

Vol. 7 No. 3 • Issue 39

Weekend Woodworking Projects

May 1994
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Shaker Table**

Entertainment Center

ABC Tree Puzzle

**Lighthouse
for the Birds**

**Deck-Rail
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**Guestroom
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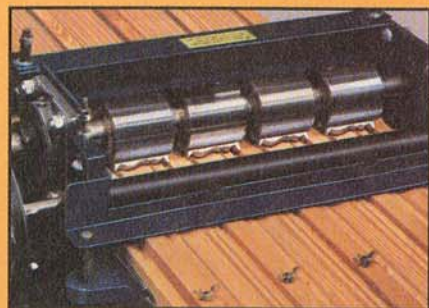
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Editor, Workbench Magazine

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E. D. Holtz, North Carolina

Weekend Woodworking Projects



Guestroom Luggage Rack,
Page 10

5 STately Side Table

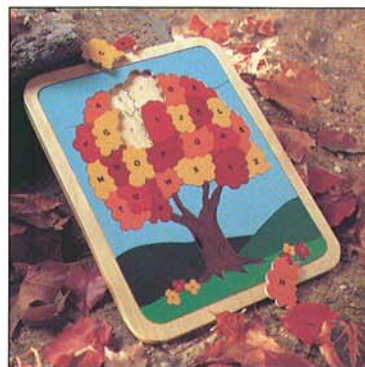
The word “stylish” may not pop immediately into your head when you think of Shaker furniture. But the elegantly contoured feet and frame of this little trestle table typify the stylistic touches that often accompany the fabled Shaker simplicity.

10 GUESTROOM LUGGAGE RACK

Here’s one of those little extras that weary travelers appreciate when they’ve been slaving over a hot dashboard all day. And once your guests are back on the road, you can put this handy design to work as a TV or breakfast-tray stand.

15 ABC LEARNING TREE

Challenge your kids to master their ABCs with this well-ordered puzzle. Our little ones kept going back and assembling the pieces one more time—without any prompting from mom or dad.



ABC Learning Tree, Page 15

18 CENTER OF ATTENTION

If you don’t have space for one of those huge entertainment centers, this cabinet offers an attractive alternative to that particleboard stuff you see in the discount stores. And you’ll still have room for a TV, VCR, stereo system, and lots of tapes and discs.

24 LIGHTHOUSE FOR THE BIRDS

This charming variation on the usual nesting box comes to us from Larry Hanapole of Marblehead, Massachusetts, who here combines the features of two originals on the Maine and Nova Scotia coasts.

28 DECK-RAIL PLANTER FRAMES

Try dressing up your plastic planter boxes or clay pots with these handsome “rail riders.” The elegance they’ll add to your deck will surprise you, especially considering the trifling amount of work that goes into them.



Lighthouse for the Birds,
Page 24



Center of Attention, Page 18

Cover photograph : Perry Struse



How's our "new look" look to you?

In November (issue 36), we started tinkering with the look of *WWP*. First, we upgraded all the art in the magazine to full color. To smooth the way for this change, we went with a glossy paper. Then, in the January issue, we launched a new logo and gave our cover a face-lift.

We hope these winds of change haven't blown you away. Before we do anything else, we'd like to hear your opinions about these changes and also about a couple of "what-ifs" that we're pondering for future issues.

1. What's your feeling about the "new look" of *WWP*? Does it suit the magazine's purpose?

- ☐ It's a great improvement over the old format
☐ It's okay, but I'm not crazy about it
☐ It doesn't look like a woodworking magazine
Other comments: _____

2. How do you feel about the new glossy paper?

- ☐ I like it better than the old matte-finish paper
☐ I liked the matte-finish paper better

3. How would you react to four additional pages of advertising in *WWP* if a large, foldout pattern packet were also added to provide full-sized patterns instead of gridded ones?

- ☐ Sounds like a good deal to me
☐ I'd rather not see additional ads in *WWP*
Other comments: _____

4. Would you like to see estimates of completion time and/or materials costs included in the project articles?

- ☐ I would find both of these helpful
☐ Completion-time estimates would be useful
☐ Materials-cost estimates would be useful
☐ Neither of these would interest me

Thanks for taking the time to help us make *WWP* more responsive to our readers. Please photocopy this page (rather than tear it out of the magazine), and mail your response to me at our editorial address listed *below left*.

Doug Cantwell

Our Pledge to You

Prior to publication, we build every project featured in *Weekend Woodworking Projects* step-by-step in our shop. Then, a seasoned team of editors reviews the how-to directions, technical drawings, illustrations, and Bill of Materials of each project to make sure the instructions we provide to you are clear, concise, and complete.

The *Weekend Woodworking Projects* Staff

WE CARE!

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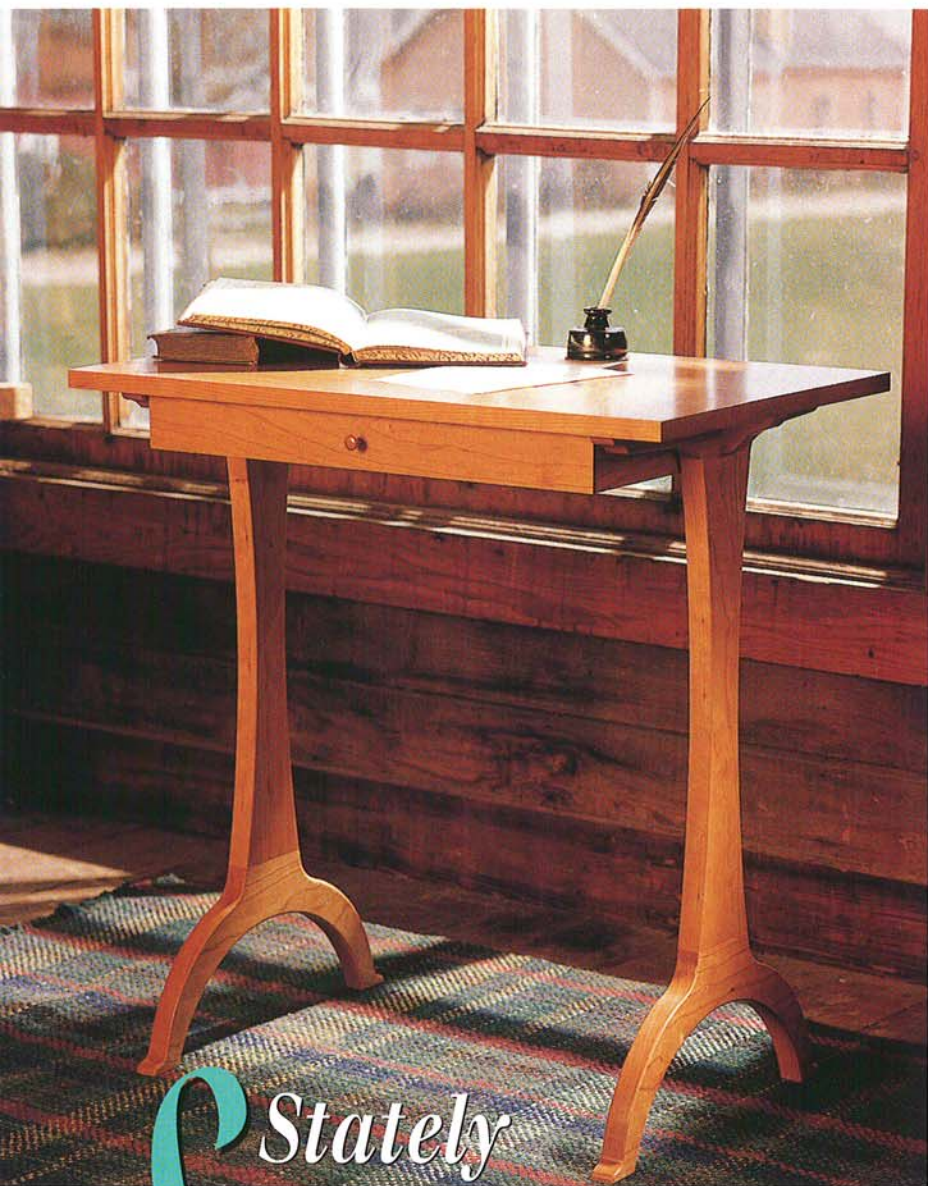
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MPA



Stately Side Table

When you think of Shaker furniture, the word “stylish” may not pop immediately into your head. But have a look at this little trestle table. The elegantly contoured feet and frame typify the stylistic touches that often accompany the fabled Shaker simplicity. And speaking of simplicity, we’ve streamlined construction by standardizing the stock thicknesses. We’ve also beefed up the stretcher width to improve the table’s stability.

Start By Making the Legs, Feet, and Crossbraces

1 From 1½” stock, rip and crosscut two pieces to 3¾×22¾” for the legs (A). (We selected cherry.) From the same stock, cut two 7½×17” blanks for the feet (B), two 1⅝×16½” blanks for the crossbraces (C), and one 3½×28¾” piece for the stretcher (D).

2 Lay out identical tenons on each end of both leg pieces where shown and dimensioned on the Leg Tenon drawing on page 6. To form the tenons, first elevate your tablesaw blade to 1”. Set a stopblock 1⅝” from the outside of the saw blade. Turn one of the legs on edge, and cut a kerf across its edge using your miter gauge with an extension and stopblock. Then, turn the leg edge-for-edge, and cut a kerf in the opposite edge. Without changing the saw settings, cut identical kerfs in the opposite end of the leg the same way. Now, repeat this procedure to kerf the other leg.

3 To finish cutting the tenons, set your table-saw blade to cut ⅞” deep. Then, lay each leg on its face, and cut kerfs across both faces at both ends of the leg using the same miter-gauge setup you used in Step 2. Now, use your bandsaw, rip fence, and miter gauge to cut away the waste on the faces and edges.

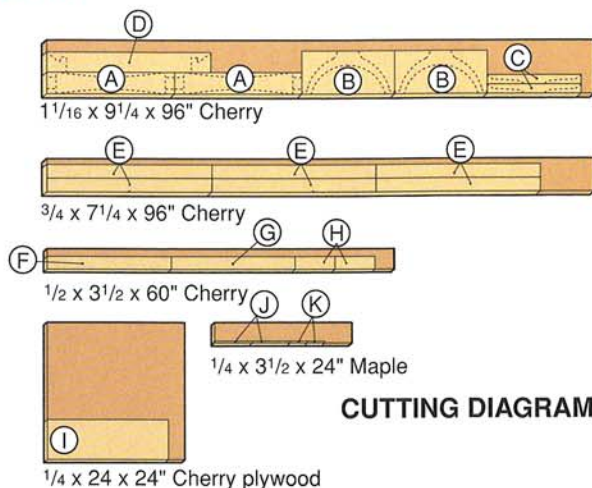
4 Enlarge the gridded Foot and Crossbrace half-patterns shown on page 9 to full size. Make two copies of each, then flip one copy over and trace the outline through onto the back side of the paper. Next, tape the halves together at the centerlines to make a full pattern of each. Find and mark a centerline across one edge of one foot blank (B), then extend this line down one face about 2”. Next, align the pattern centerline and top edge with the blank’s centerline and top edge. Then, adhere the pattern to the blank. (We used a spray adhesive.)

5 Lay out and cut a mortise for the leg tenon in the top edge of each foot blank where shown and dimensioned on the Foot drawing on page 7. To do this, drill multiple overlapping ⅜” holes along the full length of each mortise layout using your drill press and a tall fence. (We used a brad-point bit.) Then, square the corners with a sharp ⅜” chisel. Check the fit of the leg tenons in the mortises as you work.

6 Repeat steps 4 and 5 to lay out and mortise the crossbraces (C). (For mortise dimensions, refer to the Stretcher and Crossbrace drawing

Continued

Stately Side Table



CUTTING DIAGRAM

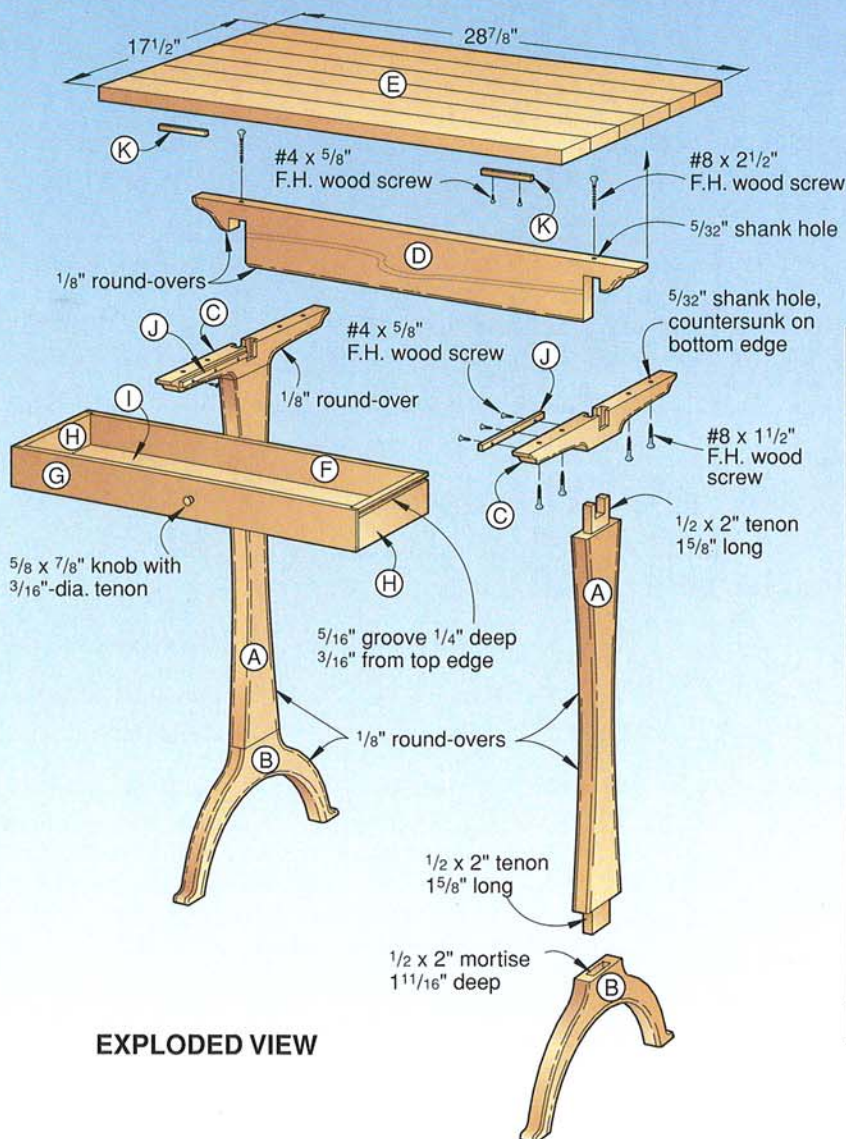
BILL OF MATERIALS

Part	Finished Size*			Mati.	Qty.
	T	W	L		
A legs	1 1/16"	3 3/4"	22 3/8"	C	2
B* feet	1 1/16"	7 1/2"	16 1/4"	C	2
C crossbraces	1 1/16"	15 5/8"	16 1/2"	C	2
D stretcher	1 1/16"	3 1/2"	28 3/4"	C	1
E* tabletop	3/4"	17 1/2"	28 7/8"	EC	1
F drawer back	1/2"	13 1/4"	21 11/16"	C	1
G drawer front	1/2"	2 1/4"	21 11/16"	C	1
H drawer sides	1/2"	2 1/4"	7"	C	2
I drawer bottom	1/4"	7"	21 3/16"	CP	1
J drawer glides	1/4"	5/16"	6 5/8"	M	2
K drawer stops	1/4"	5/16"	3"	M	2

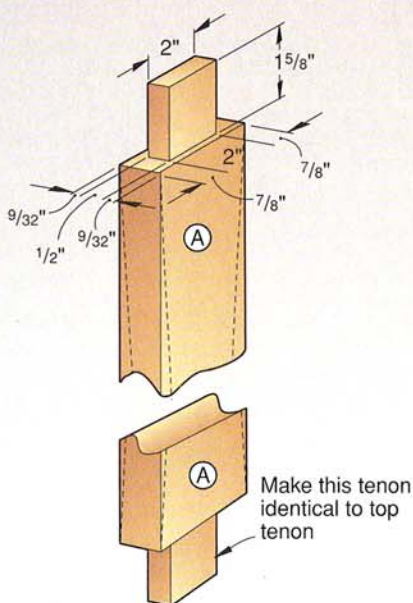
*Initially cut part oversized. Please read all instructions before cutting.

Materials Key: C—cherry; EC—edge-jointed cherry; CP—cherry plywood; M—maple.

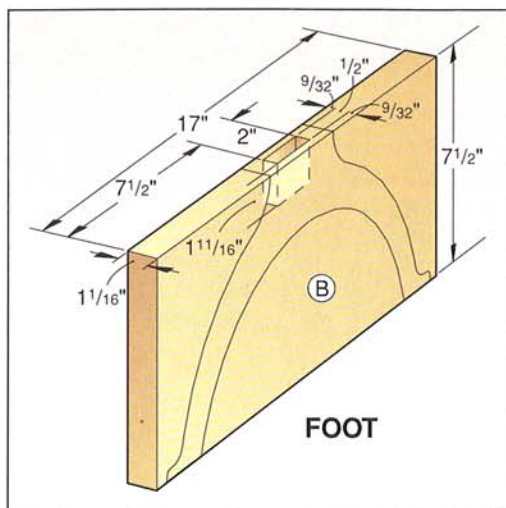
Supplies: #8 x 1 1/2", #8 x 2 1/2", #4 x 5/8" flathead wood screws; #17 x 1" brads; 5/8" cherry dowel; finish.



EXPLODED VIEW



LEG TENON



FOOT

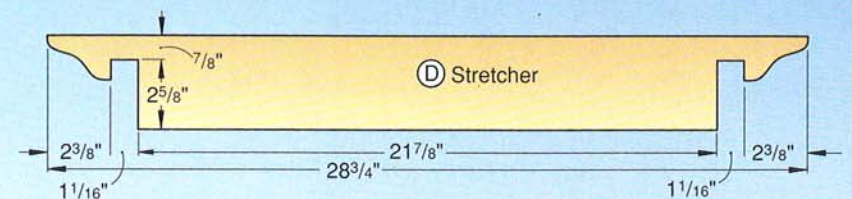
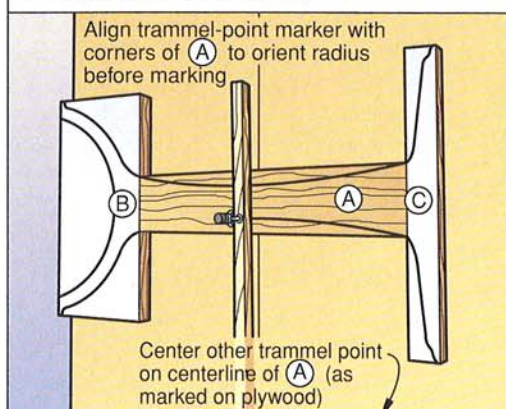
at right.) Next, lay out and drill $\frac{5}{32}$ " shank holes through the crossbraces where shown.

Assemble the Legs, Then Make the Stretcher

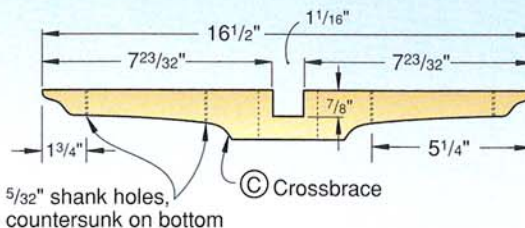
1 Dry-assemble a leg assembly (one foot, one leg, and one crossbrace), and lay it on a flat surface. (We laid ours across a 4×8' sheet of plywood near one end.) Find and mark a centerline across the leg, then extend it 60" along the flat surface. Next, using a set of trammel points, strike a 55"-radius arc on the leg as shown below. (We carefully aligned the starting points of the arc with the corner edges of the foot and crossbrace, centering the other trammel point on the centerline we marked on our plywood sheet. If you don't have trammel points, see Tip no. 1 at right.) Turn the leg end-for-end, and mark the other edge of the leg the same way. Then, assemble the second leg, and draw both arcs on it.

2 Disassemble the legs, then stack the feet, legs, and crossbraces in pairs using double-faced carpet tape. Bandsaw the parts to shape, keeping your blade outside the line. Then, separate each set of pieces, and remove the patterns.

LAYING OUT THE LEG RADIUS

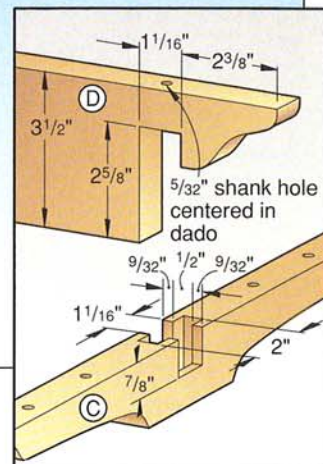


Stretcher



Crossbrace

$\frac{5}{32}$ " shank holes, countersunk on bottom



STRETCHER ASSEMBLY DETAIL

3 Glue, assemble, and clamp the two leg assemblies (foot, leg, and crossbrace). Then, wipe off any glue squeeze-out with a damp cloth. Check each assembly for square, and adjust if necessary. (To do this, we measured diagonally from corner to corner.)

4 After the glue has dried, remove the clamps, and finish-sand the edges and joints. (We used a 2"-diameter drum sander on our drill press to sand the contoured edges to the lines and a random-orbit sander on the flat surfaces.)

5 Next, lay out and dado both crossbraces (including the leg tenons you glued into the mortises) where shown on the Stretcher and Crossbrace drawing. (We clamped each leg assembly to our miter-gauge extension and cut the dados on our tablesaw.)

6 Enlarge the gridded Stretcher End pattern shown on page 9 to full size. Make two copies, and adhere a copy to each end of the stretcher. Next, bandsaw the ends to shape, keeping your blade outside the line. Sand to the line, then remove the patterns. Now, lay out and cut the dado at each end of the stretcher where shown and dimensioned on the Stretcher and Crossbrace drawing. To do this, set the stretcher on edge, and clamp it to your miter-gauge extension. Test-fit a crossbrace in each stretcher dado as you work to ensure a snug joint that will be flush along the top.

7 Fit your table-mounted router with a $\frac{1}{8}$ " round-over bit. Then, rout the edges of both leg assemblies and the bottom stretcher edges

Continued

TIP no. 1—To make a set of trammel points, cut a piece of scrap pine to $\frac{3}{4}$ × $\frac{3}{4}$ ×58". Drill a $\frac{7}{64}$ " shank hole centered near one end, and drive a #4×1" screw through it. Mark a centerpoint 55" from the tip of the screw, and drill a $\frac{5}{16}$ " hole through the piece. Insert a short, sharp #1 or #2 pencil through the hole until the point protrudes to the same length as the screw.

Stately Side Table

TIP no. 2—Since flat-sawn stock tends to cup toward the center of the tree, arrange your stock for edge-joining so that the annual rings (visible at the end of each piece) alternate in their curvature (faceup, facedown, and so on). This will help minimize warpage.

TIP no. 3—If your plywood for the drawer bottom measures less than 1/4" thick, adjust the width of the groove accordingly. Instead of using a dado set, make one pass with your 1/8"-thick saw blade, then move your rip fence and make a second pass to widen the groove enough to accommodate the drawer bottom.

Project design: Shaker community, Harvard, Mass.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Chuck Hedlund
Photograph: Perry Struse

where shown on the Exploded View drawing. Now, finish-sand the stretcher.

8 Dry-assemble the stretcher and legs. Then, lay out and drill two 5/32" countersunk shank holes through the top edge of the stretcher where shown on the Stretcher Assembly detail. Next, drill a 7/64" pilot hole into each crossbrace notch to a total depth of 2 1/2".

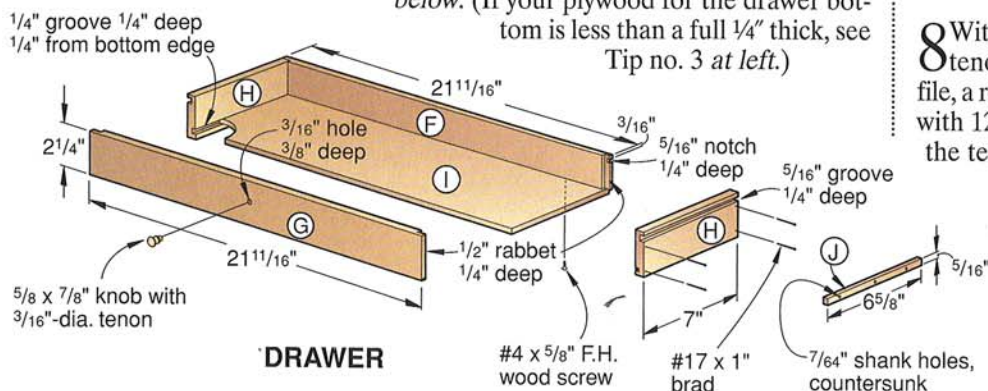
9 Glue and clamp the stretcher to the leg assemblies, then wipe off any glue squeeze-out. While the glue is drying, stand the structure on a flat surface, and make sure that all feet touch. Then, drive #8x2 1/2" flathead wood screws into the stretcher holes.

Let's Make the Tabletop And Drawer Next

1 From 3/4"-thick stock, rip and crosscut six pieces to 3x30" for the tabletop (E). Then, edge-glue and clamp them to form an 18x30" board. (To minimize warpage, see Tip no. 2 above left. We used pipe clamps across the top and underside to equalize clamping pressure and keep the tabletop flat.) Allow the glue to dry for 12 hours before removing the clamps.

2 Scrape off any glue squeeze-out, then square and trim the tabletop to finished size. Now, sand the tabletop faces and edges smooth. (We used a random-orbit sander.)

3 From 1/2"-thick stock, rip and crosscut the drawer back (F), front (G), and sides (H) to the dimensions listed in the Bill of Materials. (You can plane or resaw 3/4"-thick stock to this thickness.) Next, fit your tablesaw with a 1/4" dado set, and elevate it to 1/4". Cut a groove for the drawer bottom on the inside face of the front and sides where shown on the Drawer drawing below. (If your plywood for the drawer bottom is less than a full 1/4" thick, see Tip no. 3 at left.)



4 Change to a 1/2" dado set, and again elevate it to 1/4". Cut a 1/2"-wide rabbet 1/4" deep on both ends (inside face) of the drawer front and drawer back. To accommodate the slides, cut a 5/16"-wide groove 1/4" deep in the sides and a matching notch in each end of the back where shown on the Drawer drawing. Now, find and mark a centerpoint on the drawer front, and drill a 3/16" hole 3/8" deep for the knob.

5 Dry-assemble the drawer upside down so that the top edges of all parts are flush. Clamp the parts, then measure the opening to determine the dimensions for the bottom (I). (**Note:** The bottom's back edge should align flush with the bottom edge of the drawer back. Our drawer bottom measured 7x21 3/16".) Next, rip and crosscut the bottom to size from 1/4"-thick plywood. (We used cherry.) Reassemble the drawer (again without glue) to check the fit of the bottom. Then, remove the bottom, and set it aside. Now, glue, assemble, and clamp the drawer (F, G, and H). Check for square, then nail the drawer where shown on the drawing using #17x1" brads.

6 To make the drawer slides (J) and stops (K), first rip a 24" length of scrap hardwood to 1/4x5/16". (We chose maple for its durability.) From this strip, crosscut two 6 5/8"-long slides and two 3"-long stops. Next, drill and countersink three 7/64" shank holes through each glide and two through each stop where shown on the Drawer and Exploded View drawings.

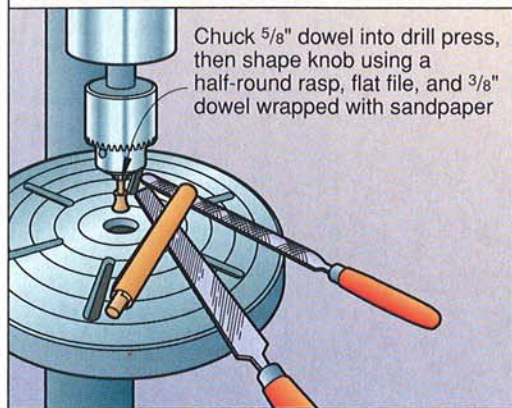
7 Next, machine the drawer knob. To do this, first cut a 3" length of 5/8" cherry dowel. Lay out the tenon and knob profiles on it where shown and dimensioned on the Knob Profile drawing opposite. Next, chuck the other end of the dowel into your drill press, leaving 2" protruding. (**Note:** If your drill press won't accommodate this diameter, shoulder down a 1"-long section at this end to 1/2" thick.)

8 With the dowel revolving, sand the knob and tenon to shape. (To do this, we used a flat file, a round wood rasp, and a 3/8" dowel wrapped with 120-grit sandpaper.) Once you've formed the tenon, remove the dowel from the chuck, and trim the tenon to 3/8" long.

Now, You're Ready For the Final Assembly

1 Lay the tabletop facedown on a flat surface. Place the leg/stretcher assembly on the underside, and cen-

SHAPING THE KNOB ON THE DRILL PRESS



pilot holes to a total depth of $\frac{5}{8}$ ". Now, screw the glides to the crossbrace using #4x $\frac{5}{8}$ " flat-head wood screws.

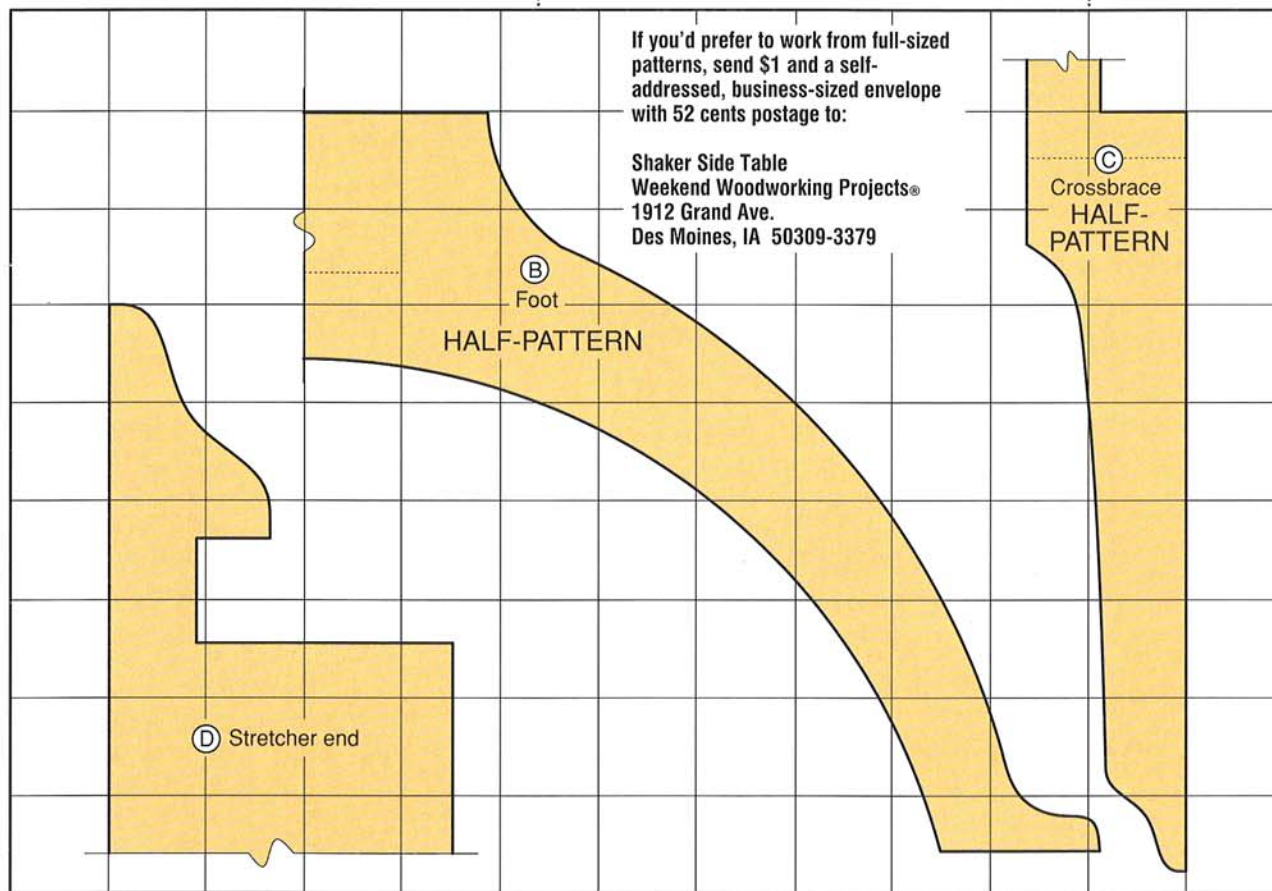
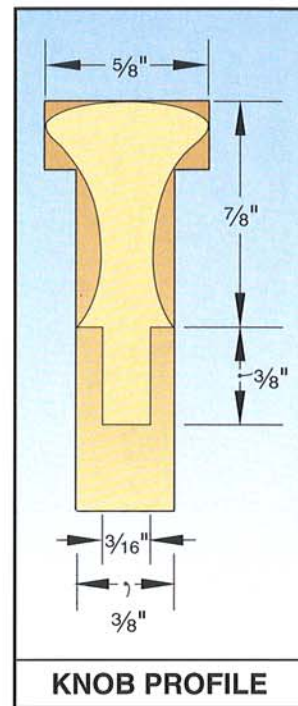
3 Slide the drawer partially into its cavity, then position the two drawer stops $1\frac{1}{2}$ " in from the tabletop front edge and against the inside faces of the drawer sides. Using the shank holes in the stops as guides, drill pilot holes $\frac{3}{8}$ " into the tabletop. Now, attach the stops using #4x $\frac{5}{8}$ " flathead wood screws.

4 Apply the finish of your choice to the table, drawer, and drawer bottom. (We first applied a coat of sanding sealer, then sanded this coat with 320-grit sandpaper. Next, we sprayed on two coats of Minwax Fast-Drying Semigloss Polyurethane, leveling the finish after each coat with 0000 synthetic steel wool.)

5 Slide the drawer bottom into its grooves. Drill and countersink four $\frac{7}{64}$ " shank and $\frac{5}{64}$ " pilot holes through the bottom and into the edge of the drawer back ($\frac{5}{8}$ " total depth). Attach the bottom using #4x $\frac{5}{8}$ " flathead wood screws. ■

ter it side-to-side and front-to-back. Using the crossbrace shank holes as guides, drill $\frac{7}{64}$ " pilot holes $\frac{1}{2}$ " deep into the tabletop. Countersink the shank holes, then use #8x $1\frac{1}{2}$ " flathead wood screws (without glue) to secure the tabletop.

2 With the table still inverted, attach the glides to the inside faces of the crossbraces. To do this, first place $\frac{1}{4}$ "-thick temporary spacers under the glides to position them at a uniform height. Butt the glide ends against the stretcher, then use the shank holes as guides to drill $\frac{5}{64}$ "



GRIDDED PATTERNS



Guestroom Luggage Rack

Here's one of those little extras that weary travelers always appreciate when they've been slaving over a hot dashboard all day. And once your guests are back on the road, you can fold this handy design flat and stow it away in a closet. Or, put it to work full-time as a TV or breakfast-tray stand in the bedroom.

First, Cut All Your Parts to Size

1 From $\frac{3}{4}$ "-thick stock, rip and crosscut two outside legs (A), one handle rail blank (B), two inside legs (C), two inside rails (D), two shelf rails (E), two shelf stiles (F), and one stop cleat (G) to the dimensions listed in the Bill of Materials. (We selected white oak.)

2 Cut seven shelf slats (H) to $1\frac{1}{2} \times 16\frac{1}{2}$ " from $2\frac{1}{2}$ "-thick stock. (You can plane or resaw thicker stock.) Now, resaw a $1\frac{1}{2} \times 28$ " waste piece from this stock to $\frac{1}{4}$ " thick. From this piece, bandsaw 12 spacers (I) to $\frac{1}{2} \times 1\frac{15}{16}$ ".

3 Cut out a 5×22 " piece of paper, and enlarge the gridded Handle Rail pattern shown on page 14 to full size. Adhere the pattern to the handle rail blank, and bandsaw the rail to shape, keeping your blade outside the line. Drill

Continued

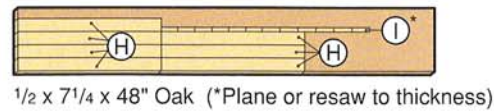
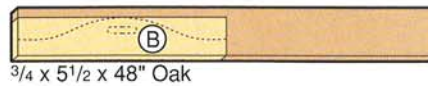
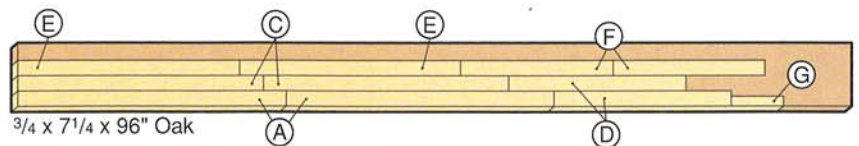
BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A outside legs	3/4"	1 3/4"	30 13/16"	O	2
B handle rail	3/4"	4 3/8"	22"	O	1
C inside legs	3/4"	1 3/4"	28 1/2"	O	2
D inside rails	3/4"	1 3/4"	18 3/8"	O	2
E shelf rails	3/4"	1 3/4"	25 1/2"	O	2
F shelf stiles	3/4"	1 3/4"	15 1/2"	O	2
G stop cleat	3/4"	1 1/8"	6"	O	1
H shelf slats	1/2"	1 1/2"	16 1/2"	O	7
I spacers	1/4"	1/2"	11 5/16"	O	12

Please read all instructions before cutting.

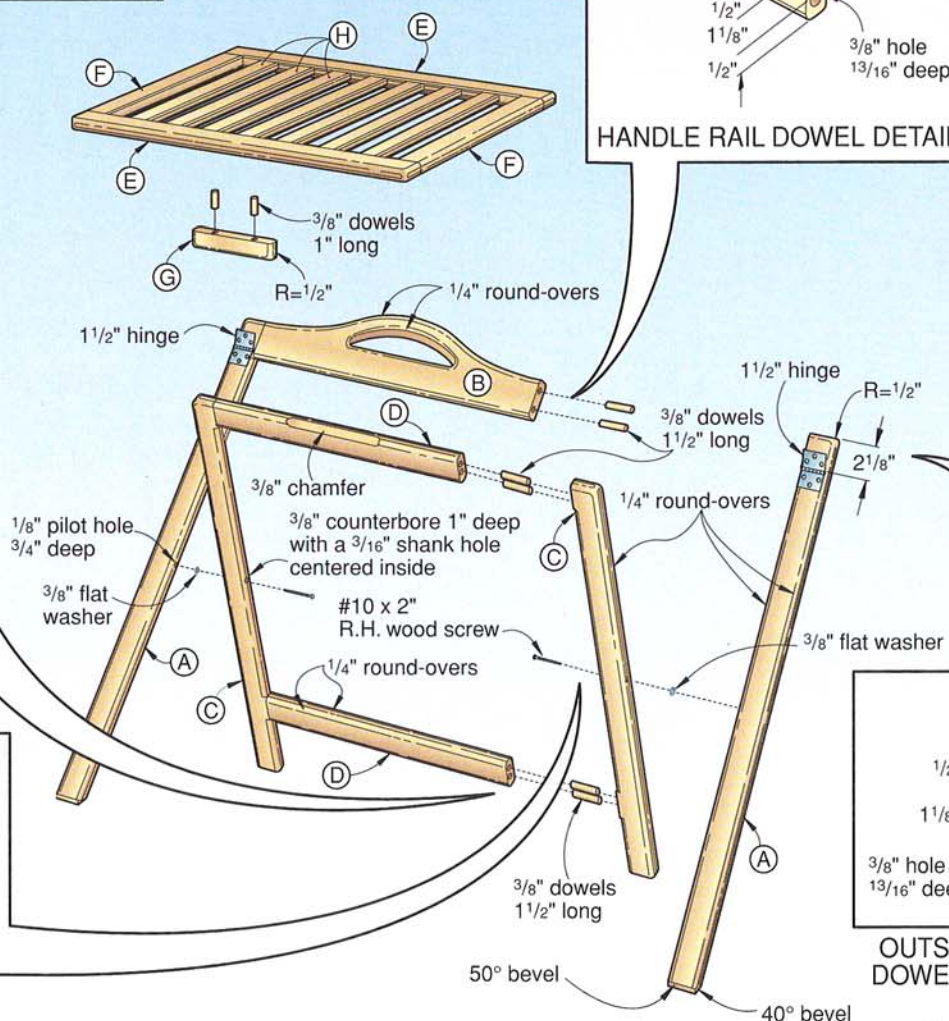
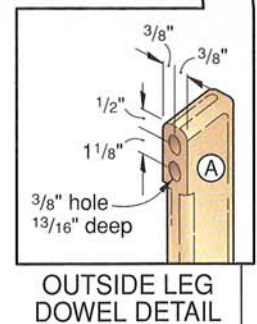
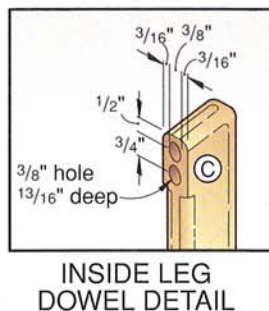
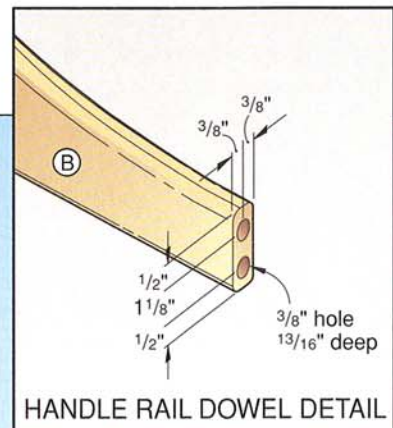
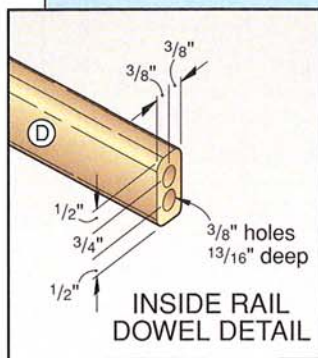
Materials Key: O—white oak.

Supplies: #10x2" roundhead wood screws; 3/8"-dia. washers; 3/8" oak mushroom plugs; one pair 1 1/2" brass-finish steel cabinet hinges (Stanley no. 73-0155); finish.

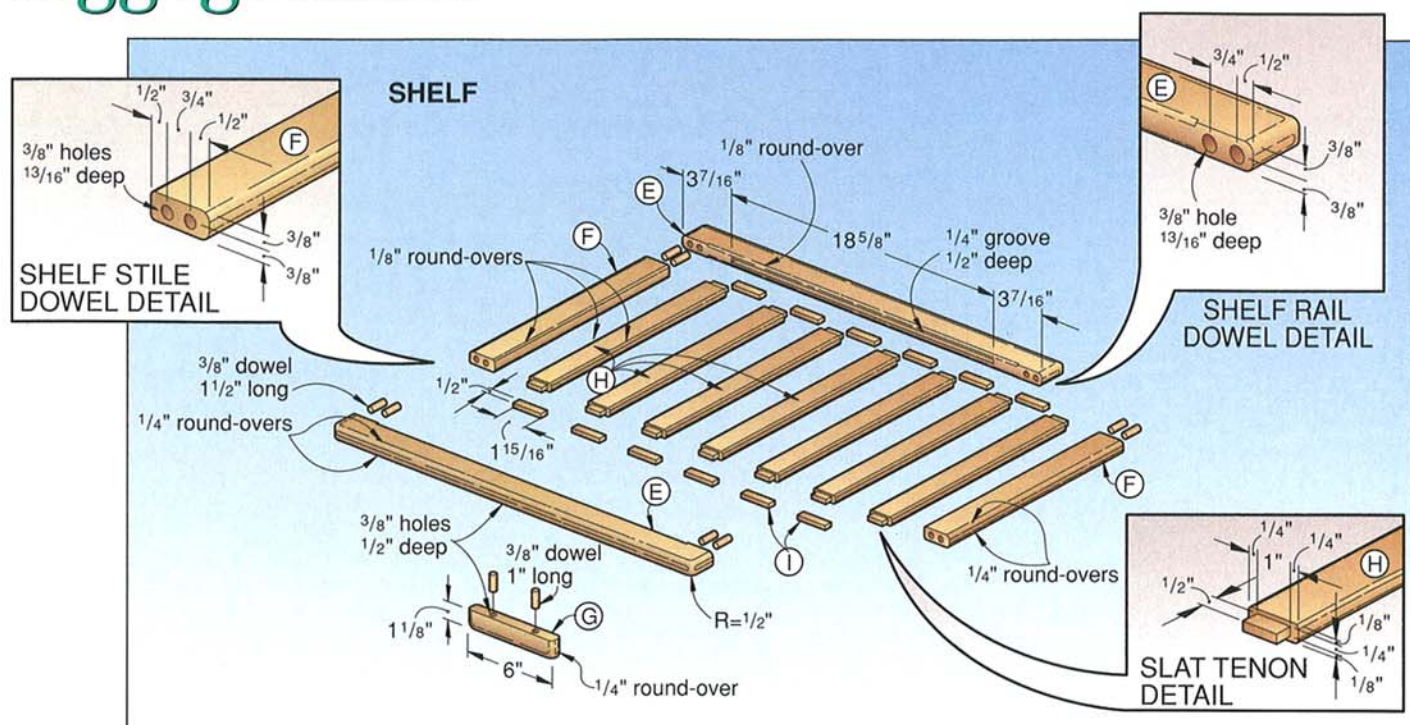


CUTTING DIAGRAM

EXPLODED VIEW



Guestroom Luggage Rack



a 1/4" start hole in the handle waste section, and scrollsaw the handle to shape. Now, sand all edges to the line. (We used 1/2" - and 1 1/2" -diameter drum sanders in our drill press.)

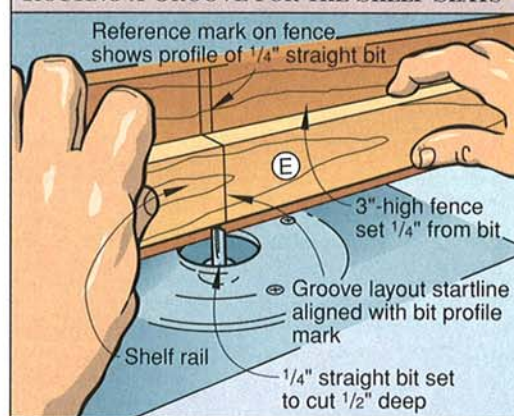
Next, Machine the Dowel Holes And Mortise-and-Tenon Joints

1 Lay out and drill holes for dowel joints in the outside and inside frames and in the shelf members. To do this, dry-clamp parts A to part B, parts C to parts D, and parts E to parts F. Lay out a pair of dowel marks at each joint where shown and dimensioned on the Exploded View drawing and on the Shelf drawing above. Then, drill the holes as dimensioned on the drawings. (We used our dowel jig and a portable drill with a brad-point bit and depth stop.)

2 Instead of cutting mortises for each shelf slat, rout a single groove along the inside edge of each shelf rail as shown at right. To do this, first lay out start- and stoplines for the groove on each rail as dimensioned on the Shelf drawing. Fit your table-mounted router with a 1/4" straight bit set to cut 1/2" deep. Then, set a 3"-high fence 1/4" from the bit, and mark the bit's profile on the fence so you'll be able to see the mark when the stock is in routing position. Start the router, and lower the stock onto the bit, feeding it from right to left. (See Tip no. 1 at left.) After you've routed a groove in each rail, square the groove ends with a 1/4" chisel.

3 Lay out the shelf slat tenons. (For dimensions, see the Slat Tenon detail that accompanies the Shelf drawing.) Next, fit your tablesaw with a 3/4" dado set, and elevate it to 1/8". Attach an 18"-long wooden extension to your miter gauge, and clamp a stopblock to it to limit the tenon length to 1/2". To cut the tenons to a 1/4" thickness, lay each slat facedown, and hold it against the extension and stopblock. Cut this face,

ROUTING A GROOVE FOR THE SHELF SLATS



then flip the piece over and cut the other face. To cut the tenons to a 1" width, elevate the dado set to 1/4". Stand the slats on edge against the stopblock and extension, and cut first one edge and then the other. Now, dry-fit all tenons and spacers in their respective mortise grooves, and adjust as necessary until everything fits.

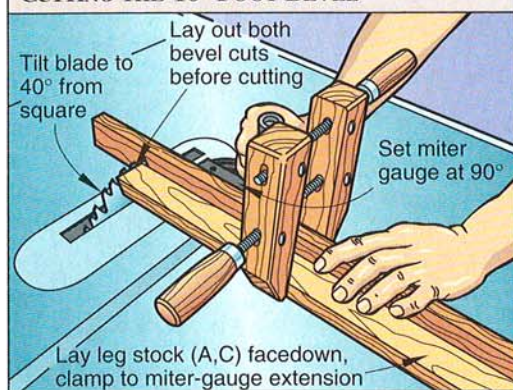
TIP no. 1—To ensure accurate grooves in our shelf rails, we lowered the stock onto the bit between the start- and stoplines (about an inch to the right of the startline). Next, we carefully backed the stock up until the startline was aligned with the bit profile mark on the fence. We then fed the shelf rail stock from right to left to complete the groove.

Do Some More Machining, Then Assemble Your Frames

1 Fit your table-mounted router with a 1/8" round-over bit, and rout the grooved edge of each shelf rail, top and bottom. Stop routing approximately 2 1/2" from each end of the rail. (We'll finish routing these edges after assembly.)

2 Lay out the 40° and 50° bevels on each foot. (See the Foot Bevel detail that accompanies the Inside Frame drawing *at right*.) Next, tilt your blade to 40°. Lay each leg on its face, then clamp it to your miter-gauge extension as shown *below* to make the cut. (See Tip no. 2 *below right*.)

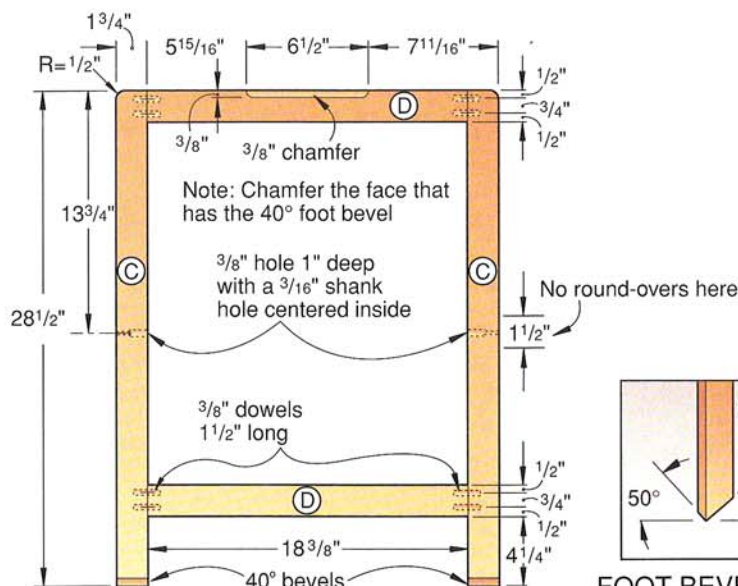
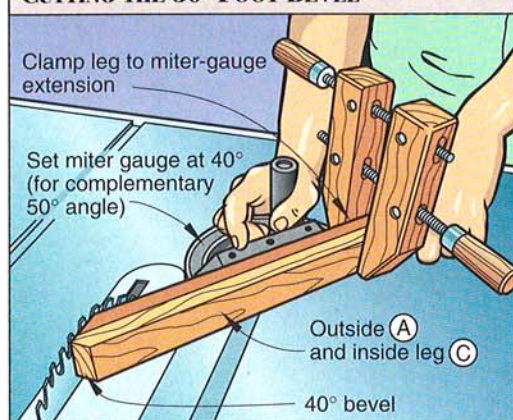
CUTTING THE 40° FOOT BEVEL



3 To cut the 50° bevel on each foot, set your miter gauge (with extension) to 40° from square as shown *below* (to cut a complementary angle of 50°). Reset your blade to perpendicular. Now, turn each leg on edge, and clamp it to the extension before bevel-cutting it.

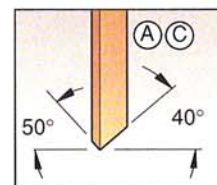
4 Dry-assemble the outside frame, the inside frame, and the shelf to check for fit. Adjust as necessary, then glue and clamp each assembly. To assemble the shelf, first glue a slat into

CUTTING THE 50° FOOT BEVEL



INSIDE FRAME

one end of the groove in one rail. Glue in a spacer, then another slat, and so on. Next, glue a stile to each end of the rail. Repeat the slat-and-spacer procedure to assemble the other rail to the slats and stiles. Now, clamp the assembly, and check for square. Wipe away any glue squeeze-out with a damp cloth.



FOOT BEVEL DETAIL

Note: The 40° bevel and the top-rail chamfer go on the same face

Route Some Round-Overs And Add a Stop Cleat

1 Fit your table-mounted router with a 1/8" round-over bit, and rout the remaining inside edges of the shelf frame. Next, change to a 1/2" round-over bit, and rout a radius on the top corners of both frames and all four shelf corners. Now, rout both corners on one edge of the stop cleat. (We stood the parts on edge and clamped them to our miter gauge before routing.)

2 Lay out the 1½"-long pivot-point sections on the inside frame legs. (For dimensions, see the Inside Frame drawing.) Next, fit your handheld router with a ¼" round-over bit, and rout the outside edges of the shelf, the inside edges of the handle, and all edges of the outside and inside frames *except* for these pivot-point sections. (We clamped stopblocks to the legs to stop the routs at these areas. See the Exploded View and Shelf drawings for round-over locations.)

3 Fit your handheld router with a chamfering bit. Then, lay out and rout a $\frac{3}{8}$ " chamfer on the edge of the inside frame top rail that has the 40° foot bevel. (See the Inside Frame drawing.) To do this, first clamp on start- and stopblocks to limit the rout.

TIP no. 2—When you cut the foot bevels, be careful to remove a uniform length of stock from each leg. To do this, lay the four legs edge-to-edge on your bench, and align the foot ends using a straightedge. Next, use your combination square to draw a reference mark across all four faces. Turn the legs on edge, and transfer this mark across the four edges. After you position and clamp the first leg for the 40° bevel-cut, transfer the reference mark to your miter-gauge extension. Then, align the mark on the three remaining legs with this extension mark to position them for beveling. Repeat this procedure (using the edge marks) to cut the 50° bevel.

Continued

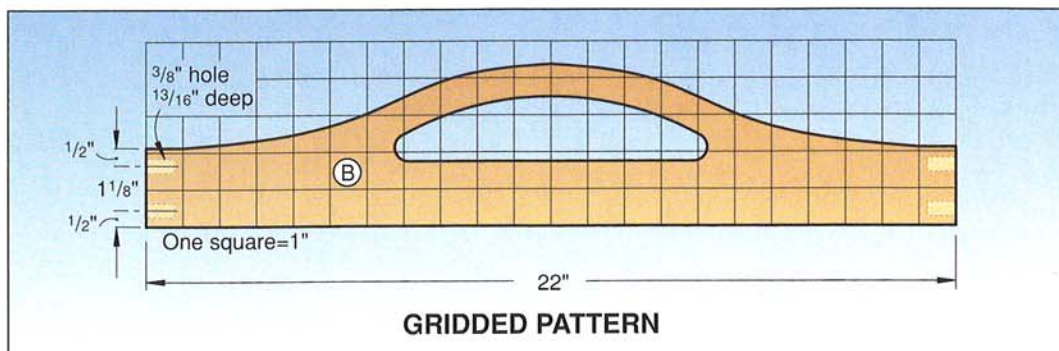
Guestroom Luggage Rack

If you'd prefer to work from a full-sized pattern of the handle rail, send \$1 and a self-addressed, business-sized envelope with 52 cents postage to:

Luggage Rack
Weekend Woodworking Projects
1912 Grand Ave.
Des Moines, IA 50309-3379

TIP no. 3—Before assembling the inside and outside frames, make sure that the foot bevels on the two frames are flip-flopped with respect to one another. Otherwise, the feet won't stand flat on the floor.

Project design: Bob Colpetzer, Clinton, Tenn.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Chuck Hedlund
Photograph: Perry Struse



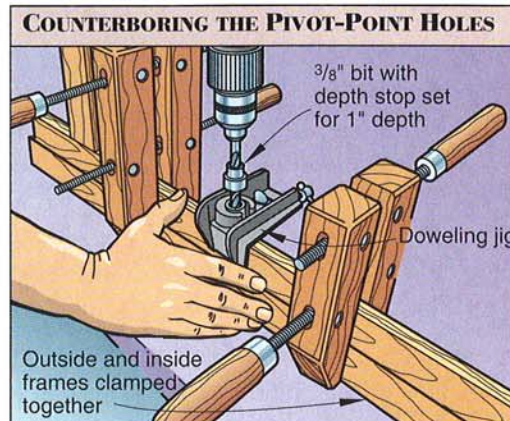
Now, for the Final Assembly

1 Dry-assemble and clamp the two frames as shown below, then lay out pivot-point holes. To do this, insert $\frac{1}{16}$ "-thick shims between the top rails of the two frames to establish uniform clearance. (We used two combination-square blades.) Then, clamp the top rails to hold the frames in position. Now, use a framing square to lay out pivot points where shown on the Inside Frame drawing. (Before assembling the two frames, see Tip no. 3 at left.)

2 With the two frames still clamped, clamp the legs as shown at right. Using a dowel jig and a brad-point bit, drill $\frac{3}{8}$ " counterbores 1" deep in the inside edge of the inside legs. Change to a $\frac{3}{16}$ " jig guide and bit, then drill shank holes in the counterbores through the inside leg and just far enough into the outside leg to mark a centerpoint for a pilot hole. Unclamp the parts, then drill a $\frac{1}{8}$ " pilot hole $1\frac{1}{4}$ " deep in the outside leg.

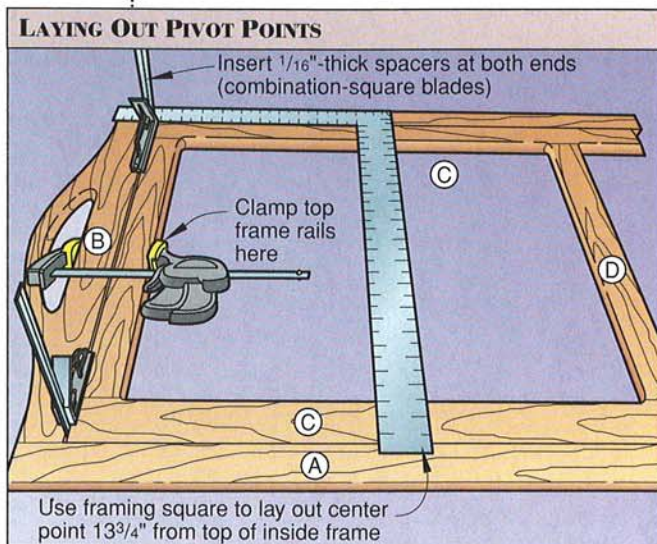
3 Attach the frames at the pivot points. To do this, insert a #10 $\times$ 2" roundhead wood screw through each inside leg hole, then fit it with a $\frac{3}{8}$ "-diameter flat washer. Now, drive the screw into the outside leg, and glue a $\frac{3}{8}$ " oak mushroom plug into each counterbore.

4 Lay out and attach hinges to the outside frame where shown on the Exploded View drawing. (We used $1\frac{1}{2}$ " brass-finish steel cabinet hinges, Stanley no. 73-0155.) Then, lay the frame assembly flat on your bench, stand the shelf on edge, and position it so you can attach the other hinge blades to it. Insert shims beneath the shelf to hold it $\frac{1}{16}$ " above the frame, then lay out and attach the hinges to the shelf.



5 To attach the stop cleat, first set up and clamp the rack on a level surface. Next, lay a level across the shelf. Then, unclamp it, and adjust the position of the inside frame's top rail against the shelf's bottom face until the shelf registers as level. Using the chamfered edge of the frame rail as a guide, mark a line on the shelf to indicate the cleat position. Now, drill dowel holes in the cleat where dimensioned on the Shelf drawing. Insert dowel centers in the holes, and press the cleat against the shelf rail to establish centerpoints. Drill dowel holes in the shelf rail, then glue, dowel, and clamp the cleat.

6 When the glue has dried, disassemble the shelf from the frame, and finish-sand all surfaces that need it. Next, apply your choice of finish. (We brushed on two coats of Watco Natural Danish Oil Finish, allowing each to penetrate for 30 minutes. We then wiped off the excess and allowed the finish to dry overnight.) Now, reattach the hinges to the shelf and frame. ■





Learning Tree

Have you found that drilling your kids on their ABCs just doesn't hold their interest? Try challenging them instead with this well-ordered puzzle. When we turned it over to our kids for field-testing, they kept going back and assembling the pieces one more time—without any prompting from mom or dad. Our only suggestion: Don't spoil things by letting on that this is a learning aid.

Cut Out Two Plywood Blanks, Then Fire Up Your Scrollsaw

Note: We do not recommend this puzzle for children younger than three years of age.

1 From 1/4"-thick Baltic birch plywood, rip and crosscut two pieces to 10 1/4 x 13 1/4", and designate one of these the puzzle blank. Lay out and bandsaw a 1 1/4" radius at each corner. Next, photocopy the full-sized pattern shown on pages 16 and 17, and tape the two halves together at the centerlines. Now, center and adhere the pattern to the puzzle blank. (We used a spray adhesive.)

2 Fit your scrollsaw with a sharp #5 reverse-tooth blade. Next, drill a 1/16" start hole where shown on the pattern. Saw out to the perimeter from this hole, then saw around the outline of the puzzle. Remove the perimeter piece, lay it on top of the base, and trace the radiused outside corners onto the base. Bandsaw these corners to shape, then glue and clamp the perimeter piece to the base. When the glue has dried, sand the laminated edges of the frame flush. Now, sand the back face smooth.

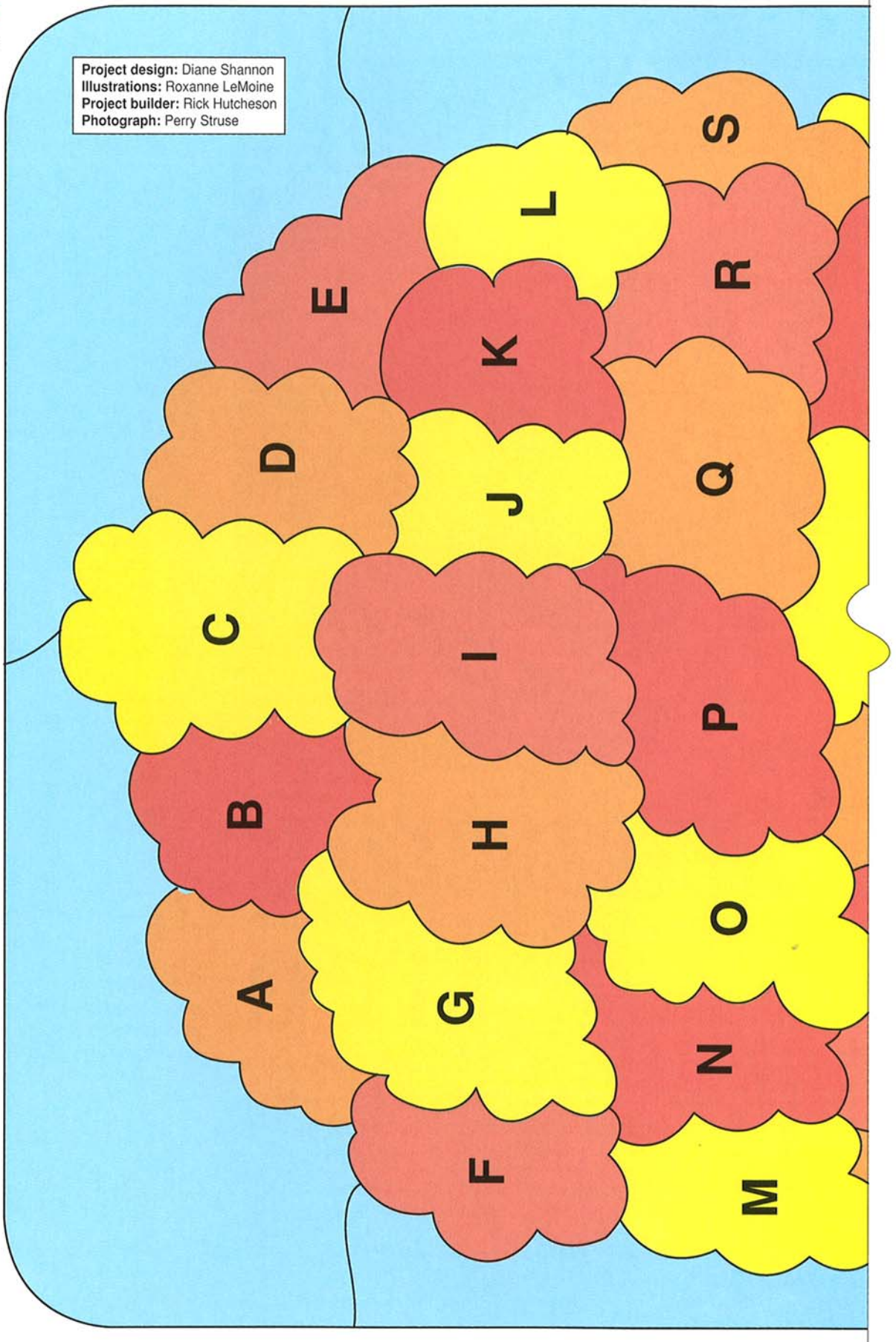
3 Starting at the top of the puzzle, scrollsaw in to the tree foliage where shown on the pattern, then saw around the outside of the foliage. Now, make three horizontal cuts to separate the alphabet pieces into four rows.

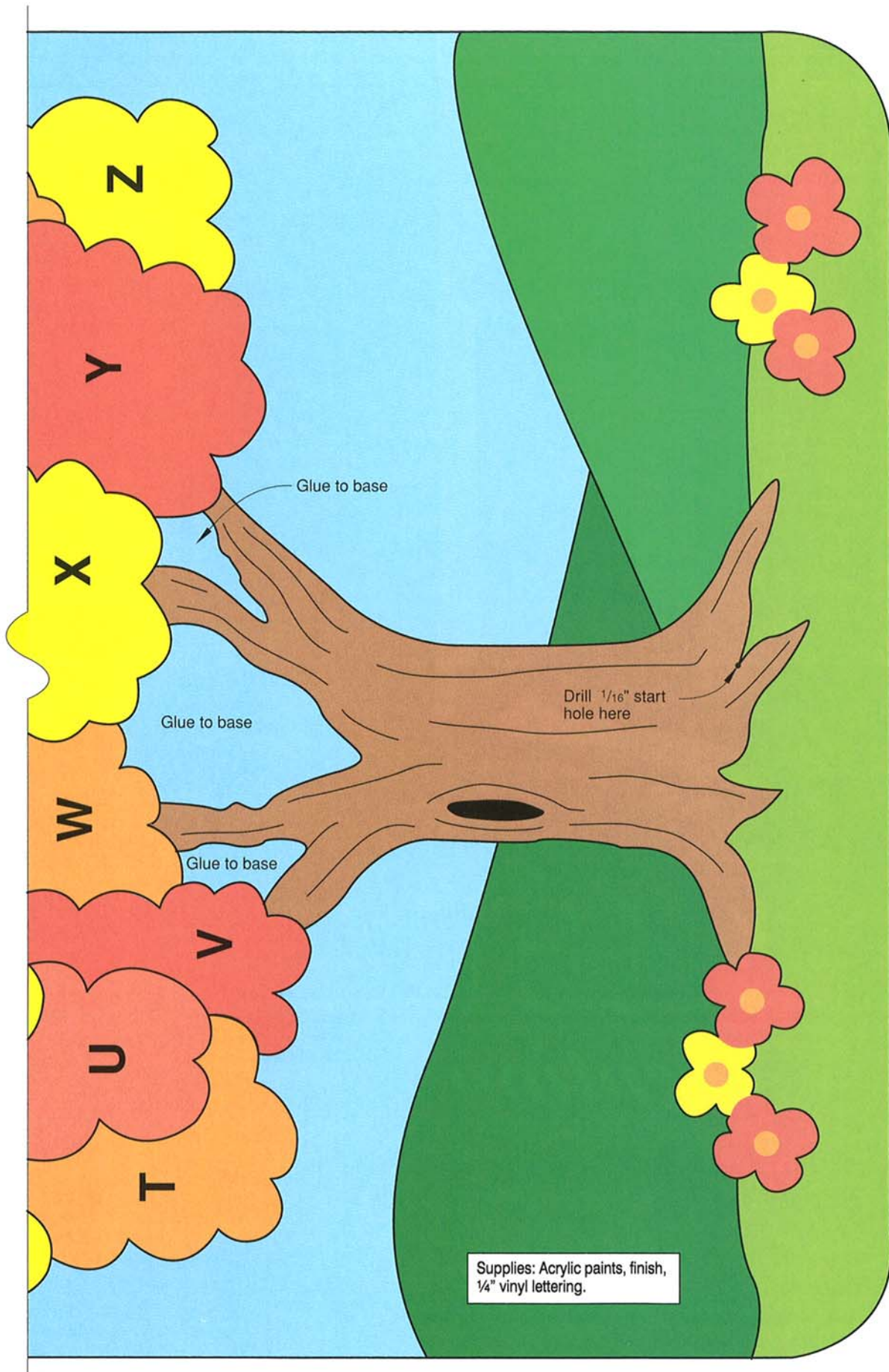
4 Saw the remaining blank where marked, working from the top to the bottom of the pattern. (**Note:** To keep track of the pieces, place each one back in the frame as you saw it, and trace its outline onto the base. Mark the back face of each piece to distinguish it from the front.) Next, saw each of the four rows of foliage to separate the alphabet pieces.

5 Remove the scraps of pattern, then sand the top face of the assembled puzzle smooth. Next, remove the pieces, and paint the top faces according to the color scheme shown on the pattern. (We brushed on acrylic paints.) When the paint has dried, position, glue, and clamp the three pieces marked on the pattern to the base. Allow the glue to dry, then apply a clear finish to the frame. (We sprayed on two coats of Deft semigloss aerosol lacquer.) When all parts have dried, reassemble the pieces in the frame, and apply two coats of finish to the top face.

6 Apply or paint 1/4"-high black alphabet letters to the pieces as designated on the pattern. (We applied Chartpak 1/4" Vinyl Lettering, which we found at an art-supply store.) ■

Project design: Diane Shannon
Illustrations: Roxanne LeMoine
Project builder: Rick Hutcheson
Photograph: Perry Struse







Center of Attention

If you don't have space for one of those wall-sized complexes, this little cabinet offers an attractive alternative to that particleboard stuff you see in the discount stores. And you'll still have plenty of room for a TV, VCR, stereo system, and lots of tapes and discs. For ease of construction, we made the drawers identical and kept the carcass simple. We've also provided a full-sized base profile to save you some time.

Let's Cut the Carcase Parts First

1 From a 4x8' sheet of 3/4"-thick hardwood plywood, rip two 20x96" pieces. (We selected oak.) From one piece, crosscut three 24"-long panels for the sides (A) and center divider (B). Mark the two parts A "left" and "right," and indicate the top edge and inside face on each. (**Note:** Determine the left and right sides by viewing the cabinet from the front.) From the second 20x96" piece, crosscut a 35 7/8"-long piece for the bottom (C). Save the remainder of this second piece for later.

2 From 3/4"-thick solid oak stock, rip and crosscut two top plates (D), three cross plates (E), and four stretchers (F) to the sizes listed in the Bill of Materials *opposite*. Then, cut the six drawer glides (G) to size.

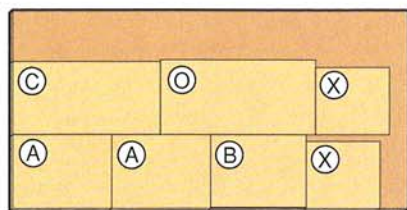
3 Lay out and cut dadoes on the sides and divider where shown on the Carcase Front View drawing on *page 20*. To do this, fit your tablesaw with a 3/8" dado set, and elevate it to 3/8". Next, dado all three parts near each end. (**Note:** Go ahead and dado the divider for now. Then, trim the divider ends in *Step 9* below, which will leave rabbets where you've cut dadoes.) Then, set the left side panel aside temporarily. Now, cut the rest of the dadoes on the right side and those on the mating face of the divider. (For help in setting up this step, see *Tip no. 1* on *page 20*.)

4 Using the same dado setup, cut a dado in the top face of the bottom (C) where shown on the same drawing. Next, mark the left end on both top plates (D). Lay out and cut dadoes across the bottom face of each to match the one in part C.

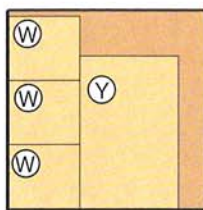
5 Without changing your setup, rabbet the bottom and both stretchers where shown on the Carcase Front View drawing. Be sure to orient each part correctly before rabbeting. (We used a miter-gauge extension and clamped a stop-block to it to ensure accurate cuts.)

6 Change to a 1/4" dado set, and cut a 1/4"-wide rabbet 3/8" deep along the inside back edge of both sides. (See the Carcase Exploded View drawing.) Using the same setup, cut a centered groove along the inside edges of both top plates (D) where shown on the Top Frame detail that accompanies the Carcase Exploded View drawing. Now, lower your dado set to 1/4", and rabbet the ends of the cross plates (on both faces) to form 1/4x3/8" tenons.

Continued



3/4 x 48 x 96" Oak plywood

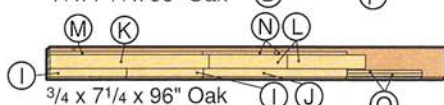


1/4 x 48 x 48" Oak plywood



3/4 x 7 1/4 x 96" Oak

(*Plane or resaw to thickness)



3/4 x 7 1/4 x 96" Oak



1/2 x 7 1/4 x 96" Oak



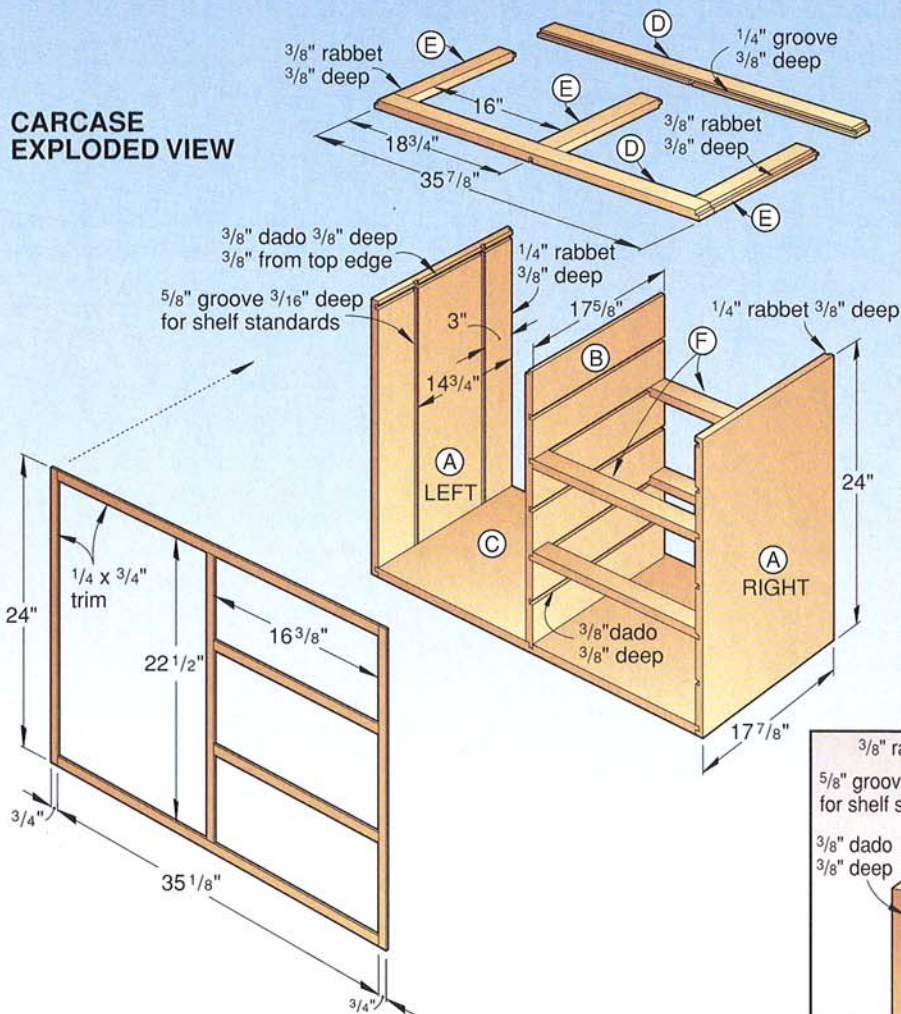
1/2 x 7 1/4 x 96" Oak



1/2 x 9 1/4 x 60" Oak

CUTTING DIAGRAM

CARCASE EXPLODED VIEW



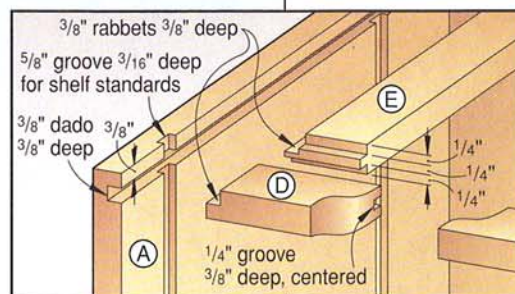
BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A* sides	3/4"	17 7/8"	24"	O	2
B* divider	3/4"	17 5/8"	23 1/4"	O	1
C bottom	3/4"	17 5/8"	35 7/8"	O	1
D top plates	3/4"	2"	35 7/8"	O	2
E cross plates	3/4"	2"	14 3/4"	O	3
F stretchers	3/4"	11 3/16"	17 1/8"	O	4
G glides	3/8"	5/8"	17 5/8"	O	6
H* base frame front	3/4"	2"	37 7/8"	O	1
I* base frame sides	3/4"	2"	18 5/8"	O	2
J base frame back	3/4"	2"	34 7/8"	O	1
K* base front	3/4"	3 3/8"	38 5/8"	O	1
L* base sides	3/4"	3 3/8"	19"	O	2
M cleat	3/4"	3/4"	37 1/8"	O	1
N cleats	3/4"	3/4"	17 1/2"	O	2
O top panel	3/4"	18 1/8"	37 3/8"	OP	1
P* front trim piece	3/4"	5/8"	38 5/8"	O	1
Q* side trim pieces	3/4"	5/8"	19"	O	2
R back trim piece	3/4"	5/8"	37 3/8"	O	1
S drawer fronts	1/2"	6 3/4"	15 5/8"	O	3
T drawer backs	1/2"	6 1/8"	15 5/8"	O	3
U drawer sides	1/2"	6 3/4"	17"	O	6
V false fronts	1/2"	7 1/2"	16 7/8"	O	3
W* drawer bottoms	1/4"	15 9/16"	17 3/16"	OP	3
X shelves	3/4"	16 1/8"	17 7/8"	OP	2
Y* back panel	1/4"	35 3/4"	24"	OP	1

*Initially cut part oversized. Please read all instructions before cutting.

Materials Key: O—oak; OP—oak plywood.

Supplies: #4 x 5/8", #4 x 3/4", #8 x 1 1/4" flathead wood screws; #4 x 1/2" brass flathead wood screws; 4—5/8 x 24" shelf standards with supports; 1 1/4" oak knobs; finish.



TOP FRAME DETAIL

Center of Attention

TIP No. 1—To cut dados in the right side (A) and the divider (B), we locked the rip fence $4\frac{1}{16}$ " from the blade, cut the top dado, then turned the piece end-for-end, and cut the bottom dado in the side panel. We followed the same procedure to dado the divider. Next, we locked the fence $7\frac{3}{4}$ " from the blade, cut the second groove from the top, turned the pieces, and cut the second set of grooves in both panels. Finally, we set the fence $11\frac{13}{16}$ " from the blade, placed the bottom edge against the fence, and cut the middle dados in both panels.

7 Glue, assemble, and clamp the top plates and cross plates, then check for square. After the glue dries, cut $\frac{3}{8}$ " rabbets $\frac{3}{8}$ " deep along both ends of this frame where shown on the Top Frame detail. Next, set a fence $18\frac{3}{4}$ " from your $\frac{3}{8}$ " dado set, and place the left end of the top frame against it. Now, cut a $\frac{3}{8}$ " groove $\frac{3}{8}$ " deep in the bottom face (parts D and E) to accept the divider rabbet where shown on the Carcase Exploded View drawing.

8 Cut vertical grooves for the shelf standards on the inside face of the left side panel and the mating face of the divider. (For locations, see the Carcase Exploded View drawing.) To do this, change your setup to a $\frac{5}{8}$ " dado, and elevate it to $\frac{3}{16}$ ".

9 Next, trim $\frac{3}{8}$ " off the top and bottom ends of the divider. (*Note: This will change the dados you cut previously to $\frac{3}{8}$ "-wide rabbets.*) Then, rip the front edges of the sides to a finished width of $17\frac{7}{8}$ " and the front edges of the divider and bottom to $17\frac{5}{8}$ " wide.

Next, Assemble the Carcase

1 Dry-assemble the carcase (A, B, C, and the D/E frame) and check parts for fit. (We held the parts together temporarily with bar clamps.) Test-fit the stretchers (F). Sand the parts if necessary, and then disassemble them.

2 Glue the drawer glides (G) into the appropriate dados on the right side and divider. (See the Carcase Front View drawing.) Then, glue, assemble, and clamp the carcase (A, B, C, D/E, and F). Align the front stretchers flush with the carcase front. At the back, align the edges of the stretchers with the edge of the divider and the inside edge of the rabbet on the side panel. Now, check the carcase for square.

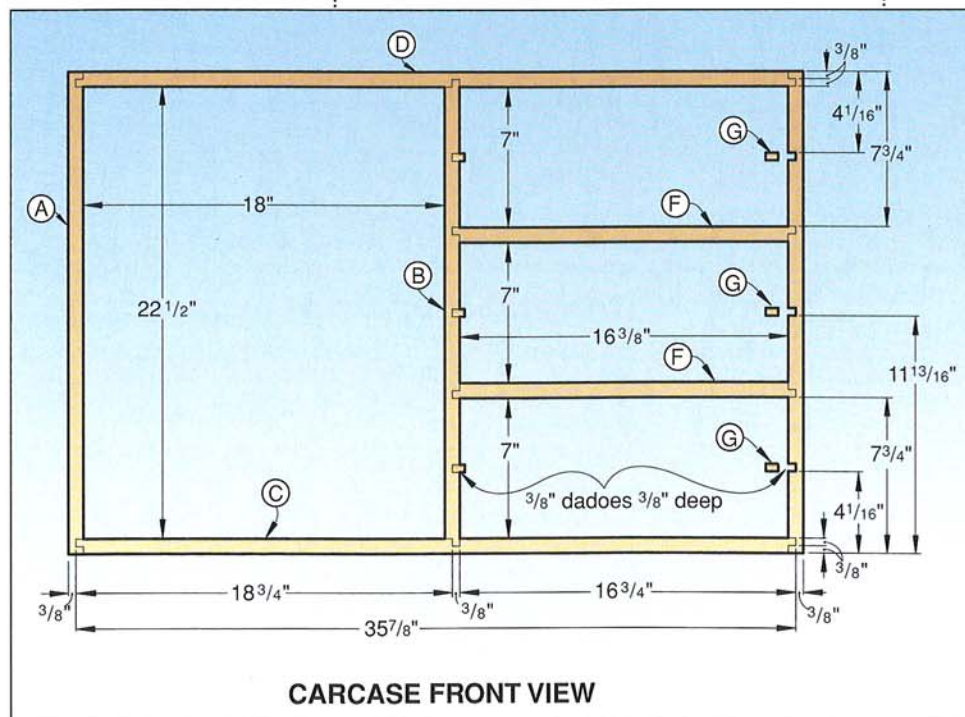
3 While the glue is drying, prepare $\frac{1}{4} \times \frac{3}{4}$ " edging for the plywood. To do this, rip three 25"-long strips, two 38"-long strips, and two 19"-long strips. (*Note: These are rough lengths.*) Using the Carcase Exploded View drawing as a guide, cut and fit the strips for the side edges, then the top and bottom edges, and finally the remaining edges. When all pieces fit, glue and clamp them to the plywood edges. (See our Tip no. 2 on page 22.)

Now, You're Ready to Make And Assemble the Base

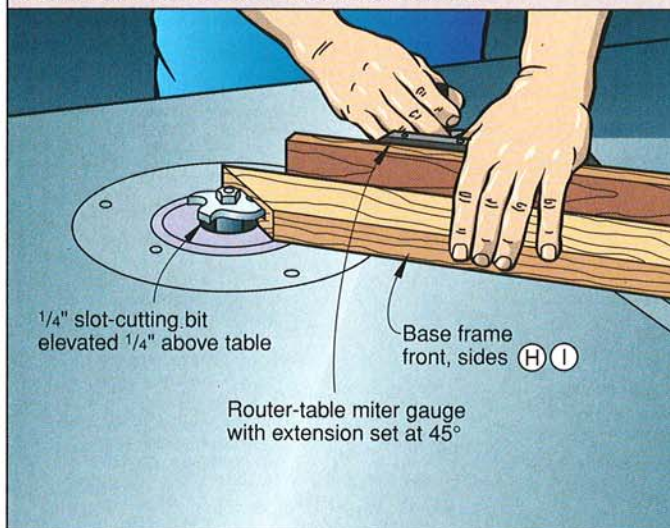
1 From $\frac{3}{4}$ "-thick solid stock, cut one piece to 2×39 " (H), two pieces to 2×19 " (I), and one piece to $2 \times 34\frac{7}{8}$ " (J). Next, miter-cut both ends of part H to $37\frac{7}{8}$ " final length. Miter-cut one end of both parts I, then trim the other end to $18\frac{5}{8}$ " long. Fit your table-mounted router with a $\frac{1}{4}$ " slot cutter, and cut a $\frac{3}{8}$ "-deep groove centered along the inside edge and mitered ends of parts I. Then, rout a groove in both ends of part H as shown *opposite top* to accept a spline. Now, cut $\frac{3}{8}$ "-wide rabbets $\frac{1}{4}$ " deep across both ends of part J to form $\frac{1}{4}$ "-thick $\frac{3}{8}$ "-long tenons. (See the Cabinet Exploded View drawing *opposite*.) From $\frac{1}{4}$ "-thick scrap plywood or hardboard, bandsaw two $\frac{1}{2} \times 1\frac{1}{4}$ " splines.

2 Dry-assemble the base frame (H, I, and J) with the splines as shown on the Cabinet Exploded View drawing. Check for fit, and adjust the parts as necessary. From scrap, cut a stretcher to fit crosswise between the long frame parts (H and J) to help hold the frame in alignment while gluing. Then, glue, assemble, and clamp the base frame. Check for square, and wipe off any glue squeeze-out with a damp cloth.

3 Fit your table-mounted router with a $\frac{3}{8}$ " cove bit, and elevate it to $\frac{7}{16}$ ". Rout around the top outside edges of



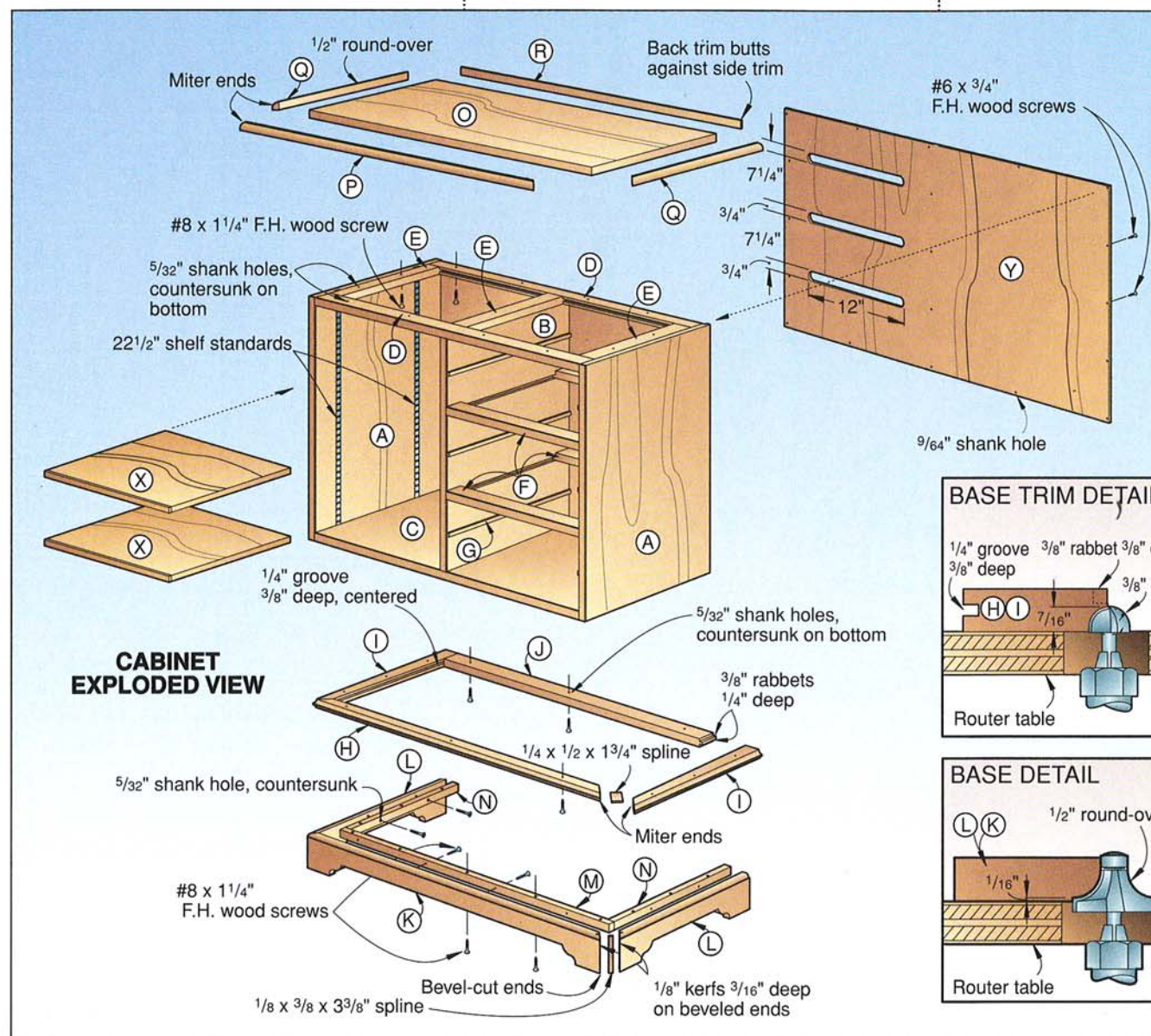
SLOTTING THE ENDS OF THE BASE FRAME



the base frame (H and I). (See the Base Trim detail that accompanies the Cabinet Exploded View drawing.) Change to a rabbeting bit, and rout a 3/8"-wide rabbet 3/8" deep where shown in the same detail.

4 From 3/4"-thick solid stock, rip and crosscut one piece to 33/8x39" for the base front (K), two pieces to 33/8x19 1/2" for the base sides (L), one piece to 3/4x37 1/8" for the long cleat (M), and two pieces to 3/4x17 1/2" for the side cleats (N).

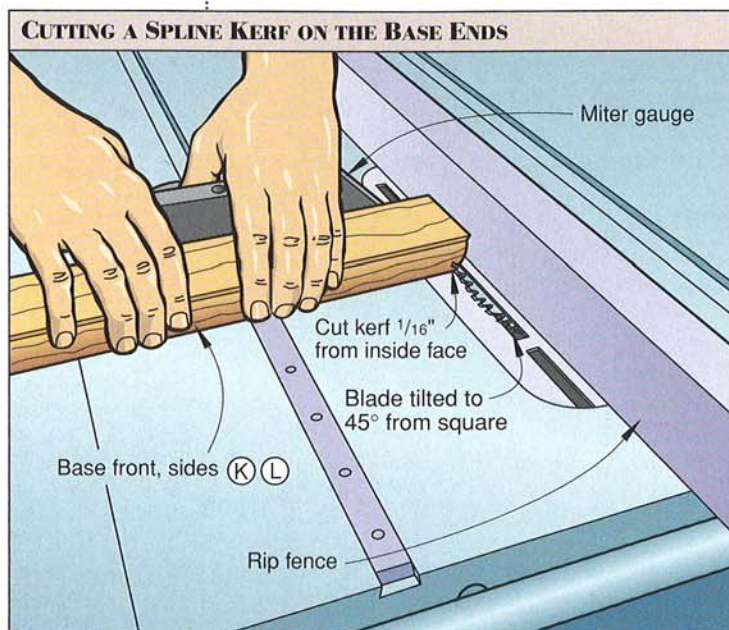
5 Fit your table-mounted router with a 1/2" round-over bit, and elevate it enough to create a 1/16" shoulder. Rout the top outside edges of the three base parts (K and L) where shown



TIP No. 2—Since our oak plywood wasn't a full $\frac{3}{4}$ " thick, we aligned the edge of each $\frac{3}{4}$ "-wide trim strip with the inside edge of the plywood part. Then, after the glue dried, we carefully sanded the outside edge flush with the plywood face.

on the Base detail on the Cabinet Exploded View drawing. Next, bevel-cut both ends of the base front at 45° to a finished length of $38\frac{5}{8}$ " long. Bevel-cut one end of both base sides (L), then trim them to 19" long. Using the same blade tilt, cut a $\frac{3}{16}$ "-deep kerf in the beveled ends of parts K and L $\frac{1}{16}$ " from the inside face, as shown below.

6 Transfer the outline of the full-sized Base End profile shown *opposite* onto both ends of part K and parts L. Next, connect the two profiles with a full-length line. Bandsaw the parts to shape, keeping your blade outside the line. Then, sand to the line. From $\frac{1}{8}$ "-thick hardboard, cut two $\frac{3}{8} \times 3\frac{3}{8}$ " splines. Now, dry-assemble the three base pieces to check for fit, and adjust the parts as necessary. Measure the space between the free ends of parts L, and cut a scrap spreader to fit between them temporarily while gluing.



Then, glue and assemble the base (K and L), insert the temporary spreader, and clamp. Check for square, and allow the glue to dry.

7 Drill and countersink $\frac{5}{32}$ " shank holes through the base frame (H, I, and J) and the cleats (M and N). (For locations, see the Cabinet Exploded View drawing.)

8 Turn the carcass over on its top. Place the base frame upside down on the bottom, center it from side-to-side on the carcass, and align the back edges. Screw the base frame to the carcass using #8 $\times$ 1 $\frac{1}{4}$ " flathead wood screws.

Next, position the base (K and L) on the base frame, and clamp these parts temporarily. (**Note:** The top edge of the base fits into the $\frac{3}{8}$ " rabbet on the base frame.) Now, glue and screw the cleats to the inside of the base and then to the base frame.

It's Time to Top Off the Cabinet

1 To make the top panel (O), cut the remainder of your second 20 $\times$ 96" piece of plywood to 18 $\frac{1}{8} \times 37\frac{3}{8}$ ". From $\frac{3}{4}$ "-thick solid stock, cut a front trim piece (P) for the top panel to $\frac{5}{8} \times 39$ ", two pieces of side trim (Q) to $\frac{5}{8} \times 19\frac{1}{2}$ ", and a back trim piece (R) to $\frac{1}{4} \times 37\frac{3}{8}$ ".

2 Fit, glue, and clamp the back trim to the top panel. Then, miter-cut the remaining trim pieces to fit the top's front and side edges. (**Note:** The side trim pieces overlap the ends of the back trim.) Next, glue and clamp the front and side trim to the top, aligning the top edges of the trim with the panel top. Wipe off any glue squeeze-out, and allow the glue to dry. Now, carefully sand the trim edges flush with the top panel.

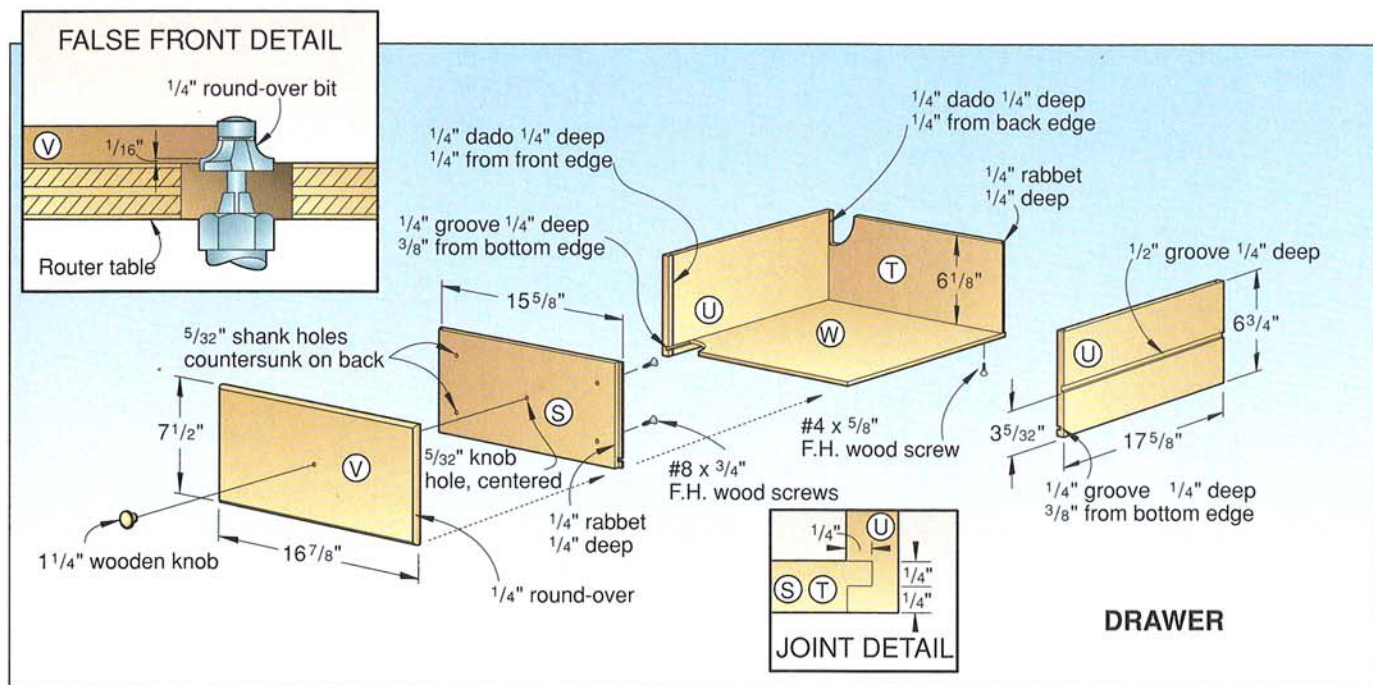
3 Fit your handheld router with a $\frac{1}{2}$ " round-over bit, and adjust it to the same height you used to rout the base. (See the Base Routing detail.) Then, rout the front and sides of the top.

4 To attach the top, first drill and countersink centered $\frac{5}{32}$ " shank holes through the carcass frame where shown on the Cabinet Exploded View drawing. Next, center the top on the carcass, and align the back edges. Drill $\frac{7}{64}$ " pilot holes $\frac{1}{2}$ " deep into the top, and drive the screws part way into the holes. Now, remove the top, and set it aside for finishing.

Make Three Identical Drawers

1 From $\frac{1}{2}$ "-thick stock, cut three drawer fronts (S), three backs (T), six sides (U), and three false fronts (V) to the dimensions listed in the Bill of Materials. (You can plane $\frac{3}{4}$ "-thick stock to this thickness.)

2 Fit your tablesaw with a $\frac{1}{4}$ " dado set, and cut a groove for the bottom on the inside face of each drawer front and side where shown on the Drawer drawing *opposite*. To make the drawer joints, cut a dado $\frac{1}{4}$ " from each end on the inside face of each drawer side. (See the Joint detail shown with the Drawer drawing.) Then, cut a rabbet at each end of each front and back where shown on the same detail. (**Note:** If your plywood



measures less than 1/4" thick, reduce the width of this groove accordingly.)

3 Change to a 1/2" dado set, and cut a glide groove in the outside face of each drawer side where dimensioned on the same drawing.

4 Drill and countersink five 5/32" shank holes through each drawer front where shown. Next, using a 1/4" round-over bit elevated to create a 1/16" shoulder, rout the edges of the three false fronts. Now, finish-sand all drawer parts.

5 Dry-assemble the drawers to check for fit. Then, measure the bottom opening, and cut three drawer bottoms (W) to size from 1/4"-thick oak plywood. (Ours measured 15 5/16 x 17 3/16.")

6 Glue, assemble, and clamp the drawers, aligning the top edges of all parts. Check for square, then allow the glue to dry. Next, sand the joints flush. Insert the bottoms into the drawer grooves, then screw the bottoms to the backs using three #4 x 5/8" flathead wood screws.

7 From your 3/4"-thick plywood, cut two shelves (X) to 16 1/8 x 17 7/8". Next, rip two 1/8 x 3/4 x 17 7/8" trim pieces from solid stock, then glue and clamp one to the front edge of each shelf.

8 To enclose the back of the cabinet, first measure the width and length of the opening. Then, cut the back panel (Y) to size from 1/4"

oak plywood.) Now, lay out and cut 3/4 x 12" slots for electrical cords where shown on the Cabinet Exploded View drawing.

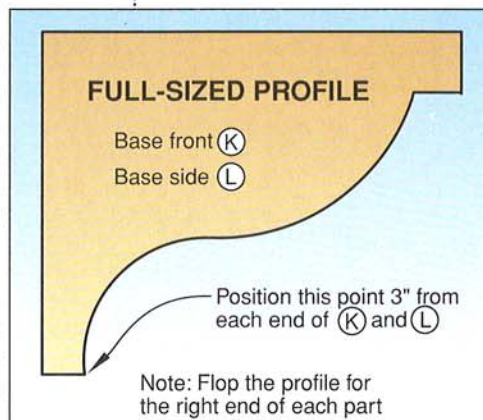
Now, Apply the Finish, Then Complete the Assembly

1 Finish-sand any parts that still need it. Then, apply your choice of finish to both surfaces of the top and shelves, the carcass, all drawer surfaces, three 1 1/4"-diameter oak drawer knobs (which we found at a local hardware store), and the inside face of the plywood back. (We applied Minwax Golden Oak stain, let it penetrate for 10 minutes, and wiped off the excess with a cloth. We then sprayed on three coats of Defthane #2 semigloss polyurethane, sanding each coat after it dried with 320-grit sandpaper.)

2 Cut four 22 1/2" lengths of 5/8"-wide brass shelf standard, being careful to cut them identically so the slots will align after installation. (We bought ours at a local home center.) Position the standards in the vertical grooves in the left side and the divider, and attach them using four #4 x 1/2" brass flathead wood screws.

3 Attach the top to the carcass. Next, screw the false fronts and the knobs to the drawers. Finally, screw the back to the cabinet, and insert the shelf supports and shelves. ■

Project design: Bob Colpetzer, Clinton, Tenn.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Chuck Hedlund
Photograph: Perry Struse





Lighthouse for the birds

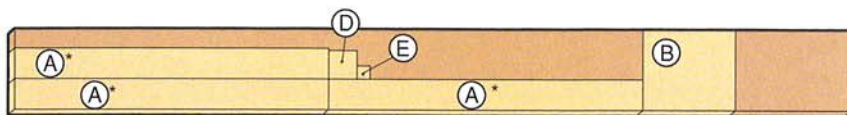
This charming nesting box comes to us from Larry Hanapole of Marblehead, Massachusetts, who ranks as one of the world's foremost lighthouse enthusiasts. In designing this project, Larry combined the features of two originals he admired on the coasts of Maine and Nova Scotia.

Let's Build The Hexagonal Tower First

1 To make the walls (A), first cut three pieces of $\frac{3}{4}$ "-thick stock to $3\frac{1}{2} \times 36$ ". (We selected poplar.) Plane or resaw these boards to $\frac{5}{8}$ " thick. Then, fit your tablesaw with a $\frac{1}{2}$ " dado set, and tilt it to 6° from square as shown on the Clapboard Cutting Setup drawing *opposite*. (See Tip no. 1 about dado sets on page 26.)

2 Make ten indexing marks $\frac{3}{8}$ " apart on your saw table, starting flush with the edge of the dado set. (**Note:** If you have an accurate ruling system on your table, simply make a mark every $\frac{3}{8}$ " along the rule with a washable marker.) Attach an auxiliary wooden fence to your rip fence, and align the edge with the first indexing mark. Now, cut the first clapboard length-

Continued



3/4 x 9 1/4 x 96" Poplar (*Plane or resaw to thickness)



1/4 x 5 1/2 x 12" Poplar

CUTTING DIAGRAM

BILL OF MATERIALS

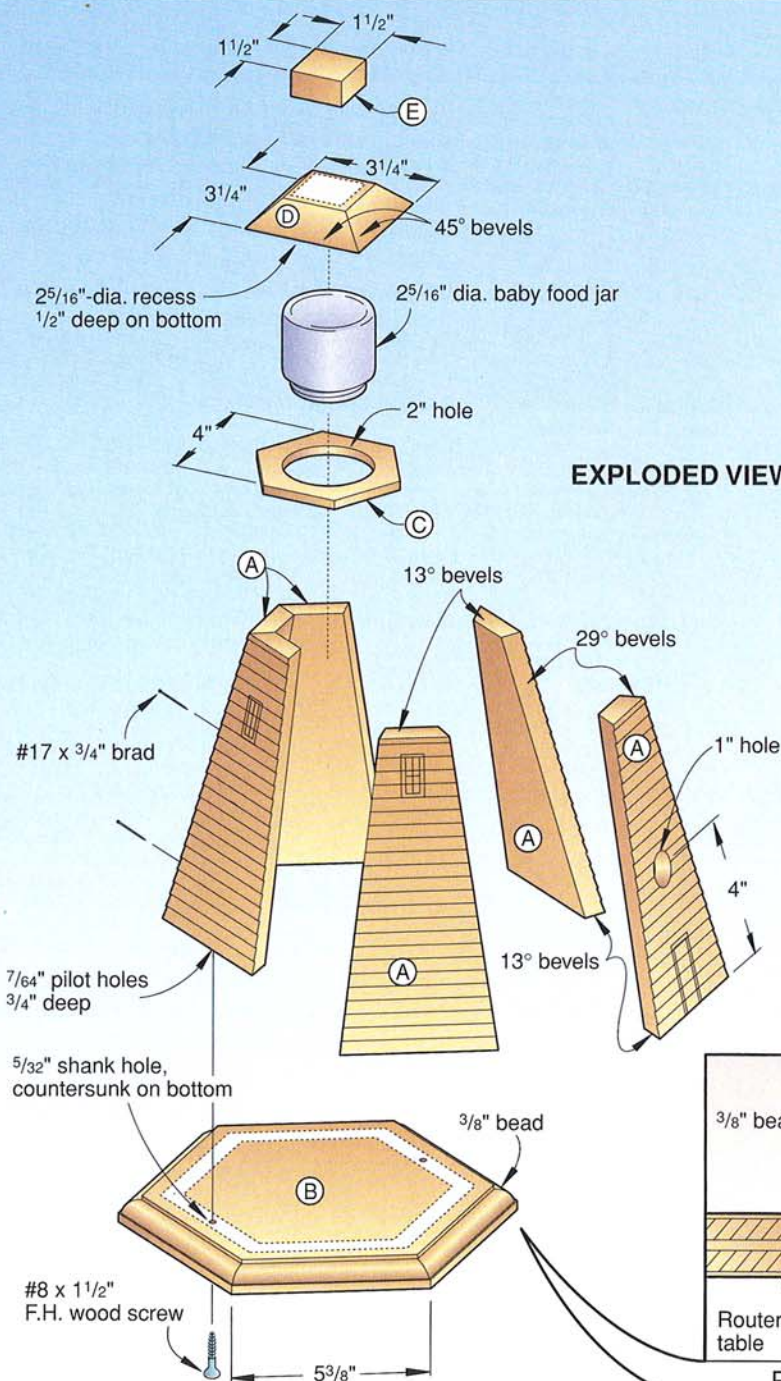
Part	Finished Size			Mati.	Qty.
	T	W	L		
A* walls	5/8"	4 1/4"	8 15/16"	EP	6
B base	3/4"	9 1/4"	10 5/8"	P	1
C walk	1/4"	4"	5 5/8"	P	1
D roof	3/4"	3 1/4"	3 1/4"	P	1
E roof cap	3/4"	1 1/2"	1 1/2"	P	1

*Initially cut part oversized. Please read all instructions before cutting.

Materials Key: EP—edge-joined poplar; P—poplar.

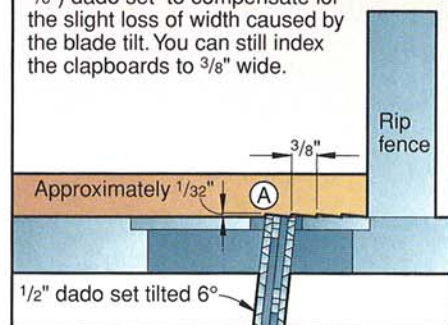
Supplies: #8 x 1 1/2" flathead wood screws; Heinz baby food jar; #17 x 3/4" brads; exterior latex trim paints; slow-set epoxy.

EXPLODED VIEW

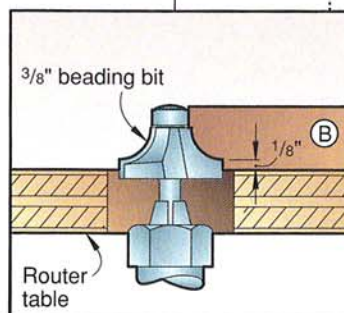


CLAPBOARD CUTTING SETUP

Note: Use a 1/2" (rather than a 3/8") dado set to compensate for the slight loss of width caused by the blade tilt. You can still index the clapboards to 3/8" wide.



ROUTER DETAIL



Lighthouse for the birds

TIP no. 1—To minimize scoring on the clapboard, we recommend using a sharp, high-quality, carbide-tipped dado set. As an alternative, you can also rout the clapboard using a trim router (with adjustable-tilt base) and mortising bit.

wise in all three boards. Move the fence back to the second reference mark, and again cut all three boards. Repeat this procedure until you've machined the entire surface of each board.

3 Rip the edges of each board so that it contains eight complete clapboards. Then, edge-glue and clamp the three boards. Wipe away any glue squeeze-out on the clapboard surface, and allow the glue to dry.

4 Bevel-rip both edges of this edge-glued stock at 13° from square to a finished width of $8\frac{15}{16}"$. (See Step One of the Three-Step Wall Preparation drawing below.) To do this, bevel-

rip the first edge with the clapboard facedown, then flip the stock over to bevel the other edge. (**Note:** Make sure you orient your stock as shown in Step One so the clapboard overlap will run in the right direction with respect to the beveled edges. This should leave you with a partial clapboard at one edge. Designate this the top edge before you miter-cut the walls.) Now, reset the blade to perpendicular, and crosscut your $36"$ -long piece of stock into two equal lengths.

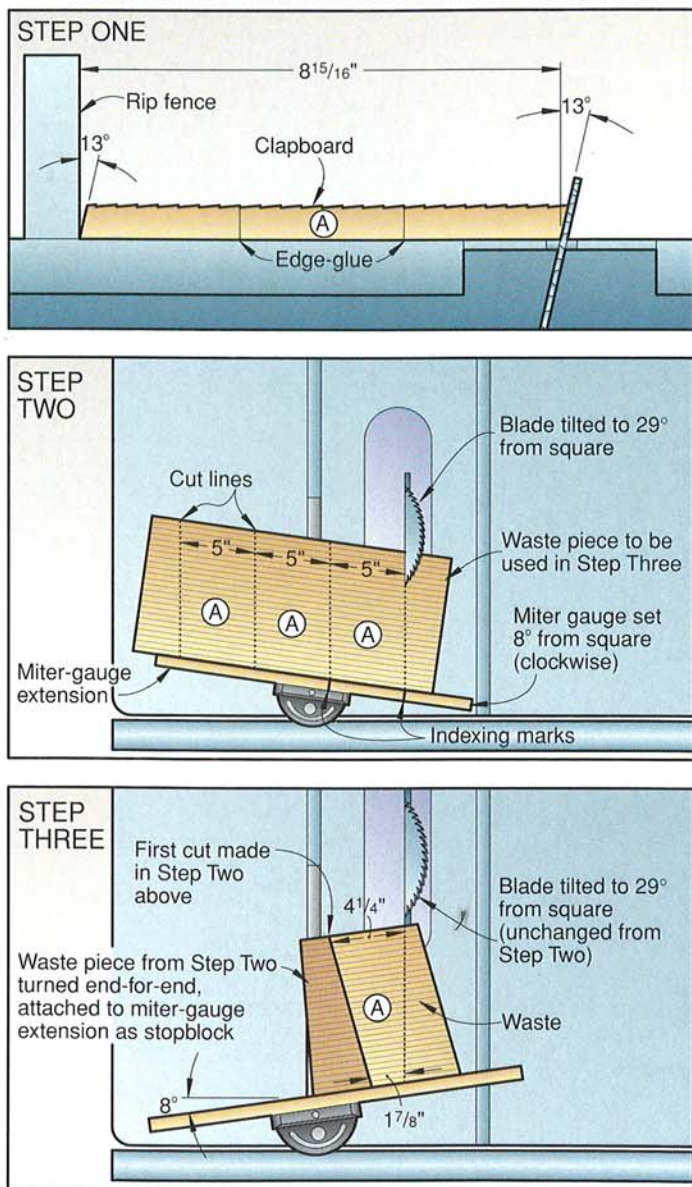
5 To compound-miter the right-hand side of the six walls, first set your miter gauge at 8° from square (in a clockwise direction), and attach an extension to it. (See Step Two of the Three-Step Wall Preparation drawing.) Tilt your blade to 29° from square, and double-check this angle with a gauge. Next, lay out three $5"$ -wide wall blanks on each piece of clapboard stock, leaving a small waste section at the lead end. Miter-cut this waste section as shown in the drawing, and save it to use in Step Three. Now, cut the six wall blanks. (We drew indexing marks on our miter-gauge extension and realigned them with the layout lines on the stock as we cut each successive wall blank.)

6 Miter-cut the left-hand side of the walls to finished shape. To do this, reset your miter gauge to 8° from square in a counterclockwise direction. (See Step Three of the drawing.) Remove the extension from your miter gauge, and attach the waste piece you saved in the previous step as a stopblock. (We used two $\#8 \times 1\frac{1}{2}"$ flathead wood screws.) Next, reposition the extension to cut the blanks to $4\frac{1}{4}"$ wide at the bottom edge, and reattach it to the miter gauge. Turn each blank end-for-end, and hold it snug against the stopblock and extension. Now, without changing your setup, cut each wall to shape.

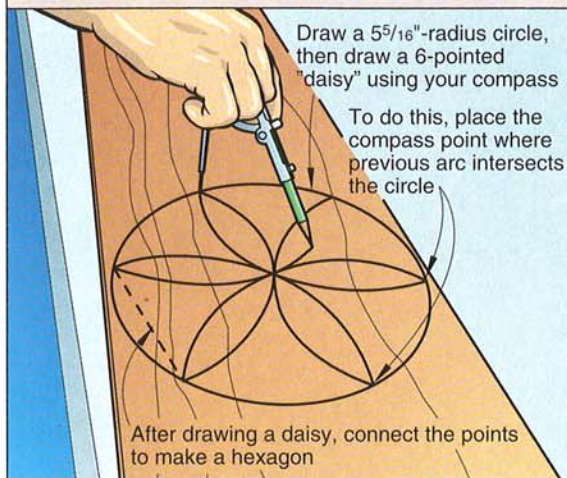
7 Bore an entry hole in one of your six walls. To do this, lay out a centerpoint on the clapboard surface, and use a multi-spur or Forstner bit in your drill press. (**Note:** Select a hole diameter and location according to the bird species you want to attract. See Tip no. 2 opposite.)

8 Dry-assemble the six walls to check for fit, then epoxy and clamp. (We used slow-set epoxy and clamped the assembly with heavy rubber bands. Before clamping, we aligned the bottom edges of the walls, then sanded the top edges smooth after assembly.) Next, nail the walls using $\#17 \times \frac{3}{4}"$ brads. (We drilled $\frac{1}{16}"$ pilot holes first to avoid splitting the stock.) Now, set the nails, and fill the holes.

THREE-STEP WALL PREPARATION DRAWING



DRAWING A "DAISY" TO LAY OUT THE BASE



Next, Machine the Base, Walk, and Roof

1 Lay out and cut the hexagonal base (B) to shape. To do this, first draw a $5\frac{5}{16}$ "-radius circle on $\frac{3}{4}$ "-thick stock using your compass. Then, draw a six-pointed "daisy" with your compass as shown above. Connect the six points with straight lines to complete the layout, and then bandsaw the hexagon to shape, keeping your blade outside the line. Now, sand to the line. (We used our stationary disc sander.)

2 Fit your table-mounted router with a $\frac{3}{8}$ " beading bit. (See the Router Setup detail that accompanies the Exploded View drawing.) Rout the edge of the base on all six sides, then sand the base smooth.

3 On a $5\frac{1}{2} \times 12$ " piece of $\frac{1}{4}$ "-thick stock, lay out the hexagonal walk (C) using the same procedure you used to lay out the base, but start with a $2\frac{5}{16}$ "-radius circle. (You can plane or resaw $\frac{3}{4}$ "-thick stock.) Before you cut the walk to shape, bore a 2"-diameter hole through the stock for the glass to sit in, using the same centerpoint you used for the hexagonal layout. (We used an inverted Heinz baby food jar, which fits nicely into a hole this size. We used a multi-spur bit to bore the hole.) Now, bandsaw the walk to shape, keeping your blade outside the line. Sand to the line, then sand the walk smooth.

4 Lay out the roof (D) in the center of a 5×12 " piece of $\frac{3}{4}$ "-thick stock as dimensioned in the Bill of Materials. Then, move your tablesaw rip fence to the side of the blade opposite its direction of tilt. Tilt the blade to 45° from square, and bevel-rip both edges of your roof to width. Now, using your miter gauge and extension, bevel-cut both ends of the roof to size.

5 Bandsaw a $1\frac{1}{2}$ " square of $\frac{3}{4}$ "-thick stock for the roof cap (E). Sand the roof and cap smooth. Next, epoxy and clamp the cap to the top center of the roof. Remove any squeeze-out, and allow the epoxy to cure.

6 Next, bore a centered recess for the glass in the bottom face of the roof. To do this, lay a handscrew clamp flat on your drill-press table, and use it to clamp the roof cap. (Our Heinz baby food jar has a $2\frac{5}{16}$ " outside diameter. We set our wing-type circle cutter at a radius of $1\frac{1}{32}$ " and cut a $\frac{1}{2}$ "-deep circle. We then bored out the core of the circle using a 2" multi-spur bit.)

You're Nearly Ready for Tenants

1 Sand the top and bottom edges of your assembled tower flush. Then, sand the entry hole if necessary. Next, center and clamp the base to the tower bottom. Invert this assembly, then drill and countersink two shank holes in the base where shown and dimensioned on the Exploded View drawing. Now, drill pilot holes in the tower bottom through the shank holes, and then unclamp.

2 Center the walk on top of the tower, then epoxy and clamp it in place. Wipe away any squeeze-out, and allow the epoxy to cure.

3 At this point, paint the various parts according to your tastes. (We applied a latex primer, then used exterior latex trim paints—olive green for the base, barn red for the roof and door, black for the walk and windows, gray for the window and door trim, and white for the tower. We painted the tower first, then laid out and painted the windows and door after the white paint had dried. See Tip no. 3 at right about laying out the door and windows.) Do not paint the interior of your birdhouse.

4 After the paints have dried, epoxy and gently clamp the glass into the walk, then epoxy and clamp the roof to the glass. (We applied epoxy around the inside edge of the walk hole, then inserted the threaded mouth of the jar. Next, we dabbed epoxy sparingly in the bottom of the roof recess before clamping on the roof.)

5 When the epoxy has cured, attach the base to the tower using two $\#8 \times 1\frac{1}{2}$ " flathead wood screws. Now, mount your house in a location suitable for the species you wish to attract. (See Tip no. 4 at right.) ■

TIP no. 2—Choose an entry-hole diameter and location that suit the species of bird(s) you hope to attract. For example, bluebirds prefer a $1\frac{1}{2}$ " hole 6" up from the floor. Tree swallows like the same diameter if it's located about half that distance from the floor. For most species of wrens, bore a 1" hole between 1" and 6" from the floor.

TIP no. 3—We made our door $1\frac{3}{16} \times 1\frac{7}{8}$ " (five clapboards high) and our windows $\frac{5}{8} \times 1\frac{1}{8}$ " (three clapboards high). We laid out the door on the entry-hole wall and laid out the windows in spiral fashion around the tower, starting on the wall to the right of the door. We located the five windows on the eighth, eleventh, fourteenth, seventeenth, and twentieth clapboard up from the base.

TIP no. 4—Birds also differ in their preferences as to nesting elevation. Bluebirds tend to nest at between 5 and 10 feet above the ground. Tree swallows prefer a higher nest (10-15 feet). Wrens usually nest 6 to 10 feet above ground level.

Illustrations: Roxanne LeMoine, Carson Ode
Project Builder: Chuck Hedlund
Photograph: Perry Struse



Deck-Rail Planter Frames

You know those unappealing plastic planter boxes they sell at your local nursery or home center? Now you can dress them up with these handsome "rail riders." The elegance they add to your deck will surprise you, especially considering the trifling amount of work that goes into them. We chose clear-finished redwood to match our outdoor furniture, but you can paint yours to complement any deck decor.

For Starters, Cut All Your Parts to Size

Note: The following instructions will build one 29"-long frame, which will accommodate a 24" plastic planter box or four 6"-diameter pots. The frame will fit over a 2x6 rail. If you'd prefer to frame a 30"-long plastic planter (or five 6" pots), cut your side slats (parts A) to a length of 35" rather than 29".

1 From $\frac{3}{4}$ "-thick stock that has been surfaced on four sides, rip and crosscut eight side slats (A) and six end slats (B) to the dimensions listed in the Bill of Materials. (We selected clear-heart redwood. Redwood lumber of nominal 1" thickness is sometimes milled to $\frac{5}{8}$ " thick, which is a bit thin for this project. Therefore, we looked around until we found stock that was at least a full $\frac{11}{16}$ " thick.)

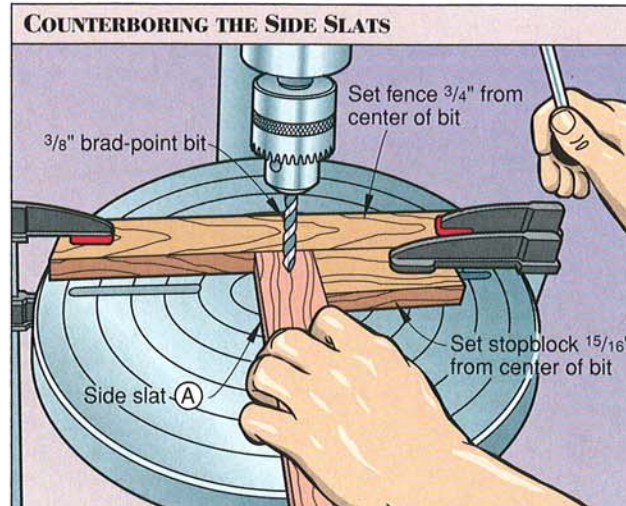
2 To make the corner posts (C), first rip $\frac{1}{8}$ " from one edge of a 48" length of 2x4 to remove the milled edge. Then, rip and crosscut a piece to $1\frac{1}{2} \times 38$ ". Using an extension on your miter gauge, crosscut this piece into four 9"-long posts. Now, sand the side slats, end slats, and corner posts smooth.

Continued

Counterbore and Drill the Slats

1 Lay out, counterbore, and drill the side slats where shown on the Front View drawing on page 30. To do this, chuck a $\frac{3}{8}$ " brad-point bit into your drill press. Next, lay out a centerpoint $\frac{3}{4}$ " from the end of one side slat, and position this centerpoint beneath the bit. Then, lower the point of the bit into the stock, and lock the drill-press quill to hold the bit and stock in this position. Square a fence to the end of the slat as shown at right, and clamp it to the table. Now, butt a stopblock against the slat, and clamp it against the fence. Use this setup to drill a $\frac{3}{8}$ " counterbore $\frac{1}{4}$ " deep. Once you've drilled all 16 counterbores, change to a $\frac{5}{32}$ " bit, and drill a shank hole through the side slat centered in each counterbore. (For this step, we used a backup board to prevent tear-out.)

2 To counterbore and drill the end slats, reset your stopblock to $\frac{5}{8}$ " from the center of the bit, and change back to your $\frac{3}{8}$ " bit. Again, butt the end of each end slat against the fence and the edge against the stopblock. Next, drill a $\frac{1}{4}$ "-deep counterbore at one end of the back face of each end slat. (For locations, see the Side View drawing on page 30.) Change to a $\frac{5}{32}$ " bit as before, and drill a shank hole through the stock centered in each counterbore. Since these holes will be off-center (to avoid colliding with the side-slat screws), you'll have to reset your



stopblock to $\frac{5}{8}$ " from the bit in the other direction as shown on page 30. Now, counterbore and drill the opposite end of each end slat.

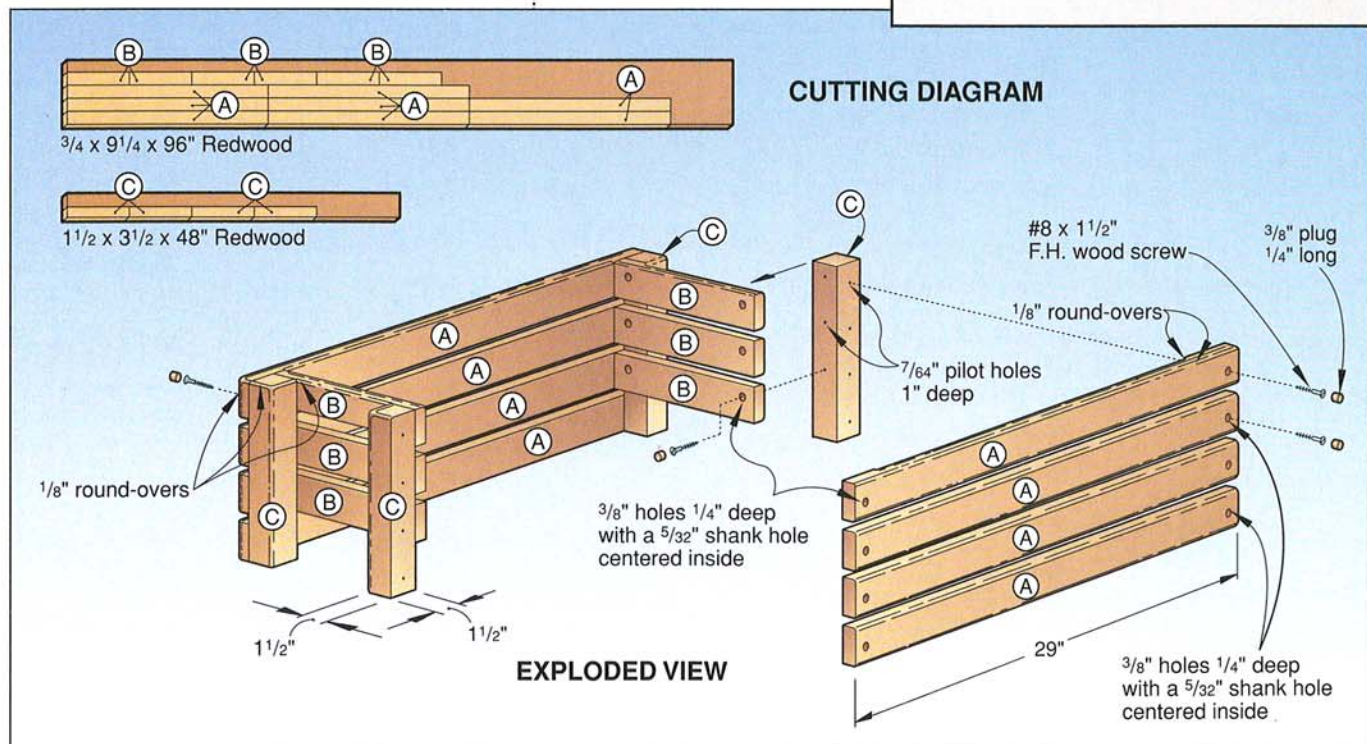
3 Fit your table-mounted router with a $\frac{1}{8}$ " round-over bit. At this time, rout the outside end-slat edges—both top and bottom on the lower two slats and just the bottom edge on the top slat—where shown on the Side View drawing. (**Note:** We'll rout the top edges of the top end slat, both inside and outside, after assembling the parts.)

BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A side slats	$\frac{3}{4}$ "	$1\frac{7}{8}$ "	29"	R	8
B end slats	$\frac{3}{4}$ "	$1\frac{7}{8}$ "	9"	R	6
C corner posts	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	9"	R	4

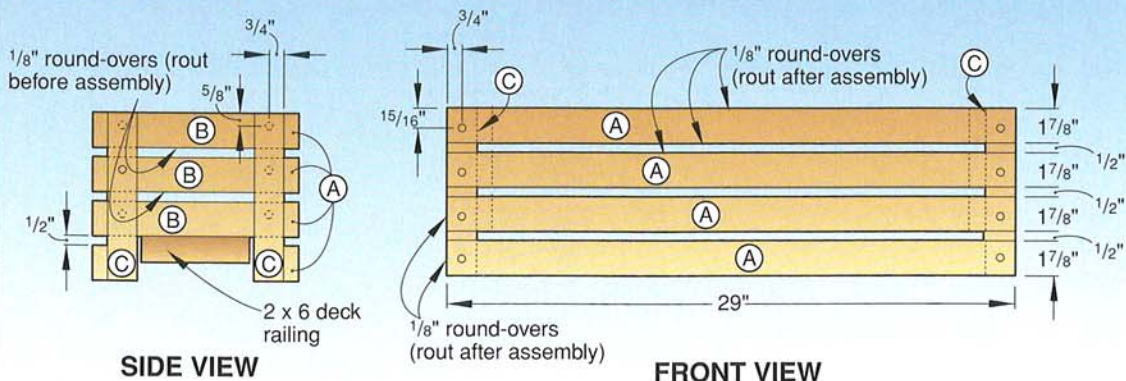
Materials Key: R—redwood.

Supplies: #8 x $1\frac{1}{2}$ " flathead wood screws; finish.



Deck-Rail Planter Frames

Note: Rout top edges of top end slat after assembly



TIP no. 1—If you have 2x4 deck rails, we recommend cutting a 29" length of 2x6 and securing it to the rail as a base for your planter and frame. Apply two coats of Thompson's Water Seal to the base, then attach it using 2 1/2" galvanized deck screws.

4 Lay out end-slat locations 1/2" apart on the inside face of each corner post. Then, dry-assemble and clamp three end slats to the back faces of each pair of corner posts. Insert an awl through each shank hole to mark pilot-hole locations, then unclamp the assemblies. Now, use your drill press to drill 7/64" pilot holes 1" deep where marked in each corner post.

Assemble and Finish Your Frame, Then Deck the Rails

1 To check for fit, temporarily attach the end slats to their respective corner posts using #8x1 1/2" flathead wood screws. Adjust the fit as necessary, then reassemble these parts using glue as well as screws. (We used Franklin's Titebond II, a water-resistant glue that is ideal for outdoor use.) Wipe away any glue squeeze-out with a damp cloth, and allow the glue to dry.

2 Using a 3/8" tapered plug cutter in your drill press, cut twenty-eight 3/4"-long plugs from scrap redwood stock. Glue a plug into each counterbore on the end-slat assemblies. After the glue has dried, fit your router with a 1/2" mortising bit set to cut flush with the face of the stock. Now, rout the plugs flush. (We first checked our bit setting using scrap stock. If you don't have a mortising bit, a sharp straight bit will suffice.)

3 Lay out the side-slat locations on the corner posts. Next, dry-assemble and clamp the side slats to the corner post/end-slat assemblies. Now, mark pilot-hole centerpoints in the corner-post edges using an awl as before. Unclamp the parts, and drill 7/64" pilot holes 1" deep in the corner posts.

4 Temporarily screw the side slats to the corner posts to check for fit. Then, reassemble the parts using glue and screws, and check for square. Wipe away any squeeze-out, and allow the glue to dry.

5 Glue a plug into each counterbore as before. When the glue has dried, rout the plugs flush. Change to a 1/8" round-over bit, and rout the edges and ends of all parts, except for the inside edges of the frame interior. (See the Exploded View for round-over locations.) Now, finish-sand all parts of your frame that still need it.

6 Apply your choice of finish. (We brushed on two generous coats of Thompson's Water Seal, allowing each coat to dry for 24 hours. We applied a third coat to the end grain.) To avoid water damage to your deck rails, set your planter on a piece of water-sealed 1x6 scrap stock. Then, place the frame around it. (See Tip no. 1 above left about deck-rail dimensions.) ■

Project design: Dr. Paul Sandin, Phillipsburg, N.J.

Illustrations: Roxanne LeMoine, Carson Ode

Project builder: Chuck Hedlund

Photograph: Joe Warwick

