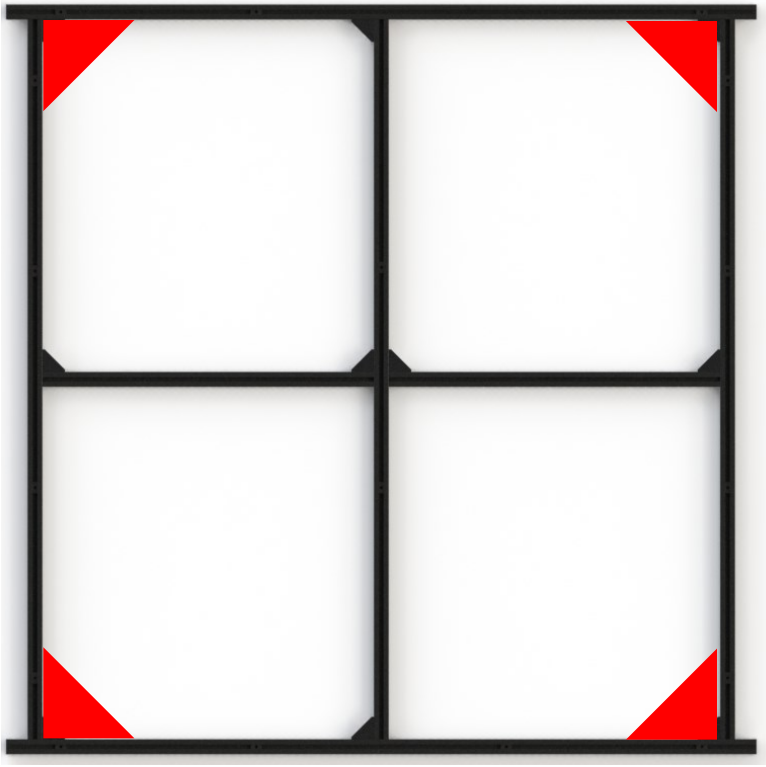
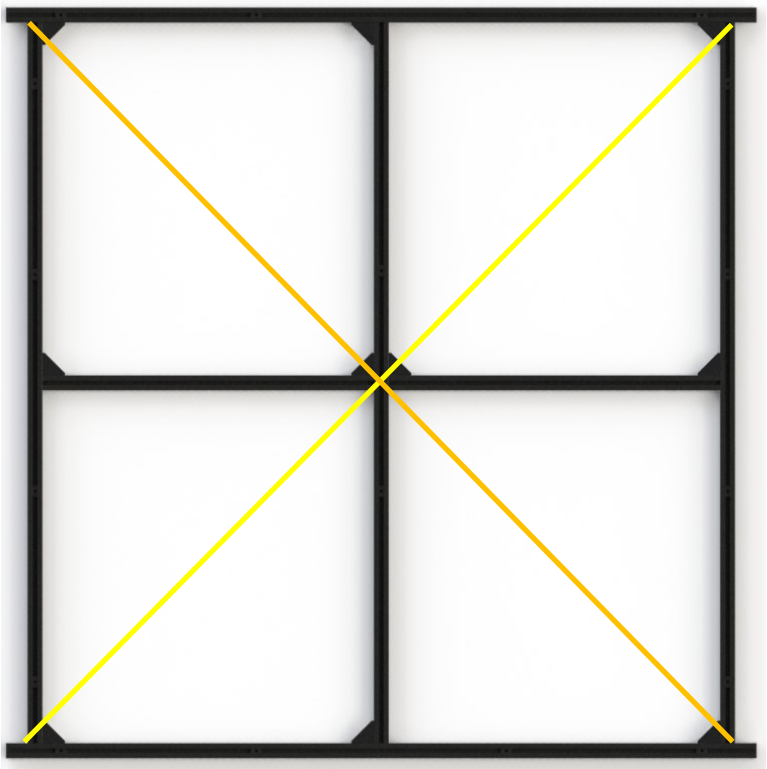
Here is the method I used to get my x-carve perfectly square when I built my new waste board. This process is more difficult than the standard way to assembly the x carve, but will give you better results. It's your choice and responsibility. This is only my opinion and it worked great for me.

-Phil Johnson



First square the 4 corners. It is more important to be square than it is to have no gaps. The cast corner brackets are very strong and capable of spanning gaps. Try to make the stick out even for the longer extrusions although they don't have to be perfect.



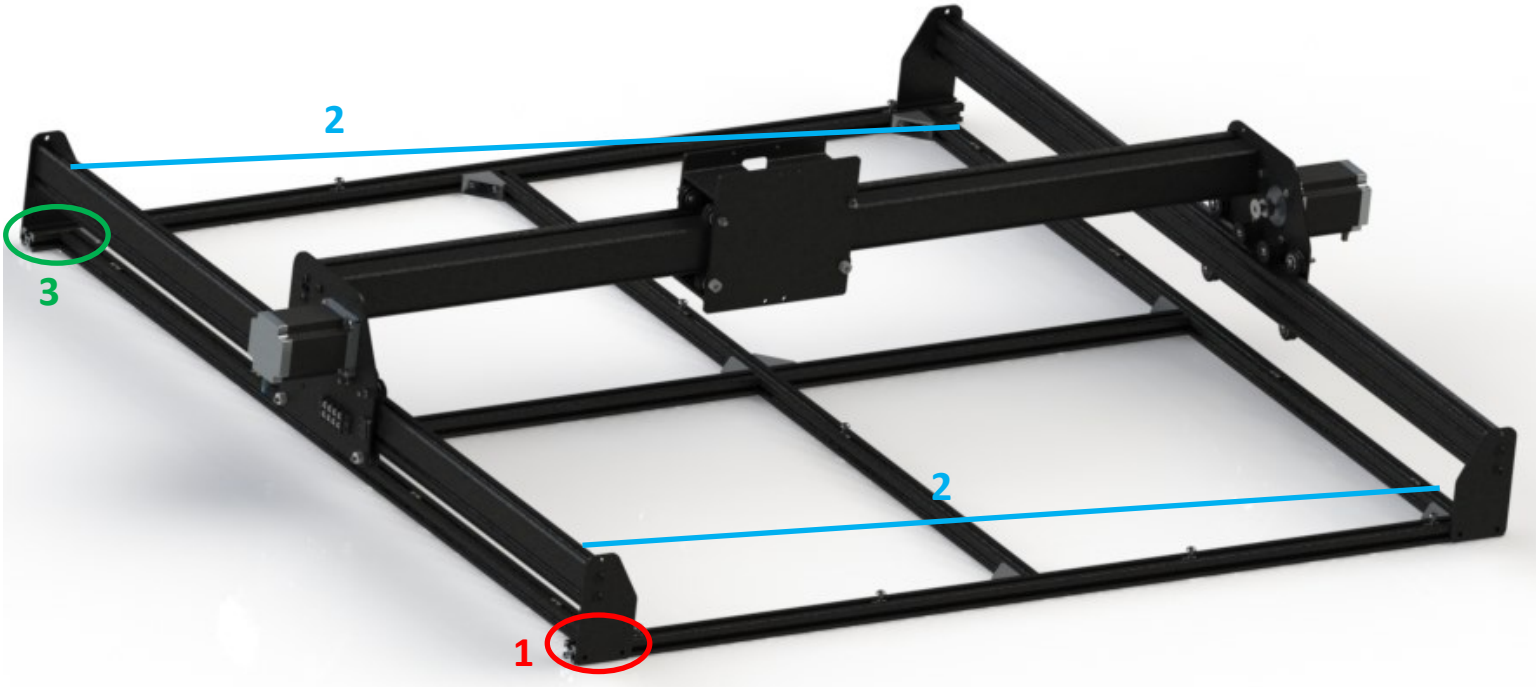
Next cross check the opposite corners of the shorter extrusions, NOT the stick out parts. They should be exactly the same or within 1/32".

Tolerance is stacked. Any out of square here will just be added to more with all the parts you add.

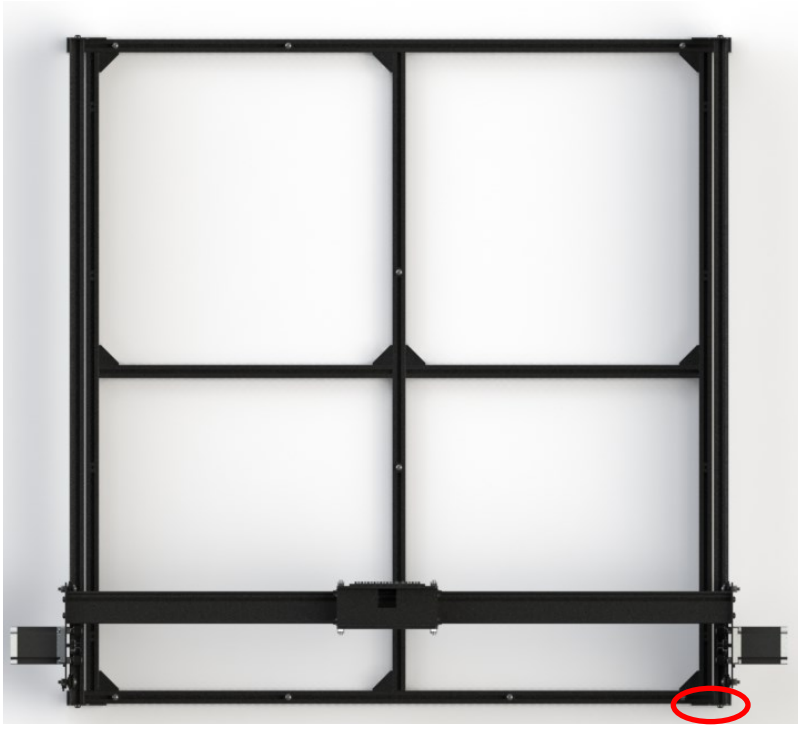
The upper assembly should be together. The best way to do that is allow the rail to relax and be in the same position in the mounting holes. You do that buy setting the assembly on a very flat surface like a pool table. Then loosed the 8 screws on the Y end plates to the Y rails. Then tighten them one at a time. There is at least .1mm of slop in those holes and you want all of them in the same position, bottomed out on the hole.

This should be done then to the x axis end plates top V wheels, then the x axis extrusion itself. Then the carriage's top v wheels.

Remember to tight the eccentric spacers so that the v wheels can be slipped with 2 fingers gripping the v wheel, but not slip with one finger tip.



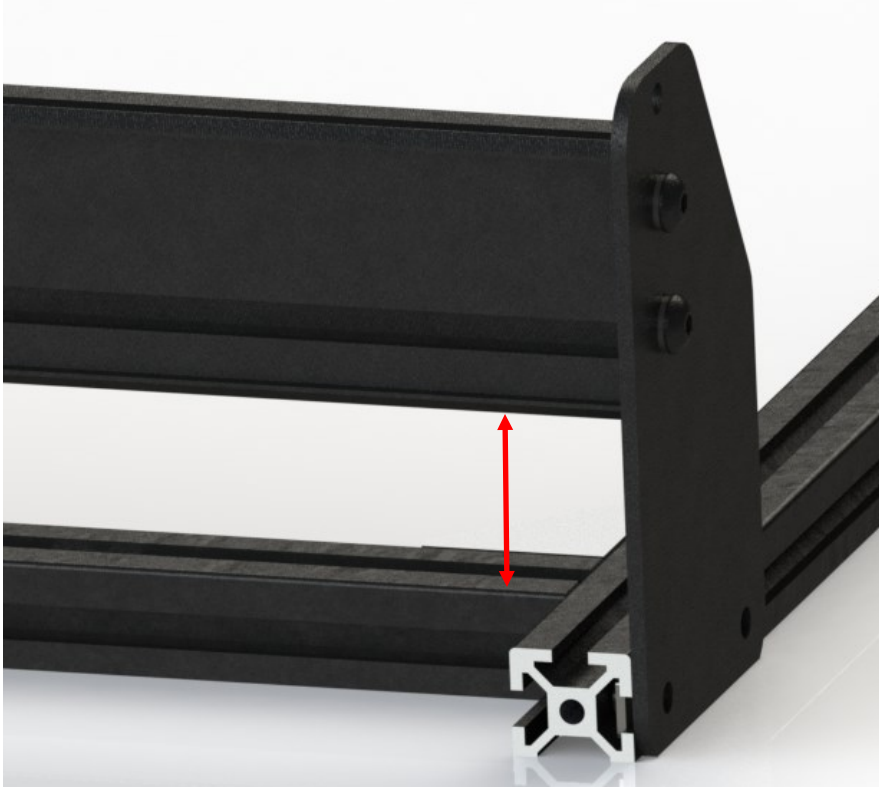
Next attach the upper assembly to the base extrusion leaving all the screws loose except for the front left one. Tighten that one down so that the left edge is even with the extrusion end (**see 1**). Then since the base is square, you can use that to get the left Y rail parallel with the base extrusions. Measure from the left-top of the left Y rail to the right-top of the right side base extrusion all the way in the front. Make the back match (**see 2**). Then tighten down the back Y axis end bracket (**see 3**).



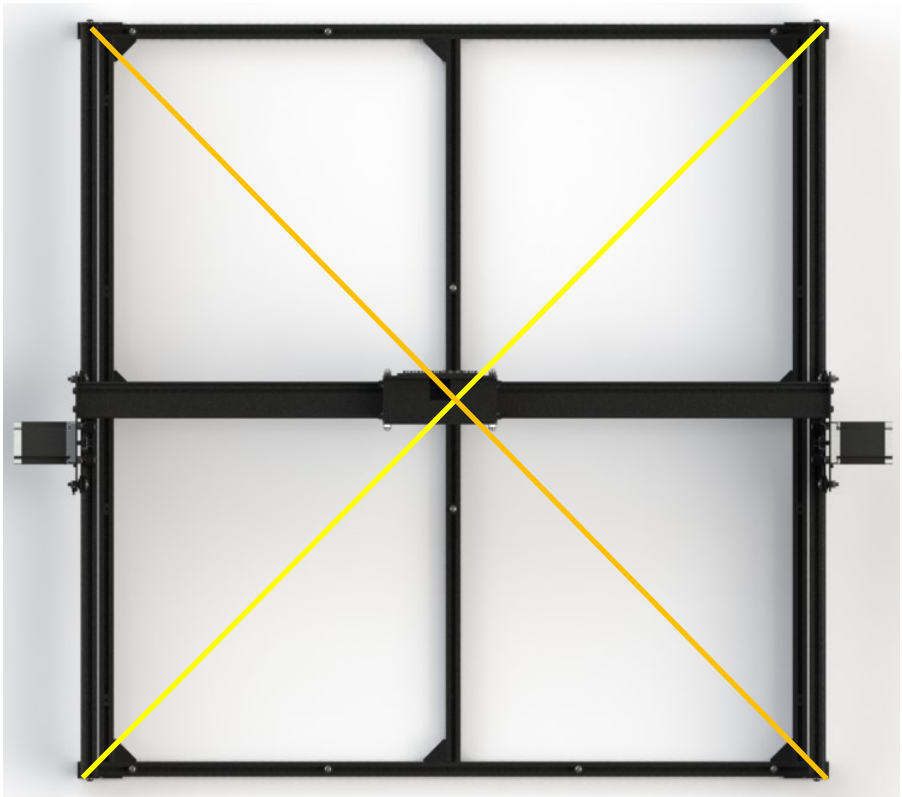
Next slide the gantry all the way to the front. Then tighten the front Y end plate.

Next slide the gantry all the way to the back. Then tighten the rear Y end plate.

You just let the gantry set the spacing between the rails and they should be parallel now.



At each of the 4 corners, measure from the top of the base extrusions to the bottom of the Y rails. All 4 should be equal.



Now cross check the top of the Y rails. The 2 dimensions should be the same or very close.