

After a request on the forum for a bit of detail on one of my CNC jigs, I recently posted on the forum a bit about my CNC Jigs and Neck making process. Robbie kindly asked if he could share it on the Lutherie Academy resources page. I've made a slightly expanded version of that post here, correcting some minor errors, and adding a bit more information.

This is a run down of my current (as of May 2025) CNC jigs for making necks, how I went about building them and a bit about how I use them.

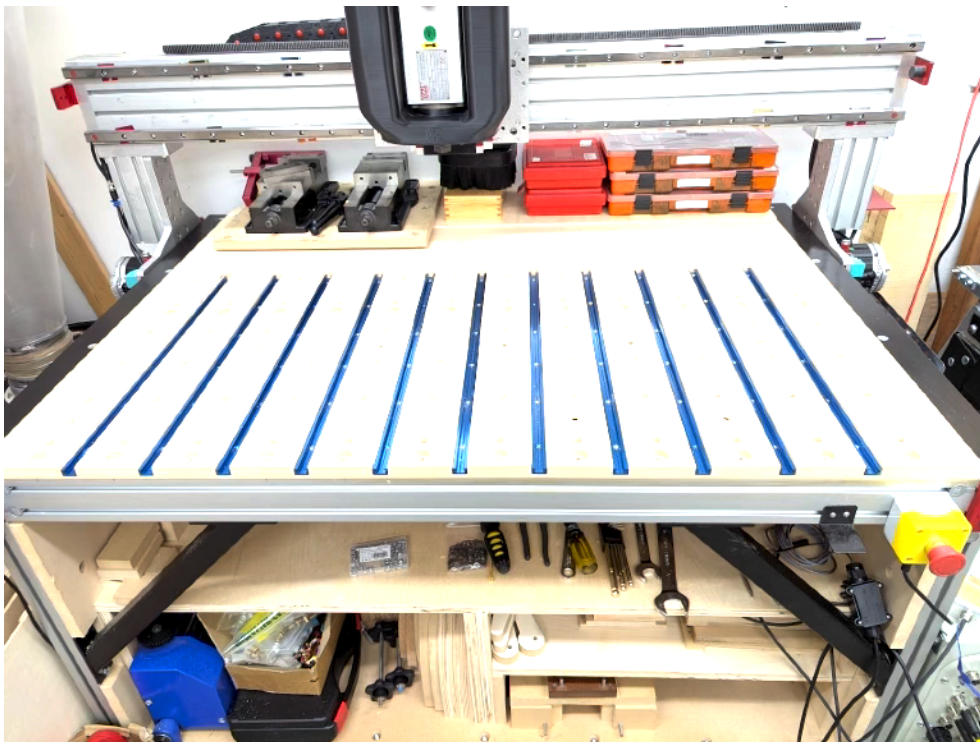
I've evolved this process over a number of years, and every so often I update it as I learn from making a new instrument. Most recently I found myself making smaller scale instruments and had to revise some jigs to work with smaller neck dimensions for example.

I'll make some general comments on jig making, then outline my jigs and how they are used and talk specifics about how the various jigs are made, especially where there are some not so obvious details. I won't do a full tutorial of my whole neck making process here. I don't really have pictures of every step, but I will try to show some examples of how each jig is used, and gives walkthroughs of most of the major steps taking shots from different experiments I've done. That should give a pretty good idea of how I approach things and why the jigs are built the way they are.

My CNC setup

I am currently using a [4' x 2' CNC machine](#) from Avid CNC.

Here is a picture of my setup, just after I revised the spoil board design last fall, and added in some under the machine storage to increase mass and improve shop organization.



This is an aluminum frame rack and pinion machine meant for large format machining of wood. Avid offers much larger versions of this. In fact you can keep extending the table along the Y axis in principle as long as you want, although a 5'x10' is the largest offered without custom configuration. In my configuration it has a 3 HP spindle that takes ER20 collets, but much larger 8 HP spindles with automatic tool changing are available. You can do some light metal work in Aluminum and other non-ferrous metals with it, but it's really designed for woodworking, with my spindle designed to run between 8,000 and 24,000 RPM.

I choose this machine for a couple of reasons. It is small enough to fit into my rather small shop (13'x17') along with all my other equipment and benches, but also large enough that I can do pretty much any guitar work I can imagine on it. I use this to make forms, machine necks, build other tools, machining inlays and more. I sometimes use it for smaller furniture work as well. I expect I could handily do an archtop or even a cello top on this machine. One of the features is that the Z axis has 8" range of motion, and clearance. The other is that the machining envelope extends a bit past the front of the machine, allowing for some vertical machining.

The Z axis clearance is required for my approach to making necks, and one of the reasons I chose this machine was to be able to run a bit with a 4" reach and still raise it above the top of heel blank on a neck mounted on a work board, but at the same time be able to reach the spoil board with a small mill that has only 0.5" of reach. This lets me machine a neck with the heel block glued on already, and machine solid necks as well.

The vertical machining capability is important, because it allows me to cut the tenon on the end of a neck. If you have a CNC machine that doesn't allow for this, you can use a traditional router jig like the O'Brien neck jig instead. It would be relatively easy to also make a carrier board for the neck jig that uses the same registration pins I use to position the neck for tenon routing.

Another thing I depend on is that my machine has a fairly accurate hard homing ability. Every time I turn it on and home it, it comes to the same zero position within about 0.001" or less. If your machine doesn't do this, or at least get as close as you find acceptable for your working tolerances, you will need a way to probe and register a reference zero that is repeatable for my processes to work, but they should still be applicable. A key reason this is important is that if I shut down my equipment part way through making a neck, I am confident I can turn it on the next day and resume work.

All that said, I think most of what I have to say here is applicable to most any modern CNC router setup, and should work equally well on machines with less capacity, although adapting to very small Z clearance for some operations may not be possible.

Jig Materials

I've made vacuum jigs from a number of different materials, including MDF, HDPE, Baltic Birch and more recently a kitchen countertop material called PaperStone which is effectively a paper based Phenolic material.

MDF. I don't use MDF anymore, as you have to do too much work to seal the surfaces, and if you nick the jig you have to reseal things again. Basically MDF leaks air too much to be a good material for vacuum jigs, unless you are using it as a chamber and taking advantage of the fact that it is leaky to just pull air through it. Lots of big CNC machines do this, but it requires enormous vacuum pump capacity, and I'm running a small shop. It's also more suitable for large sheet work, and not smaller parts. If you do use MDF, you can seal it with shellac or epoxy resin. Multiple applications may be required.

HDPE. Better than MDF as it doesn't leak, but it also doesn't stay flat without constraining it to another surface, and it's really mostly impossible to glue to a carrier surface. That ends up requiring bolting the whole fixture down to a carrier to get things in place and hold them there. I still have some fixtures I made with HDPE, but I probably won't make any more with this material.

Baltic Birch Plywood. Stays flat, generally void free and does not leak nearly as much as MDF. I still seal fixtures made with Baltic Birch plywood with epoxy, but it's a good material, easily available, dimensionally stable and easy to machine.

Paperstone. (<https://paperstoneproducts.com/products/>) This is currently my favorite material for vacuum jigs. You need to machine it like other plastic/composite materials, but it is very stable, leak free and easily makes good vacuum jigs. You do need to be a bit aware of the possibility of splitting along the paper layers if you don't pre-drill and tap screw holes, or if you over-tighten recessed hold down bolts, but with a bit of care it's a great material for this kind of stuff.

This stuff is a bit expensive, so I just buy the occasional waste/second offcut from these guys (<https://www.greencountertopsdirect.com/product-category/panels/budget-panels/>). They are relatively close to me in Seattle which keeps shipping costs down as well. Despite the cost, Paperstone is much less expensive than Phenolic sheets ordered from machine tool suppliers, and it is robust enough for jigs in my opinion.

One more warning, while Paperstone is relatively robust, and I have cut threads into it, it will not stand up to repeatedly running bolts into a finely threaded hole and torquing them tight. I put metal thread inserts into my jigs for holes that I need to run bolts into.

Aluminum. Harder to machine well, but if I was really sure of my design, I would probably use aluminum for future vacuum jigs. It's more expensive than other options though, and unless you're sure your process will not result in damage to the jigs during machining, it may not be the material you want to use. Also, if you really want a robust aluminum jig, you probably want to get it hard anodized after making it, and that adds even more costs.

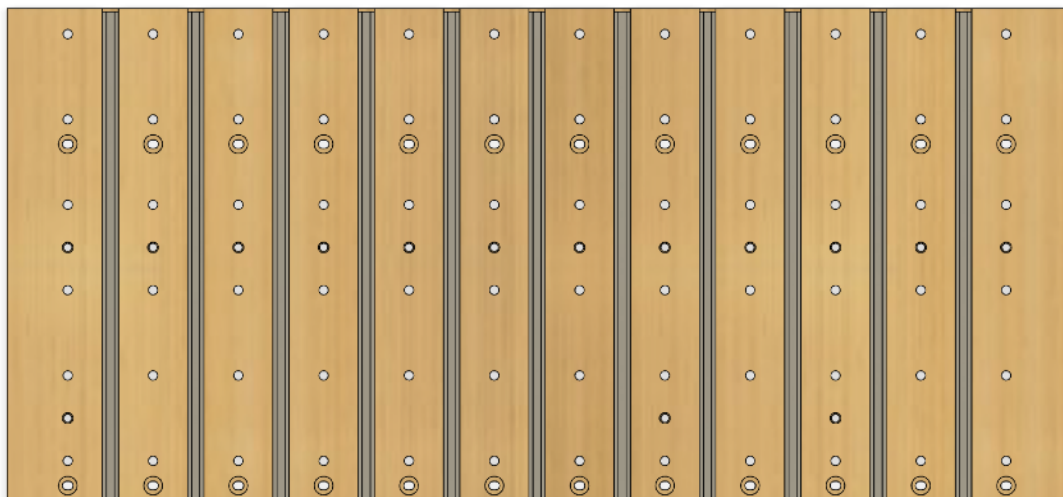
I would not recommend steel for jigs, even if you have the capacity to machine it, because the last thing you want is a high speed carbide mill making contact with steel at wood cutting feed rates. You will either get shattered carbide spraying about your shop (and maybe at you), or a fountain of sparks and molten steel, or maybe both. As Robbie would say, it happened to a friend of mine.

Jig Locating

When I first started doing CNC work, I would register my jigs against fences on the spoil board, clamp them down, and then measure stock positions or jig features to figure out where things were. Often things ended up out by a bit during measurement one way or another, or I spent a lot of time doing precise measurement at each step, which I didn't really have the right probe equipment for. It was time consuming and frustrating to me to work this way.

I have since set up my machine with a series of bronze bushings for 1/4" locating pins at known locations. The bores for these were carefully done, the bushings inserted, then probed for location, and if it was out too much, pulled, filled and rebored until I got them right. Mostly the source of error here is either backlash when machining, or sometimes misalignment when I press in the bushings. Generally I aim for repeatability of around 0.001" for these, and when they are out a bit, I reseal them. This took a bit of extra time initially, but it gives me a foundation to work from. These bushings are placed at 100mm intervals along the centerline of the long axis of my machine, with a few more located near the front of the machine to locate some jigs that allow parts to be machined vertically. My machine has the machine table front set back about 30mm from the front edge of the machining envelope specifically so I can mount a neck or board vertically and machine the end of the part.

Here is a CAD drawing of the spoil board for clarity.



The larger holes are for bolting the spoilboard to the machine frame. There is also a regular pattern of M8 threaded inserts spaced on a 100mm grid that I use for hold down clamps and bolting jigs in place. I recently also added T-tracks spaced also at 100mm intervals for rapid hold and more adjustable hold down clamping for sheet goods. The bores for the bushings go down the center along the X axis, and you can see 3 more bores near the front of the machine.

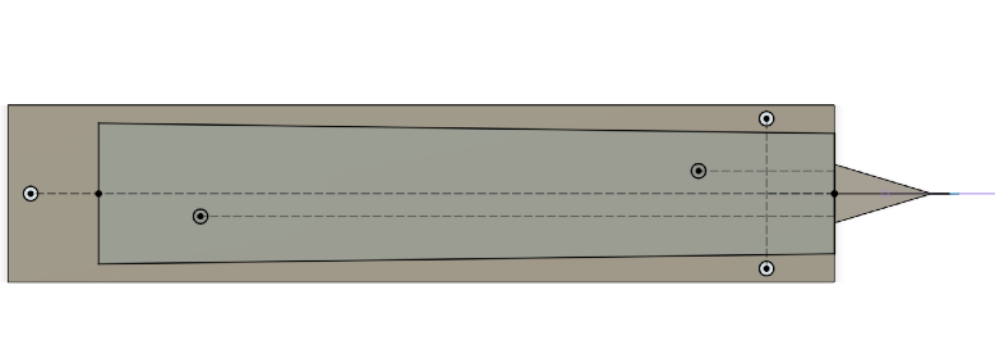
I use simple flanged bronze oil free bearing bushings from McMaster Carr, but any reasonable bearing bushing should do. You don't need to get the most exotic expensive bushings, these are only for alignment.

All my jigs are built on boards that have matching bushings and I use 3" long 1/4" diameter ground steel dowel pins to locate the jigs, and then I bolt them down on the 100mm pattern of M8 inserts. For the most part I use 4 or 6 bolts to hold a jig in place and ensure it is flat to the spoil board. For the most part, I make the jigs in place on the spoil board, so they are manufactured exactly where they will be used. I always use the jigs in the same place they were made. This compensates for any local variations in the machine travel. While I have spent a lot of effort to make the machine consistent across the entire operating envelope, these types of machines generally have higher local repeatability than accuracy. My machine has measured repeatability around 0.001" or better, but the global accuracy spec is $\pm 0.005"$. When you are machining parts on multiple sides, this can mean alignment errors around 0.01" when you flip a part, which is more than I want to allow for.

Part Locating

To locate parts on my jigs, I use shorter 3/4" or 1" long 1/4" steel dowels. Most of my jigs have dowels permanently glued in place, although some have removable dowels. All of my necks use the same pattern of two holes on the front of the neck to locate them on all jigs. This is a shop standard designed to work across a range of neck sizes, but to keep the two holes far enough apart that a little bit of slop in the locating holes will not cause significant mislocation of the neck. I space my locators 220 mm apart on the x axis, diagonally around the centerline of the neck (on opposing sides), one 10mm above the center line, and one 10mm below the center line. The first dowel hole is spaced back 60mm from the point at which the headstock slopes back from the neck. For most of my guitars this is the back edge of the nut, but different designs could use this reference a bit differently.

Below is the plan image for a neck blank for a v-neck. I use this blank for multiple different sizes of necks. The two locator holes for most of the machining are diagonal around the centerline, but you can also see 3 other locator holes that are used in earlier stages of machining on some jigs. I initially designed these around a scarfing glue up jig that I no longer use, and realistically I could probably get away now with only the two diagonal locators.



I chose the two diagonally located pins, because I also wanted to be able to have the truss rod slot milled (or at least mostly milled) on necks with a truss rod without interfering with the locators. Note that in order to use a vacuum fixture, you have either have the truss rod slot stop a bit short of the end of the neck on either end so the part can hold vacuum, or you need to insert some kind of vacuum gasket in the slot. I have taken both approaches, and I don't really have a favorite.

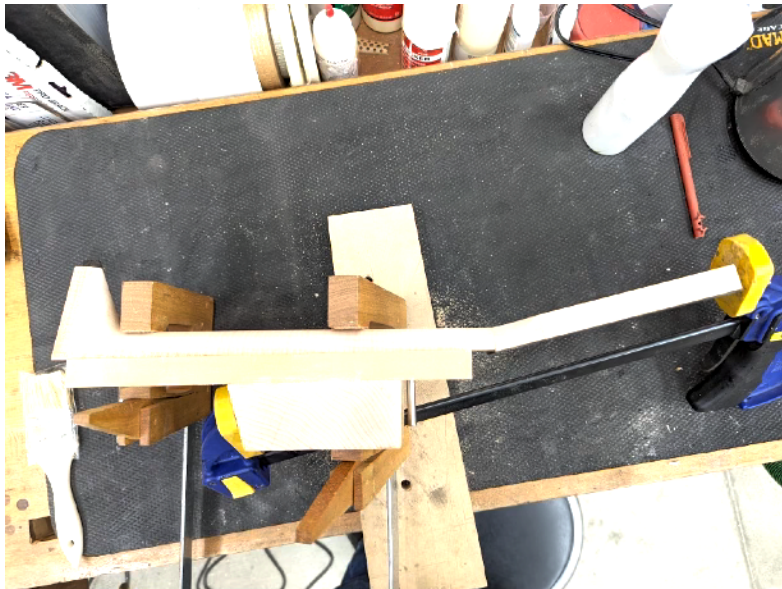
Here is a shot of three smaller finished necks with the locator holes still visible. The fingerboards have not been attached yet at this point. The two headstocks are glued on here already.



I have a clamping fixture for the headstocks that also makes use of the locating pins to glue on v-neck and bird's beak headstocks in near finished form.

I do a bit of pre-shaping of the transition before glue up, and finalize the transition after glue up.

Sometimes I glue the headstock on earlier, and let the CNC shape the transition as well when I shape the neck, but I find transitions are sometimes a bit of a fluid design element that is hard to model until I have made a few of them by hand to understand what I want.

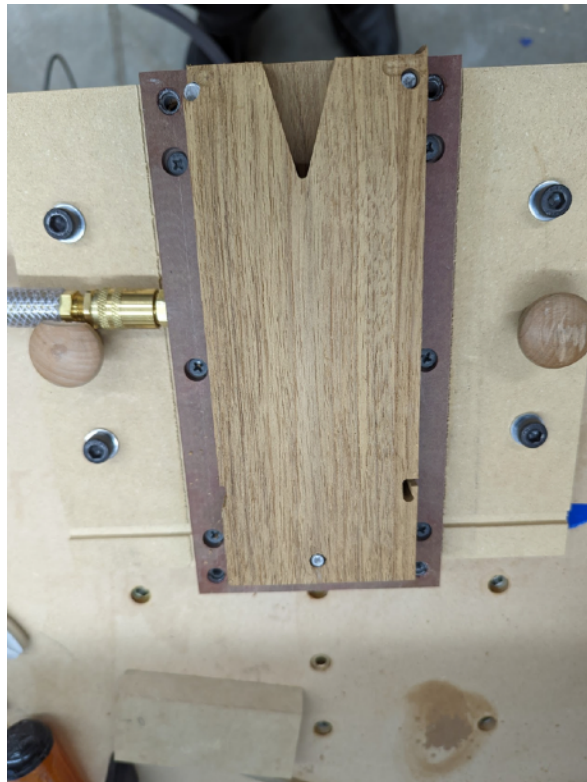


Other jigs for other parts use locating pins similarly. One key element of using locating pins that are at well known locations relative to the machine zero, is that I can work on parts from multiple sides knowing that the various cuts will very closely align. My aim in all of my jigs is to limit sanding to 0.1mm or less of material to remove any machining / alignment issues. I haven't always gotten this, but I can do this pretty reliably for the most part now.

Vacuum Tubing and Fittings

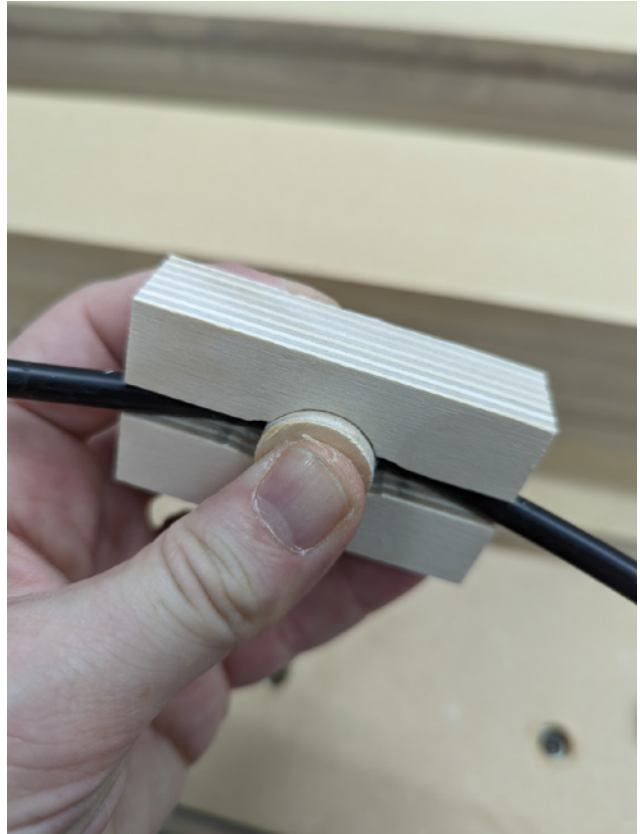
I use a mix of NPT threaded fittings and $\frac{3}{8}$ " tubing and $\frac{1}{4}$ " drip irrigation tubes and fittings to make my vacuum jigs. My vacuum pump is a small setup I got from the folks at <https://www.veneersupplies.com>. My brass fittings and $\frac{3}{8}$ " tubing are sourced here, and I got my vacuum bagging system from these folks as well. I use the same pump for my CNC jigs that I use for vacuum bagging. I tend to use $\frac{1}{8}$ " NPT fittings to bring the vacuum line to the jig itself, but sometimes I use a $\frac{3}{8}$ " tube to extend the vacuum line attachment point a bit away from the body of the jig if I am worried about the vacuum pump hose end being too close to the cutting zone.

Here you see an $\frac{1}{8}$ " BPT vacuum fitting and the hose that leads to my vacuum pump at the edge of my headstock machining jig.

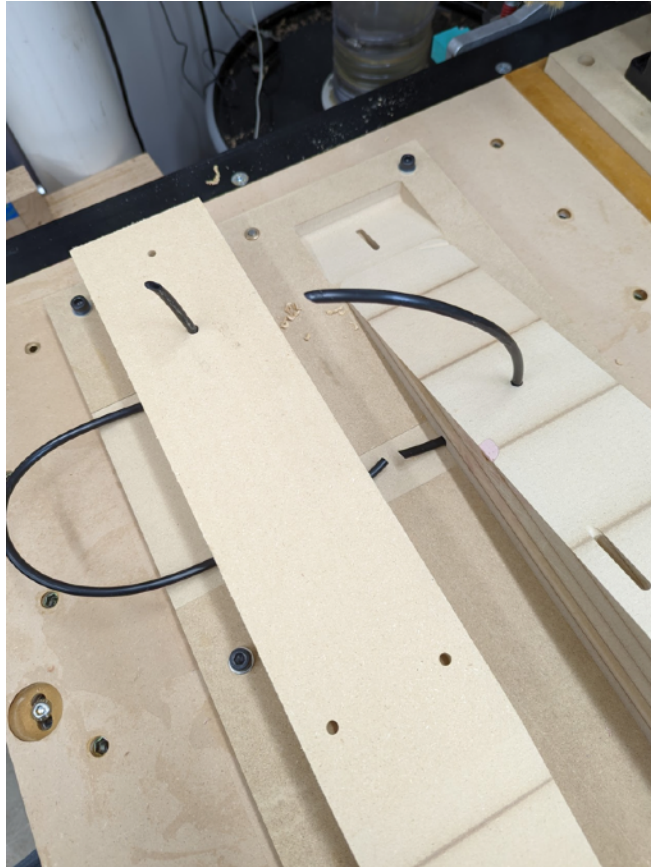


The drip irrigation fittings are a cheap source of $\frac{1}{4}$ " tubing and fittings that are good to 70 PSI, so more than adequate for vacuum fittings. This allows simple manifolds to be quickly made to distribute vacuum to different jigs on a work board. I buy my fittings at my local hardware store, but an example of the $\frac{1}{4}$ " tubing is here: <https://store.rainbird.com/t22-50-1-4-in-blank-tubing-50-ft.html> and they have the range of $\frac{1}{4}$ " tubing fittings (valves, tee's, splices, etc.).

Here is an example of a valve being fitted into a small plywood block as part of a distribution manifold assembly to show the kind of irrigation fittings I am talking about.



And here is some tubing being worked into some jig bodies to distribute vacuum to different parts of this jig.

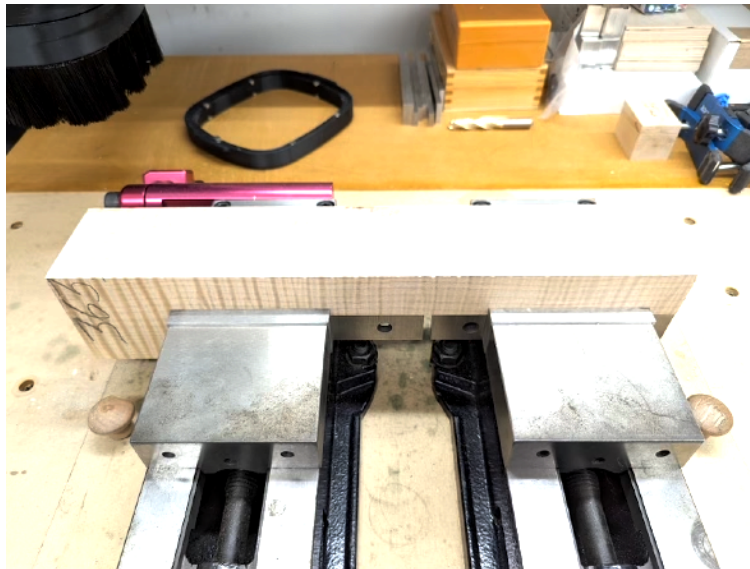


The Jigs

I have 6 primary jigs I use for making necks

1) Vise board. Nothing too fancy here. This is a carrier board that holds a pair of carefully aligned 4" machinists vises. I use this to do operations on large single piece necks establishing the top face and locator holes, and sometimes the slope of the headstock tenon. I also use this for metal work on the same CNC (primarily brass and aluminum) although I've since gotten a metalwork dedicated smaller mill to do higher accuracy work and to allow for working with steel as well. The carrier board was fabricated in place with its bushing holes, the bushings were mounted and pinned to the board, the whole thing was bolted down, and then keyways for the vises were machined. The vises were mounted, and then shimmed and indicated into alignment, and bolted down in place. The result is that the vises relocate on the machine within 0.001" every time, as long as the machine itself stays in adjustment. (I have had crashes that forced me to recalibrate, but that's CNC for you).

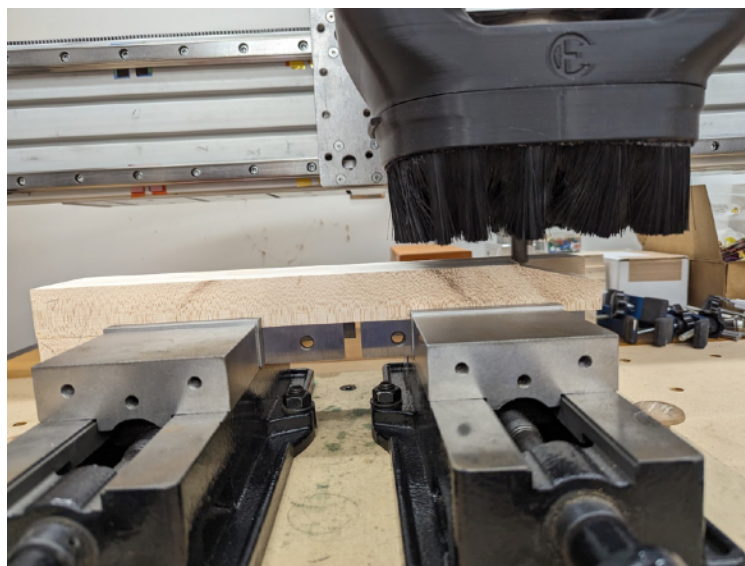
Here is a picture of the vises being used to get the stock setup for a solid maple neck. This is the blank after cutting it apart at the bandsaw. The wood was jointed and planed to rough thickness previously, so the two sides are parallel, and the blank is a bit oversized. This is one case where I am measuring the location of the stock in place, but for this neck it was the only operation that depended on measuring the location of the stock in place, and accuracy is not critical as long as the final neck shape fits in the volume of the rough stock as located.



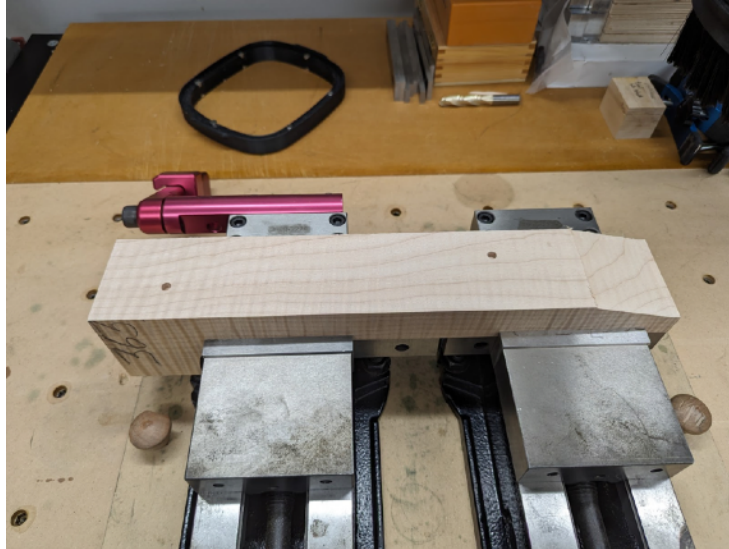
The first operation here is to plane the neck back face flat and square



The machine the ramp that defines the neck / headstock joint, and defines the top side of the tenon



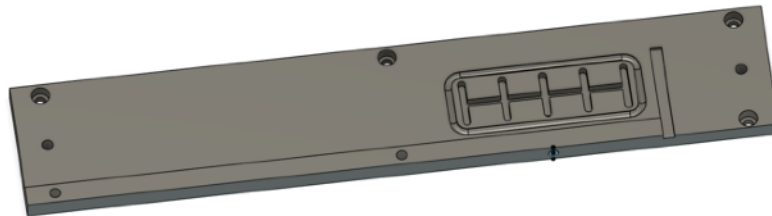
And finally bore my two locator holes that are used to locate on all subsequent jigs



Because this particular neck has no complicated undercutting in the heel, this neck blank is now ready to go all the way to my neck shaping jig to form the tenon, and then later on the same jig to machine the final shape of the neck.

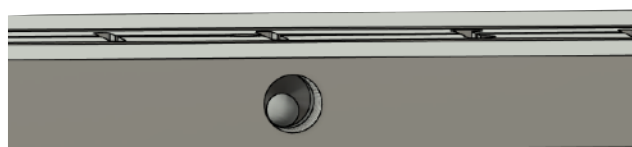
2) Stock roughing jig.

When I am making a neck with a built up heel, this is the first jig that comes into play on the CNC.



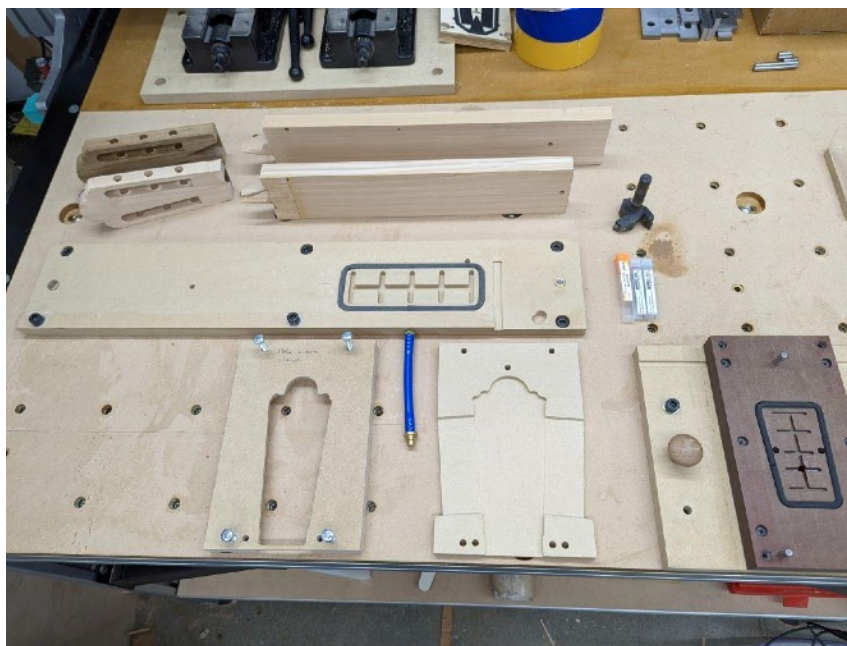
There is an integral fence, and the slot at the front defines the nut line location for some operations. I use this to size headstock blanks, neck blanks and at times fingerboard blanks (although lately I just glue/tape those down, size them and cut the frets in one go), and add critical locator holes. I have also since added some locator pin holes and used the same jig to machine birds' beak and v-neck tenons on a neck blank before gluing on the tail block assembly. The channels are 1/4" wide, and the air valve channel is simply drilled from the front side to intersect the air distribution channels of the jig and threaded for a 1/8" NPT pipe fitting. The outer channel is cut with a 1/4" round nose bit, to receive 1/4" foam for the vacuum seal.

NOTE: care must be taken that the intersecting hole does not cut through the channel for the foam seal. That means it must be either small enough or offset a bit toward the bottom of the jig so that it passes under the sealing channel. This is common to many of my jigs. Here is a view in CAD of what I mean.



If the cross drilled hole was closer to the top surface, it would break the vacuum seal around the edge of the fixture.

Here is a picture with the jig, and a couple of test necks made with this jig.



These are bird's beak and v-neck tests I did when I was designing these jigs. These necks are part way through manufacturing, having the tenon and bird's beak respectively formed, and they are now ready to have their heel blocks attached, and to have the headstocks glued on. The other jig you can see on the lower right, is the headstock jig which I will discuss next.

I used various scrap wood, mostly pine, for these tests. I do that a lot when designing new processes. I keep a few 2x4s drying most of the time so I have some stable scrap around for this kind of thing. I have found using fresh 2x4's is just a bad idea as the wood is nowhere near stable yet when you get it from the lumber yard despite being kiln dried.

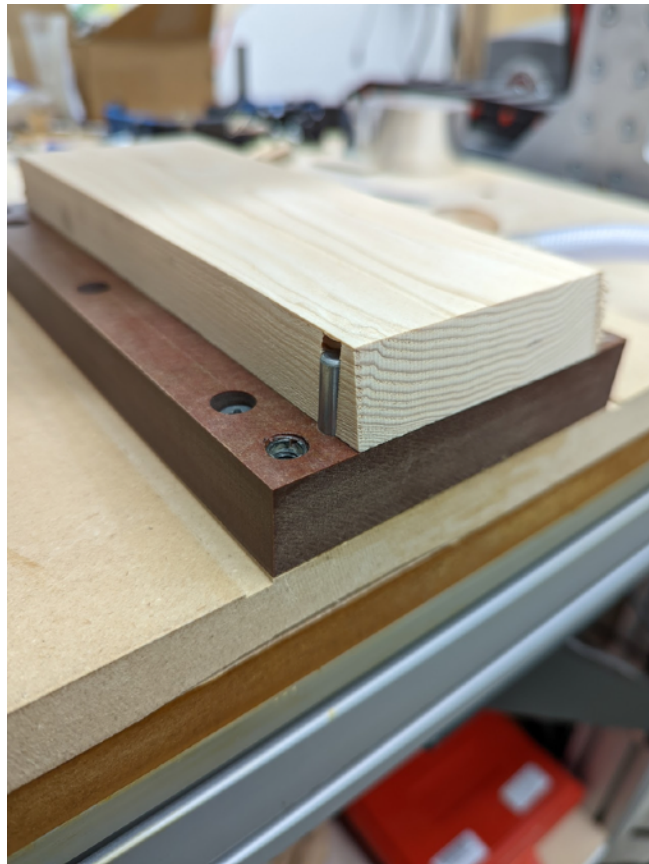
3) Headstock jig

The headstock jig is used to shape a headstock blank intended for a v-neck or bird's beak style neck. I have some other jigs for scarf jointed necks, but I don't use them any more, as I find it harder to control the outcome with them. Someday I'll probably revisit my process for that, but I find it easier to do them with manual processes at the moment as the neck angle is never quite precise enough after glueing up to fit fixed jigs.

The headstock jig has a few indexing holes for the headstock blank to allow it to be turned over and machined from both sides accurately. It also is designed to receive some clamp down plates that you can see to the left of the jig. These hold the headstock down for machining the slots and ramps, after the mortise has been established and the outer shape has been completed and locate the drilling jig for making the tuner holes.

The jig here is made similarly to the stock roughing jig, with the air inlet is simply drilled from the side of the jig, again to intersect one of the air channels, tapped and then a 1/8" NPT fitting is screwed into the fixture.

The headstock starts with a blank in place located by 3 pins at the outer edges of the stock. The slope at the back of the headstock is established on the body of the blank first.



The stock is then flipped and locator holes are bored where the slots will be, so the outline can be cut without hitting the outer locating pins



Next the mortise is cut



The stock is then removed, pins are placed for the inner holes, a faceplate is glued on, and the stock is put back on the fixture so the outline of the headstock can be machined. In the shot below, the machining of the outline is completed, and the headstock is being held in place by two hidden locator pins.



The next step is to drill the tuner holes.

Here is a shot of the simple jig I use to both line up the tuner hole drilling jig, and act as a two part clamping caul on the jig above for machining the slots.



In practice I clamp down the drilling jig on this as well as the headstock, and then drill my tuner holes as normal.

Then I mount the headstock and the caul on the vacuum fixture using the locator pins



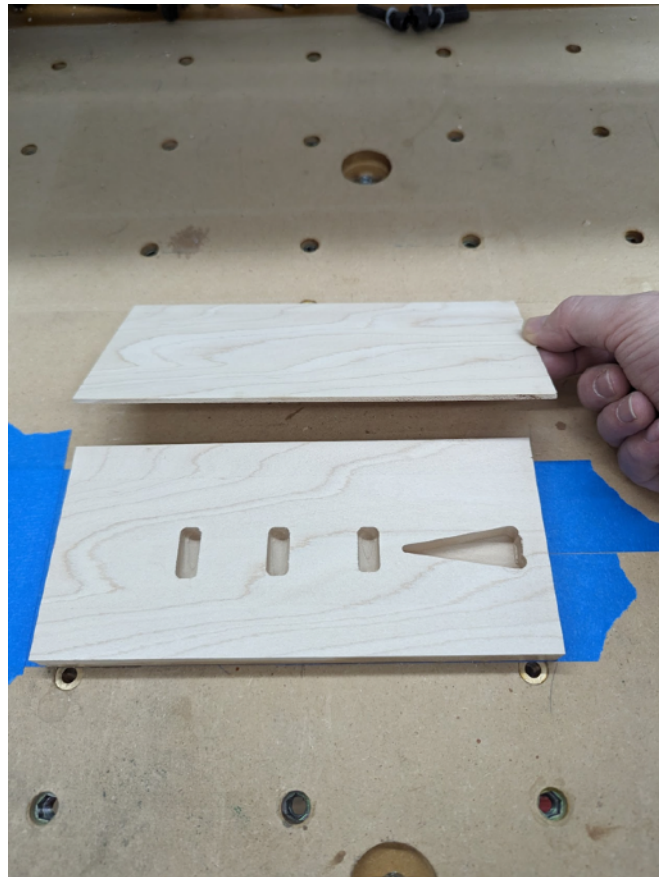
And then clamp the headstock from above with a fitted top caul to machine the slots as shown here



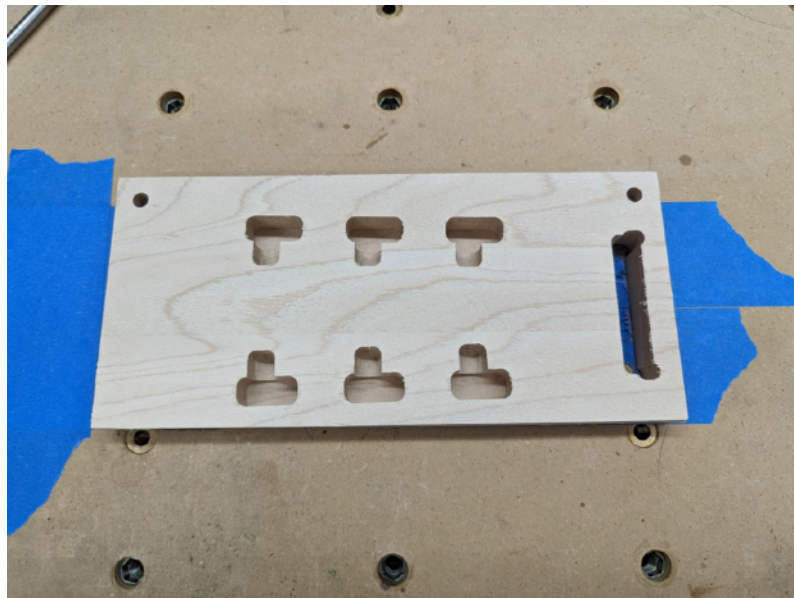
A disadvantage of this approach is that I need a pair of cauls for each headstock shape I make, but they are relatively small and easy to store.

More recently, for some builds I have directly machined the headstock on the CNC table with a couple of locator pins and blue tape + CA glue for a hold down. For those headstocks I did a series of back side operations, bored two reference pin locations, and then flipped the part and placed on the locator pin, glued it down again, and did all the front side operations. This requires a bit more waste stock but this approach also works well.

Here is a quick sketch of that process. First I take a blank with a faceplate glued to it, and thickessed. In this case, I am making a headstock for a Lactote reproduction, with tuners that are inserted from the back. In the picture below, I have machined the internal cavities that hold the ends of the tuners, and the tenon pocket, and I am about to glue on a matching back plate that was sliced from the same blank as the main body of the headstock. The blank is held down to the table with blue painters tape and CA.



I glued this slice on to the main headstock body in place, using cauls and clamps bolted down to the CNC table to provide pressure. Once that was done, I machined the cavities that the tuner gear boxes are inserted into (from behind) and the slope of the neck / headstock joint, which appears to be a slot on the right from this angle.



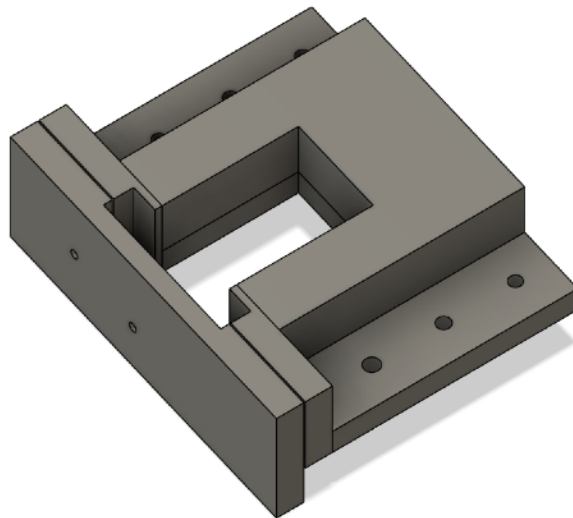
You can see here that two locator pin holes have been bored as well at the top of the stock. This is what requires the stock to be a bit larger than for my vacuum clamped approach.

I then flipped the part and machined it from the other side, locating it on pins and holding it down with simple clamps



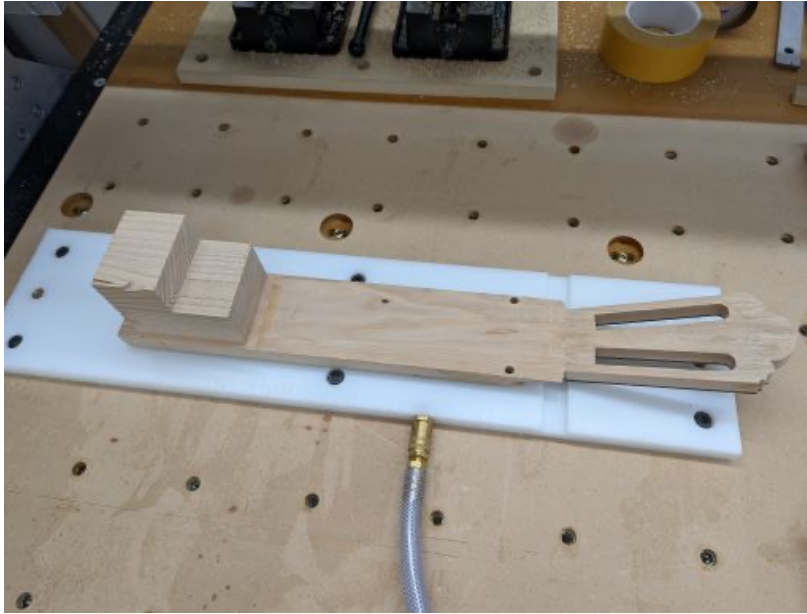
In this picture I used tabs to keep the part in place, and clamped over a bit of cardstock so I could machine through in the slots without having to worry about gumming up the end mill with blue tape.

4) Tenon Jig

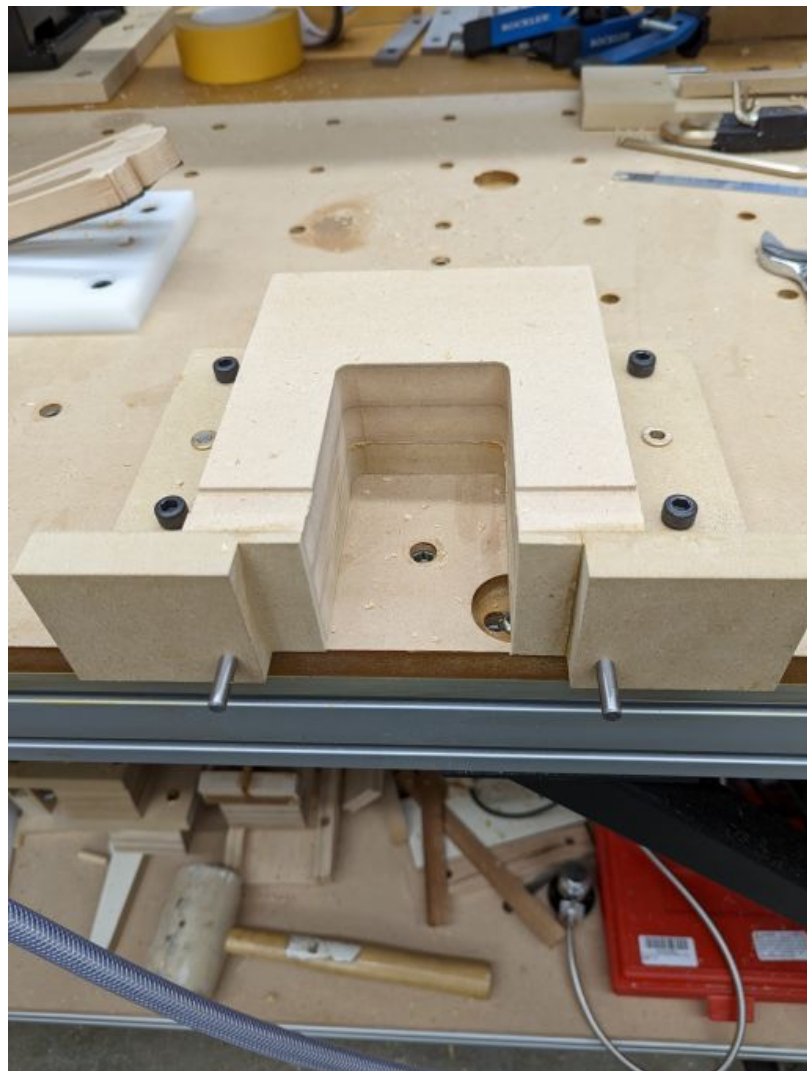


This jig is used to machine the tenon onto a neck from the end (if I am using a tenon). The heel blank is glued to the neck if using a built up heel. The heel block region is then shaped from the back of the neck to precisely fit into this jig and hold the neck in place for the tenon machining. This is designed to cut the heel block down to 70mm width, with a flat step at a known distance from the neck/body joint line.

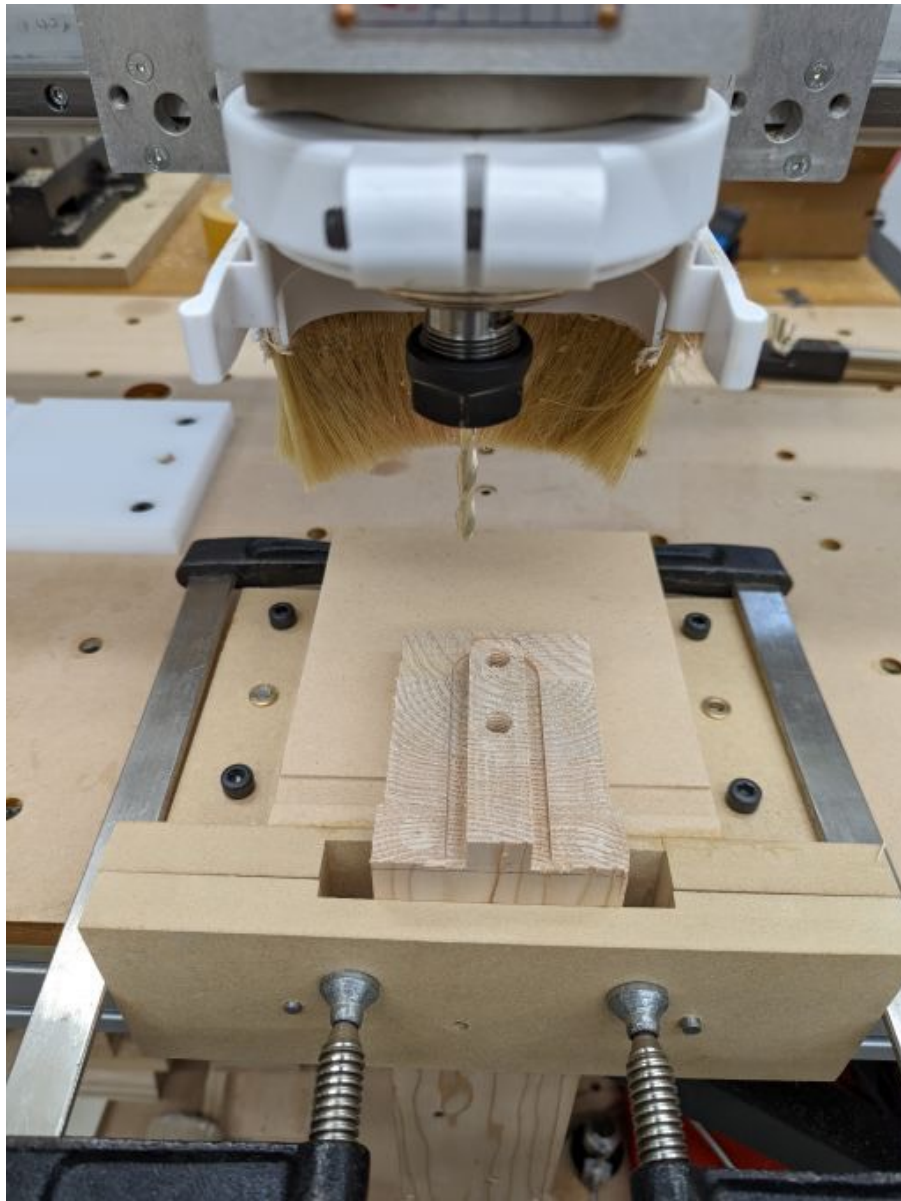
Heel block shaped to fit the tenon jig. Jig it is being held on is an earlier revision of my neck shaping jig detailed further below. I have since remade this jig to allow for smaller neck sizes to be machined.



Tenon Jig mounted, waiting for a neck blank.



Tenon part way through shaping operation.

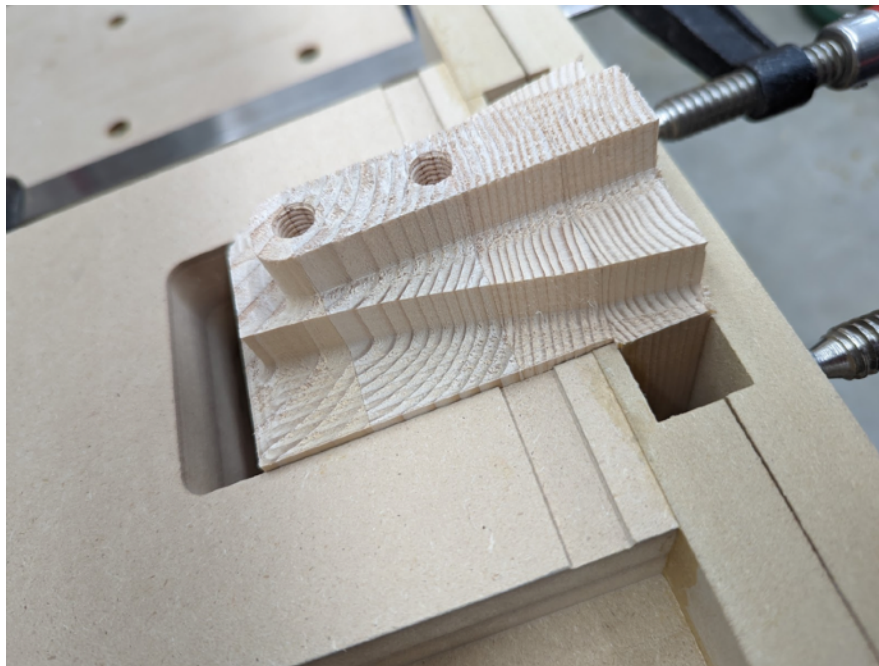


Once the tenon is established, I refine the end of the heel a bit and then I either go to side machining (next jig) or directly to the final shaping.

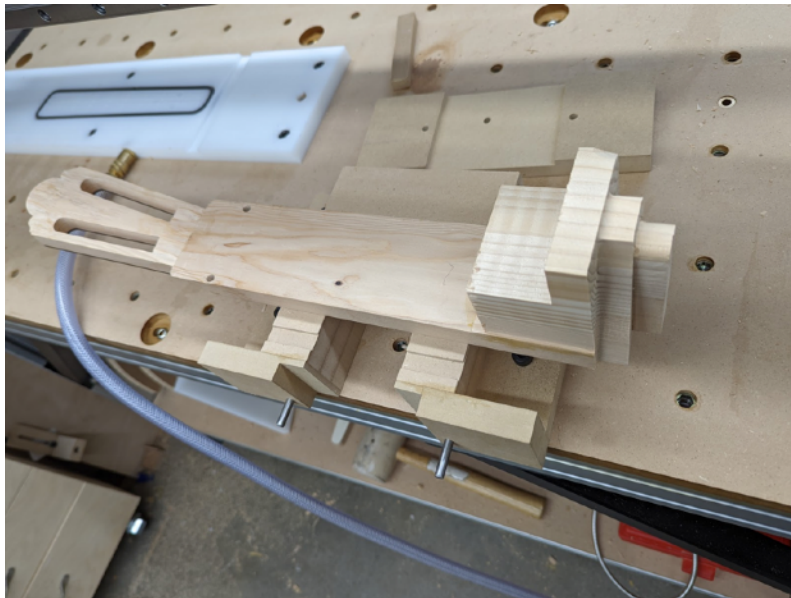
A couple of words on the tenon shaping process. The order of operations is important to prevent tearout. Typically I shape the tenon first, then bore and tap holes for threaded inserts, then further shape the heel by defining the body/neck joint as seen here. This is establishing a 2 degree slope surface that I can then tweak to get the neck fitted closely to the body.



Once that surface is established, I then shape the end of the heel to establish the shape at the body/neck transition completely.



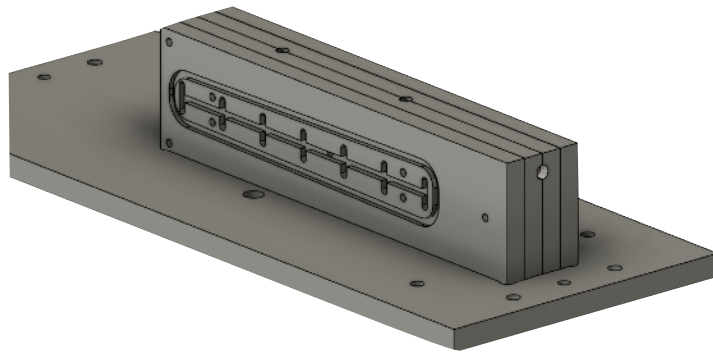
This prevents tearout problems when I am later machining the final shape of the heel. Here is a prototype neck after doing the work on the tenon jig, ready for side machining.



Notice that the Tenon Jig is just a clamping fixture, no vacuum parts!

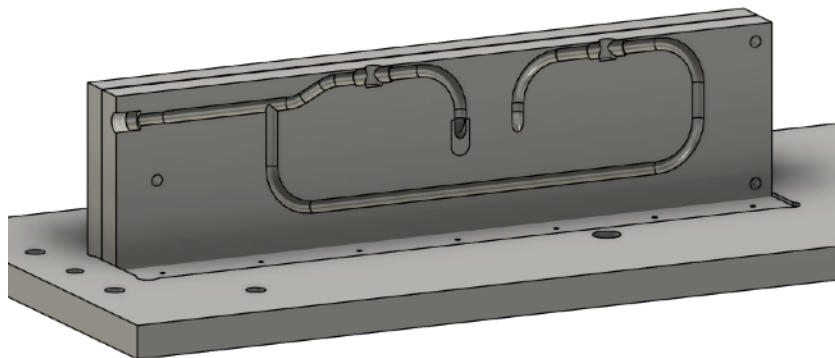
5) Side Machining Jig

This is the most complex fixture.



It has two symmetrical clamping faces which hold the neck sideways for machining from the left and the right. This required machining the tombstone (the clamping surface in the middle) to a precise size, and known location, and allowing for internal air channels. I probably made this more complicated than it needed to be in retrospect.

The tombstone is made up of 4 layers, with an internal channel cut between the center two layers



This is shaped with a ball nose cutter, and tubing and valves are fitted into the channels. The tubing is irrigation drip tubing with an outside diameter of 1/4". I don't seem to have any pictures of the tubing assembly.

In retrospect, I could have made the inner part of the fixture hollow instead, and just fixed the valves and the inlet fitting to the outer frame, and just sealed the piping to the outer faces. If I had to make this jig again, I would probably do that instead.

To control the sizing of the parts, I cut the first 3 layers on the spoil board, and cut locators in the unfinished 4th layer. I then assembled them with dowels in the locator holes, clamping the whole assembly square against a known reference surface. At this point the tubing and valves were glued in place in the assembly. The whole assembly was deliberately a bit oversized. I then located the assembly using the dowel holes, and cut the final face vacuum channels in, and then milled the outer dimensions and thickness to be an exact fit for the mounting board. I then glued the whole thing down into the mounting board, and screwed it together from the back with screws spaced every 50mm. The idea there was to get the glue line as flat as possible. If I did this one again I would probably mount it to the carrier board with epoxy and pop it into my large vacuum bag overnight instead of messing around with the screw holes, but I didn't have the vacuum bag yet when I built this.

Even being careful, the faces ended up a bit of position vs. where I designed it, so once it was all assembled, I carefully located where the faces of the vacuum clamping regions actually landed, and then modified by CNC model to reflect the "as-built" location of those two faces, so that my machining setups reflect where things actually end up when shaping necks.

Again, in retrospect, I should have built it so the faces could be adjusted somewhat in place on the jig rather than gluing the whole thing together. If I did this again, I would now probably make a central carrier out of aluminum with some hollow regions for routing piping, and bolt two vacuum faces into it such that they could be shifted and shimmed into their final places accurately. That would also allow me to replace the faces for different sized instruments if needed.

Here are a couple of shots of this jig in use on a test article. As usual I only seem to document my test runs, and not actual builds. Probably because when I am testing I am trying to document what is going wrong so I can think about how to fix it.

Here is a test neck mounted after the tenon machining, waiting for the right side to be shaped.



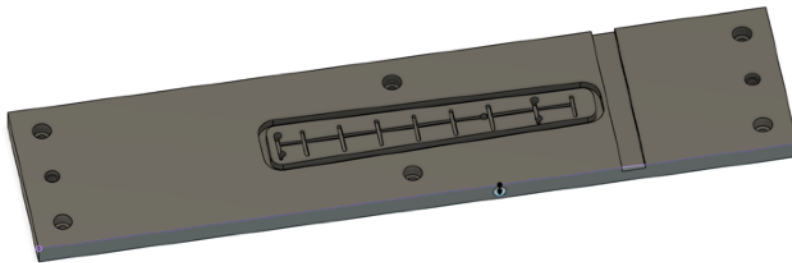
Rough shaping done on the right side, notice the stair casing effect. There is still about 0.5mm of stock left here.



Ball nose has been used to bring the main part of the heel close to the final shape. This leaves about 0.1mm still.
I don't bother machining the areas that can be reached easily from the back in the final step here.



6) Neck Shaping Jig.



This one is the workhorse for most of my neck shaping. The vacuum region is sized to work with necks down 630mm scale length, and nut widths down to 44mm, but it also works for larger necks without trouble. You can see the slot defined where the slope from the neck face and the headstock face intercept. This allows for machining at the neck/headstock joint to reach down without damaging the fixture, and gives a good visual reference that everything is lined up correctly.

This jig is used to do final shaping from the back of the neck, but I have also used to do the operations for forming a tenon on stock once the locator holes have been established.

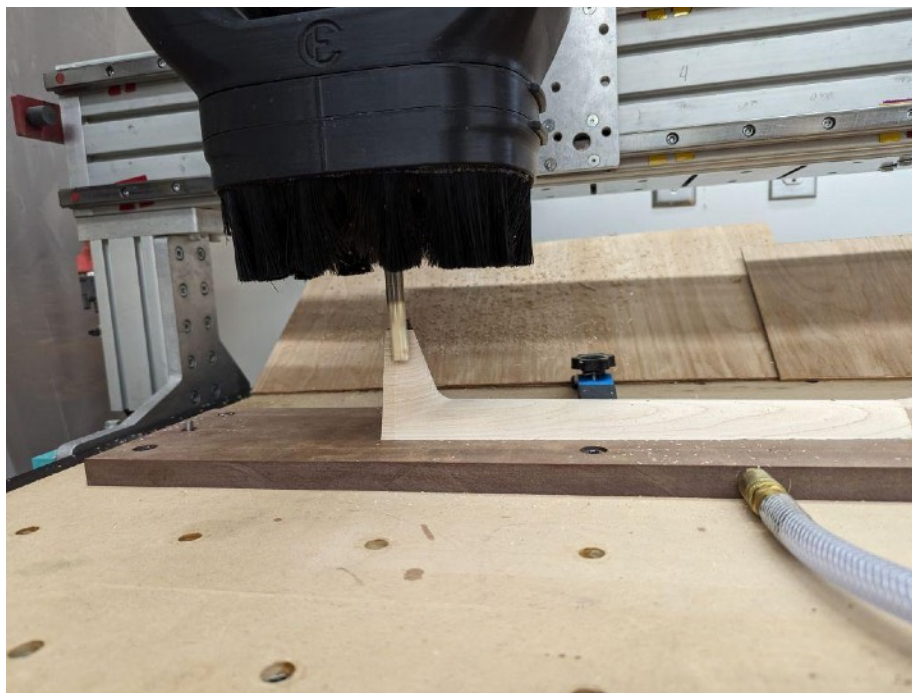
When doing final machining for a neck that has no undercutting at the heel, the side machining jig is skipped and the neck goes directly to this jig once the heel block is in place and a tenon is established on the tenon jig (if needed, I do some neck joints where the neck sits directly in a pocket on the guitar without a tenon as well).

This jigs air channels are also established with simple machining from the top of the jig, and an intersecting hole drilled from the side to provide the air feed. Again, pay attention to having the air feed hole come in below the bottom of the foam seal channel.

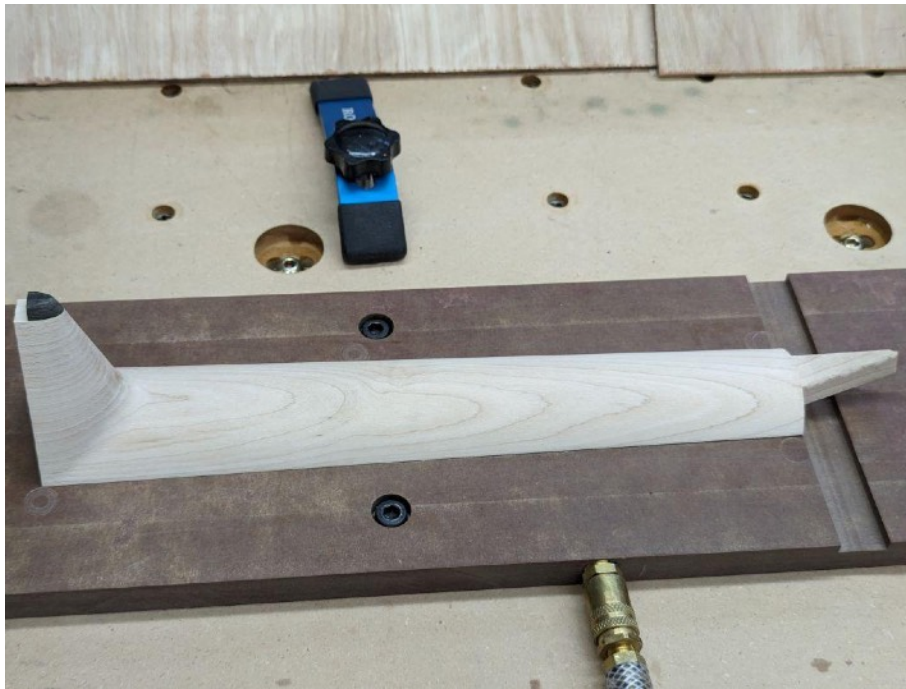
Here is a picture of the jig being used to mill the shape of a 630mm scale neck for my Lacote reproduction. Since the heel has no undercut, all the shaping is being done in a single step. This picture is part way through the roughing of the shape.



Same neck final shaping pass almost done. The bit is moving vertically up and down the heel at this point. The shaping pass is a series of parallel cuts starting at the headstock end of the neck here.



Neck finished, still mounted to the jig.



I don't have any pictures of a full sized neck being formed on this jig, but it's essentially the same process.

Hope this was helpful and of general interest. If anyone has questions, please ask.

Cheers,

Eric