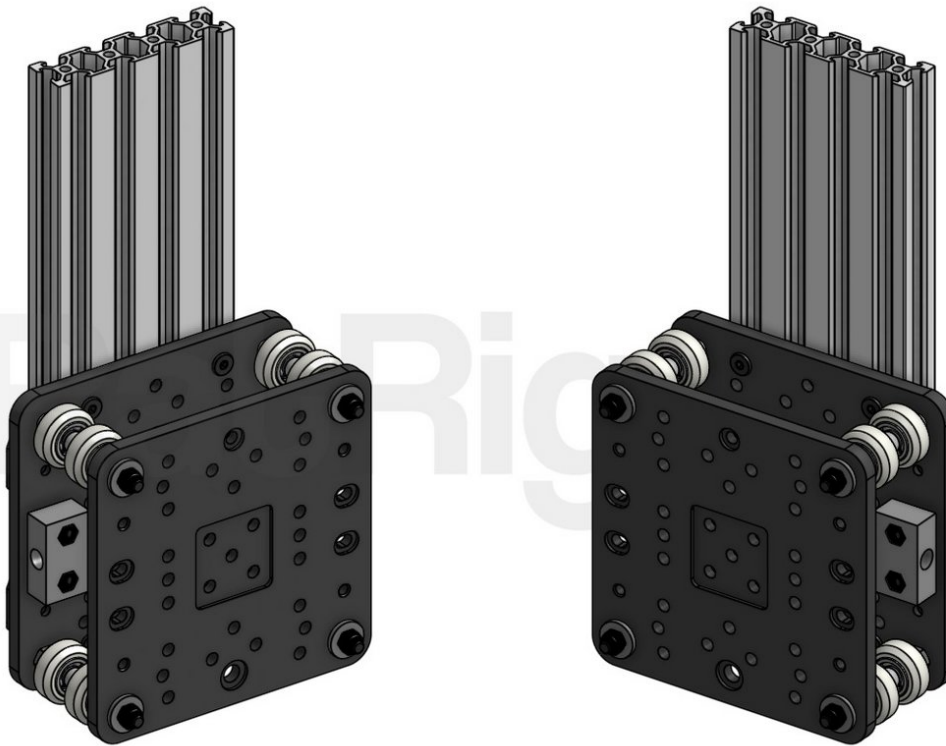


# Rat Rig

## 1.2. Y Carriages assembly

Written By: Rat Rig

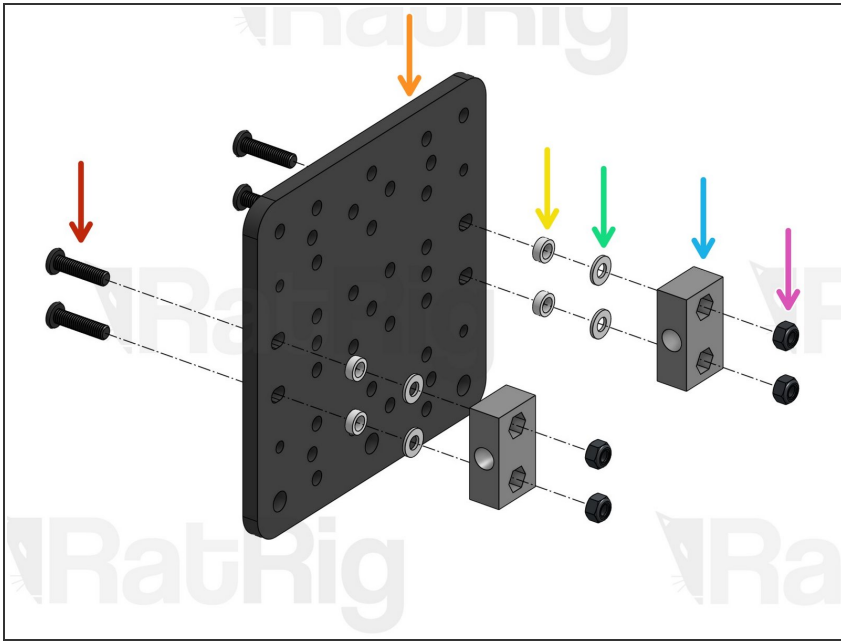


## INTRODUCTION

Since both Y Carriages are exactly the same, this guide includes steps to assemble only one of them. All steps should be repeated to assemble the second carriage.

**Tip:** you may prefer to assemble both carriages in parallel, at the same time (instead of starting over once you finish the first one).

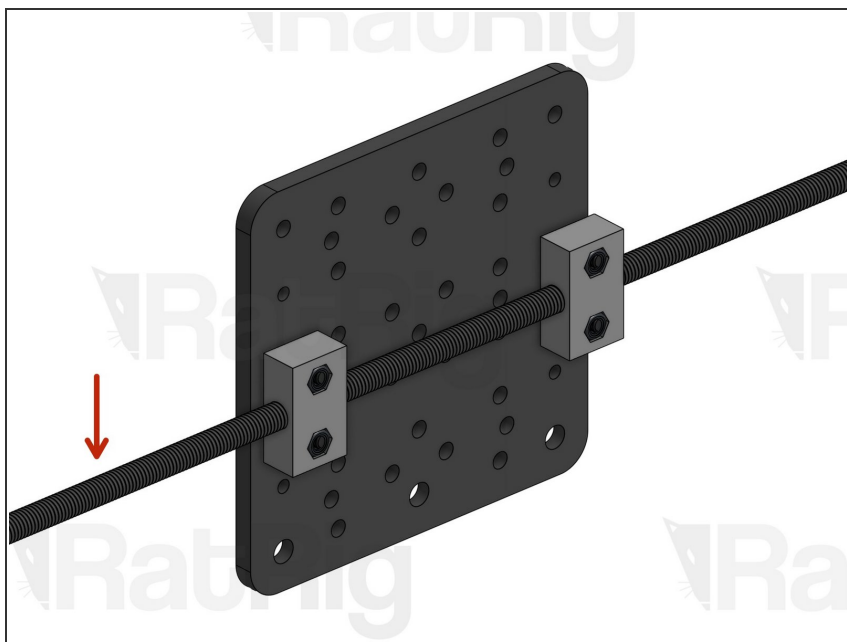
## Step 1 — Attach Nut Blocks to Gantry Plate



**i** Tighten down the Nut Block on the left, but leave the one on the right slightly loose. You will need some play in a moment.

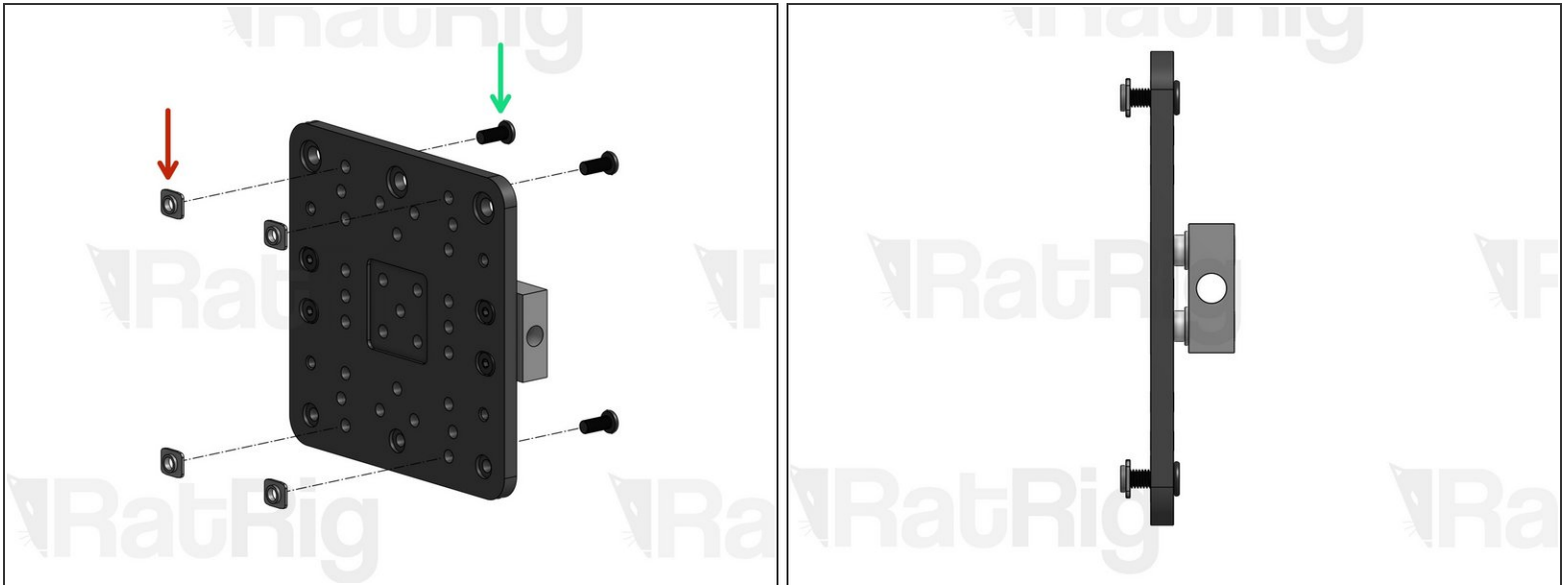
- Low Profile Screw M5x20mm
- C-Beam Gantry Plate XL
- Spacer 3mm
- Precision Shim 10x5x1mm
- Nut Block
- Hex Locking Nut M5

## Step 2 — Calibrate position of Nut Blocks to remove Backlash



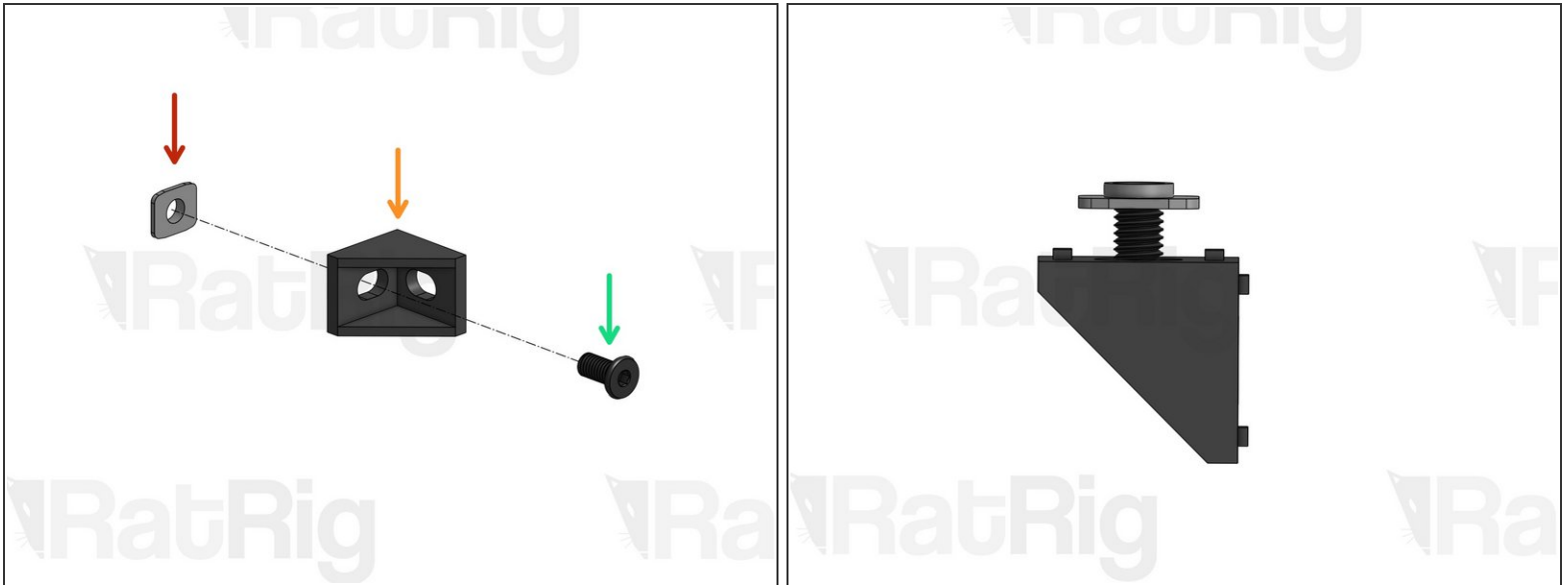
- Lead Screw
- Fasten a lead screw (at this point it doesn't matter which one) through both nut blocks.
- Tighten down the loose Nut Block on the right, while applying lateral pressure on it at the same time (towards the other Nut Block). Once both blocks are tightened, your lead screw should have zero backlash.
- To check if there's backlash, grab the plate with one hand and the lead screw with the other. Without turning the lead screw, try to move it back and forth. There should be no wiggle room for the lead screw to move at all. If there is, loosen one of the nut blocks and try adjusting its position again.
- Once all backlash is removed, unfasten your lead screw, you will add it to the build later on.


### Step 3 — Set up 2080 profile mounting points (1)






- T-Nut M5.
- Low Profile Screw M5x10mm

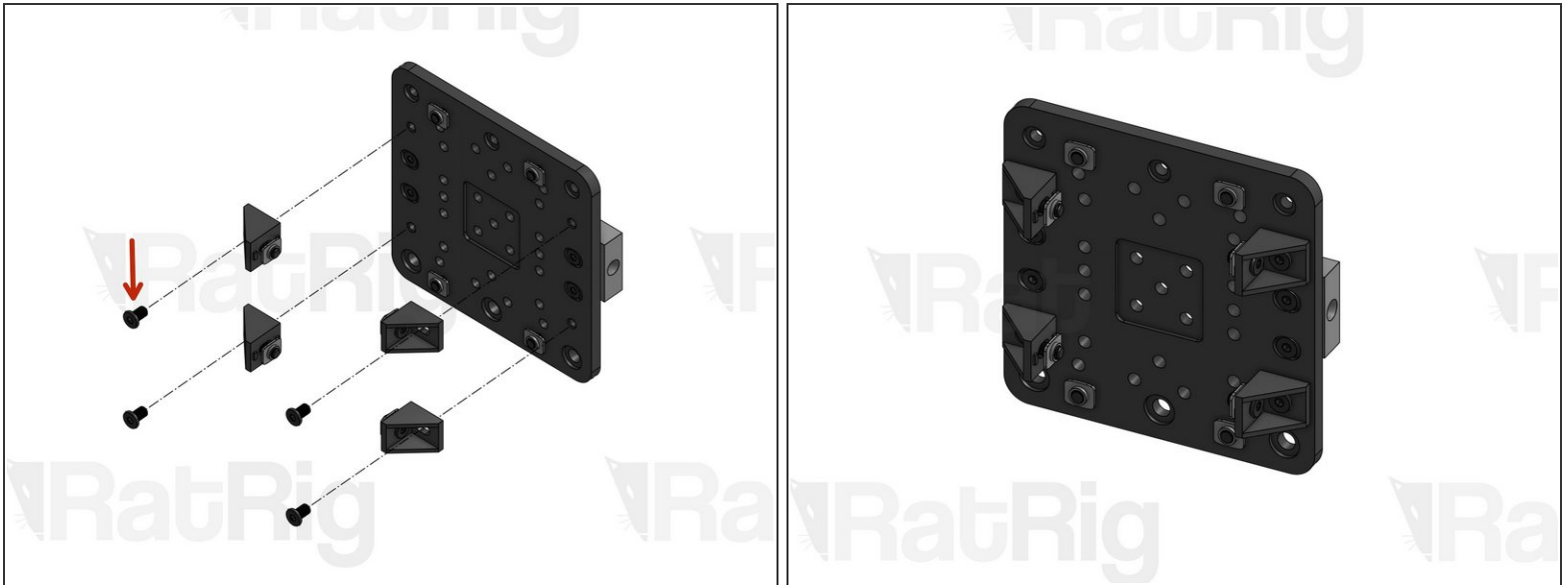
⚠ Set T-Nuts in position, but don't tighten them.

**Step 4 — Set up 2080 profile mounting points (2)**

 Repeat this step with 4 Cast Corner Conectors

-  T-Nut M5
-  Cast Corner Conector
-  Low Profile Screw M5x10mm

 Set T-Nut in position, but don't tighten it.

**Step 5 — Set up 2080 profile mounting points (3)**

- Low Profile Screw M5x8mm. Use them to attach the Cast Corners you set up on the previous step to the carriage.

## Step 6 — Mount 2080 profile



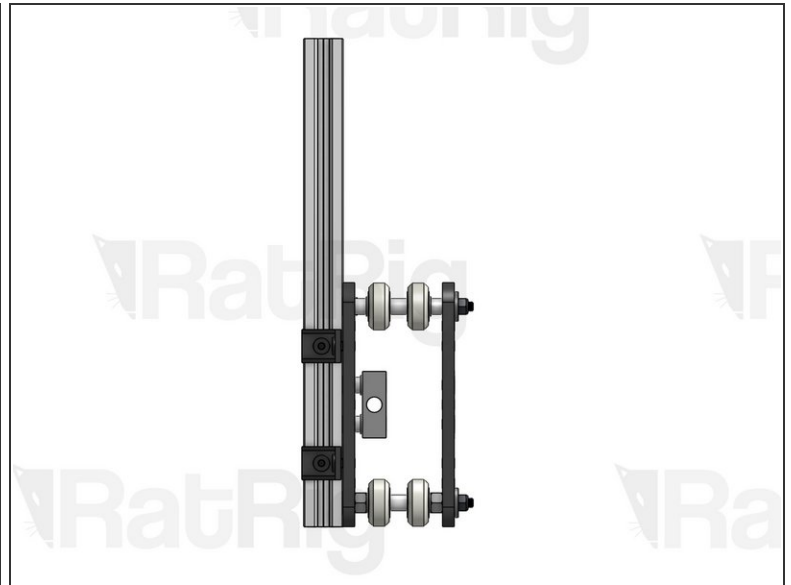
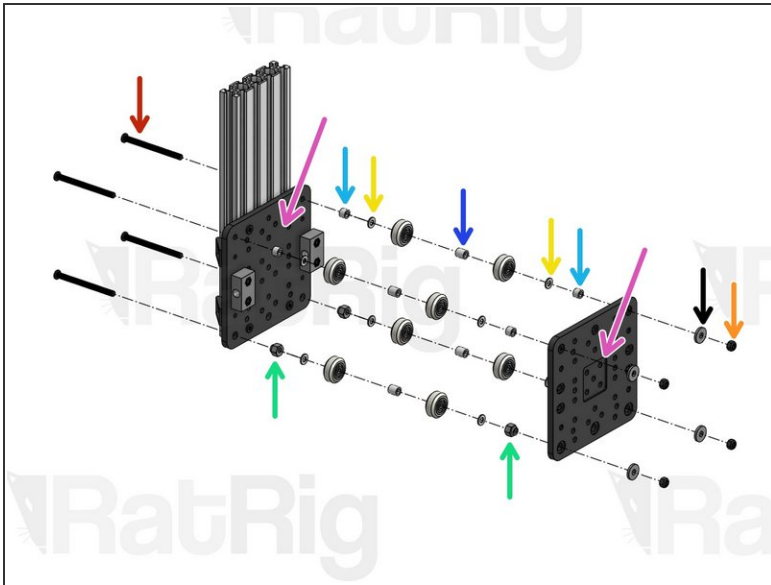
- X-Gantry 2080 Profile. Align it flush with the bottom of the plate.
- Tighten down these screws (check second image too).

**⚠ CAUTION: The Plate is not symmetrical!**

- Smaller hole
- Larger hole

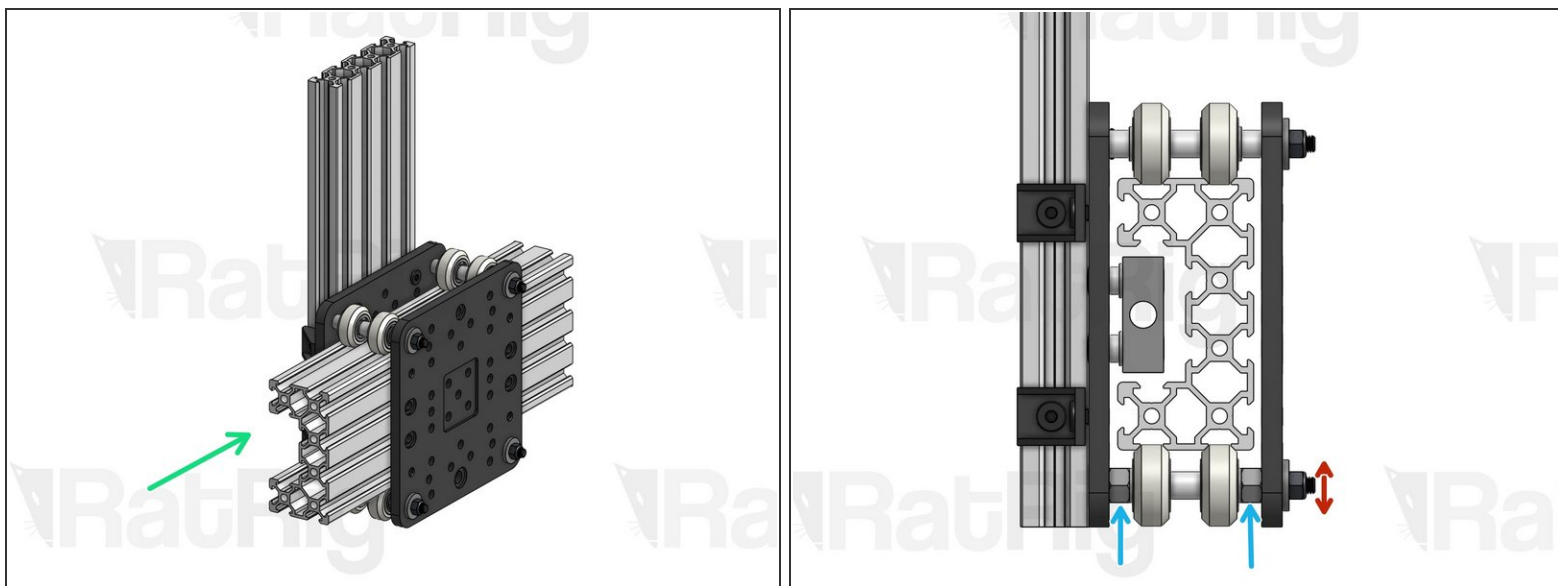


## Step 7 — Assemble Y Carriage



- Low Profile Screw M5x65mm
- Aluminium Spacer 6mm
- Eccentric Spacer
- Precision Shim 10x5x1mm
- Aluminium Spacer 9mm
- C-Beam Gantry Plate XL. Note the orientation of the plates!
- Slot Washer 15x5x2mm
- Hex Locking Nut M5

## Step 8 — Tune the wheels



- Insert a C-Beam profile (doesn't matter which one at this point) through your assembly.
- Eccentric Spacers have an off-center through-hole. Because of this, when you rotate them, your entire wheel axis moves laterally. This gives you the adjustment margin you will need to make sure your wheels are grabbing the profile with the correct amount of force.
- Use a spanner to subtly adjust the position of each eccentric spacer until every wheel is in contact with the profile. You want to find a sweet spot where your carriage is not wobbly and the motion is perfectly smooth, but where there isn't excessive force pressing the wheels against the rail, as this will increase wear on the wheels.