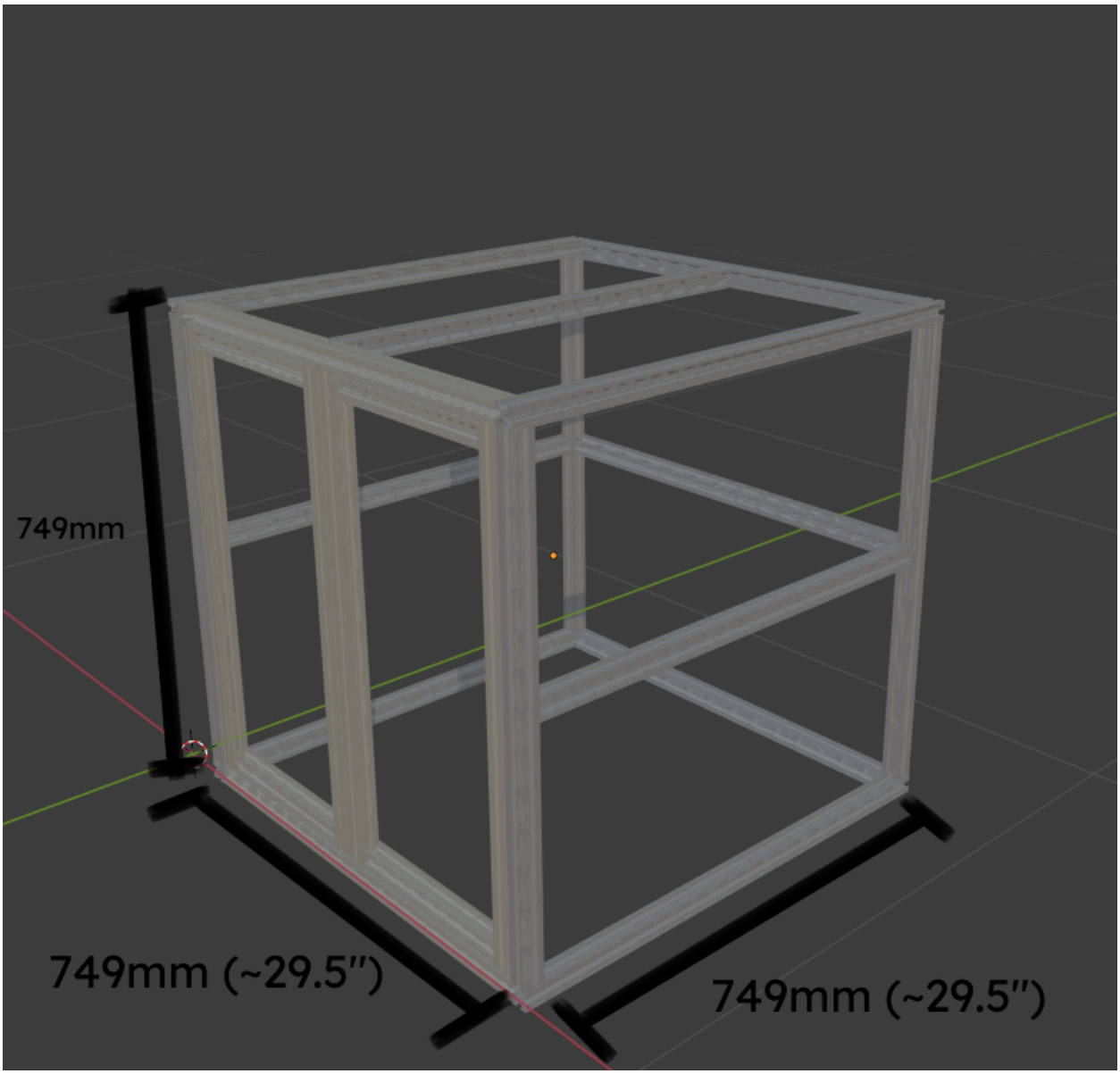
How to make a Faraday cage

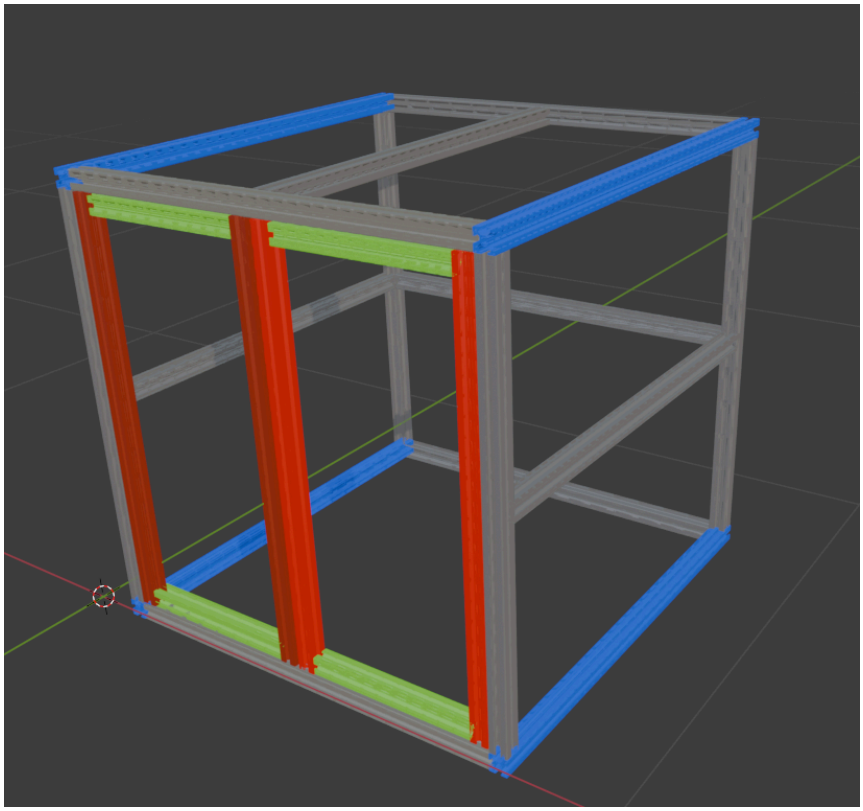
Steve Hess, 2025

1. Identify the size of the cage you want to make. It should be large enough to contain anything you need for your experiments or needs. For these instructions, we will be using the following dimensions.



2. Prepare a cut list for the aluminum. I found it useful to use visuals and drawings along with a table. Make sure to number and mark off cut lines on the aluminum. Sharpie is good for this.
   Note the lengths with a star– it is advised to wait before marking or cutting these lengths until the frame is completed in case joints do not line up perfectly, or if you accidentally cut the door height too short. What I did was I built the frame, then incrementally cut down the length until the door pieces fit in without grinding against the frame when attached to the hinges. I also did the same for the sideways pieces of the doors, testing after a cut to see if it fit and if the doors could open and close smoothly without too large a gap in any direction. This will be covered in a later step, but I wanted to make the cut list contain everything.*

AMOUNT	LENGTH (mm)	COLOR
4x	749	
12x	689	
4x	~680*	
4x	~280*	

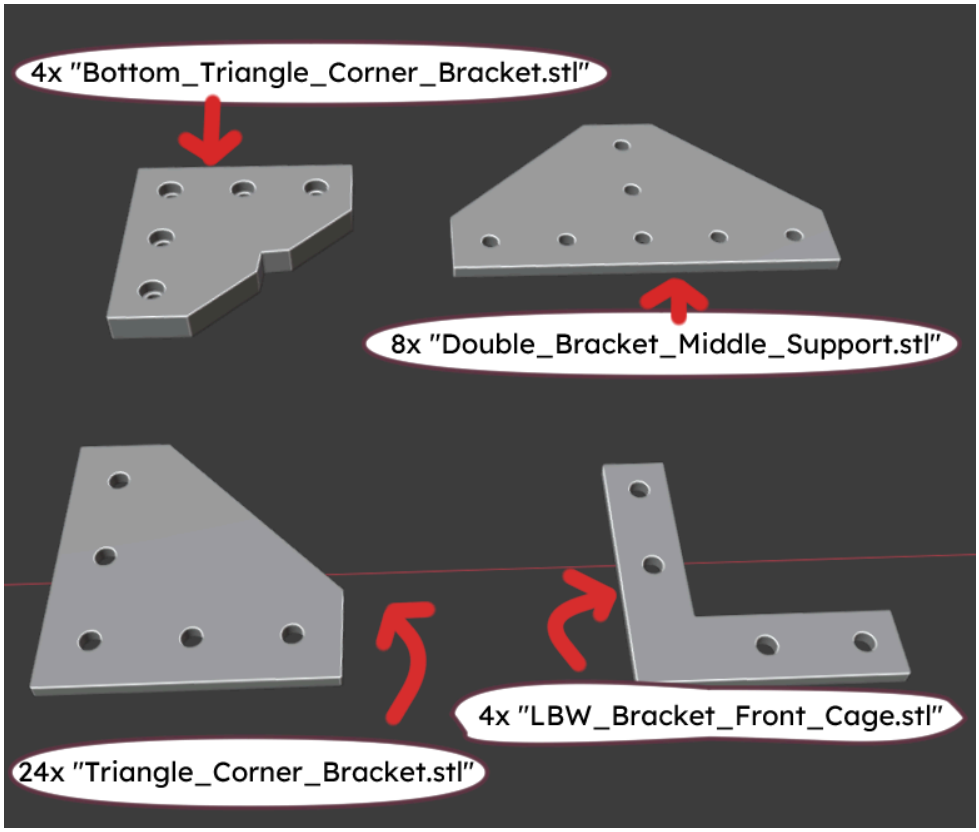


3. Cut the aluminum pieces of the frame to their marked length using a bandsaw with a blade that can cut aluminum. Use proper safety precautions, and ensure you are well versed in how to use the machine properly. **This is not a training guide for bandsaw or power tool operation. Discretion is advised.** Remember to be patient, as cutting aluminum is not a quick or pleasant experience in many regards. Overheating parts, screeching sounds, slow cutting speed, uneven results are not out of the question. Don't worry if your cuts are a couple of degrees off. This design is meant to work even in that event. (But it helps to be closer, of course.)

   If you're someone with big standards, just even it out on an endmill. (Or a CNC, for you CAM enthusiasts. I'm old fashioned, alright?)

4. Now comes the fun part. Using a 3d printer of your choosing, print out the following amounts of each bracket available on the Github.

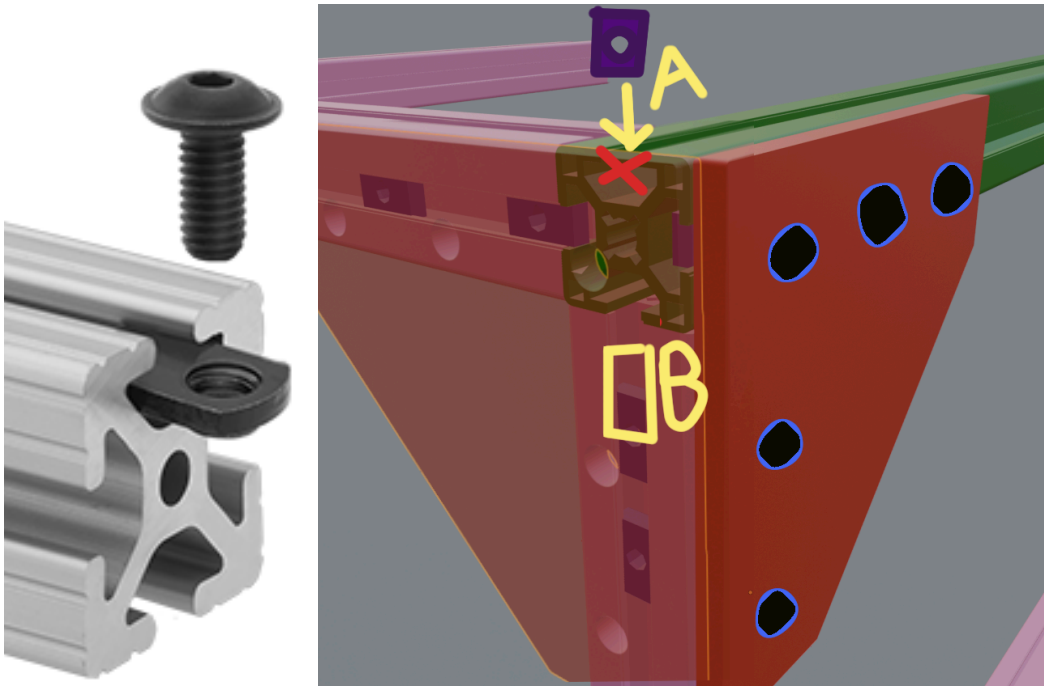
   4x of "LBW_Bracket_Front_Cage.stl"
   24x of "Triangle_Corner_Bracket.stl"
   8x of "Double_Bracket_Middle_Support.stl"
   4x of "Bottom_Triangle_Corner_Bracket.stl"



The important thing is to not print 24 of the wrong parts!
Once you've 3D printed all the required parts, you can begin assembling the frame.

IMPORTANT! If you're using end-insert T-slot nuts (these nuts are the kind that must slide in from the end of the rail, shown below), please read the section below carefully. If you purchased the recommended drop-in style nuts from the shopping list (or equivalent ones that can be inserted anywhere along the rail), you can skip to step 5, where you can begin assembling the frame.

Some T-slot nuts can only be inserted from the ends of a rail. If you're using these, you'll need to plan ahead. Before assembling any part of the frame that will block access to a rail's ends, make sure you've already slid in all the nuts needed for that section and any adjacent pieces. Otherwise, you may find yourself unable to add the nuts later, which will force you to disassemble parts of the frame just to insert them.



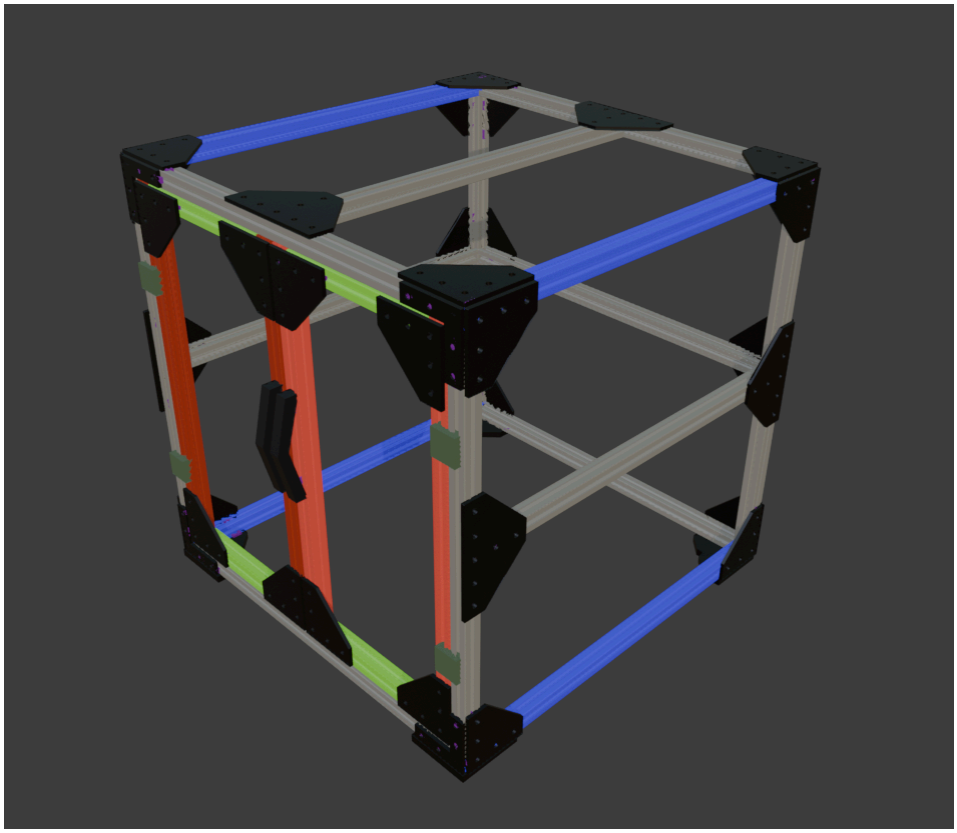
Left: An example of a nut that can only go into rails by being slid into the ends of a rail.
Right: An… "interesting" rendition attempting to show how poor foresight when the right bracket is screwed in could become an issue later. Notice how the green bar blocks the assembly by preventing the nut at A from sliding into the rail at B.

*There **is** a solution that does not involve disassembly if you make this mistake, but it is dangerous and I would never condone danger. …All I'm saying is that if you happened to somehow widen the track in the middle, you could probably manage to fit the nut in when it's already assembled. Not that I would know. Me? The guy making the instructions? Making mistakes? Impossible.*

…

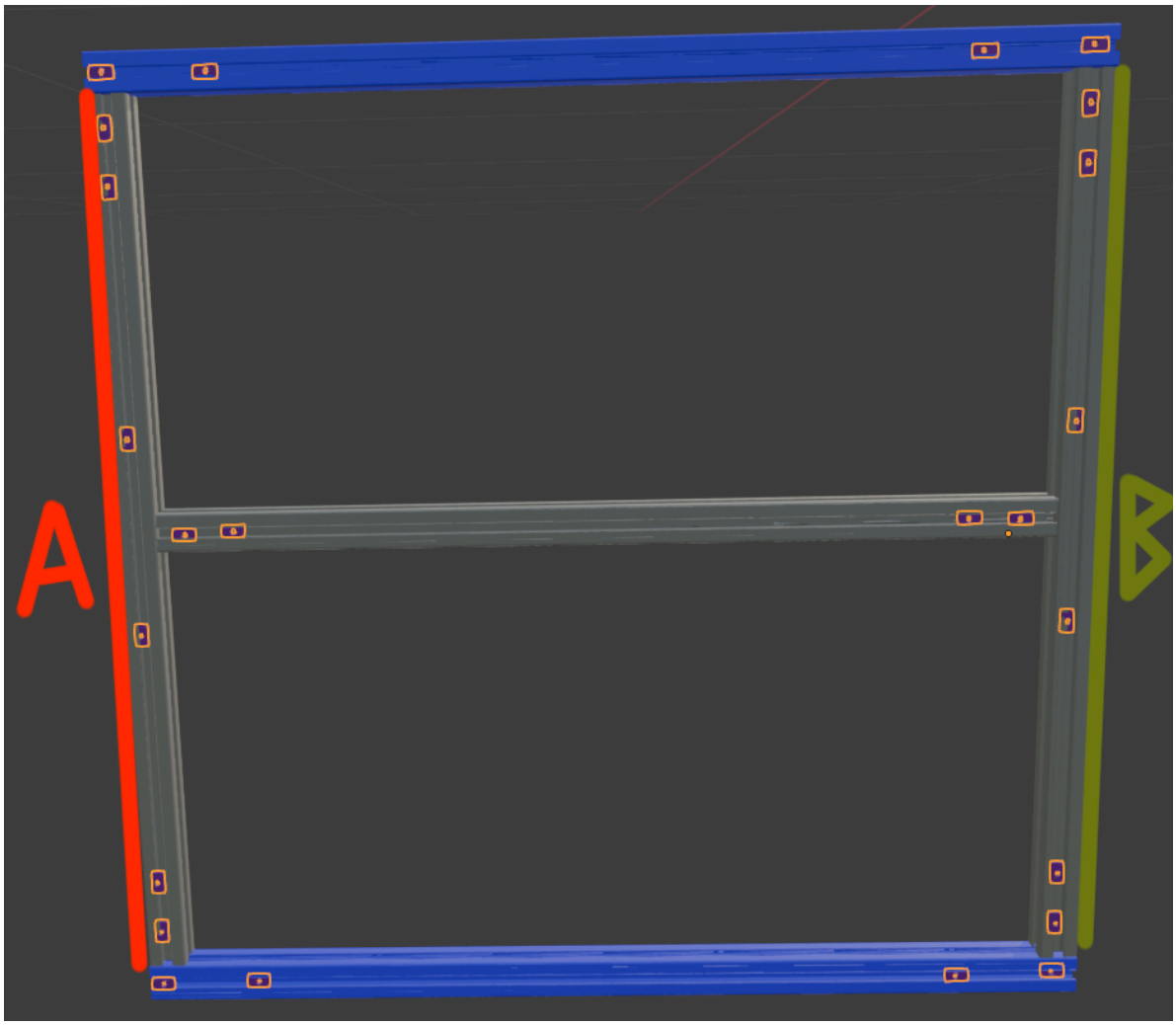
…Or you could just plan ahead. The diagrams below will show you where you'll want to put the nuts for each side. If you use the shopping list hinges, they come with enough of the nuts that insert anywhere to cover all four screws per hinge. The same cannot be said of the handle.

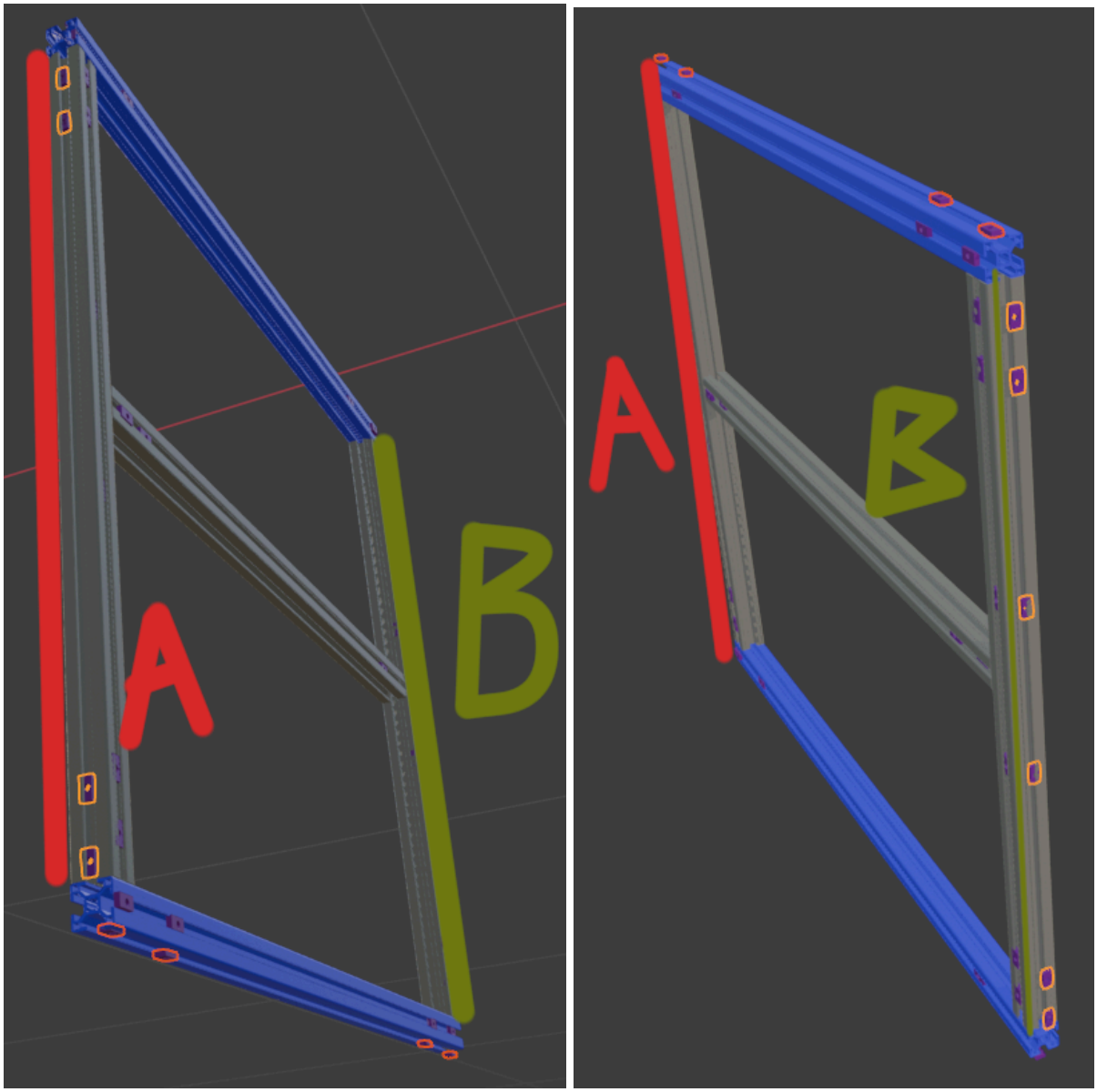
5. It's time to begin assembling the frame! I'm sure there are many ways to go about this, but I will show how I did it and advise from there.



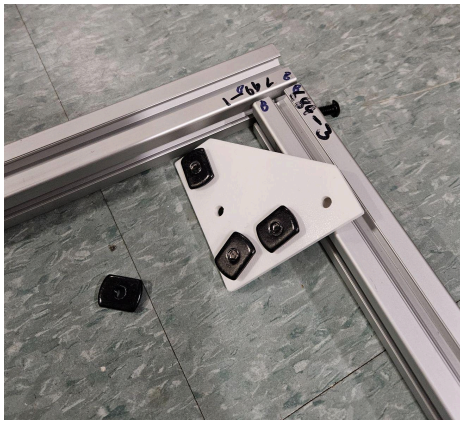
The CAD model of the completed frame with doors.

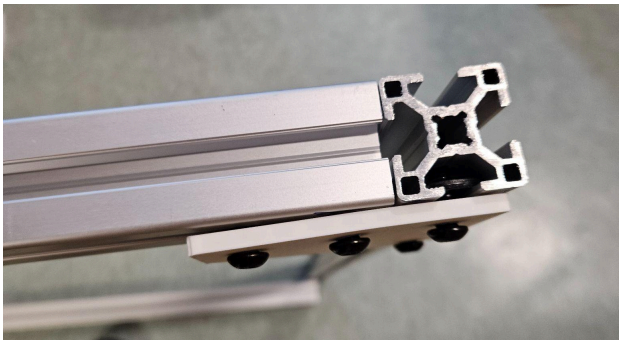
First, let's tackle the right panel. Remember, the blue pieces are the longer ones, and we only have four of them. The gray pieces are all 689mm. The orange highlighted areas represent where a nut needs to be inserted. A and B are just for reference between diagrams.

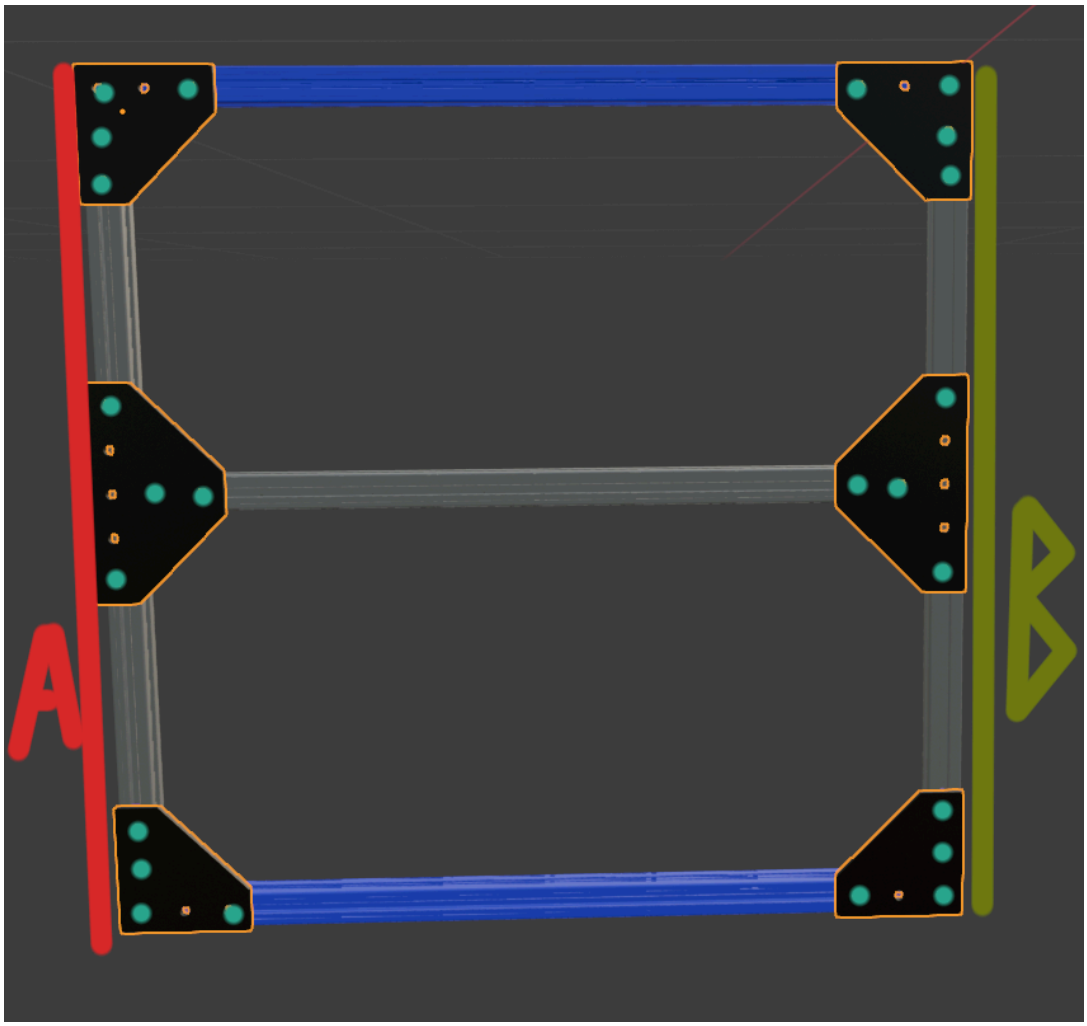

A
B



Once all of the nuts have been inserted, the next course of action is to put the brackets and screws into their places.

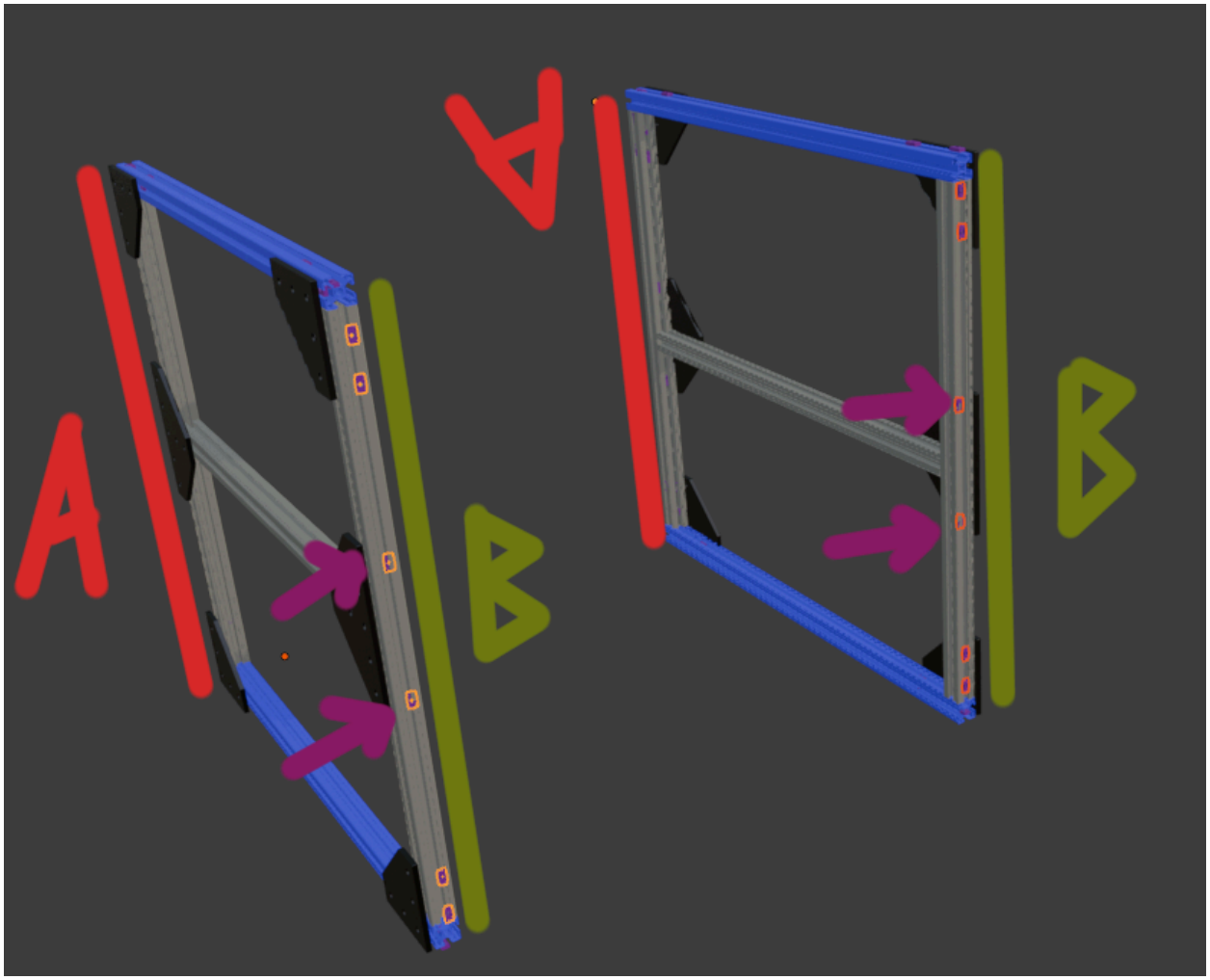






The light blue dots indicate which holes should receive screws.

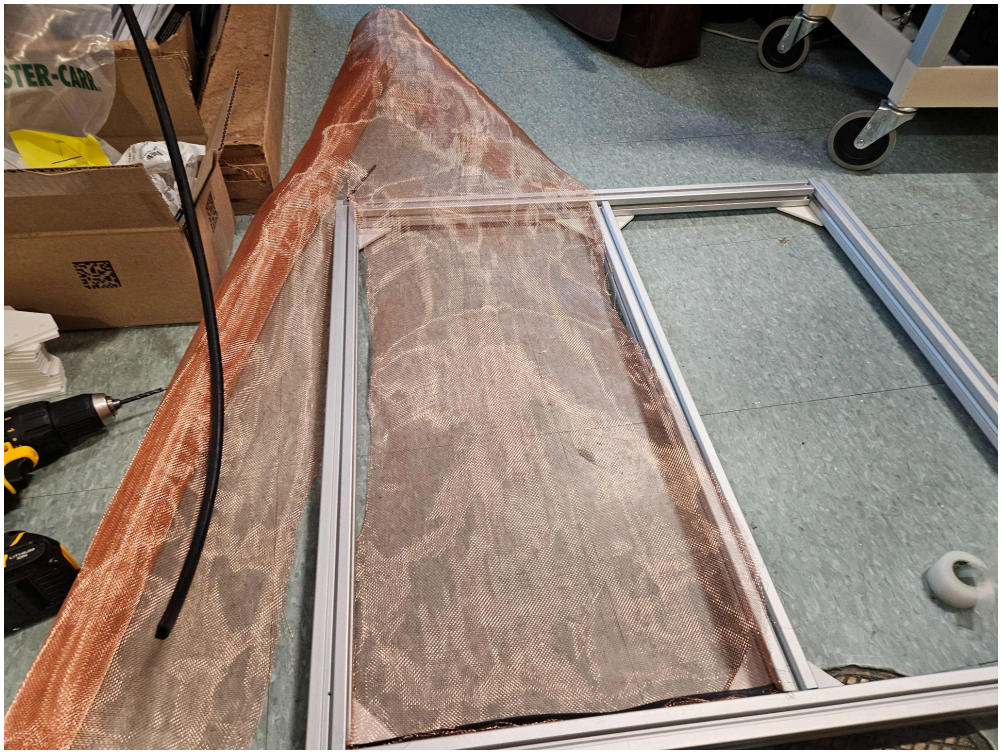
Fantastic! We have one panel. The left panel can be constructed in exactly the same way as the right panel, down to the locations of the nuts.



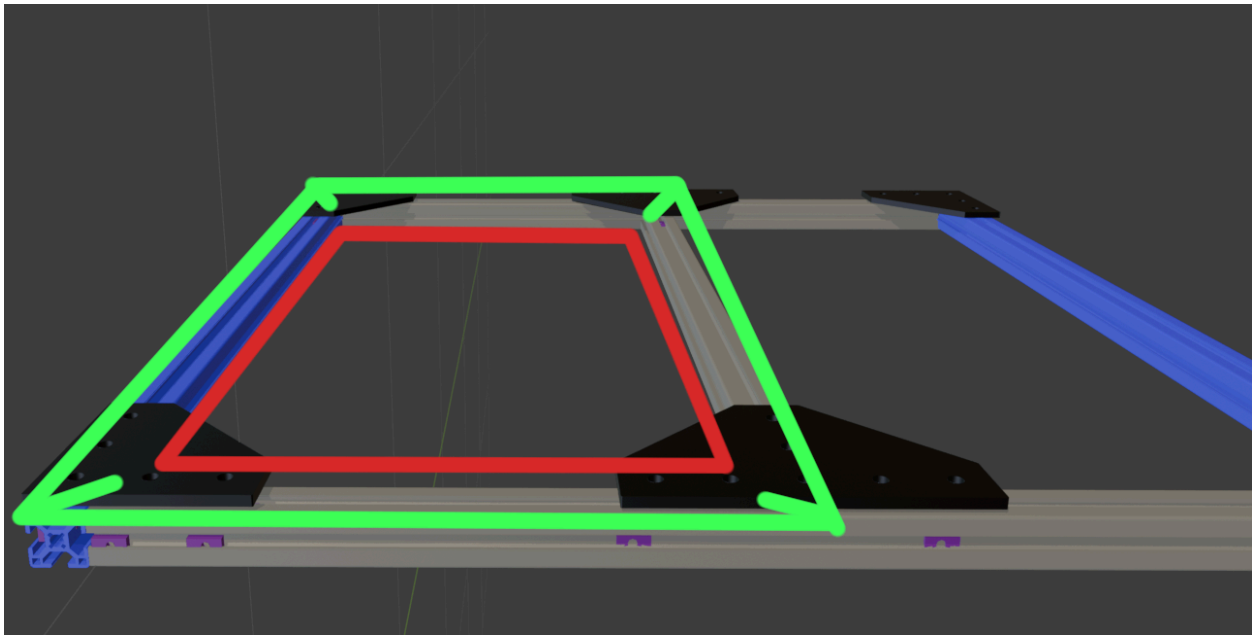
The right and left side are identical if flipped. Just be sure that "B" is the side with the two nuts in the middle, whereas "A" should not have any at this point in the construction. "These nuts of distinction", as I call them, are what the purple arrows point to.

Before you continue assembling the frame, you should put the mesh inside of these two panels while they are still separate and easy to maneuver.
But how?

6. Prepare the mesh for two panels. The easiest way to do this is to simply overlay the (mesh still on the roll) over one half of the panel, seen below.



One thing this photo misses is the importance of making the mesh you cut out larger than the hole it will span. This is because we will roll the edges around the rubber seal, which will be wedged into the inside of the rail. Below is a representation of how you should and should not cut the mesh. Notice how green, the correct way, has small shallow cuts at the diagonals, and also how it borders the outside of the rails rather than the way the red pattern is.



You can cut the mesh with either a utility knife or shears. I recommend using shears, as the knife option is both more dangerous and makes a worse edge.

Cut four segments of rubber sealing that are as long as the inside edges of the rail where the mesh will go.

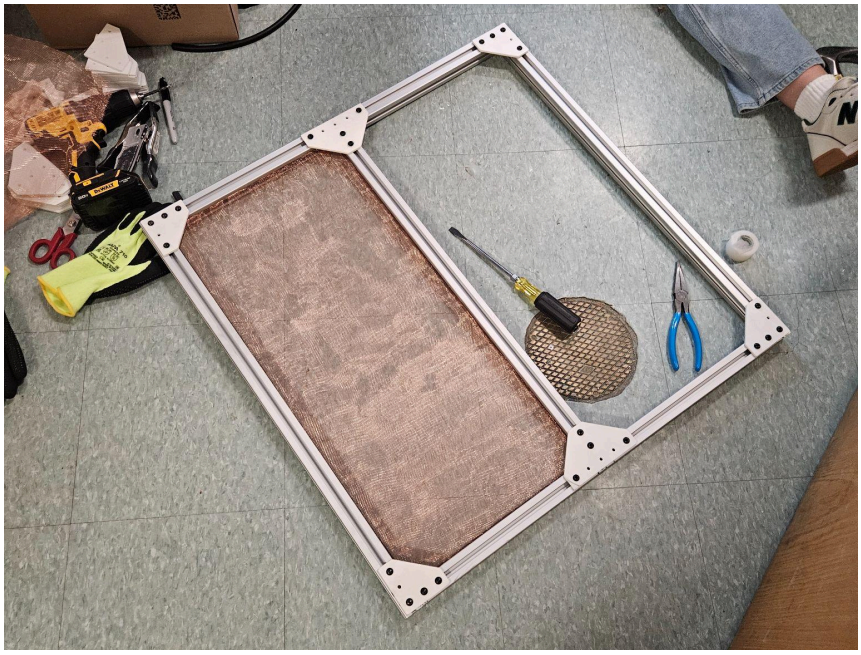
Choose one side and roll a small amount of your cut mesh around one such rubber piece. You should not roll several times, as it needs to make it to the other end and wrap around the other rubber piece as well. (This is why it helps to have three mesh orders instead of two, as it makes giving wiggle room a lot easier in terms of the sizes you cut the mesh from.)

This is one of the hardest parts of the construction as a whole, so be ready for frustration.

Next, using a large and wide flathead screwdriver, CAREFULLY squeeze and push the rubber tubing with the mesh around it into the inside rail. Getting it nice and even is important.

It is difficult to say if anything makes this process easier. Yes, the edges are sharp and will probably poke you many times. I tried gloves, they went through them. It's up to you whether to use them or not. If your fingers are black from the rubber and hurt like hell when you finish, strap in, because there's a lot more of that coming soon. It's the only way I could figure out how to do this part. (Or, if you're smart, come up with a less painful way. I am sure there is a better way.)

Do this for all four sides and you have half of one panel with netting.



“This took me forever! Do I seriously have to do this again?”

“Why can’t I get it tight? Why won’t it stay in place? Do I have to take the other side out and do it again?”

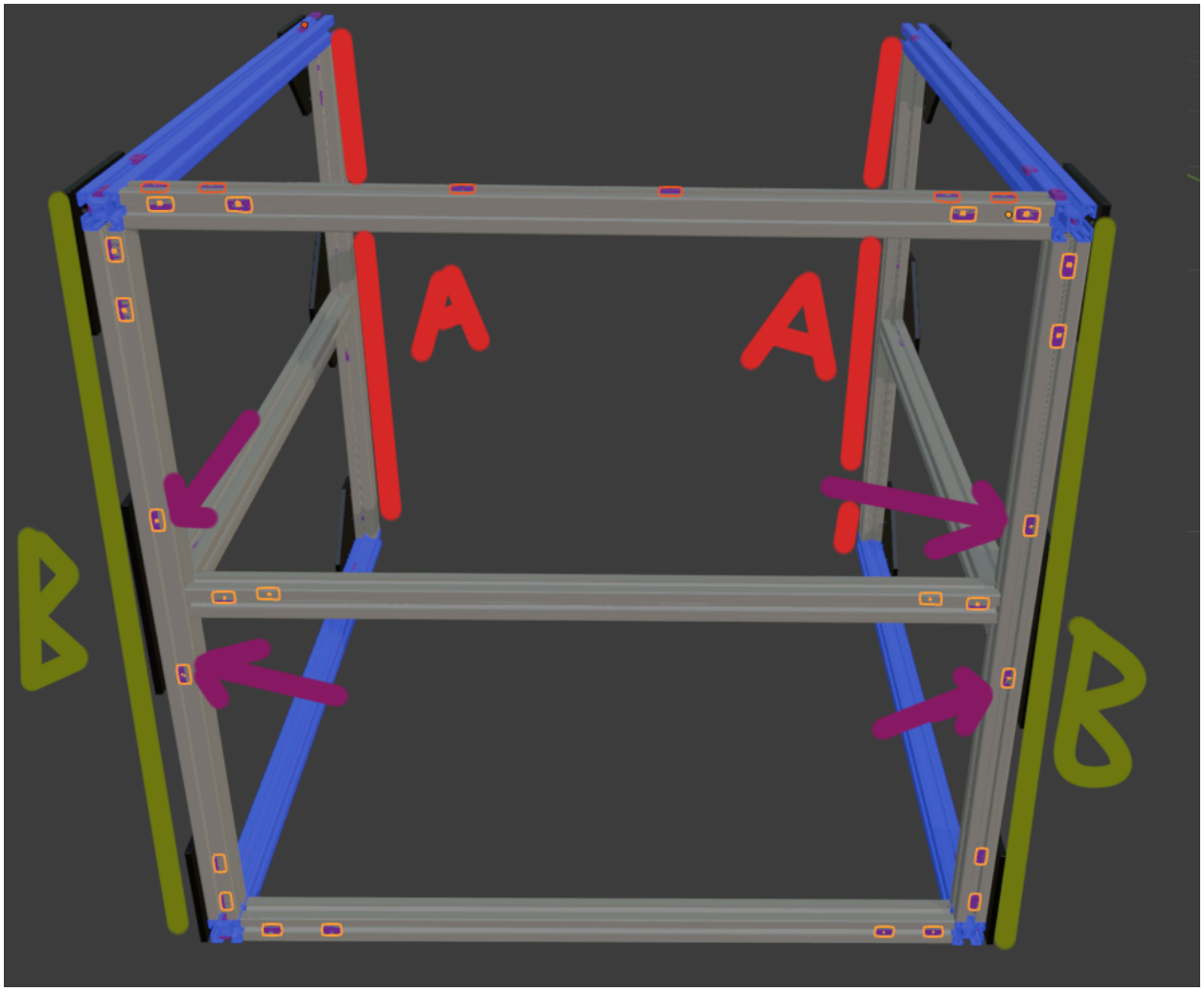
“Crap, I accidentally made a hole in the mesh!”

I’ve been there, too. Just stick with it and it’ll be done soon! Adding the mesh was the worst part from my experience. (It was at this point that I realized why erecting Faraday cages using mesh walls can be much harder than you’d think.)

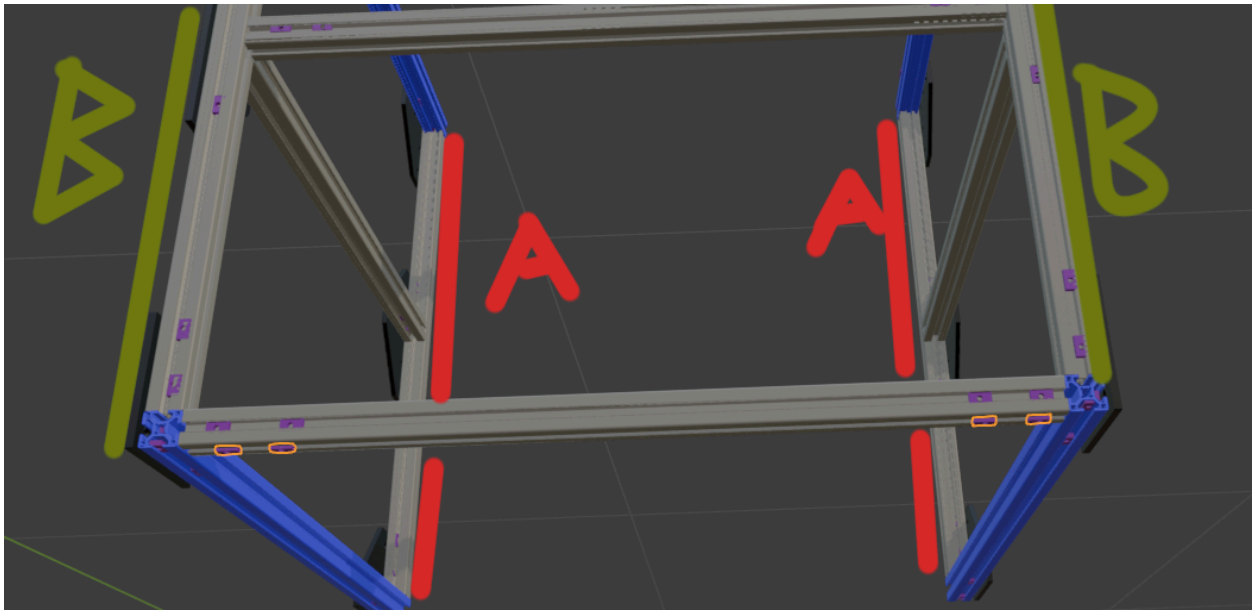
Do the same procedure three more times for the two panels you should have made so far. Don’t worry, your fingers will get a short break after you finish these, because it’s time to work on the rear.

7. Now that we have two sides done, we will start on the back.

You could do the front first, but I found that because it uses 3d-printed Elbow-brackets at the corners, it was less stable while I worked on it than I would have liked. (These brackets are weak. Honestly, if you have a lot of trouble with them, see if you can find some metal ones instead. I couldn’t find any with enough holes on the two suppliers I was limited to that met the size constraints but if you can, absolutely replace them with metal ones for the front four “LBW” (ElBoW) brackets. Just make sure they do not interfere with the doors opening if you opt for this!)



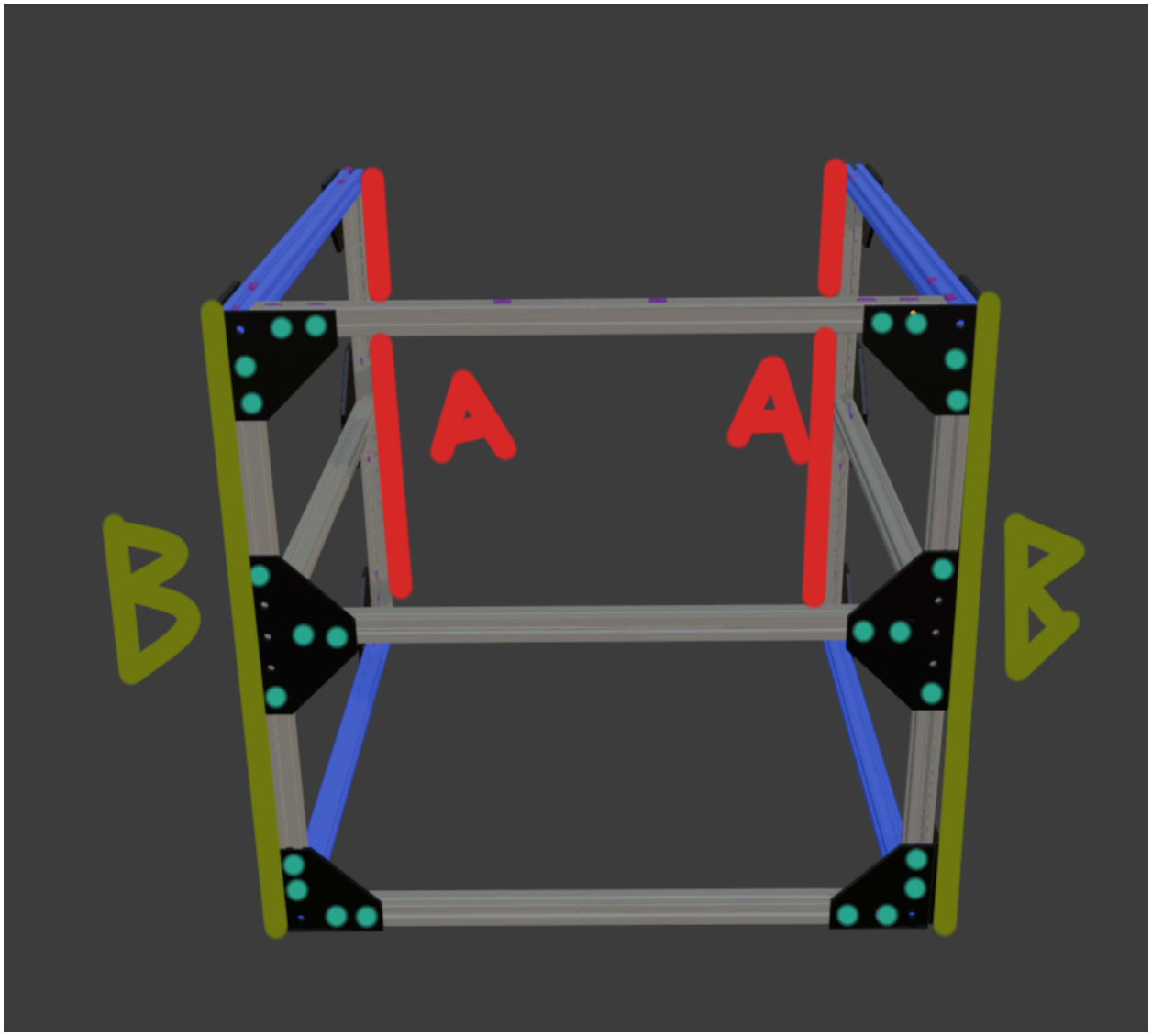
To do this, we simply add one of our 689mm bars to the top, one to the middle, and another to the bottom of the back side. (Remember, the back should have two distinct nuts on each side, again pointed out below with purple arrows)



There are also four other nuts on the underside you will want to insert before continuing.

8. The next step is to screw the brackets into the nuts to ensure the backside is stable.

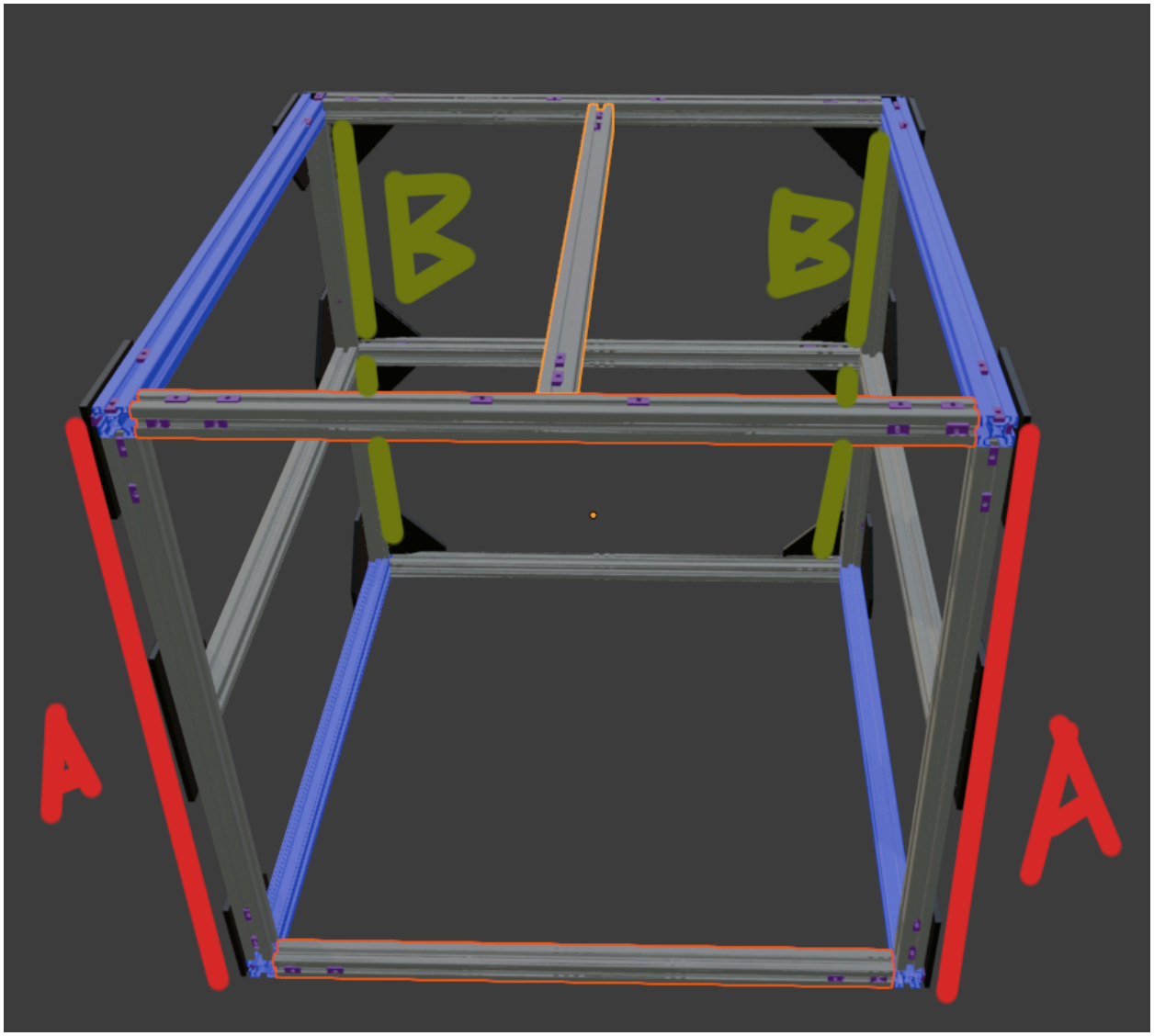
IMPORTANT! If you're using end-insert T-slot nuts (the kind that must slide in from the end of the rail) then you should double check you have all nuts in place before continuing any further!!!!



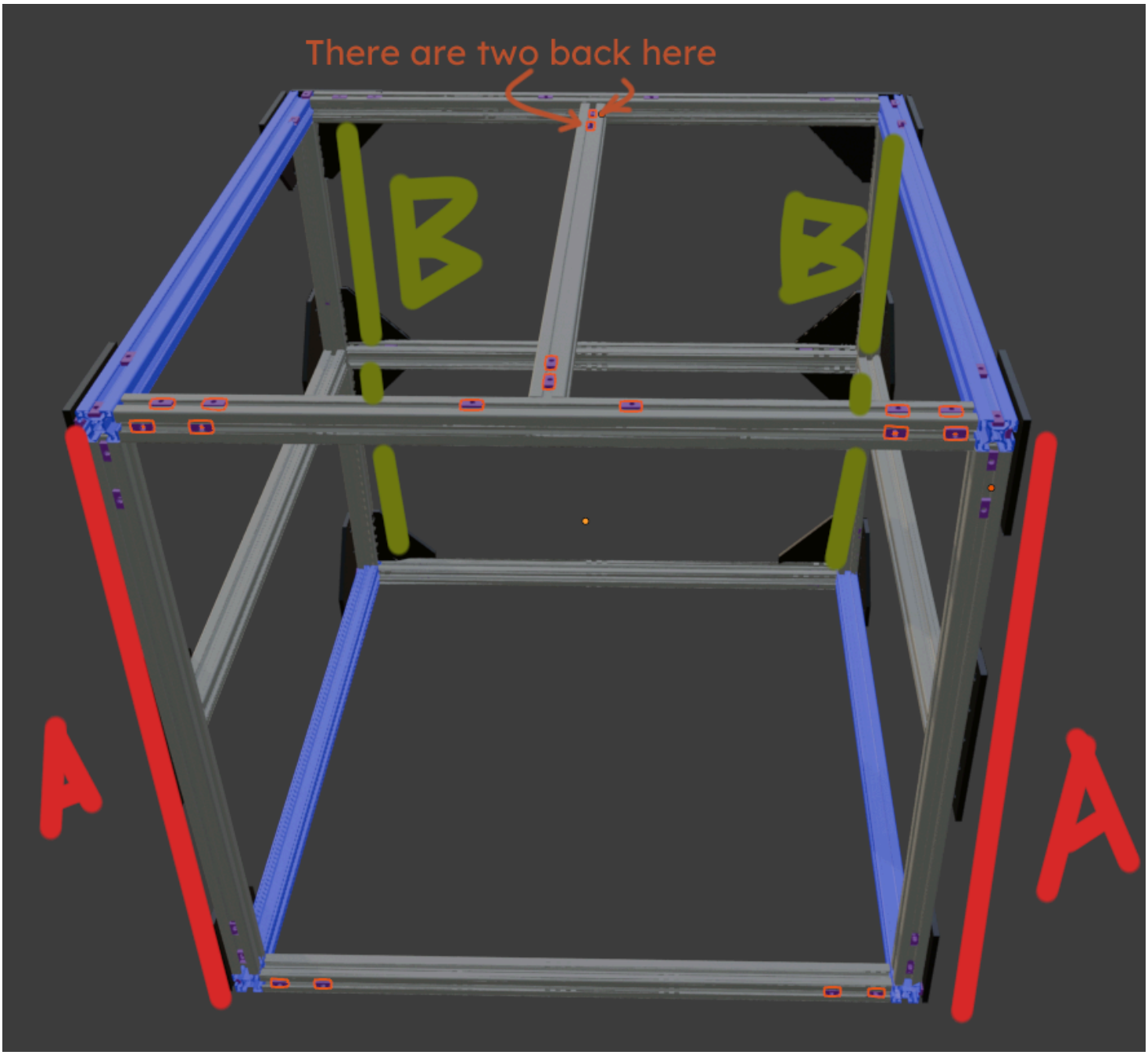
The light blue dots indicate which holes should receive screws.

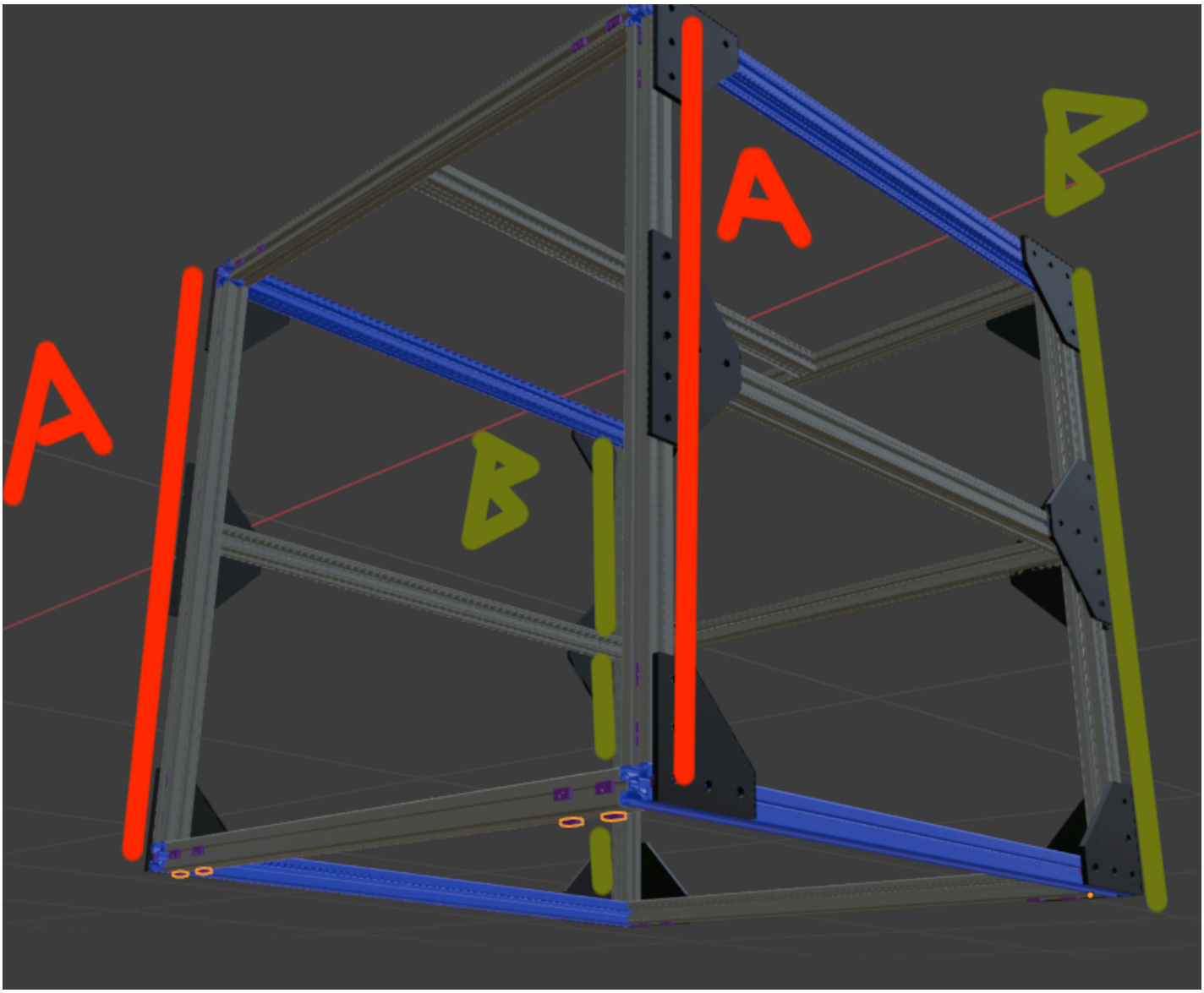
9. Using a large and wide flathead screwdriver, CAREFULLY squeeze and push the rubber tubing with the mesh around it into the inside rails of the back panel like earlier. Getting it nice and even is important. Do this for both the top and bottom half.

10. Next up, we add in the last three rails. They are highlighted in orange below.

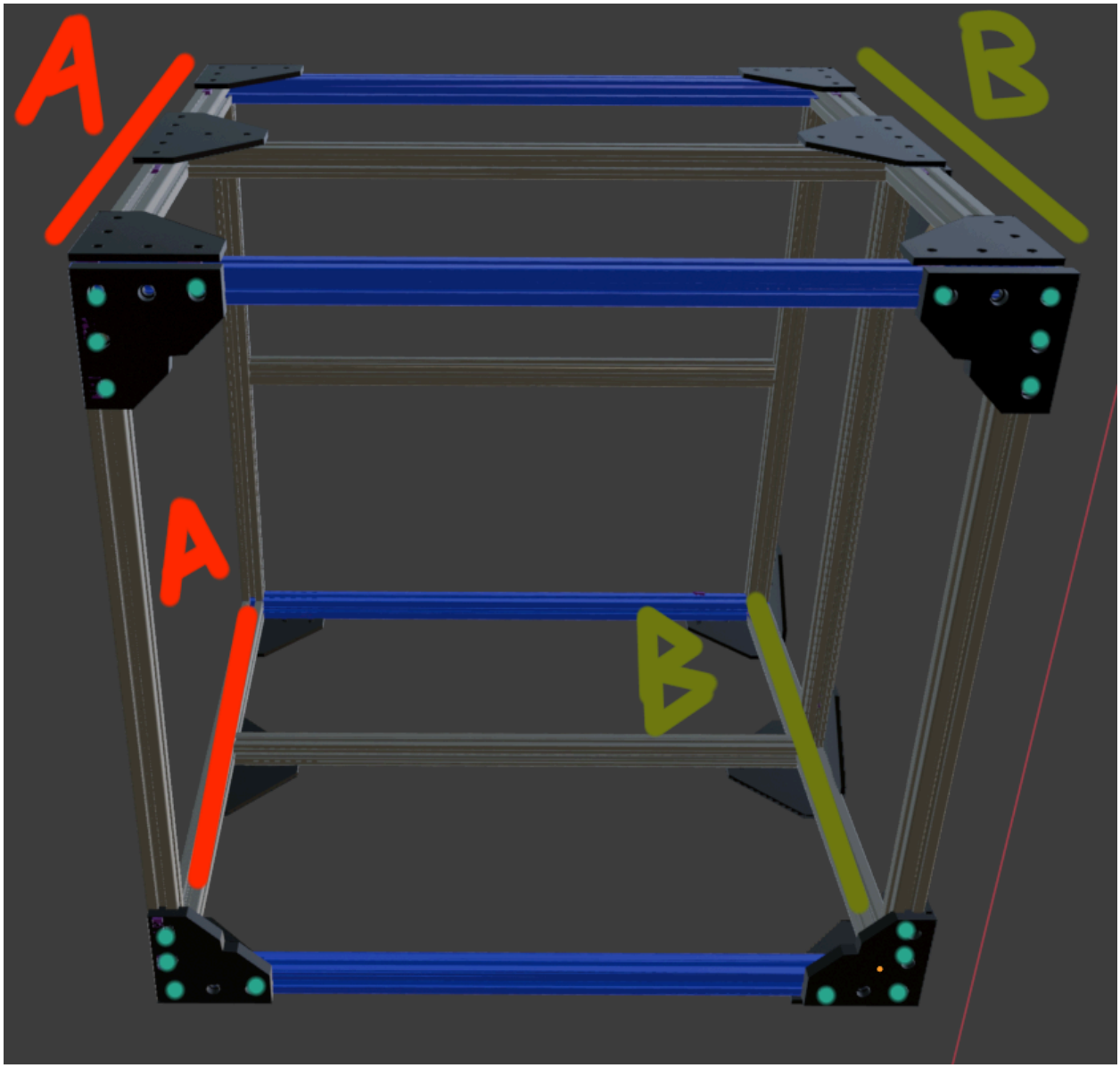


The two diagrams below this show the locations of the nuts that need to be added in.

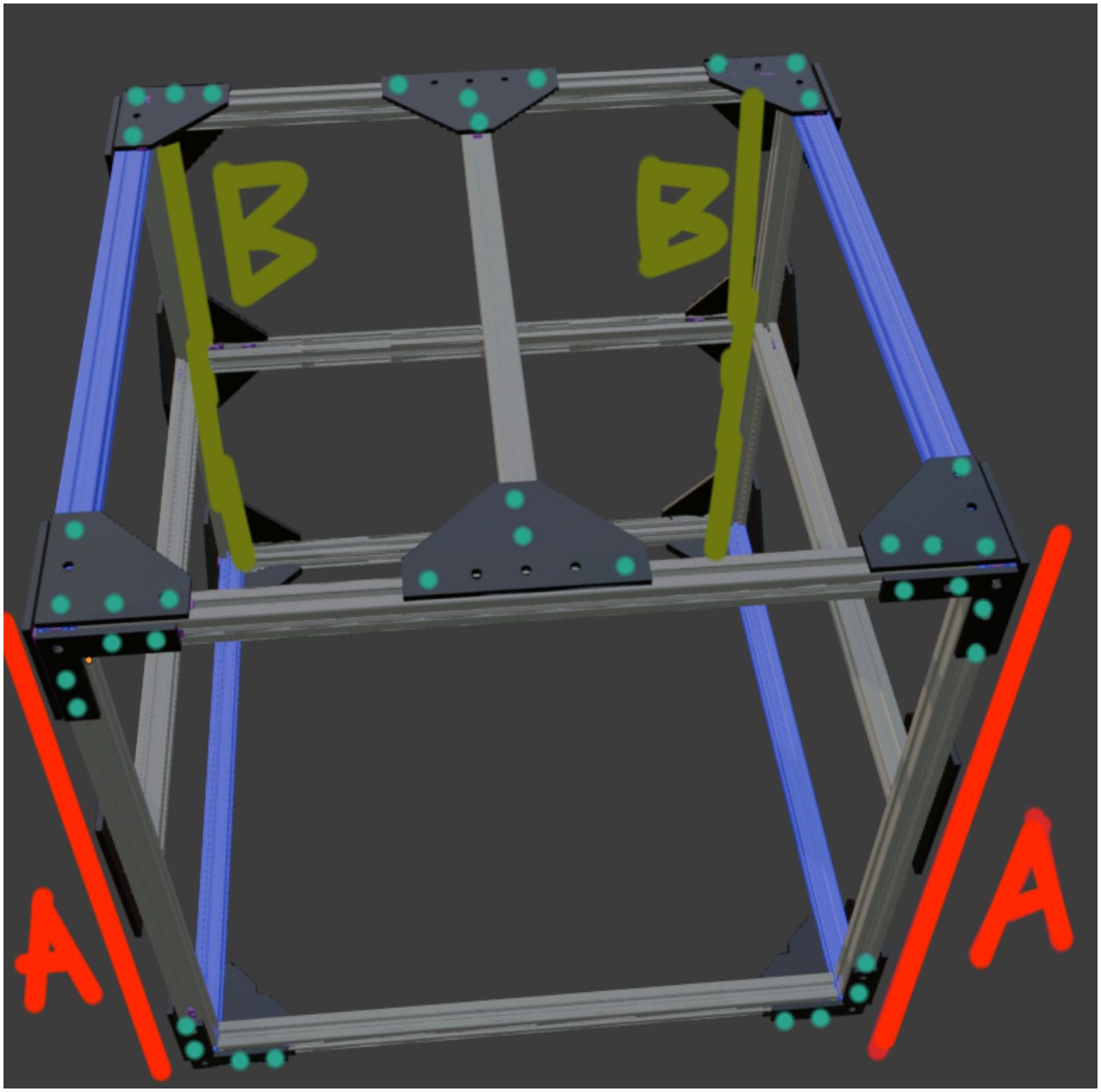

There are two back here
B
B
A
A



11. Once these nuts are in place, it is a good idea to put the brackets in place. This will stabilize the frame. The diagrams below show how to do this.

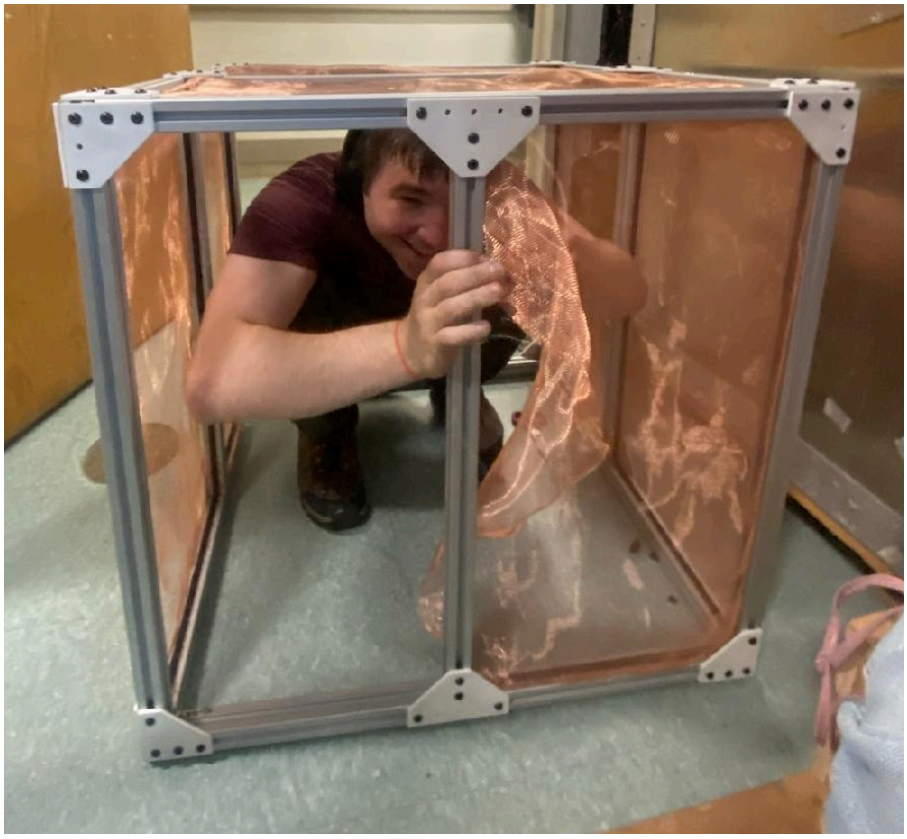


This diagram is shown from the bottom and looking upwards. The light blue dots indicate which holes should receive screws.



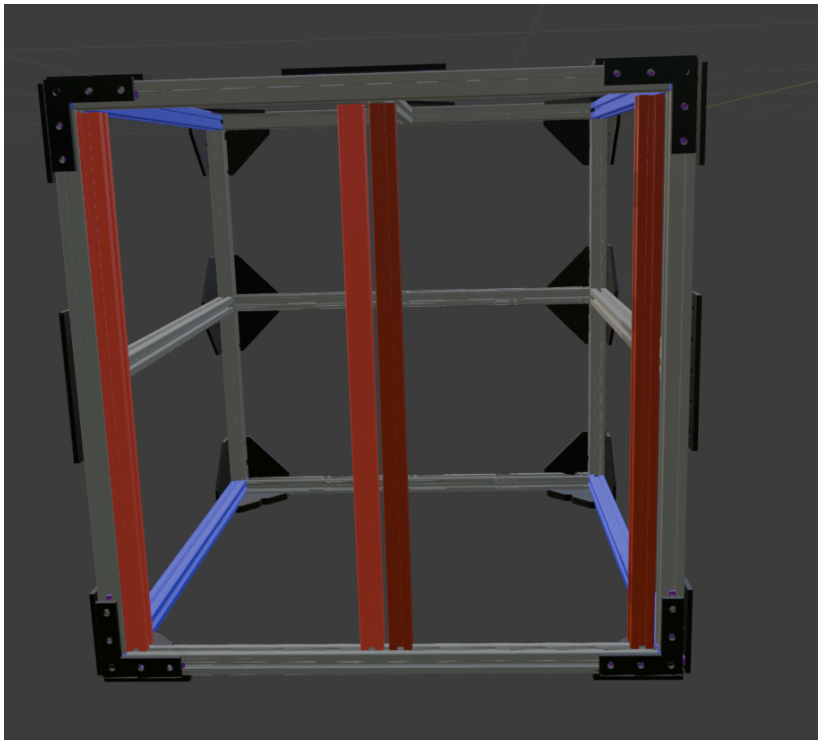
The light blue dots indicate which holes should receive screws.

12. The next step is tricky. Now, you need to insert the mesh on the top two halves. There's no easy way to go about this that I can think of. It'll be awkward and tricky no matter how you slice it. Here's a photo of me doing it.



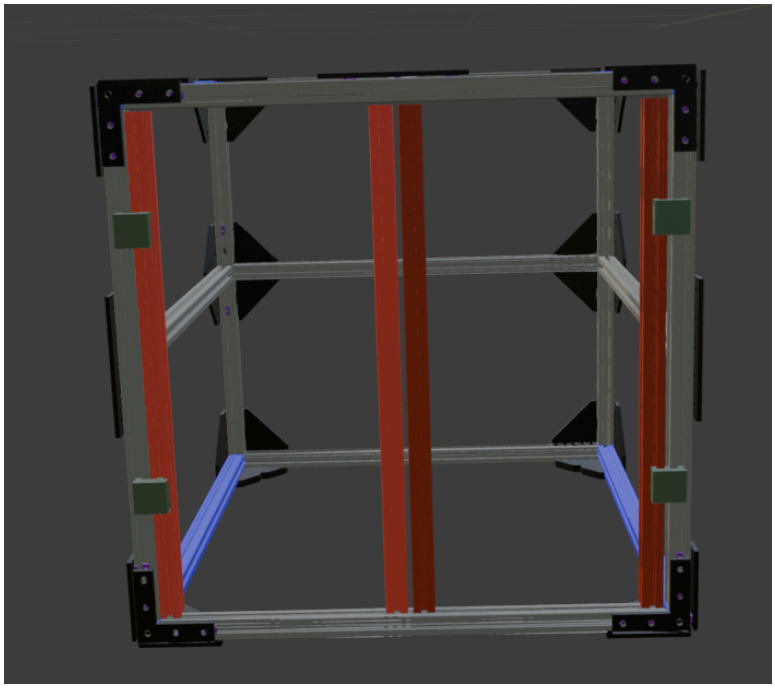
Same as before, screwdriver, rubber strips. Give your back a good stretch before and after doing this! Although solid metal panels would be easier to build with, without some kind of chicanery, there would have been no way for me to fund it, so this backbreaking mesh installation really was my only option! (Or, you know, I could have designed the panels to come together differently. That also would have worked. I did not think of that at the time.)

13. Now it's time for the doors.

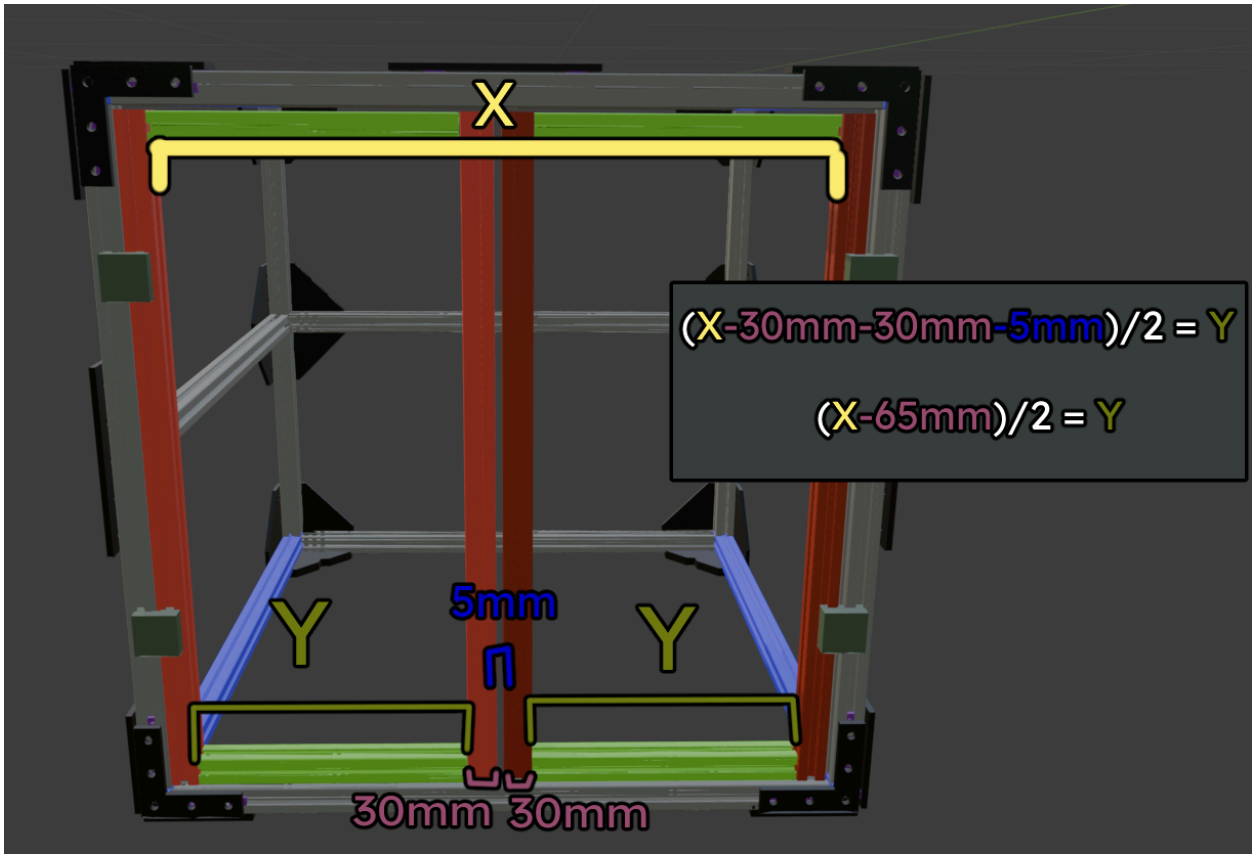


Carefully measure the height of the front opening and mark four pieces for cutting so that they can fit into that space with a small gap above and below. (Be careful not to cut too much off. It is easy to make the gap too large. I found 5mm to be more than enough of a gap. So, using that logic, make the height of each column about 10mm less than the height of the space it will inhabit.)

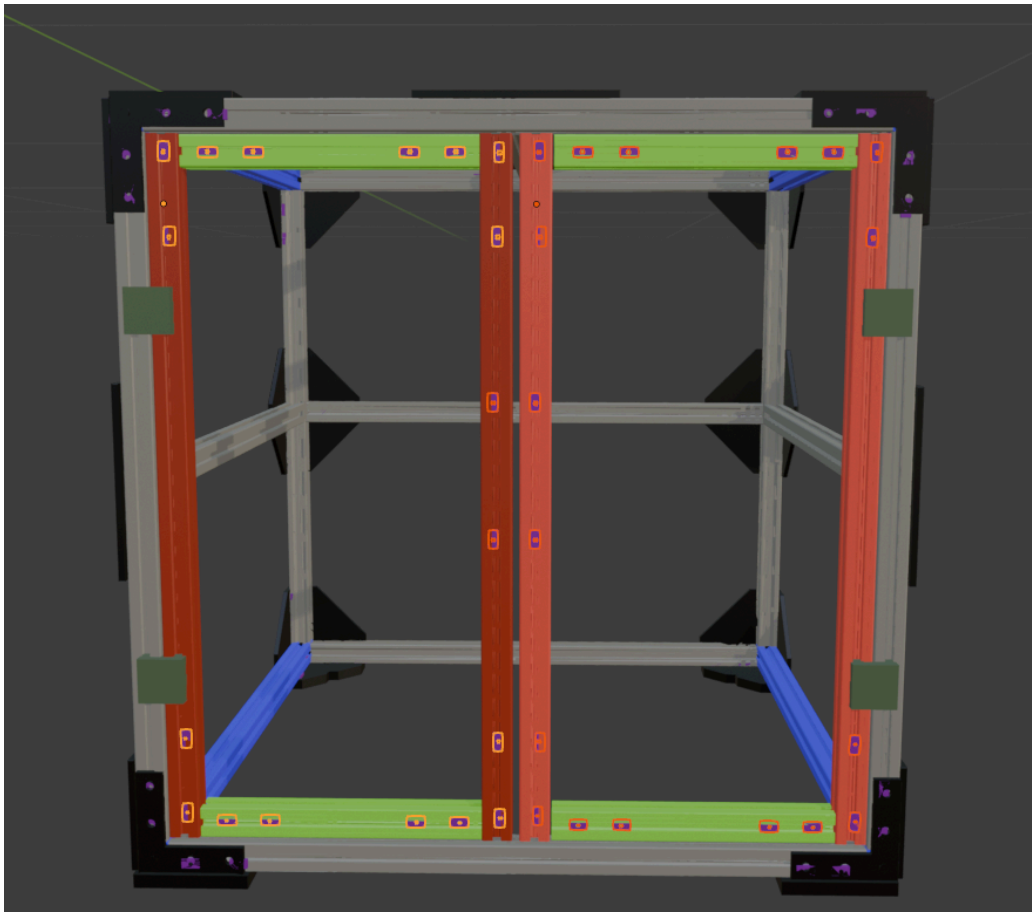
14. Once you have cut the columns, insert the nuts for the hinges (again, if you use the shopping list hinges, it should come with the type that can be inserted anywhere along the rail.) and screw in the hinges to the frame as well as to the leftmost and rightmost column. Try moving the hinges and adjust if needed until the motion feels smooth and the columns do not grind against the frame.



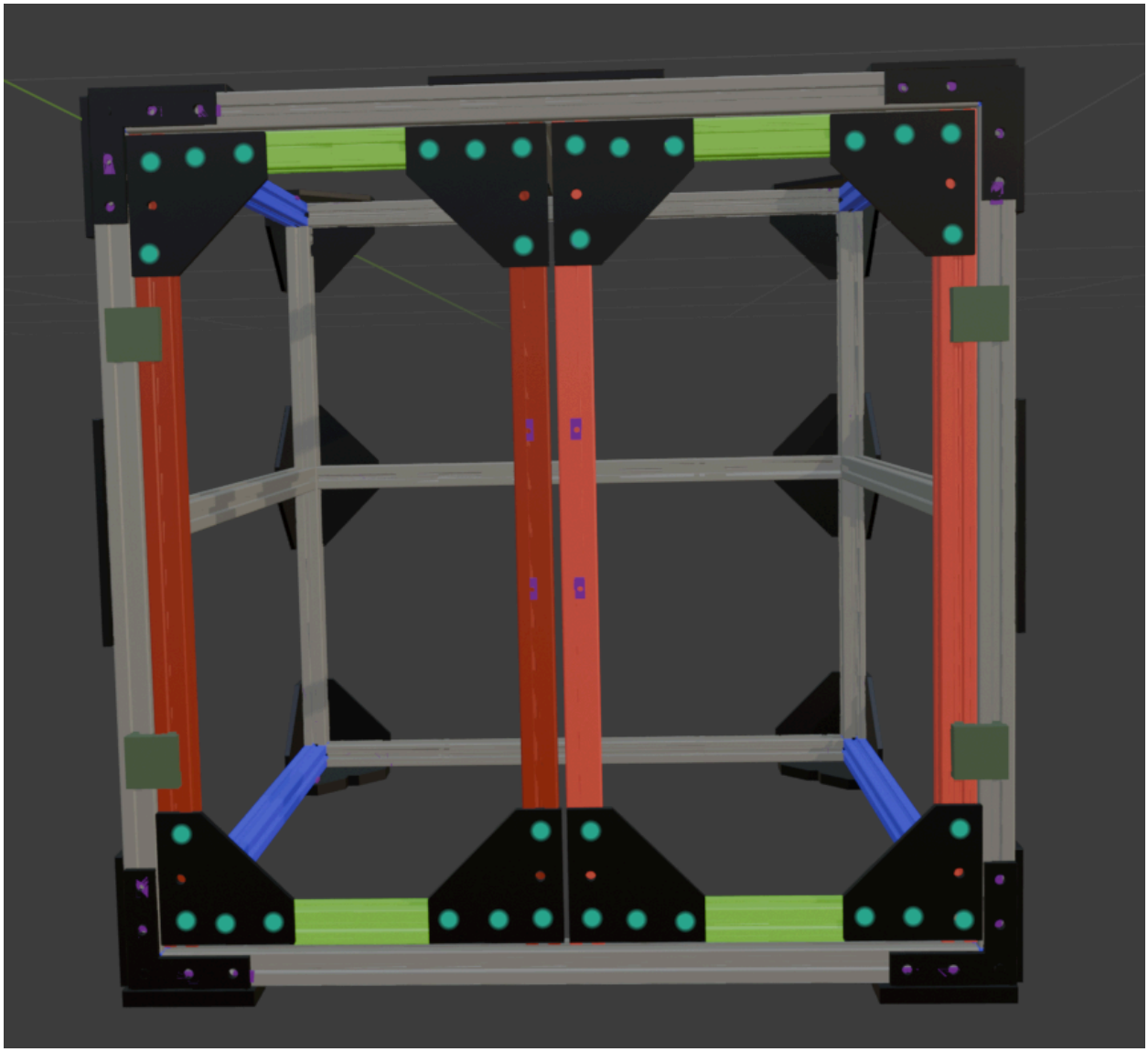
Once this is done, measure the distance between the leftmost and rightmost columns. Subtract around 65mm from this amount (30 for each remaining pillar, and 5 for the gap between doors) then divide the result by 2. This will be the length of the “row” rails for the doors. The diagram below illustrates this.



15. Cut the four pieces marked green in the above diagram to the calculated length Y. Now, we will insert the nuts. The diagram below shows where to do this.



16. Now, install the brackets as seen below.



The light blue dots indicate which holes should receive screws.

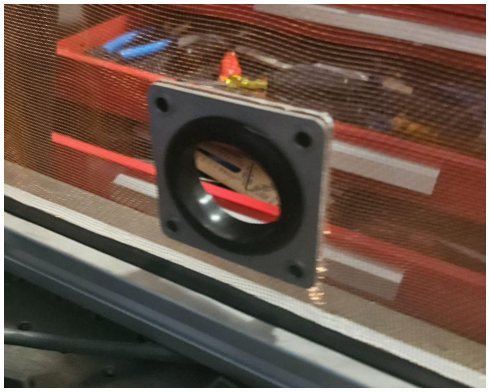
17. Make sure that the doors can open and close without issue. If they cannot, make adjustments as needed. If your cage is off square, you may have to dismantle the doors and adjust the height of the column (red) pieces. If your row (green) pieces are too long, you may have to shorten them. Once you have verified that you are satisfied with the opening and closing, remove the hinge screws from the red columns to take the two door frames off of the main frame.

18. With the doorframes ready, insert the mesh into each door. This is it!



Once you have done this for both doors, you can install the handles and reattach the doors to the rest of the frame.

19. If you have the cable adapter piece, choose your preferred location on the cage to place it. Mark out the locations for the four holes, cut a hole for each, mark and cut out space for the larger hole, and install the adapter. The inside and the outside of the cage should both have a metal plate. Screw together the plate at the four corners and insert the rubber circle to finish the installation.



20. Ground your Faraday Cage! This is what makes the cage actually block electromagnetic fields—grounding gives the electrical noise a path to escape instead of building up or leaking in. To do this, it is very simple.

Attach a wire to a metal part of the cage (making sure it touches bare metal), then connect the other end to a known ground—like the ground pin of a 3-prong outlet, a grounded metal pipe, or a ground rod—so the whole cage can safely discharge any electrical buildup.

CONGRATULATIONS! If you have made it this far, it means you have successfully created your very own Faraday cage! I hope this helps you cancel any noise and create something amazing. Thank you for following along!

-Steve