

Mission Style Dining Table Build Plans

Project Introduction

This is one of my favorite projects and the end result is an extremely well built, heirloom piece of furniture that will be passed down to my kids and beyond. Best yet, it is of better quality than you can buy at most furniture stores and of course, you built it with your own hands. It's also a cool project to do with your spouse and your kids too. Guests at the dinner table always ask, "you built this?" My super power: I turn wood into useful things.. and so can you.



General Overview

As you saw in the YouTube video, I chose to custom order thicker sanded White Oak stock from a local hardwood lumber supplier. Though the thicker lumber helps add to the beefiness of the leg structure and the overall table, this project can also be completed with standard available Oak or other hardwood stock available at a better quality / local lumberyard. In North America, $\frac{3}{4}$ inch material will work as well, or 19mm thick sanded lumber from European countries. I'm not going to lie to you. The thicker wood stock looks better and stands apart from almost every other piece of retail furniture which is normally built with $\frac{3}{4}$ inch thick wood.

Cut Dimensions

Regardless of the thickness of your lumber, the length and width cut dimensions found in these build instructions will apply. Your finished table will be at the same overall dimensions as the one in the video where the only difference will be leg and table top thickness.

Overall Cost

I hate to dump this statement on you, but "it depends". $\frac{5}{4}$ White Oak sanded stock was ridiculously expensive for me, as would be Cherry, Black Walnut or Hard Maple. Soft woods like a clear Pine or Poplar would be cheaper, but the material is too flimsy and soft to hold up over time. Just don't do it. Spend the extra money and choose a quality hardwood that won't scar when you jam your thumbnail into it. In the end, even though you'll feel like the project was expensive, your finished table will be a fraction of the cost of anything comparable on the retail market made with solid hardwood, excluding cheap Lauan from China. My table finished out at just over \$1,400 in 2022 money, and that pricing might have been inflated due to Covid supply issues. Your local lumber prices may vary, sometimes dependent on local varieties available.

Safety

Be careful. Read all usage and safety instructions on every power tool you use. Wear all recommended safety equipment (ear, eye and dust protection) during cutting, assembly and sanding activities. Wood shop happiness comes from finishing a project with all your fingers and toes, eyes and lungs intact.



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Pitfalls & Lessons Learned

Be a square. Most of the precision cuts on this project require that your table saw blade is calibrated at an exact 90 degrees. Use a square, use a digital angle meter, whatever, just make sure you're not wasting time and money by your blade being off a half degree. Check it. Stay happy.

The 60 Tooth Trim Blade. You're not supposed to strain your saw motor using a trim blade for hardwood rip cuts. But, the finished surface after the cut requires very little planing and sanding. I went slow on my cuts, not pushing the stock too hard and just letting the new sharp saw blade do it's thing.

The Best Tool You Own... Is your credit or debit card. Time and tools are precious. It's worth it to find a good hardwood supplier that can do some initial mill work on your selected stock. As shown in the video, I hand selected my own boards and then had the lumber yard do the initial thickness planing for me. They also glued up my boards for the table top and ran the entire top through a commercial planer to make the surface perfectly smooth. I don't own a 40 inch wide commercial planer... so my best tool for that job was a credit card. I wound up with 1 ¼ thick stock (5/4), ready for trim cuts and assembly. If you have the time and the tools to do all that rough lumber mill work, have at it. Sometimes it's cheaper to pay for prep work.

Wood Moves. When you do find your local hardwood supplier and you purchase your raw stock, be aware that some of the wood is likely to twist or warp slightly after you make further rip and cross cuts. Even the kiln dried stuff you paid for isn't completely stable at 7% moisture rating. Commercial kiln drying usually only brings the lumber down to 10% or 11% moisture content. Fresh cuts open up the grain for it to dry a little more and the wood might move. Just be ready. Make your rip cuts or cross cuts just before you glue and assemble your components together. Once you get joints glued up and other pieces assembled, the chance for further movement is diminished. If you make a bunch of your cuts and then let the lumber sit for a week, you might be asking for trouble.

Patience. Let your glue joints dry and cure for at least 6-8 hours. Trust me on this. It's easy to get excited and want to move on to the next step. Wait. Have a beverage. Take a nap. Watch a game on TV.

Know Your Limitations. I've heard stories and seen some pretty ugly YouTube videos where improper usage of power tools can lead to serious injury. The table saw is the worst offender, especially if you're not watching how you feed the lumber into the blade, or twisting the wood against the blade. That will cause an immediate kick back and an injury. Make sure your rip fence is calibrated square to the saw blade and that you are keeping your stock hard up against the fence during your feed. Don't rush the cut. Don't over stress the motor. Let your brand new super sharp saw blade do the work. For smaller piece cuts or thin cuts, always use a quality push stick that puts pressure down on top of the stock as you hold it against the fence and push it through the cut. The height of your saw blade should only be slightly above the thickness of the wood you are cutting. Don't have a spinning blade cranked up all the way begging to be introduced to your fingers.

If you are new to woodworking, this project is actually pretty simple from a cut and assembly perspective. But if you are not all that comfortable on the table saw or using trim tools like a router, maybe call for some help from dad, or uncle Bob, or your neighbor if they happen to be woodworkers. You can do this. Just take care and be safe.

Mission Style Dining Table

Materials / Cut Dimensions

Unless specified, All structural boards finished to 5/4" thick

(All dimensions are at finished measurements)



Table Top

Overall 38" X 76" This size will allow seating for 8 people. It uses 5/4 plainsawn White Oak lumber (1 1/4 inches thick) glued and surface planed for me at the lumber supplier after picking out my boards. Other hardwoods like Cherry, Walnut, Hard Maple or Hickory are also good candidates for this table design, depending on your color and style preference. If doing your own glue up, add extra width and length to allow for a final trim cut to finished dimensions.



Set of 2 Legs

- (4) Leg front facing pieces: 4" wide X 27 1/4" length.
 - (4) Leg side pieces: 2 1/2" wide X 27 1/4" length.
 - (2) Top stretcher pieces: 2 1/2" wide X 17 3/4" length.
 - (2) Bottom arched stretchers: 5" wide X 17 3/4" length.
 - (8) Vertical staves: (3/4" thick) 1 1/4" wide X 16" length.
 - (2) Leg Top Attachment Plates: (3/4" thick) 5 1/2" wide X 30" length.
- (My top plate fits snugly inside the apron, but can be shortened for added clearance)*

Leg Trestle

Single trestle spanning the gap between the table legs, attached to the lower arched leg stretcher.

- (1) Trestle: 2 1/4" wide X 49 1/2" length.

Underside Tabletop Apron

- (2) Long apron pieces: (3/4" thick) 2 1/2" wide X 68 1/2" length.
- (2) Short apron pieces: (3/4" thick) 2 1/2" wide X 31 1/2" length.

Long apron pieces fit inside the short pieces, butt jointed and doweled. Inside apron/frame dimensions should be finished at 30" X 68 1/2"



Mission Style Dining Table

Assembly Steps



Cut down your leg lumber to the specified lengths and widths and finish plane / sand the edges for glue up. Prepare and glue each of the 4 vertical leg pieces. Make sure the glued edges are smooth and flat, forming a tight and true 90 degree corner. The 2 ½ inch board should butt joint on the inside of the wider 4 inch board in effect showing you a nearly equal sized front facing and side facing leg width. Using TiteBond III glue, make sure the edges line up before clamping and adjust the alignment with a plastic hammer as needed. Clamp along the leg length and wait until cured and dry. Do this procedure for all 4 vertical leg pieces.



OPTIONAL: Draw an arc on each of the bottom leg stretchers. Be sure to leave at least a 2 ½ inch wood width at the top of the arc to allow for the attachment of the trestle. This is purely a design element and an option for your project. The bottom leg stretcher can remain a 5 inch wide rectangular piece and still fit into the Craftsman / Mission style design. Cut out each arc on the band saw or with a jig saw and do your initial rough sanding to smooth out the cut.



Once the vertical leg pieces are dry, measure and center drill 3/8 inch dowel holes down the length of each leg, so that an oak dowel can be hammered in place to secure the wider front facing part of the leg to the side piece. Drill 4 dowel holes minimum, equally spaced down the leg, at a 2 inch depth. It's easiest to make a simple drill template and centers and positions each hole so that you can overlay that template and make exact duplicates of the drill pattern on each leg. Cut your dowels to a length of 2 ¼ inches. Glue and hammer in the 3/8 inch oak dowels into each leg. Trim off the excess dowel material with a flush cutting saw.



Make a "Back Slat" ¼ inch hole drill template that will center and equally space dowel drill holes for the four vertical staves that fill the inside of the leg assembly. The staves are using ¾" thick material at 1 ¼" wide, the template helps center the inset staves within the width of the thicker leg frame. Take your time with this step and make sure your template equally spaces the staves away from the left and right side of the leg, while centering them on the thicker 1 ¼" stock. See the video for more detail on this step. These holes are drilled into the top flat edge of the arched leg piece and the matching hole pattern on the top leg frame piece (2 ½ X 17 ¾ inch piece)



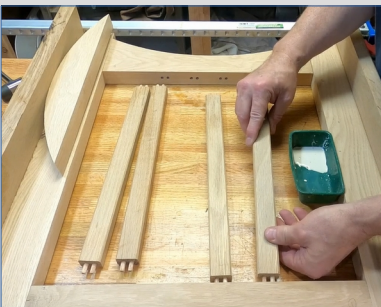
Matching the hole drill pattern used above, create another small jig to center the drill holes in both ends of each staff – 4 on each leg, 8 staves total. Each staff will then accommodate a 1 ½ inch long oak dowel at ¼ inch thick.

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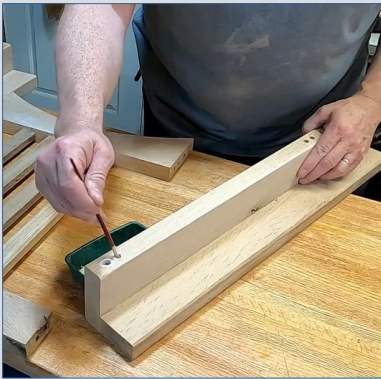
Assembly Steps



Prepare 3/8 inch dowel holes that align the vertical legs with the top and bottom frame pieces. Create a drill template or mark and center drill your dowel holes to accommodate 2 inch oak dowels, (2) on each end of the top frame board, and (3) dowels on the bottom arch board. Your drill hole in each piece should be a little deeper than 1 inch so that the dowels fully bury themselves inside the clamped and glued frame. The wider 4 inch front of each leg should face forward, exposing the vertical leg dowels.



Glue and clamp the inside leg assembly first. Pre-glue and hammer the 1/4 inch dowels into the top and bottom of each stave, wiping off the excess glue. Add glue to the dowel holes on the bottom frame piece and hammer the staves down into the holes. Finish the glue process on the top of the frame, again hammering the entire frame section together, top and bottom. Using your arch cut off to help support a flat surface for clamping, clamp the top to bottom frame section, pulling the staves tight against the frame. You can also use the vertical legs and additional long clamps to help keep the entire assembly square.



Once the center stave section is dry, you can complete each leg structure by gluing in the thicker 3/8 inch dowels into the vertical legs, and then glue the leg pieces into the center stave assembly. Clamp them together checking the full assembly for square, and wipe off any excess glue with soapy water.

Let the entire assembly sit for 6 – 8 hours to completely cure and dry.



Out of 3/4" thick oak stock, cut two pieces 5 1/2 inches wide by 30 inches long. This will act as a top plate for each leg assembly and provide the structure for attaching the leg to the underside of the table top. Center this flat board on each leg, marking and drilling in holes down each vertical leg and across the top frame rail. Counter sink the drill holes so that your chosen wood screws sit below the surface of this board. This will allow the top plate to sit flat on the underside of the table. Recommended screw length: 2 inches.

This flat top board does not need to be glued onto the legs.

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Assembly Steps



Assemble the underside table apron by squaring the corners of the apron frame pieces and drilling in holes for $\frac{1}{4}$ inch oak dowels. The $31\frac{1}{2}$ inch shorter pieces should face outward towards each end of the table, showing the dowel detail as seen with the legs. A small template measured out to center the holes will help consistency of your drill pattern.

Glue and hammer in the dowels to complete the underside apron assembly.



With the apron centered on the underside of the table top, pre drill and counter sink holes approximately every 8 – 12 inches apart, down the center of the $2\frac{1}{2}$ inch apron sides. The apron will be attached to the underside of the table with 3 inch self tapping cabinet screws, digging into the table top about $\frac{3}{4}$ of an inch.

CAUTION: If you choose to use tabletop material thinner than $\frac{5}{4}$, or your apron is less than $2\frac{1}{2}$ inches in width, the screw heads may penetrate the table top. Be sure, be extra sure, that your screw length is appropriate for the apron and table top thickness. We're only looking for $\frac{1}{2}$ to $\frac{3}{4}$ inch of screw depth to hold the apron to the top.



The flat panel on the top of each leg gives you some flexibility as to where the leg is positioned on the underside of the table. For me, I needed enough distance between the legs to accommodate 3 of our dining chairs, so the distance between the inside edges of my legs is 43 inches. The flat oak top plate is then drilled and screwed into place with $1\frac{1}{2}$ inch cabinet screws.

No glue is used here as I designed the legs to be taken apart for easier transportation. The table was built in our old home in anticipation of moving it to our current home.



The trestle board is finally attached to the center of each arched bottom frame piece with (2) 3 inch heavier duty screws. These were counter sunk with a Forstner bit to leave a clean, circular hole, and those holes provide a way to trim out the trestle attachment with trim dowels, or like you saw in the video, I created an end cap to cover the screws.

The table assembly is complete and can be disassembled for final finishing.

Mission Style Dining Table Assembly Steps



Of course, we skipped over some of the details that you'll see in the YouTube build video, like the router work we did to ease the hard edges, or all the finish sanding required to make the entire table perfect. But you already knew that.

The finishing of a project like this is personal, including whether or not to stain the natural wood or not. This is a bit of a wood religion argument between woodworkers. "How dare you stain a beautiful White Oak table?"

I did it to match the chairs we already owned. In fact I chose a color that is consistent with the Craftsman / Mission style period of furniture design. So there. I did it because I wanted to.

But, please make this project your own. Your table size can vary to suit the room you're putting the table in. The hardwood you choose is a personal choice too. I think this time tested Mission style leg design will work well for all sorts of tables, from bedside tables to dining tables and everything in between.

So, go forth. Design. Cut. Build. Make something you're proud of and that will be fought over by your children and grandchildren long after you're gone. It's a legacy thing.