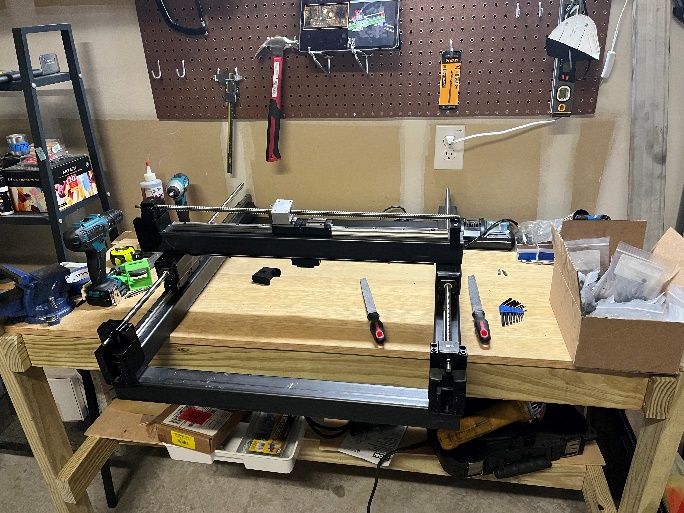


The blue parts are intended to be printed and then replaced with aluminum.

This project started with some CAD I found online under the name of “The PrintNC – mini” and boasts of being a CNC machine that starts out with tapped steel tubing and 3D printed components which are then replaced with parts you machine with that CNC.



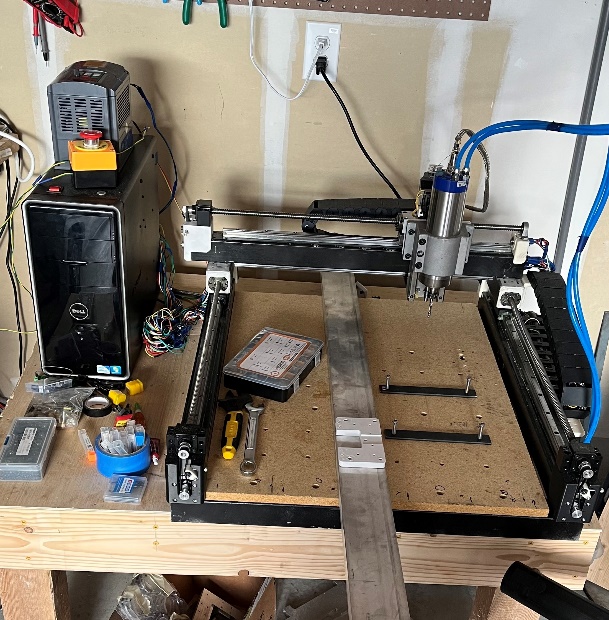
I drilled and tapped every hole for all three linear rails, and 5+ for every connection point between pieces of tubing. That’s more than 70 tapped holes and 40 more clearance holes!

Here is the base frame screwed together (minus the 2 additional cross members, which were added later). Unfortunately, I didn’t get a picture when this was on my kitchen countertop while my wife and I cooked dinner. The countertop is the closest thing I have to a surface plate and I wanted to shim the linear rails so that they were relatively flat.



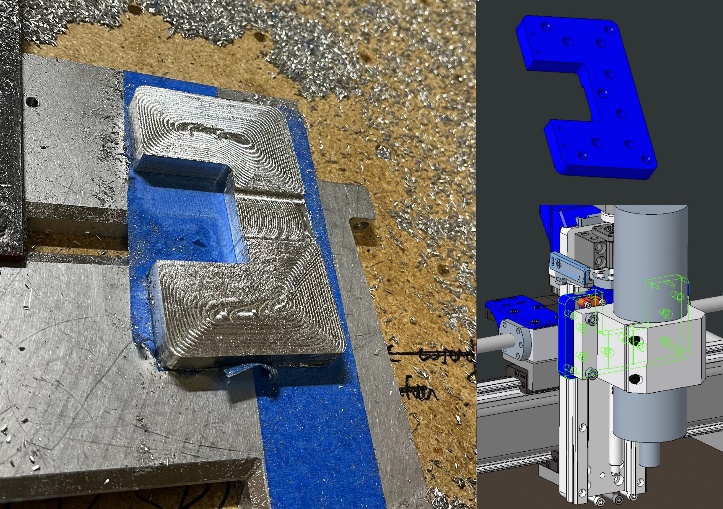
Pay attention to how clean this desk looks, its not going to ever be that nice again…

If you’ll take a closer look at the design, you’ll notice that the whole gantry system of this “3D printed” CNC machine is composed of bolted steel extrusions and linear rails with a relatively short path to ground. The 3D printed components are mainly motor mounts and other accessories, which shouldn’t have much of an impact on the rigidity of the machine, especially when they are replaced with aluminum parts. This, in addition to the extremely parametric CAD is why I decided to make this machine instead of another.



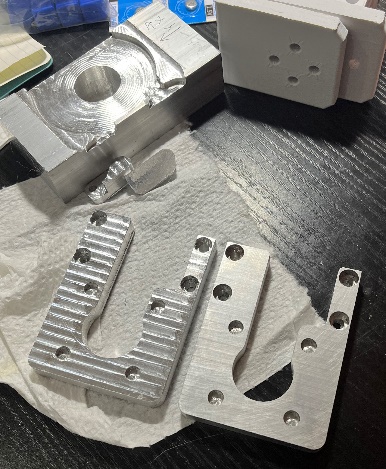
The first cuts were terrifying.

This is where we get to the bootstrapping part of the router. With the frame installed and electronics routed it is now time to start cutting aluminum! (I will not go into the wiring here. I do not want to re-live debugging why my electronics weren’t talking to each other. Apparently, things running on SPI protocol can’t have cables longer than a few mm long before the signal times out. I still don’t really know what SPI is, only that I really hate it.)



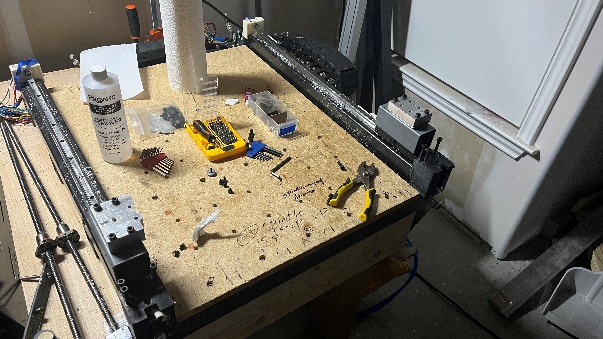
Once I got the faceplate roughed out, I was able to breath a sigh of relief.

First cut down and my surface finish is kind of crunchy. This is mainly because what I was making is the faceplate – the only component I don’t think should have been made from 3D printed material it is far too weak and I needed to baby it or else it would vibrate to pieces. Once I got that done, the cut quality went way up.

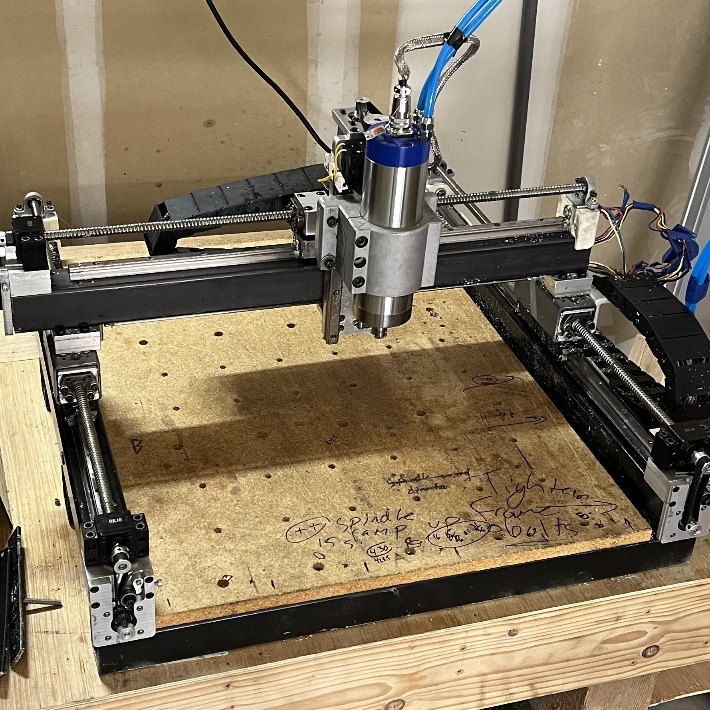


What is the machinist’s version of “a grinder and paint make me the welder I aint.”?

With the newly created faceplate installed I was able to breeze through rest of the aluminum parts for this machine. And with a little scotch-brite they look pretty good, if I do say so myself!



It was hard to take this thing down and

With the new parts made, it was time to take the machine apart and put them back together. The thin layer of grease and aluminum chips covering the machine made it much more fun to work with.

Look at it!! Soo pretty!! Hopefully parts made on this machine will feature in future projects on this page.

And there we have it! A mostly functional CNC router! There are still a million things I want to do to this thing, but I am going to leave it here for now and get working on other projects. Making tools is fun, but I don’t want to spend my whole life making the perfect CNC machine, only to realize that I’ve never made anything with it!