Arts & Crafts Bookcase

This classic Limbert design offers a unique twist on a traditional style

BY WILLIE SANDRY

I like to build in the Arts and Crafts style, and I usually design each piece from the ground up. But once in a great while, I stumble onto a design that cannot be improved. This was the case with Charles P. Limbert's No. 355 Cottage Bookcase. With its glass doors and pierced panels featuring integral corbels, it's a true gem among Arts and Crafts designs.

Start with the sides

The No. 355 is like three small bookcases in one. There is a main case behind the glass door, flanked by two side-facing banks of open shelves. These side assemblies are the place to start. I use a pair of routing templates to make the pierced panels: one for the shelf dadoes and a second for the edge profile and cutouts.

Start with the dadoes for the shelves. I elected to make a full-size template and rout the dadoes using a guide bushing. The finished dadoes are ⅝ in. wide, so I use a ½-in.-dia. straight bit to cut them in two passes. I mount a ¾-in. guide bushing in the router that rides in ⅞-in.-wide slots in the template.

The next task is to rout the profile and the cutouts. I use a full-size template made from ½-in.-thick MDF

A PAIR OF TEMPLATES FOR THE SIDES

The pierced panels give the bookcase its unique look. Sandry uses one template for routing the shelf mortises and another for routing the profile and piercings.

Rout the shelf dadoes. *Clamp the dado template in place and use a router equipped with a straight bit and guide bushing to rout the dado in two passes.*

Guide bushing, ¾ in. dia.

Straight bit, ½ in. dia.

⅞ in.

Template

Dado, ⅝ in. wide by ½ in. deep
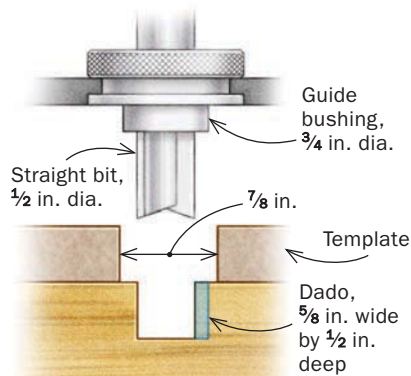
Trace the profile and rough out the shape. *Use the profile template to shape the panels. The front panels have a decorative cutout as well. Cut the profile at the bandsaw, staying just outside the line. Use a drill and jigsaw to remove the waste from the cutouts.*
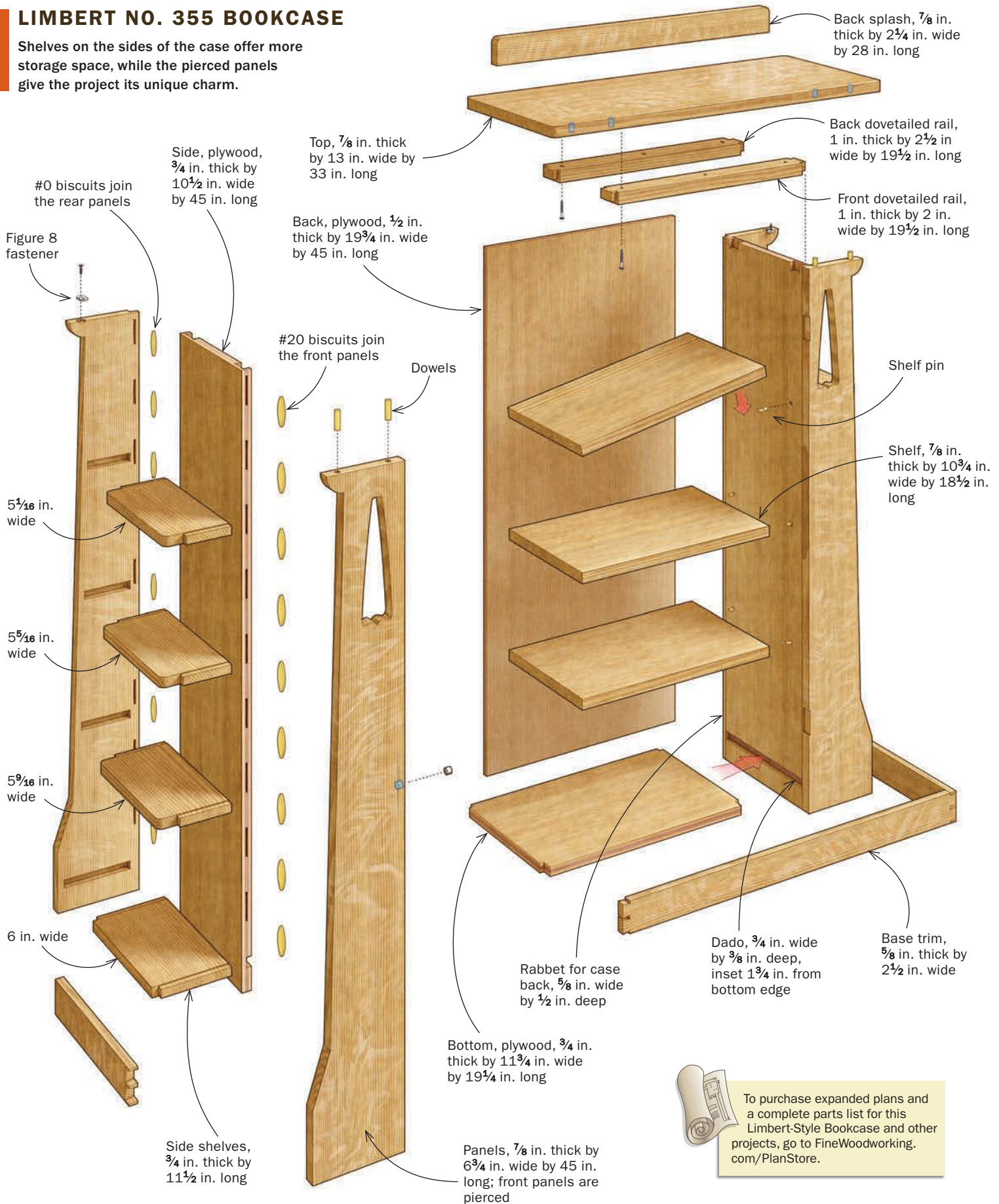
Workpiece

Flush-trimming bit, ¼ in. dia.
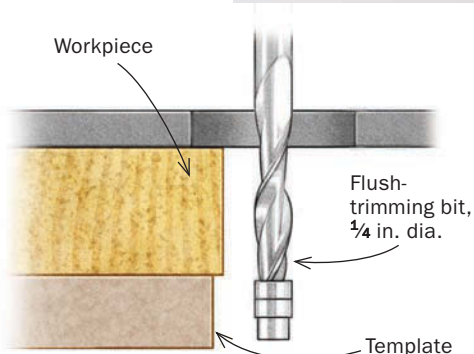
Template

Rout the profile. *Clamp the profile template to the bottom of the panel. Then use a bearing-guided straight bit to rout the final shape. Work counter-clockwise along the perimeter, and clockwise around the inside of the cutout.*
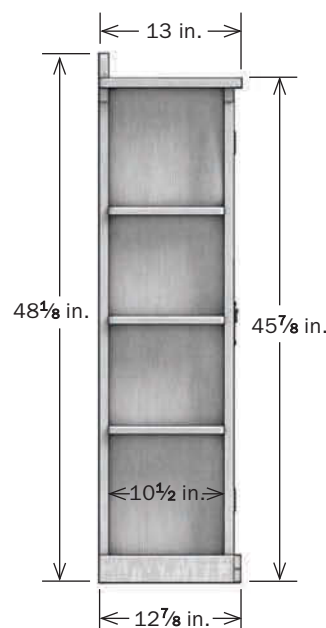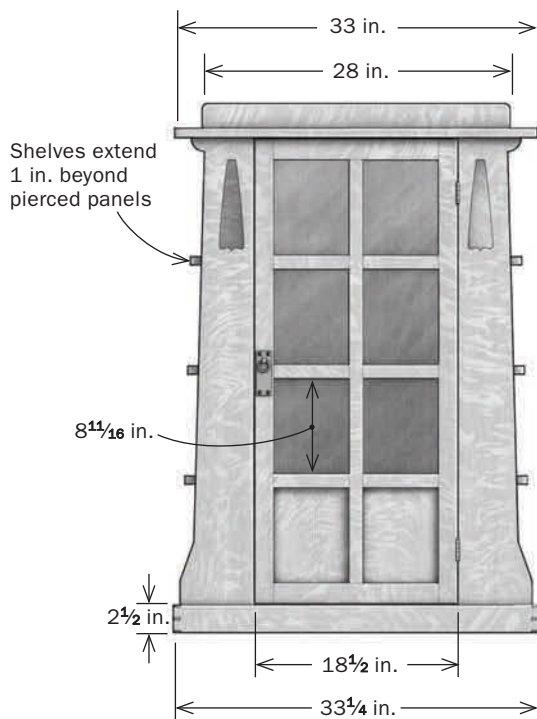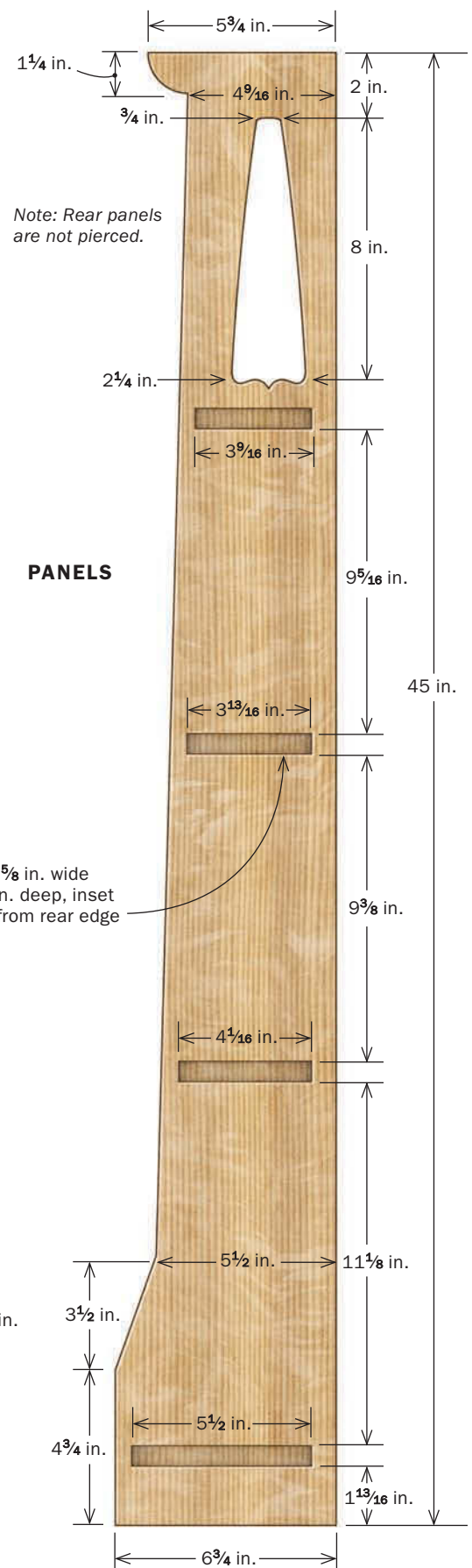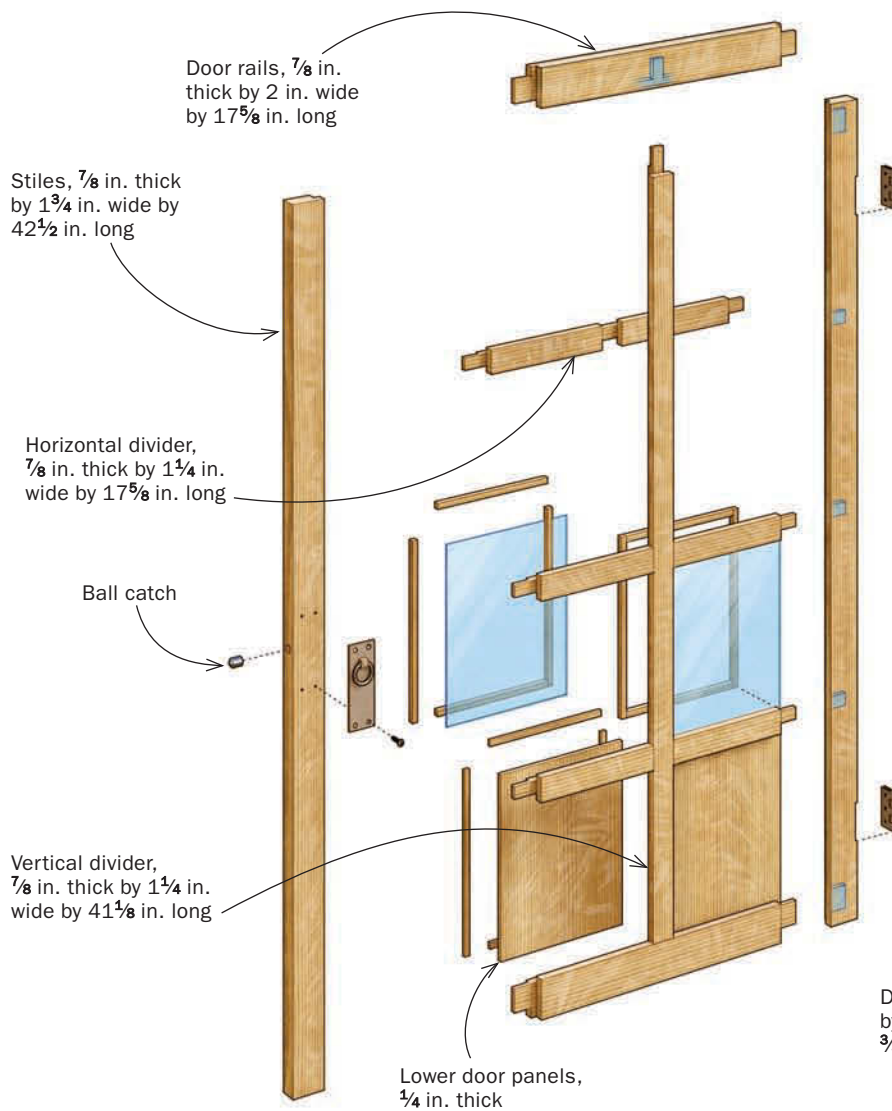
LIMBERT NO. 355 BOOKCASE

Shelves on the sides of the case offer more storage space, while the pierced panels give the project its unique charm.

Side, plywood, ³⁄₄ in. thick by 10½ in. wide by 45 in. long

#0 biscuits join the rear panels

Figure 8 fastener

Back splash, ⅞ in. thick by 2¼ in. wide by 28 in. long

Top, ⅞ in. thick by 13 in. wide by 33 in. long

Back dovetailed rail, 1 in. thick by 2½ in. wide by 19½ in. long

Front dovetailed rail, 1 in. thick by 2 in. wide by 19½ in. long

Back, plywood, ½ in. thick by 19¾ in. wide by 45 in. long

#20 biscuits join the front panels

Dowels

Shelf pin

Shelf, ⅞ in. thick by 10¾ in. wide by 18½ in. long

5¹⁄₁₆ in. wide

5⁵⁄₁₆ in. wide

5⁹⁄₁₆ in. wide

6 in. wide

Rabbet for case back, ⅝ in. wide by ½ in. deep

Dado, ³⁄₄ in. wide by ³⁄₈ in. deep, inset 1¾ in. from bottom edge

Base trim, ⅝ in. thick by 2½ in. wide

Bottom, plywood, ³⁄₄ in. thick by 11¾ in. wide by 19¼ in. long

Side shelves, ³⁄₄ in. thick by 11½ in. long

Panels, ⅞ in. thick by 6¾ in. wide by 45 in. long; front panels are pierced

Photos: staff; drawings: John Hartman

Door rails, ⁷⁄₈ in. thick by 2 in. wide by 17⁵⁄₈ in. long

Stiles, ⁷⁄₈ in. thick by 1³⁄₄ in. wide by 42¹⁄₂ in. long

Horizontal divider, ⁷⁄₈ in. thick by 1¹⁄₄ in. wide by 17⁵⁄₈ in. long

Ball catch

Vertical divider, ⁷⁄₈ in. thick by 1¹⁄₄ in. wide by 41¹⁄₈ in. long

Lower door panels, ¹⁄₄ in. thick

PANELS

Note: Rear panels are not pierced.

5³⁄₄ in.

1¹⁄₄ in.

4⁹⁄₁₆ in.

³⁄₄ in.

2 in.

8 in.

2¹⁄₄ in.

3⁹⁄₁₆ in.

9⁵⁄₁₆ in.

3¹³⁄₁₆ in.

45 in.

9³⁄₈ in.

4¹⁄₁₆ in.

Dado, ⁵⁄₈ in. wide by ¹⁄₂ in. deep, inset ³⁄₄ in. from rear edge

5¹⁄₂ in.

11¹⁄₈ in.

3¹⁄₂ in.

5¹⁄₂ in.

4³⁄₄ in.

1¹³⁄₁₆ in.

6³⁄₄ in.

Shelves extend 1 in. beyond pierced panels

33 in.

28 in.

13 in.

8¹¹⁄₁₆ in.

48¹⁄₈ in.

45⁷⁄₈ in.

10¹⁄₂ in.

2¹⁄₂ in.

18¹⁄₂ in.

12⁷⁄₈ in.

33¹⁄₄ in.

A rabbet for the case back. *Cut a rabbet in the rear face of just the rear panels. Use a dado blade buried in a sacrificial fence to make the cut in a single pass. Feed the stock with push pads to apply pressure along the cut for a rabbet of consistent depth.*

Biscuits for the case side. *Mark centerlines for the biscuits on both the panels and the case side. Register the base of the biscuit joiner on the tabletop to make the cuts in each part (above). Finally, dado the inside face of the case sides (right) to accept the case bottom.*

that is longer than the workpiece. This extra length helps me to safely enter and exit the profile cut.

Use the template to mark the profile on the side panels. Then head over to the bandsaw and cut just outside the layout line. The two front panels receive the cut-out, so you'll need to drill a hole and rough out the shape with a jigsaw.

Next, clamp the template to the panel, and then clamp both to the workbench. Make sure the panel is accurately positioned on your layout marks, and trim it to shape with a router and flush-trimming bit. Because the grain direction changes along the profile, I use a ¼-in.-dia. down-cut spiral bit, which is ideal for handling the details and inside curves. Move the router in a counterclockwise direction along the edge of the panel, and in a clockwise direction inside the cutout. Consider an over-size router baseplate for improved stability.

Now is a good time to circle back to the rabbets in the rear panels. These ½-in.-deep by ⅝-in.-wide rabbets receive the back of the center bookcase. Since the rabbets extend the entire length of the rear panel, they are easily handled with a dado blade at the tablesaw.

Then adjust the width of the dado stack to fit the ¾-in. plywood bottom of the center case and cut the dadoes for it on the inside face of the sides. It's important to position these dadoes accurately, so the case bottom aligns with the bottom side shelves.

Finally, tenon the side shelves to fit the dadoes in the front and rear panels. The upper three shelves extend beyond the panels and need rounded corners as well.

Glue the side units

When dry-fitting one of the side assemblies, I realized it was rather difficult to align the case side with the rear edge of the panels, while at the same time positioning the shelves correctly. The solution was a row of biscuits connecting the panels to the case side. I used #20 biscuits on the front pierced panel, and smaller #0 biscuits on the rear panel because of the rabbet along the edge.

Before assembly, do a complete dry-fitting and make sure all the components fit as they should. Once you're satisfied with all the joinery, you're ready for glue.

Apply glue to the dadoes and biscuit slots and assemble the side units. Make sure the case sides are flush with the top of

Glue up the side assemblies, then connect them with the case bottom. Fit the case side and shelves into one panel and drop the second into place (above). Tap the shelves tight to the case side and clamp the assembly together. When dry, glue the side assemblies to the case bottom (right).

the panels. While no glue is required behind the shelves, double check that there's no gap between the case side and shelves. Apply a small army of clamps and set the assemblies aside to dry for 24 hours.

Connect the side assemblies

Once the clamps are removed from the side assemblies, you can add the case bottom. You'll need to notch the corners of the bottom to fit the dadoes, which is an easy matter at the bandsaw. Give the bottom a good sanding and glue it between the two side assemblies. At this point the bookcase is starting to take shape.

Now move on to making the dovetailed rails that hold the bookshelf together at the top. Not only do they prevent splay at the top of the case, but they also function as a stop for the glass door, and firmly support the back of the case.

Determine the exact shoulder-to-shoulder length of the rails by measuring directly from the case sides. Cut a shoulder on the bottom of the rails to aid in alignment when scribing and dovetail the ends with a handsaw or at the bandsaw.

When scribing the case sides for the dovetails, set the front rail ⅛ in. back from
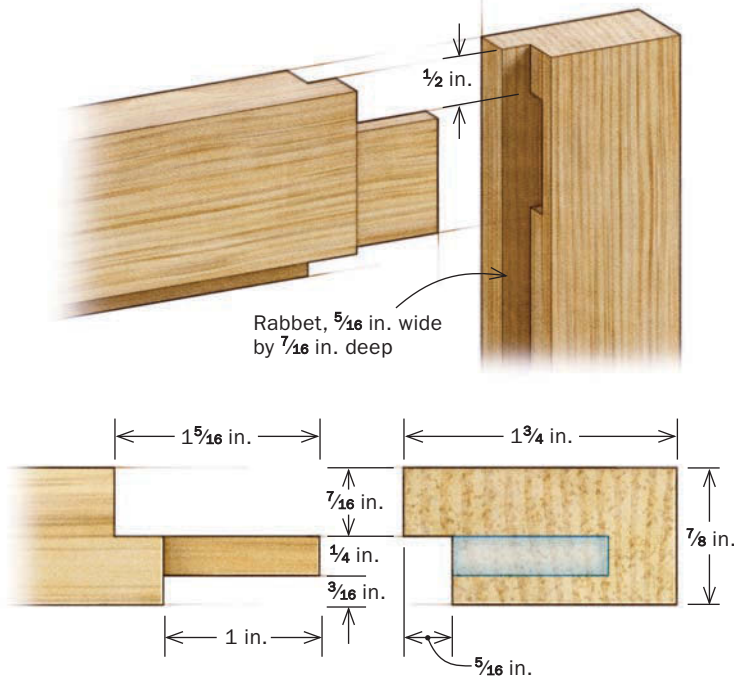

Add the dovetailed rails. A shallow rabbet on the bottom of the dovetail makes it easier to align the rail for scribing. After scribing, rout out the waste with a spiral bit and chisel into the corners. Then glue in the rails.

Finally, install the top. Glue the back splash to the top, then screw the top to the case. Dowels align the top at the front edge. Glue the top only at the front and use figure-8 clips to secure it at the back to allow for wood movement.

A FRAME WITH A BUILT-IN RABBET

½ in.

Rabbet, 5⁄16 in. wide by 7⁄16 in. deep

1 5⁄16 in.   1 ¾ in.

7⁄16 in.

¼ in.

3⁄16 in.

7⁄8 in.

1 in.

5⁄16 in.

Now move on to installing the top of the bookcase. Start by gluing the backsplash to the top, and then attach them as a unit. Dowels are used to align the top at the front of the case. Add glue and screw the top along the front rail. At the back, skip the glue and screw the top to the rear rail through elongated holes to allow for seasonal movement. Use figure-8 fasteners to secure the corners of the top to the rear panels.

Build the door

While you could assemble the door first and then rout a rabbet for the glass afterward, I like to make a door with a built-in rabbet. The key is to rabbet the parts first, and then offset the tenon shoulders to match. This technique may seem daunting, but if taken one step at a time, it's not that difficult. And it saves you from squaring 32 inside corners.

Begin by rabbeting all the door parts. The horizontal and vertical dividers receive rabbets along both rear edges. Next, cut the mortises so they are aligned with the inside face of the rabbet. I cut them with a mortising machine, but any method would work. Then move on to the tenons, cutting them using a dado blade at

Start with the rabbet. *Use a dado blade partially buried in a sacrificial fence to make the cut.*

Cut the front tenon cheek. *Adjust the fence to the final width of the tenon and use a miter gauge to cut the cheek in two passes.*

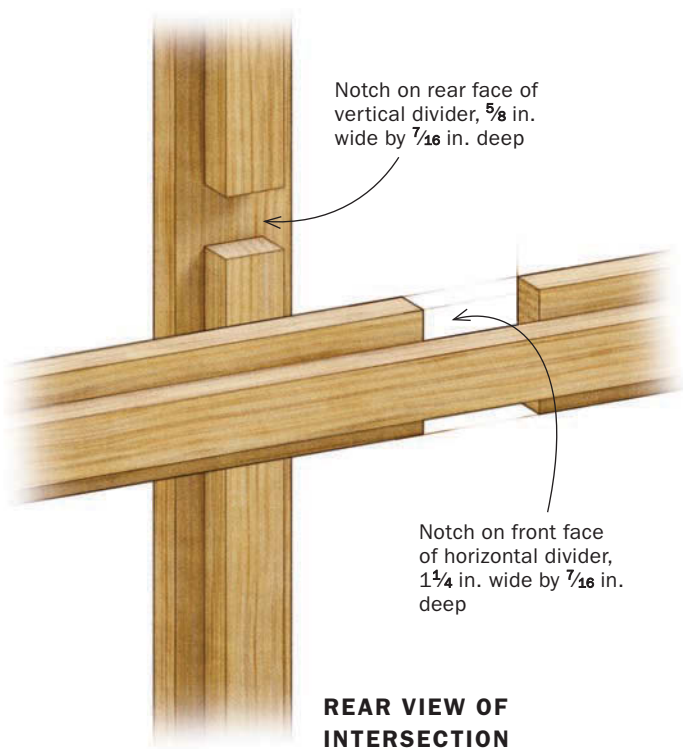**Cut the rear cheek.** *Adjust the fence to account for the width of the rabbet when cutting the second cheek.*

the rear of the front panels to allow for a cork door bumper. Use a ¼-in.-dia. spiral bit and plunge router to excavate most of the waste, then use a sharp chisel to clean up the inside corners. Before gluing the rails in place, drill the countersunk holes in them that will be used to attach the top.

Final assembly

There are a few loose ends to wrap up before this bookcase is finished. Install base trim along the front and sides of the case to tie everything together. The original piece featured a mitered molding, but I used dovetails at the corners instead. The shoulder-to-shoulder length on the face trim needs to be spot-on. The side trim pieces can be left long while dry-fitting the dovetail joints, and then marked and cut to length before final assembly.

WHERE THE DIVIDERS MEET

Notch on rear face of vertical divider, ⅝ in. wide by ⁷⁄₁₆ in. deep

Notch on front face of horizontal divider, 1¼ in. wide by ⁷⁄₁₆ in. deep

REAR VIEW OF INTERSECTION

Notch the rear face of the vertical divider. Adjust the dado set to the width of the narrow portion of the divider and set the blade height equal to the rabbet. Register the divider end against the rip fence.

Notch the front face of the horizontal dividers. The wider notch will require two or more passes. Register the end of the divider against the rip fence for the first cut, then rotate it for the second cut. Using this technique will keep the notch centered.

Bring it all together. To assemble the door, first connect the horizontal and vertical dividers (above). Then insert the assembly into the rails and finally add the stiles (right).

Dye and seal. *Sandry adds an overall tone to the wood by wiping on TransTint golden brown dye (above). Then he seals the finish with SealCoat, a blond dewaxed shellac (right).*

Add a glaze. *Sandry uses General Finishes walnut gel stain as a glaze to darken the pores and highlight the medullary rays of the oak. He works the stain into the wood, then wipes it off to achieve the desired color. Sandry sealed it with a sprayed lacquer, but any satin finish would be appropriate.*
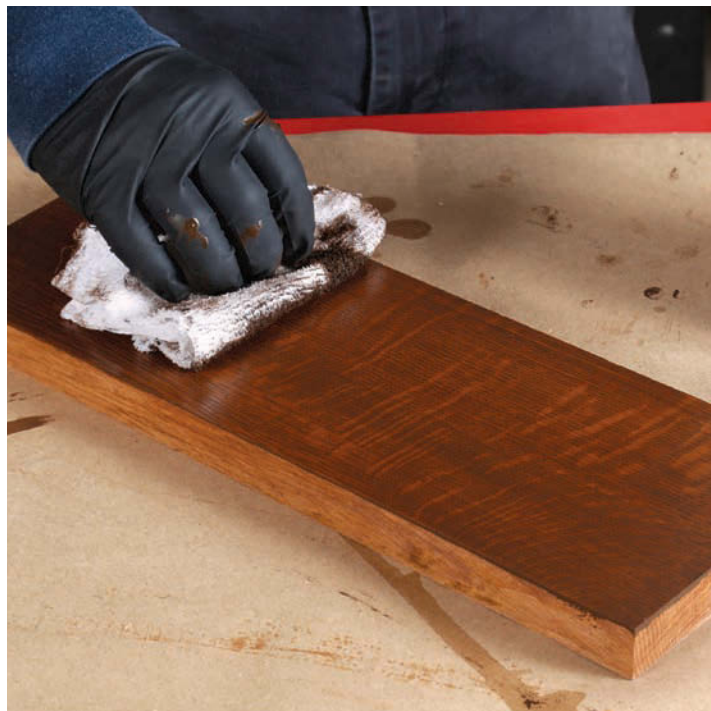
the tablesaw. Start with the front cheek of the tenons, then adjust the fence to account for the width of the rabbet and cut the rear cheeks. The result is a tenon with offset shoulders. Sneak up on the blade height until the tenon fits the mortise. Then incrementally adjust the rip fence until the offset shoulders seat fully in the rabbeted stiles.

The last bits of joinery for the door are half-laps on the dividers. Start with a ⅝-in.-wide dado stack and cut three half-laps in the back side of the vertical divider. Before you cut them, make a test cut in some scrap to confirm that a full ⅝-in. dado stack will make the cut in one pass (I had to add a 0.020-in. shim for the parts to fit), and set the blade height to match the rabbet.

With those cut, turn your attention to the horizontal dividers, which are notched on the front face. Don't bother adjusting the width of the dado stack, as multiple passes with the ⅝-in. width will work just fine. With the workpiece against the miter gauge, use the rip fence on your tablesaw to register the end of the stock and cut passes from both ends to ensure a centered cut. Sneak up on the rip fence position until the intersecting parts fit like a glove.

Make glass stops to secure the individual panes in the door. This 5⁄16-in.-square trim can be left extralong and cut to length after finishing. You will also need 5⁄16-in. by 3⁄16-in. trim to secure the wooden panels in the door. After the finish is applied, attach the glass stops with a 23-gauge pin nailer and ⅝-in.-long pins, or

dabs of silicone. I selected "hand blown" glass, which has slight wavy imperfections and occasional seedy texture.

Apply the finish

I used a stain-over-dye technique to highlight the medullary rays of the white oak. After finish-sanding, raise the grain with a spray bottle of distilled water. Once the surface is dry, scuff-sand it with 220-grit sandpaper to knock down the raised grain. A final cleaning with cheesecloth and compressed air prepares the project for the first layer of color.

Next apply a water-based dye. In this case, I used TransTint golden brown mixed in a ratio of 1 oz. of dye to 1 qt. of dis-

tilled water. Apply the dye with a rag or staining sponge, moving quickly for consistent color. Follow that with a seal coat of shellac, and finally a walnut gel stain used as a glaze. Sealing with a coat of shellac first makes it easier to get uniform color with the glaze coat. Wipe off the excess gel stain until you are satisfied with the color. I sprayed two coats of pre-catalyzed lacquer as a topcoat. Any finish would work, but pick one with a "satin" sheen for an authentic Arts and Crafts look. Extruded brass hardware is the final "tip of the cap" to Limbert's creation. □

Willie Sandry is a woodworker and small-scale lumber kiln operator in Camas, Wash.