna build and question life less' crowd. Pins? That's for when you wanna feel fancy... or superior.



#### END STOP SWITCHES

Pre solder the wires onto your end stop switch (using the 2x outside pins). Place it into position. There is a cable tie anchor circled on the image above for securing the wires.



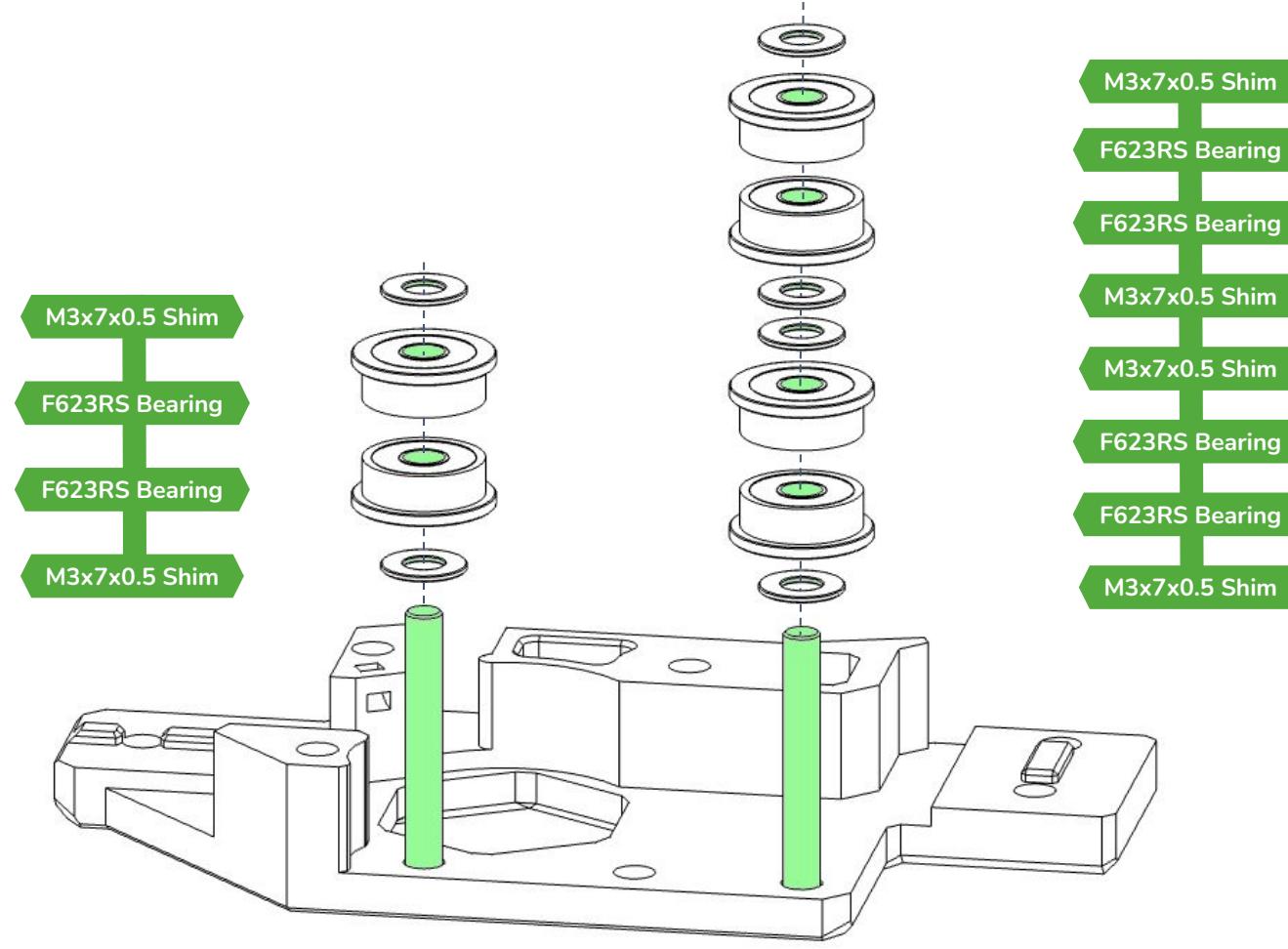
#### SENSORLESS

Insert the **Y Endstop Sensorless Plug** into the slot provided where the switch would usually go.

## A / B MOTOR MOUNTS | A Drive - Bearing Stacks

### DIFFERENT, BUT THE SAME...

The next part is the same for both pinned and screwed variants. We're now going to assemble the bearing stacks onto the previously installed screw / pin using gravity to our advantage.



## A / B MOTOR MOUNTS | A Drive - Assembly

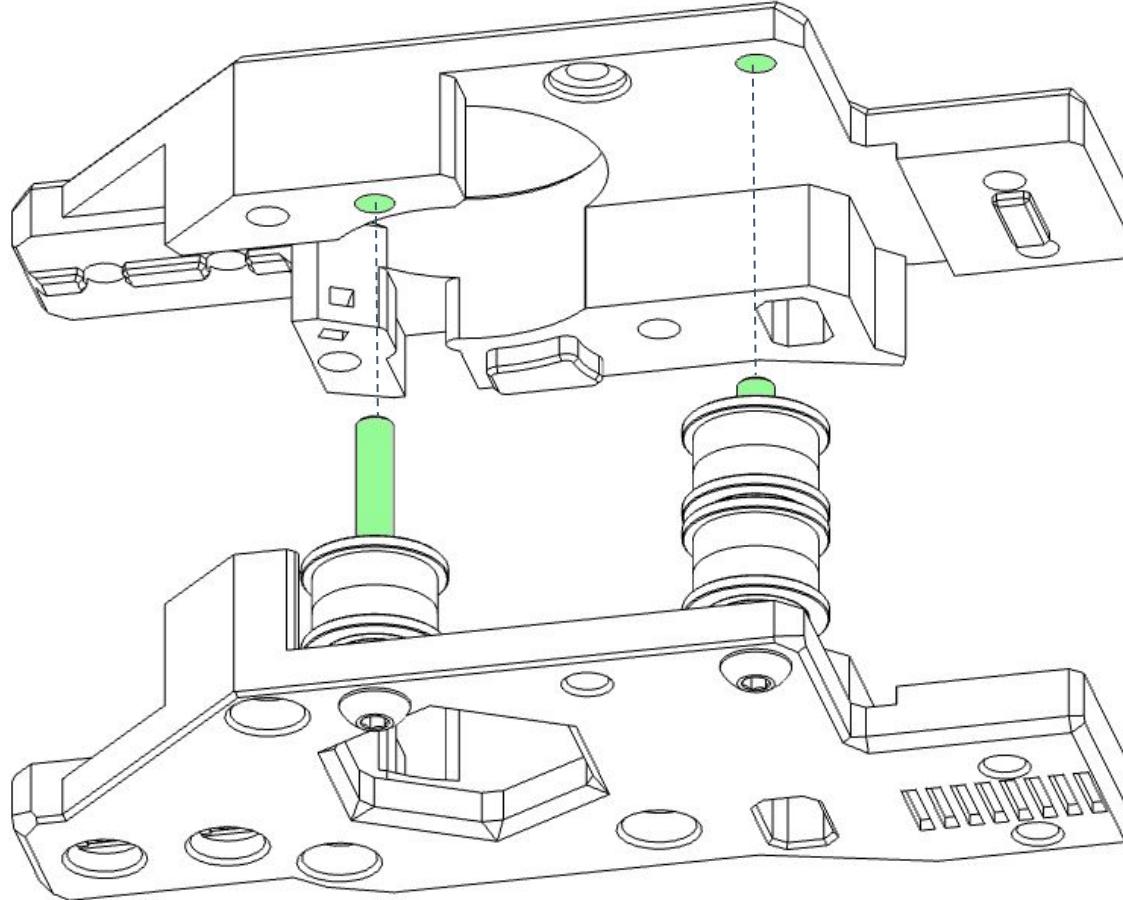
### PREVENTATIVE MEASURES

Now, before you knock it over hand have to rebuild the bearing stacks approximately 7x, we're going to secure them in place with the **A Drive Lower** piece. If using screws, you'll need to carefully screw them into the highlighted holes. If using pins, these are push fit. Ensure your endstop switch or spacer slides into the corresponding position too.



### HOW MANY UGGA DUGGAS?

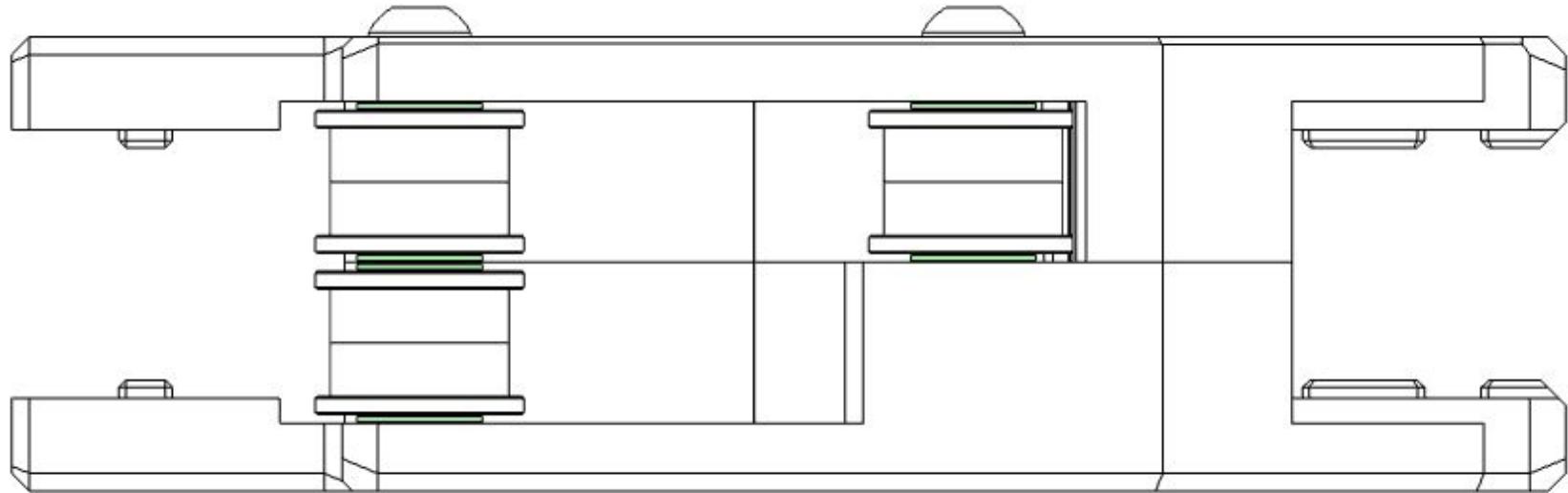
Not too many. These screws are only screwing into the plastic of the printed part. They aren't structural so no need to over do it. Don't go back for that one last 'nip' as you'll strip the threads from the hole. (We've all been there. Don't pretend you haven't)



## A / B MOTOR MOUNTS | A Drive - Double Checking

### DOUBLE CHECK THOSE SHIMS

The last thing you want is your swanky new printer chewing through belts. Now is an ideal time to ensure you have the correct amount of shims, in their relevant locations. Go back 2 pages and check!



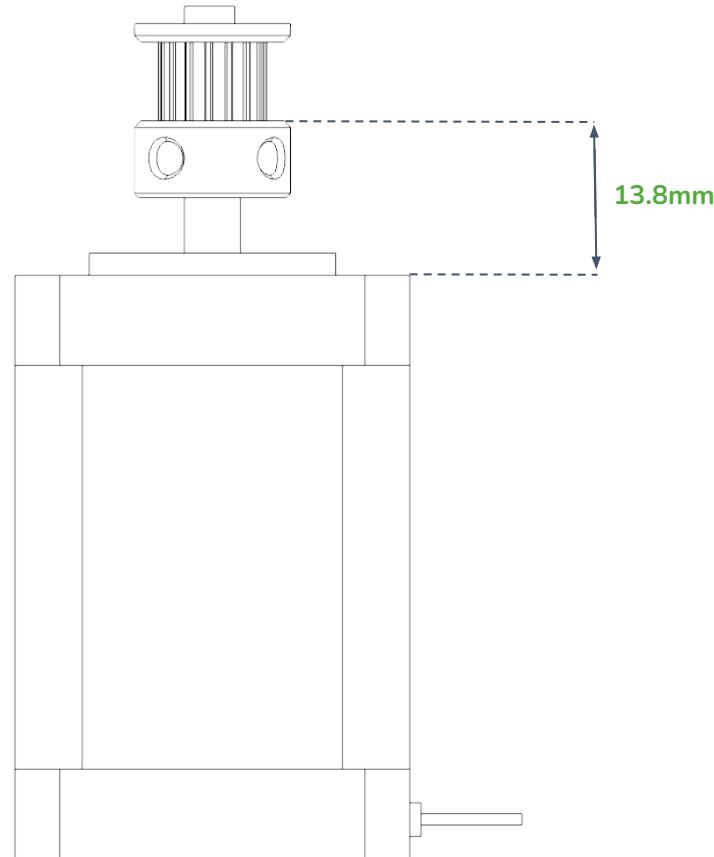
### STOP IT

You were about to move onto the next step weren't you? We saw you. Check your shims. You'll only regret it later if you don't. Most belt issues are caused by shims being incorrect.

## A / B MOTOR MOUNTS | A Drive - Motor Preparation

### MEASURE TWICE, FIT ONCE, QUESTION YOURSELF, THEN MEASURE SEVERAL MORE TIMES...

You've done this 4x already with the Z-drives, you should be able to do this with your eyes closed. Grab a [GT2 16t Pulley](#) and slide it onto the motor shaft in the following orientation. Loctite those lil' grub screws, these ones are constantly moving at speeds and are prone to vibrating lose.



### OPEN WIIDE

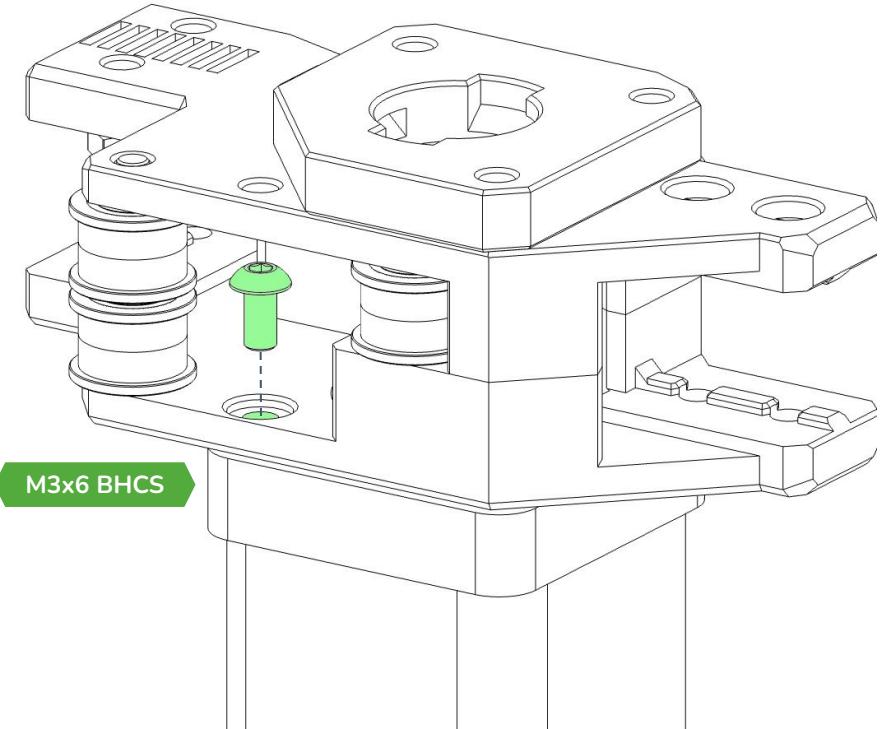
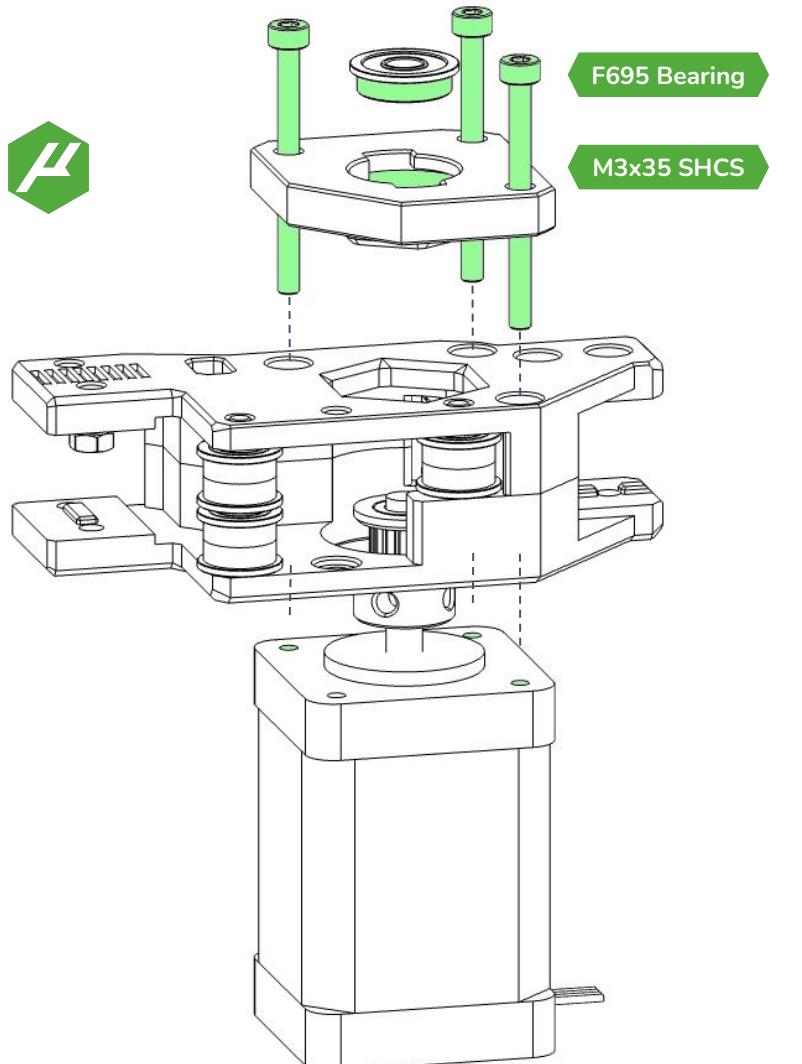
You may be able to, but you definitely shouldn't do this with your eyes closed.

## A / B MOTOR MOUNTS | A Drive - Motor Mounting

### DUAL SHEAR GOODNESS?

Are you not blown away by all these gucci options we've made available for you...? There are 2x mounting options for your AB motors. Dual shear adds a second bearing to further support the motor shaft when it's under tension from the belts. If you're not planning on using dual sheer, you can screw the motor directly to the A drive assembly as shown on the next page.

**Default Decision:** Screws. Sweet, simple, and as low-effort as you can get — perfect for the 'just wanna build and question life less' crowd. Pins? That's for when you wanna feel fancy... or superior.



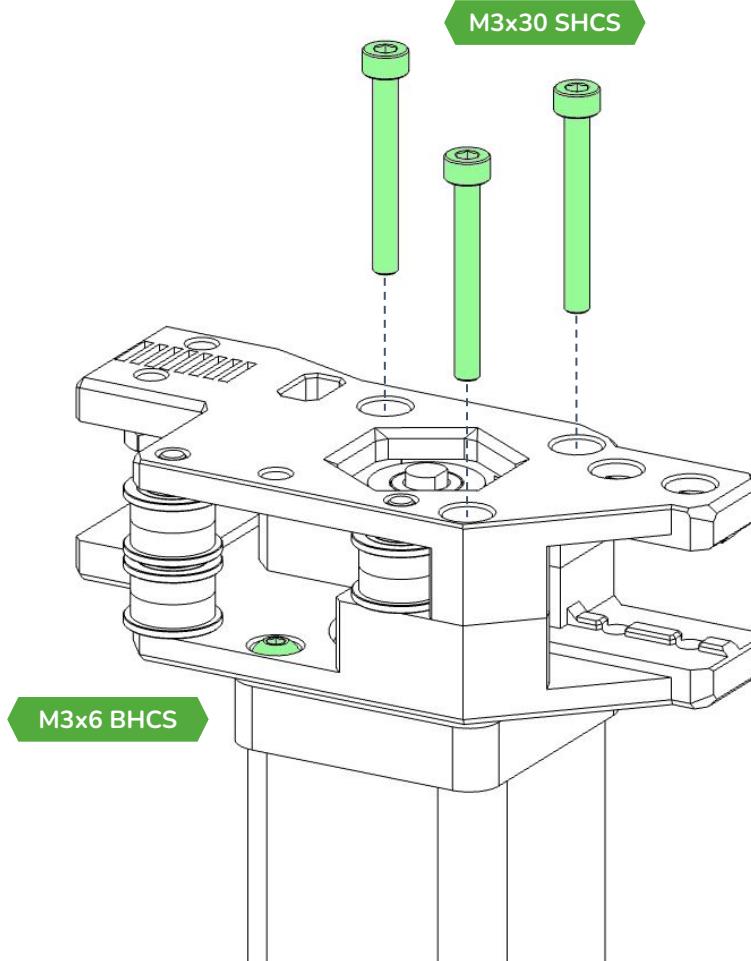
### SMALL SCREW SYNDROME

This **M3x6 BHCS** is required if you are using dual shear or not. Don't forget him!

## A / B MOTOR MOUNTS | A Drive - Motor Mounting

### DON'T WANT DUAL SHEAR?

If you're not using dual shear, we got you covered there too! Mount the motor to the A drive assembly with **3x M3 x 30 SHCS**, and **1x M3x6 BHCS**.



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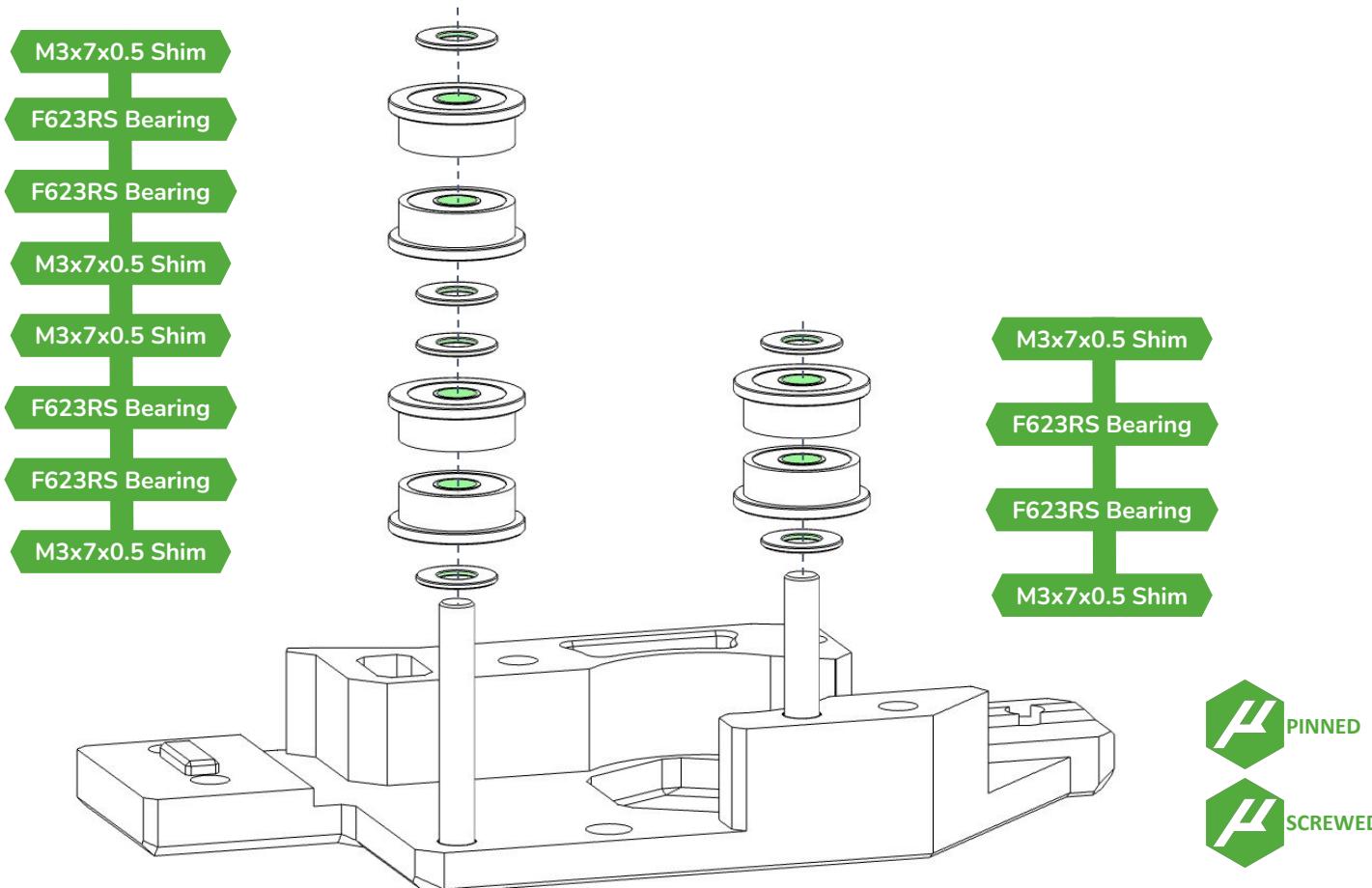
No, we're not sure why either....

## A / B MOTOR MOUNTS | B Drive - Bearing Stacks

### THIS LOOKS FAMILIAR

It is... we use the same process for the B-Drive as we did the A-Drive, just mirrored.

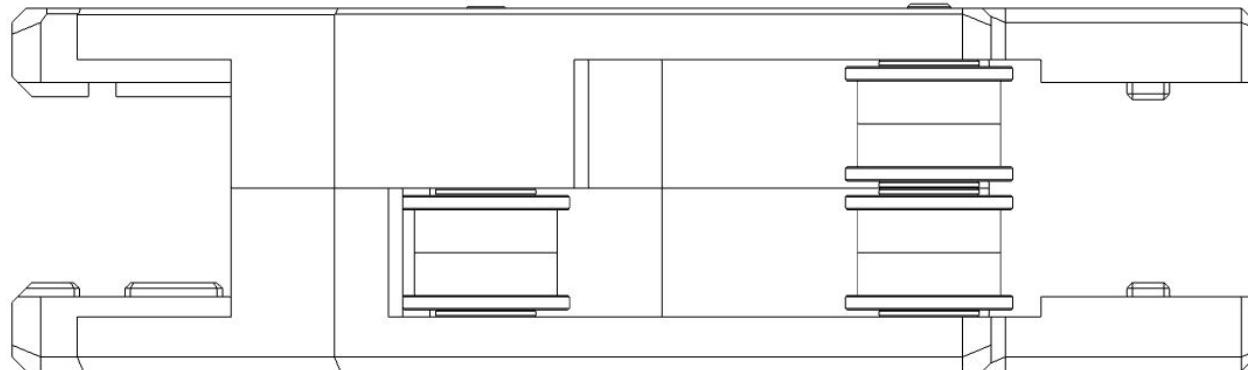
The only main differences are the bearing stacks, and the location of the 16t Idler on the motor, so we'll just cover those 2 elements, the rest you can use the previous steps from the A-Drive assembly.



## A / B MOTOR MOUNTS | B Drive - Double Checking

### DOUBLE CHECK THOSE SHIMS

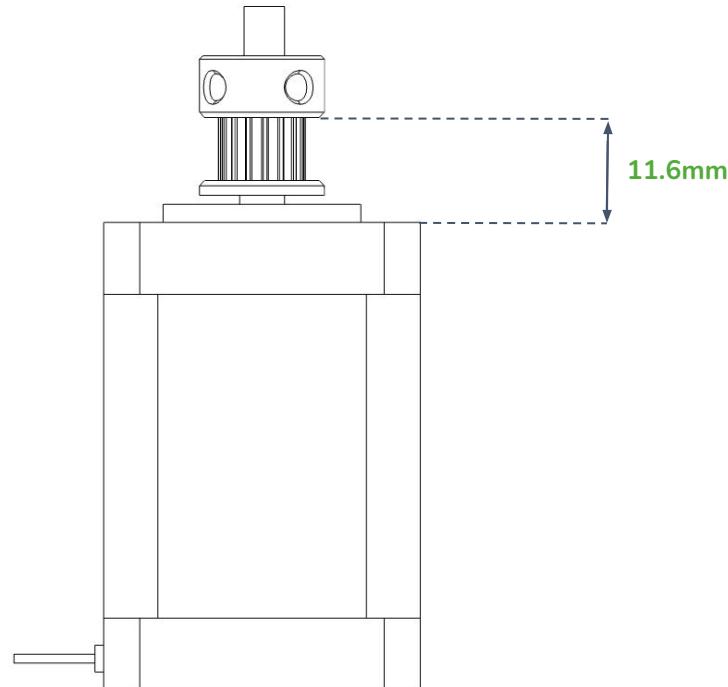
The last thing you want is your swanky new printer chewing through belts. Now is an ideal time to ensure you have the correct amount of shims, in their relevant locations. Go back to the previous page and check!



## A / B MOTOR MOUNTS | B Drive - Motor Prep

### MEASURE TWICE, FIT ONCE, QUESTION YOURSELF, THEN MEASURE SEVERAL MORE TIMES...

You've done this 4x already with the Z-drives, you should be able to do this with your eyes closed. Grab a [16t Pulley](#) and slide it onto the motor shaft in the following orientation. Loctite those lil' grub screws, these ones are constantly moving at speeds and are prone to vibrating lose. Why do we feel like we're repeating ourselves here?



## A / B MOTOR MOUNTS | B Drive - Finishing touches

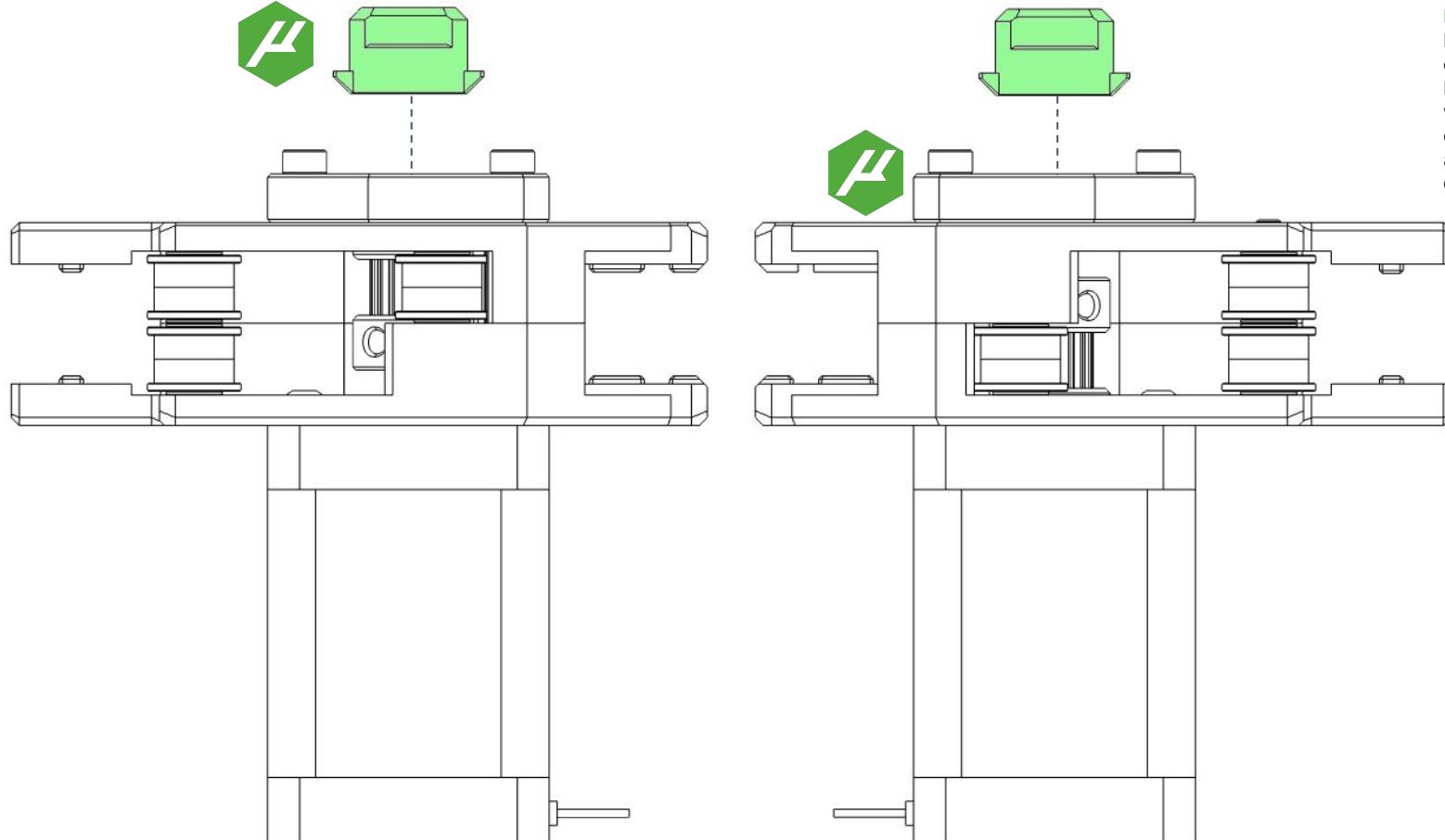
### IT'S THAT TIME TO SIT AND ADMIRE YOUR WORK AGAIN.

As we previously mentioned, the rest of the steps are the same as the A-Drive, so once you've followed those, you should have something that resembles the below. If you decided to use the Dual Shear Option, you can now add your bearing retainers. Pop them into the slot and twist.



#### DON'T PANIC

Remember, if you opted not to use Dual Shear, you won't have the components above this handy dotted line below.



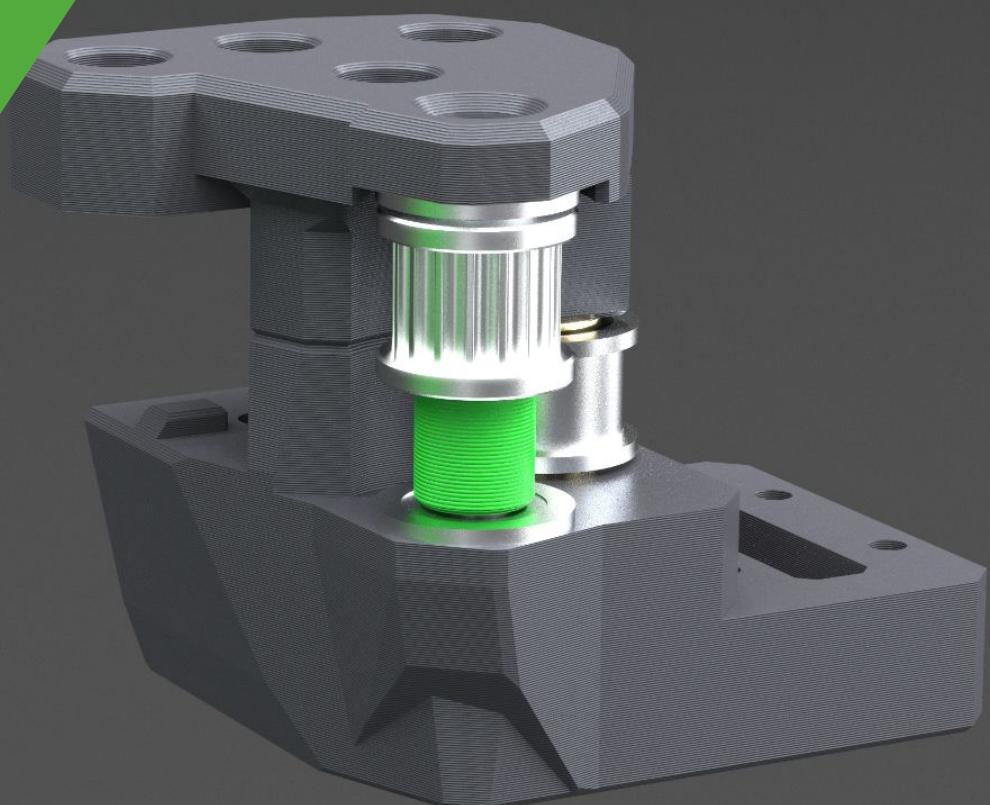
## X / Y JOINTS

### Hardware Qty.

M2x12 SHCS	x8
M3x8 BHCS	x4
M3x20 BHCS	x2
M3x25 BHCS	x4
M3x35 SHCS	x4
M3 Heatset	x4
GT2 16T Idler	x2
F623RS Bearing	x4
M3x7x0.5 Shim	x4

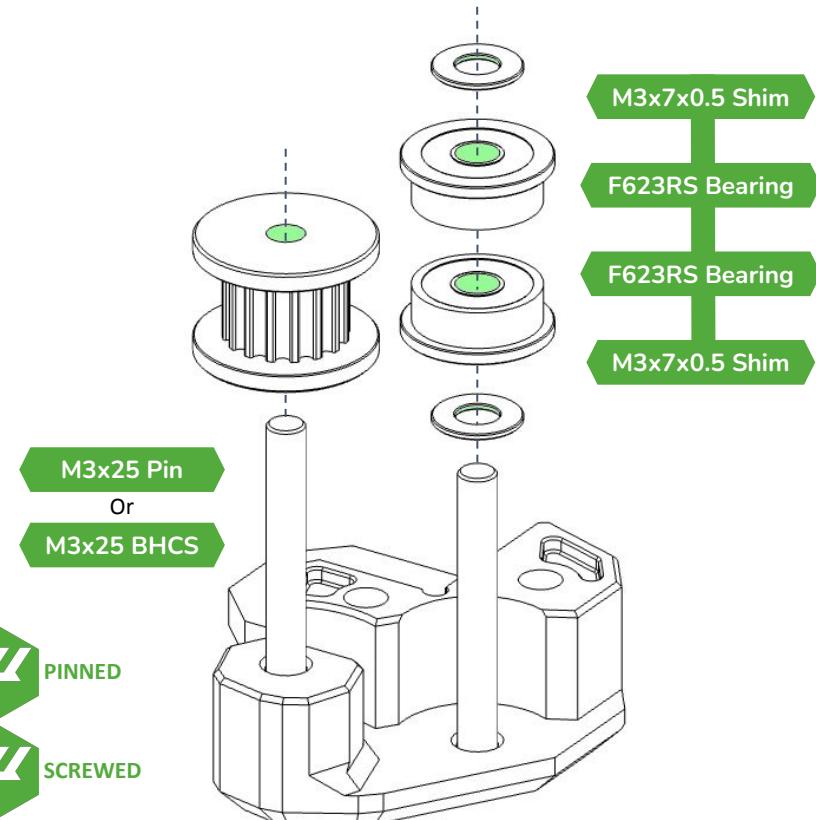
### Optional Hardware

F623RS Bearing	x4
Live Idler 16T Pulley	x2
M3x25 Pin	x6
M3x7x0.5 Shim	x4



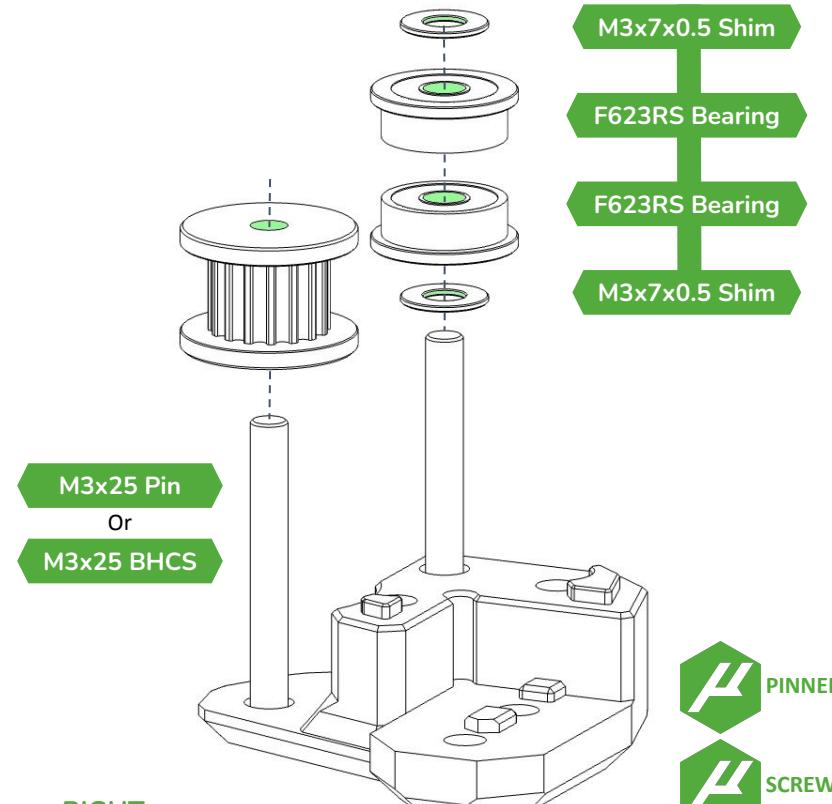
**HIT ME BABY...ONE MORE TIME....with yet another decision to make.**

Yes, yes, we know, we've thought of everything. Now it's over to you... Pins or Screws? Tough call. (It's usually dictated by what hardware you have on hand). This time it's XY joints. This time though, we won't baffle you with several pictures, we'll be showing the pinned variant going forwards, but the process is the same for screwed.



**LEFT**

Insert the M3x25 Pin or M3x25 BHCS, then slide the motion components onto them. Much the same as we did with the AB drives.



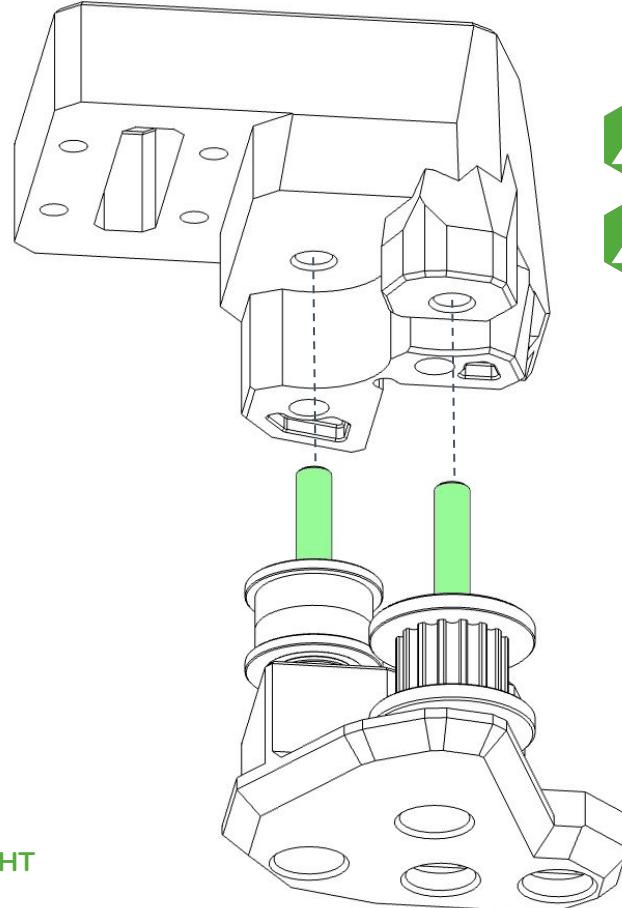
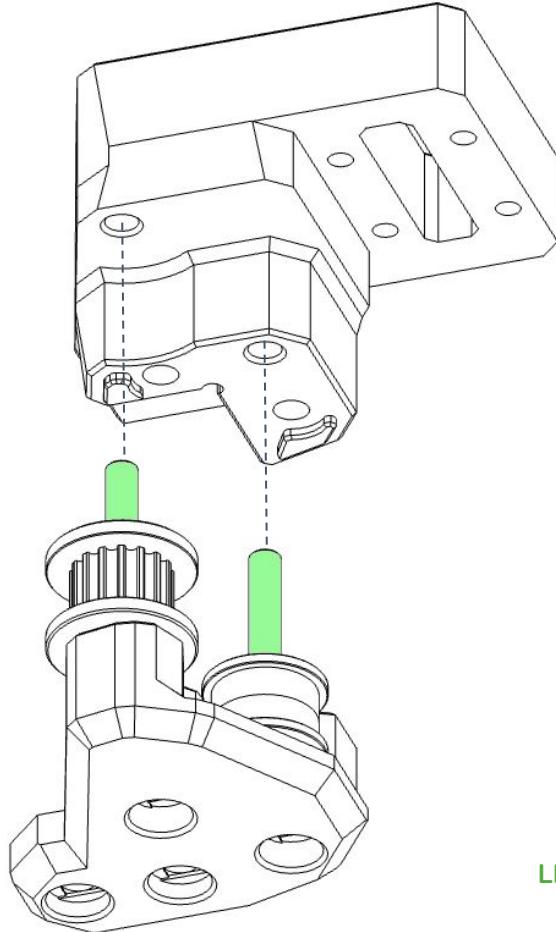
**RIGHT**

See 'Left' across....

## X / Y JOINTS | Bearing Stacks & Motion Components

### YOU'RE A PROFESSIONAL AT THIS NOW..

You can do this, you got it! Take the lower half of the XY joints and either screw it into place, or friction fit it in place for the pinned variant. (be careful, the screws are only threaded into plastic - remember; not too many ugga duggas)

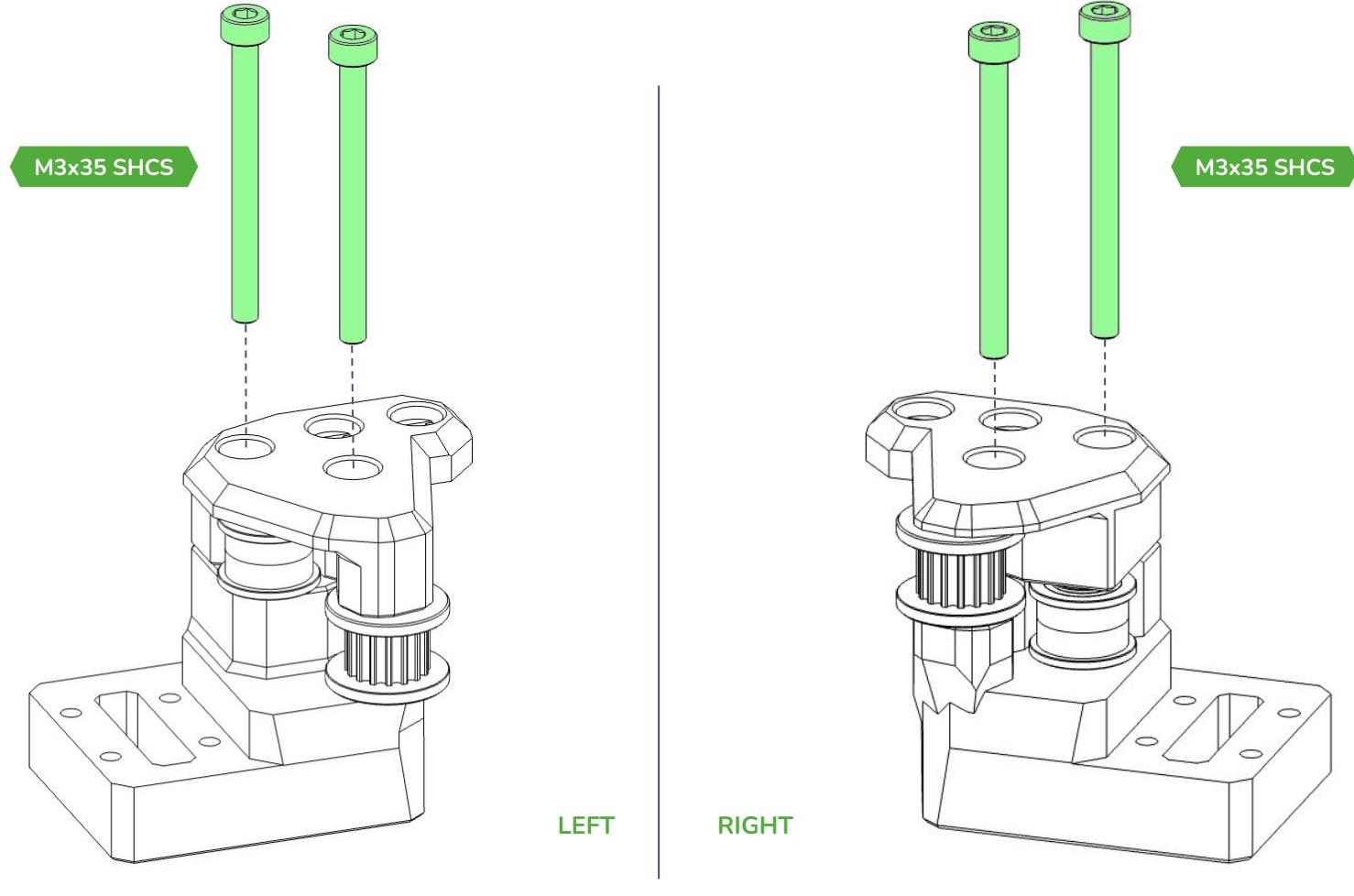


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## X / Y JOINTS | Bearing Stacks & Motion Components

### YOU'RE GUNNA NEED THE BIGGER ALLEN KEY...

Flip them gucci little XY joints over, so we can insert the 2x **M3x35 SHCS** into each one to secure everything in place. Don't over tighten these screws or you'll clamp your bearing stacks too tight and have motion issues. We just want to hold them together nice and snug.

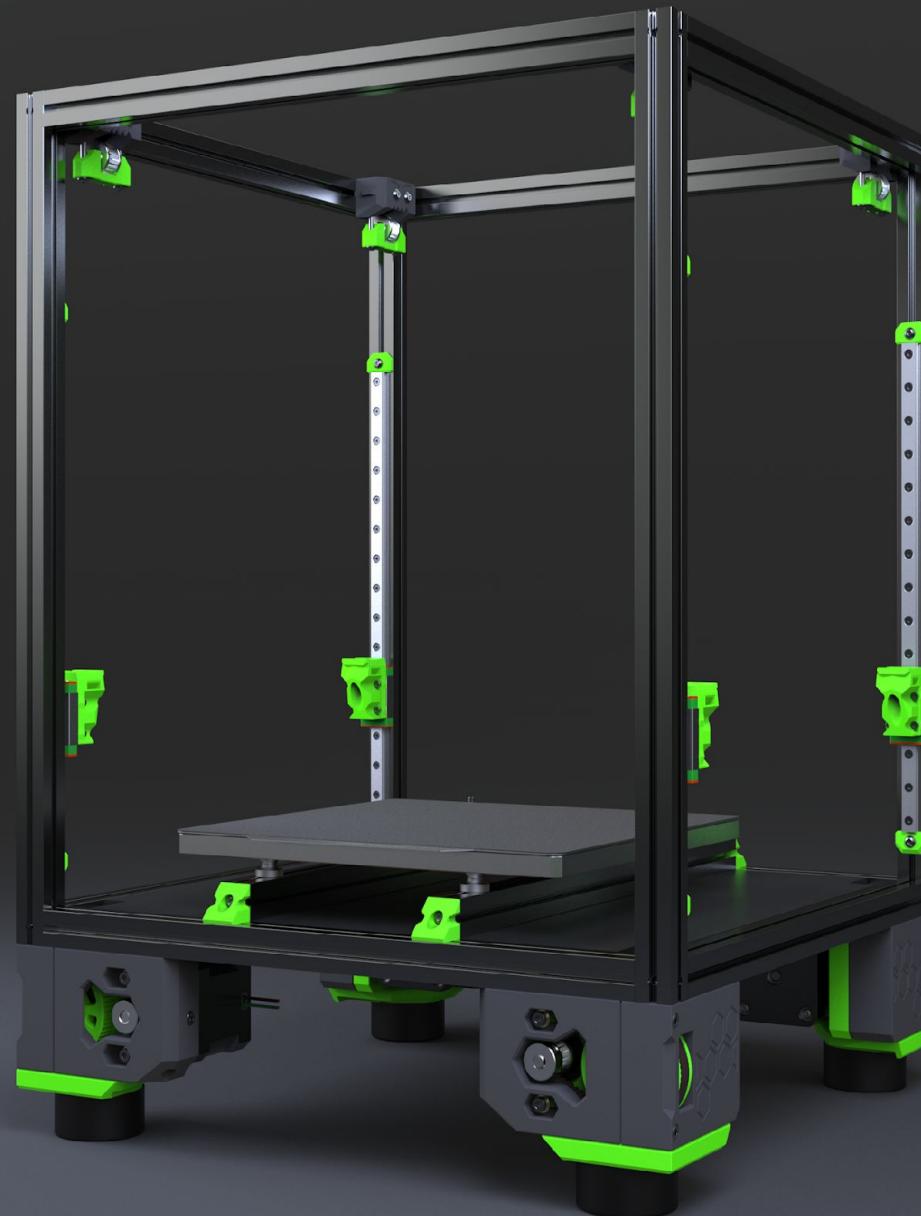


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You've done awesome so far. Let's take 5 minutes.

No we're not giving you any clues about the 22 words hidden below.

I	P	D	S	H	G	F	U	M	D	A	N	I	G	H	T	H	A	W	K
Z	I	D	J	Z	E	K	C	I	I	N	B	H	S	M	V	G	L	J	L
S	N	X	C	L	T	H	T	C	S	T	P	D	O	O	M	C	U	B	E
K	N	A	G	G	A	E	R	R	P	H	H	A	R	T	K	I	N	P	O
I	E	H	P	M	A	A	X	O	L	E	P	F	W	Z	E	F	L	Q	P
L	D	O	B	A	Q	T	X	N	A	A	O	M	O	X	K	N	B	M	X
L	Q	E	G	F	Q	S	S	V	Y	D	I	E	X	T	R	U	D	E	R
I	R	H	K	T	H	E	R	M	I	S	T	O	R	E	W	T	H	Q	W
S	N	L	O	S	B	T	W	V	R	K	E	X	T	R	U	S	I	O	N
S	F	I	F	T	E	E	N	F	I	F	T	E	E	N	M	W	N	O	D
U	E	P	R	I	N	T	E	R	S	F	O	R	A	N	T	S	F	H	A
E	J	E	B	B	E	A	R	I	N	G	S	T	A	C	K	U	D	N	J
B	P	A	N	E	L	S	D	U	A	L	S	H	E	A	R	Z	B	G	V

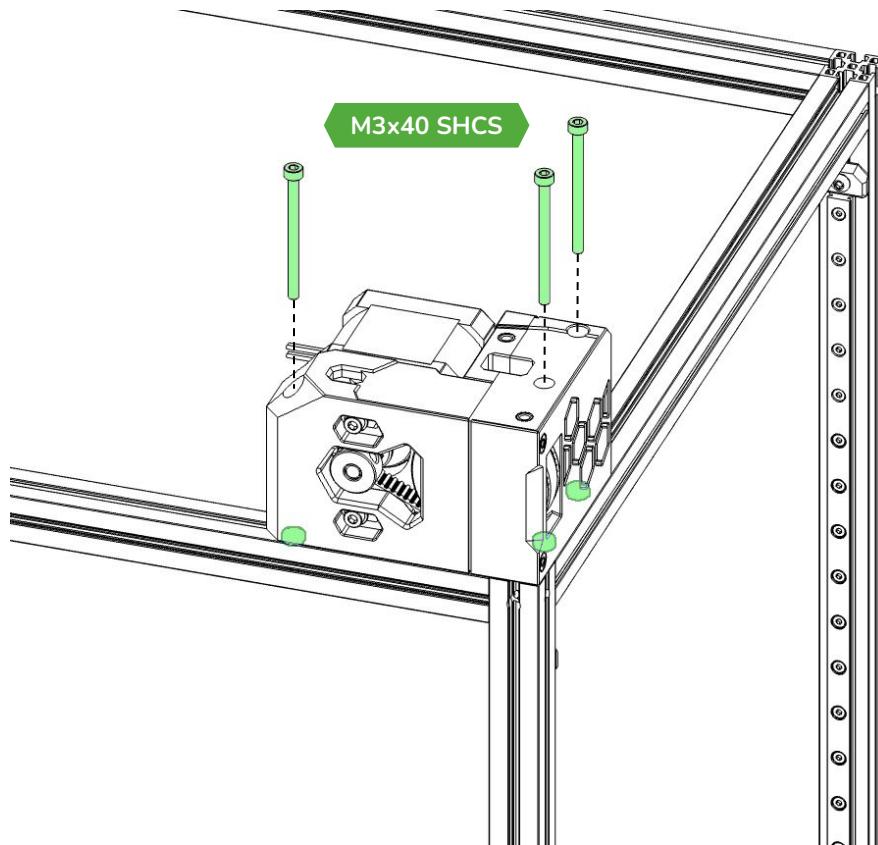


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### YOU SPIN ME RIGHT ROUND, BABY RIGHT ROUND

Like a Micron frame, baby, right 'round 'round....

Ok enough of that, grab your frame and flip it so the underside is pointing upwards. We're now going to install the **4x Z-Drive Assemblies** you have just carefully assembled onto the frame using **3x M3x40 SHCS** into the pre loaded nuts.



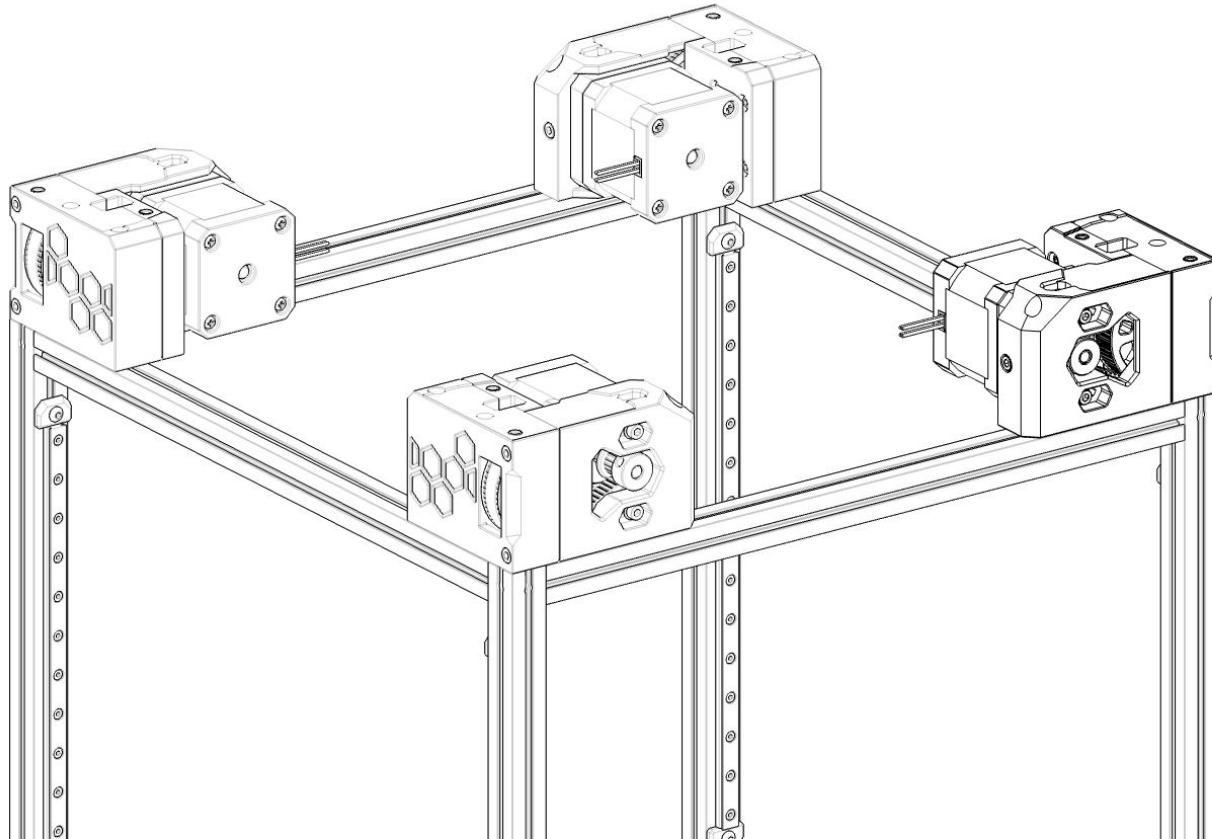
### CHECK YOUR RAILS

Ensure your Z rails are orientated in the same direction as your Z motors.  
If you need to check which way is up, the Z rails should be closer to the top in this step.

## Z DRIVE ASSEMBLY | Installation (continued)

**AAAAND AGAIN, WE'RE GOING TO REPEAT THAT PREVIOUS STEP**

OK, you should be used to this now, install the other **3x Z Drive Assemblies** to your frame. You should now have an assembly on each corner.

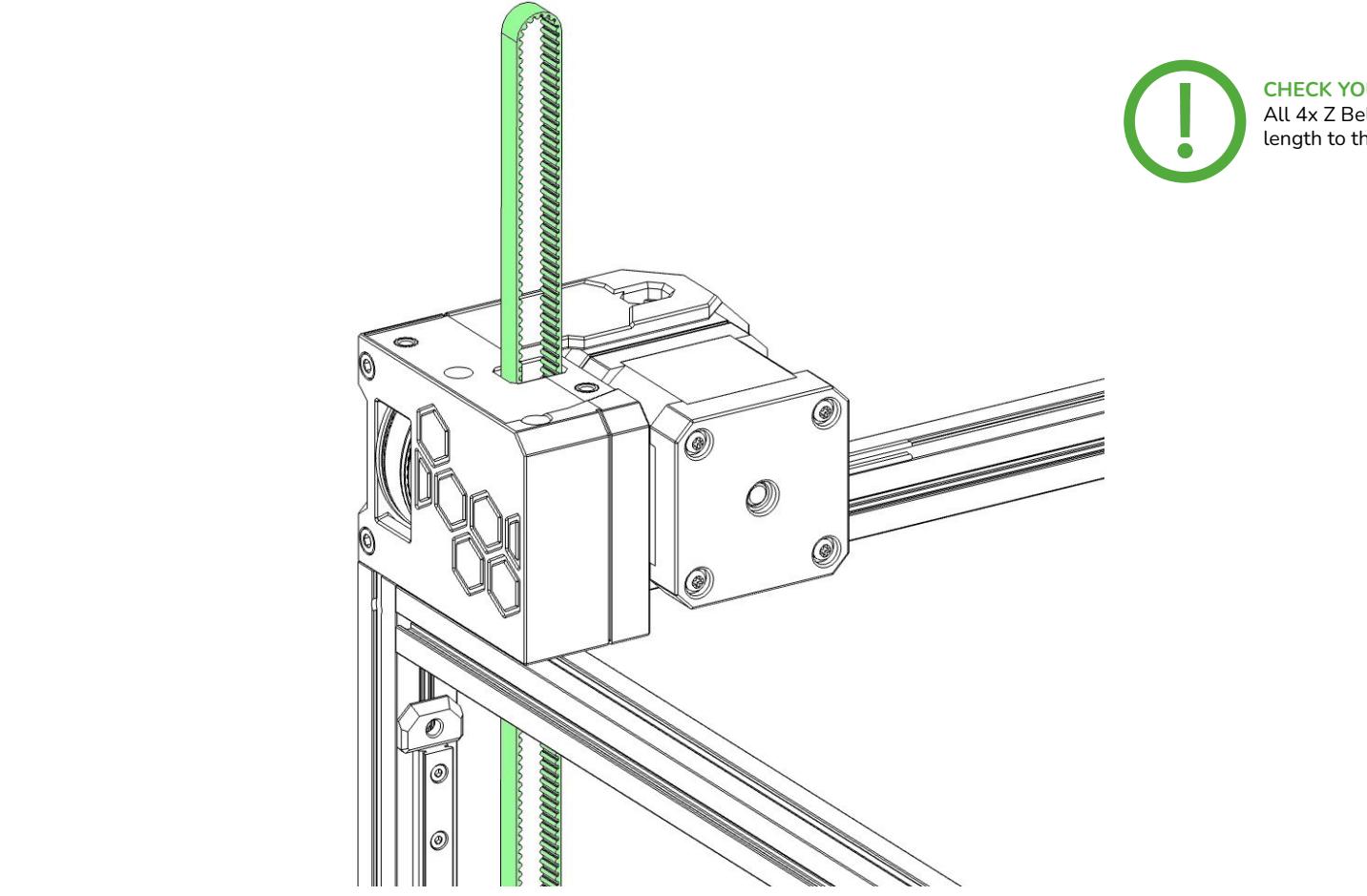


## Z DRIVE ASSEMBLY | Belt installation

### PUT ON THE DAMN BELT!

(Extra internet points if you guess the movie reference there.)

Now we're going to insert the Z Belts into the Z Drive Assemblies before we attach the accent pieces and rubber feet. This step saves us a world of pain later down the line. Do this for all 4x corners.



### CHECK YOUR BELTS

All 4x Z Belts should be equal length to the tooth.

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