

# Build Your Own



Easier than you think to make and install, a custom door stands out



The front door is the first contact anybody has with a house. My mother has a charming Arts and Crafts house from 1932, with a front door from the late 1950s. Aside from any aesthetic judgments, 50 years of people coming and going had taken its toll, and I decided to replace her door before another upstate New York winter took hold. I got lucky, because the existing jamb and sill were in

great shape. This makes installing a new door easy. Just match the old hinge locations and existing dimensions and swap the new door for the old one. If your jamb and sill aren't in good shape, you'll have to tear them out and replace them.

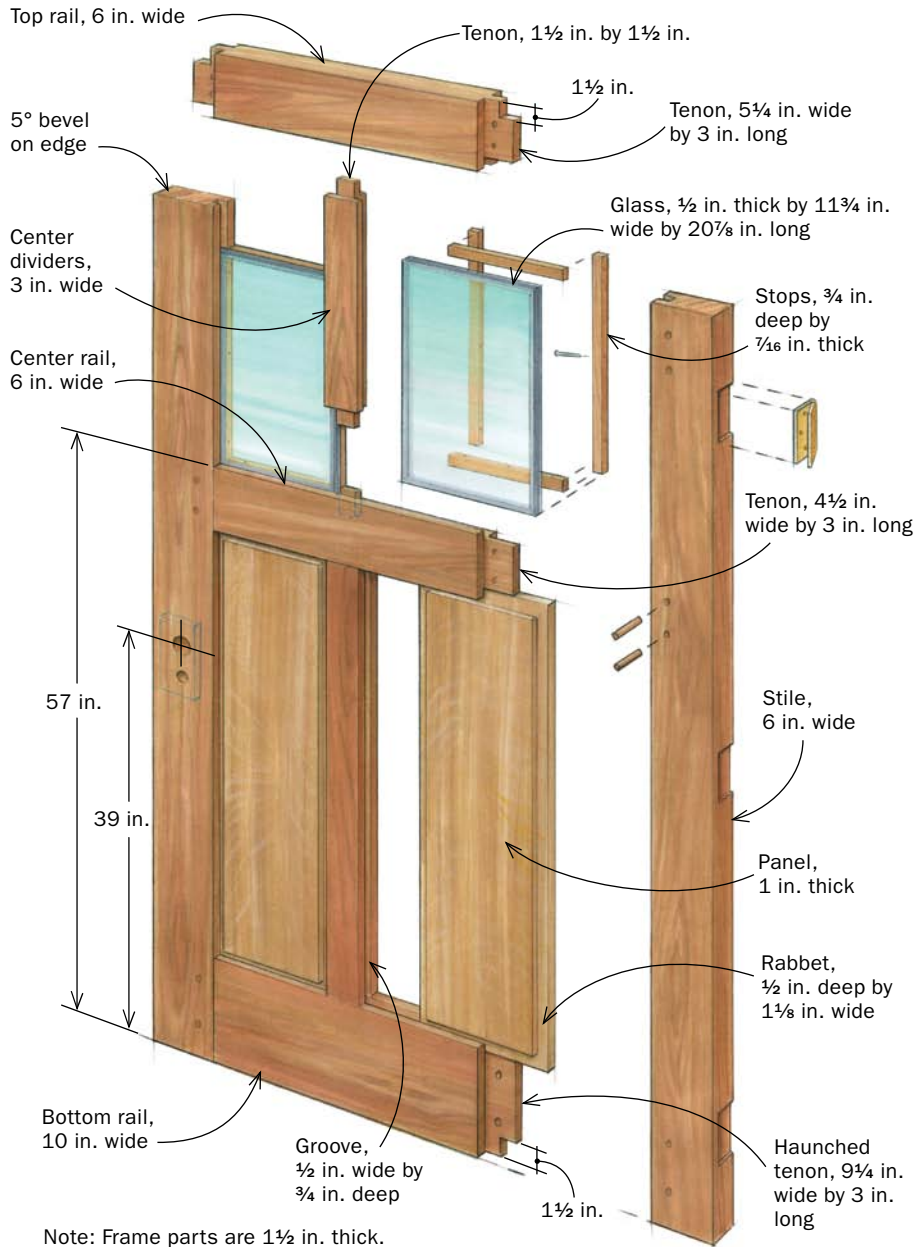
### Three reasons to build your own

You may ask why you should spend the time and money to build your own entry



# Front Door

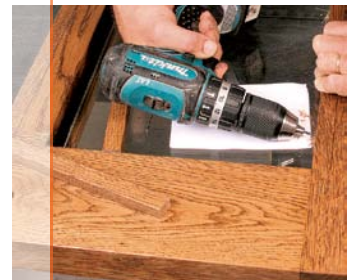
BY JOSH FINN



## GLASS MUST MEET CODE

In most areas, exterior doors must use insulated and tempered or laminated safety glass, but check the code in your area. Thermopane panels (shown) are a good choice, and widely available.

**Easy install.** Apply a clear silicone bead around the rabbet, set the glass in place, and add the stops. Finn secures the long stops first, predrilling and setting the nails, and then finishes with the short stops.



door when you could go to the home store and pick from a wide array of them. If you are a woodworker, you'll be disappointed with the style and quality you find there. The bottom line is you can afford to build a much better door than you can buy.

**Cost**—The nicer the door and the nicer the materials, the higher the price. In-stock, standard-size frame-and-panel doors in pine start at \$400. If you want anything

beyond that, you have to start looking in a higher price range. Once you've looked at the more expensive manufactured doors, it makes more sense to build the door yourself, especially because the joinery is basic and it doesn't take that long. I've made a lot of doors, and I have the process down pat. The last door I built took five hours, and that included milling the lumber. Not to mention that if it's an odd-size open-

ing (I recently made a front door for an old house where the opening was 3 ft. wide by only 6 ft. 1 in. tall), the cost at the store goes up even more. If you can't get anything off the shelf, you're looking at a special order. Incidentally, this door is 82 in., which is 2 in. taller than standard.

Hardware adds to the overall cost, but it doesn't come with stock doors either. That extra cost is there regardless. It can be



# Regular mortises and tenons, only bigger

Use easy, tried-and-true woodworking joinery to make an entry door. The only daunting thing about the construction is the overall size of the pieces.



## MORTISES

**One groove does it all.** With a dado blade in the tablesaw, Finn cuts the groove for the panels in the rails, stiles, and center dividers (above). Then, where the rails intersect the stiles, Finn uses a hollow-chisel bit in his drill press to extend the groove into mortises (right).



## TENONS

**Haunched tenon fills the groove.** Cut the cheeks on the tablesaw, supporting the rails upright with a tall tenoning jig (left), and then establish the haunch shoulder using the miter gauge (above). Complete the haunch on the bandsaw (right).





purchased economically at a home center, but I suggest buying hardware as distinctive and sound as the door you'll make. I get mine from Horton Brass, WhiteChapel, or Restoration Hardware. Unless you can reuse some of the old stuff, you will need hinges, a mortise lockset, and a handle (lever or knob).

**Design**—Building the door yourself gives you a blank slate to design an original. You may want to match the style of your house or create a really unique door that captures attention. I chose a flat-panel style for this door because I felt it suited the house. But you could choose to bevel the panels or add other details.

By the way, even though this is an exterior door, you aren't limited to outdoor woods. Most homes provide some sort of overhang to protect the door from the elements, but if yours doesn't, marine spar varnish (see "A Durable Exterior Finish," *FWW* #179) or paint provides adequate protection.

**Quality**—This is obvious, but when you build your own door you control the quality of the materials, adhesives, hardware, finish, and craftsmanship.

### A note on R-value

The truth is that the R-value of a solid-wood door (R-1.8 to R-3.0) will never match that of a fiberglass insulated door (R-7 to R-9). But a new solid-wood door with a double-glazed light and beefed-up weatherstripping is much better than a leaky older door. Add a storm door for even more weather protection.

### Familiar construction

There is nothing about making an exterior door (or an interior door for that matter) that isn't a common woodworking practice. It is just like making a cabinet door, only bigger.

While the door is still on the drawing board, choose the hardware so that a large mortise lock won't eat away most of your stiles or the joint of your center rail. When selecting boards, choose the very straightest for the stiles to reduce movement as much as possible. Mill all the frame pieces at the same time for consistency.

I start at the tablesaw by running a groove down the length of the stiles and rails. This not only receives the panels but also creates a haunched tenon, which is better for big doors because it eliminates wobble and adds glue surface. Then I extend the groove into mortises wherever the rails



**Break assembly into steps**  
As with the construction, the door glue-up is straightforward when broken into manageable steps.

**Insert the panels.** Prefinish them, or seasonal movement will expose sections of unfinished wood in the rabbets. Then epoxy and clamp the center dividers in place as shown, and slide in the panels.



**Add the stiles.** As a defense against the elements, Finn uses two-part marine epoxy when gluing exterior doors. Once the door is in clamps, you can peg the tenons.



**Turn a groove into a rabbet.** The glass sits in a rabbet, held with stops. Use a handheld router with a bearing-guided bit to cut away the top of the groove, creating the rabbet.



**Bevel the latch side.** A 5° bevel on the back edge of the latch side keeps that edge from scraping on the jamb while opening and closing. Rip the bevel on the tablesaw using a big outfeed table or a friend to help catch.



## Hinge placement is easy

If you don't have to replace the sill or jambs, it's easy to find the hinge placement. Just use the old door as a guide. If the old door fits the jamb well, you can also use it as a template for trimming the new one.



will meet the stiles. For strength, I like to have the mortises at least 3 in. deep, but the maximum throw on my drill press with the hollow-chisel mortising bit is only 2½ in., so I have to chisel the extra depth away. By the way, if there is going to be glass in the door, I turn the groove into a rabbet after assembly with a handheld router.

Once all the grooves and mortises are cut, I cut the tenons on the rails: shoulders first, then cheeks, then haunches. Then I make the panels, and I sand and finish them before assembly.

### Assemble and add the hardware

After a dry-fit, it's time to glue up. For exterior doors, I use two-part marine epoxy. Once the glue is dry, I pin the tenons, trim the door to size, and add a 5° bevel on the latch side. For a finish, I recommend an exterior varnish that is UV-resistant.

If the door is going into an existing jamb, the hinge mortises already are in the jamb, so you need only mortise for the hinges in the door. I use the old door or a story stick to transfer the hinge locations to the new door. Then I place the lockset and knob and install the door. If there is a new jamb in place, put the hinges on the door first and then hold the door in the jamb to check reveals and mark hinge locations.

Now, assuming everything went well, you should have a quality start to every day and a welcome return. □

*Josh Finn makes furniture in High Falls, N.Y.*

## Don't settle for ordinary

Making your own entry door means you don't have to settle for typical factory fare. Your dimensions and design possibilities are unlimited. In these examples, Finn built doors well outside standard dimensions or with unique carved panels that can't be found on the rack.



**From old to new.** To transfer the hinge locations, line up the old door with the new one and use a square and a knife to mark their locations (above). Finn routs free-hand, close to the knife lines (left), and chisels the mortises clean. He uses a Vix bit, a self-centering hinge drill bit, to predrill perfectly centered screw holes (right).





## Lockset is the final step

Most locksets are sold with precise manufacturer's instructions and a template you can follow. Although it's slightly more work to install, Finn prefers a mortise lockset over a cylinder lockset because it lasts longer, exudes quality, and is truer to original hardware you'd find in an older home.



**Start with the knob location.** On the edge of the door, mark where the center of the old knob would fall. Set the new lock body so the knob hole is centered over that mark, and mark the outside edges of the lock body as shown.

**Manufacturer's template will guide you.** Line it up with the lock-body marks and mark where to drill the holes for the lock and knob.



**A deep mortise for the lock body.** Use a handheld drill with a spade or Forstner bit to waste away most of the mortise. Clean up the walls with a chisel.



**A shallow mortise for the faceplate.** With the depth set to the thickness of the faceplate, rout close to the line and finish the job with a chisel.



**Insert the lockset.** Once the holes for the knob and cylinder are drilled, you can screw the lock body in place and install the escutcheon plates and knob.

