Woodsmith PLANS

CRAFTSMAN COFFEE TABLE

TOTAL SUCCESS
SHOP TESTED
GUARANTEED

FEATURE PROJECT

COFFEE TABLE

Quartersawn oak, mortise and tenon joinery, and a beveled glass top make this coffee table a welcome addition to any home.

Drilling a round hole to create a mortise for a square tenon has always struck me as a bit odd. But aside from investing in an expensive machine for making mortises, the only solution I could come up with in the past was to round the tenon or square up the mortise with a chisel.

Now, if you're only talking about a few mortises, that's not a big deal. In fact, it's kind of relaxing. But when it comes to the numerous spindles on the ends of this coffee table, it's a bit of a different story.

There are twenty-six spindles in the table, which means there's a total of fifty-two mortises to drill and square up. Instead of a quiet hour or two, you could spend the better part of a day on this part of the project alone.

Fortunately, I came up with a different procedure to make the mortises both quickly and accurately. (I'll give you a hint — it doesn't involve using a drill press or a chisel.)

GLASS TOP. But the mortises aren't the only feature of this table worth mentioning. The beveled glass top is also a little out of the ordinary.

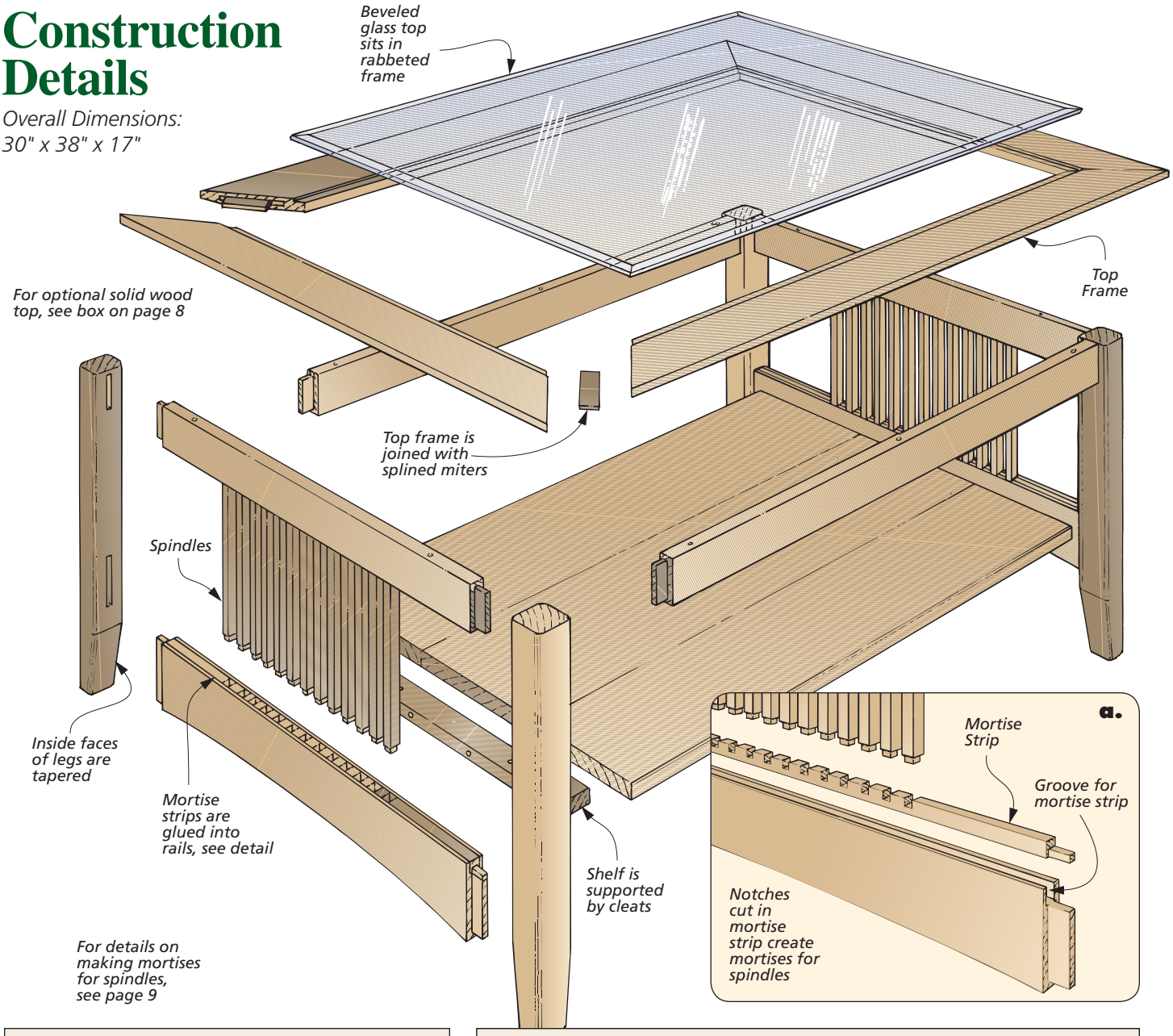
At first, I was worried that the beveled glass would look too "modern" for this style of table. But actually, it complements the style by giving you a clear view of the spindles from just about any angle.

However, if the glass top doesn't suit your home decor or taste and you would prefer the look of a solid wood top, I've included that as an option in the box on page 8. You'll find that it isn't too difficult to make the switch to a more traditional look.

CHOOSING MATERIALS. One more thing. For the table pictured above, I decided to use quartersawn white oak. This balances the coffee table's more contemporary glass top with its traditional Craftsman design.

Construction Details

Overall Dimensions:
30" x 38" x 17"



MATERIALS

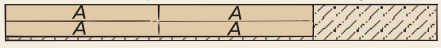
A	Legs (4)	1¾ x 1¾ - 16¼
B	Upper End Rails (2)	¾ x 2 - 24½
C	Lower End Rails (2)	¾ x 3 - 24½
D	Mortise Strips (4)	½ x ⅜ - 24¼
E	Spindles (26)	½ x ½ - 8¼
F	Cleats (2)	¾ x 1½ - 17
G	Stretchers (2)	¾ x 2 - 32½
H	Shelf (1)	¾ x 22 - 32
I	Frame Front/Back (2)	¾ x 3½ - 38
J	Frame Sides (2)	¾ x 3½ - 30

HARDWARE

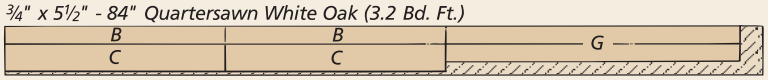
(1) Beveled Glass ¼ - 24 x 32
(6) #8 x 1¼ Fh Woodscrews
(18) #8 x 2 Fh Woodscrews

CUTTING DIAGRAM

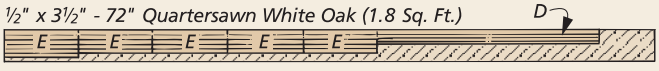
1¾" x 4" - 48" Quartersawn White Oak (2.7 Bd. Ft.)



¾" x 5½" - 84" Quartersawn White Oak (3.2 Bd. Ft.)

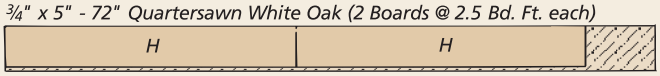


½" x 3½" - 72" Quartersawn White Oak (1.8 Sq. Ft.)



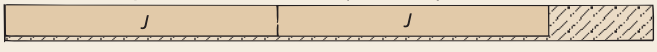
¾" x 5" - 60" Quartersawn White Oak (2.1 Bd. Ft.)

¾" x 5" - 72" Quartersawn White Oak (2 Boards @ 2.5 Bd. Ft. each)



¾" x 4" - 84" Quartersawn White Oak (2.3 Bd. Ft.)

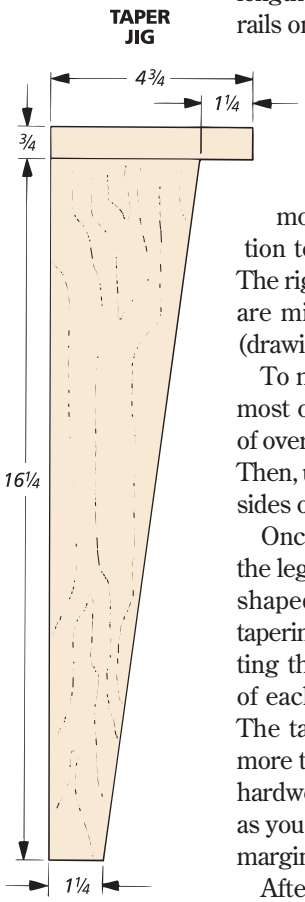
¾" x 4" - 72" Quartersawn White Oak (2.0 Bd. Ft.)



End Frames

Broken into its basic parts, the coffee table is nothing more than a couple of end frames joined by a top and a shelf. And each end frame contains a pair of legs, a pair of end rails, and a row of spindles. I started building these frames by making the legs.

LEGS. The legs begin as four squared-up blanks cut from 1¾"-thick stock, as shown in the drawing at right. After cutting the leg blanks to length, I laid out the mortises for the rails on each leg (detail 'a').

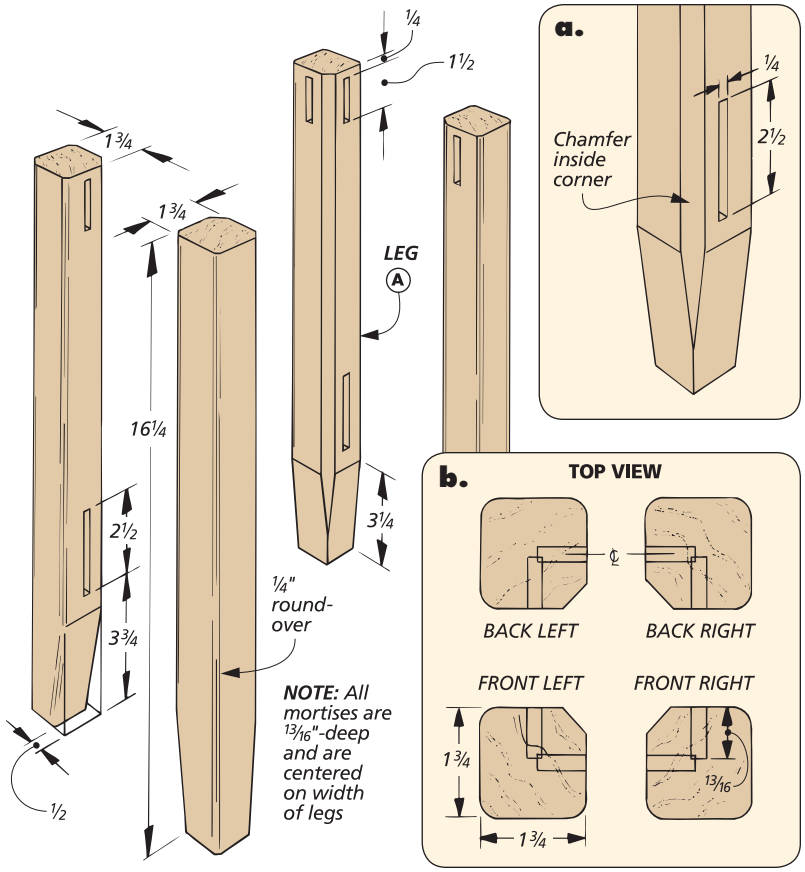


You can't go wrong laying out the two mortises at the top of each leg — they're on adjacent faces. But when laying out the single lower mortise on each leg, pay attention to the orientation of the legs. The right and left legs of each frame are mirror images of one another (drawing and detail 'a' at right).

To make the mortises, I removed most of the waste by drilling a row of overlapping holes on a drill press. Then, using a chisel, I cleaned up the sides of the mortises.

Once the mortises are complete, the legs are ready to be tapered and shaped. A table saw and a simple tapering jig make quick work of cutting the tapers on the inside faces of each leg, as shown in Figure 1. The tapering jig I used is nothing more than a piece of plywood with a hardwood cleat attached to one end, as you can see in the drawing in the margin at left.

After cutting the tapers, rout a chamfer on the inside corner of each leg on a router table, as shown in Figure 2. But don't try to chamfer the tapered edge. Instead, push the leg straight through the router table — the chamfer will narrow to a point at the bottom of the leg, as you see in detail 'a' above.

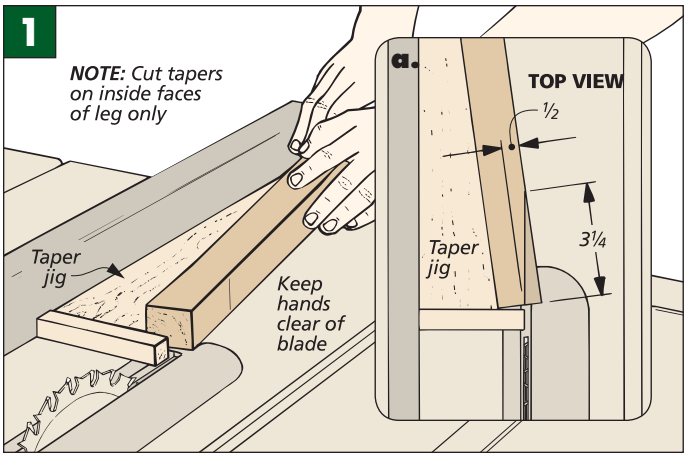


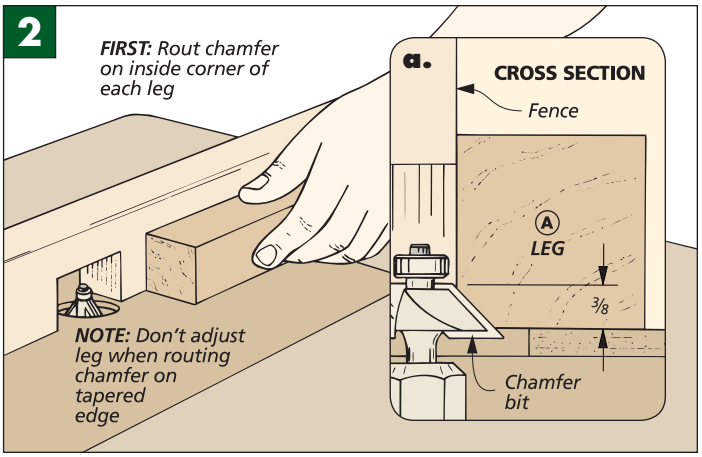
When it came to the three outside corners of the leg, I wanted a softer look. So instead of a chamfer, I routed ¼" roundovers on the edges, again using the router table. You can see this in the drawing above.

Finally, to prevent the legs from splintering in the event the table is dragged across the floor, I rounded over the bottom edges of each leg slightly with sandpaper.

At this point, I put the legs aside and began work on the other parts of the end frames. The next step is to make the end rails that connect the legs. Then later, spindles will be added between these rails.

END RAILS. I cut the upper and lower end rails to size from ¾"-thick stock first. All the rails are 24½" long. The only difference is that the lower rails are an inch wider than the upper rails, as you can see in the drawing at the top of the following page.





MORTISE STRIPS. The next step is to make the mortises for the spindles. But instead of drilling a hole for each mortise and squaring it up with a chisel, I used a different approach.

First, I cut a groove on one edge of each rail, as shown in Figure 3a. Then, I glued in a narrow strip of wood with a row of notches (Figures 3 and 3b). Once these mortise strips are glued into the grooves, the notches become mortises.

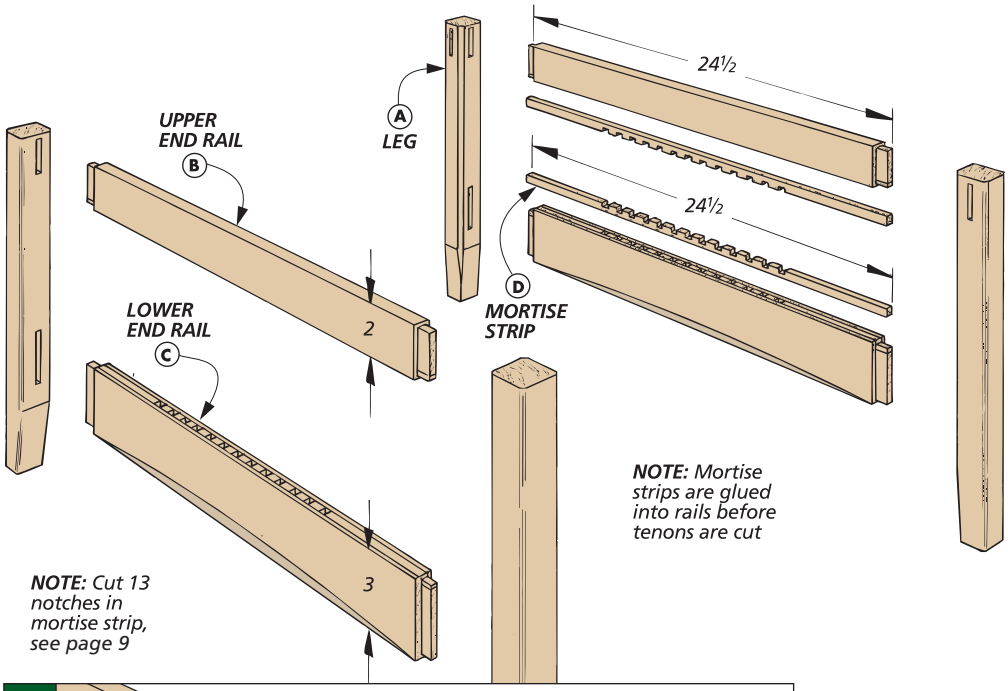
TENONS. After gluing the mortise strips into the rails and sanding them flush, tenons can be cut on the ends of the rails to fit the mortises in the legs (Figures 4, 4a, and 4b).

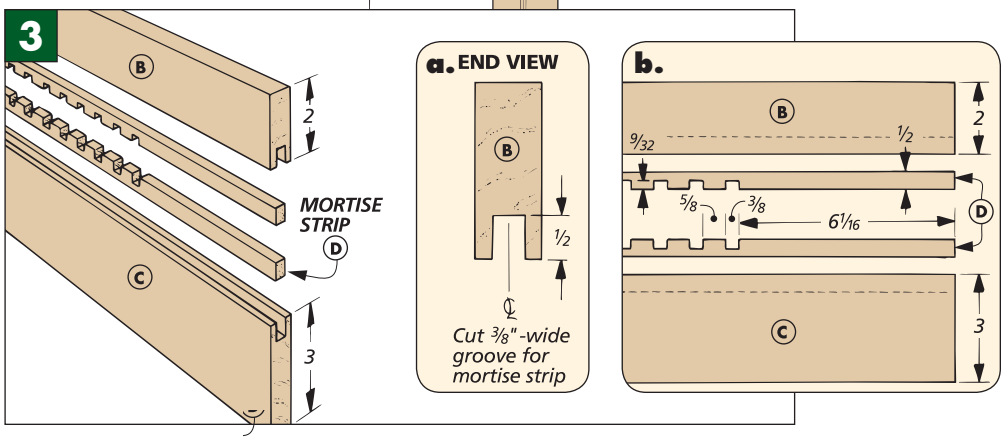
Cut the tenons after gluing the mortise strips in place. The ends of the mortise strips will become part of the tenons of the rails (Figure 4b).

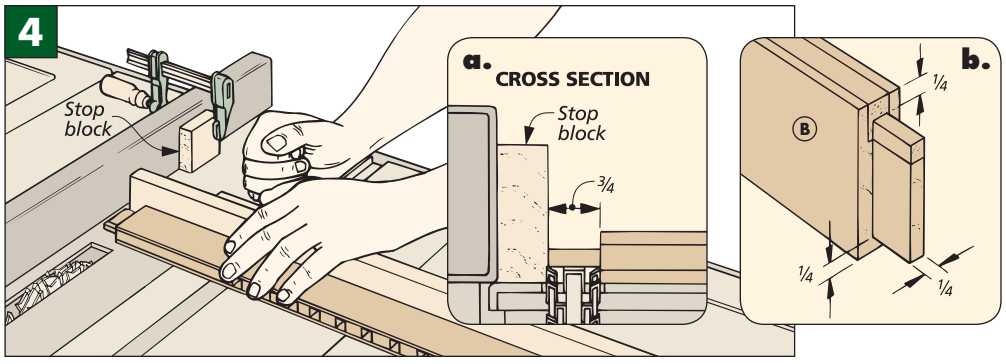
ARCS. Now there are only a couple of steps left to finish up the rails. On the lower rails, I cut a gentle arc along the bottom edge (Figure 5). To lay out this arc, I used a pencil, a flexible straightedge, and a couple of blocks of wood (photo below).

I cut the arcs on the lower rails with a band saw and then sanded them smooth with a sanding drum. But you could also use a jig saw and then sand them smooth by hand using a rounded sanding block.

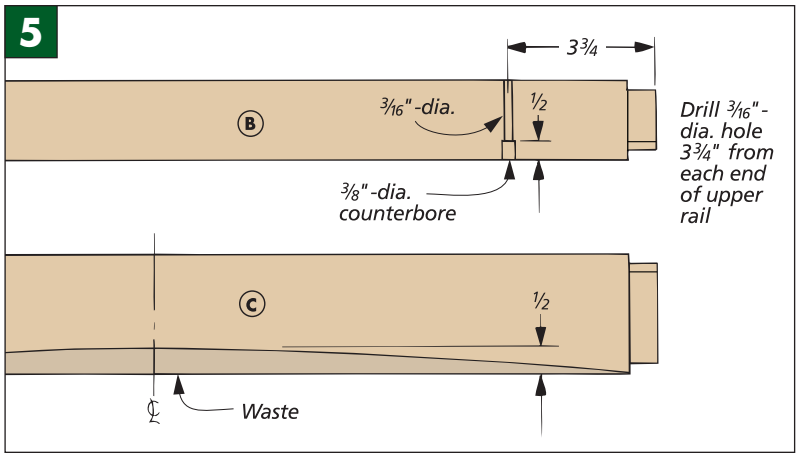
To complete the upper rails, I drilled a couple of counterbored shank holes in each rail (Figure 5). These are for the screws that will be used to fasten the top later. The shank holes are slightly oversized (3/16"-dia.) to allow room for wood movement (especially if you're planning to build the solid wood top).

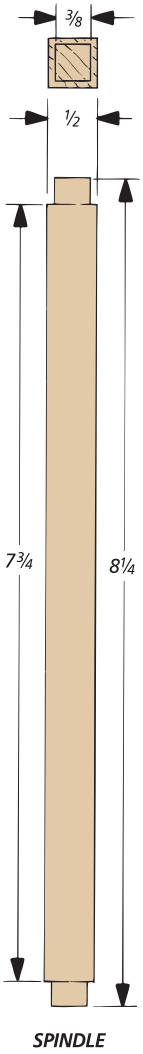






▲ ***Layout.*** *To flex the straightedge and lay out the arcs, clamp pointed scraps to the ends of the rails.*





SPINDLE

SPINDLES. The rails and legs are the main components of the end frames. But when the project is done, the spindles are what catch your eye.

Making the twenty-six spindles for the table isn't difficult — just a little repetitive. The spindles are first cut to size from ½"-thick stock, as shown in the drawing in the margin at left.

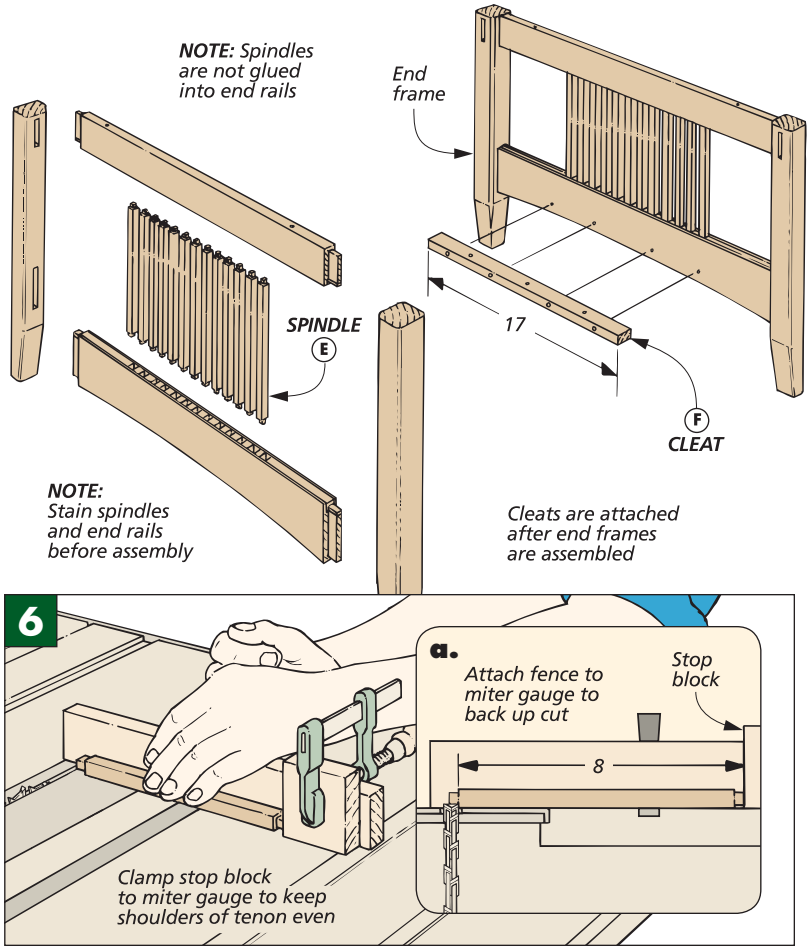
Then the tenons on the ends of each spindle are cut with a table saw and dado blade, rotating each piece a quarter turn between passes (Figure 6). And to keep the shoulders even and the shoulder-to-shoulder distance the same on each spindle, I used a stop block clamped to my miter gauge fence (Figure 6a).

With the spindles completed, you might think the next step is to glue up the end frames. Normally, this would be the case, but for this project, I did things a little differently.

Because the spindles are so narrow and spaced so closely, I decided to stain them all before assembly. I also stained the end rails. This way, I didn't have to worry about trying to work the stain in around the spindles after the table was assembled.

ASSEMBLY. Don't worry about trying to assemble all the spindles between the end rails before the glue sets up. The spindles aren't glued in place — they're captured between the rails.

I used a two-step procedure to assemble the end frames. First, fit the spindles between the rails and hold them in place with band clamps.

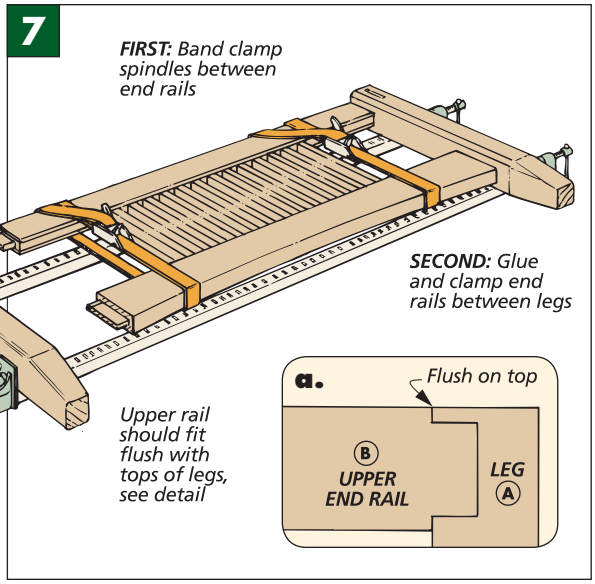


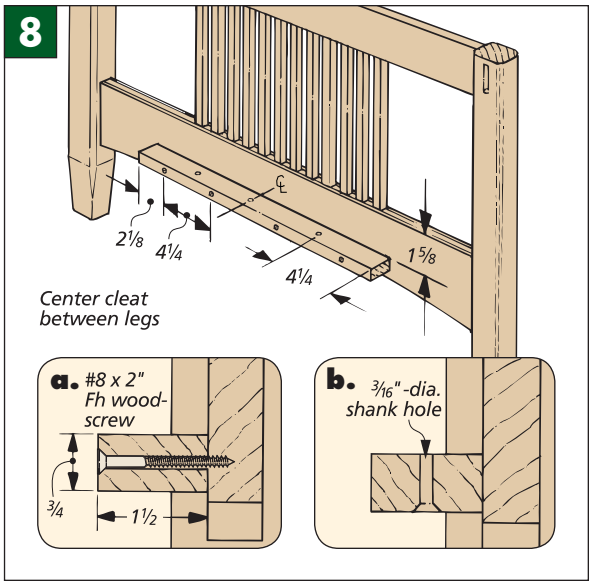
Then, glue and clamp the legs to the rails (Figure 7). Not having to worry about the spindles makes the gluing up process a lot easier.

CLEATS. After assembling the end frames, there's still one more piece to add to each frame — a cleat.

A cleat is attached to the lower end rail of each frame to support a shelf (drawing above and Figure 8). These cleats are nothing more than two narrow strips of ¾"-thick stock.

Before attaching the cleats to the end frames, I drilled three 3/16"-dia. countersunk shank holes in each cleat for the screws that will be used to attach the shelf (Figures 8 and 8b). Then, I simply glued and screwed the cleats to the inside of the lower rails (Figures 8 and 8a).





Stretchers & Shelf

With the end frames done, you're more than halfway home. Now, you need to join the two end frames with a couple of stretchers and a shelf, and then add a top. I made the stretchers first so I could assemble the base of the table and take measurements for the shelf (drawing at right).

STRETCHERS. Each stretcher is cut to size from a piece of ¾"-thick stock. Then a tenon is cut on each end to match the mortises in the legs of the table (detail 'a' at right).

Like the upper end rails, each stretcher is drilled and counterbored for three screws that will be used to attach the top (detail 'a').

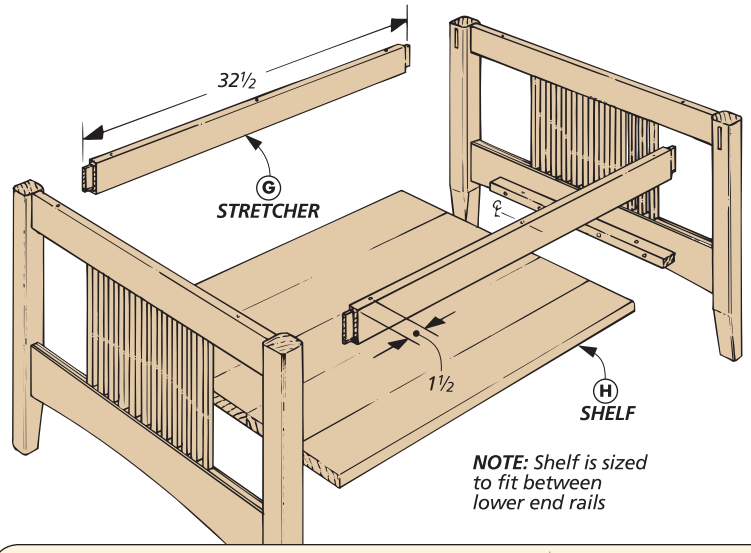
SHELF. Aside from providing a place for books or magazines, the shelf serves another purpose. It acts as a lower stretcher, helping to tie the base of the table together.

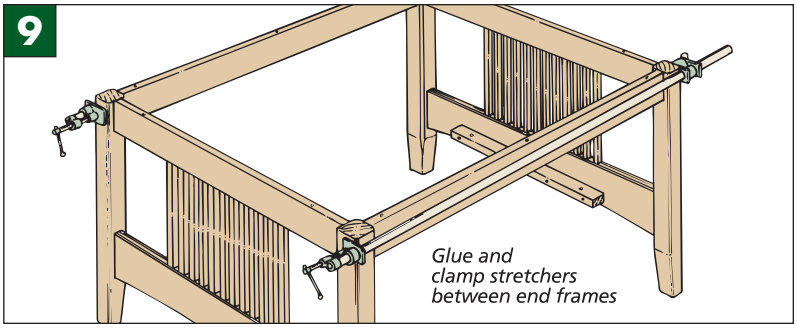
I made the shelf from an oversized, glued-up panel of ¾"-thick stock. If you're planning on building a solid wood top for the table (box on page 8) you may also want to glue up a panel for the top at this time.

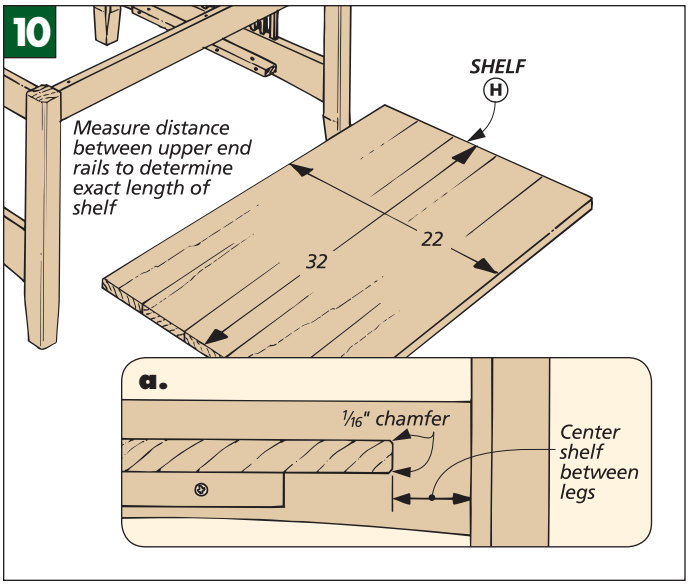
After gluing up the panel, rip the shelf to its finished width (22"), as shown in Figure 10. To determine the exact length, measure the distance between the upper end rails (32" in my case). Then, trim the ends of the shelf to match this measurement.

Before attaching the shelf, take the time to break the sharp edges by routing a small (1/16") chamfer along the front and back edges (both top and bottom), as in Figure 10a. (The ends of the shelf are not chamfered.)

To attach the shelf, I placed it on the cleats and centered it from front to back. Then, using a pair of clamps to pull the end frames tight against the ends of the shelf, I drove screws up through the cleats into the bottom of the shelf (Figures 11 and 11a).







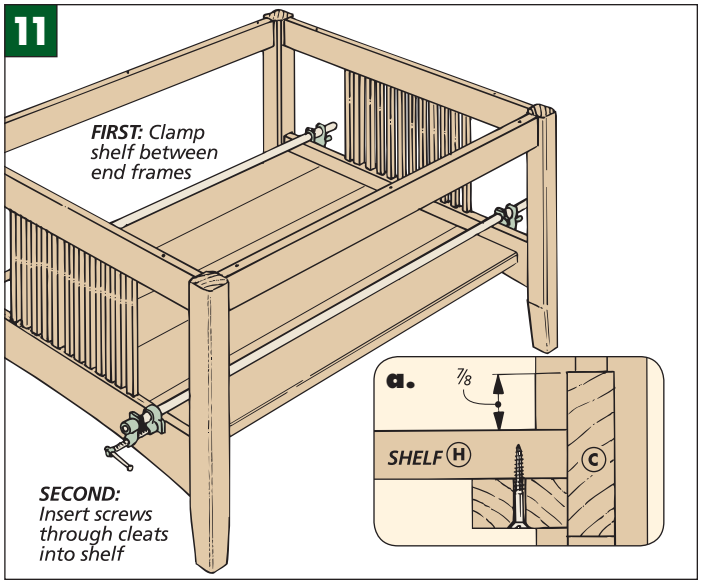


Table Top

The top of the coffee table is something like a picture in a frame — a really big frame. But the "picture" in this case is a piece of beveled glass.

BEVELED GLASS. If you've never worked with beveled glass before, there are a couple of things you should know. First off, the piece of glass I used is fairly large (¼"-thick and 24" x 32"). So don't expect to simply run down to your local hardware store and find it in stock. I had to special order the glass from a local glass shop, and it took a week to fill the order. I would suggest finding a glass shop in your area ahead of time.

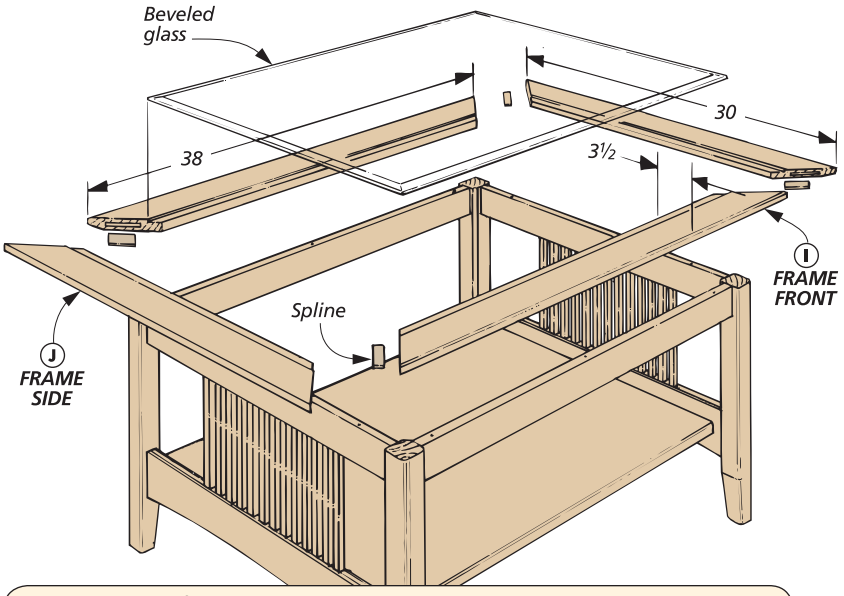
Another important thing to know about ordering glass is that the final measurements aren't always exact. Because of the cutting and polishing process, the glass can vary as much as ⅛" from what you specify when you order it. But this isn't a problem as long as you obtain the glass before you cut the top frame pieces to length.

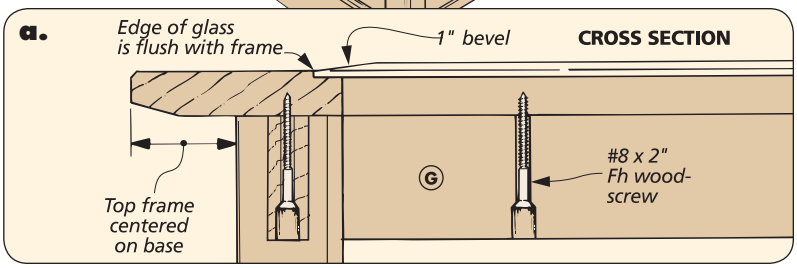
The frame front/back and frame sides are cut from ¾"-thick stock. They can be ripped to finished width (3½"), but don't cut them to length just yet. They will be mitered to length a little later.

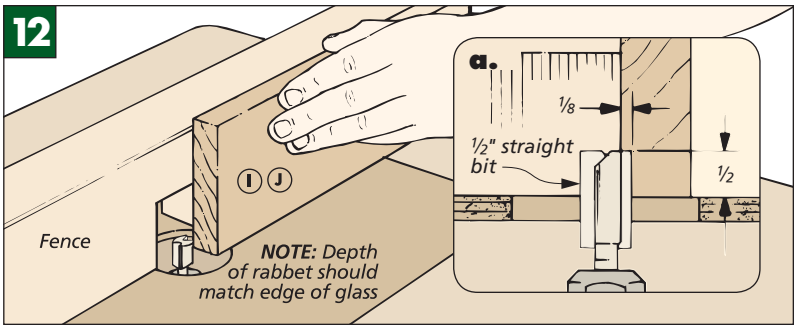
Before mitering the frame pieces, I cut a rabbet on one edge of each piece, see Figures 12 and 12a. This rabbet creates a necessary ledge for the glass top to rest on. Shop Note: The rabbet should be deep enough so the beveled edge of the glass will sit flush with the top surface of the coffee table frame (⅛" in my case), as shown in detail 'a' above right.

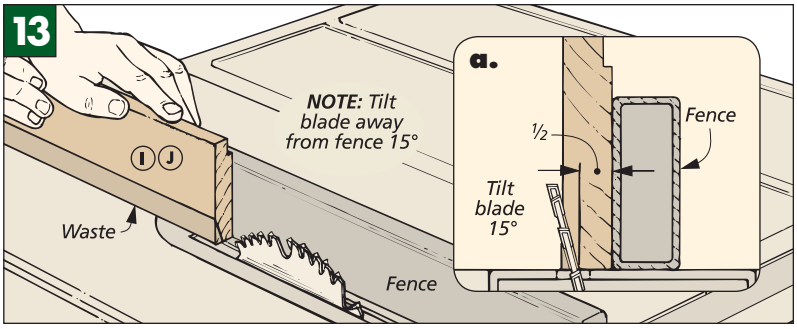
Then to keep the outside edges of the top from looking too thick and heavy, I beveled the underside of each frame piece, as shown in Figures 13 and 13a. I did this by running the pieces through the table saw on edge and then sanding off the saw marks.

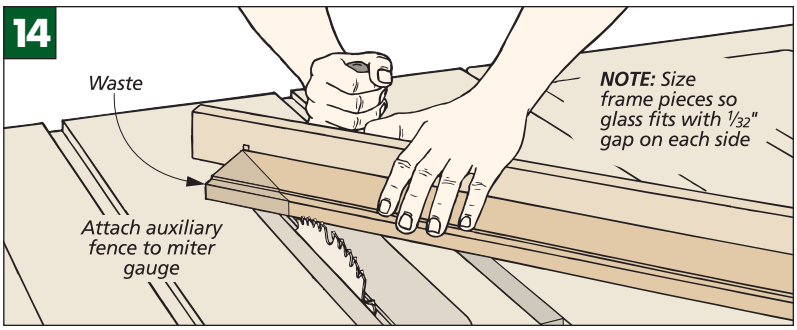
After rabbeting and beveling the frame pieces, they can be mitered to length to fit the beveled glass (Figure 14). Shop Note: To avoid making the opening for the glass too tight, allow a little extra (1/16") when figuring the length of the frame pieces.











SPLINES. To strengthen the miter joints, I added splines. But the splines serve another purpose, as well. They help to keep all the pieces even when gluing and clamping them together.

To cut the slot for the splines, use a hand-held router and a slot-cutting bit (Figures 15 and 15b). Be sure to stop the slot short of the edges of the workpiece (Figure 15a).

After routing the slots, I cut splines to fit. The thing to remember here is that for a strong joint, the grain should run across the joint line of the miters, as shown in Figure 15a.

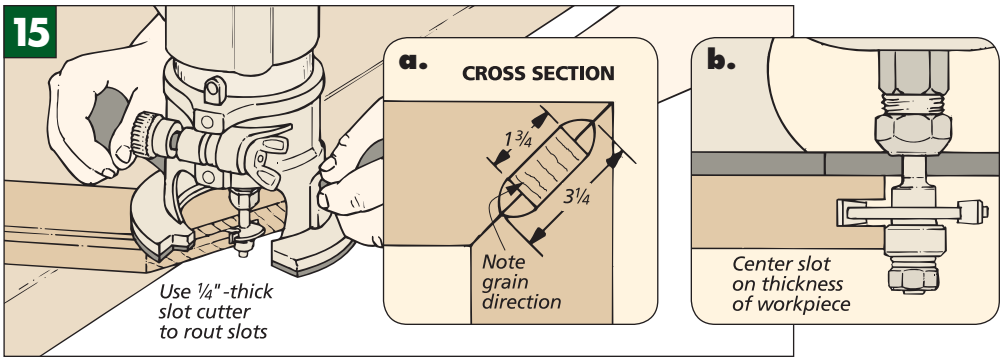
ASSEMBLING THE TOP. Before gluing up the top, dry assemble the pieces and clamp them together with band clamps to check the fit of the glass (Figure 16). To avoid breaking the glass, make a template out of hardboard the same size as the glass and use that to check the fit instead.

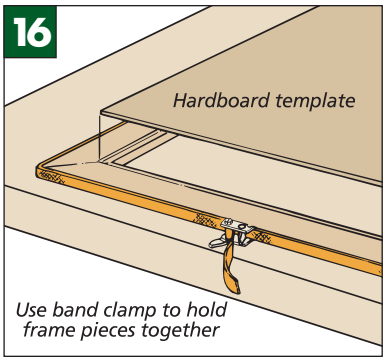
When you're satisfied with the fit of the miters and the size of the glass opening, glue up the frame pieces and clamp them together. Then, use the template to check the glass opening again with the clamps in place.

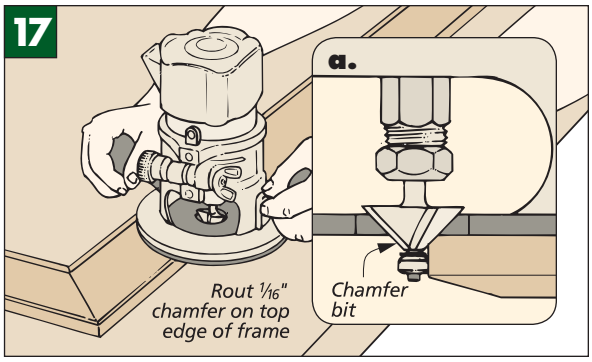
CHAMFER. As a final detail, I relieved the sharp edges by routing a very small (1/16") chamfer all around the top edge (Figures 17 and 17a).

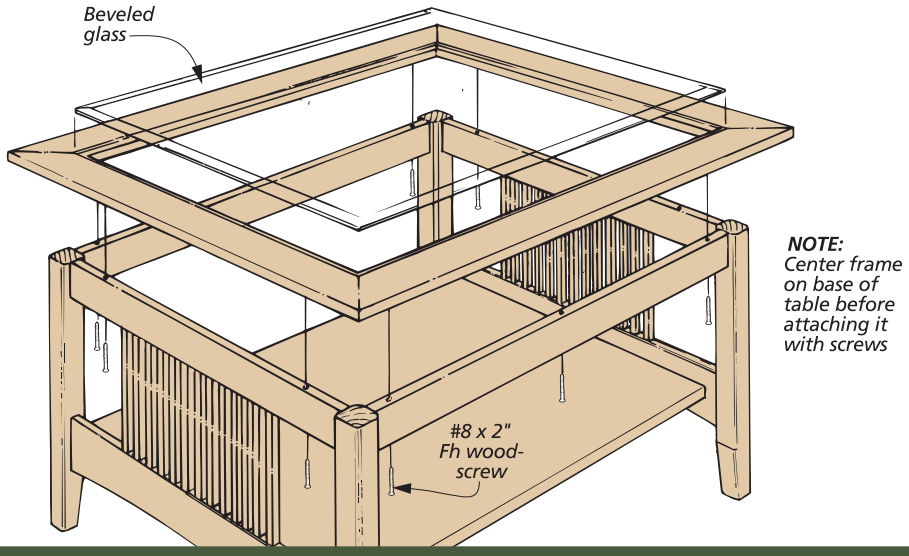
To attach the top, I simply centered it front-to-back and side-to-side. Then, I drove screws up through the stretchers and upper end rails into the top (drawing at right).

After staining and finishing the entire table, I added the glass top.



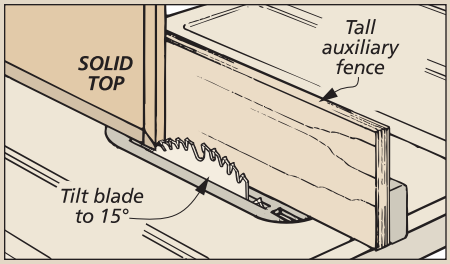






SOLID WOOD TOP

If you would prefer a more traditional look for the coffee table, you may want to substitute a solid wood top for the frame and glass top, as shown in the photo at right.



To do this, start by gluing up an oversized panel of ¾"-thick stock. After the glue is dry, the panel can be trimmed down to a finished size of 30" x 38" (the same size as the frame for the glass top).

Once the panel is cut to finished size, the bottom edges can be beveled. But there's a small problem here. Because of the large size of the top, I was a little nervous about standing the top on edge and running it through the table saw. So to provide a little extra support, I attached a tall auxiliary fence to my rip fence (drawing at left).

Mortise Strips

Instead of making individual mortises for the spindles in the coffee table, I used a different approach. First I cut a groove on one edge of each end rail. Then I glued in a "mortise strip."

GROOVES. There's not much to making the grooves. I cut them in two passes, flipping each rail end for end between passes to center the grooves on the thickness of the workpiece (Figures 1 and 1a).

MORTISE STRIPS. The mortise strips are just narrow strips with notches cut in them. When glued into the grooves, they create mortises.

Instead of trying to cut the notches in narrow, individual strips, I started with a wide blank cut to the same length as the rails (24½"). Then after the notches are cut, the blank will get ripped into strips. (I made the thickness of the blank the same as the depth of the grooves in the rails.)

NOTCHES. To cut the notches, I used a dado blade and a table saw. The trick is to keep the notches evenly spaced. So, I used a simple indexing jig.

To make the jig, I clamped an auxiliary fence to the front of my miter gauge. Then I cut a dado through the center of my blank and through the auxiliary fence (Figure 2).

To keep the notches evenly spaced, I glued an index key into the notch in the auxiliary fence (Figure 2a). Then I readjusted the fence so the key was ⅝" from the edge of the dado blade (Figures 3 and 3a).

Next, I cut six more notches on one side of the center notch, as you can see in Figure 4. To do this, I simply placed each newly cut notch over the key to cut the next one.

Then, after cutting the notches on one side, I turned the piece around and cut six more notches on the other side of the center notch — following the same procedure. Keep in mind that you should end up with a total of 13 notches.

RIPPING. Before ripping the strips, I drew a reference line on one end of the blank (Figure 5). Later when the rails are glued between the legs, this line will help you orient the end rails so the mortises line up (Figure 6).

Shop Note: When gluing the strips into the rails, use a sparing amount of adhesive to avoid getting any glue in the mortises.