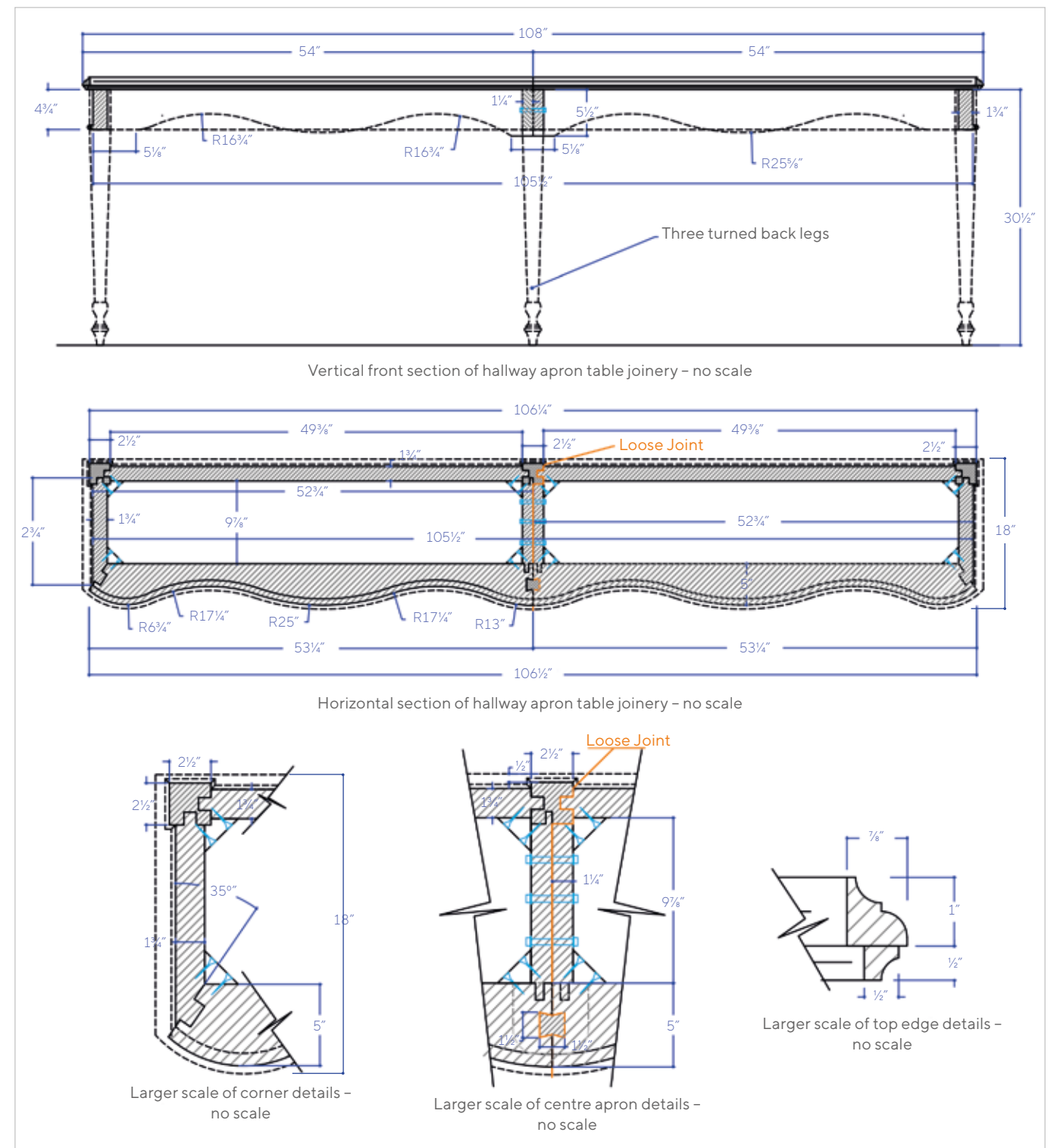


DESIGNING AND MAKING CUSTOM FURNITURE - PART 2

DENNIS ZONGKER TURNS THE BACK LEGS AND ASSEMBLES THE APRON OF HIS HALLWAY TABLE

In the last article (see *F&C* 309) I explained my process on how I came up with the design for a hallway table and two side chairs for a client. In this article I will be turning the three back legs on the lathe, gluing up the large front apron then cutting in the mortise, tenons and the dovetail loose joint in the centre of the apron. Then on the bandsaw I will cut in the double serpentine radius front and bottom edge of the apron.

To make this hall table and chairs I decided to use American black walnut, which is highly prized for its dark coloured, straight-grained true heartwood. Historically speaking, from the end of the 17th century all the way to today's contemporary style, walnut has been the popular choice for fine furniture. It is excellent for all types of woodworking. It is easy to stain dark if needed, but also has a beautiful natural colour when clear coated.



To complete this furniture order, I estimated 400 board foot of 3/4 inch thick premium no sapwood and no knots, which is a little more than the cost of standard walnut but well worth it for the quality and waste wood cutoffs. I ordered it from a company in a different state about 700 miles away. They do an excellent job of milling the hardwood and kiln-drying it to just the right amount of moisture between 6 to 8%, which I always check. When I received the order, I was very happy with the quality - it was the

best-looking walnut that I have ever seen. This made me even more excited to get started.

Before I started making sawdust, however, I finished my drawing in AutoCAD. I drew the vertical and horizontal sections in a 1 in scale so I could figure out the exact sizes, angles and radiuses and also the layout of the three turned back legs. This way I could print to full scale to make any templates, which is very helpful to duplicate when turning on the lathe.



PHOTOGRAPHS BY DENNIS ZONGKER



TURNING THE LEGS

1 I start by gluing up all three legs to thickness. The leg size is $2\frac{1}{2} \times 2\frac{1}{2} \times 30\frac{1}{2}$ in long. It is best to cut in the mortise for the side apron and back tenons before turning because the legs are still square. I like to use a chisel mortise machine with a $\frac{3}{4}$ in chisel bit. This is a real time saver. To help me duplicate the three legs I tape my paper template to the comparators on the back of the lathe. Once I have one leg locked in between the centre points, I turn the leg round using a roughing gouge. I have to be very careful at the top of the leg because it is square where the side aprons joint to the leg. To complete this step, I use the roughing gouge until I reach the $2\frac{1}{2}$ in diameter.

2 Referencing the paper template with a pencil I mark the leg cutting locations. Then with a parting tool, I cut in the depths by checking with a calliper for the different depths calculated by the template.

3 Once all the parting tool depth cuts have been completed, I use a roughing gouge to blend the sections between the parting tool cuts together. This will give you a smooth and accurate size to the leg.

4 For turning the smaller sections of the leg, I use a $\frac{1}{2}$ in wide round scraper to remove the waste wood between the depth cuts. A round scraper is an excellent turning tool for smoothing and blending smaller details together.

5 I use a skew turning chisel to get into tight corners and round over corners to make a radius bead or ring.

6 After I am done turning with turning gouges, I use 150-grit sandpaper to smooth and blend any blemishes. Then to remove any sandpaper cuts I take a handful of the chips that I just turned to lightly polish the leg.

7 This is the completed leg, showing the square upper part of the leg with the mortises. I left the leg a little longer for safety because of the lathe centre points, which I will hand cut once all three legs have been duplicated.

LARGE GLUE-UP

8 The front apron is slightly large measuring 5in deep, $5\frac{1}{2}$ in tall and $106\frac{1}{2}$ in long, and needs to be glued up as one piece even though it will be cut in half for the loose joint. By gluing it in one piece I can match up the grain to where the loose joint will look invisible, giving it the appearance of one piece of wood. I start by cutting three pieces of walnut $1\frac{1}{16}$ in high by $5\frac{3}{4}$ in wide by 108in long with matching grain and colour, then glue them together. I use poplar hardwood on the outside faces so that the clamps don't leave a mark on the face. After the glue dries, I square up the front apron on the jointer, then cut the ends and centre on a mitre saw, making sure everything is exactly square.

9 Close-up of the apron glue-up.

LOOSE DOVETAIL JOINT

10 I next make a routing jig that wraps around the apron centre joint. I basically made a box out of soft maple that slips over the end with a snug fit, then attached the two outer sides that the router base would ride against allowing me to make a larger dovetail almost double the size of the router bit.

11 Showing the router bit cutting in the opposing side with the router base riding against the outer side.

12 Close up of the dovetail router bit and the baseplate, following the router jig side.



13 This dovetail spline is 1½ x 1½in square. I use the same dovetail router bit and set-up in a router table to where I split the height of the router bit to half at ¾in. It's a good idea to make your dovetail spline longer until you get a perfect set-up. Once I have the router bit set, then I just run all four faces through the router bit.

14 Showing the dovetail loose joint spline separated.

15 Showing the dovetail joint together. It is very important to keep all your cuts square and accurate and the spline should be able to move in and out without moving the apron. This will keep the joint with a snug fit when together.

CORNER JOINTS

16 Routing the mortise on the outside corners of the apron by making a similar jig as the dovetail jig the difference is that the corners are cut at a 35° angle. I used a straight cutting router bit to cut in the mortise, using the sides of the jig as a guide for the router base to rout in the 1½in wide mortise.

17 Showing the cut-in mortise and full jig clamped to the apron.

18 To cut the tendons onto the apron sides and back I use a dado blade set with a tablesaw sled. On the side apron rails I set my blade at a 35° angle and set my cutting depth. On my straight tendons I set the dado blade to where I cut on both faces and one cut on the bottom of the edge to fit into the mortise.

19 Dry fitting all the mortise, tenons and loose joints – this is an important step to have a proper fitting joint that is not too tight or loose. If the joint is too tight, I use a block plane or wood chisel file to shave off just a little at a time until the fit is snug. If the joint is too loose, glue a piece of veneer to the tenon then trim to fit.

BANDSAW DOUBLE RADIUS

20 The front apron has two different sets of radiuses. The face of the apron matches the top just set back 1¼in while the bottom of the apron has an opposing set of radiuses. For me it was easier to print full-scale drawings of one side of both sets, since the top and the apron are mirrored from the centre of the table. Then I would cut and tape the paper template to the apron then draw a line

following the template. This was much easier than using trammel points. Once I have my lines all drawn onto both faces, I set up my bandsaw with a ½in wide blade 3-tpi positive claw to be able to cut through this walnut at 5½in thick. I also have a bed extension to help support the apron as I feed it through the bandsaw blade.

The location of the hand-carved acanthus leaves that will wrap around the bottom edge of the apron means that I will need to allow extra wood at all four placements. So, I draw in an extra opposing arch before I start cutting.

It's important to check your blade and table top are square to each other by checking it with a square. Once I start feeding the apron into the blade, I just follow the pencil line. If it is cutting properly, it should be a nice even flow.

21 Once I am done cutting the bottom radiuses, I tape the waste wood back onto the apron.

22 This will give me a solid block with the opposing lines on top for cutting the front radiuses.

23 Now that I have both the face and the bottom of both aprons cut out, I can draw in the acanthus leaf location.

24 With a full-scale template of the acanthus leaves I draw around the outside edge for the exact placement on the face of the aprons. Then I go back to the bandsaw to cut out the wrap around acanthus leaves.

25 The last step before I start hand carving is to rout in a ¾in-deep rabbit into the top apron. This will be a depth cut to help me gauge how deep I will be carving.

26 Here you can see the full apron with the loose spline connecting both sides together. Ready to start the carving.

THE NEXT STAGES

In my next article I will be showing the steps for hand carving the shells and acanthus leaves and the radius bullnose trim in the bottom edges of the apron, plus how to make and carve the three front legs.

You can also follow my work on Instagram: [@denniszongker](https://www.instagram.com/denniszongker)