

Rat Rig

01. V-Hive Enclosure Base Model

Step-by-step assembly guide for the Rat Rig V-Hive Enclosure, a DIY Enclosure kit.

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 RatRig

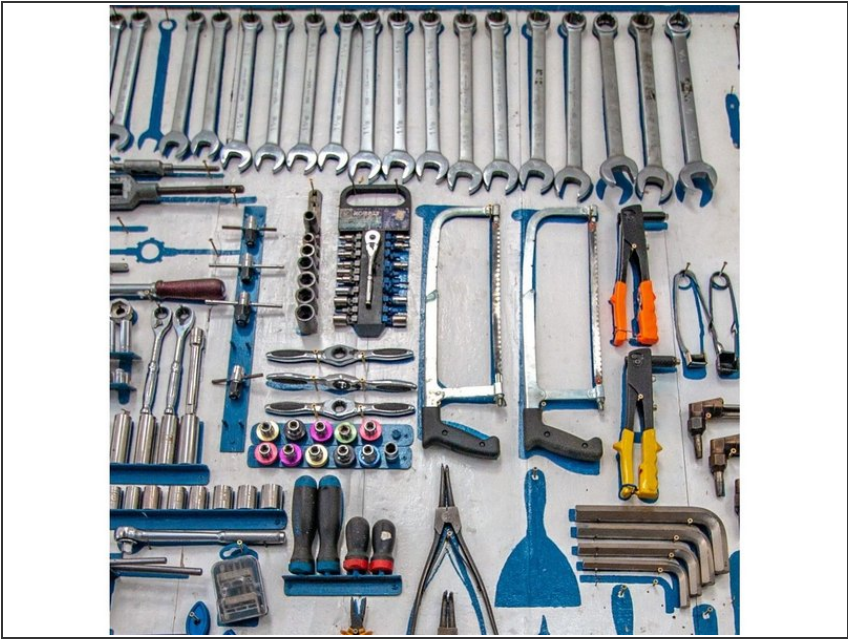
INTRODUCTION

To start the build, make sure you have a **clean and empty working area** dedicated to this assembly, that way, in case you need to take a break you don't need to move everything mid-build, decreasing the risks of losing or mismatching other components from outside the kit. Always **have your tools close** and organized in order to optimize your workflow. The steps in the Build Guide indicate what components are required and how many to use. In the step title there is a number, for example, (x2) means you have to repeat the step 2 times.

It is **strongly recommended** to assemble the frame on a known flat surface (such as a solid table, work surface or similar). Assembling the frame on a carpeted floor, or other non-flat surface, can cause the finished frame to not be square.




- The enclosing panels themselves are not supplied, the user is meant to source them locally. A 4mm thick polycarbonate sheet is suggested.
- DXF files for the panels can be downloaded [here](#)

Step 1 — Recommended Tools






- i** It is recommended to have the following tools available for assembling the V-Hive Enclosure :
- Allen Key / Hex Wrenches in the following sizes: 3mm, 5mm
 - Tape measure or calipers
 - Engineers Square


Step 2 — Extrusion Size Adjustments

		V-Hive Enclosure Size		
		500x500	600x600	700x700
				
Extrusion size	Horizontal Extrusions	500 mm	600 mm	700 mm
	Vertical Extrusions	548 mm	648 mm	748 mm

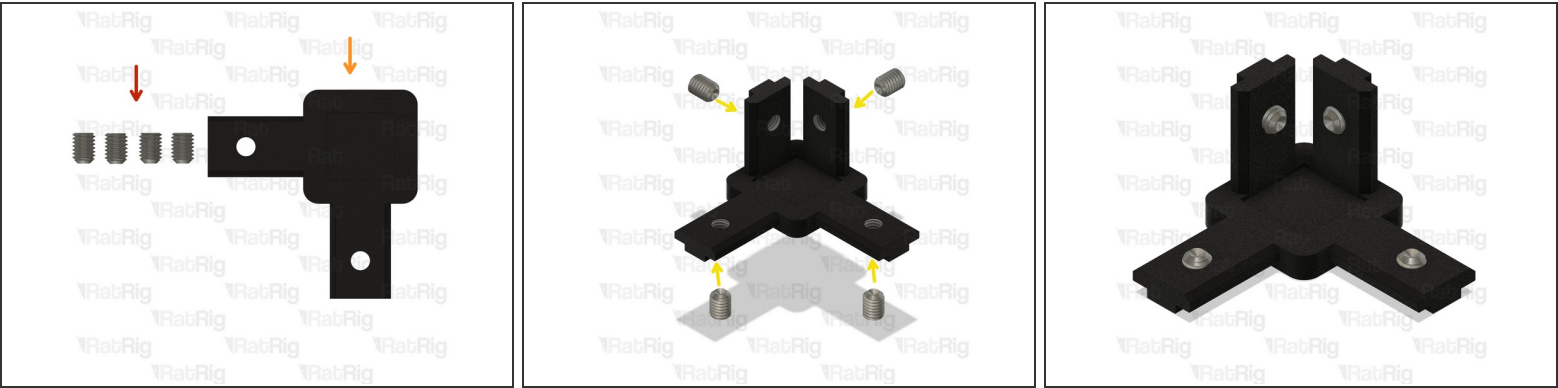
- ★ Please note:** All measurements provided in this guide are based upon building a 500x500 V-Hive Enclosure.
- i** If you are building an enclosure of a different size, the following adjustments can be made to the stated extrusion lengths.

Step 3 — Panel Sizes

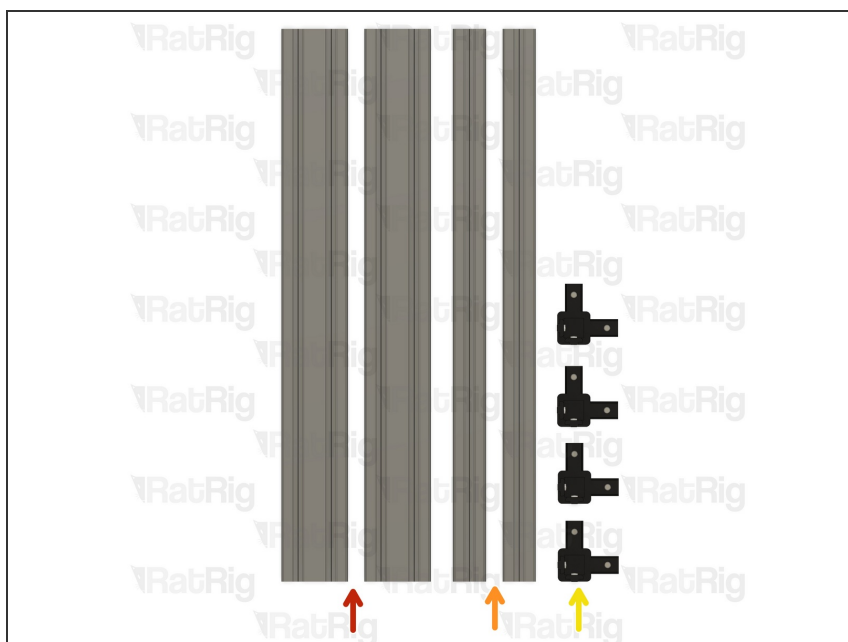
PANEL SIZES V-HIVE					
	ENCLOSURE SIZE	BASE / TOP	DOOR	REAR	SIDES
	500 X 500	514 X 454	540 X 530	558 X 558	514 X 514
	600 X 600	614 X 554	640 X 630	658 X 658	614 X 614
	700 X 700	714 X 654	740 X 730	758 X 758	714 X 714

 **Please note:** Rat Rig provides DXF and STEP files for you to have your own panels produced locally. These are available for download [here](#). Recommended panel thickness is 4mm for the best fit and seal.

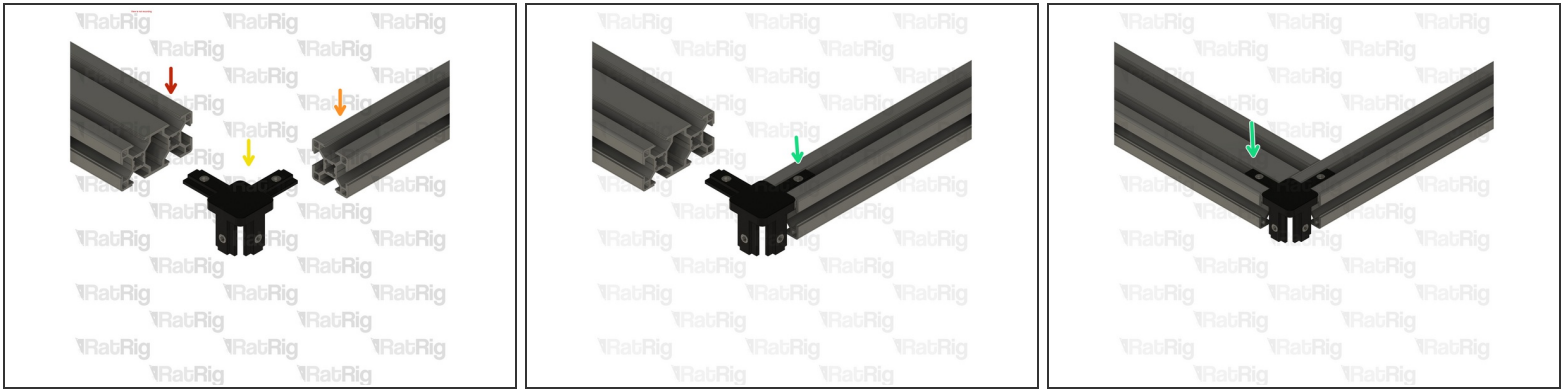
Step 4 — Hidden three way corners (x8)



- 4x M6x8 Set Screw
- Hidden Three Way Corner
- Insert the set screws into the part's threads.

Step 5 — Prepare the top and bottom of the frame

- 2x 500mm 3060 Extrusion
- 2x 500mm 3030 Extrusion
- 4x Hidden three way corner assembly

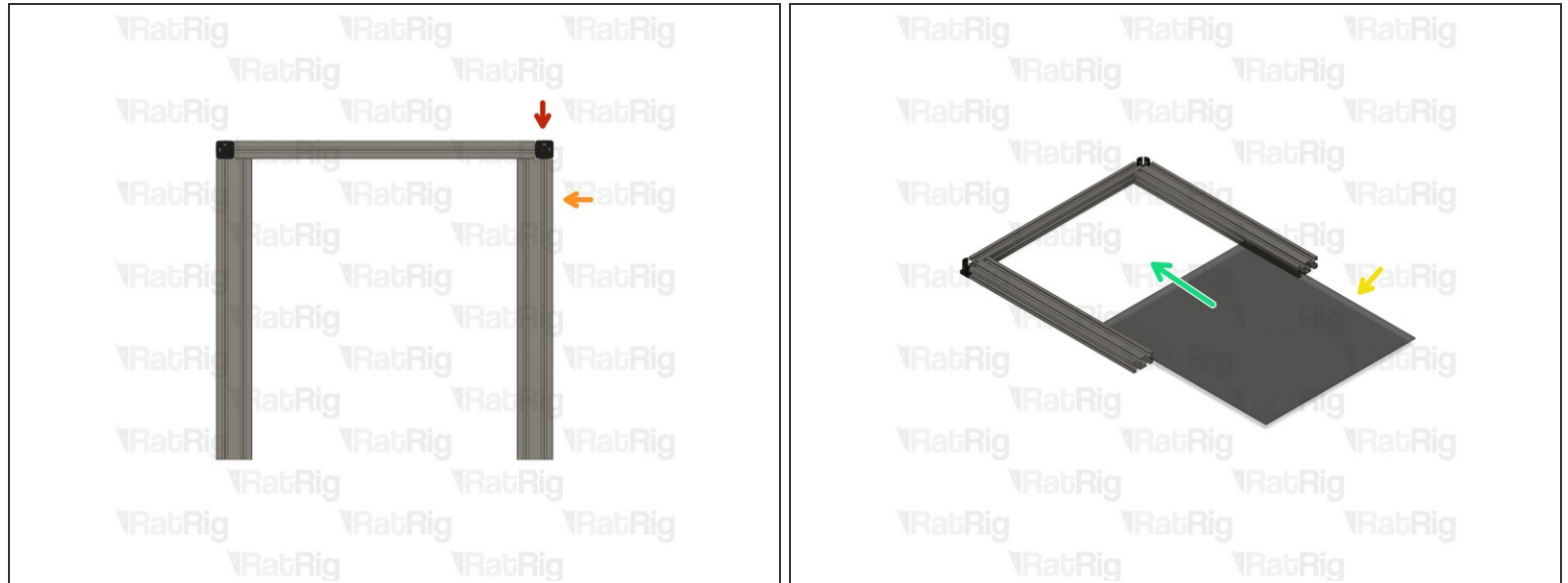
Step 6 — Prepare the top and bottom of the frame - Part 1

- 500mm 3060 Extrusion
- 500mm 3030 Extrusion
- Hidden three way corner assembly

⚠ Ensure the extrusions are flush and square with the hidden three way corner assembly before and after tightening the screws.

- Tighten the M6x8 set screws.

⚠ Be careful while tightening the set screws, extreme force may break the three way hidden corner.

Step 7 — Prepare the top and bottom of the frame - Part 2

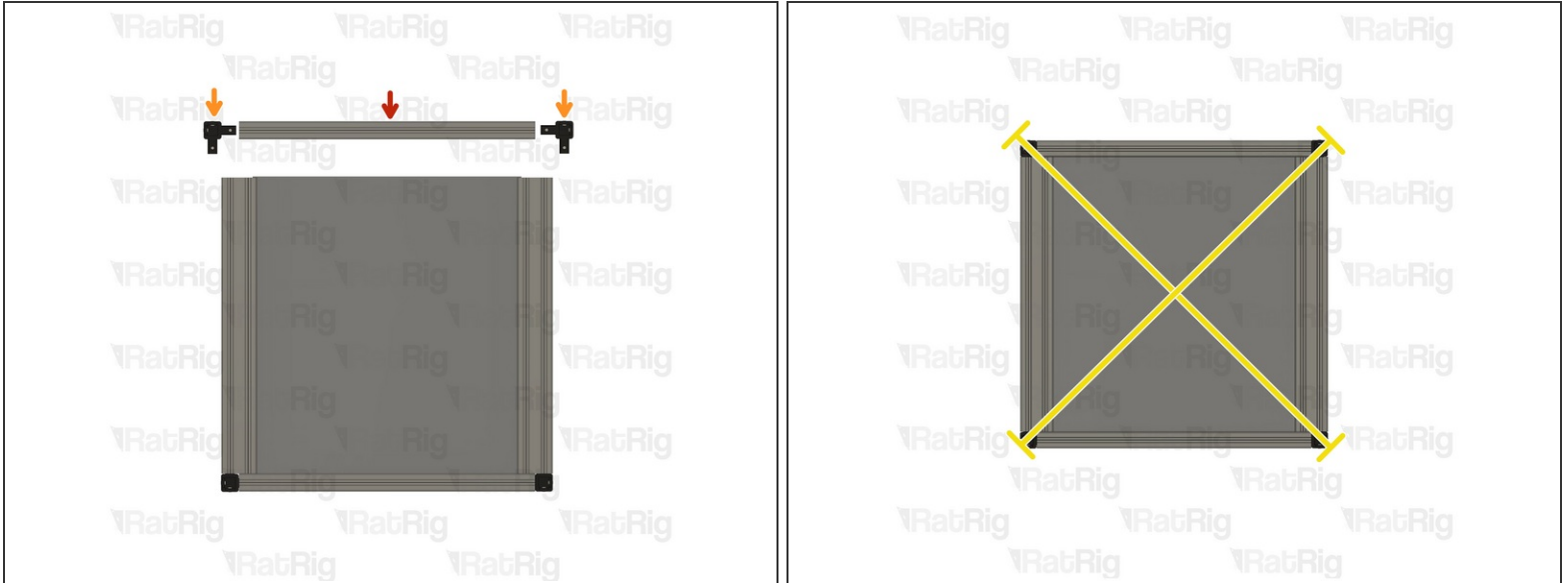
- Install one hidden three way corner assembly into the position shown. Tighten the M6x8 set screw to secure them.

⚠ Be careful while tightening the set screws, extreme force may break the three way hidden corner.

- 500mm 3060 Extrusion

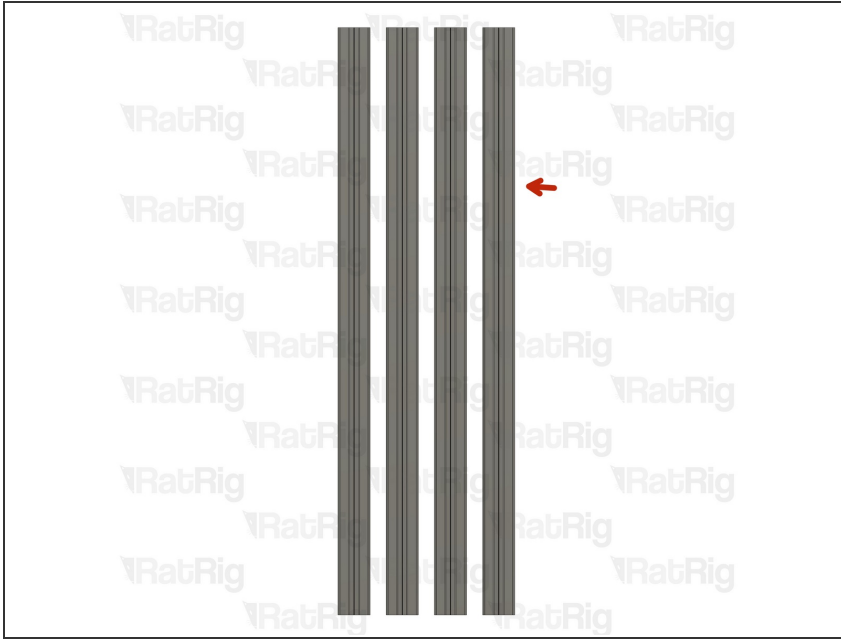
⚠ Ensure the extrusions are flush and square with the hidden three way corner assembly before and after tightening the screws.

- V-Hive Enclosure Bottom/Top Panel
- Slide the Panel into the 3060 extrusions slots.

Step 8 — Prepare the top and bottom of the frame - Part 4

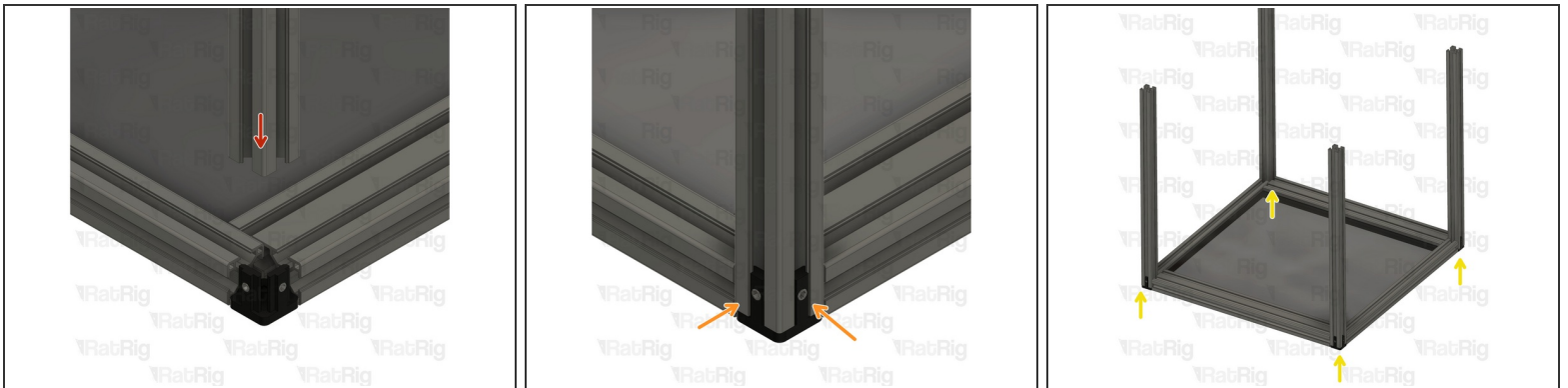
- 500mm 3030 Extrusion
- 2x Hidden Three Way Corner Assembly
- ① Insert the hidden three way corner assembly into the 3030 extrusion fist, then place them on the previous assembly.
- Measure both of the distances shown using a long ruler (preferred), or a tape measure. The measurements should be equal to each other.
- ⚠ If the measurements are not equal, double check all corners are square and then check again.
- ① Go back to step 1 and build another assembly for the top of the V-Hive Enclosure.
- ⚠ Be careful while tightening the set screws, extreme force may break the three way hidden corner.

Step 9 — Prepare the vertical extrusions



- 4x 548mm 3030 Extrusion

Step 10 — Assemble the vertical extrusions - Part 1



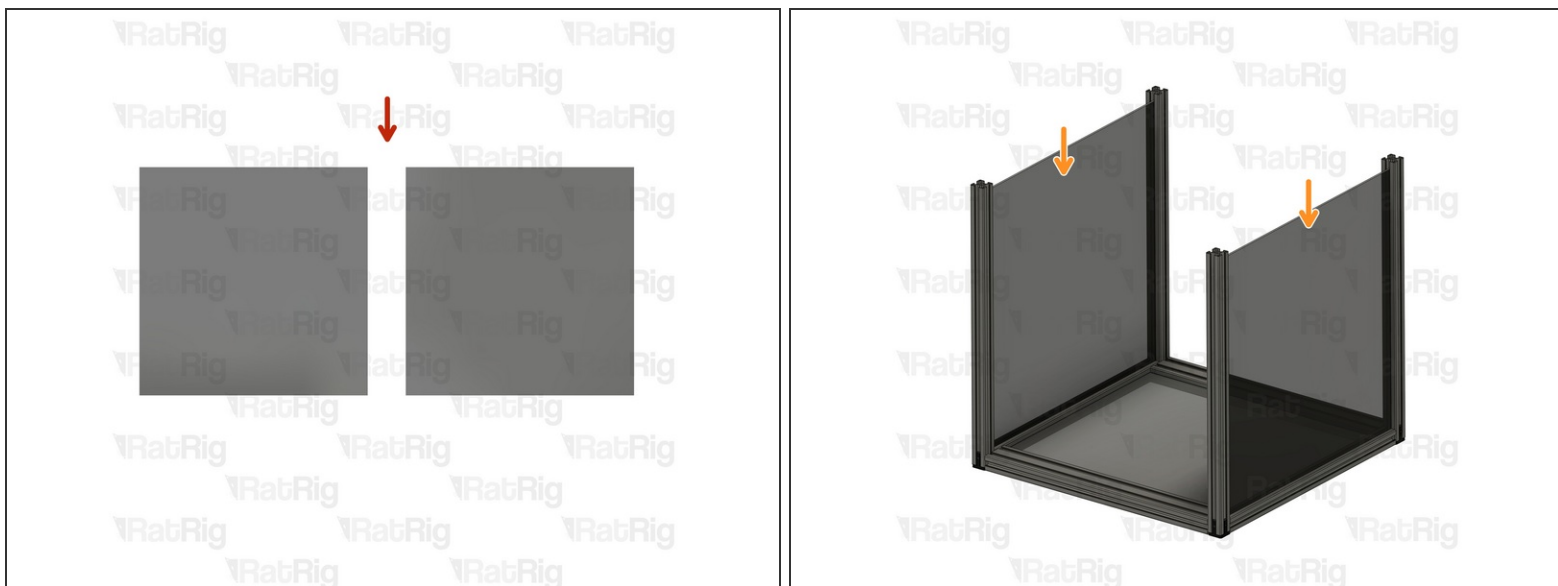
- Insert the 3030 extrusions onto the previously built assembly.

⚠ Ensure the extrusions are flush and square with the hidden three way corner assembly before and after tightening the screws.

- Tighten the M6X8 set screws.
- Repeat for the remaining 3030 vertical extrusions.

⚠ Be careful while tightening the set screws, extreme force may break the three way hidden corner.

Step 11 — Side Panels Insertion



- V-Hive side Panels
- Slide the panels into the vertical 3030 extrusions, along the 500mm 3030 extrusions.

Step 12 — Place the top frame square



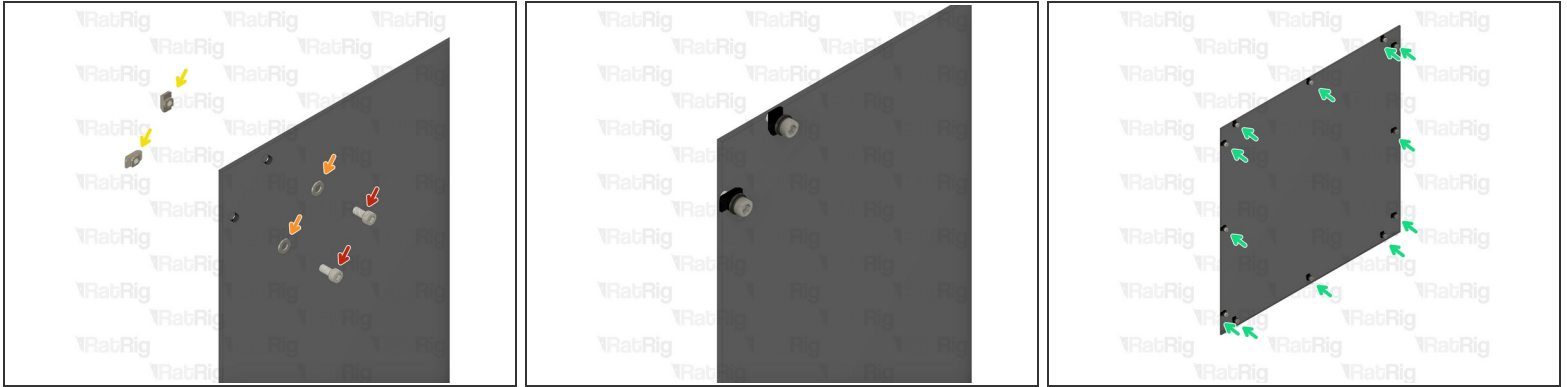
- Assembly with the vertical extrusions
- Frame square assembly.
- Tighten the M6x8 set screws.

⚠ Ensure the corner assemblies are flush and square with the ends of the extrusions after tightening the screws.

- Repeat for all 4 corners.

⚠ Be careful while tightening the set screws, extreme force may break the three way hidden corner.

Step 13 — Prepare the back panel



● 12x M6x12mm Cap Head Screw

● 12x M6 Washer

● 12x M6 T-nut Drop In 3030

❗ Loosely thread the 3030 T-Nuts onto the M6x12 screws. Do not tighten them at this point.

● Repeat for all M6 holes in the panel.

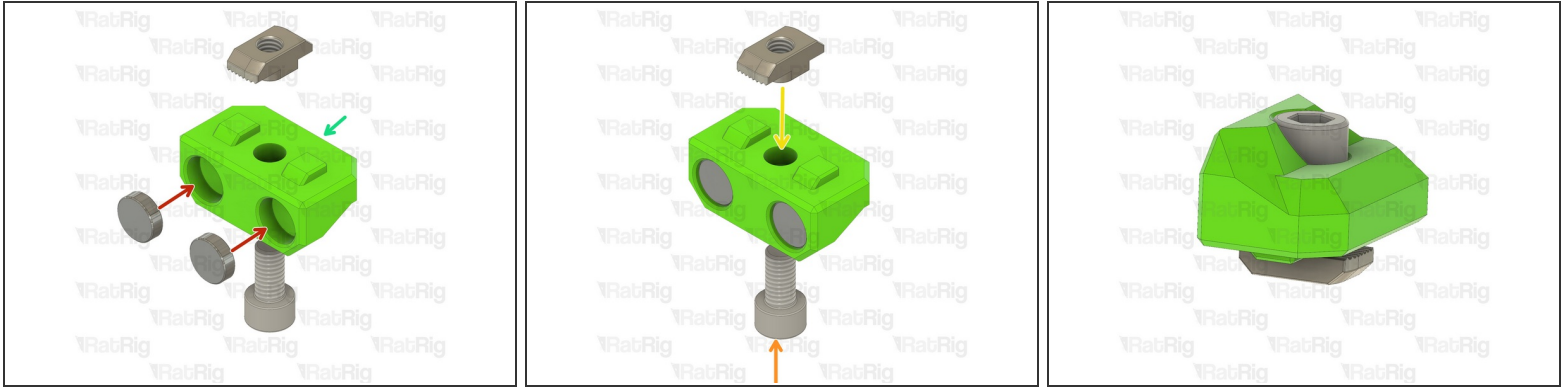
Step 14 — Assemble the back panel



- Tighten all M6x12 screws, to secure the back panel to the assembly.

⚠ Take care not to over tighten the M6x12 screws as you can damage the panel.

- 🔧 If you're mounting your electronics to the panel, it's advised to do so before assembling the panel to the frame.

Step 15 — Front panel magnets (x5)

- Neodymium Disc Magnet - 10x4mm

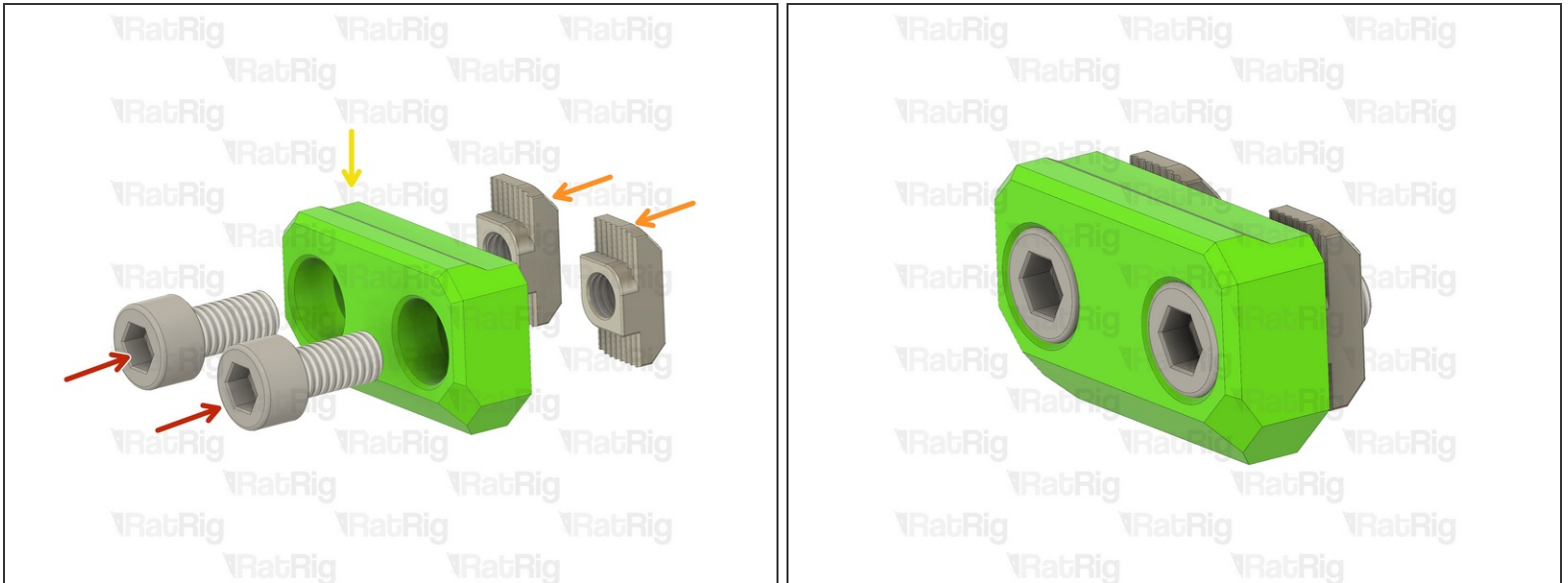
i The magnets are designed to be a tight fit into the printed part. If they are loose, or you wish to secure them further, place a few drops of cyanoacrylate glue into the printed part before adding the magnet.

- M6x12mm Cap Head Screw

- M6 T-nut 3030 Drop in

- V-Hive Enclosure Magnet Holder

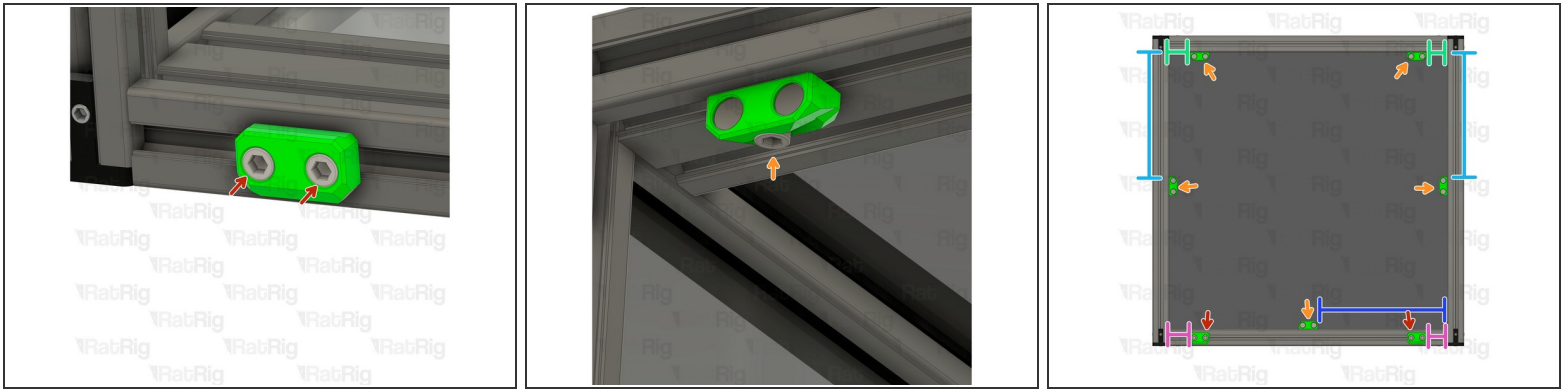
i Loosely thread the 3030 T-Nuts onto the M6x12 screws. Do not tighten them at this point.

Step 16 — Front panel holders (x2)

- M6x12mm Cap Head Screw
- M6 T-nut Drop In 3030
- V-Hive Enclosure Panel Holder

i Loosely thread the 3030 T-Nuts onto the M6x12 screws. Do not tighten them at this point.

Step 17 — Front panel mounts

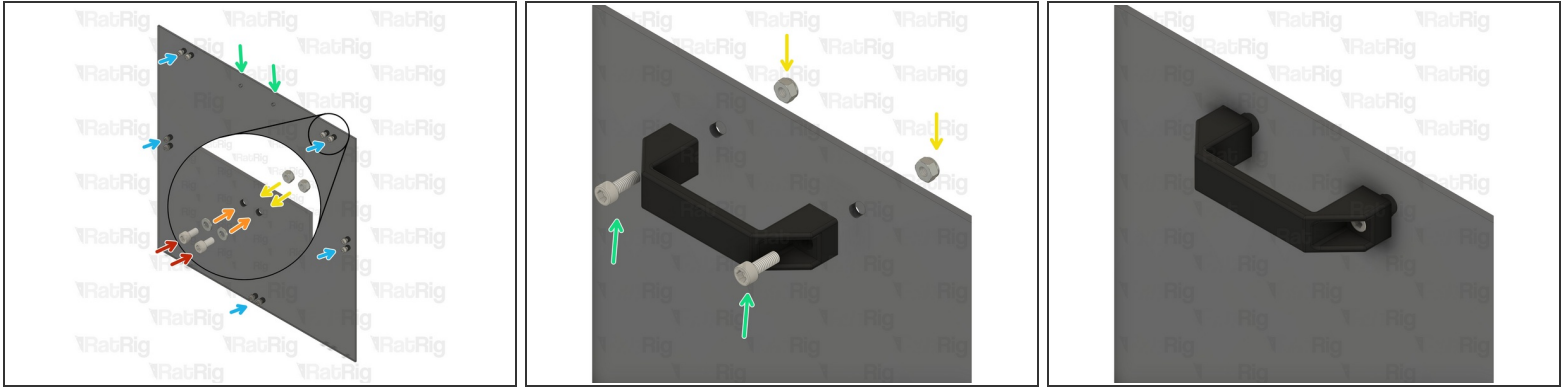


- Front panel holders
- Front panel magnets

i Make sure to place the parts accordingly to the distances bellow.

- 38 mm
- 224 mm
- 232.5 mm
- 39 mm

Step 18 — Front door assembly

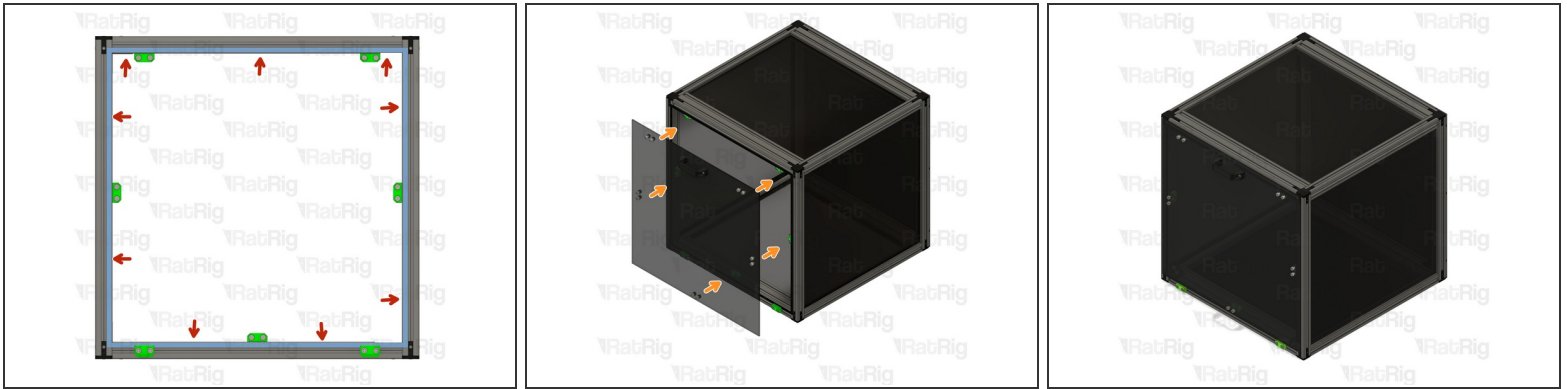


- 10x M6x12mm Cap Head Screw
- 10x M6 Washer
- 12x M6 Locking Nut
- 2x M6x18mm Cap Head Screw

⚠ Take care not to over-tighten the screws as you can damage the panel.

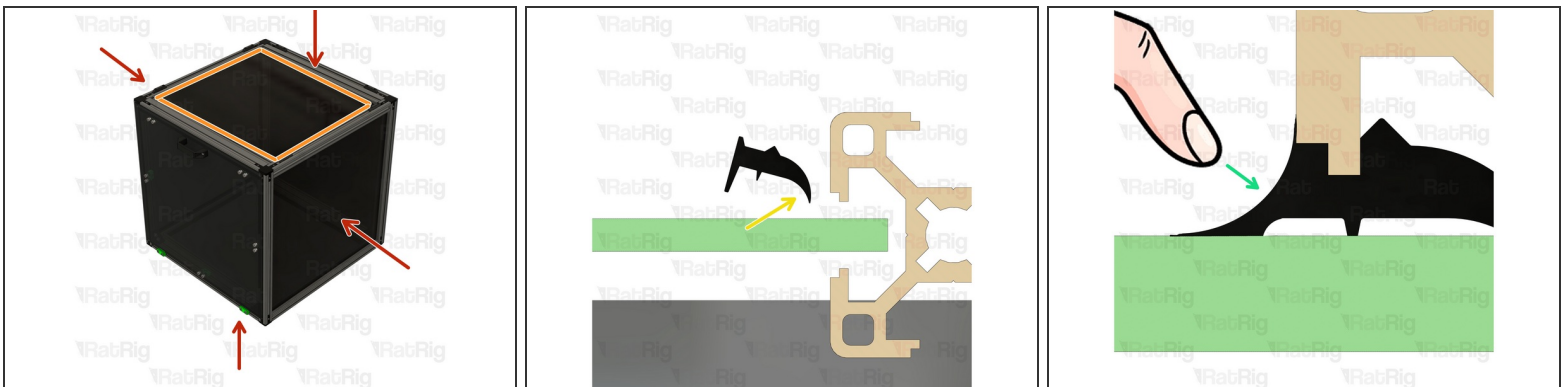
- Insert the screw-washer-nut assembly into each pair of holes.
- Assemble the M6x18 screws with the V-slot handle and the locking nuts.

Step 19 — Place the door on the frame



- Install the foam door seal around the inner front faces of the door extrusions (highlighted in blue in the first image).
- Make sure the nuts align with the magnets, if not, loosen the magnet mount screws installed on step 18 and align them.

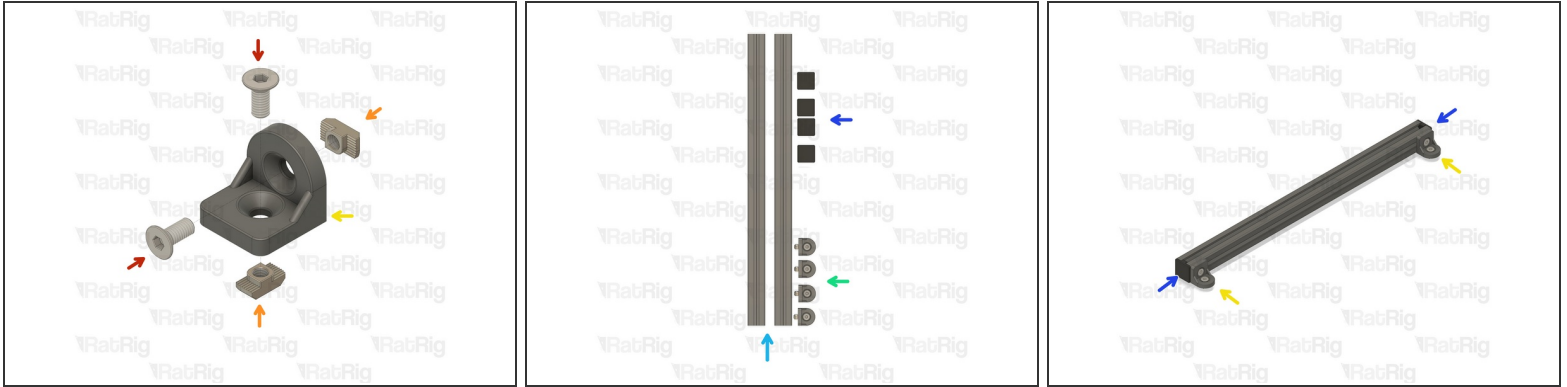
Step 20 — Insert the Rubber Seals



- Only the top, bottom and side panels need rubber seals.
 - Insert the rubber seals on the four sides, between the extrusion and the panel. They should fully cover the length of the extrusion slot.
 - Make sure all the seals are oriented with the pointy tip to the panel.
 - Push down with your finger until the rubber seal sits tight in the gap, ensuring a good isolation.
- ☒ The rubber seals can be inserted outside or inside the V-Hive structure, depending on personal preference.

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Step 21 — Assemble the mounting rails



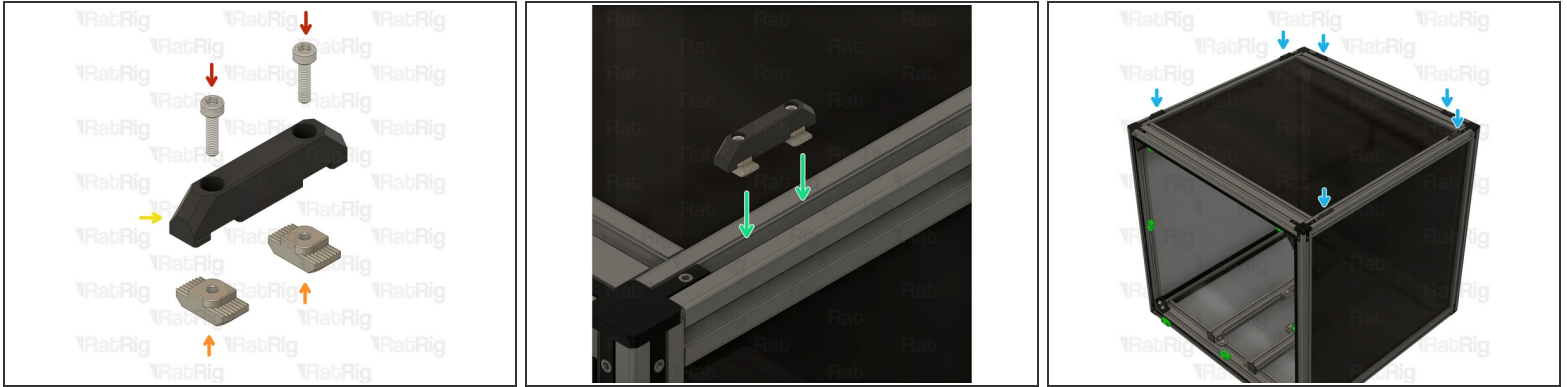
- 2x M6 x 14 mm Countersink Screw
 - 2x 3030 Drop In T-Nut M6
 - 90 Degree Corner Bracket.
 - Assemble four 90 degree corner brackets.
 - 2x T-Slot 3030 Extrusion
 - 4x 3030 End Cap
- ⓘ Repeat the steps and assemble another rail.

ⓘ Depending on your V-Hive Enclosure application refer to the appropriate sub-guide. All sub-guides can be found on the V-Hive homepage.

Step 22 — Stacking your V-Hive Enclosure - optional steps.

- ⓘ If you plan on stacking multiple modules on top of this one, please follow the next steps which will help reinforce the structure for extra stability

Step 23 — Assemble the V-Hive Stacking Tabs



- 2x M3x12 Cap Head Screw

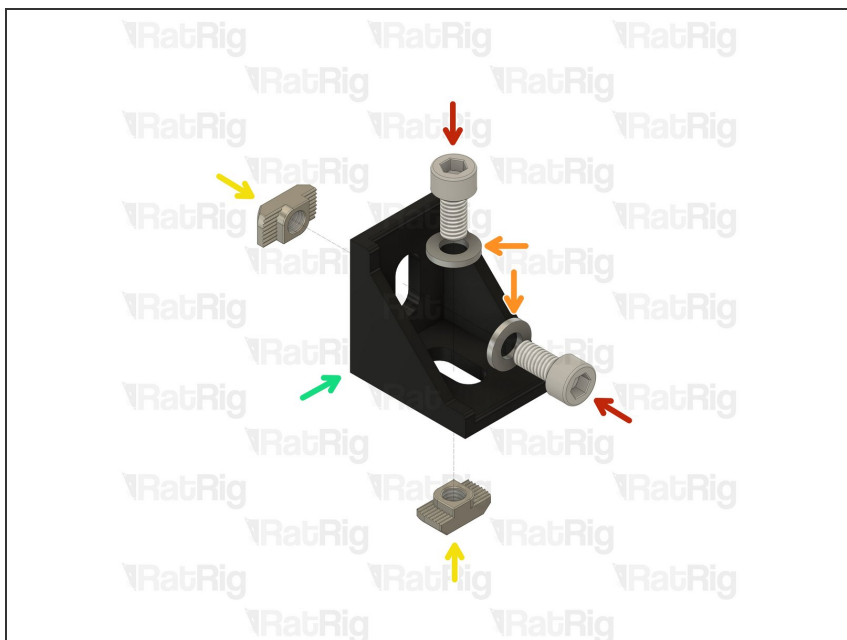
- 2x T-nut Drop in 3030 M3

- V-Hive stack locator printed part

i Assemble 6x V-Hive stacking tabs.

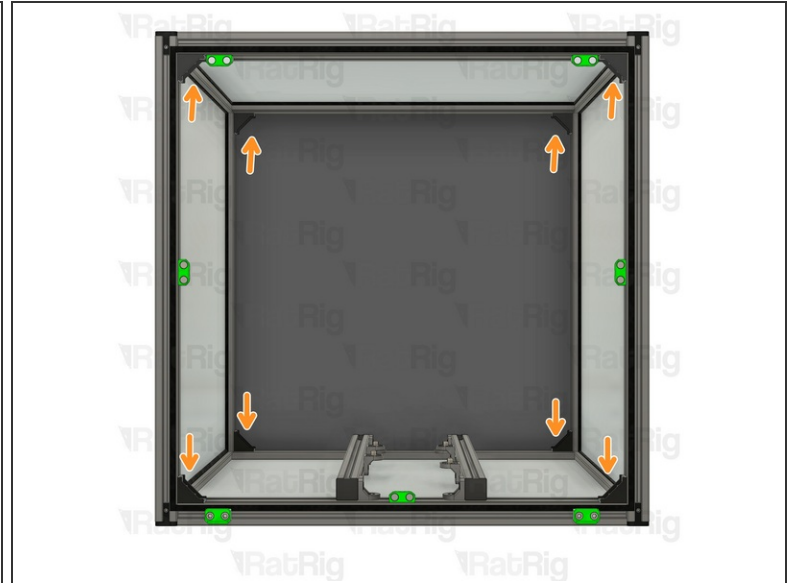
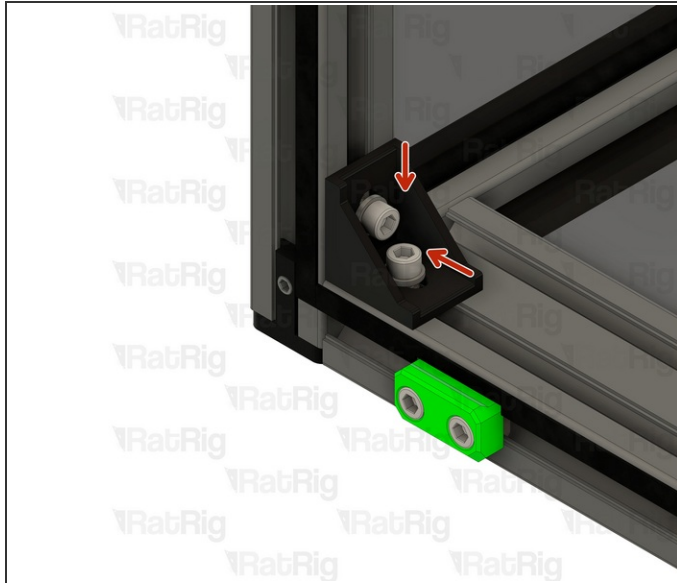
- Mount the stacking printed parts onto the top of the V-Hive enclosure by tightening the M6x12 screws.

- Repeat for the other five parts.

Step 24 — Assemble the 90 degree corners (x8)

- 2x M6x12 Cap Head Screw
 - 2x M6 Washer
 - 2x M6 T-nut Drop In 3030
 - Cast 90 Degree Corner Bracket for 3030
- ⓘ Loosely thread the 3030 T-Nuts onto the M6x12 screws. Do not tighten them at this point.

Step 25 — Frame Reinforcement



- i** By adding the 90 degree corners the frame will be sturdier, allowing you to stack another module on top.
- Install one 90 degree corner assembly into each end of both 500mm 3060 extrusion and the 548mm 3030 extrusion as shown. Tighten the M6x12 screw to secure them.
 - Repeat for all 8 corners.

Step 26 — Prepare the Rubber Feet



- 4x M5x14 Cap Head Screws
- 4x Rubber Foot with Metal Insert
- 4x 3030 M5 Drop-in T-Nut
- ☑ Only Install the Feet if you're not planing on stacking the Hive.

Step 27 — Instal the Rubber Feet



- M5x14mm Cap Head Screw
- Rubber Foot with Metal Insert
- 3030 M5 Drop-in T-Nut
- Mount the components in the order shown, keeping the feet close to the ends of the 3060 extrusion.