

Bookcase Made with Biscuit Joinery

Lumber matched for color and figure lends elegance to this charmingly simple case

by Peter S. Turner



***A small bookshelf—
This V-shelf bookcase
is made of solid
cherry, joined with
No. 10 biscuits.***

(see the drawing on p. 60). You can edge-join two boards for the sides and bottom shelf, or you can use single boards if your stock is wide enough. If I edge-join two boards for the sides, I make sure that the glueline ends up in the exact center.

I begin by flattening, edge-jointing, then thickness-planing all my stock down to $\frac{3}{16}$ in. Then I pick through the boards and find the best matches to make up the two sides and bottom shelf. I glue up the sections using pipe clamps. After the glue is dry, I clean up any squeeze-out and joint one edge of each side and the bottom shelf. Then I select the boards for the two V-shelves, joint one edge and rip them slightly oversize on the tablesaw.

At this point, I run the lumber through a thickness sander until everything is $\frac{1}{2}$ in. thick. I prefer a sander because on highly figured woods, my planer produces tear-out. You could, of course, thickness-plane the boards, and take care of any blemishes with handplanes and scrapers. Once all the stock has been sanded to $\frac{1}{2}$ in., I rip it to final width on the tablesaw.

Using the sliding crosscut sled on my tablesaw, I cut the sides and shelves to length. It's critical that the shelf components all be

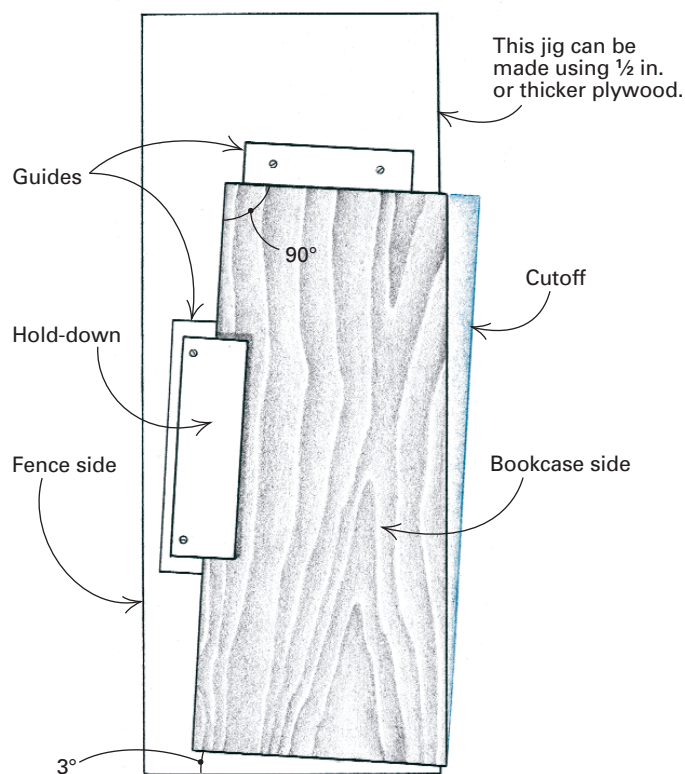
Furniture with few design flourishes benefits from wood that has lots of figure. When I build simple bookcases like this one, I look for cherry with bold grain patterns, which I often find when sifting through stacks of No. 1 and No. 2 common grades. Using lumber with beautiful figure, selecting and matching all the stock, is really my favorite part of furnituremaking. I modeled this bookshelf after one that once belonged to my great

grandmother. It's a small, easy-to-build piece whose few design details are quite simple. For the joinery, I use No. 10 biscuits for everything. All the pieces are $\frac{1}{2}$ in. thick, which gives the bookshelf a light and delicate look.

Roughing out all the pieces

When picking lumber for this project, I select stock that's at least 7 in. wide, so each half of a V-shelf requires only one plank

SIMPLE JIG FOR CUTTING TAPERS



square and exactly the same length. The joint between the shelves and ends are what will make or break this piece, so be sure your crosscut sled is right on.

I taper the sides using a homemade jig on my tablesaw (see the drawing above). The jig is just a piece of plywood with a few guides screwed to it at an angle. To use the jig, I place it flush against the tablesaw's fence and nudge the fence toward the blade until the left side of the jig just touches the blade. I lock the fence, place one of the sides in the jig and screw a piece of scrapwood onto the right-side guide to act as a hold-down. I cut the taper by pushing the jig along the tablesaw fence (see the top photo at right).

To cut the opposing taper, I flip the workpiece on its other face, place the cutoff against the right edge of the workpiece and, finally, place a shim the same thickness as my tablesaw blade between the cutoff and the jig guide (see the photo at right). I make sure all the pieces are snug, attach a hold-down and cut the taper.

Join V-shelves, and shape edges

With all the pieces cut to size, it's time to join the V-shelves and cut the biscuit slots

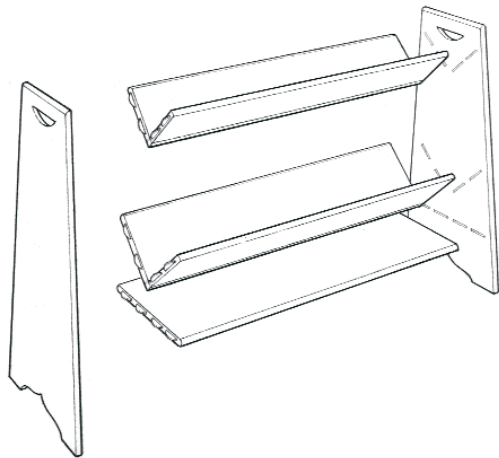
Rip one side.
A hold-down screwed to the right guide of the jig keeps the workpiece snug when sawing.



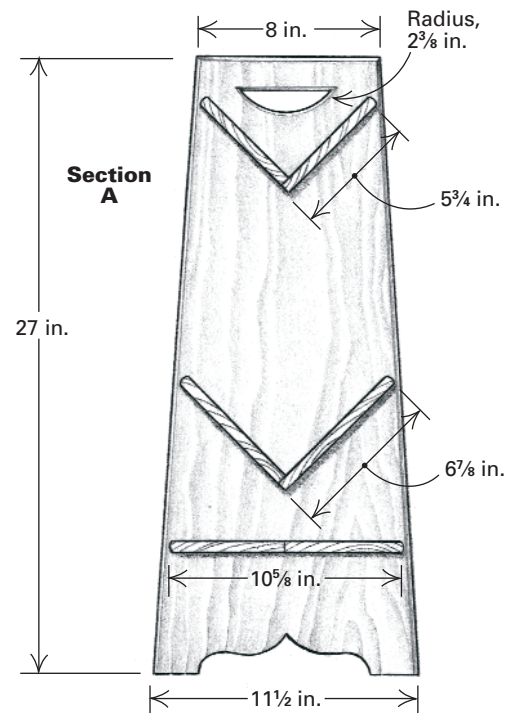
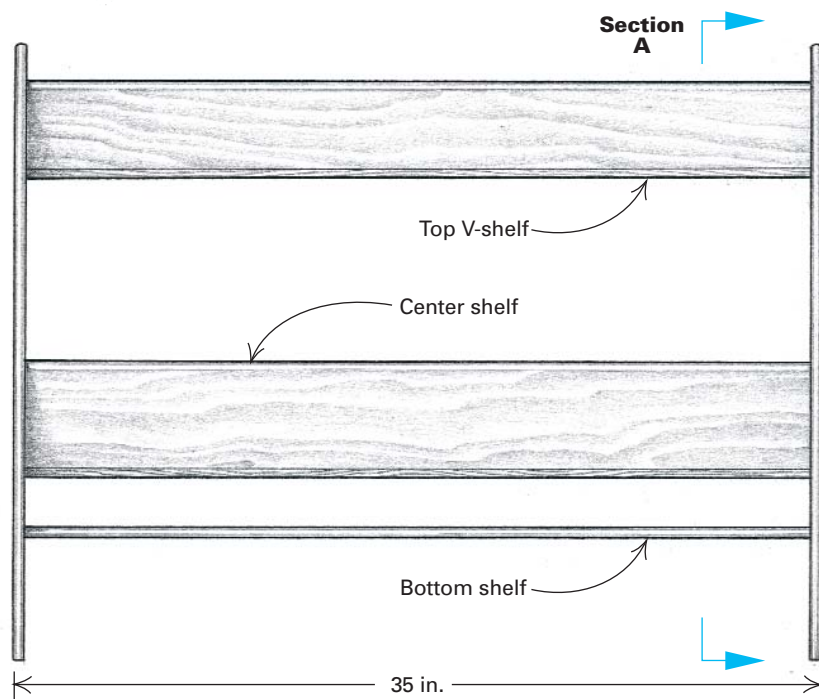
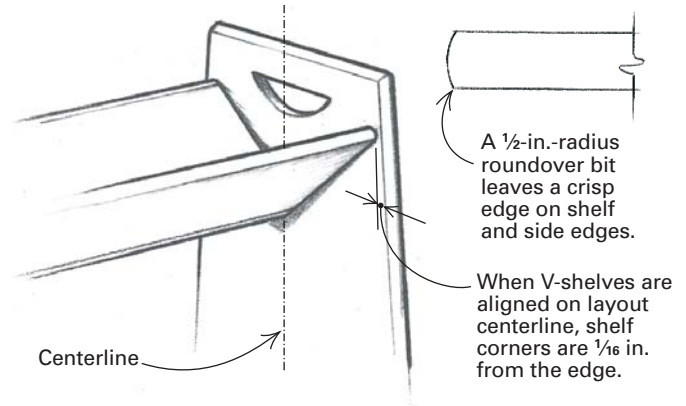
Cutting the opposite taper—
Place a shim the thickness of the sawblade against the right guide, then the cutoff and, last, the workpiece, which is turned over on its other side.



Bookcase with V-shelves



All parts of this bookcase are made from 1/2-in.-thick material. The shelves are joined to the sides with No. 10 biscuits. The lengths of all three shelves should be the same and the ends of the V-shelves dead even.



These joints hold the case together. The V-shelves are joined at 90° to each other. Biscuit slots cut in the ends of the shelves join them to the case sides.



in the sides that will fasten the shelves. First I join the V-shelves. I use four biscuits per shelf, evenly spaced. For each V-shelf, one set of slots is cut in the edge of one board, and the mating set is cut into the face of the other board.

To glue up the V-shelves, I use scrap along the faces where the clamps are positioned to protect the wood. I'm not worried about the edges because they get shaped later. When I tighten the clamps, I use a try square to check that the pieces stay 90° to each other (see the far left photo). I use four clamps for each shelf, each clamp positioned over a biscuit joint. The ends of each V must be dead even. When the glue is dry, I rip each wing of each V-shelf to its final width on the tablesaw.

The long edges of both V-shelves and all edges of the sides, excluding the feet and

cutouts, are rounded over leaving a crisp edge where the roundover meets the edge of the board. To get that shape, I set my router-table fence slightly past the outside edge of the pilot bearing on a 1/2-in.-radius roundover bit. I use hold-downs and featherboards to make sure the stock passes firmly and squarely over the bit. Because all the stock for this project is 1/2 in. thick, I only have to set up once. When all the edges are machined, I lightly scrape and sand them to get a fair roundover, being careful not to soften the edges.

Slots in sides and shelves need to match

I first cut all the slots in the shelves with the biscuit joiner. The shelves have four slots cut on each end. After I cut these, I'm careful not to get carried away and erase the layout marks until I have transferred them onto the sides.

To mark the location of the mating slots on the bookcase's sides, I use the V-shelves as layout guides. First I draw a vertical centerline on the inside face of each side. To locate a V-shelf, I place it on end against a side, keeping the apex of the V on the centerline, and slide it along the centerline until both edges are inset 1/16 in. from the case side. I hold the shelf in place and trace along the bottom edge with a pencil. I also transfer to each side the layout marks showing where the biscuit slots should be cut.

To cut the slots in the sides, you need something to register the biscuit joiner against because you can't use the tool's fence as you did on the shelves. I clamp a straight block of wood parallel to the lines I traced off the shelves. I offset this straightedge to make up for the fact that I'm registering the base of the biscuit joiner, not its adjustable fence, against the straightedge. Here's how I figure out the offset: I measure the distance from the bottom face to the bottom of a V-shelf slot (see the photo at right). On my biscuit joiner, I measure the distance between the bottom of the blade (I use a raker tooth) to the base. I subtract the first number from the second; that's the offset, which I lay out on the side (see the top right photo). I use two clamps each time I reposition the straightedge, and then I cut all the slots.

Template routing the cutouts and shaping the edges

I made up a template for the cutouts in the sides using a piece of 1/4-in. hardboard. It's

USE V-SHELVES AS LAYOUT GUIDES



Mark the inside faces of the sides. Transfer the biscuit slot marks from the shelves to the sides.



Mark the offsets from the lines just traced. These new marks are used to position a straight-edge for the biscuit joiner.



A straight board guides the biscuit joiner. The author places the base of the tool against a board clamped to the side to cut the slots for the shelves.



Assemble the bookcase on end.
Cauls, a squaring jig and backer boards ensure that the case is clamped tightly and won't be marred.

tom shelf and one side to keep the case properly aligned during glue-up.

When I assemble the case, I stand it on its side. After clamping it, I check whether all the shelves fit flat against the sides (see the photo at left). I mark any that don't and after unclamping the case, plane them to fit.

Prior to finishing, I sand all the pieces through 180-grit. Then I wipe everything down with a damp rag to raise the grain. When the pieces are dry, I continue sanding up to 320-grit. When I sand the edges, I'm careful not to lose their definition.

I lied earlier when I said that selecting and matching the stock was my favorite part of building furniture. I forgot about applying the first coat of oil. It's nice to see the grain and figure pop out when oil is rubbed into the wood.

I use three coats of Kaldet finish oil, which is made by Livos, a German company. It is a linseed oil-based product that contains citrus solvents. The oil is available from The Natural Choice (800-621-2591). I prefer Livos products because of their low toxicity, nice satin sheen and pleasant lemony scent. □

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easy to work with, and if you don't like the look of a template you've just shaped, it's cheaper and faster to make another template than another bookcase side. If you add a router with a guide bushing, a template also makes quick work of cleaning out the cutouts. When I made my template, I used a compass to draw the curve of the handle and a French curve to draw the whale tail. I faired out the curves by sanding and filing.

I mark the cutouts on both ends and remove the waste with a jigsaw, staying at least $\frac{1}{16}$ in. off the line. Then I clamp the template over a cutout and go over the area again using a router fitted with a $\frac{5}{16}$ -in. guide bushing and a $\frac{1}{4}$ -in. straight bit. The bookcase's handles get one more run past the router. After removing the templates and guide bushing, I chuck a

$\frac{1}{4}$ -in. roundover bit in the router and ease the edges of the cutouts.

The final shaping of the sides is accomplished using hand tools. Using a file and chisel, I shape the corners of the handles and the sharp junctures where the curves of the whale tails meet.

Assembly, cleanup and finish

Before final assembly, I dry-fit the case to make sure that everything lines up. To avoid marring the piece and to make sure I get even clamping pressure, I use cauls and backer boards. The backer boards are two pieces of scrap plywood slightly larger than each side. To these, I attach a pair of cauls with double-faced tape.

I also use a shopmade squaring jig that's nothing more than a right-angled triangle made of scrap. I clamp this jig to the bot-

