

Glass Doors Made Easy

You can do it all at the tablesaw

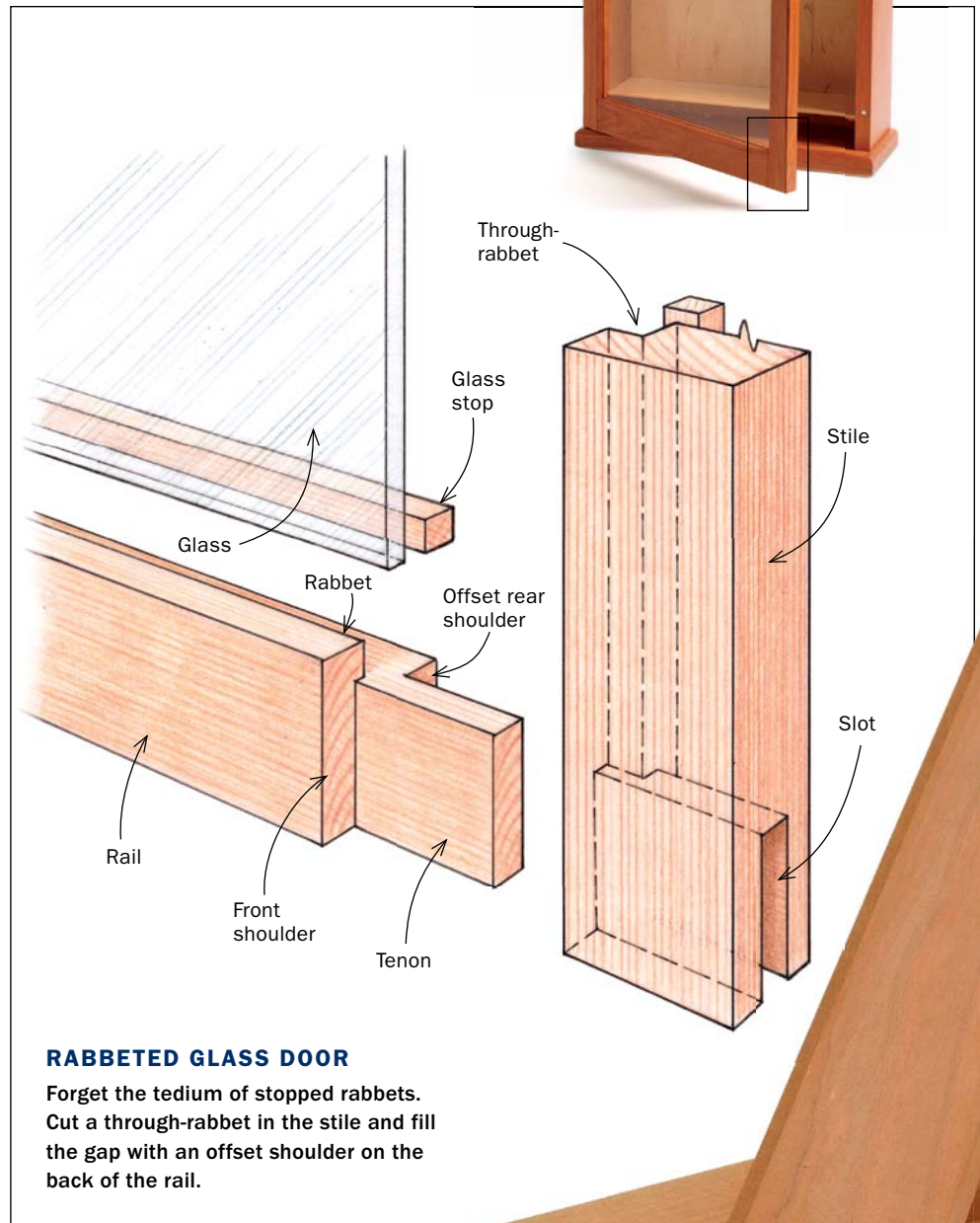
BY DOUG STOWE

I live in Eureka Springs, a small town in northwest Arkansas that's home to many artisans and art collectors. And so I've made several cabinets with glass doors to house art collections. Glass doors are also great for kitchen cabinets, allowing you to display decorative dishes while protecting them, and for enclosed bookshelves. But many people build them in a tedious way, by making a normal mortise-and-tenoned door and then rabbeting the pieces for the glass in a separate series of steps. I've learned that the best way to make those doors is with a bridle joint. Not only is the joint easy to make—I do it with a tenoning jig at the tablesaw—but by shortening the length of the tenon cheek on the back face of the rails, I can cut through-rabbets for the glass at the same time. That saves you the hassle of routing stopped rabbets and squaring their corners after the door is glued up.

As simple as this joint is to make, it is one of those assemblies—like the dovetail—that can be hard to wrap your mind around, at least at first. That's because it can be difficult to imagine how the offset tenon shoulder on the back of the rail fills the rabbet on the stile. But don't worry, it does. And the steps are easy.

Make the bridle joint first

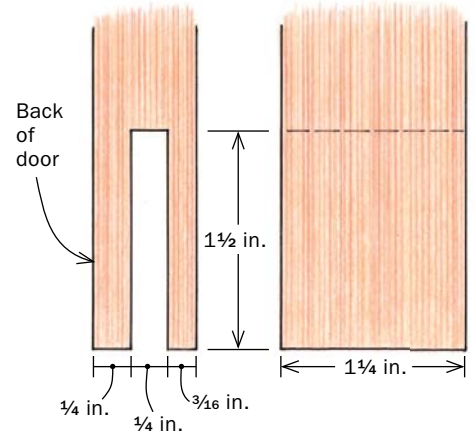
There are two parts to the joint. A slot is cut into the end of the stile, and a tenon onto the end of the rail. On a door with a wood panel, both of the tenon's shoulders





START WITH A SIMPLE SLOT IN THE STILES

Offset it toward the front to allow room for the stops that hold the glass in place.



Use a tablesaw tenoning jig. Set up the jig so that the blade cuts the side of the slot closest to the jig first. The slot is $\frac{1}{4}$ in. wide, so with a standard blade, the second cut will complete the slot.

are the same distance in from the end of the rail. However, in order to cut through-rabbets on the back of the parts, the cheek is shorter on the back than it is on the front so that the shoulder on the back fills the rabbet on the stile after the door is glued up. That means there are no unsightly gaps in the door frame from the through-rabbets.

Before you make the joint, lay the parts on the bench and mark their faces and inside edges to help keep them properly oriented

as you cut the joints and rabbets. Also, I start with rails and stiles that are about $\frac{1}{8}$ in. longer than final size. I cut the joints so that the ends of the tenons and slots are $\frac{1}{16}$ in. proud after assembly and then trim them.

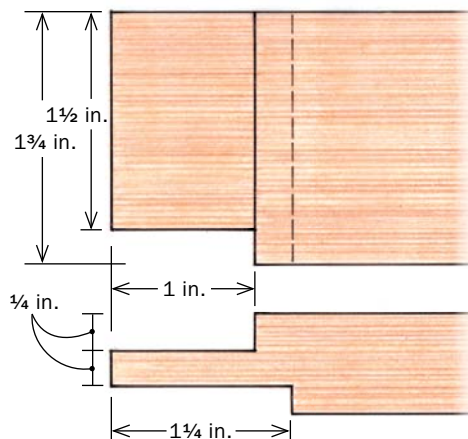
Start with the slots on the stiles. I use a tenoning jig to hold the stile on end as I run it through the tablesaw blade. Use a blade with a flat-top grind, like a ripping blade. Some combination and crosscut blades leave a V-shaped notch in the bottom of the kerf that would be visible after assembly.

Put the back face of the stile against the jig and clamp the stile in place. Cut the first side of the slot. Make the same cut for the remaining three slots. Adjust the fence to align the blade with the other side of the slot and make that cut for all four slots. I use a blade that's $\frac{1}{8}$ in. thick, so those two cuts form the entire slot. A thinner blade requires a third cut to clean out the middle.

Now it's time to cut the tenons on the ends of the rails. This joint will seem strange at first, because the tenon's cheeks

CUT SHOULDERS ON THE RAILS

Use your tablesaw sled to cut the offset shoulders.



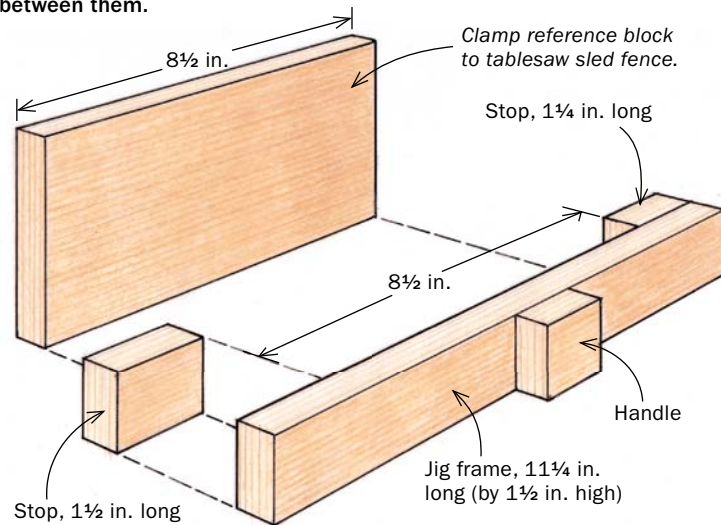
Set the blade height directly from the stile. It's quicker and more reliable than transferring a measurement from the slot.



Cut the short shoulder first. Use the end with the longer stop to make the shorter side.

TWO-SIDED STOP BLOCK MAKES PRECISE CUTS

For this joint to work, the shoulders' offset must be precise. That's no trouble with this jig. Flip it end for end to create the 1/4-in. offset between them.



All parts made from 1/2-in.-thick plywood.

are different lengths. But after you put the joint together, it makes perfect sense.

I cut the shoulders at the tablesaw with a crosscut sled and a jig that has two different stops built into it. One stop lets me cut the shoulder for the shorter cheeks on the rail's back, and the other is set to cut a shoulder for a cheek that is 1/4 in. longer. Cut the back shoulders of the rails first. Then switch the stop to its second position and cut the front shoulders.

Now cut the cheeks using the tenoning jig. Because the cheeks on the front are longer than those on the back, cut them first. Put the rail in the jig with its back against the main fence and cut all of the front cheeks. Then lower the blade and cut the cheeks on the backs.

Finally, trim the tenons to their final width. This is more critical than usual for a tenon, since the fit will show on the



Flip the stop. The reference block ensures that it ends up in the right place.



Then cut the long shoulder. The second stop is 1/4 in. shorter than the first, so the second cheek is 1/4 in. longer.

NOW THE CHEEKS

Using the right jigs, you can cut these quickly, accurately, and safely at the tablesaw.

Pull out the tenoning jig again. Set the blade to cut the shorter cheeks first. Then adjust the jig, raise the blade, and cut the longer cheeks.



Use the jig to cut the tenon's width, too. Set the blade height to the lower (rear) shoulder.

outside of the frame. After setting the blade height so that it is just lower than the length of the tenon, I clamp the rail into the tenoning jig with its inside edge against the main fence. I then define the final width of the tenon with a single cut of the blade. Then I use a crosscut sled with a stop to make the shoulder cut that frees the waste piece. The stop ensures that the shoulder aligns with the shoulder on the front of the rail.

Cut the rabbets and assemble the door

Now that the bridle joints are finished, you can cut the rabbets that hold the glass. Because of the way the bridle joint is cut, these are through-rabbets, made quickly at the tablesaw.

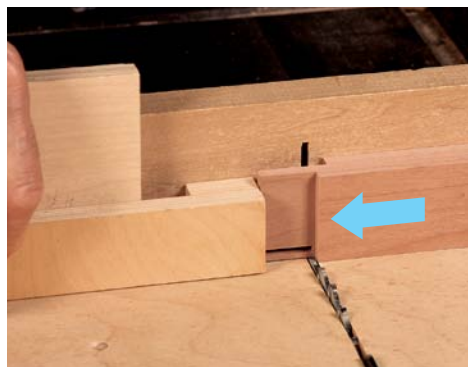
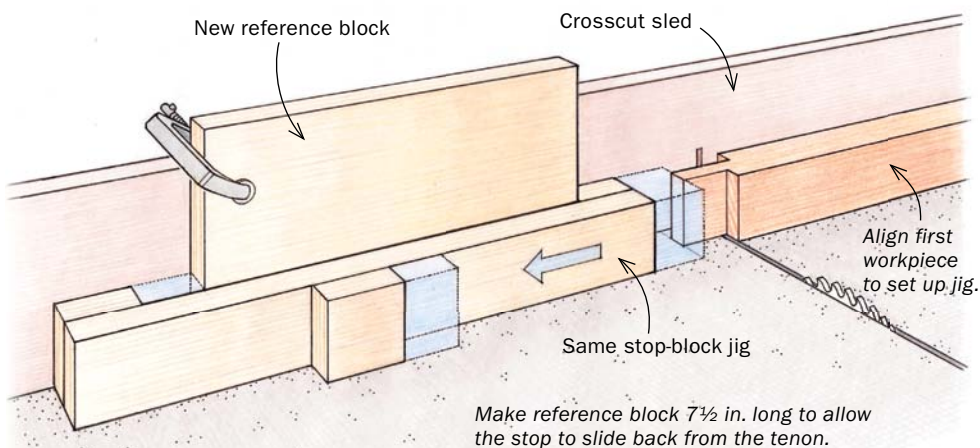
Set the blade height to $\frac{3}{8}$ in. Set the rip fence so that the outside edges of the blade's teeth are $\frac{1}{4}$ in. from it. Lay the rail back down on the saw's table and cut the first side of the rabbet. Next, lower the blade to $\frac{1}{4}$ in. and adjust the rip fence so that the outside teeth are $\frac{3}{8}$ in. from it. Stand the rail on its inside edge and cut the second side of the rabbet. The blade can push the waste back toward you after it's cut free, so don't stand directly behind the blade.

After the rabbets are cut, the joint fits together and you can see why the tenon's cheeks are different lengths. Now I dry-assemble the door and rout a slight chamfer on the inside edges of the rails and stiles, using a chisel to square the rounded corners left by the bit. The joint fits tightly enough that you don't need clamps, which would get in the way at the router. Disassemble the door and sand the inside edges of the parts, which would be more difficult to do after the door is glued together.

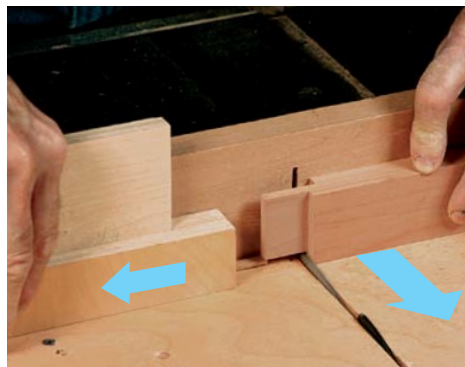
Now glue up the door. Apply glue to the tenons only and push them into the slots. If you put glue in the slot as well, the tenon will push most of it out, creating a mess on the outside edge of the joint. You should be able to bring the joint completely together with hand pressure. Then use a C-clamp and cauls (to protect the door from the clamp heads) to hold the joints together. No other clamps are needed.

After the glue has dried, trim the rails and stiles to length and sand the frame, but don't re-sand the inside edges.

ALTER YOUR STOP SETUP FOR THE FINAL CUT



Position the workpiece. Push the stop block toward the blade, and the workpiece toward the block.



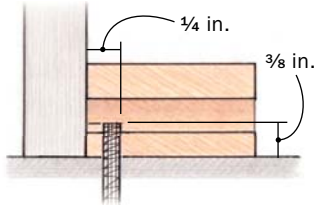
Move the stop and make the cut. This allows the waste piece to move away freely.

CUT THE RABBETS AND ASSEMBLE

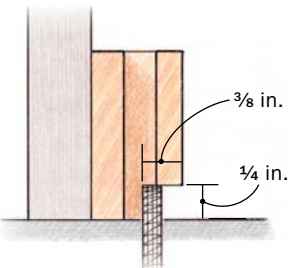
None of the rabbets (for the glass) are stopped, so you can cut them all quickly on the tablesaw.

TWO CUTS FOR THE RABBET

FIRST CUT



SECOND CUT



The first one is made with the rails and stiles face down, the second is with them on edge to free the waste.



One clamp for each joint. If the frame is square and the joints tight, you don't need clamps across the width and length.

I use glass that is 1/8 in. thick, so the stops (wood strips) that hold the glass in place are made from 1/4-in.-square hardwood. After milling them, I sand them and then fit them to the frame, using butt joints at the corners. Fit the sides first, and then the top and bottom. That way, if you make a mistake cutting the sides, you can cut them shorter and use them for the top and bottom.

I hold the stops in place with 1/2-in.-long #20 gauge brad nails. To prevent the stops from splitting, pre-drill for the nails at the drill press. Now apply a finish to the frame and stops. Clean the glass and put it in place. Use a tack hammer and nail set to drive the nails into the stops, placing a piece of cardboard between the hammer and glass so that it doesn't get scratched or broken. The nail set helps you direct the hammer's force and keep the nail moving straight in. Once a small brad nail begins to bend, there is no correcting it, so just cut your losses by pulling it out and starting a new one. Finally, I install hinges. I generally use knife hinges because they are less visible, but butt hinges will work fine, too. □

Doug Stowe, a furniture- and boxmaker in Eureka Springs, Ark., is the author of *Building Small Cabinets* (The Taunton Press, 2011).

THEN INSTALL THE GLASS



Hold it in place with stops. Stowe predrills clearance holes in these thin wood strips and nails them in using a hammer and nail set. He uses a piece of manila folder to protect the glass. Use butt joints between the stops, not miters, so they are easy to remove for repair.