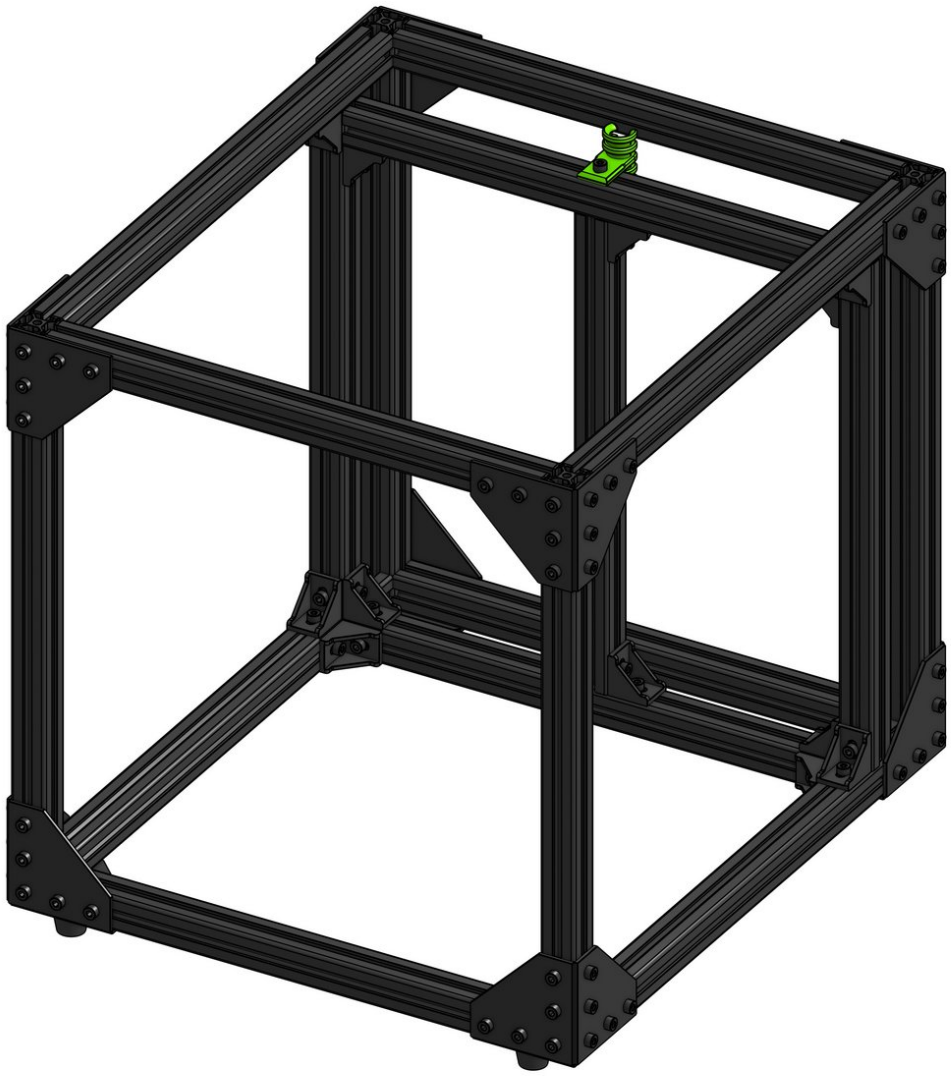
Rat Rig

01. Frame assembly

Written By: Paweł Kucmus

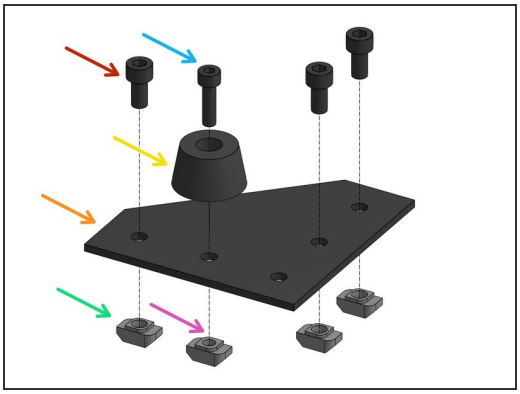
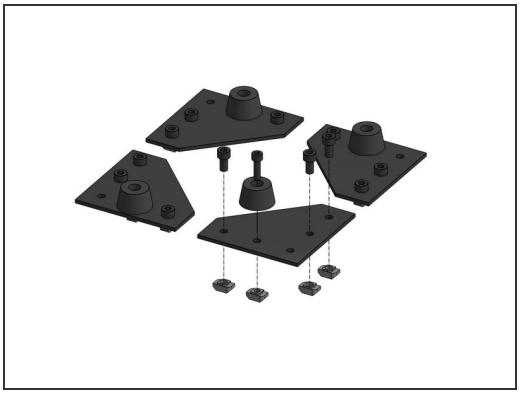
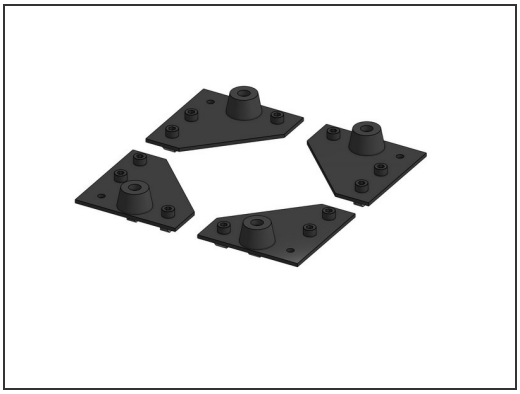


INTRODUCTION

NOTE: all measurements in this guide assume you're assembling the 300x300x300mm machine!

As a general rule, add 100mm to the measurements if you're assembling a 400 machine, or 200mm if you're assembling a 500 machine (this may not be valid for some of the measurements provided).

Step 1 — Bottom corner plates (4 pcs)

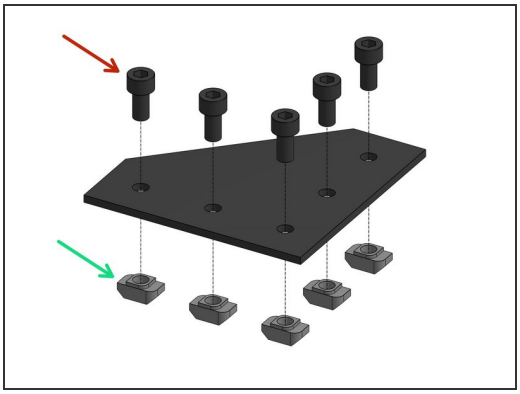
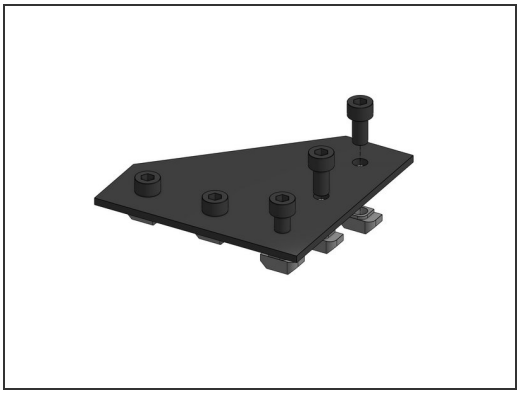
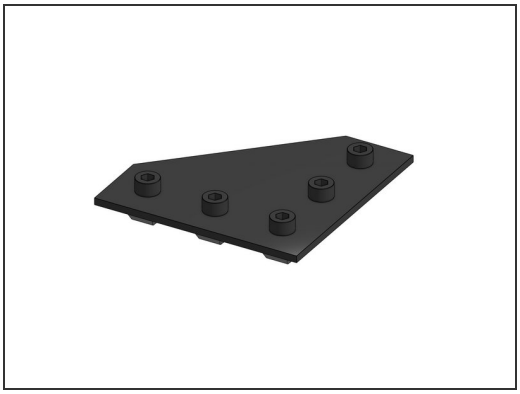




Repeat this step for 4 Joining plates (2 are mirrored)

- Cap Head Screw M6x12
- Cap Head Screw M5x18
- Rubber foot
- Joining plate
- 3030 Drop-in T-Nut M6
- 3030 Drop-in T-Nut M5

Set the T-Nuts in position, but do not tighten them just yet.

Step 2 — Joining Plates (16 pcs)

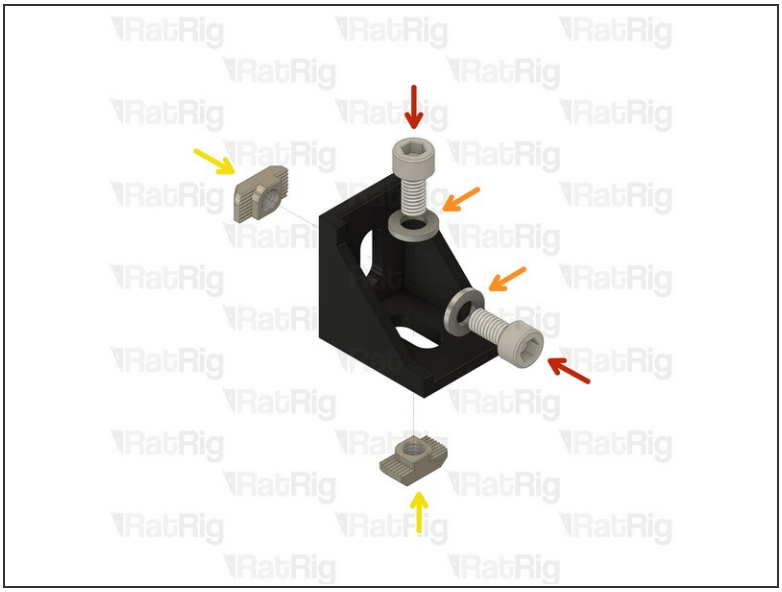




Set up all remaining Joining Plates in the kit

- Cap Head Screw M6x12mm
- 3030 Drop-in T-Nut M6

Set T-Nuts into position, but do not tighten them just yet.

Step 3 — Corner brackets (12 pcs)



Set up all Corner Brackets (x12) in your kit.

- Cap Head Screw M6x12
- M6 Washer
- 3030 Drop-in T-Nut M6

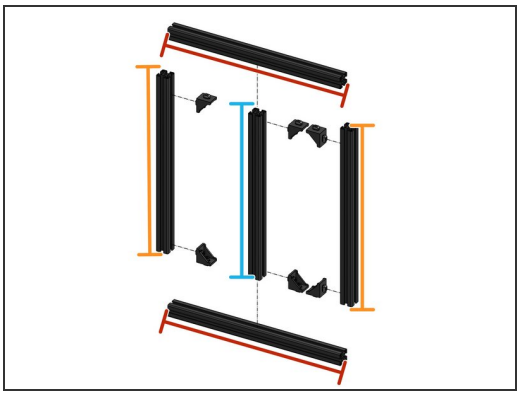
Set T-Nuts into position, but do not tighten them just yet.

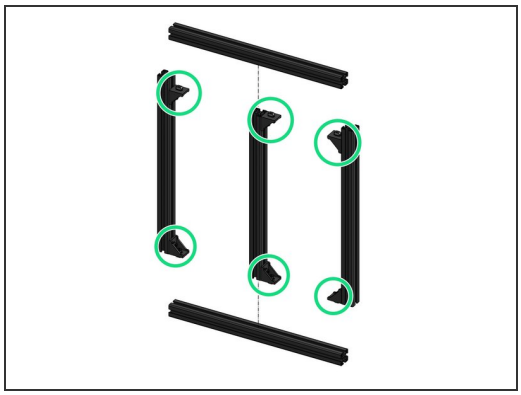
Step 4 — Prepare the inner frame 3030 extrusions

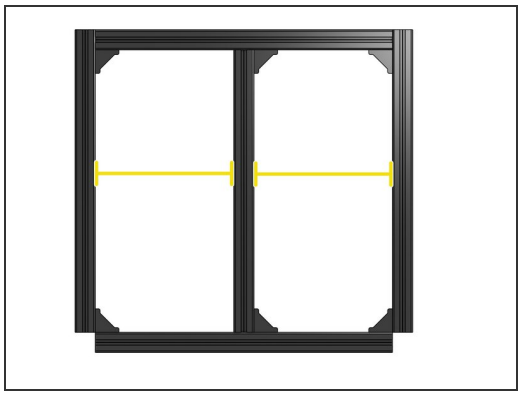
For the next step you will need:

- 420mm 3030 extrusion
- 440mm 3030 extrusion
- 450mm 3030 extrusion

Step 5 — Electronics Frame

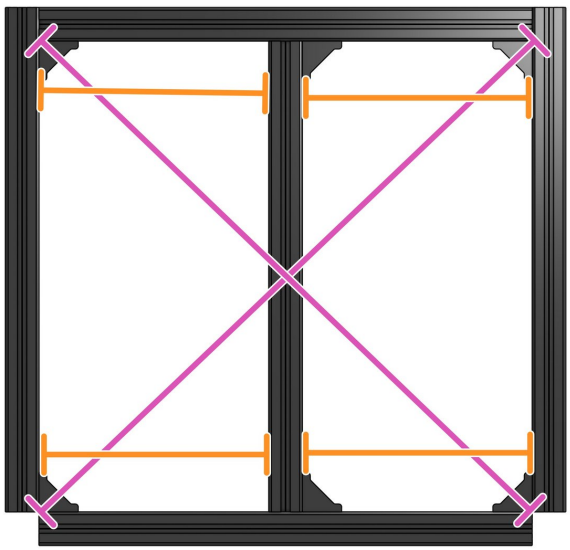






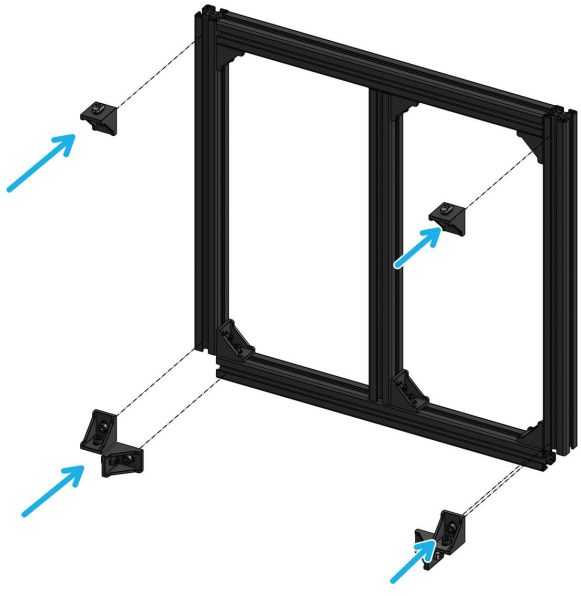
- Prepare the 3030 extrusions:
  - 440mm
  - 450mm
  - 420mm
- Attach 6 Corner Brackets to the ends of the vertical extrusions
- 205mm
- Carefully attach the extrusions by tightening all screws on the Corner Brackets. Make sure the frame is perfectly square. A flat surface may help.

Step 6 — Check squareness



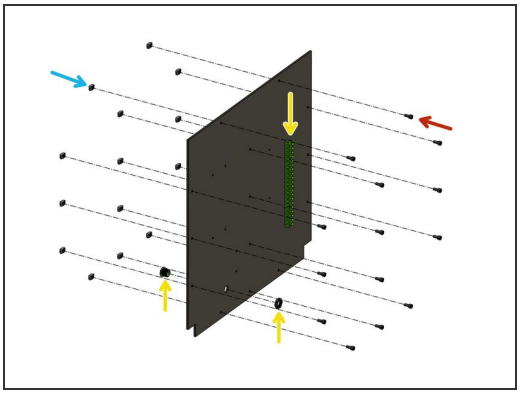
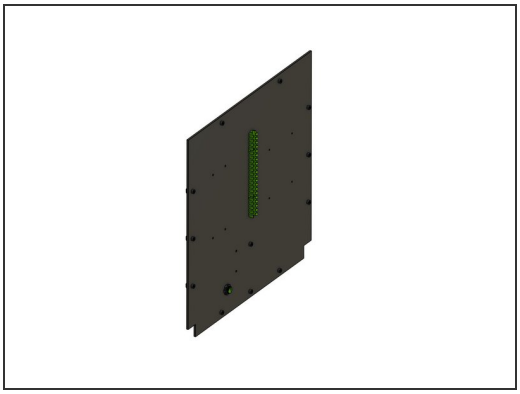
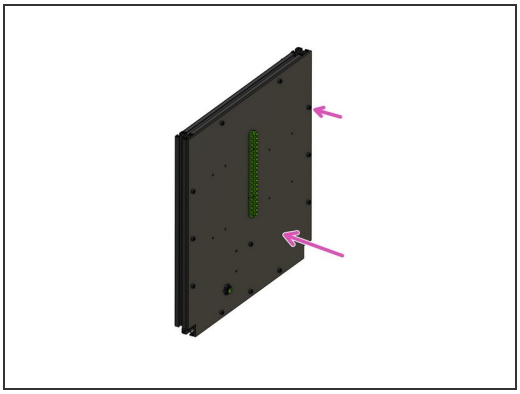
- Make sure the frame is square. The diagonal lengths should be equal
- The middle extrusion should be in the exact middle of the inner frame - 205mm from the side extrusions

Step 7



- Loosely attach 6 corner brackets. Don't worry about alignment, you will adjust their position in a moment.

Step 8 — (Optional) Inner frame panel

ⓘ If you are opting for a back panel this is a good time to attach it. It's going to be difficult later.

ⓘ Panels are not supplied by Rat Rig, they are meant to be sourced locally. DXF files are provided for each panel and machine size.

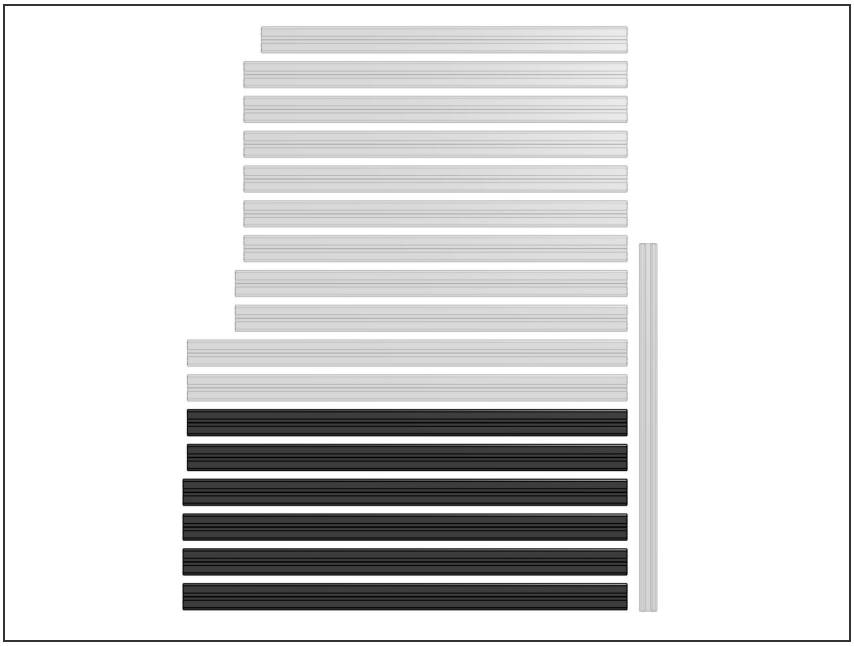
⚠ CAUTION: Panel should not be thicker than 4mm, or it will not fit.

- If needed, drill the M6 holes and fasten the **Cap Head Screw M6x12** through them
- Attach the **3030 Drop-in T-Nut M6** to the screws

⚠ Some kits may use M5x12 screws with M5 T-Nuts for this step. If this is the case for your kit, it will include 18 M5x12 Cap head screws. If not, it will include only 4 of those screws.

- Cable Management Printed Parts (Optional and not included in the kit shipped by Rat Rig)
- Fit the panel on the inner frame and fasten all of the screws

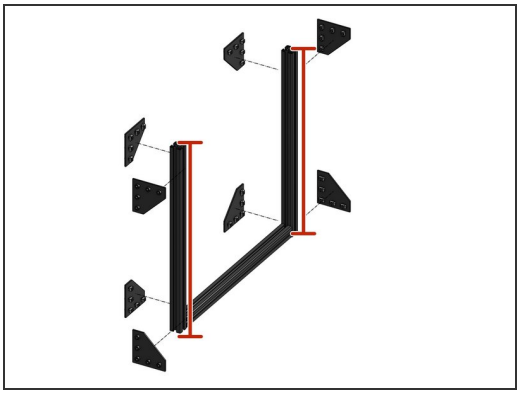
Step 9 — Prepare frame sides extrusions

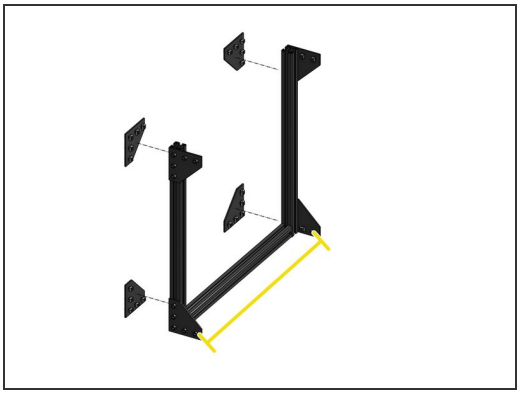


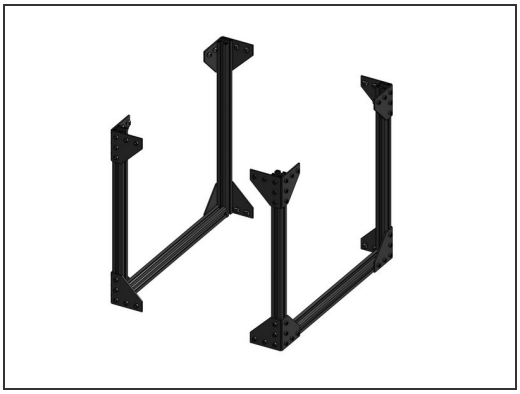
⚠ CAUTION: These lengths are very similar, do not mix them up!

- Prepare 3030 extrusions:
  - 2x 505mm
  - 4x 510mm

Step 10 — Assemble frame sides







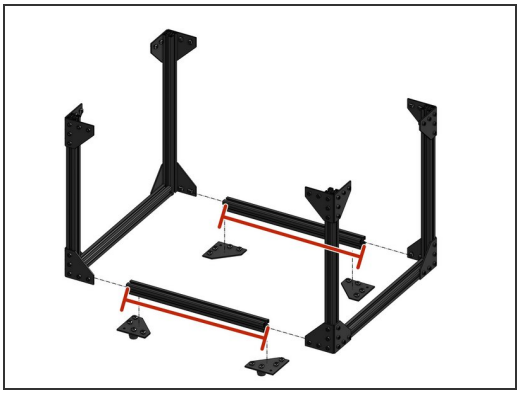
- Attach the **corner plate assemblies** to the Z extrusions (510mm)
- Add the Y extrusion (505mm)
- Repeat for the other side of the frame

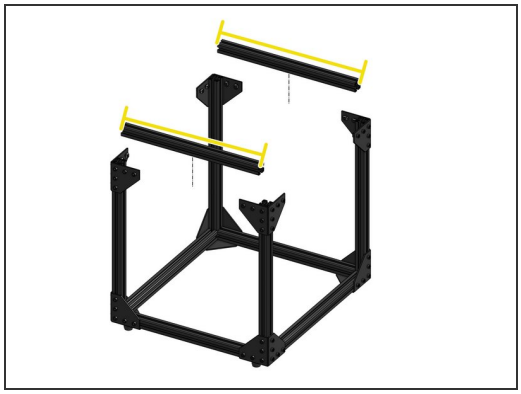
ⓘ Don't worry about the top Y extrusions - those will be added later

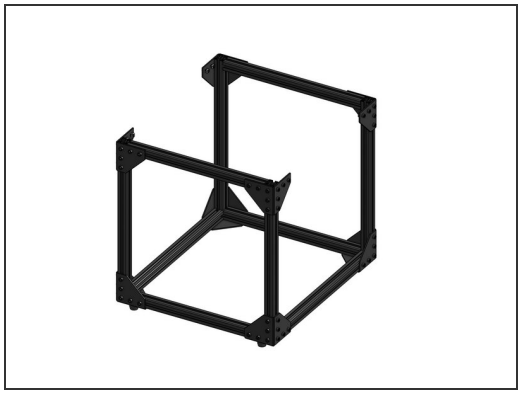
Step 11 — Prepare the X 3030 extrusions

- Prepare the X 3030 extrusions:
  - 4x 440mm

Step 12 — Complete the bottom assembly

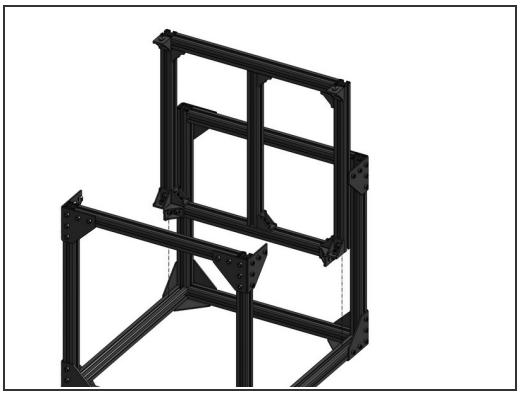
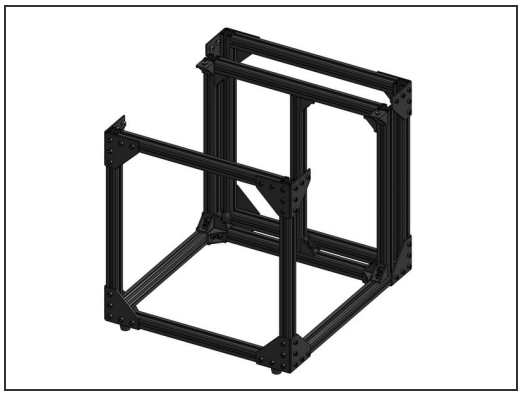
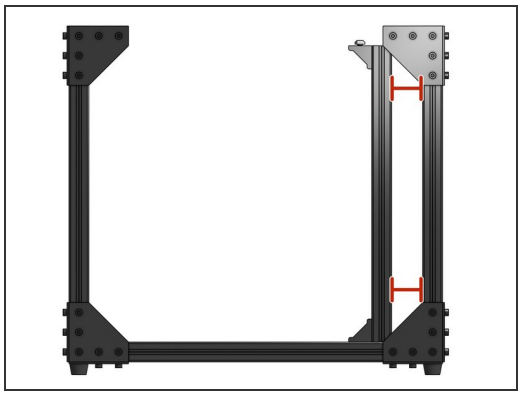






- Join the two frame sides with 440mm X extrusions
- Attach the **bottom corner assemblies**
- Add the top 440mm X extrusions

Step 13 — Attach the inner frame

- Insert the inner frame into the main frame

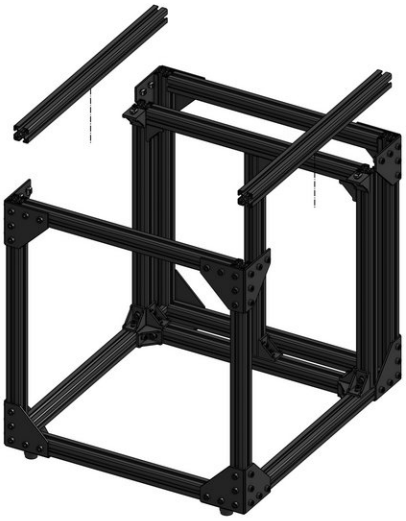
ⓘ You will need to loosen the bottom **corner assemblies** a little

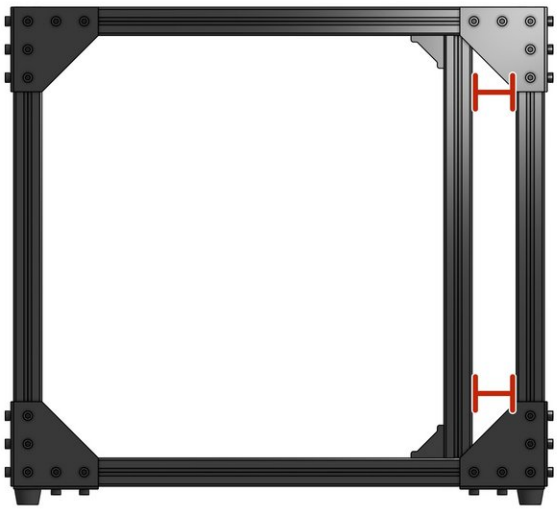
- The distance between the inner frame and the main Z extrusions should be 47mm

Step 14 — Attach the top Y extrusions

- Prepare the Y 3030 extrusions
  - 2x 505mm

Step 15



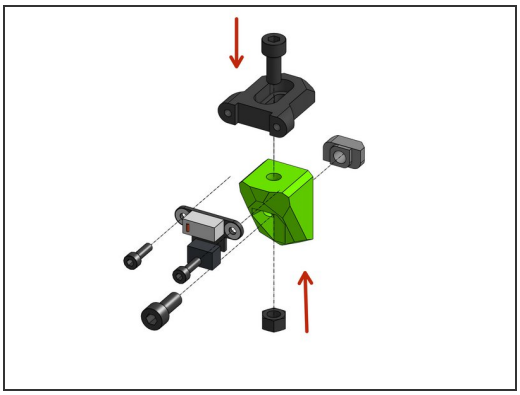
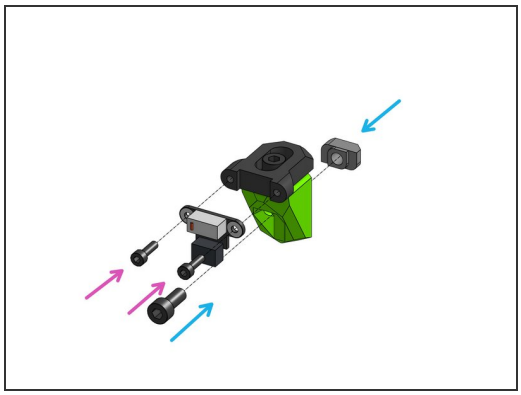
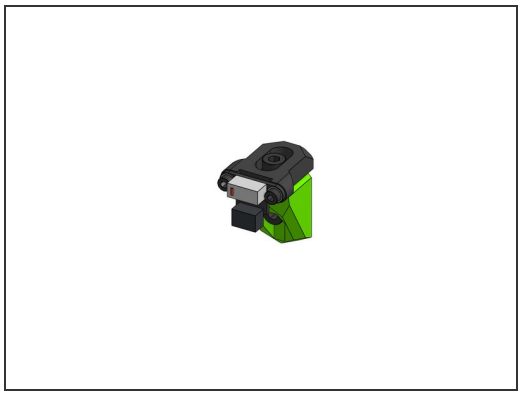


- Attach the top Y extrusions

ⓘ You will need to loosen the **corner brackets** in the top of the inner frame

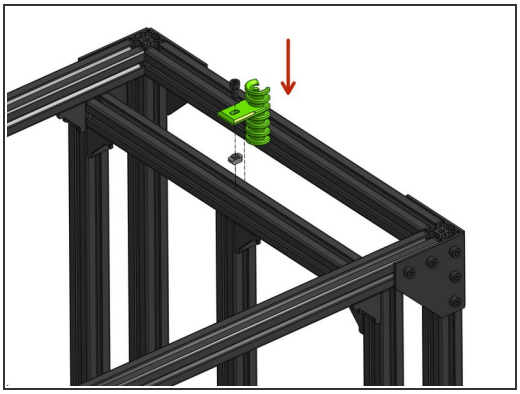
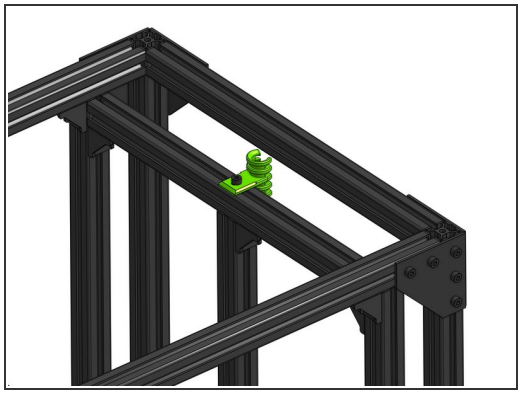
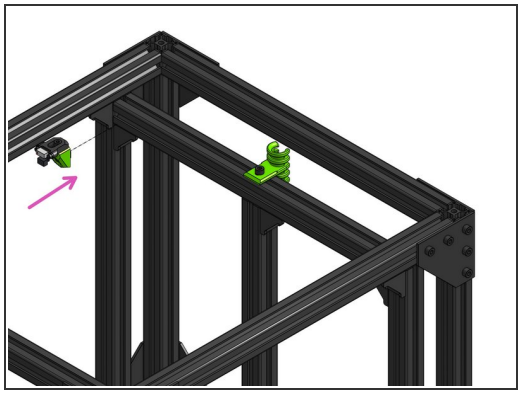
- Again, ensure the **inner frame** is parallel to the main frame - the distance between those should be 47mm

Step 16 — Assemble the Y endstop

- Backpull the **M5 hex locking nut** and fasten the two printed parts together with a **Cap Head Screw M5x12**
- Attach the **3030 M5 T-nut** to a **Cap Head Screw M5x12** through the bottom part
- Fasten the endstop to the top printed part with 2x **Cap Head Screws M3x10**

Step 17 — Attach the cable guide and Y endstop

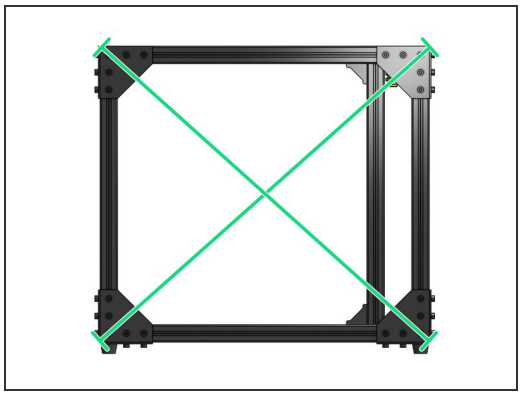
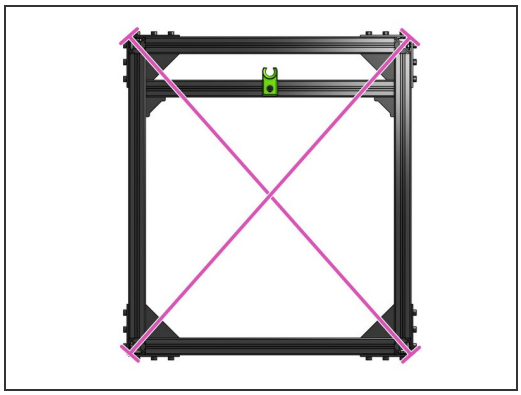




- Thread the **M6x12mm** screw through the back cable guide and attach the **3030 M6 T-nut**
- Screw the part the the center of the inner frame's top extrusion

ⓘ Don’t tighten too hard

- Attach the Y endstop to the frame

Step 18 — Ensure the frame is square

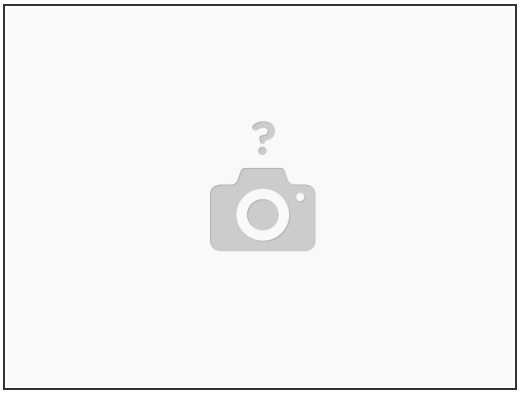




⚠ VERY IMPORTANT: a frame that is not square will produce noise and will wear out parts like bearings and belts

ⓘ Go around your frame and check the diagonal lengths - those need to be as equal as possible (a difference of less than 1mm is acceptable)

- Front and back
- Right and left
- Top and bottom

Step 19 — Next guide...



- 02. XY Drive Assembly