



Stackable shelves

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Stackable Shelves



Project facts

Cost
\$250

Time
2 weekends

Skills
Beginner to
intermediate

Special tools
Circular saw
Jigsaw
Clothes iron
Fine file
Laminate edge
trimmer

A shop-made jig makes this project simple to build and a snap to assemble

by **David Radtke**

If you need shelving, storage, a desk or a work surface, check out this modular system. It's got lots of storage space for your electronic gear and books and a nifty recess to accommodate a stool. And you can easily customize this system to suit your storage needs and wall space.

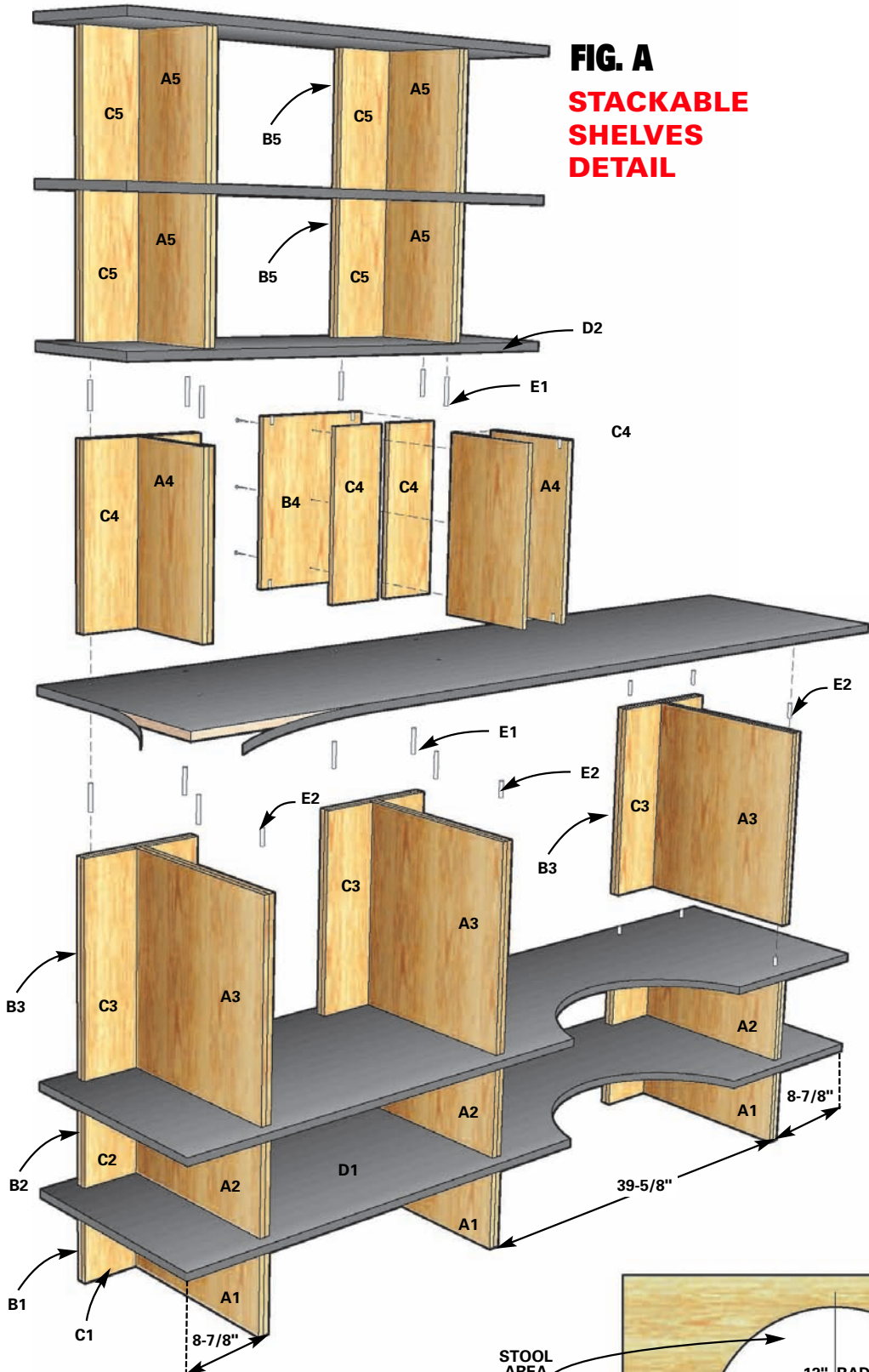
The T-shaped standards (**Photo 5**) are simple to cut and glue. (We used Baltic birch because we liked the look of the multiple laminations on the edges, but any 1/2-in. hardwood plywood will do.) We chose sturdy, easy-to-clean 3/4-in. Melamine for the horizontal shelves because it has a tough, plastic-like surface, but you can use plywood, MDF (medium-density fiberboard) or particleboard and paint it any color you wish.

More SHELVES >>

Stackable Shelves

FIG. A

STACKABLE SHELVES DETAIL



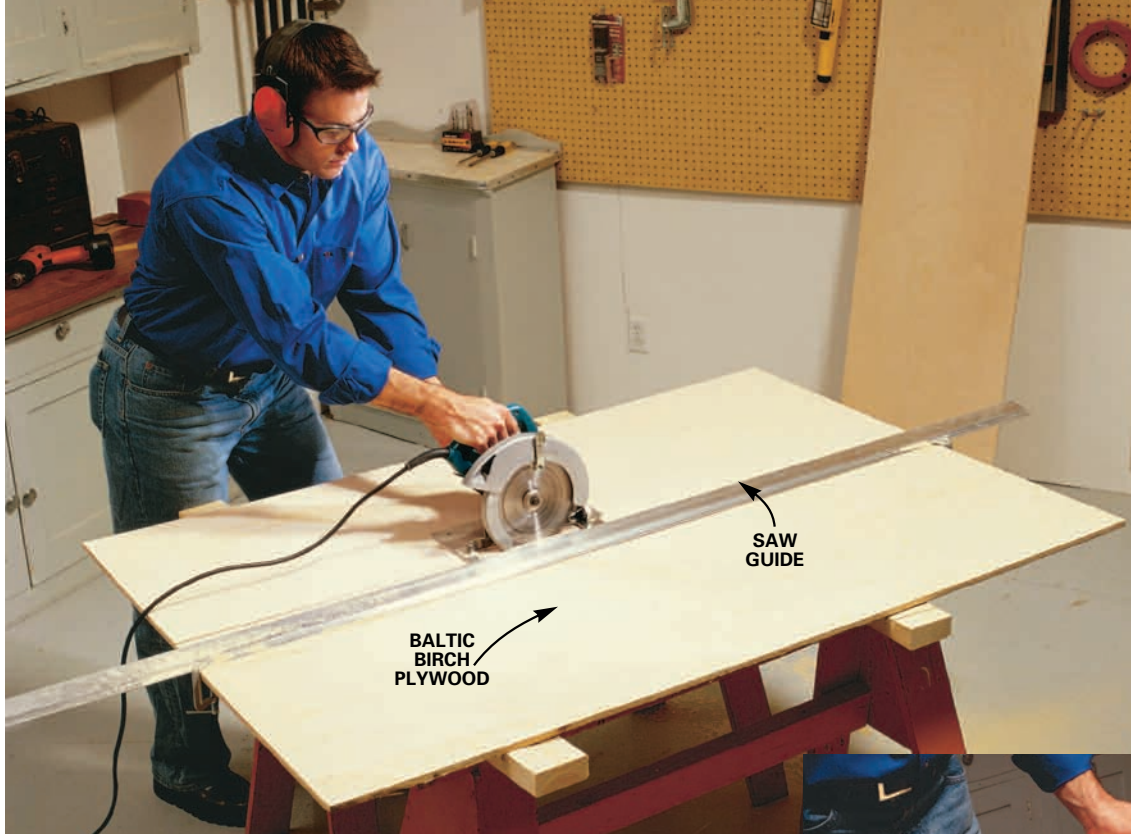
Cutting List

KEY	PCS.	SIZE & DESCRIPTION
A1	6	8" x 18" 1/2" plywood (first-tier standard pieces)
A2	6	9" x 18" 1/2" plywood (second-tier standard pieces)
A3	6	19-3/4" x 18" 1/2" plywood (third-tier standard pieces)
A4	4	16" x 9-1/2" 1/2" plywood (fourth-tier standard pieces)
A5	8	12" x 9-1/2" 1/2" plywood (fifth- and sixth-tier standard pieces)
B1	3	8" x 11-3/4" 1/2" plywood (standard T-end backs)
B2	3	9" x 11-3/4" 1/2" plywood (standard T-end backs)
B3	3	19-3/4" x 11-3/4" 1/2" plywood (standard T-end backs)
B4	2	16" x 11-3/4" 1/2" plywood (standard T-end backs)
B5	4	12" x 11-3/4" 1/2" plywood (standard T-end backs)
C1	6	8" x 5-3/8" 1/2" plywood (standard end blocks)
C2	6	9" x 5-3/8" 1/2" plywood (standard end blocks)
C3	6	19-3/4" x 5-3/8" 1/2" plywood (standard end blocks)
C4	4	16" x 5-3/8" 1/2" plywood (standard end blocks)
C5	8	12" x 5-3/8" 1/2" plywood (standard end blocks)
D1	3	21" x 84" 3/4" Melamine or other sheet good
D2	3	12-1/2" x 44-3/8" 3/4" Melamine or other sheet good
E1	36	3/8" x 2-1/2" steel pins
E2	11	3/8" x 1-1/2" steel pins

For details about materials, see p. 92.

STOOL
AREA

CUTOUT
TEMPLATE



1 **RIP** your 1/2-in. plywood into pieces to make the standards, then cut the lengths with a circular saw. Cutting large sheets with a straightedge guide and a circular saw is easier than wrestling large sheets through a table saw.

The plywood standards and the shelves are drilled precisely with a homemade jig (**Photos 4 and 6 and Fig. B**) and are held together with 3/8-in. dia. steel pins. The pins slide through the shelves and into the standards, so putting this together is sort of like stacking blocks or Lego pieces.

Glue the front pieces together for each standard and then 'sandwich clamp' them

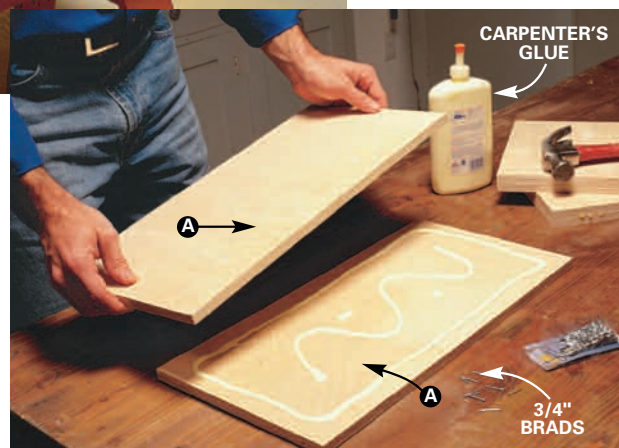
We went to all the trouble of gluing the 1/2-in. plywood standard fronts together to create a more stable, 1-in. thick support. This thickness also allows us to use 3/8-in. pins in the assembly for more strength and sturdiness. It would take you a month of Sundays and dozens of

Text continued on p. 90

More SHELVES >>

CLAMP three laminated pairs (A) together using 2x4s to help distribute the pressure evenly across the sheet surface. Leave the assembly clamped for at least two hours.

2 **GLUE** together the two pieces that make up part A of the standards. Nail the two pieces together at two corners with 3/4-in. brads once you've aligned them. This keeps them from drifting apart when you clamp them.



Stackable Shelves



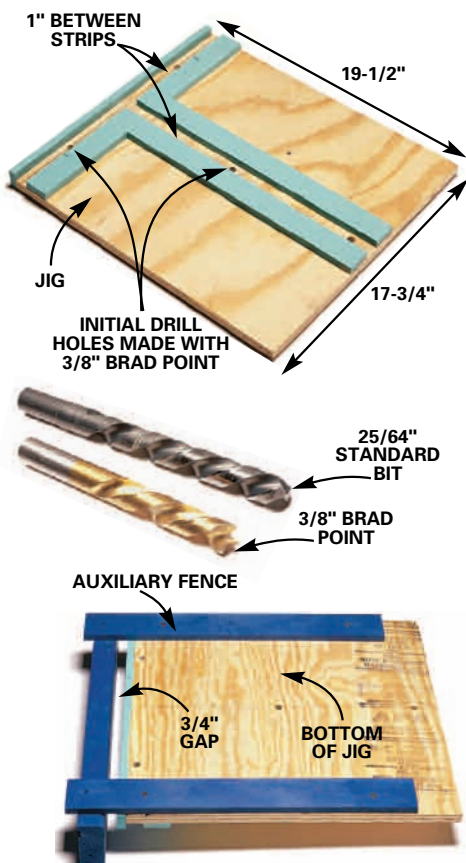
4 GLUE AND SCREW the 1/2-in. plywood back (B) to the laminated part A to form the T-shape of the standard. Be sure to center the standard and make sure everything is aligned. The jig will help with the correct alignment.



5 GLUE AND CLAMP parts C to each standard. Be sure to glue around the perimeter of each piece and also run a bead of glue along the inside corner. Use as many clamps as necessary. For tall standards you may need up to four clamps per side. Remove the standard from the jig and glue another standard together while the glue sets.

DRILLING JIG DETAIL

FIG. B

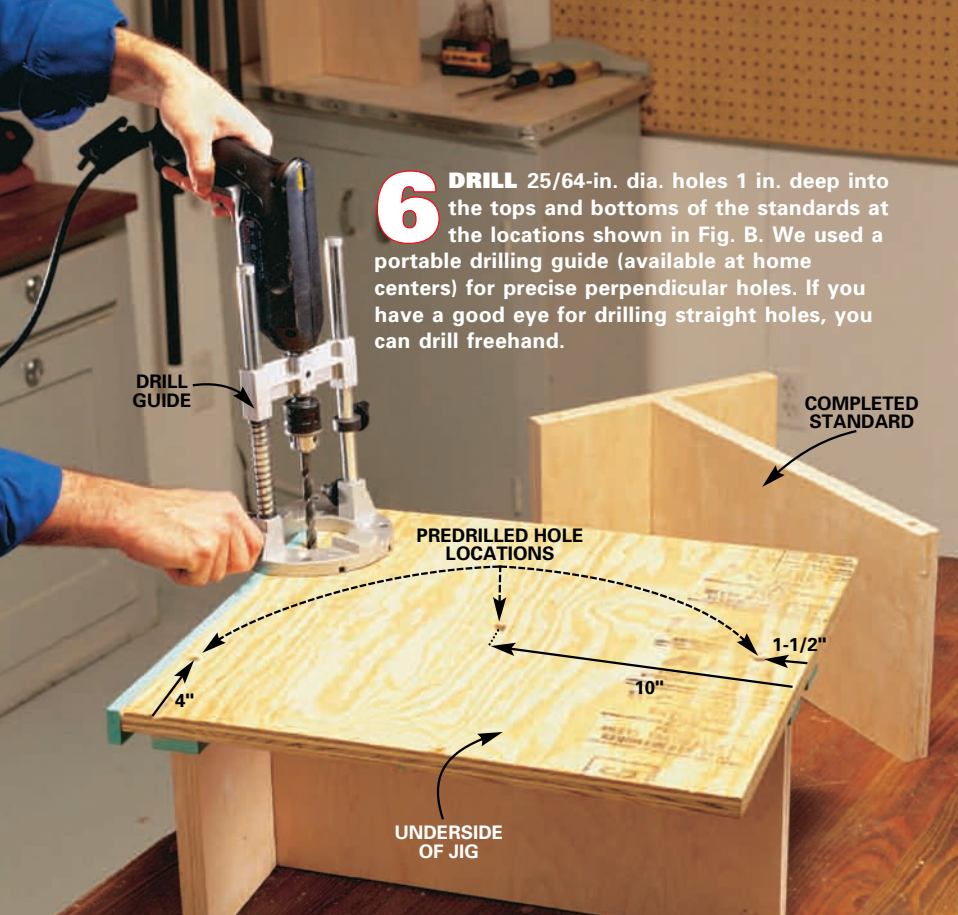


BUILD A JIG TO ASSEMBLE AND DRILL THE T-SHAPED SHELF STANDARDS

You can't successfully build this project without maintaining exact consistency. This handy jig will help. You make the jig by gluing and nailing 1/2-in. plywood strips to a 3/4-in. scrap plywood base. Use a square to lay out everything precisely as shown in Fig. B. This jig helps you assemble the parts of each standard precisely. And you can flip it over and use it to accurately drill the pin holes (Photo 6).

The jig will also be your guide for drilling the holes into the horizontal shelf boards, which need to perfectly align with the standards (Photo 8). All you need to do is screw an auxiliary fence to the jig to maintain the proper overhang on the front and back of each shelf.

More *SHELVES* >>



6 **DRILL** 25/64-in. dia. holes 1 in. deep into the tops and bottoms of the standards at the locations shown in Fig. B. We used a portable drilling guide (available at home centers) for precise perpendicular holes. If you have a good eye for drilling straight holes, you can drill freehand.

clamps to individually clamp all the standard fronts together. Instead, get all your pieces cut and ready to glue and then clamp three or four pairs together at one time as shown in **Photo 3**.

Measure the height and width you need for each shelf

If you plan to alter this project to suit your personal stuff, establish the height of each shelf so you can cut the plywood for the T-shaped standards. Measure the heights of things you plan to display, like a TV, stereo equipment, computer or books. Also, leave some room from the top shelf to the ceiling.

Text continued on p. 93

More SHELVES >>>

Stackable Shelves



7 **CUT** the assembly pins from 3/8-in. rod using a hacksaw. File the burrs on the cut edge to make the pins easier to slip into the holes.



8 **DRILL** the pin holes in the shelves using the same 25/64-in. drill bit and an accessory fence screwed to the jig. The auxiliary fence positions the jig automatically to ensure consistent overhang from the standards. Be sure to set the depth stop on your drill so you don't drill through the top piece of your shelving unit, which is located on the bottom of the stack as shown.

Stackable Shelves



9 **IRON** the preglued strips onto the edges of the shelves. Use a medium to high setting on the iron. When the glue has set, use a special edge trimmer (available at home centers) for perfect edges. After trimming the edges, sand the edges lightly with 220-grit sandpaper or a fine mill file.



10 **CUT** your Melamine or plywood using a 60-tooth carbide blade in your circular saw. Cut with the good side down to minimize chipping. If you're using black Melamine, you can hide minor chipping with a permanent marker.

Choosing materials

Melamine is tough to cut without chipping. If this is one of your first projects, you may want to consider using a different shelf material. In some areas, the black will be difficult to find unless you have a full-service lumberyard special-order it. White Melamine, however, is sold in 3/4-in. thicknesses in most home centers.

Hardwood plywood with iron-on wood edging or MDF (medium-density fiberboard) are excellent substitutes for 3/4-in. Melamine. You can sand the edges of MDF easily, and it paints beautifully because it's so smooth. Plywood is readily available as well, but you'll need either 1/4-in. glue-on strips or iron-on wood edging to cover the exposed edges. You can then stain, varnish or paint the plywood.

Baltic birch may also be tough to find in some areas. It's usually sold in 5-ft. square sheets. We used nine-ply sheets because the cut edges look great when sanded and finished. Each layer, or ply, stands out. And unlike with other plywood choices, there are no voids. You can buy Baltic birch with one good side and the other made from lower-quality veneer. This makes the most sense for this project because you can hide the bad side. You can substitute any hardwood plywood, but you may need to glue hardwood strips over the edges to hide voids.



11 ASSEMBLE the standards and shelves one tier at a time. Begin by positioning the bottom standards, then align the shelf and tap the pins through the shelf and into the standard.

You don't want your new shelves to sag, so don't exceed a span of 29 in. between the rear wings of the standards.

The span is measured from the closest points between the T-shaped standards (**Photo 11**). For example, if the front edges of your standards are 38 in. apart, the rear wings of the T-shaped standards will be close to 27 in. apart—well within the limit. 🏠



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