MICRON

Assembly Manual

Small package. Big fun. Micron.

VERSION 3/4/2023

TABLE OF CONTENTS

STL FILE KEY

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

PRIMARY COLOR

Example
z_drive_main_a_x2.stl
These files will have nothing at the start of the filename.

ACCENT COLOR

Example
[a]_z_motor_mount_a_x2.stl
These files will have ''[a]'' to the front to mention that they are intended to be printed with an accent color.

QUANTITY REQUIRED

Example
[a]_z_motor_mount_a_x2.stl
If a file ends with ''_x#'', that is telling you the quantity of that part required to build this system..

PRINT GUIDELINES

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

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

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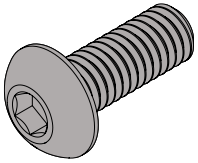
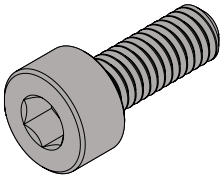
GIT GUD

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.



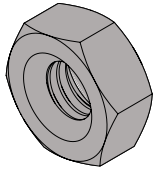
BUTTON HEAD CAP SCREW (BHCS)
Metric fastener with a domed shaped head and hex drive. Most commonly found in locations where M3 fasteners are used.

ISO 7380-1



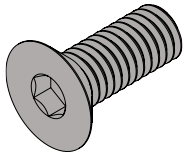
SOCKET HEAD CAP SCREW (SHCS)
Metric fastener with a cylindrical head
and hex drive. The most common fastener used on the Voron.

ISO 4762 / DIN 912



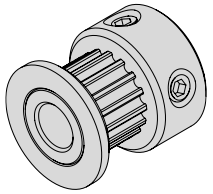
HEX NUT
Hex nuts couple with bolts to create a
tight, secure joint. You'll see these used in both M2 and M3 variants throughout this guide.

ISO 4032 / DIN 934

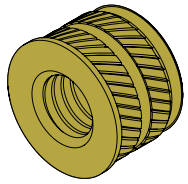


FLAT HEAD CAP SCREW (FHCS)
Metric fastener with a cone shaped head and a flat top.

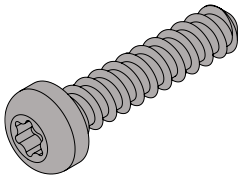
ISO 10642



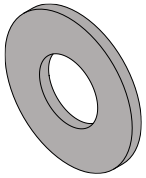
PULLEY
GT2 pulley used on the motion system of the Micron.



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.

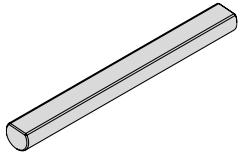


SELF TAPPING SCREW
Fastener with a pronounced thread profile that is screwed directly into plastic.



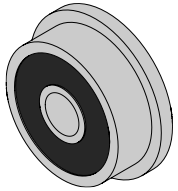
M3 SHIMS
Not to be confused with stamped washers. These are used in all M3 call-out locations in this manual.

3x6x0.5 DIN 988

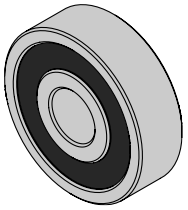


5mm x 47mm Shaft
Steel shaft, 5mm in diameter, 47mm long with a flat ground on it used in the Z drive gear box assembly

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



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



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

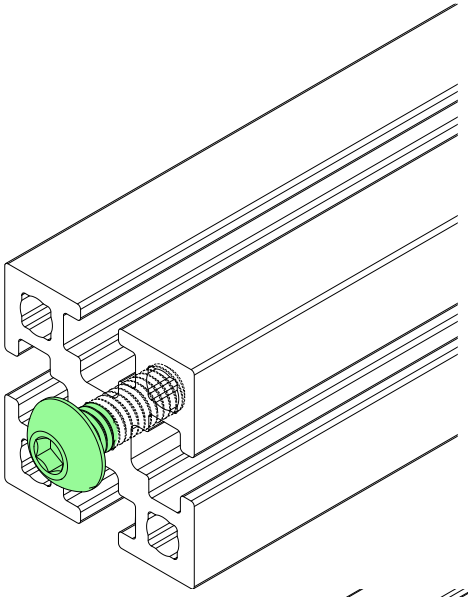
MICRON Logo
Look for Micron Logo next to the printed part, this is a direct link to the file on the github repo.

Hardware Used

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

(qty) – location - **SIZE**

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

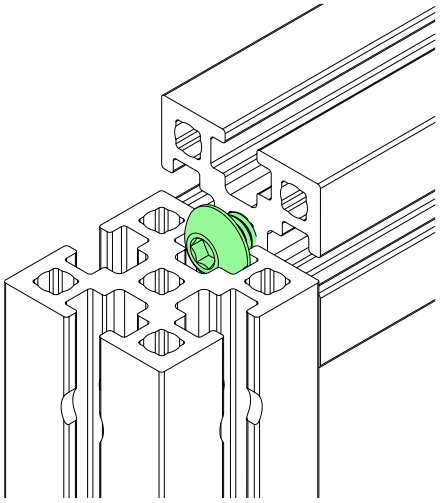


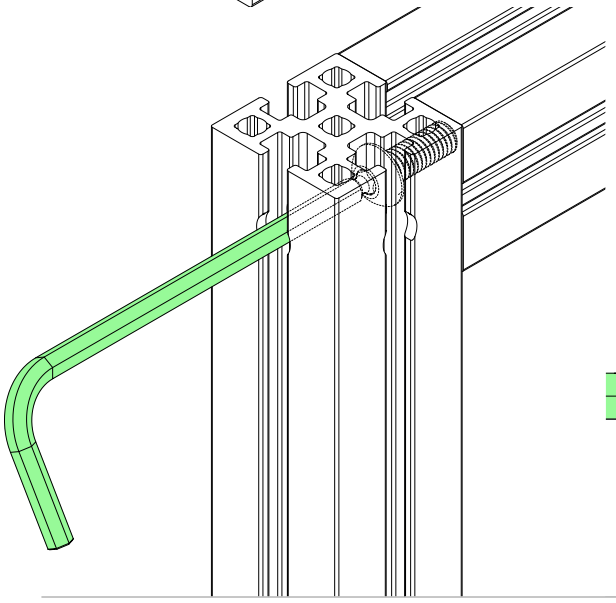
BLIND JOINT BASICS

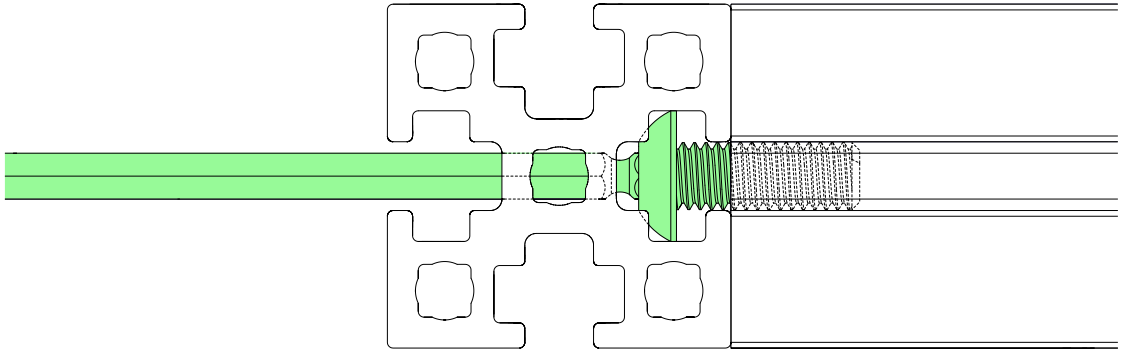
Blind Joints provide a cost-effective and rigid assembly method.

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.







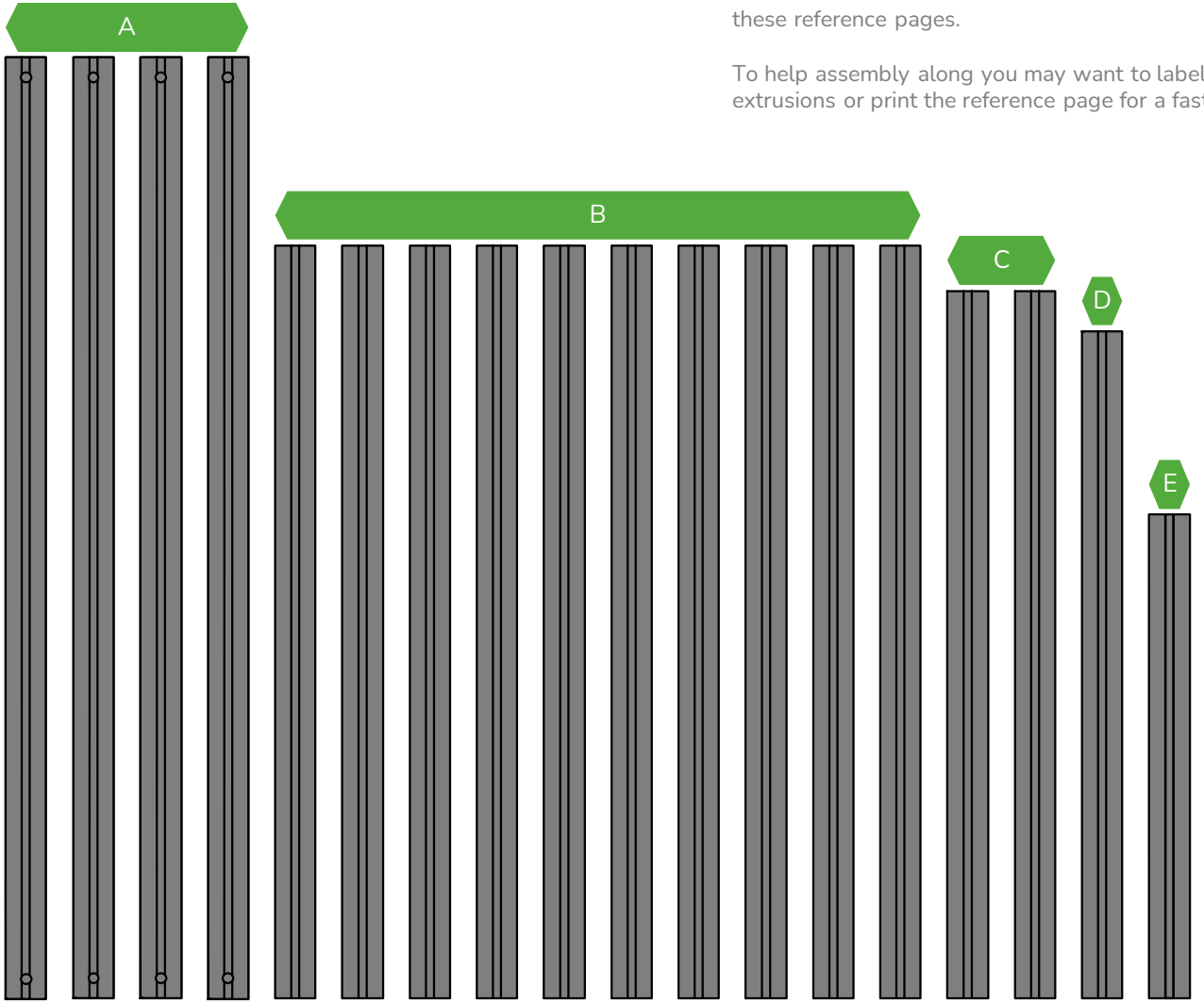
SORT EXTRUSIONS

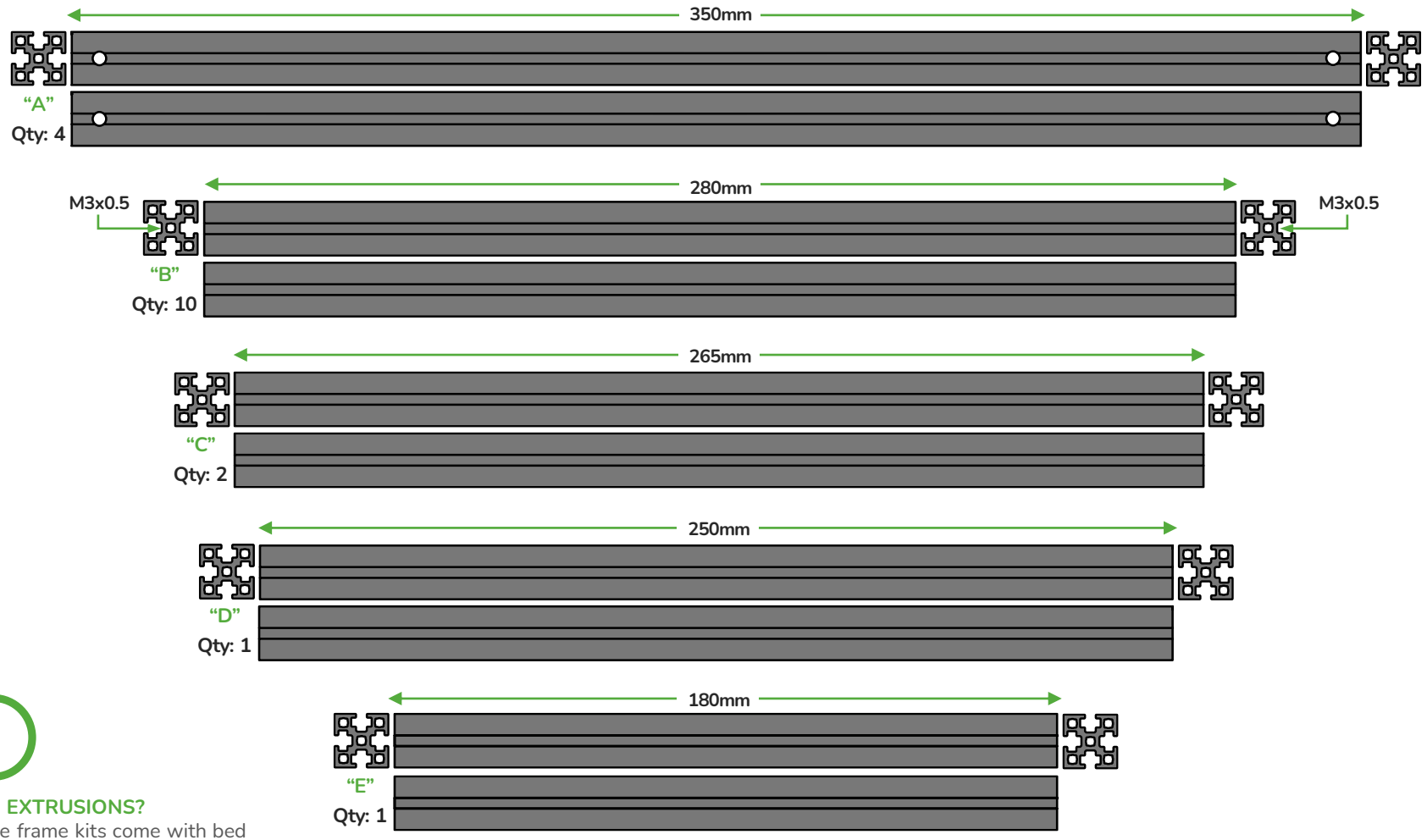
Collect your extrusions and sort them by length. We will highlight the extrusions used in each step and label them as shown on this page.

EXTRUSION CALL-OUTS

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

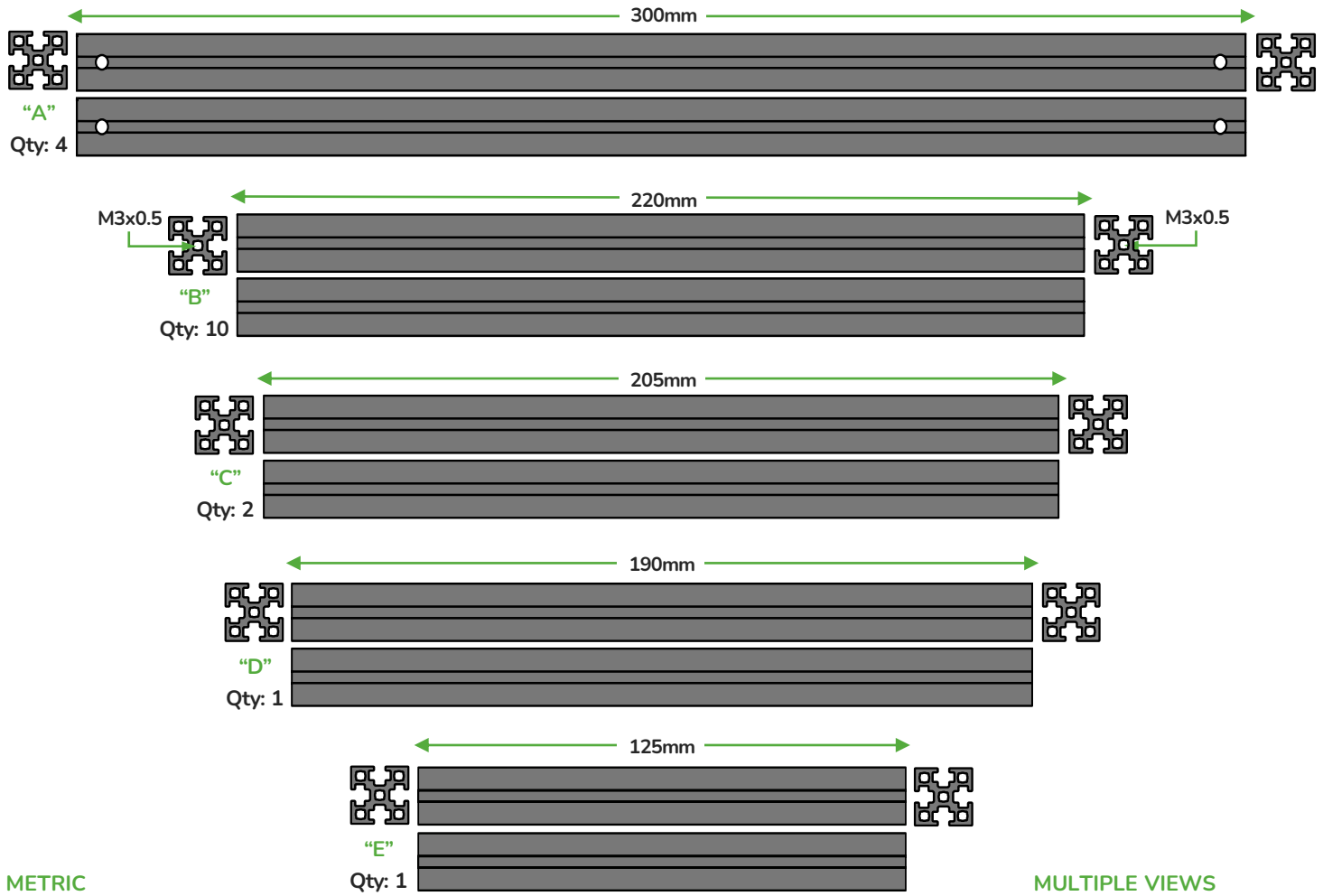
To help assembly along you may want to label the extrusions or print the reference page for a faster lookup.





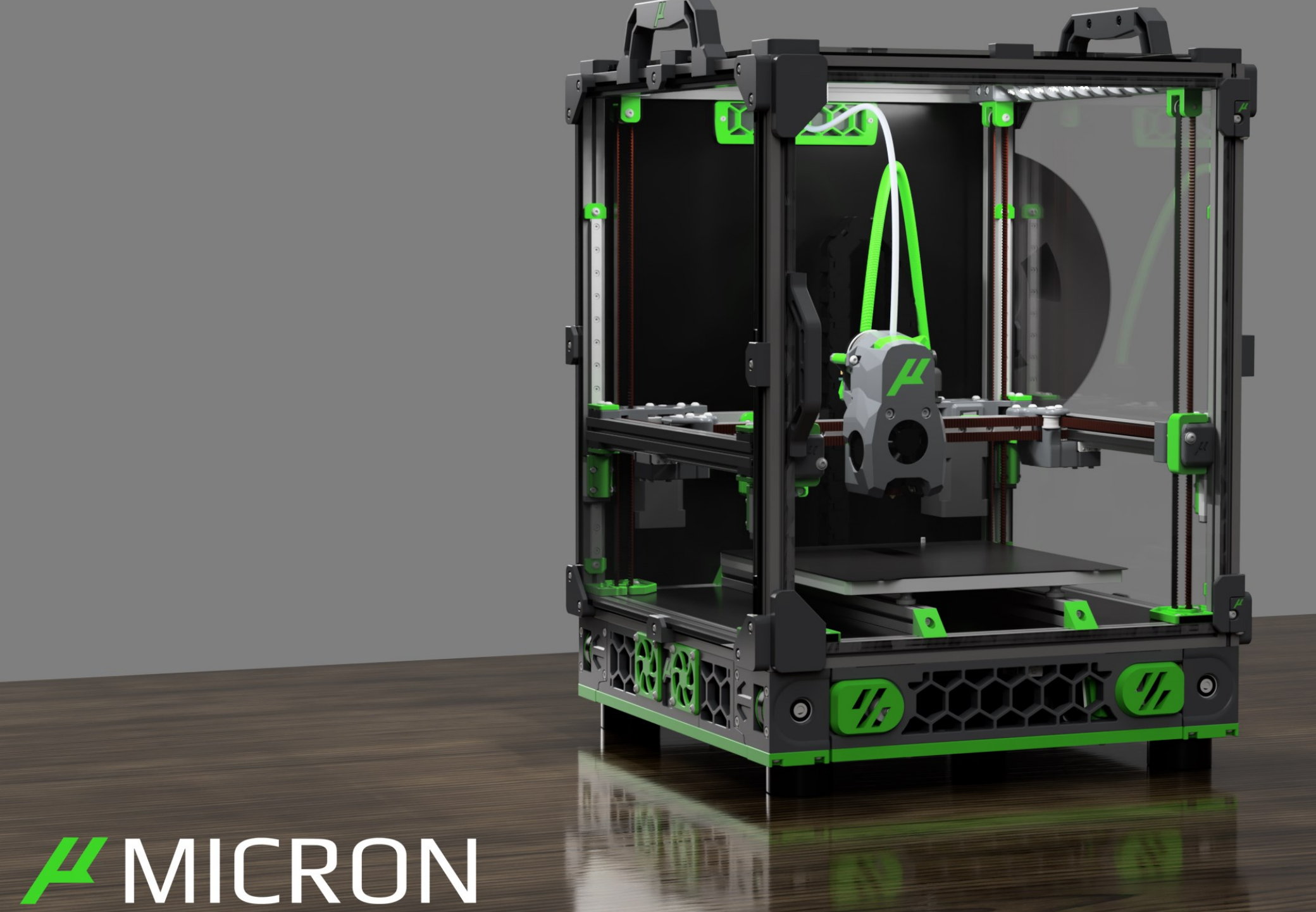
BED EXTRUSIONS?
Some frame kits come with bed extrusions that are mounted using blind joints. These will end up being 2 longer extrusions and 8 **B** extrusions.

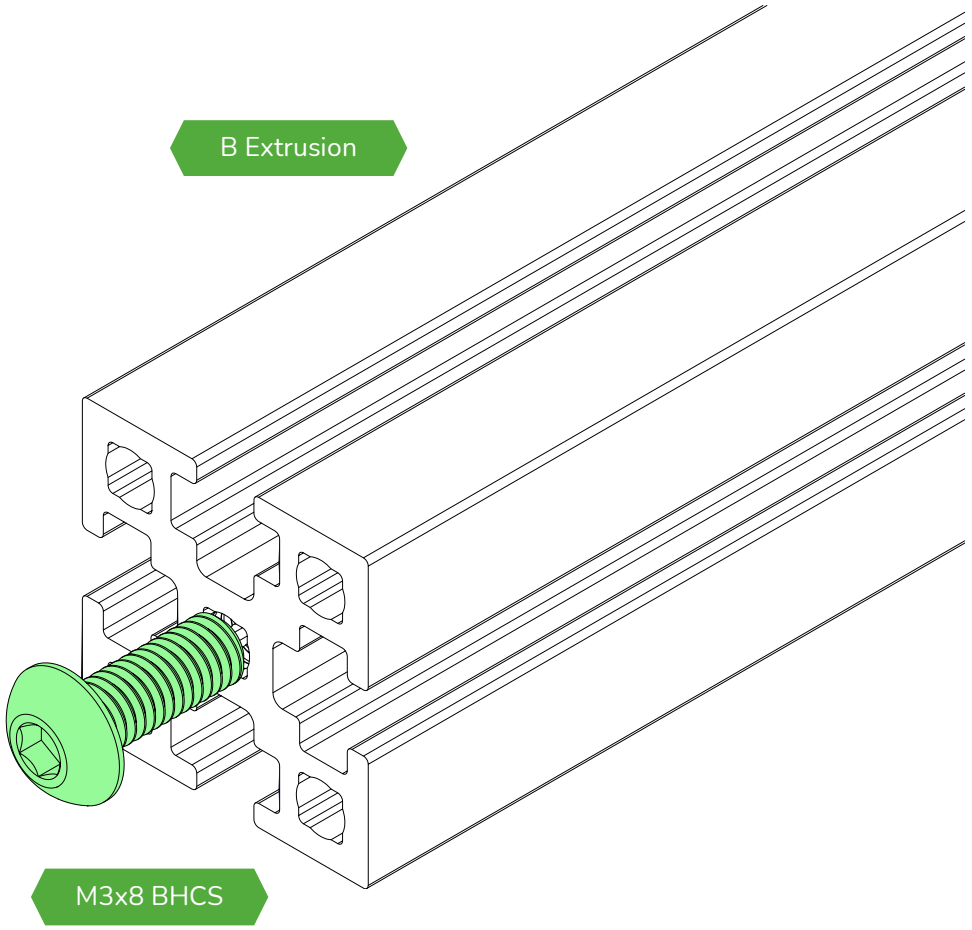
MULTIPLE VIEWS
The views shown are the left, front, right, and bottom views of each extrusion.



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

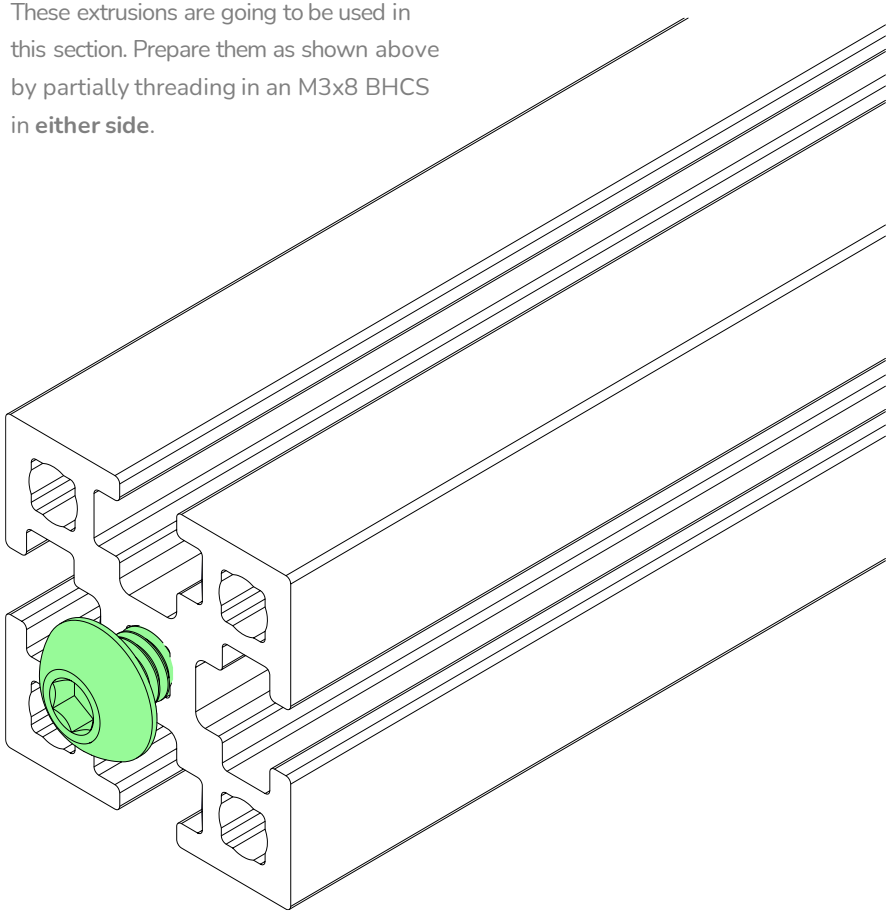
MULTIPLE VIEWS
The views shown are the left, front, right, and bottom views of each extrusion.


MICRON



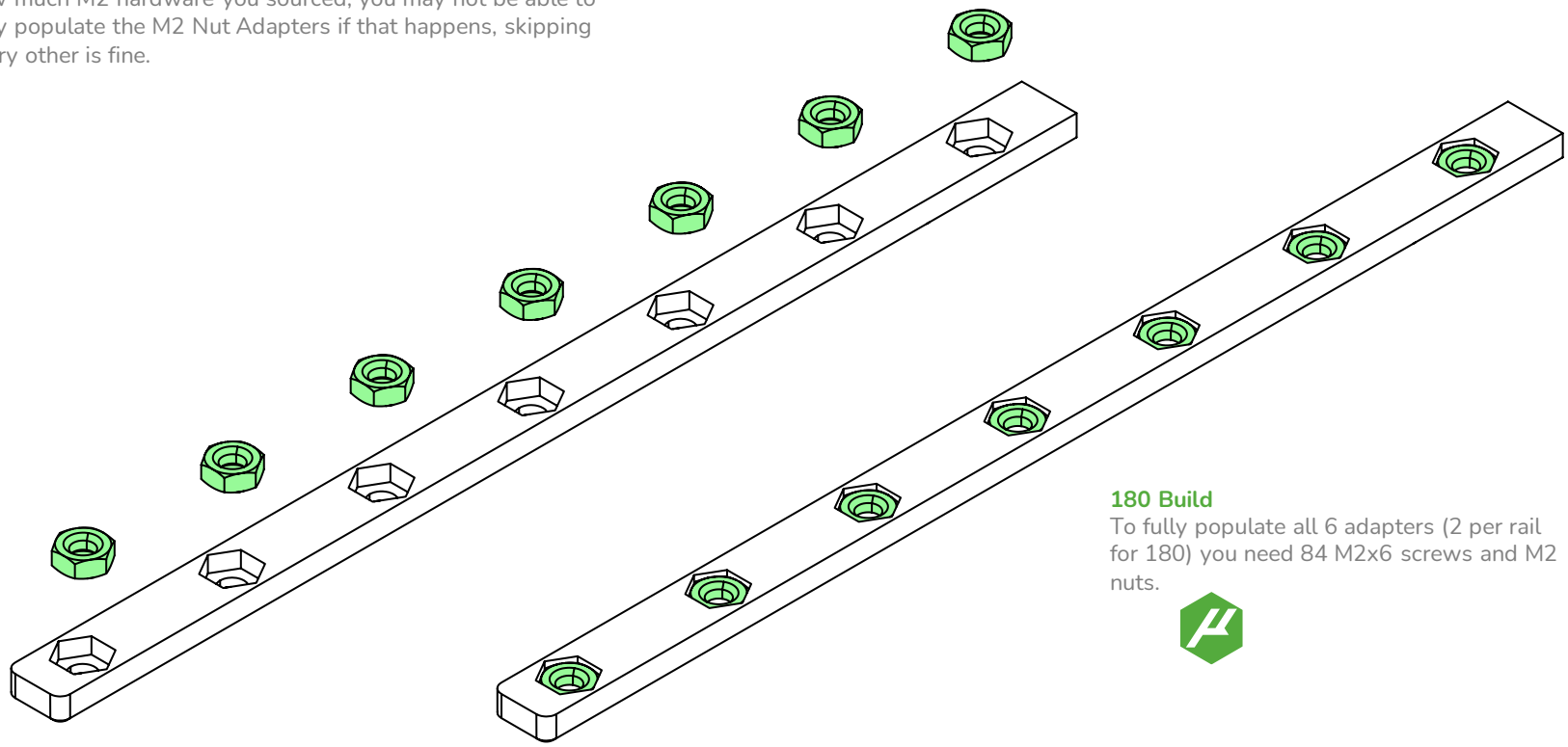
PREPARE 8 EXTRUSIONS

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**.



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.

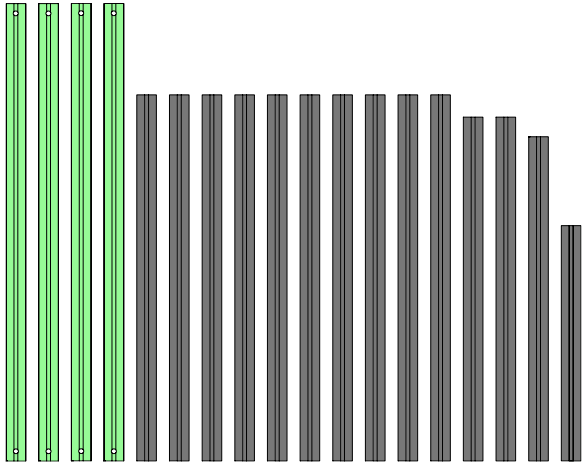


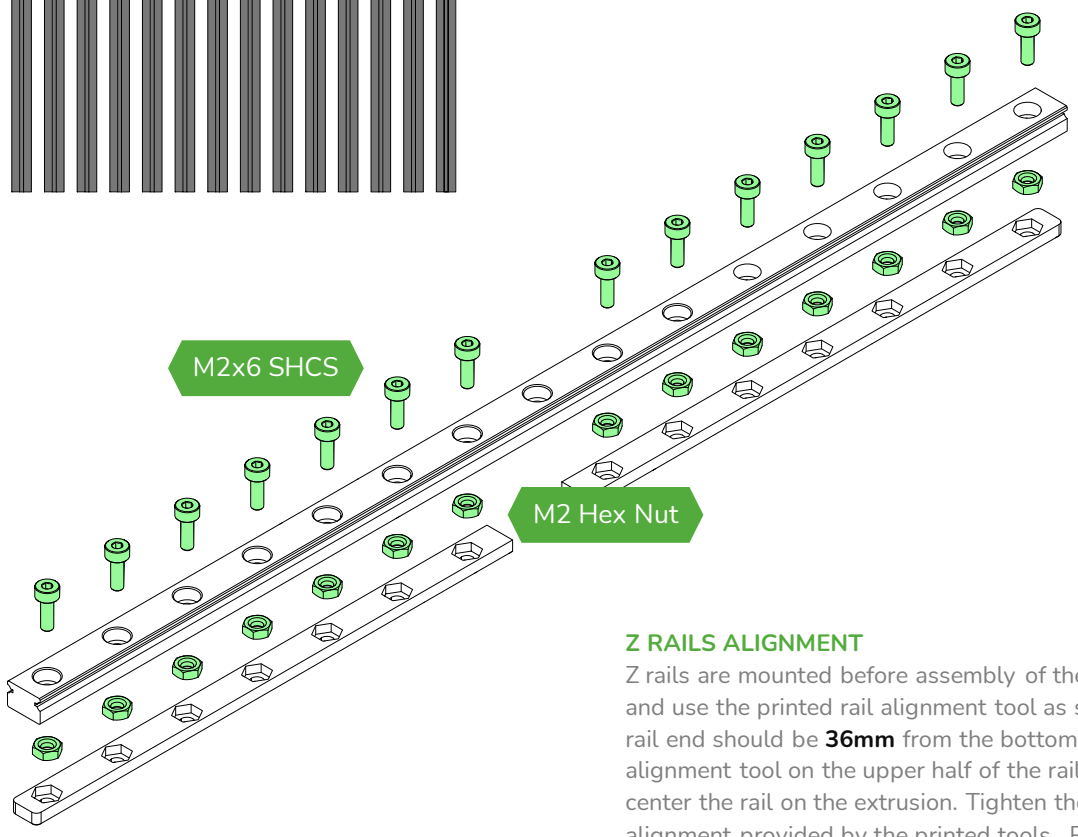
180 Build

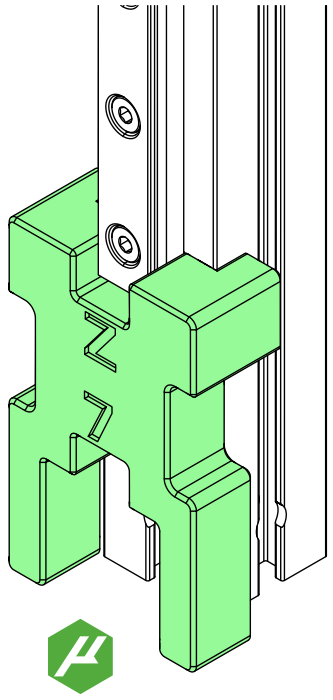
To fully populate all 6 adapters (2 per rail for 180) you need 84 M2x6 screws and M2 nuts.

120 Build

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







Z RAILS ALIGNMENT

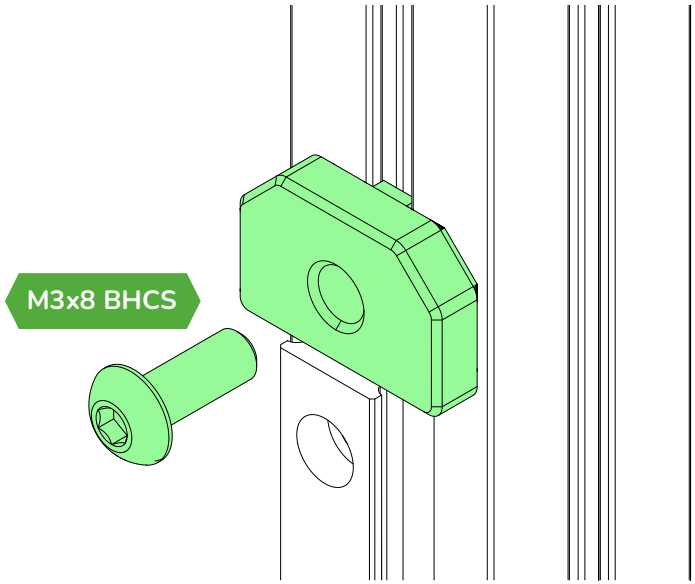
Z rails are mounted before assembly of the frame. Stand up one of the **A** extrusions and use the printed rail alignment tool as shown to align the bottom of the rail. The rail end should be **36mm** from the bottom of the extrusion. Use a second rail alignment tool on the upper half of the rail, using 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.

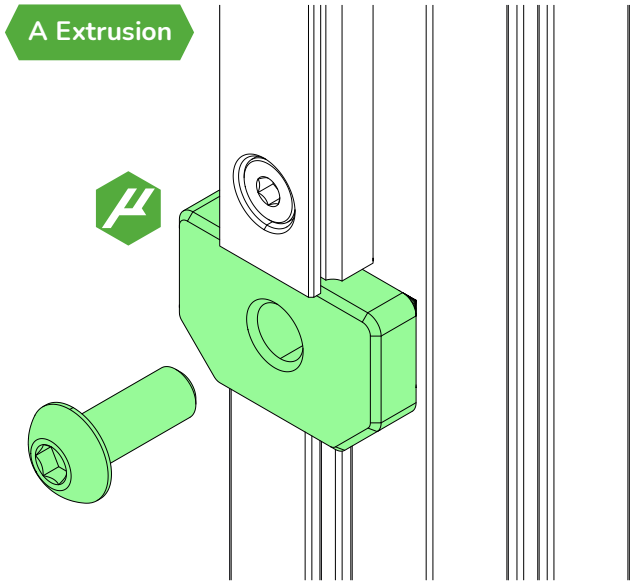
WHERE'S THE NUT!?

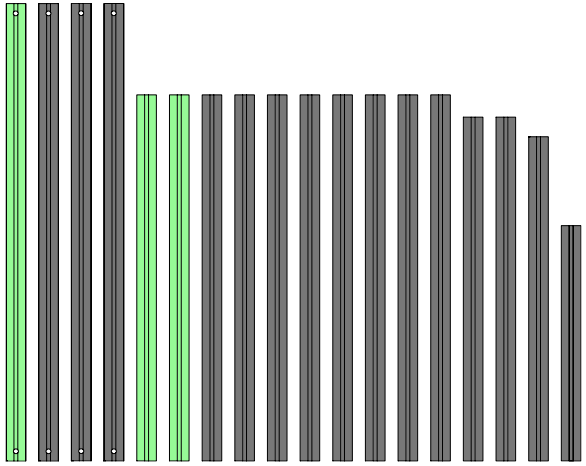
The instructions won't call out nuts that were inserted in a previous step, nor nuts that can be easily inserted in the current step. if a screw does NOT thread into a nut we will explicitly state this. **You can assume that all screws that enter extrusion slots thread into a nut.**

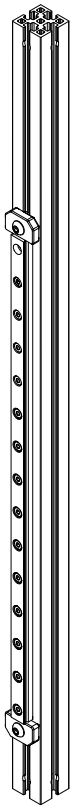
RAIL STOPS

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.



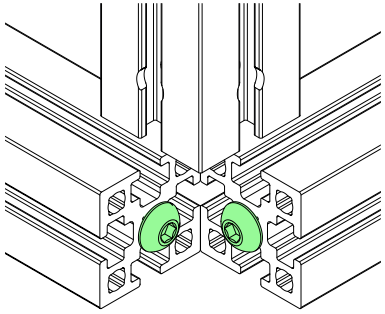






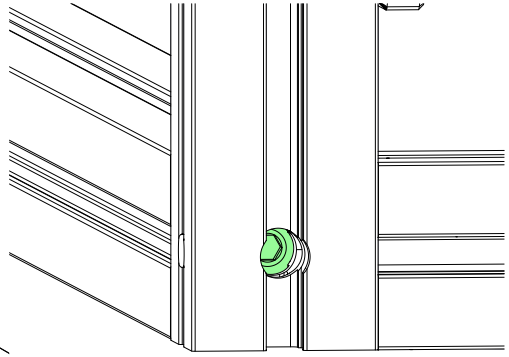
CORNER #1 ASSEMBLY

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



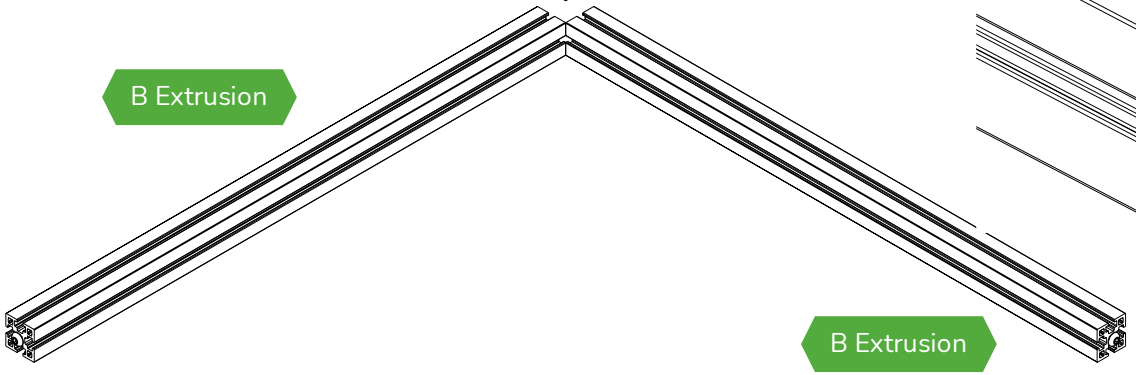
BUILD ON A FLAT SURFACE

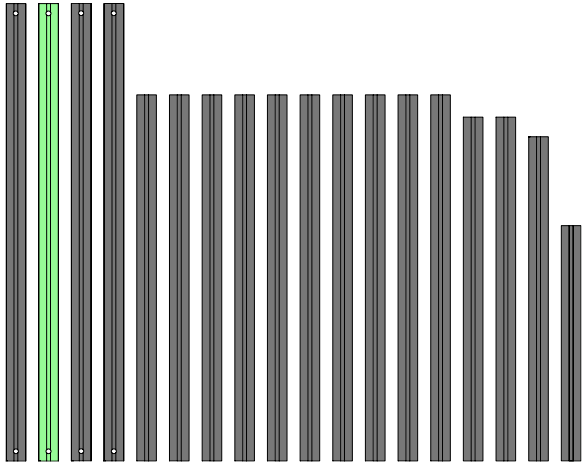
Build the frame on a glass or granite surface to ensure you can get it as square as possible.



FRAME ASSEMBLY

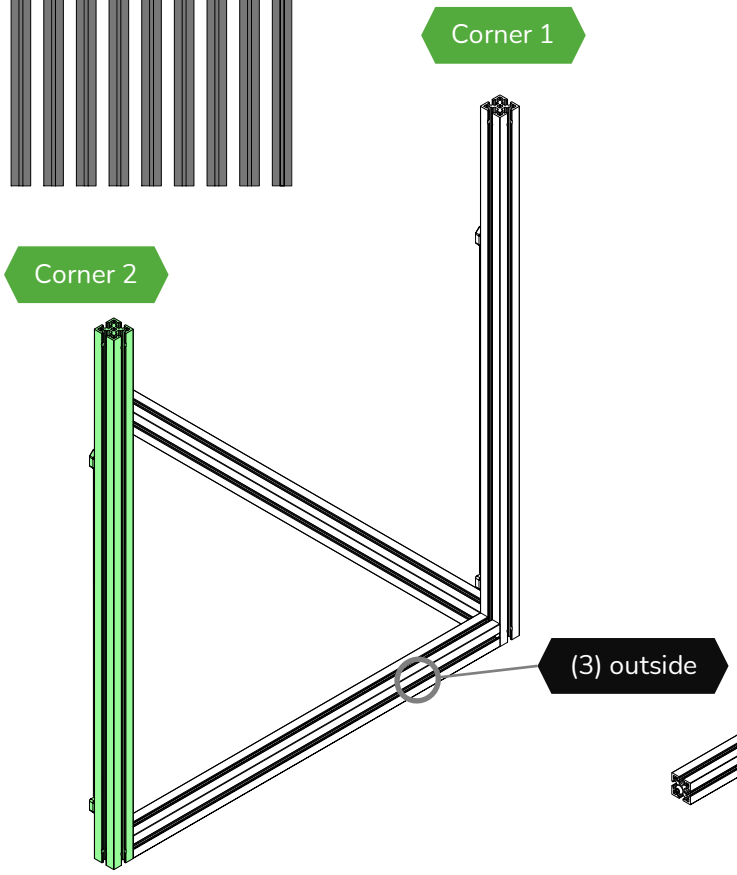
This design relies on blind joints to assemble the frame. We outlined the basics of blind joints on page 7

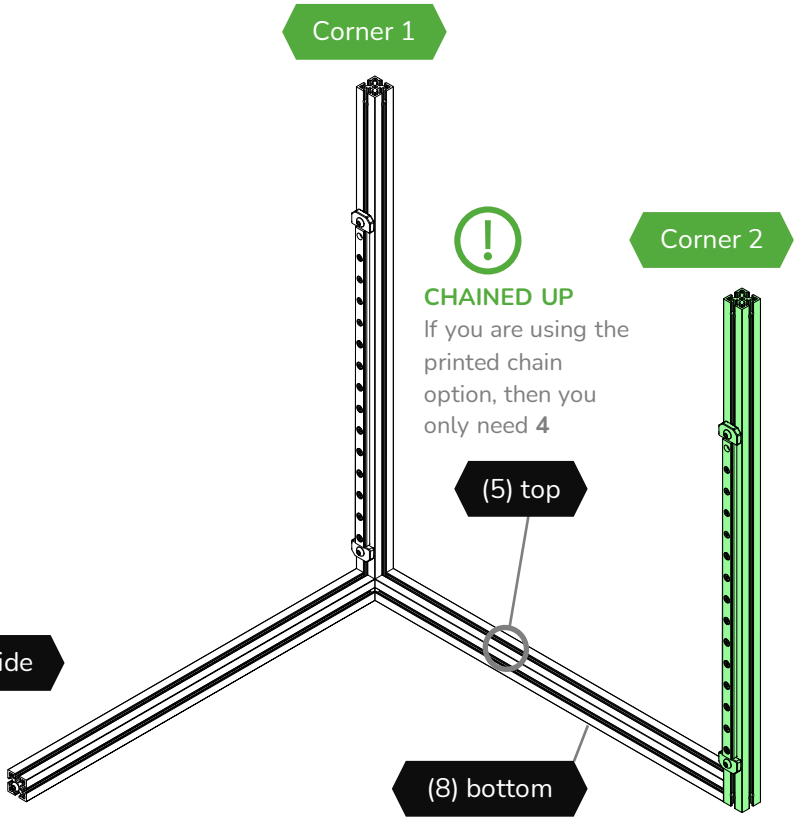




CORNER #2 ASSEMBLY

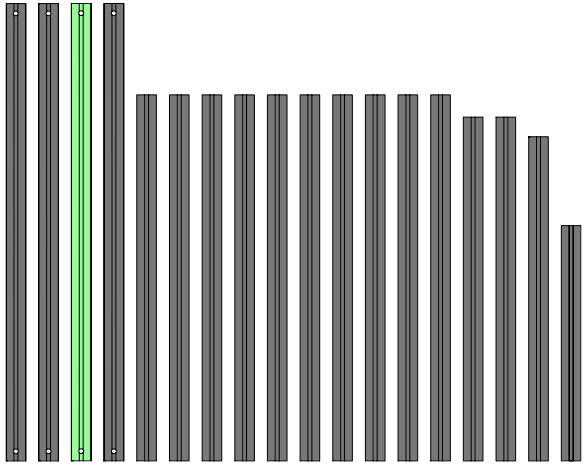
Before adding the next **A** extrusion, preload nuts into the **B** extrusion that is about to be enclosed, as shown. It receives. Corner extrusion **#2** will install the same as the first, using an M3x8 BHCS for the blind joint. Note that the linear rail should face the same direction as the rail on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

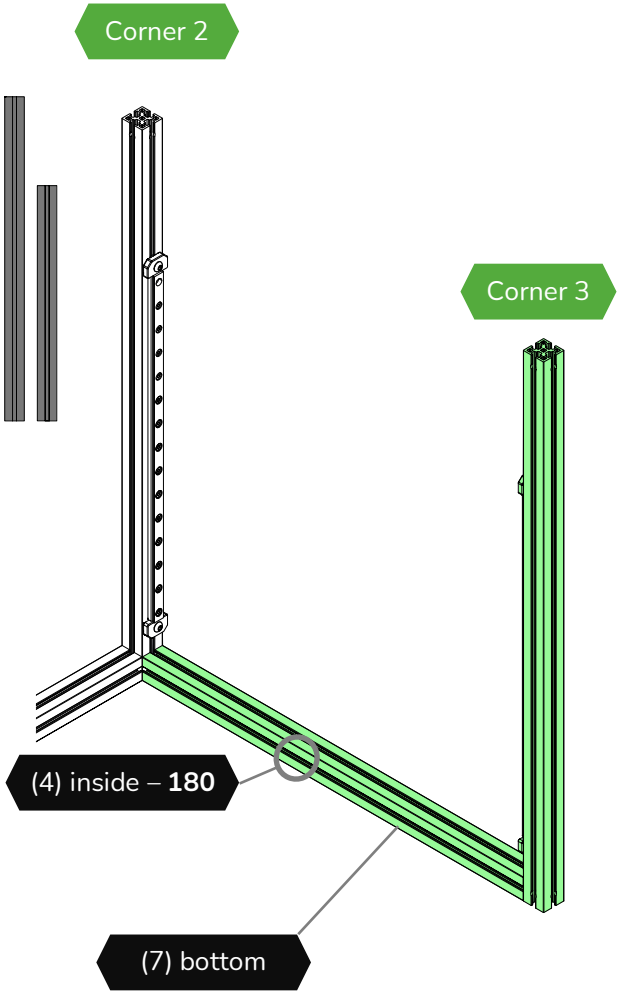


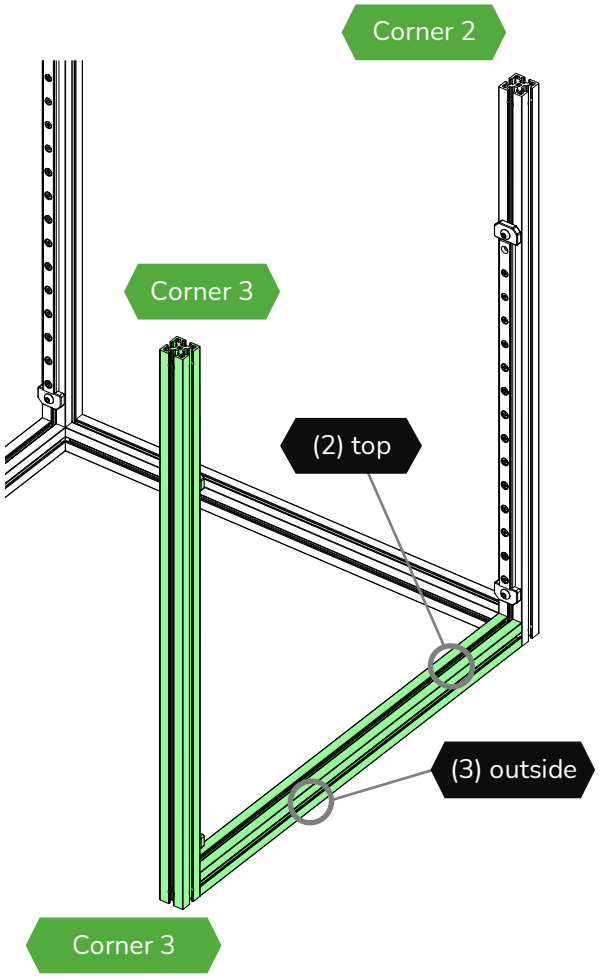


CHAINED UP

If you are using the printed chain option, then you only need **4**

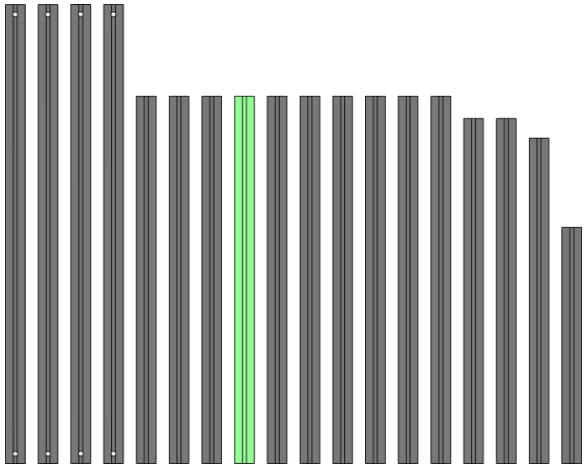






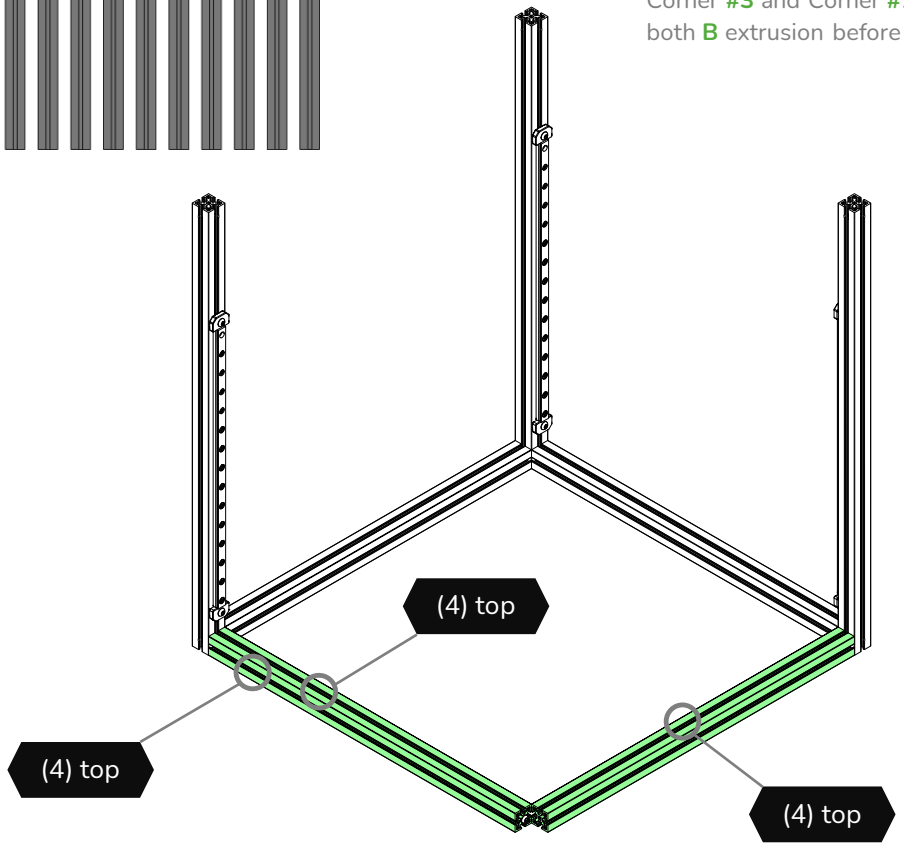
CORNER #3 ASSEMBLY

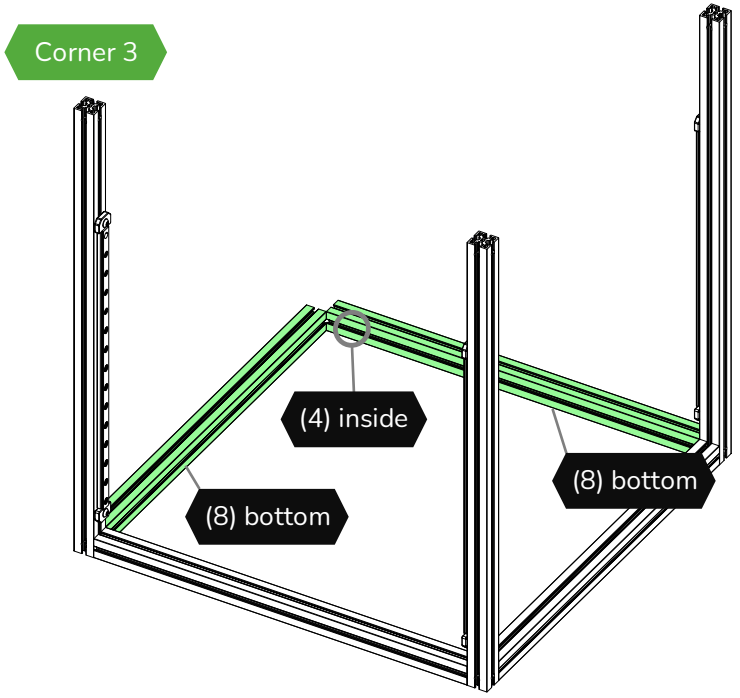
Before adding the next **A** extrusion, preload M3 nuts into the **B** extrusion that is about to be enclosed, as shown. It receives. Corner extrusion **#3** will install the same as the others, using an M3x8 BHCS for the blind joint. Note that the linear rail should face Corner **#2**. Keep things as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

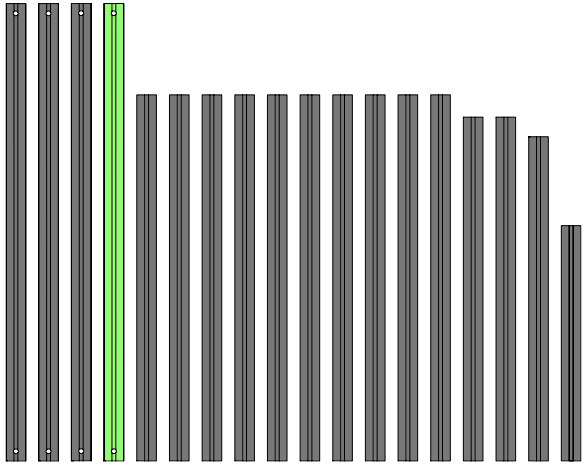


FINAL LOWER EXTRUSION

Before adding Corner **#4**, the 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.

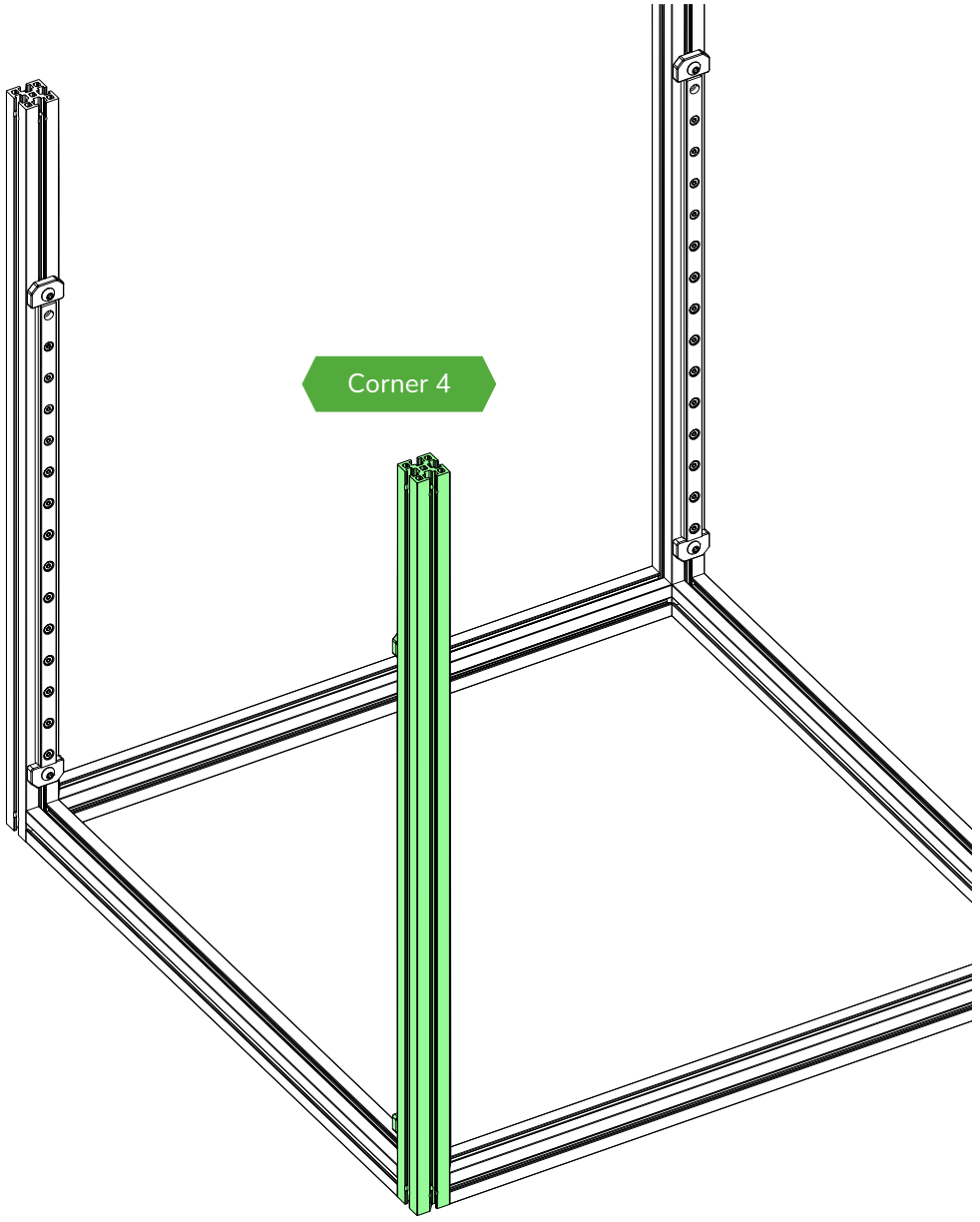


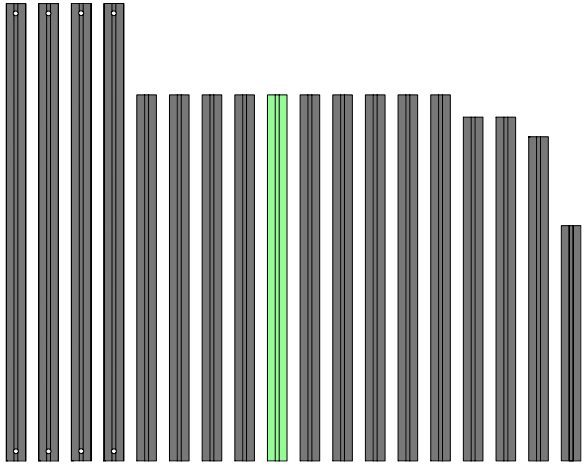




CORNER #4 ASSEMBLY

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.



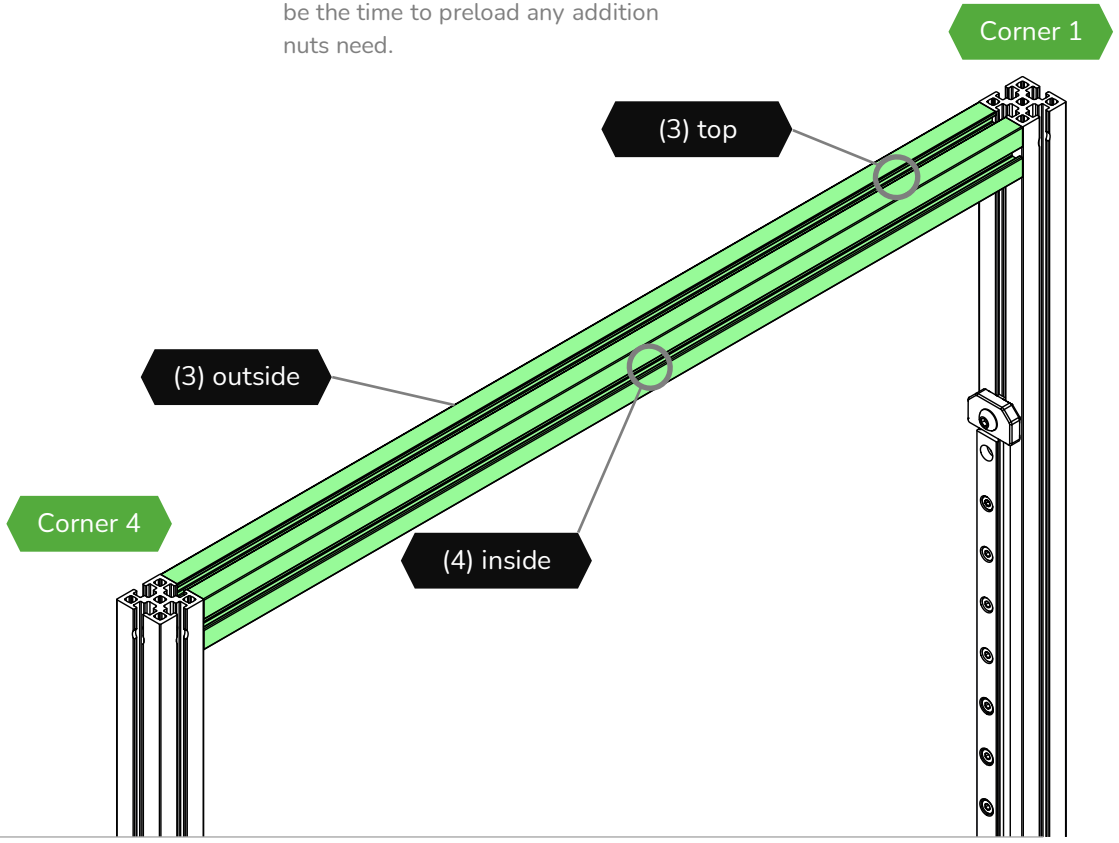


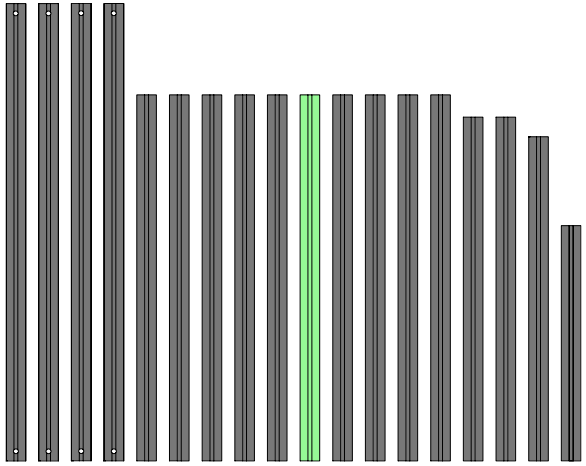
CAN YOU HANDLE IT?

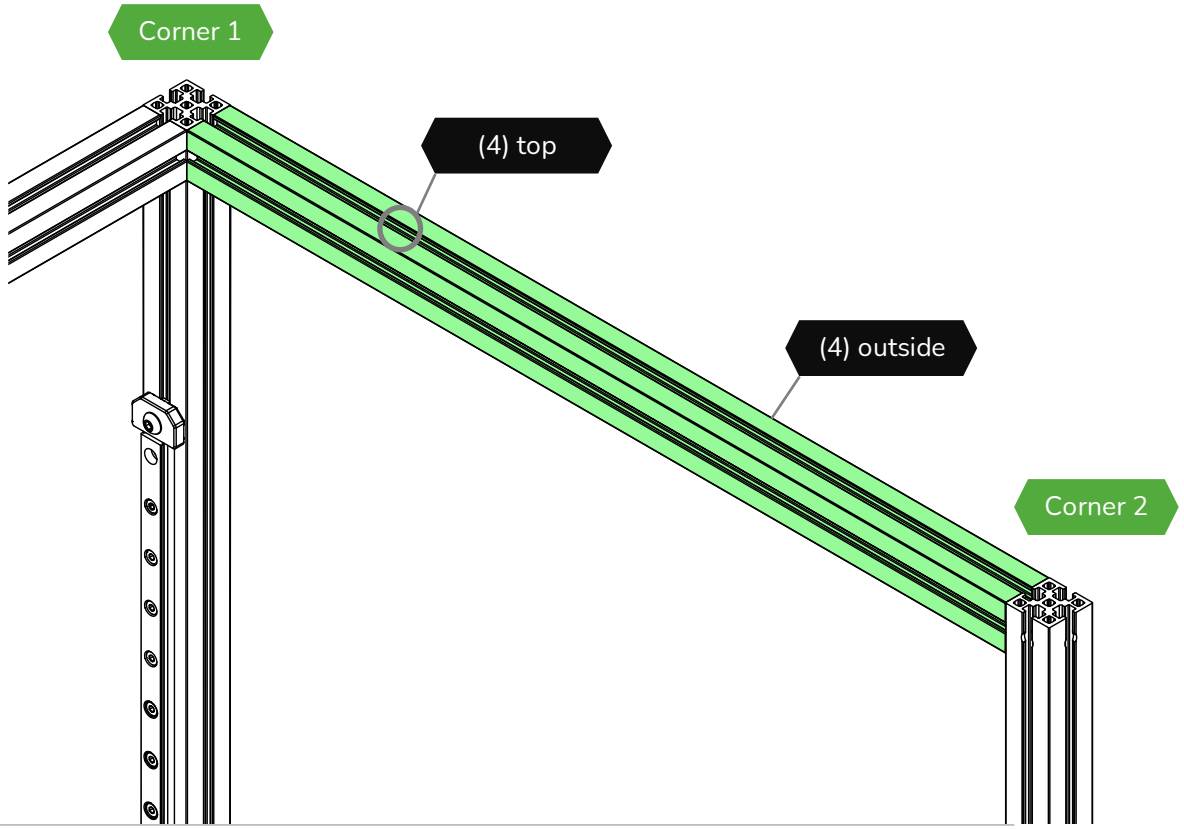
Handles are an optional component you can install atop your Micron. They make carrying the printer very easy. If you want to install handles now would be the time to preload any addition nuts need.

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**.

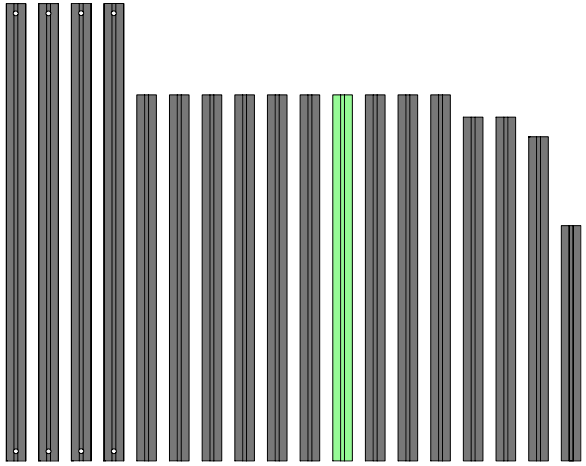






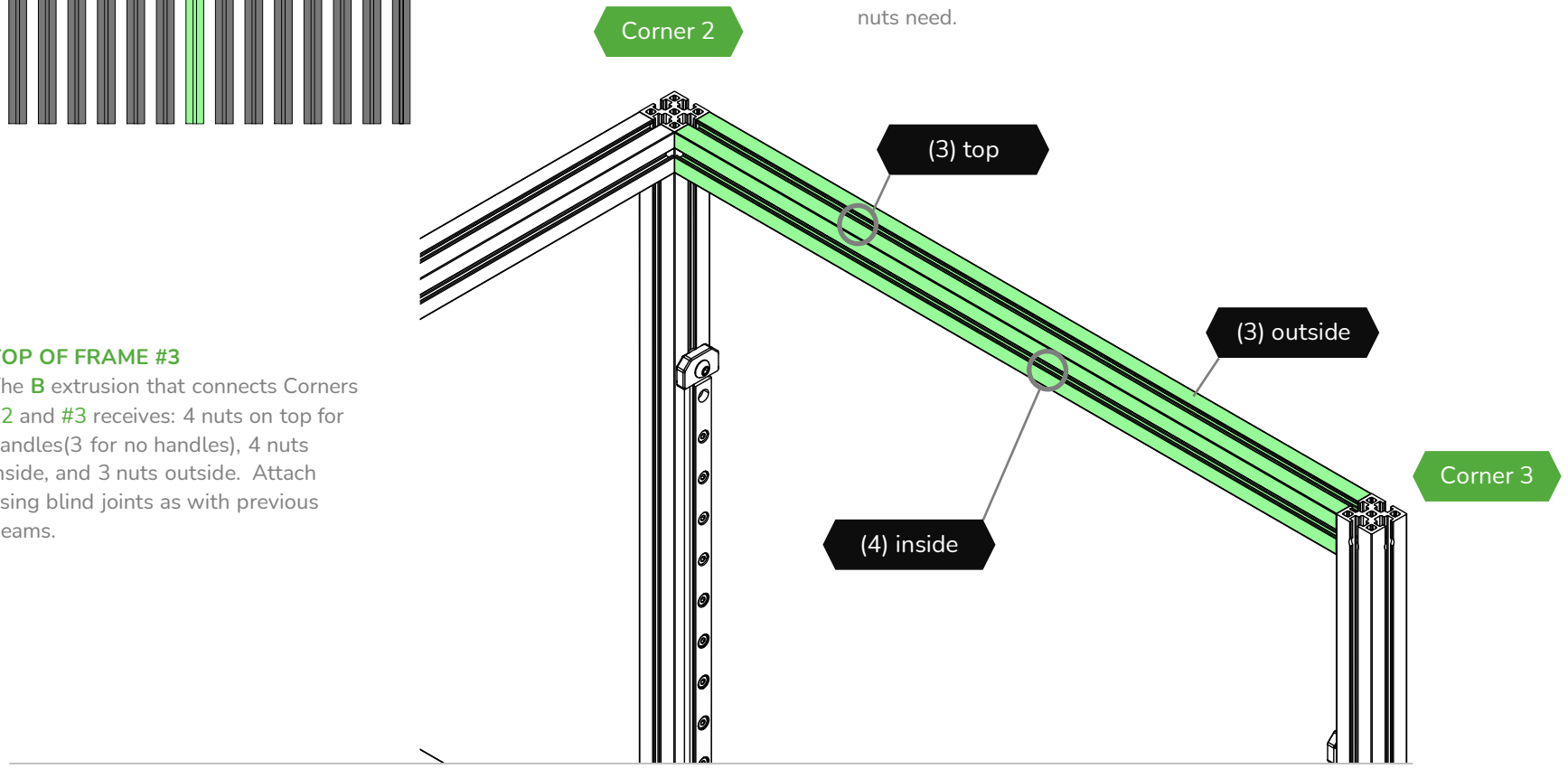
TOP OF FRAME

The **B** extrusion that connects Corners #1 and #2 receives: 4 nuts on top, and 4 nuts on the outside slot. Attach using blind joints as with previous beams.



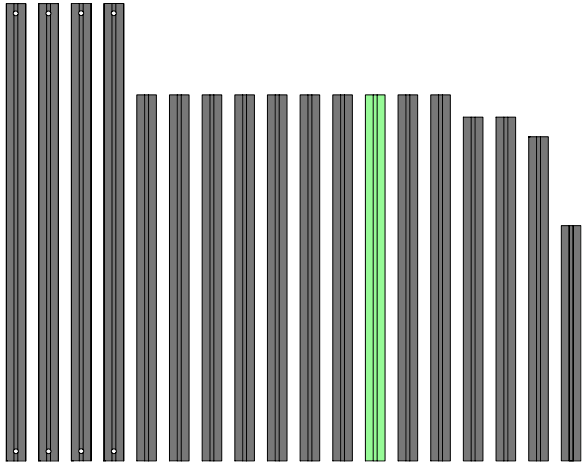
YOU CAN'T HANDLE THE TRUTH!

Handles are an optional component you can install atop your Micron. They make carrying the printer very easy. If you want to install handles now would be the time to preload any addition nuts need.



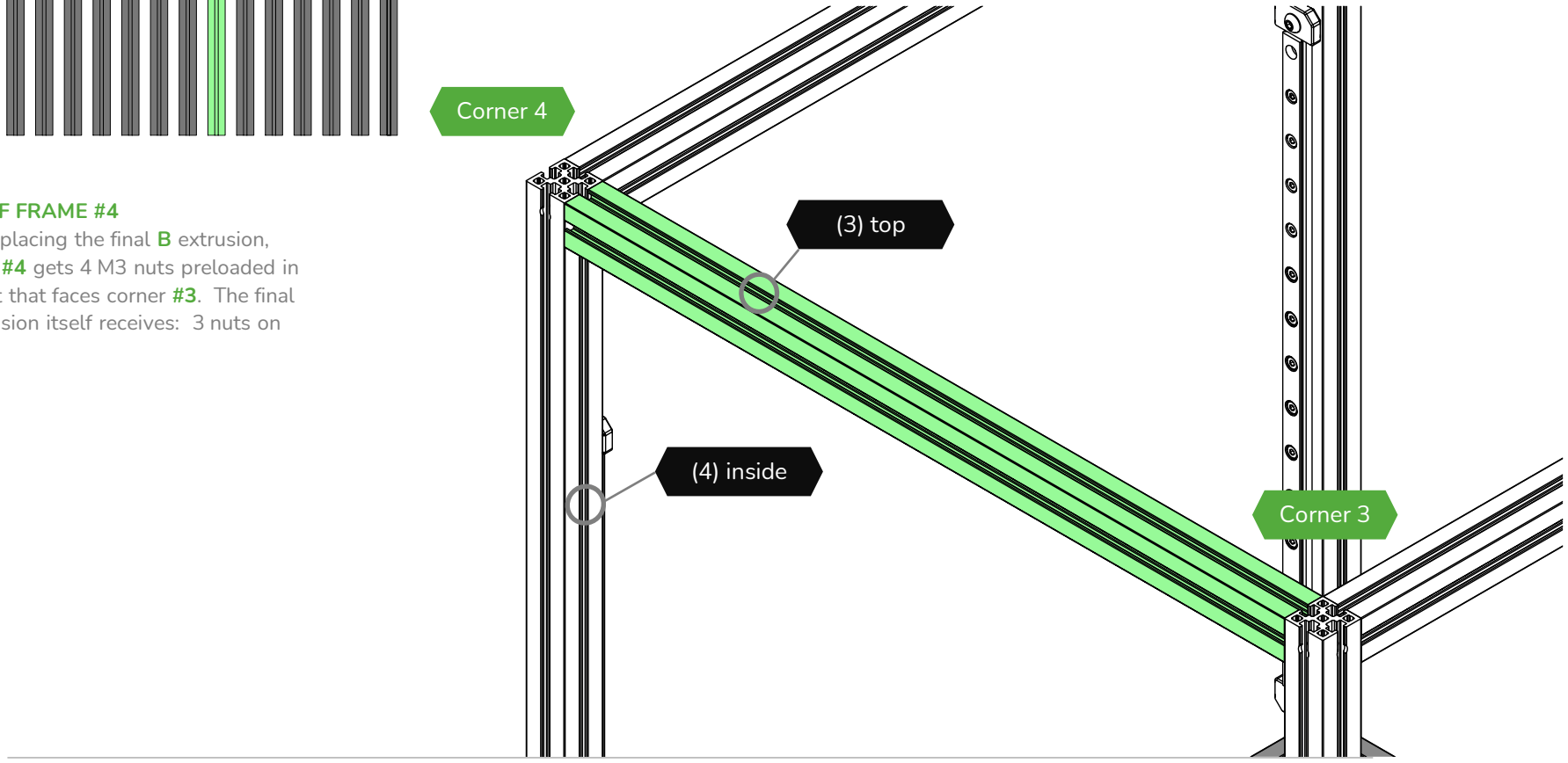
TOP OF FRAME #3

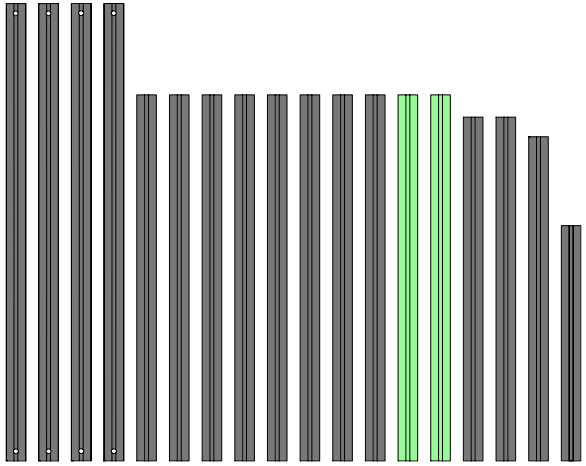
The **B** extrusion that connects Corners #2 and #3 receives: 4 nuts on top for handles(3 for no handles), 4 nuts inside, and 3 nuts outside. Attach using blind joints as with previous beams.



TOP OF FRAME #4

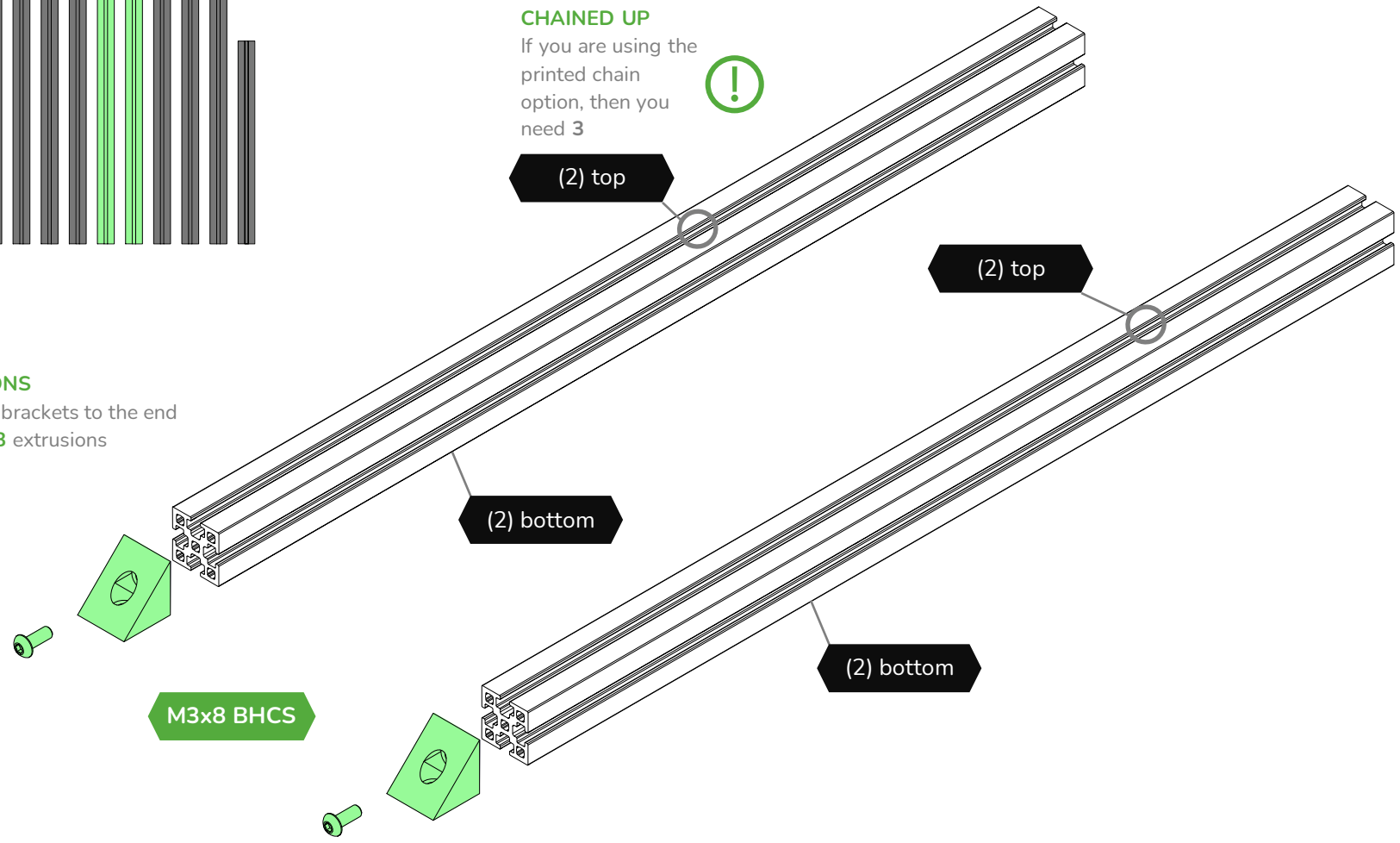
Before placing the final **B** extrusion, Corner **#4** gets 4 M3 nuts preloaded in the slot that faces corner **#3**. The final **B** extrusion itself receives: 3 nuts on top.





CHAINED UP

If you are using the printed chain option, then you need **3**

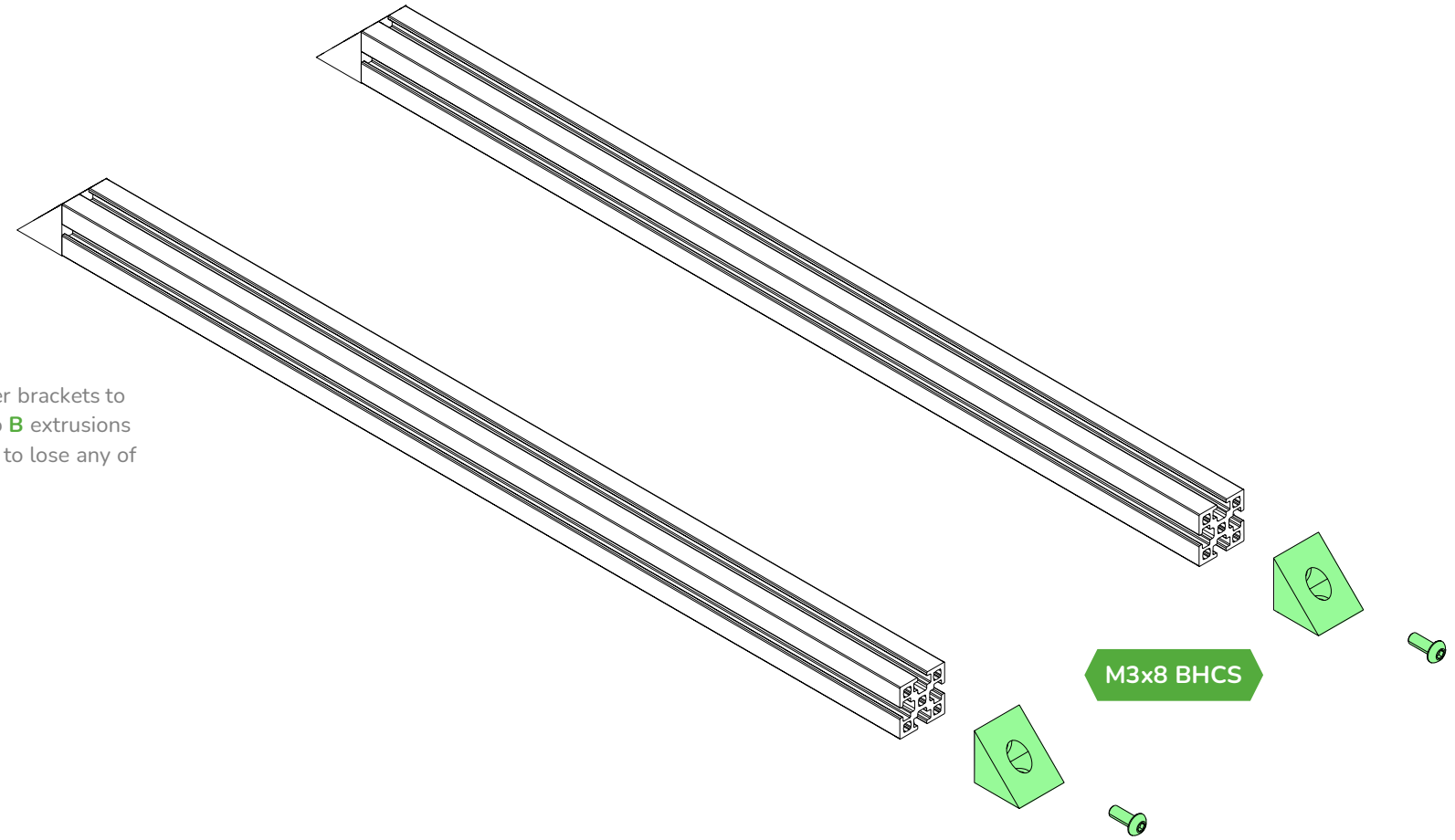


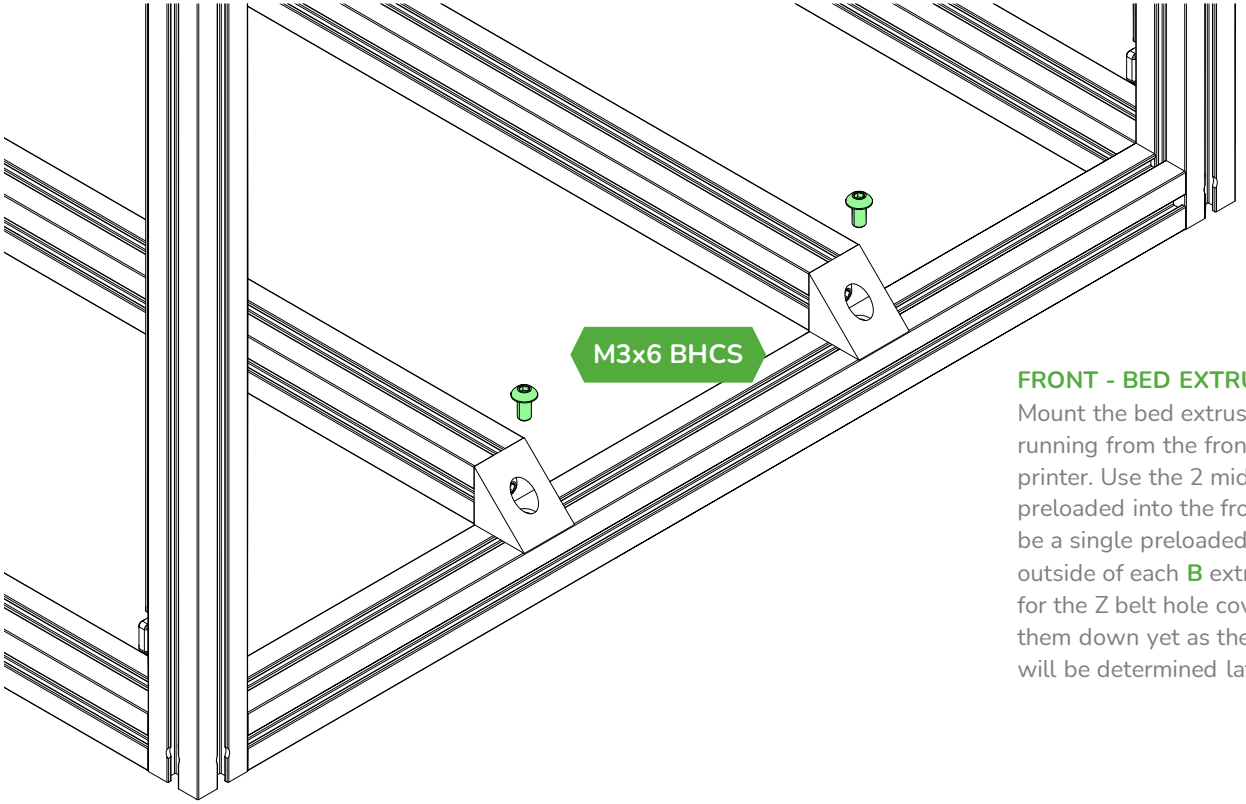
BED EXTRUSIONS

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

BED EXTRUSIONS

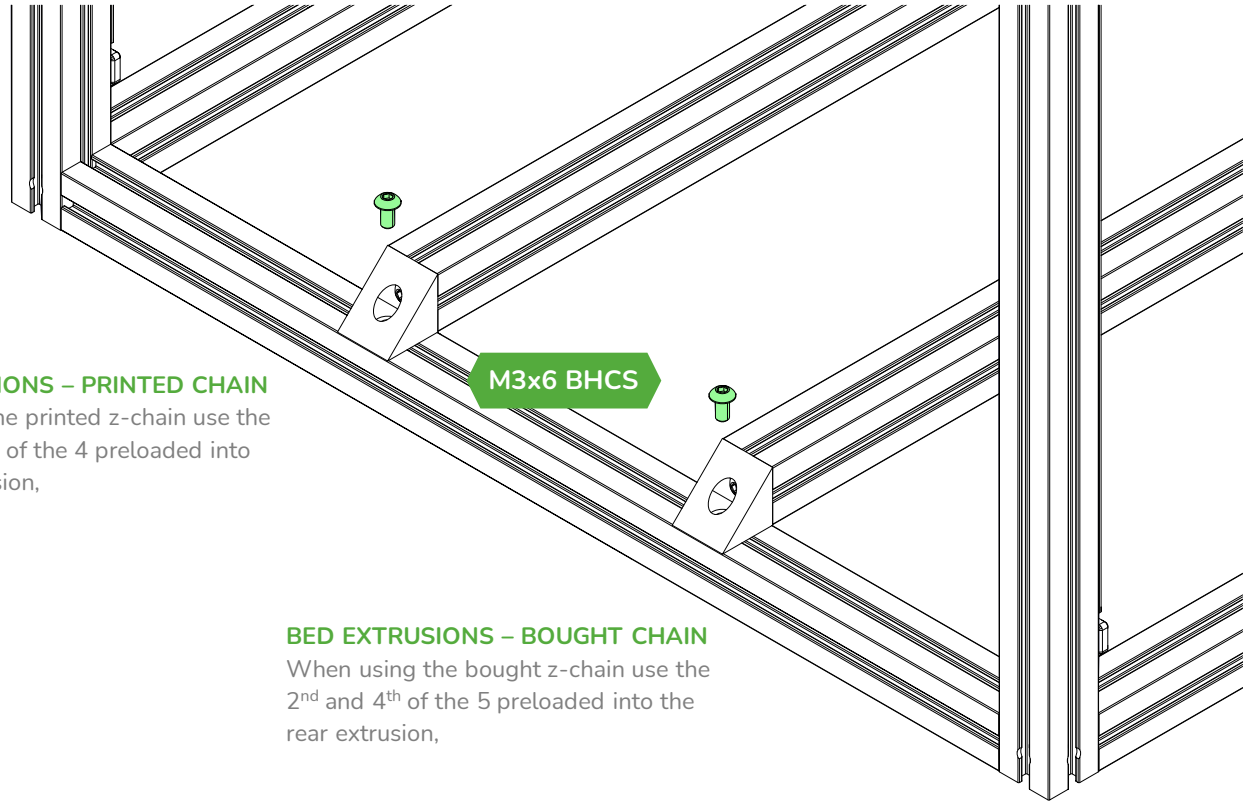
Attach the last 2 corner brackets to the end of the last two **B** extrusions while making sure not to lose any of the preloaded nuts





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 . There should be a single preloaded nut on the outside of each **B** extrusion when done for the Z belt hole covers. Don't tighten them down yet as the proper spacing will be determined later.



BED EXTRUSIONS – PRINTED CHAIN

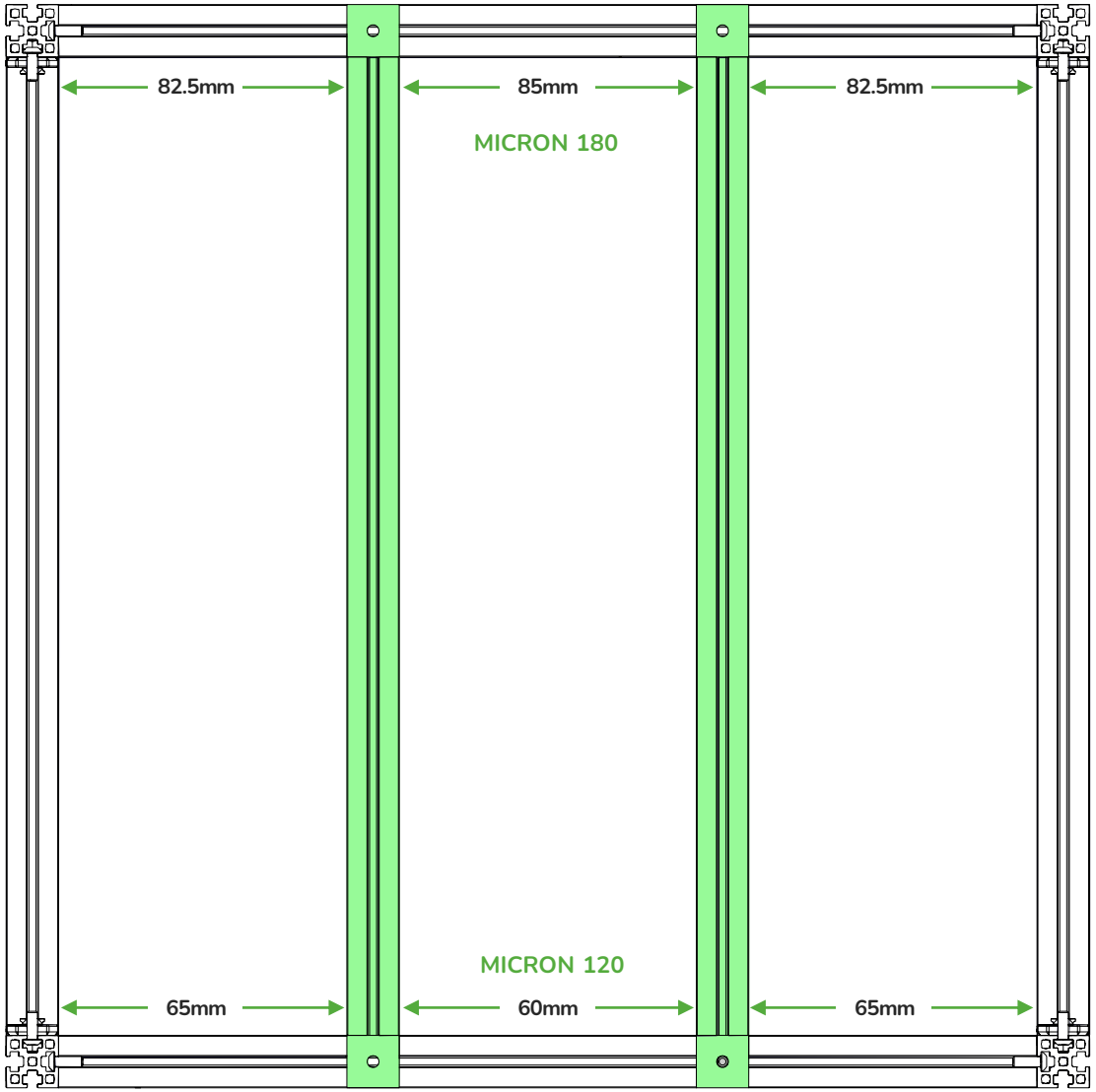
When using the printed z-chain use the 2 middle nuts, of the 4 preloaded into the rear extrusion,

BED EXTRUSIONS – BOUGHT CHAIN

When using the bought z-chain use the 2nd and 4th of the 5 preloaded into the rear extrusion,

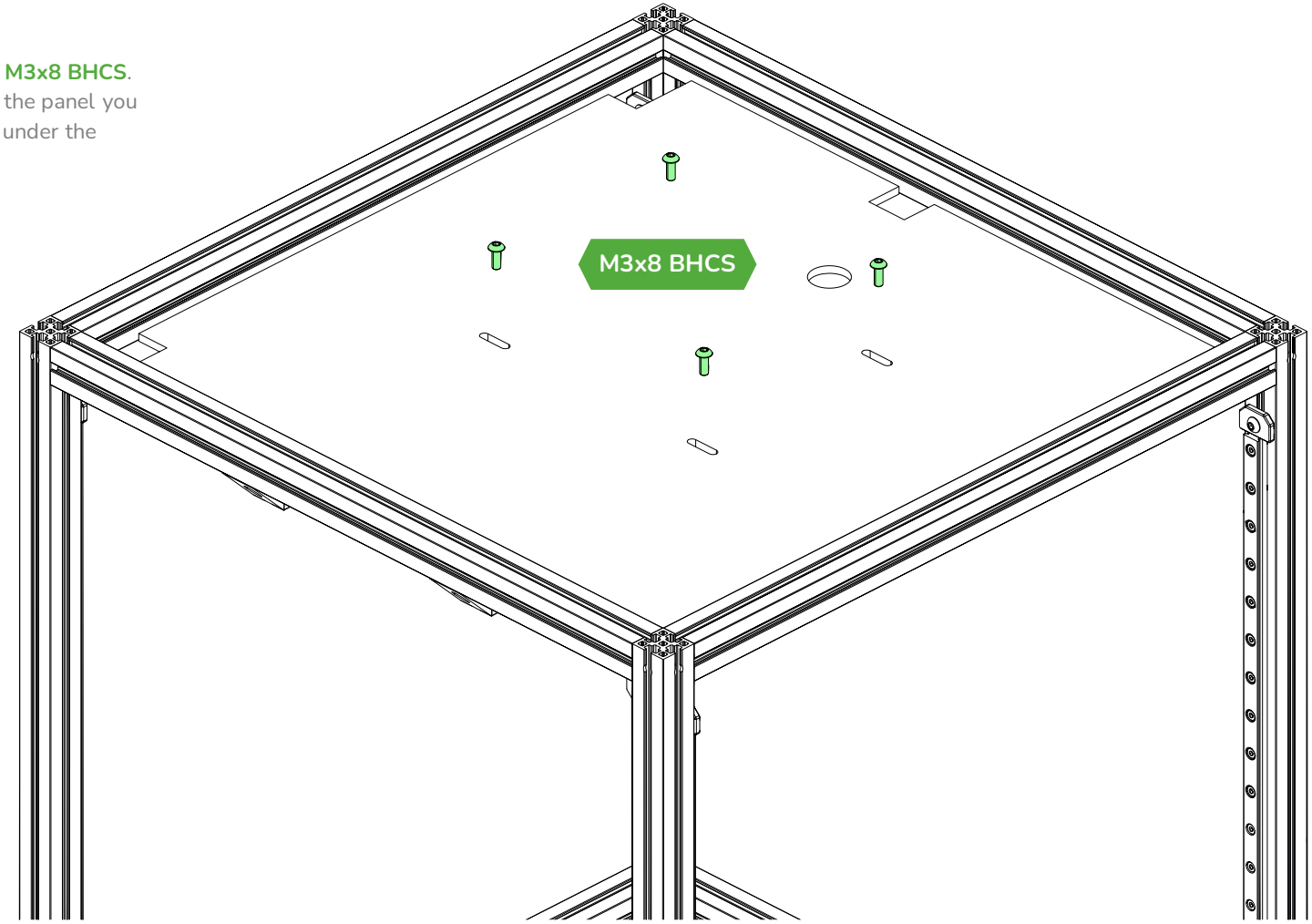
BED EXTRUSIONS

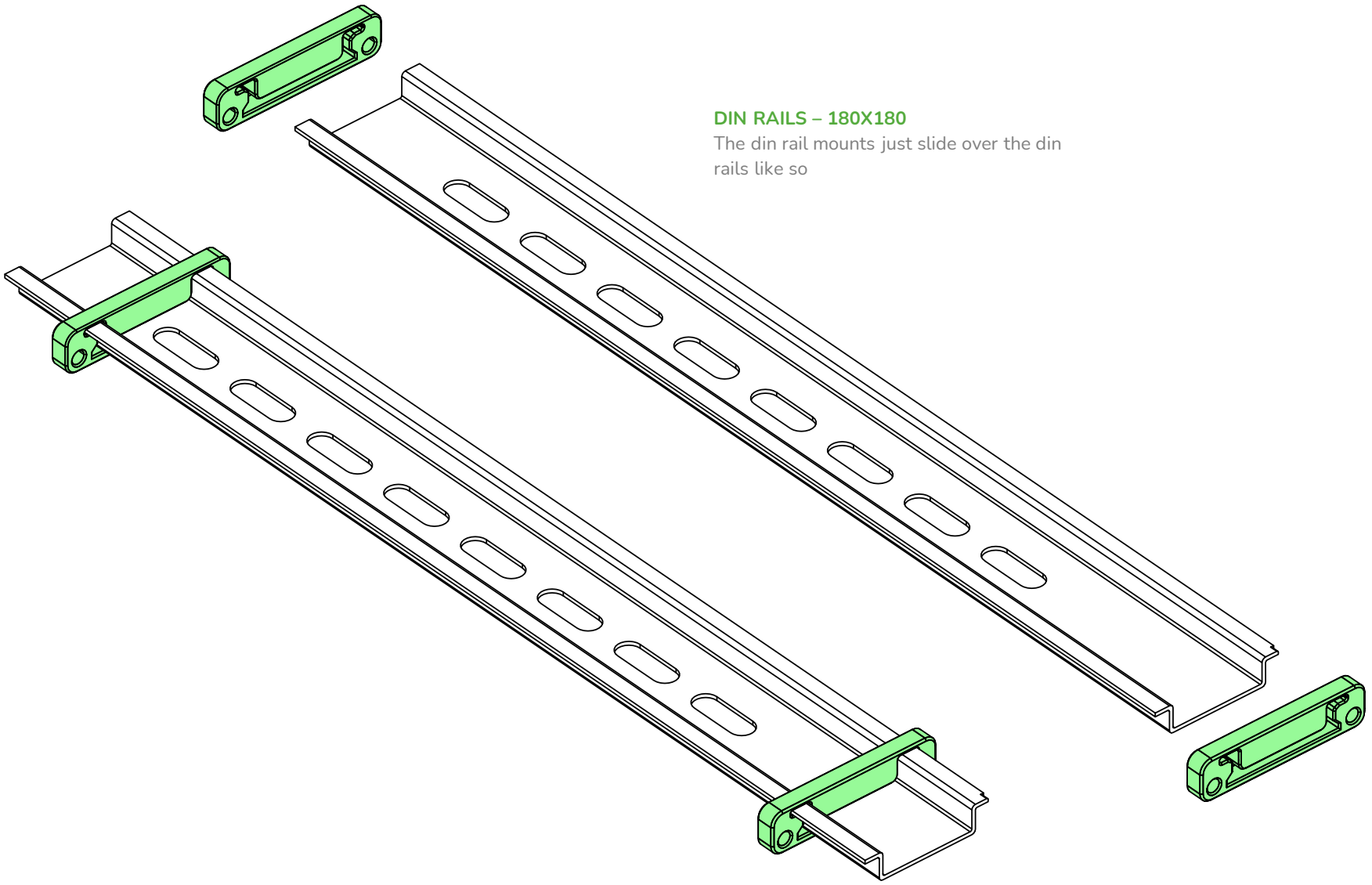
Mount the bed extrusion as shown, making sure to center the extrusions on the frame with the correct amount of space between them for your build. After they are aligned properly, you can then tighten the 4 **M3x6 BHCS** to secure the bed frame.



DECK PANEL

Install the deck panel , using 4 **M3x8 BHCS**. Depending on the thickness of the panel you may or may not need washers under the screws



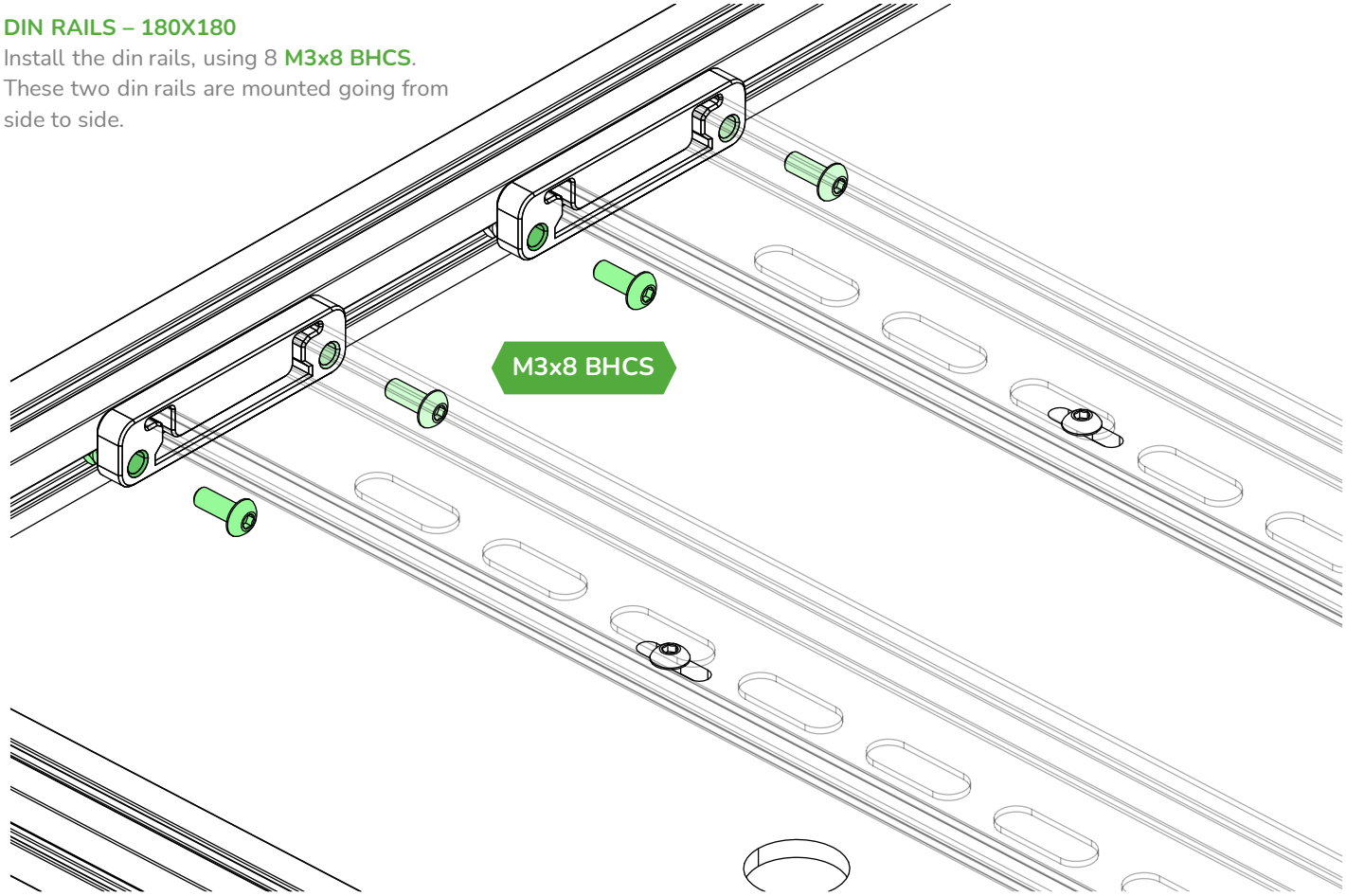


DIN RAILS – 180X180

The din rail mounts just slide over the din rails like so

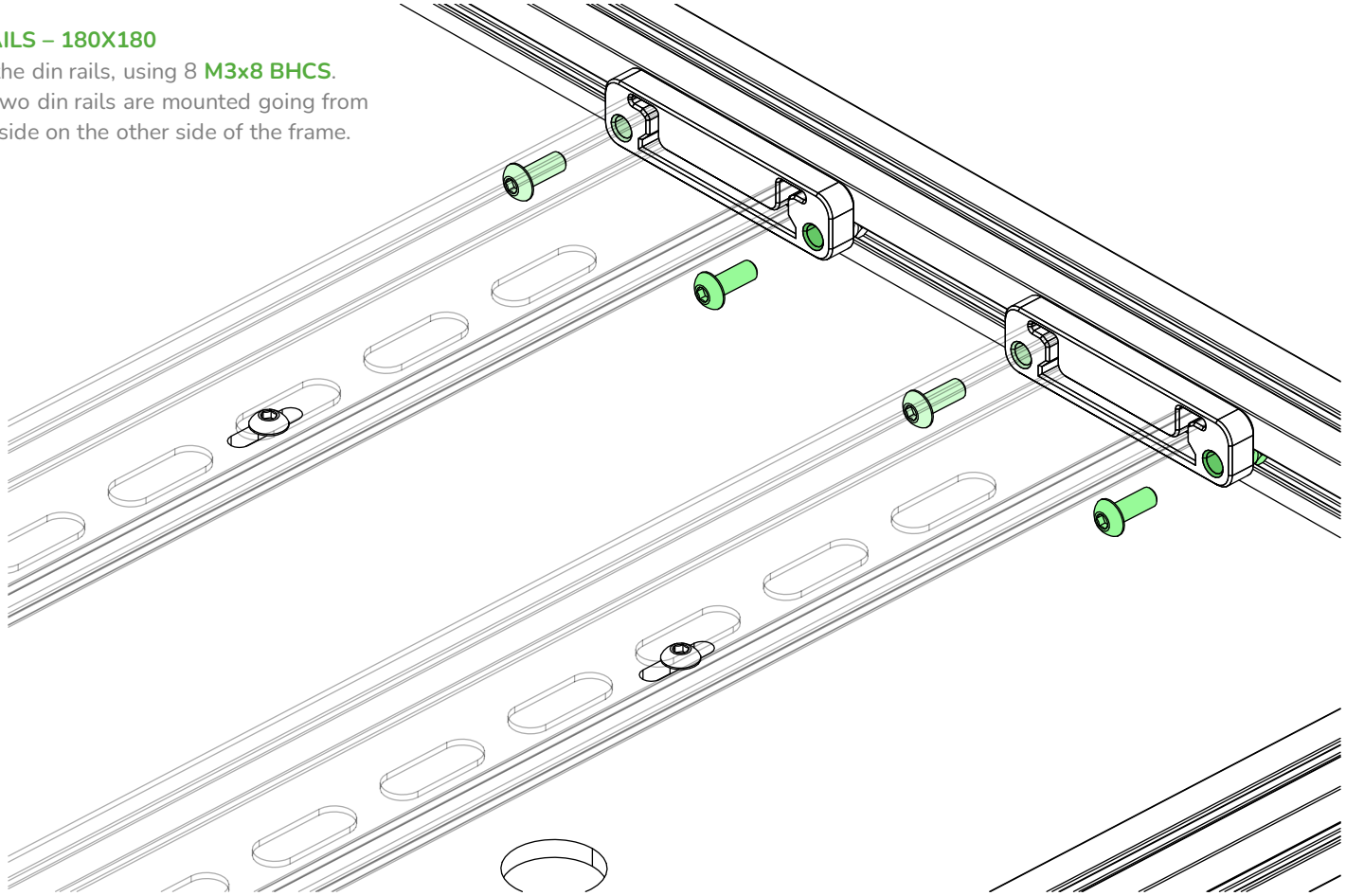
DIN RAILS – 180X180

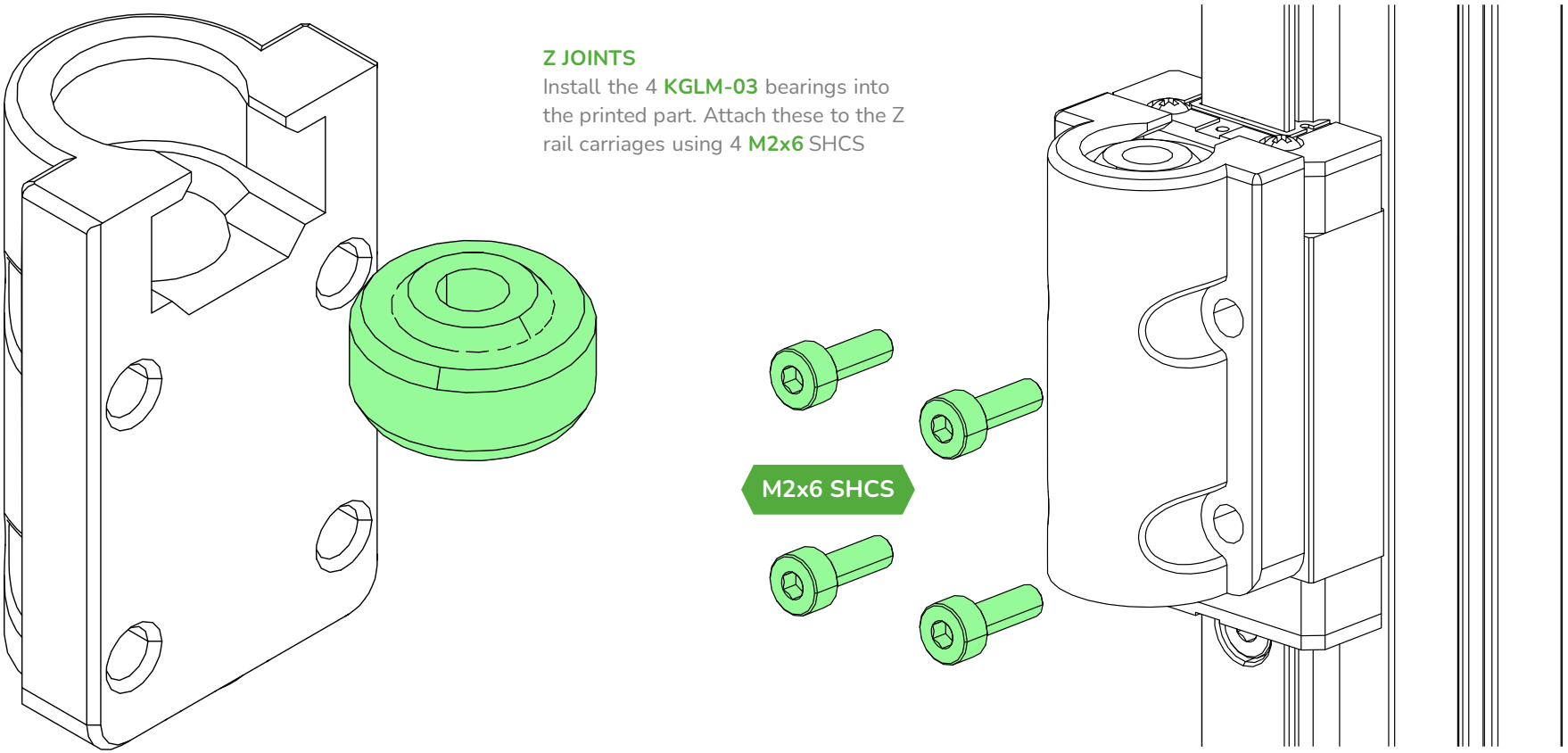
Install the din rails, using 8 **M3x8 BHCS**.
These two din rails are mounted going from side to side.



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.



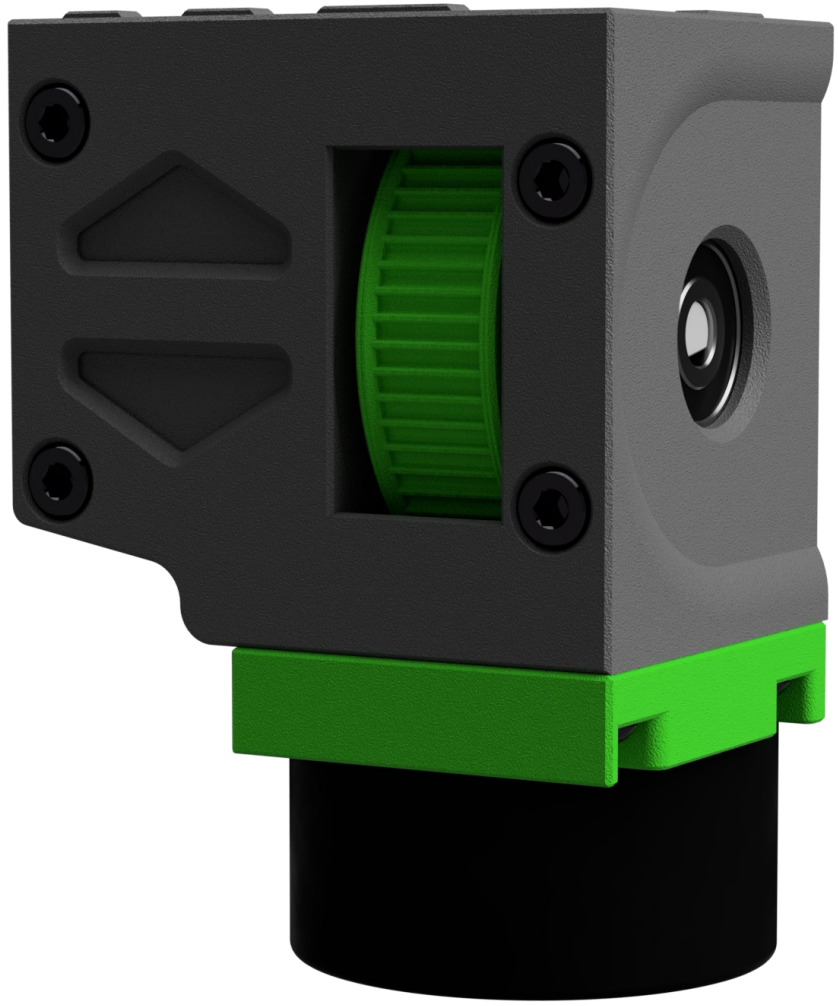


Z JOINTS

Install the 4 **KGLM-03** bearings into the printed part. Attach these to the Z rail carriages using 4 **M2x6** SHCS

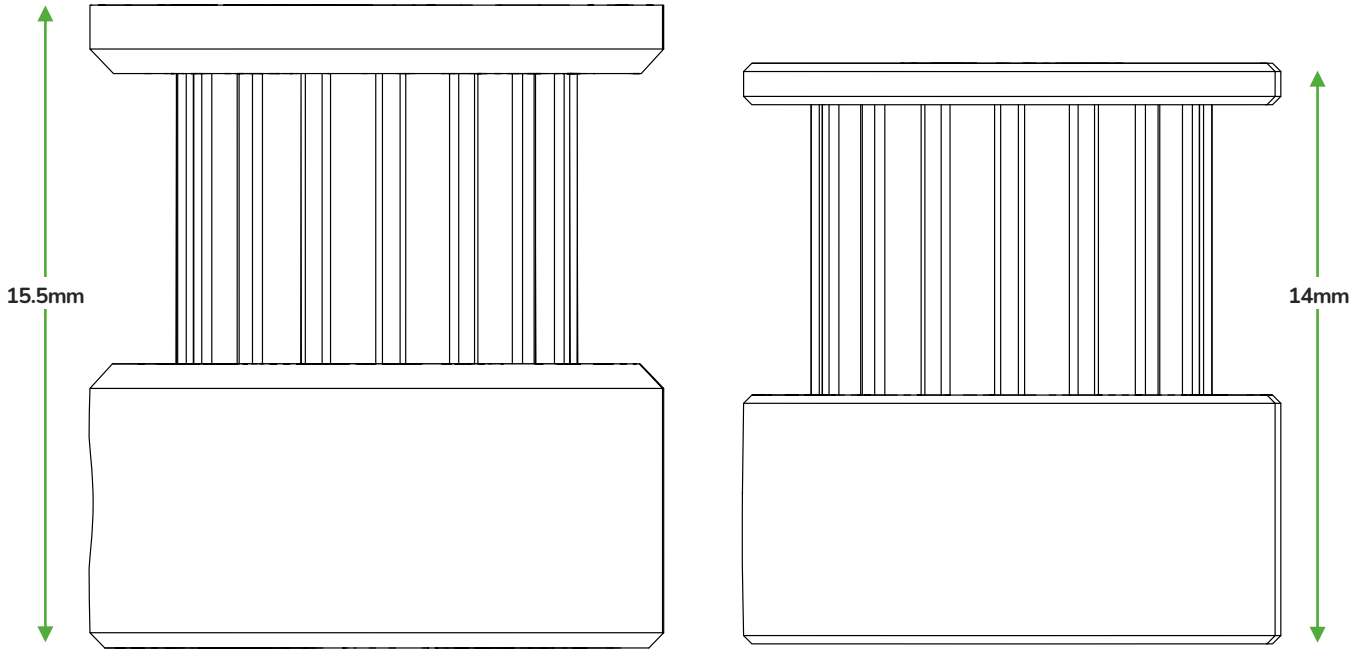
YOU HAVE BEEN FRAMED!!

At this point your frame should begin to assemble this picture here



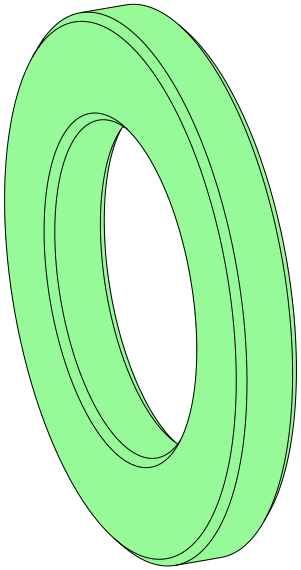
WHICH PULLEY?

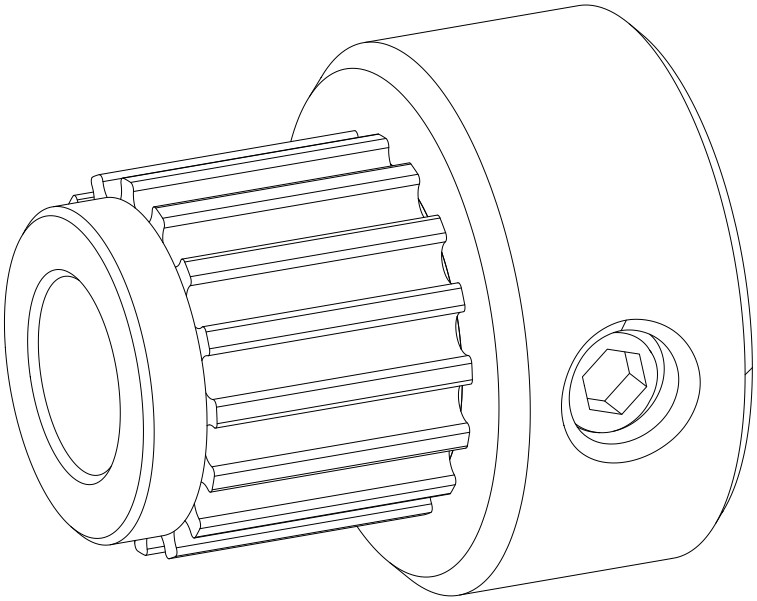
Before you start the shaft assembly, make sure to measure the length of your **GT2-16T** pulleys. There are 2 different lengths. The length will determine how you assemble the shaft assembly, and which printed spacers to use.

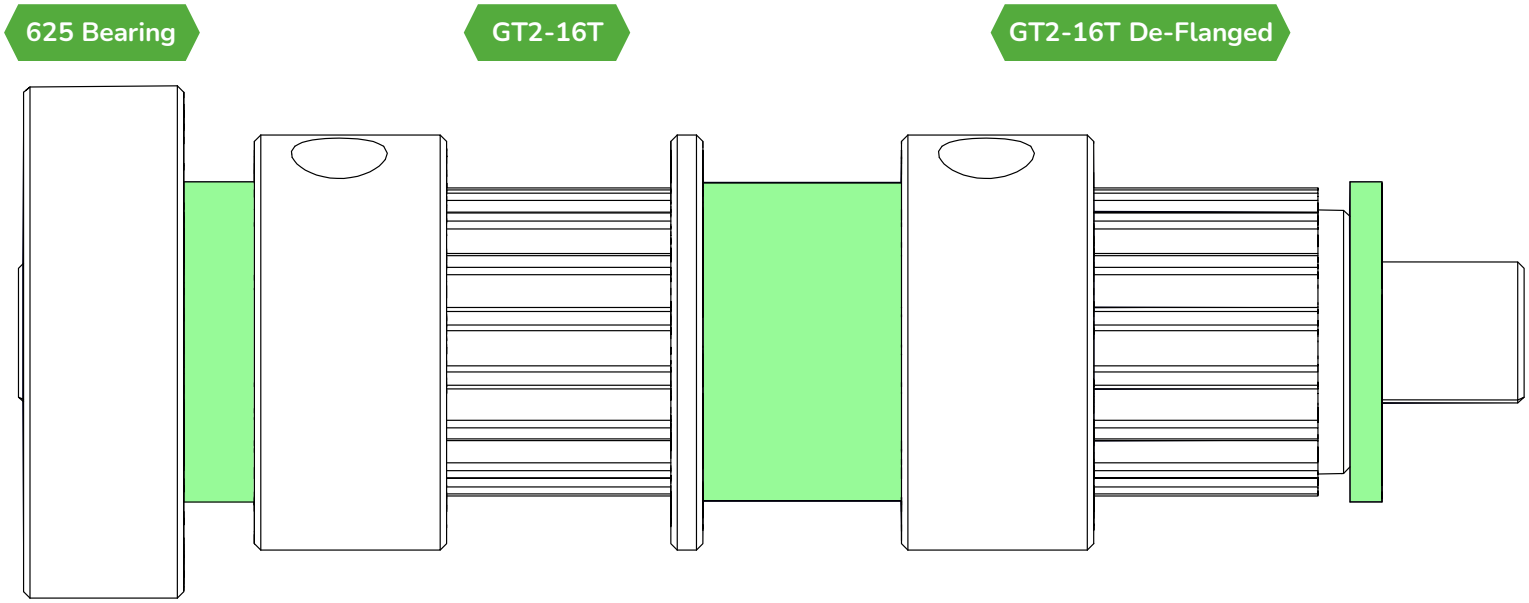


DEFLANGING PULLEY

To start assembly of the Belted Z drives you will start by removing the top flange from **x4** of the **GT2-16T** pulleys. To do this, you can use a pair of pliers and pull the top flange off the pulley.






625 Bearing
GT2-16T
GT2-16T De-Flanged