

Vol. 7 No. 4 • Issue 40

Weekend Woodworking Projects™

July 1994
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Bandsawed Bunny Box

Turned Letter Opener

Collector's Cabinet

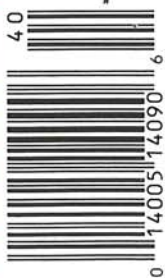
Stand-Up Mirror

3-D Fish Puzzle

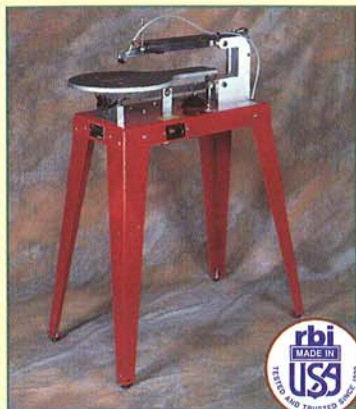
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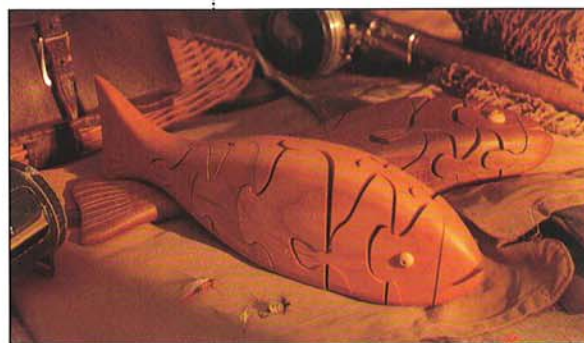
Collector's Cabinet, Page 5

5 COLLECTOR'S CABINET

Whether you collect butterflies or baseball cards, Irish lace or South American stamps, this ten-drawer beauty has got you covered. Not only does it make an ideal organizer for just about any hobby or craft, but it also serves handsomely as an end table.

10 BAFFLING BASS

Is this puzzle a tempting toy for kids of all ages? Or a finely sculpted piece of the woodcrafter's art? Whatever you want to call it, Peter Chapman's design intrigues just about everybody who picks it up.



Baffling Bass, Page 10

14 ADIRONDACK TABLE AND FOOTSTOOL

When we published our Adirondack-style lounge chair six years ago, we had no idea that it would become one of our most popular projects ever. With the addition of these matching pieces, we've completed our set.

20 STELLAR STAND-UP MIRROR

If morning mirror time is in heavy demand during your family rush hour, here's an attractive solution to the problem. If getting out of the fast lane is more what you had in mind, this little space-saver travels well in an RV or camper.

25 LATHED LETTER OPENER

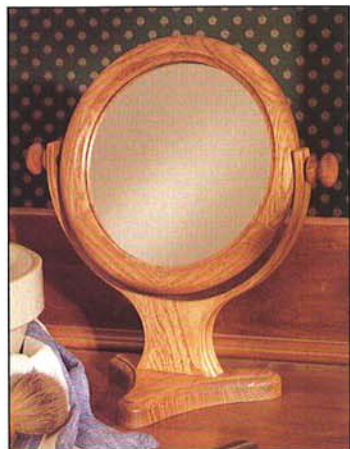
Ever find yourself shredding an envelope to get at the contents? This elegant project offers a more civilized approach—and gives you an opportunity to try off-set turning at the same time.

28 FLIP-TOP COTTONTAIL

No rabbeting required to make this loveable longears. Our bandsawed bunny box makes a nice one-after-noon project and a charming child's gift that has definite hareloom possibilities.



Flip-Top Cottontail, Page 28



Stand-Up Mirror, Page 20

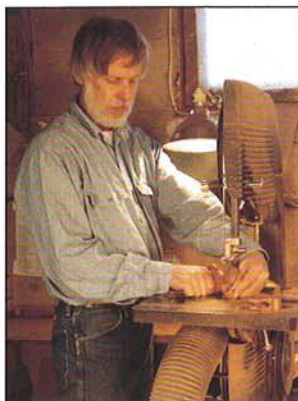
Cover photograph : King Au



A woodcrafter's success: no fish story

To find new projects for *WWP*, we go on the road several times a year, scouting craft shows and visiting with professional woodcrafters. At a recent Pennsylvania show, we met up with Peter Chapman of Bent Mountain, Virginia, who agreed to let us feature one of his designs in this issue. (See our "Baffling Bass" on page 10.)

In a Blue Ridge Mountain studio, Peter has spent a decade developing his "Class Menagerie" of what he calls "puzzled sculptures." These three-dimensionally interlocking puzzles have a way of undulating, not unlike the creatures they depict—dolphins, alligators, manatees, starfish, and brontosaurus, among others.



Peter Chapman at work in his Blue Ridge Mountain studio

Like a lot of brilliant discoveries, Peter's technique is surprisingly simple. After machining your bass (let's say) to shape, you bandsaw a first puzzle piece on the top edge of the fish, making a tongue that will lock loosely into the next piece. You then turn the fish 90°, and cut the second piece on the side. You alternate, cutting on the vertical and then the horizontal axis, to complete the puzzle.

Having grown bored with conventionally interlocking puzzles, Peter started running variations on his one-dimensional designs

in search of something truly original. As he experimented one day with a length of 1x1" stock, he found he had a string of pieces that hung together like vertebrae in a spinal column. "I can't remember the exact moment of discovery," says Peter. "But I saved that string of pieces, the way some businesses save their first dollar. I still have it here in the studio."

Since then, the experimenting has never let up, and the menagerie has expanded every year to its present population of about 15 creatures. Lately, Peter has been developing a tyrannosaurus with moving jaws. Also in the works is a line of puzzles-within-puzzles.

Consider this success story a brief tribute to Peter Chapman and the thousands of other professional woodcrafters out there. These artisans not only help keep skilled craftsmanship alive and well in a mass-produced world, but they've also shared a pretty fair number of original designs with you, the home woodworker who reads *Weekend Woodworking Projects*.

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

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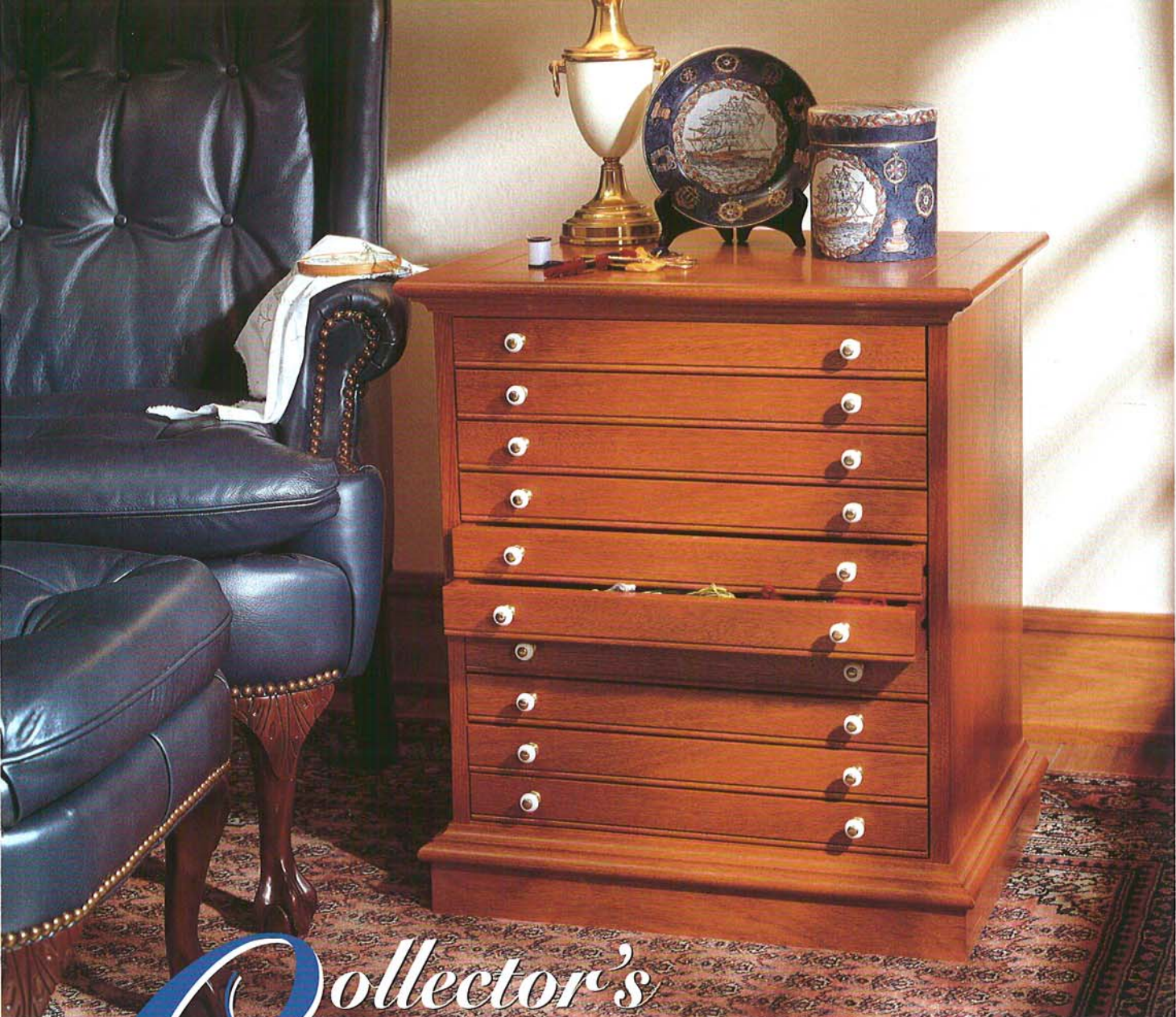
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Collector's Cabinet

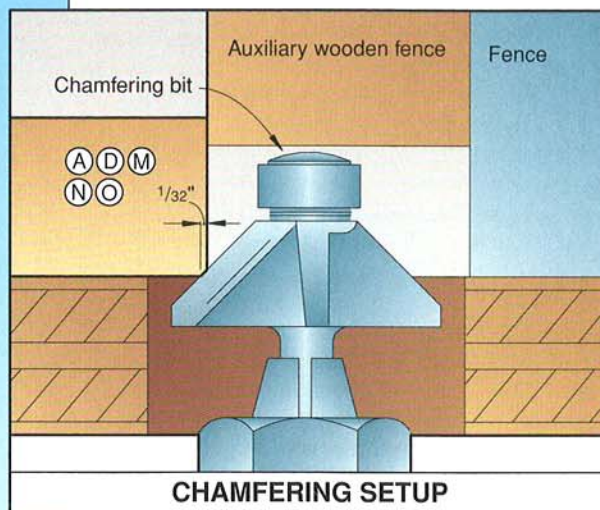
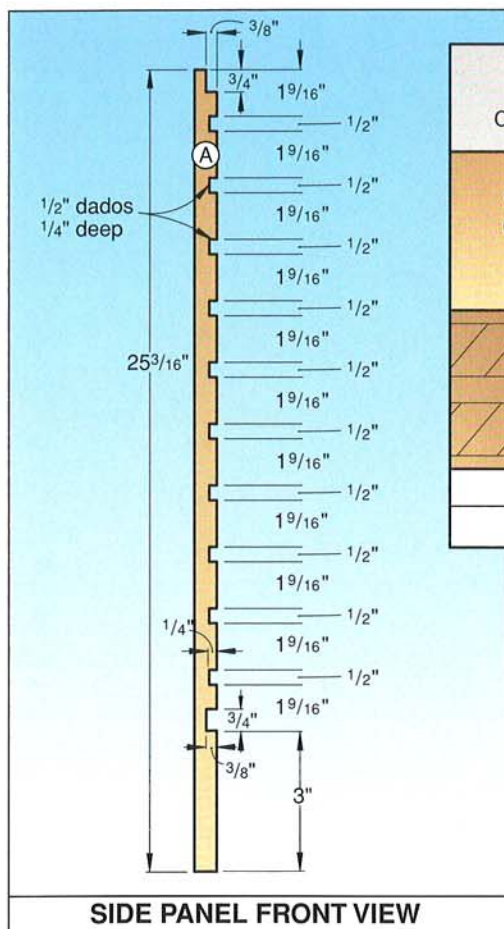
Whether it's butterflies or baseball cards, Irish lace or South American stamps, this ten-drawer beauty has got your collection covered. Not only does it make an ideal organizer for just about any hobby or craft, but it also serves quite handsomely as an end table.

Let's Start by Cutting Four Plywood Panels

1 From a 48x48" sheet of $\frac{3}{4}$ "-thick plywood, cut the two side panels (A) to the dimensions listed in the Bill of Materials. (We selected Honduras mahogany.) Lay out the $\frac{1}{2}$ " and $\frac{3}{4}$ " dadoes on the front edge of one of the side panels where shown on the Side Panel Front View drawing on page 7.

2 Fit your tablesaw with a $\frac{1}{2}$ " dado set, and elevate it to $\frac{1}{4}$ ". Next, align the first marked dado with the dado set ($1\frac{1}{16}$ " from the top end), position your rip fence, and cut the dado. Without moving the fence, cut the dado in the other side panel. Then, reposition the fence, and repeat this operation to cut the second dado in both panels. Now, use the same approach to cut the remaining $\frac{1}{2}$ " dadoes.

Continued



chamfer along the outside front edge of each side panel (A).

7 Glue and clamp the four panels (A and B) together, and check for square. Next, temporarily nail the back panel (C) in place to help hold the assembly square until the glue dries. Then, drive 4d finish nails through the sides and into the ends of the top and bottom where shown on the Exploded View drawing. Now, remove the back panel.

Add the Face Frame and Trim

1 From 3/4"-thick solid stock, rip and crosscut the face frame stiles (D), the bottom rail (E), and the top rail (F) to size. Next, using the same chamfering setup you used in Step 6 above, rout the back outside edge of the two stiles (D). Now, tape these trim pieces temporarily to the front edge of the assembled cabinet. Check for fit, and trim if necessary.

2 Glue and clamp the face frame (D, E, and F) to the cabinet where shown on the Exploded View drawing. (**Note:** The mating 1/32" chamfers on the stiles and side panels will form a 1/16" decorative V-groove. See Tip no. 1 above right.)

3 To make the front base molding (G) and side base moldings (H), first rip the parts to width, then crosscut them 1" longer than the lengths specified in the Bill of Materials. Next, tilt your tablesaw blade to 45° from square, and bevel-cut both ends of the front piece to finished length. Bevel-cut the front ends of the side moldings, and then trim the back ends to length. (For accuracy, we attached an extension to our miter gauge and clamped a stopblock to it.) Now, glue and clamp the base moldings (G and H) to the bottom front and sides of the assembled cabinet.

Continued

3 Change to a 3/4" dado set, and cut the one 3/4" dado 3/8" deep in both side panels where shown. Next, cut a pair of 3/4" rabbets 3/8" deep along the top end of each side panel. To do this, attach an auxiliary wooden fence to your rip fence, and set it right against the dado blade for zero-clearance.

4 Change back to a regular 1/8" blade, and cut the top and bottom cabinet panels (B) to size from the same plywood stock. Next, switch to a 1/4" dado setup, and cut a 3/8"-deep rabbet along the back inside edge of these two panels. Then, cut an identical rabbet along the back inside edge of each side panel (A). (To cut these rabbets, we used our zero-clearance auxiliary fence.)

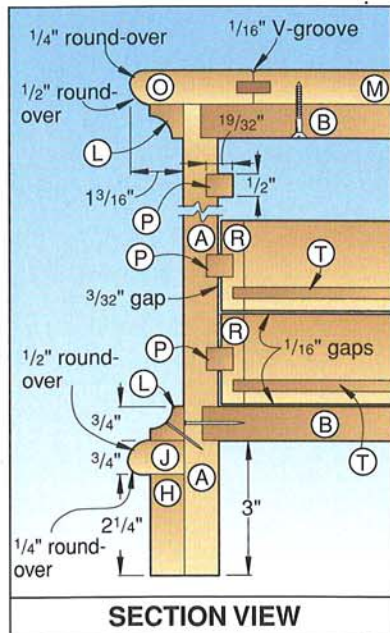
5 Lay out and drill four countersunk 5/32" shank holes on the underside of the top panel (B). (See the Exploded View drawing.) Then, dry-clamp the four panels (A and B), and measure the rabbeted opening for the back panel. (Ours measured 19 3/4" x 21 7/16".) Now, cut the back panel (C) to size from 1/4"-thick mahogany plywood.

6 Next, fit your table-mounted router with a chamfering bit as shown in the Chamfering Setup drawing above right. Now, rout a 1/32"

TIP no. 1—When you glue the face frame to the cabinet, we suggest placing masking tape along the chamfered front edges of the side panels (A) to avoid getting glue squeeze-out on the faces. Use this same technique later on when gluing the edge pieces (N and O) to the top (M).

Project design: Bob Colpetzer, Clinton, Tenn.
Illustrations: Roxanne LeMoine, Troy Doolittle
Project builder: Chuck Hedlund
Photograph: King Au

4 To form the bottom trim pieces (I and J), first cut a piece of $\frac{3}{4}$ "-thick solid stock to $1\frac{3}{16}$ "x62". Fit your table-mounted router with a $\frac{1}{4}$ " round-over bit, and rout one edge of this piece. Then, switch to a $\frac{1}{2}$ " round-over bit, and rout the adjacent edge.



5 From the 62"-long piece of stock, crosscut the trim pieces (I and J) to 1" longer than their finished lengths. Set your miter-gauge at 45° from square, then miter-cut both ends of part I and one end of parts J. Next, trim parts J to length. Now, glue and clamp the trim pieces to the top edges of the base moldings (G and H) and to the cabinet.

6 To form the top and bottom cove moldings (K and L), cut a piece of $\frac{3}{4}$ "-thick solid stock to 3x64". Fit your table-mounted router with a $\frac{1}{2}$ " cove bit and a fence, and rout both edges as shown below. Then, rip a $\frac{3}{4}$ "-wide strip from each edge to form two lengths of molding. From these, miter-cut and trim two front cove moldings (K) and four side cove moldings (L), using the same approach you used in the previous step.

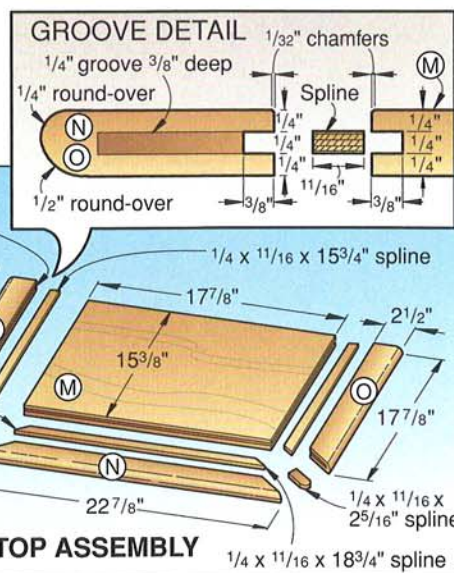
TIP no. 2—Since a good drawer fit is essential for smooth operation and good looks, we built just one drawer first to verify its fit in the cabinet. In case your cabinet dimensions vary from those shown on the drawings, we recommend that you use this same approach and adjust dimensions if necessary.

The Top Comes Next

1 Cut the top (M) to size from $\frac{3}{4}$ "-thick plywood. Next, make the top edge pieces by first cutting a strip of $\frac{3}{4}$ "-thick solid stock to $2\frac{1}{2}$ "x62". From this piece, miter-cut both ends of the front edge piece (N) to length. Miter-cut one end of the two side edge pieces (O), then crosscut the opposite end of each to length.

2 Fit your table-mounted router with a chamfering bit as shown in the Chamfering Setup drawing. Next, rout a $\frac{1}{32}$ " chamfer along the inside top edges of parts N and O and along the top front edge and sides of the top panel (M). (These mating chamfers will form a decorative V-groove.)

3 Change to a $\frac{1}{4}$ " slotting cutter, and rout a $\frac{3}{8}$ "-deep groove centered along the inside edges of the edge pieces (N and O). (See the Top Assembly drawing and Groove detail above.) Then, rout an identical groove along the front and side edges of the top panel (M).



4 Transfer two copies of the full-sized Corner Spline pattern shown on page 9 to $\frac{1}{4}$ "-thick plywood or hardboard stock. Next, bandsaw the two splines to shape. Now, cut and miter-cut the three longer splines to the dimensions shown on the Top Assembly drawing.

5 Glue, spline, and clamp the edge pieces (N and O) to the top (M). (See Tip no. 1 on page 7.) Allow the glue to dry, then remove the tape.

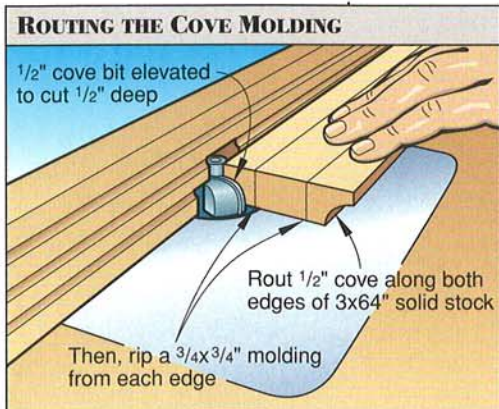
6 Center the assembled top from side-to-side, and align its back edge with the back edge of the cabinet. Using the shank holes you drilled earlier in the top panel (B) as guides, drill $\frac{7}{64}$ " pilot holes $\frac{1}{2}$ " deep in the underside of the top (M). Now, attach the top to the cabinet (without glue) using four #8x1 $\frac{1}{4}$ " flathead wood screws.

7 To attach the cove moldings (K and L) to the cabinet, first drill $\frac{1}{16}$ " shank holes in the moldings. Glue and nail the moldings where shown using #17x $\frac{3}{4}$ " brads. Then, set the brads.

Now, Set Up an Assembly Line To Build the Ten Drawers

1 Rip and crosscut twenty $\frac{1}{2}$ "x $\frac{19}{32}$ "x15 $\frac{3}{4}$ " drawer glides (P). Glue and clamp them in place where shown on the Section View drawing. Remove any glue squeeze-out immediately. (Before making the drawers, see Tip no. 2 at left.)

2 Cut the drawer fronts (Q) to size from $\frac{3}{4}$ "-thick stock. Then, from $\frac{1}{2}$ "-thick stock, rip and crosscut the drawer sides (R) and backs (S). Next, fit your table-mounted router with a $\frac{1}{8}$ "-radius corner beading bit, and rout the decorative bead along the bottom front edge of each drawer front. (See the Bead Routing Setup drawing opposite.)



3 Lay out and drill a pair of $\frac{1}{8}$ " screw holes (for knobs) through each drawer front (Q) where shown *below* on the Drawer drawing and the Drawer Front Section View detail.

4 Fit your tablesaw with a $\frac{3}{8}$ " dado set, and cut a rabbet along both ends of the back face of each front (Q). (See the Front Joint detail shown with the Drawer drawing. We used a wooden auxiliary fence for zero-clearance.) Next, change to a $\frac{1}{4}$ " dado set, and cut a $\frac{1}{16}$ "-deep notch in both ends of each drawer front. (We stood these parts on end and adhered them to a carrier board.) Change to a $\frac{3}{16}$ " dado set, and cut a dado near the front end of each drawer side (R).

5 Using the same $\frac{3}{16}$ " dado setup, cut a dado near the other end of each drawer side (R) where shown on the Rear Joint detail that accompanies the Drawer drawing. Next, cut a mating $\frac{3}{16}$ " rabbet at both ends of each drawer back (S) where shown on the same detail. Then, cut a groove for the drawer bottom along the inside face of each front, back, and side. (For reference, see the Drawer drawing and accompanying Drawer Front Section View and Drawer Side detail drawings.) Now, change to a $\frac{1}{2}$ " dado set,

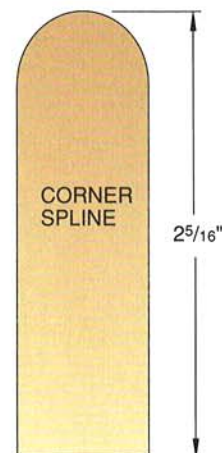
and cut a groove $\frac{1}{4}$ " deep along the outside face of each side where shown for the drawer glides.

6 From $\frac{1}{4}$ "-thick mahogany plywood, cut ten drawer bottoms (T) to size. Then, glue, assemble, and clamp the drawers. Check for square, then nail the drawers where shown on the Drawer drawing. Now, set the nails, and allow the glue to dry.

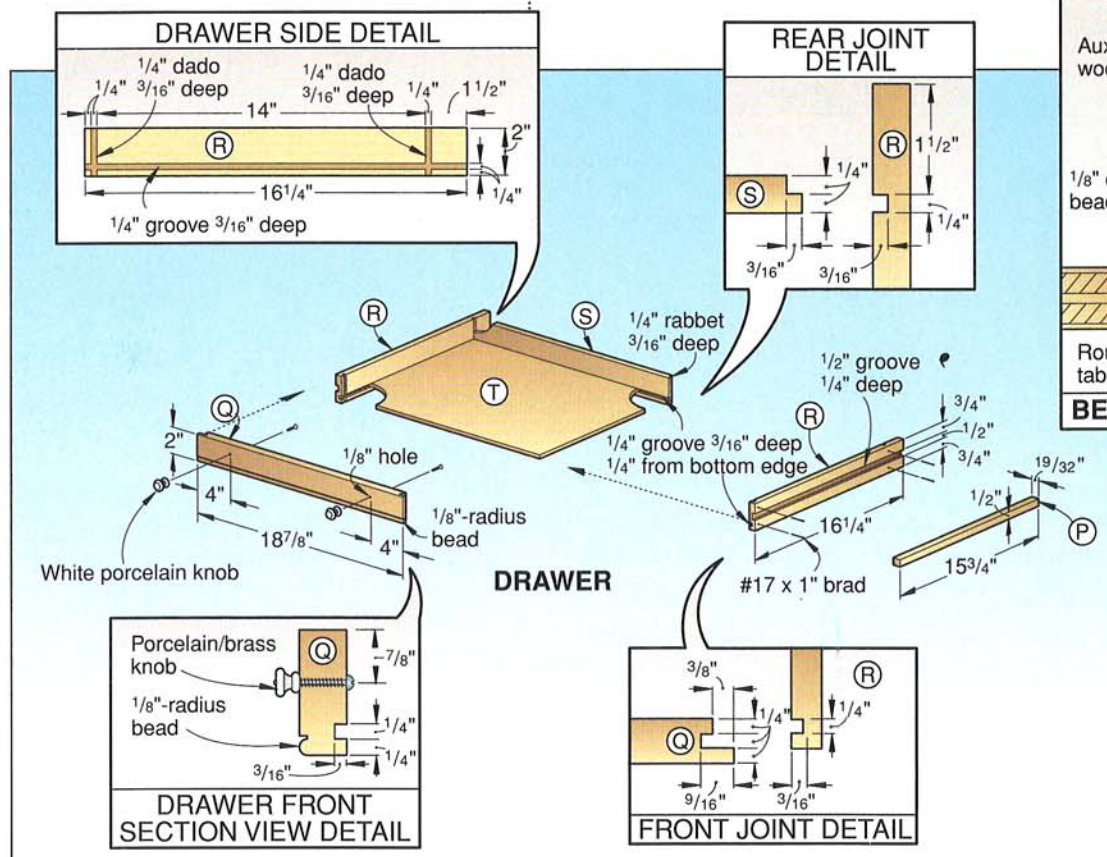
Sand, Stain, and Add the Finish

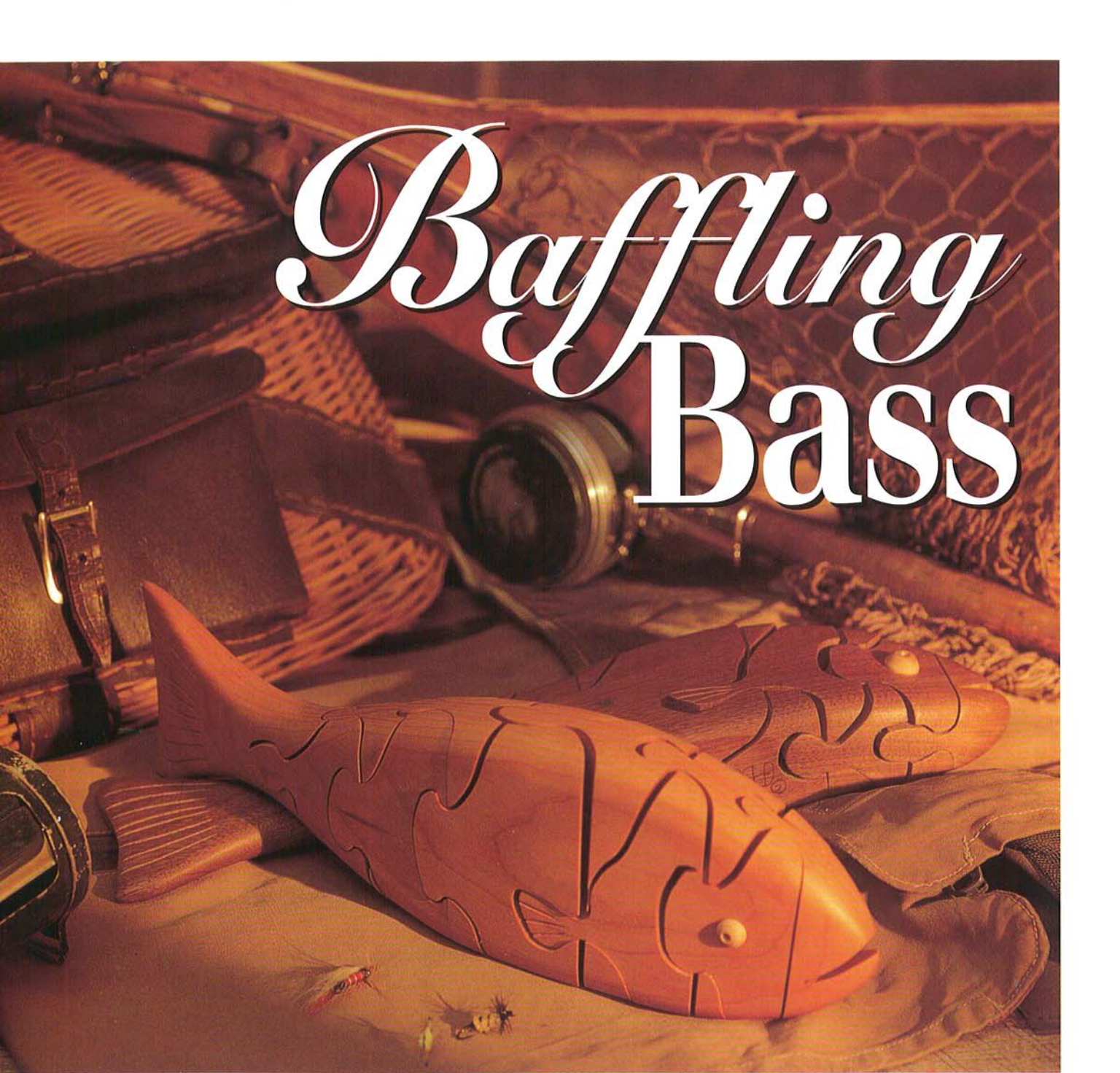
1 Finish-sand the cabinet assembly, drawers, and back panel. Then, apply your choice of finish. (We applied two coats of Minwax natural oil stain, allowing each to penetrate for 10 minutes and then wiping off the excess. After the stain had dried overnight, we sprayed on three coats of Deft semigloss lacquer, sanding lightly between coats with 320-grit sandpaper.)

2 Nail the back panel (C) in place. Then, attach a pair of $\frac{3}{4}$ "-diameter knobs to each drawer front. (We used brass and porcelain knobs, which we found at our local hardware store.) Finally, rub a bit of paraffin on the drawer glides, and insert the drawers. ■



FULL-SIZED PATTERN



A large, detailed wooden fish puzzle is the central focus, lying on a light-colored surface. The fish is intricately carved with interlocking puzzle pieces along its body, fins, and head. It has a realistic appearance with a small eye and a slightly open mouth. In the background, there's a warm, golden-brown setting with fishing-related items: a wicker basket, a fishing reel, a fishing rod, and some fishing lures. The overall lighting is soft and warm, creating a cozy, rustic atmosphere.

Baffling Bass

Here's what puzzles us about this project: Is it a tempting toy for kids of all ages? Or a finely sculpted piece of the woodcrafter's art? Well, whatever the case, Peter Chapman of Bent Mountain, Virginia, has come up with a design that intrigues just about everybody who picks it up. And we've come up with full-sized patterns that will take the puzzlement out of cutting the interlocking pieces.

First, Fashion a One-Piece Fish

1 Rip and crosscut a piece of $1\frac{3}{4}$ "-thick stock to $3\frac{1}{2}\times 12$ ". (We chose cherry.) Next, make two copies of the full-sized Side- and Top-View patterns shown on pages 12 and 13. Cut out the halves, and tape them together to make full patterns. Now, adhere a side-view pattern to one face of the stock. (We used a spray adhesive.)

2 Drill a $\frac{1}{2}$ " eye hole where shown on the pattern. (We used a brad-point bit and a backup board to prevent tear-out.) Next, bandsaw the side

profile of the fish to shape, keeping your blade outside the line. (We used a $\frac{1}{16}$ " blade with 24 teeth per inch.) Sand to the line using a 2"-diameter drum sander, then remove the pattern.

3 Cut one of the top-view patterns to shape. Adhere it to the top edge of the stock, then bandsaw the sides of the fish to shape. Next, remove the top-view pattern, and sand the sides smooth. (We used our stationary belt sander.)

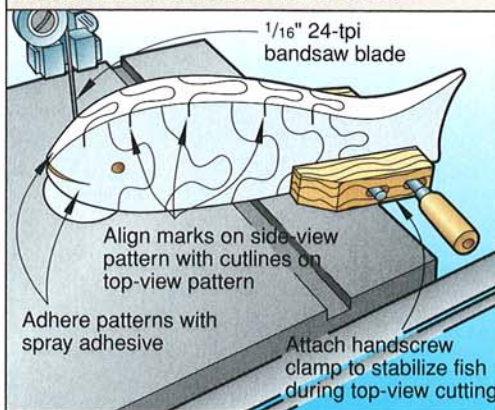
4 Fit your table-mounted router with a $\frac{1}{4}$ " round-over bit, and rout all four edges of the fish. (**Note:** Rout only those sections where the stock is thick enough to give the bit's pilot bearing a surface to ride on.) Next, switch to a $\frac{1}{2}$ " round-over bit, and rout each edge again.

5 Sand a $\frac{1}{2}$ " round-over on those edges you couldn't reach with the router. (We used a 3x3" drum sander. See Tip no. 1 opposite.) Next, sand the bottom edge flat where shown on the pattern. (We used our stationary disc sander.) Now, finish-sand the entire fish. (We used a flap sander. For both drum and flap sanders, see our Buying Guide.)

Adhere Your Patterns, Then Cut the Interlocking Pieces

1 Cut out your remaining patterns, and adhere the top-view pattern to the fish. Next, adhere the side-view pattern, this time aligning the marks on this pattern with the cutlines on the top-view pattern. (See Tip no. 2 on page 12.) Then, attach

BANDSAWING THE TOP-VIEW CUTS

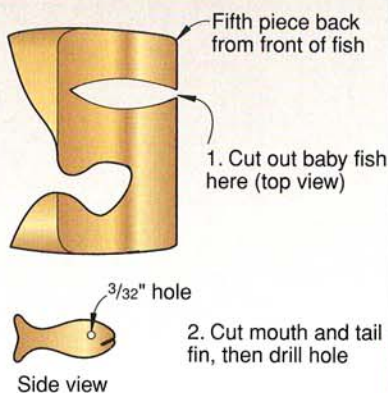


a small (5/0) handscrew clamp as shown above to stabilize the stock while bandsawing the top-view cuts. Now, bandsaw the first top-view cut to separate the mouth section from the fish.

2 Remove the clamp, and adhere the waste piece you removed earlier to the back side of the fish as shown on page 12. (We used double-faced

Continued

BABY FISH DETAIL



Stock required: $1\frac{3}{4}$ x3 $\frac{1}{2}$ x12" cherry.

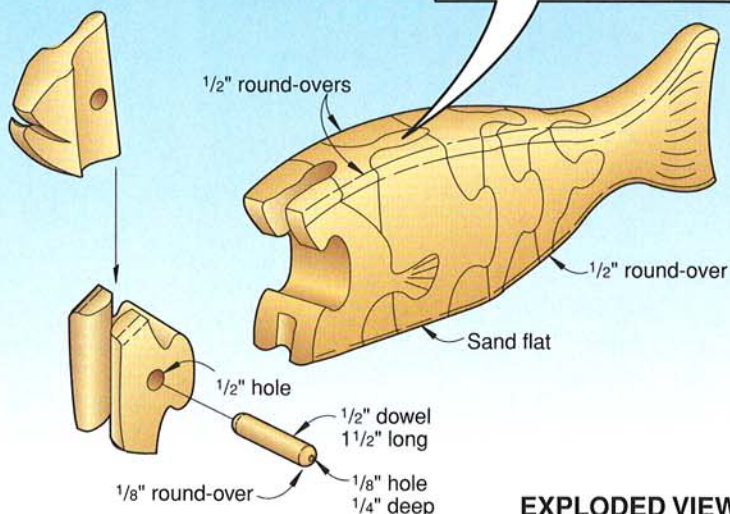
Supplies: $\frac{1}{2}$ " maple or birch dowel stock, double-faced carpet tape, spray adhesive, finish.

Buying Guide

3x3" Sleeveless Drum Sander. Sponge rubber backing. Locking device enables use of standard sandpaper sheets (cut to size). $\frac{1}{2}$ " shank. Catalog no. 06P51. \$20.95 plus \$4.95 shipping and handling. Woodcraft, 210 Wood Co. Industrial Park, P.O. Box 1686, Parkersburg, WV 26102-1686. Phone 800/225-1153.

Sand-O-Flex Contour (Flap)

Sander. 4"-dia. wheel, eight bristle heads, $\frac{1}{4}$ " shank. Wheel dispenses eight lengths of $\frac{1}{8}$ "-wide abrasive cloth. Catalog no. 06L31. \$28.50 plus \$5.95 shipping and handling. (Shipping and handling for both drum and flap sanders is also \$5.95.) Woodcraft. See address and phone no. above.

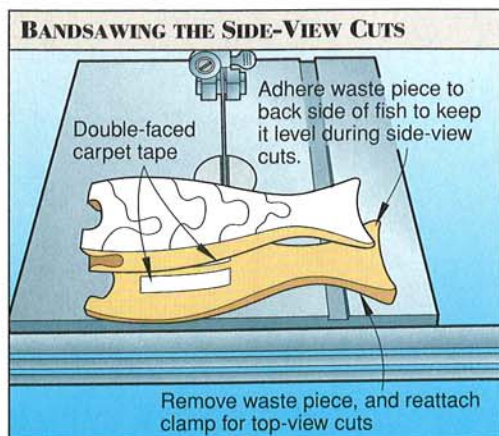


EXPLODED VIEW

Baffling Bass

TIP no. 2—Once you've cut the sides of the fish to shape (as shown on the top-view pattern), the side-view pattern will no longer fit the fish profile as it did before. The important thing at this point is to make sure that the top- and side-view cuts are properly staggered by aligning the marks on the side-view pattern with the cutlines on the top-view pattern.

Project design: Copyright © Peter Chapman, Bent Mountain, Va.
Illustrations: Roxanne LeMoine, Troy Doolittle
Project builder: Chuck Hedlund
Photograph: King Au



carpet tape. This will keep the fish relatively level while you make the side-view cuts.) Next, make the first side cut to remove the eye section.

3 Repeat the two previous steps, alternately bandsawing the remaining top- and side-view pieces. For each top-view cut, remove the leveling waste piece and reattach the handscrew clamp. Then, remove the clamp and reattach the leveling piece to make each side-view cut.

4 To make the baby fish, first bandsaw a foot-ball-shaped piece from the fifth piece you cut. (See the Baby Fish detail that accompanies the Exploded View drawing.) Then, bandsaw the fish to shape. (We clamped the baby fish using a 5/0 handscrew clamp, which we laid flat on our bandsaw table.) Now, drill a $\frac{3}{32}$ " hole for the eye.

Add a Few Details, Then Apply Your Finish

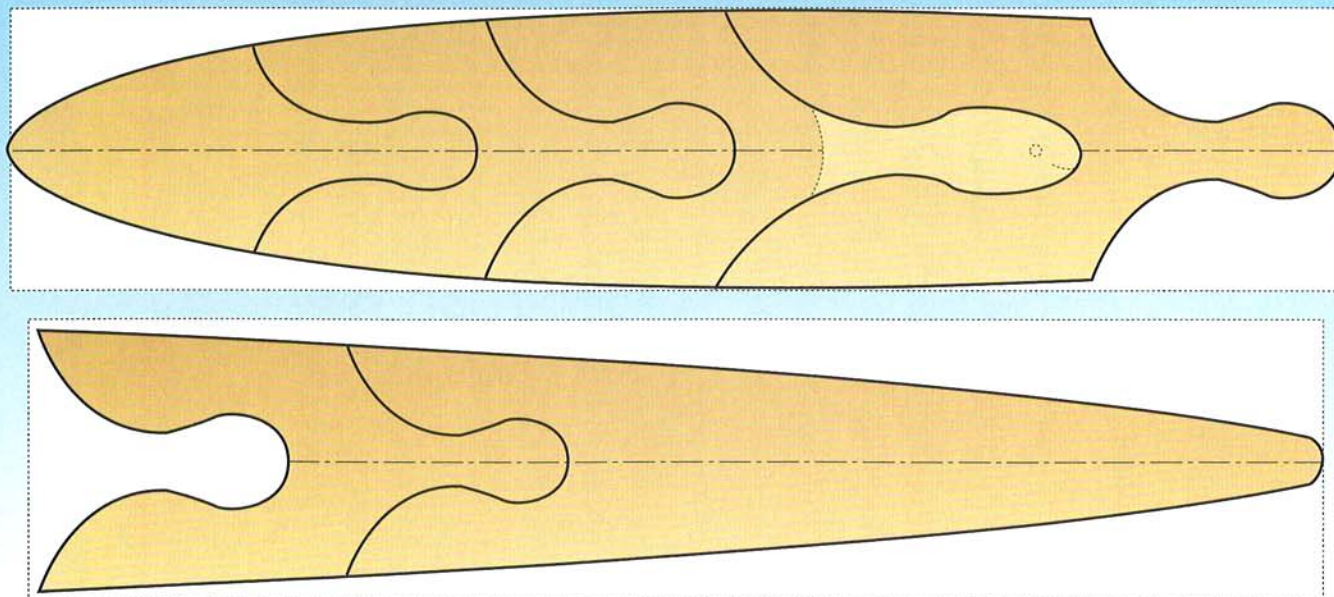
1 To make the eye piece that locks the puzzle, cut a $1\frac{1}{2}$ " length of $\frac{1}{2}$ " dowel stock. (We used maple.) Next, drill a $\frac{1}{8}$ " hole $\frac{1}{4}$ " deep in each end. To do this, clamp a scrap piece of 2x4 to your drill-press table. Drill a $\frac{1}{2}$ " hole $\frac{3}{4}$ " deep in this piece, then insert the dowel into the hole. Without removing the clamps, change to a $\frac{1}{8}$ " bit, and drill the two holes. (This clamped jig will ensure a centered, perpendicular hole.) Now, sand a $\frac{1}{8}$ " round-over on each end of the dowel.

2 Carve $\frac{1}{16}$ "-deep V-grooves for rays in the pectoral and tail fins where shown on the side-view pattern. (We used a 1-mm no. 12 V-parting tool, although a hobby knife will work.)

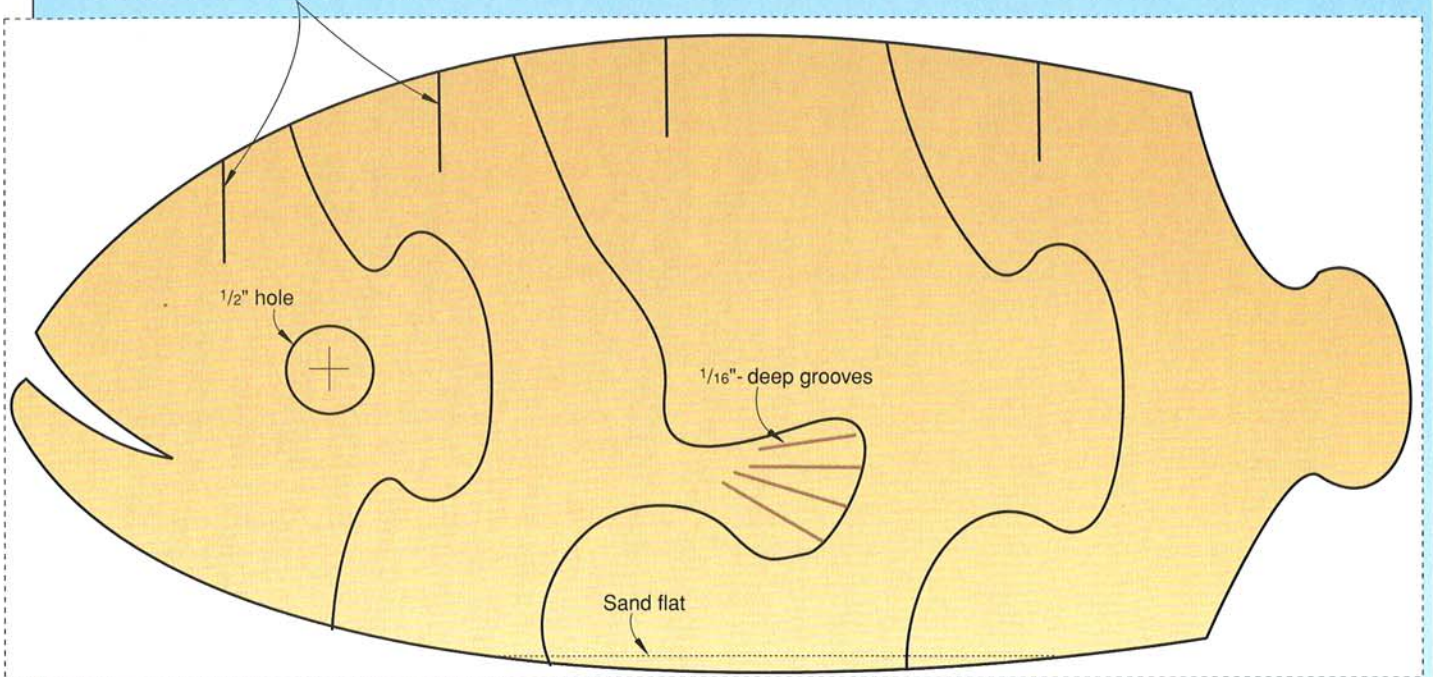
3 Remove all pattern scraps, and sand any bandsaw burrs from the interior surfaces of the pieces. Next, assemble the entire fish, and hand-sand any surfaces that still need it.

4 Disassemble the fish, and apply your choice of finish to all interior and exterior surfaces. (We brushed on Watco Natural Danish Oil Finish and allowed it to penetrate for 30 minutes. We then wiped off the excess, allowed the finish to dry for an hour, then repeated this procedure. After the finish had dried overnight, we buffed it with a clean cotton cloth.) ■

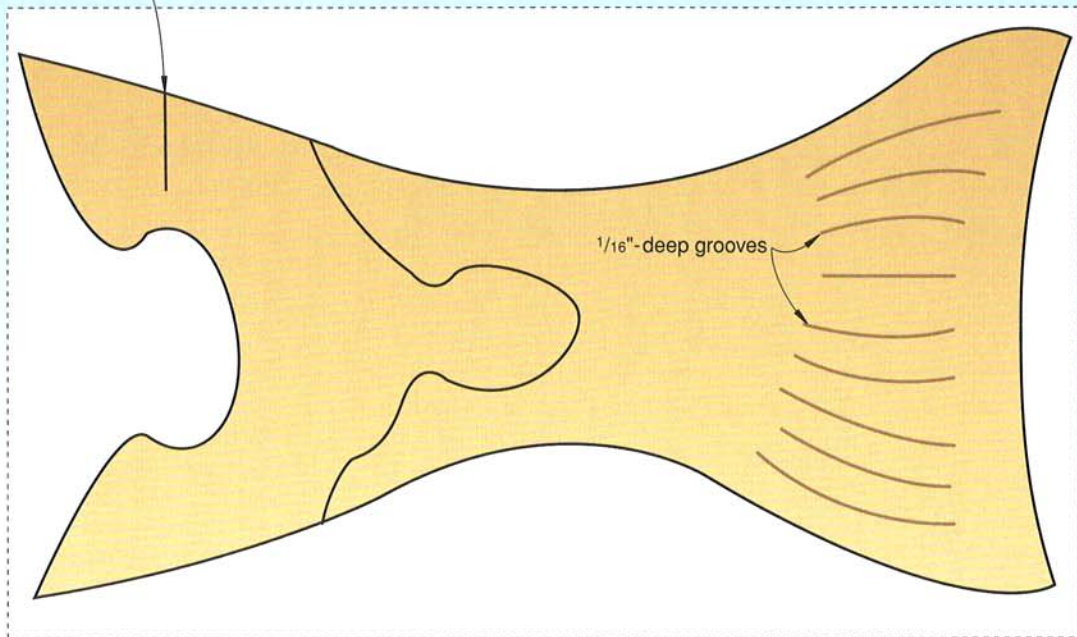
FULL-SIZED TOP-VIEW PATTERN



Align with cutlines on top-view pattern



Align with cutline on top-view pattern



FULL-SIZED SIDE-VIEW PATTERN



Adirondack TABLE AND FOOTSTOOL

Back in 1988, when we published our Adirondack-style lounge chair (issue 5), we had no idea how popular it would become. And now, with the addition of these matching pieces, we've completed our outdoor set. If you don't have issue 5, you can order plans for the chair on page 16.

For Starters, Cut and Assemble The Table Frame

1 To make the legs (A), rip and crosscut four pieces of $\frac{3}{4}$ "-thick stock to $5 \times 17\frac{1}{2}$ ". (We selected clear pine.) Next, lay out and cut the tapered inside edge of each leg on these pieces where shown on the Table Exploded View drawing *opposite*. (We used our tablesaw and an adjustable tapering jig, but you can also cut this taper on your bandsaw.)

2 Rip and crosscut two side rails (B) and two end rails (C) to the dimensions listed in the Bill of Materials. Next, make two copies of the full-sized $2\frac{1}{4}$ "-radius pattern shown on page 19, and transfer it onto the ends of both end rails. Now, bandsaw the ends to shape, keeping your blade outside the line. Then, sand to the line. (We used a 2"-diameter drum sander.)

3 Lay out the screw-hole centerpoints on the side and end rails where shown and dimensioned on the Table Exploded View drawing. Then, drill and countersink $\frac{5}{32}$ " shank holes through the four rails. Now, sand the rails smooth.

Continued

BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
TABLE					
A legs	¾"	5"	17½"	P	4
B side rails	¾"	2¼"	21"	P	2
C end rails	¾"	2¼"	19½"	P	2
D middle top	¾"	7"	24"	P	1
E* middle ends	¾"	7"	9"	P	2
F side tops	¾"	3"	24"	P	4
G* inside ends	¾"	3"	5½"	P	4
H* outside ends	¾"	3"	2½"	P	4

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

Materials Key: P—pine.

Supplies: #8x1", #8x1 1/4", and #8x1 1/2" flathead wood screws; oil-based primer; oil enamel.

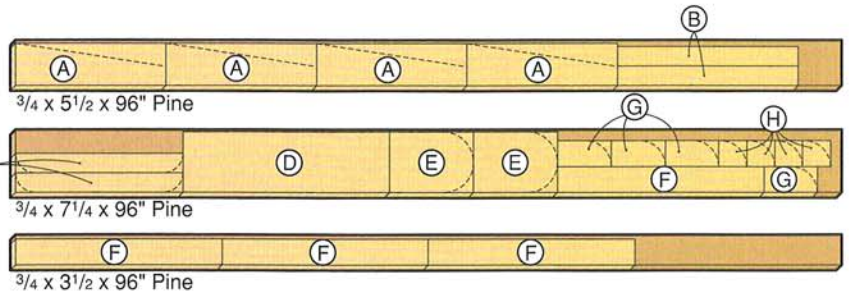
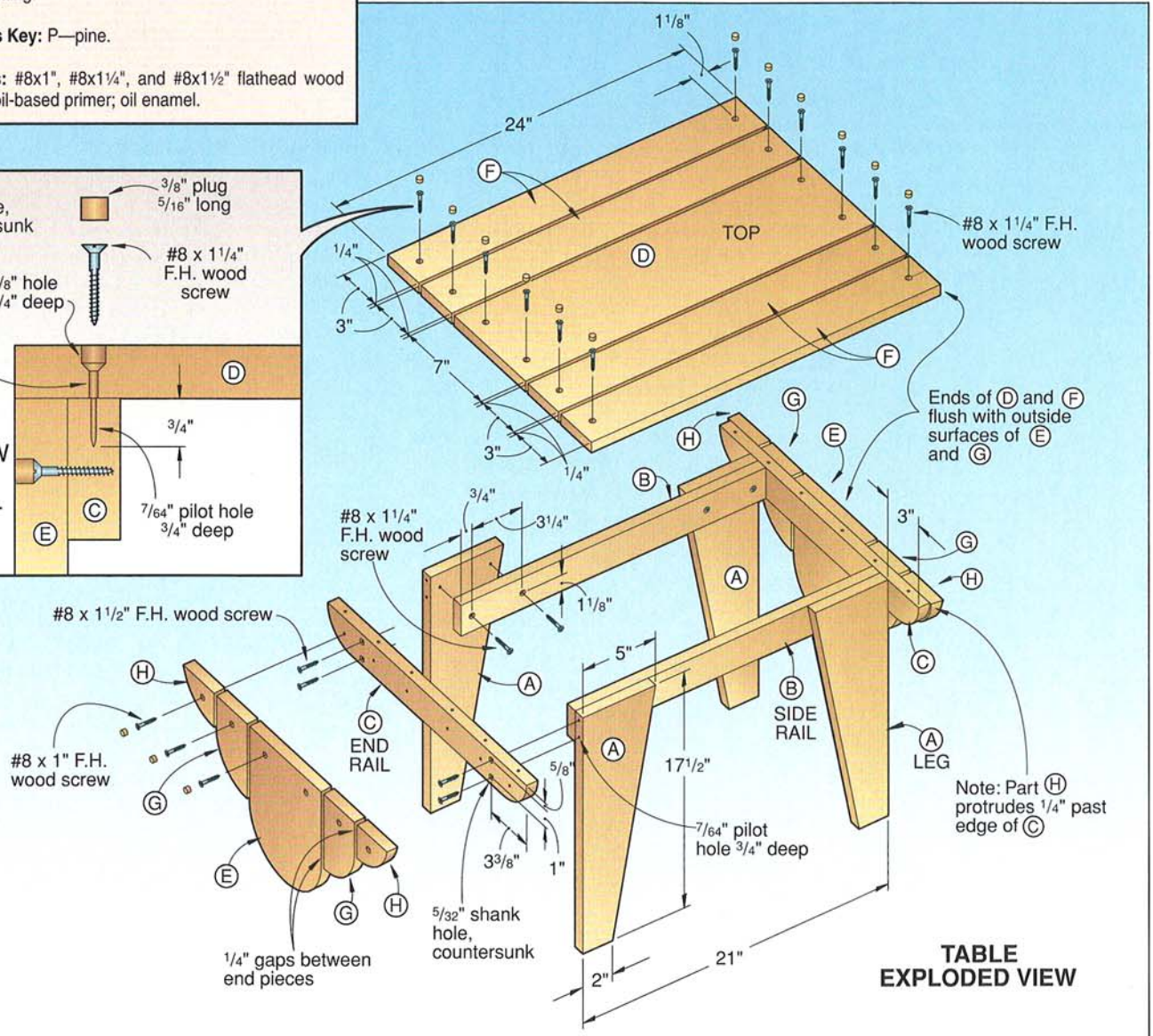
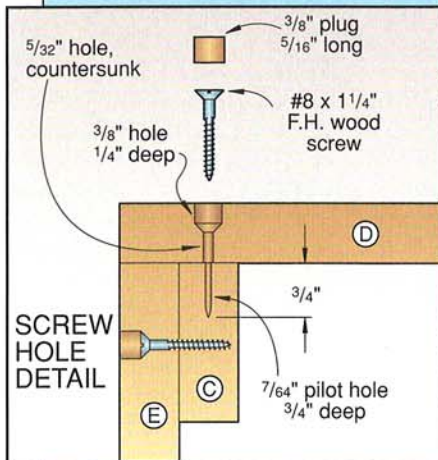


TABLE CUTTING DIAGRAM



Note: Updated plans for the chair shown on page 14 have been published as one of WOOD® magazine's WOOD PLANS®, which you can order by sending \$9.95 to:

WOOD Project Plan Sales
P. O. Box 9255, Dept. WP-1
Des Moines, IA 50306

TIP no. 1—The tabletop pieces (D and F) should measure $1\frac{1}{2}$ " longer than the distance from one end-rail face to the other. In other words, the top pieces need to extend $\frac{3}{4}$ " beyond the outside end-rail face at each end. (See the Screw Hole detail that accompanies the Table Exploded View drawing.)

4 Glue and clamp the legs to the side rails, making sure that each leg aligns flush with the side-rail edges and ends. (We used Franklin's Titebond II, a water-resistant glue suitable for outdoor use.) Next, using the shank holes you drilled in the side rails as guides, drill $\frac{3}{4}$ " pilot holes $\frac{1}{2}$ " deep in the legs. Now, drive a pair of #8× $1\frac{1}{4}$ " flathead wood screws, then unclamp.

5 Glue and screw the end rails to the leg/side rail assemblies, making sure that the top edges of all parts are flush. (See the Exploded View drawing.) To do this, first drill $\frac{3}{4}$ "-deep pilot holes in the leg edges using the same procedure you followed in the previous step. Next, stand the table frame on a flat surface, and check for wobble. If the frame wobbles, identify the longest leg(s), and sand the bottom end(s) until the table sits flat.

Next, Prepare the Tabletop And End Pieces

1 From $\frac{3}{4}$ "-thick stock, rip and crosscut a piece to 7×24" for the tabletop middle piece (D) and two pieces to 7×10" for the mating middle ends (E). Next, cut the four remaining tabletop pieces (F) to size. (See Tip no. 1 at left.)

2 To cut the rest of the end pieces, first rip a piece of $\frac{3}{4}$ "-thick stock to 3×42". Then, cut four inside end pieces (G) and four outside end pieces (H) to 1" longer than finished length.

3 Copy the full-sized 3"- and 3½"-radius patterns shown on page 19. Next, transfer the outline of the 3½"-radius pattern onto one end of

one part E. Stack this part E on top of the other part E using double-faced carpet tape. Bandsaw the radius, keeping your blade outside the line, then sand to the line. Now, crosscut the two parts E to final length, and then separate the pieces.

4 Transfer the 3"-radius pattern onto the ends of parts G and H. Then, repeat the stacking and bandsawing procedure described in the previous step. Sand all radii smooth as before, then crosscut the parts to length.

5 Lay out screw-hole centerpoints on the five tabletop pieces (D and F) where shown on the Table Exploded View drawing. Next, counterbore and drill shank holes as dimensioned on the Screw Hole detail. (We clamped a fence and stop-block to our drill-press table to ensure accuracy.) Using the Table End View drawing shown below left for reference, lay out and counterbore the ten end pieces (E, G, and H). Now, drill a shank hole centered in each counterbore. Finally, sand the tabletop and end pieces smooth.

You're Ready to Assemble And Finish the Table

1 Position the tabletop pieces (D and F) on the frame. (We cut $\frac{1}{4}$ "-thick scrap spacers and placed them between the parts to ensure even spacing.) Now, center the pieces and check for square. You should have a $\frac{3}{4}$ " overhang at each end and a $\frac{1}{4}$ " overhang at each side.

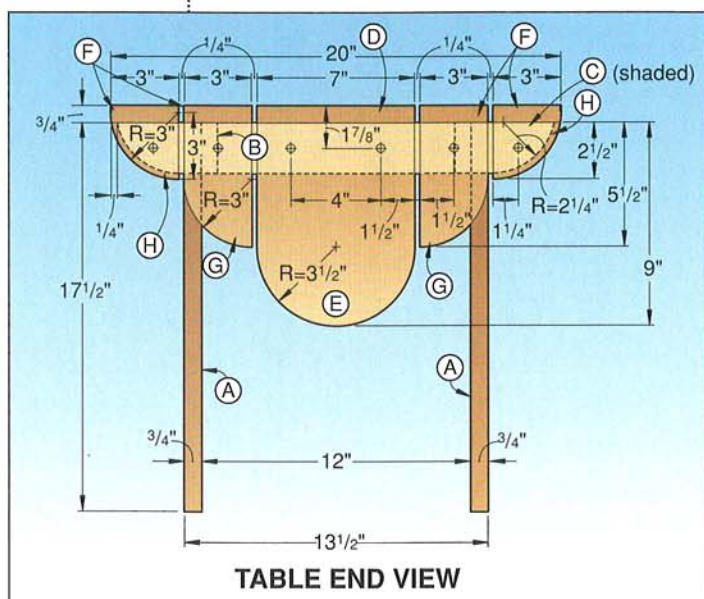
2 After positioning parts D and F, clamp them to the end rails (C). Using the shank holes as guides, drill $\frac{3}{4}$ " pilot holes $\frac{3}{4}$ " deep in the end rails. Then, screw the top pieces to the end rails using #8× $1\frac{1}{4}$ " flathead wood screws.

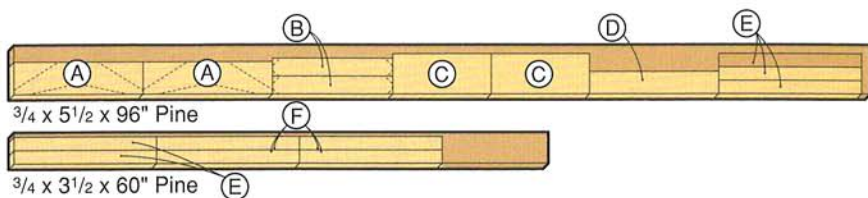
3 Using the same technique, attach the ten end pieces (E, G, and H) to the end rails using #8×1" flathead wood screws. To do this, align each part with its mating tabletop piece, and butt it snugly against that piece.

4 To plug the counterbores, first cut twenty-four $\frac{3}{8}$ × $\frac{5}{16}$ " plugs. (We cut the plugs $\frac{1}{2}$ " deep in $\frac{3}{4}$ "-thick stock, then resawed the stock to $\frac{5}{16}$ " thick.) Now, glue a plug into each counterbore. After the glue dries, sand the plugs flush, then sand the ends of the top pieces flush with the outside faces of the end pieces.

5 Sand all surfaces that need it. Then, prime and paint your table. (We used an oil-based primer and then applied an oil enamel.)

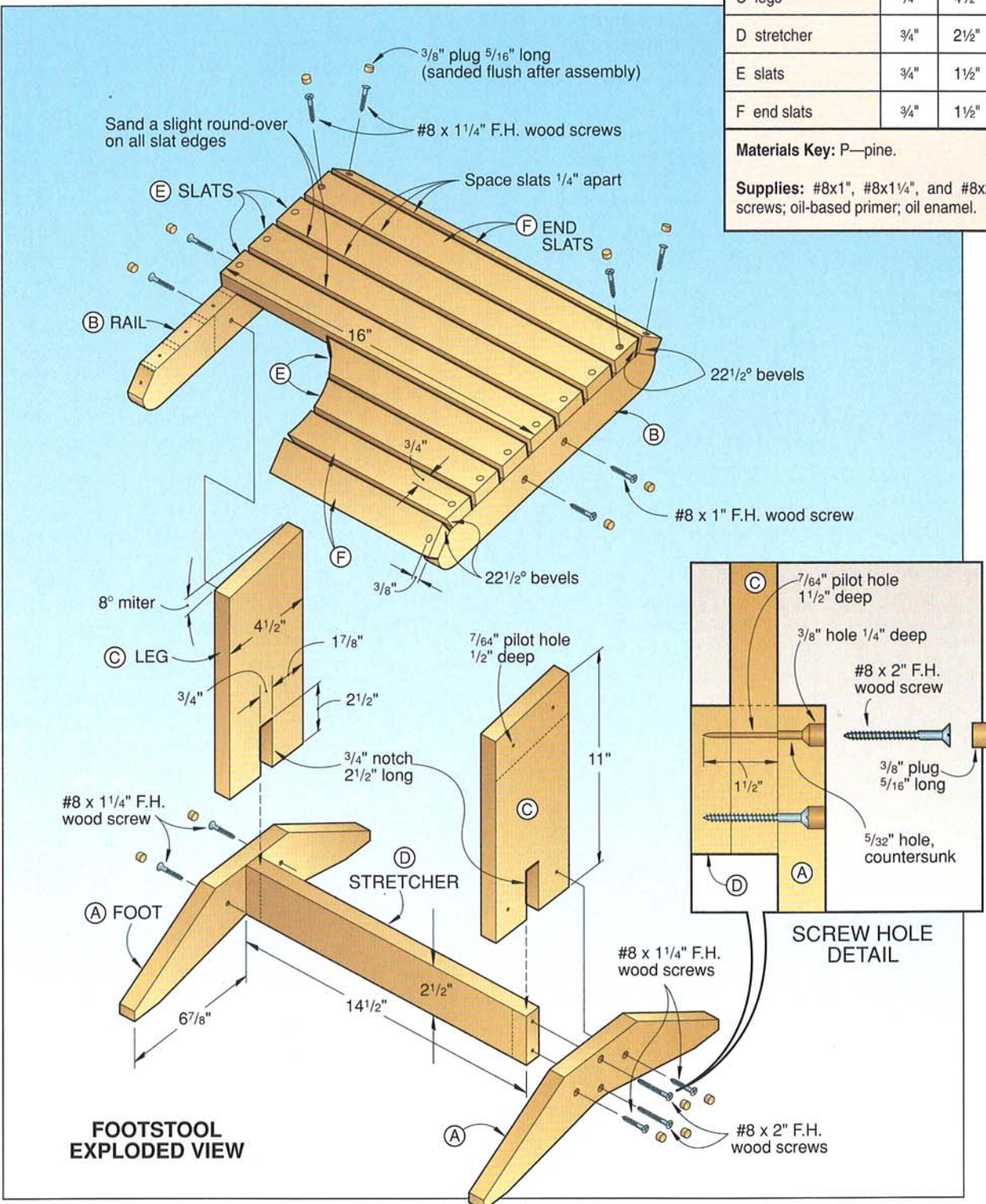
Continued





FOOTSTOOL CUTTING DIAGRAM

BILL OF MATERIALS					
Part	Finished Size			Matl.	Qty.
	T	W	L		
FOOTSTOOL					
A feet	¾"	3⅝"	14½"	P	2
B rails	¾"	2"	13¾"	P	2
C legs	¾"	4½"	11"	P	2
D stretcher	¾"	2½"	14½"	P	1
E slats	¾"	1½"	16"	P	5
F end slats	¾"	1½"	16"	P	4
Materials Key: P—pine.					
Supplies: #8x1", #8x1¼", and #8x2" flathead wood screws; oil-based primer; oil enamel.					



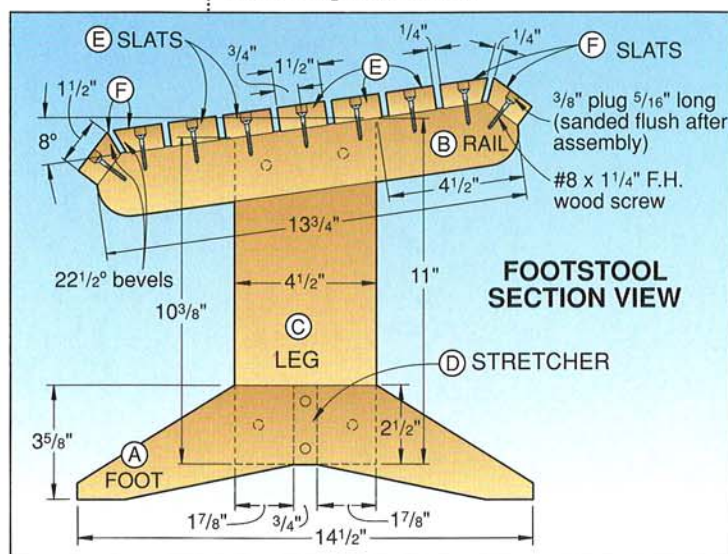
Let's Cut and Shape The Footstool Parts

1 From $\frac{3}{4}$ "-thick pine stock, rip and crosscut two pieces to $3\frac{5}{8} \times 14\frac{1}{2}$ " for the feet (A), two pieces to $2 \times 13\frac{3}{4}$ " for the rails (B), two pieces to $4\frac{1}{2} \times 11$ " for the legs (C), and one piece to $2\frac{1}{2} \times 14\frac{1}{2}$ " for the stretcher (D). (We lettered each part after cutting for easy identification.)

2 Stack the two feet (A) face-to-face using double-faced carpet tape, and do the same with the rails (B). Make two copies each of the full-sized Foot and Rail half-patterns shown on page 19. Flip one copy of each over, and trace the pattern through onto the back of the paper. Attach the halves to make a full pattern of each, and adhere the patterns to the two stacks.

3 Bandsaw the feet and rails to shape, keeping your blade outside the line. Then, sand to the line. Using a backup board to minimize tear-out, drill $\frac{5}{32}$ " shank holes through both feet and rails where marked on the patterns. Next, drill $\frac{3}{8}$ " counterbores $\frac{1}{4}$ " deep, centered on each shank hole, on the outside face of each foot and rail. Now, separate the pieces.

4 Lay out and cut a $\frac{3}{4} \times 2\frac{1}{2}$ " notch in one end of each leg (C) where shown on the Footstool Exploded View drawing. (*Note: Be careful to make accurate cuts so that the legs will fit snugly around the stretcher.*) Next, set your table-saw miter-gauge at 8° from square, and miter-cut the other end of both legs where shown on the same drawing. (For uniformity, we attached an extension and stopblock to our miter gauge and mitered both legs at once.) Then, sand all footstool parts smooth.



Now, Assemble Your Footstool

1 Dry-assemble and clamp the feet, stretcher, and legs to check for fit. Then, disassemble the parts, apply water-resistant glue to the mating surfaces, and reclamp. Now, remove any glue squeeze-out with a damp cloth.

2 While the glue is drying, use the shank holes in the feet as guides to drill $\frac{3}{4}$ " pilot holes in the legs and stretcher. (For dimensions, see the Footstool Exploded View drawing and the accompanying Screw Hole detail.) Then, drive $\#8 \times 1\frac{1}{4}$ " flathead wood screws into the feet and legs, and use $\#8 \times 2$ " screws to attach the feet to the stretcher. Now, remove the clamps.

3 Glue and clamp the rails (B) to the top outside edges of the legs where shown on the Footstool Section View drawing below left. To do this, center both rails along the top ends of the legs, and carefully align their top edges flush with the leg ends. Using the rail shank holes for guides as before, drill pilot holes in each leg. Now, attach the rails to the legs using $\#8 \times 1$ " flathead wood screws, and remove the clamps.

4 Measure the distance between the outside edges of the two rails. (Ours measured 16 ".) Next, cut five $1\frac{1}{2}$ "-wide slats (E) to this length from $\frac{3}{4}$ "-thick stock. Cut four more slats (F) to these same dimensions, but tilt your blade to $22\frac{1}{2}^\circ$, and bevel-rip one edge of each. (For reference, see the Footstool Section View drawing.)

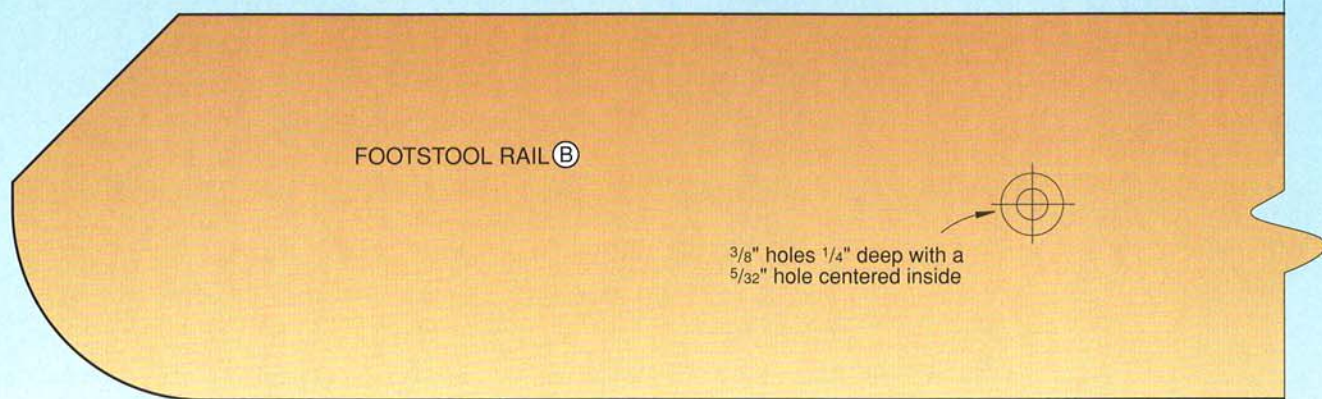
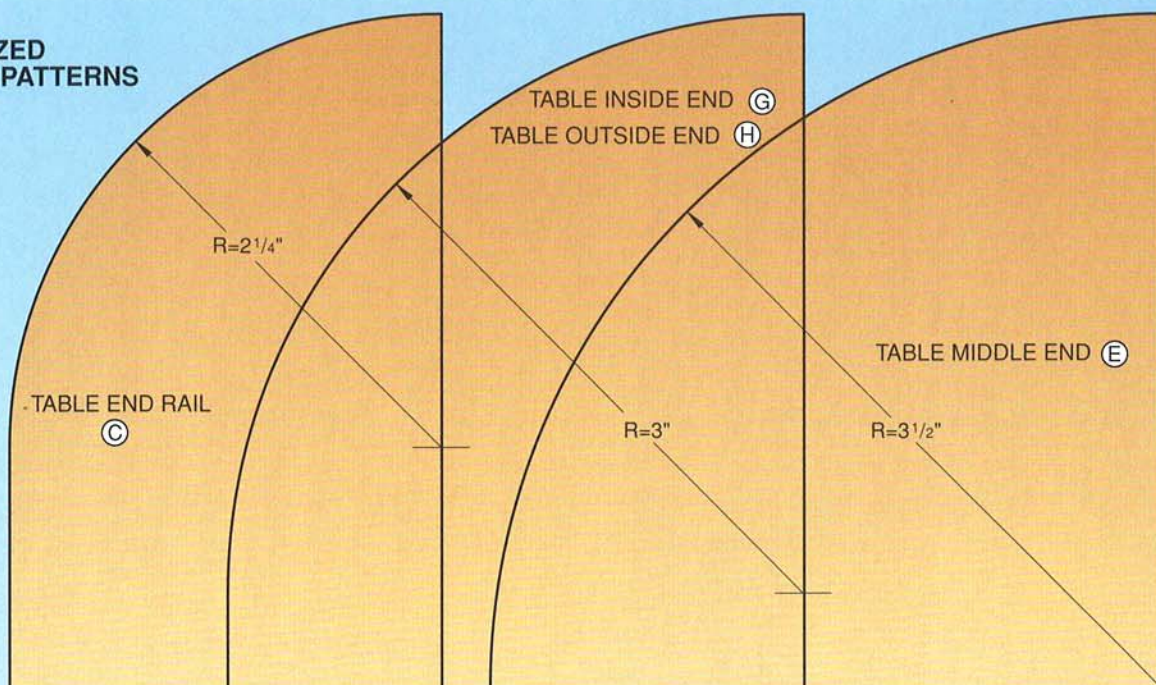
5 Counterbore and drill a shank hole at both ends of all nine slats where dimensioned on the Footstool Section View drawing. (We clamped a fence and stopblock to our drill-press table to ensure uniform hole placement.) Now, sand a slight round-over on all slat edges, then sand the slats smooth.

6 Starting with one of the beveled slats (F) on the angled flat surface at one end of the rails, attach each slat in succession using glue and screws. (For positioning, see the Footstool Section View drawing.) To do this, first drill pilot holes as dimensioned on the Footstool Exploded View drawing, using the shank holes in each slat for guides. After attaching the first slat, use a $\frac{1}{4}$ "-thick strip of scrap to space the slats consistently.

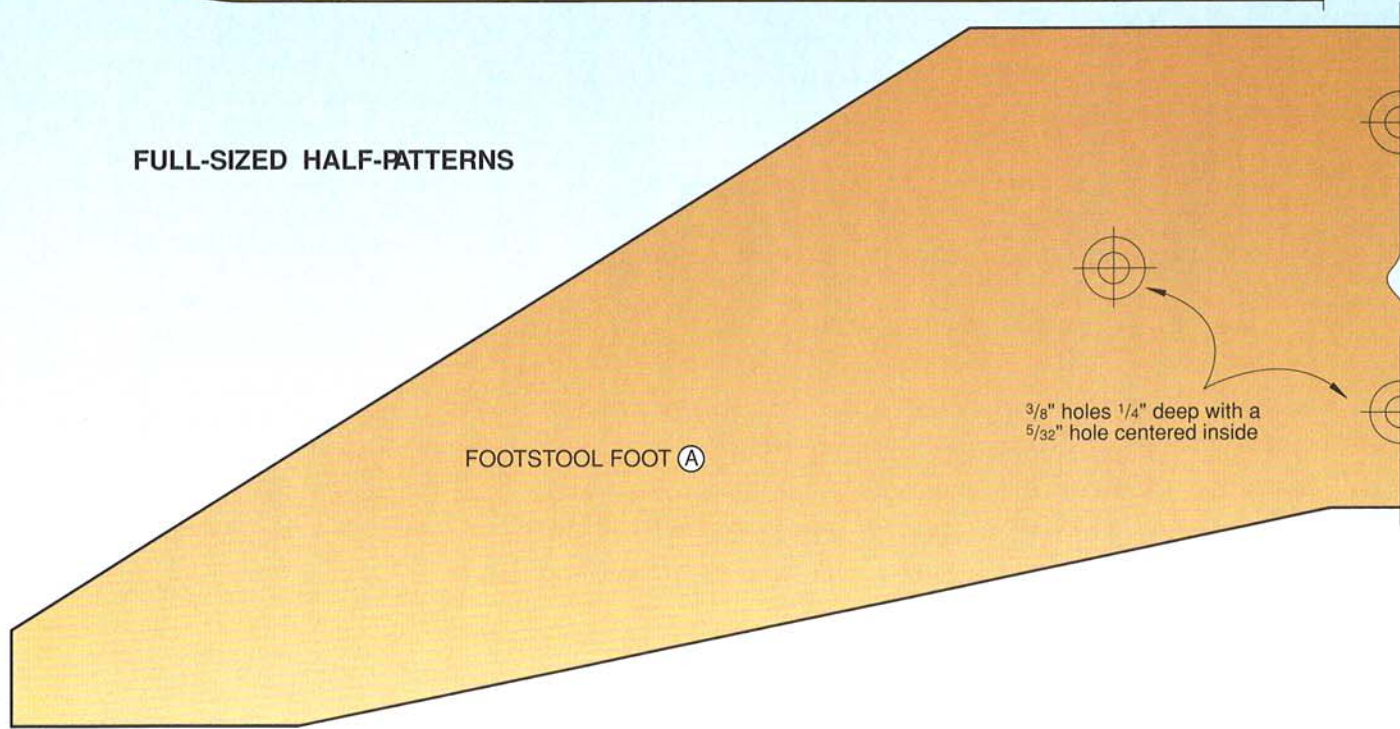
7 Follow the same approach described for the table to cut thirty $\frac{3}{8}$ " plugs. Glue the plugs into the counterbores, and then sand them flush after the glue dries. Now, prime and paint your footstool as you did the table. ■

Project design: James R. Downing
Illustrations: Roxanne LeMoine,
Kim Downing
Project builder: James E. Boelling
Photograph: King Au

FULL-SIZED RADIUS PATTERNS



FULL-SIZED HALF-PATTERNS





Stellar Stand-Up Mirror

If folks around your house have to compete for morning mirror time during the family rush hour, here's an attractive solution that's sure to reflect favorably on you. If getting out of the fast lane is more what you had in mind, this little space-saver travels well in an RV or camper.

Start with a Simple Gluing Form

1 On a 14x16" piece of 3/4"-thick plywood, lay out the gluing form shown on the drawing opposite. (Also, see Tip no. 1 in the same location.) Bandsaw the form to shape, keeping your blade on the waste side of the line for each cut. Saw around the bottom of the inside circle to remove the section labeled part A.

2 To form the frame centerpiece (A), trace the outline of the part you removed from the gluing form onto 3/4"-thick stock. (We selected red oak.) Bandsaw and sand the centerpiece to shape, then center and adhere it to the bottom of the inside gluing form. (We used double-faced carpet tape.) Now, transfer the centerline on the gluing form to the centerpiece.

3 Sand the edges of the inside gluing form and the frame centerpiece to establish continuous contours. (We used a 2"-diameter drum sander in our drill press.) Then, sand the edges of the two outside forms to the line.

Continued

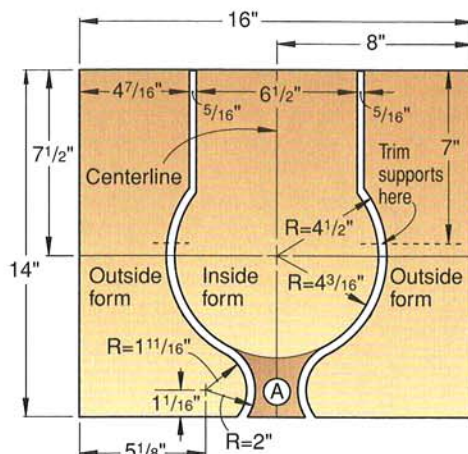
BILL OF MATERIALS

Part	Finished Size			Mati.	Qty.
	T	W	L		
A frame centerpiece	3/4"	3 1/4"	2 1/2"	O	1
B* mirror supports	3/4"	5 1/16"	7 3/4"	OL	2
C* base	3/4"	5 7/8"	5 1/8"	O	1
D* mirror frame	3/4"	7 1/8" dia.		EO	1
E back panel	1/4"	7 1/4" dia.		OP	1

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

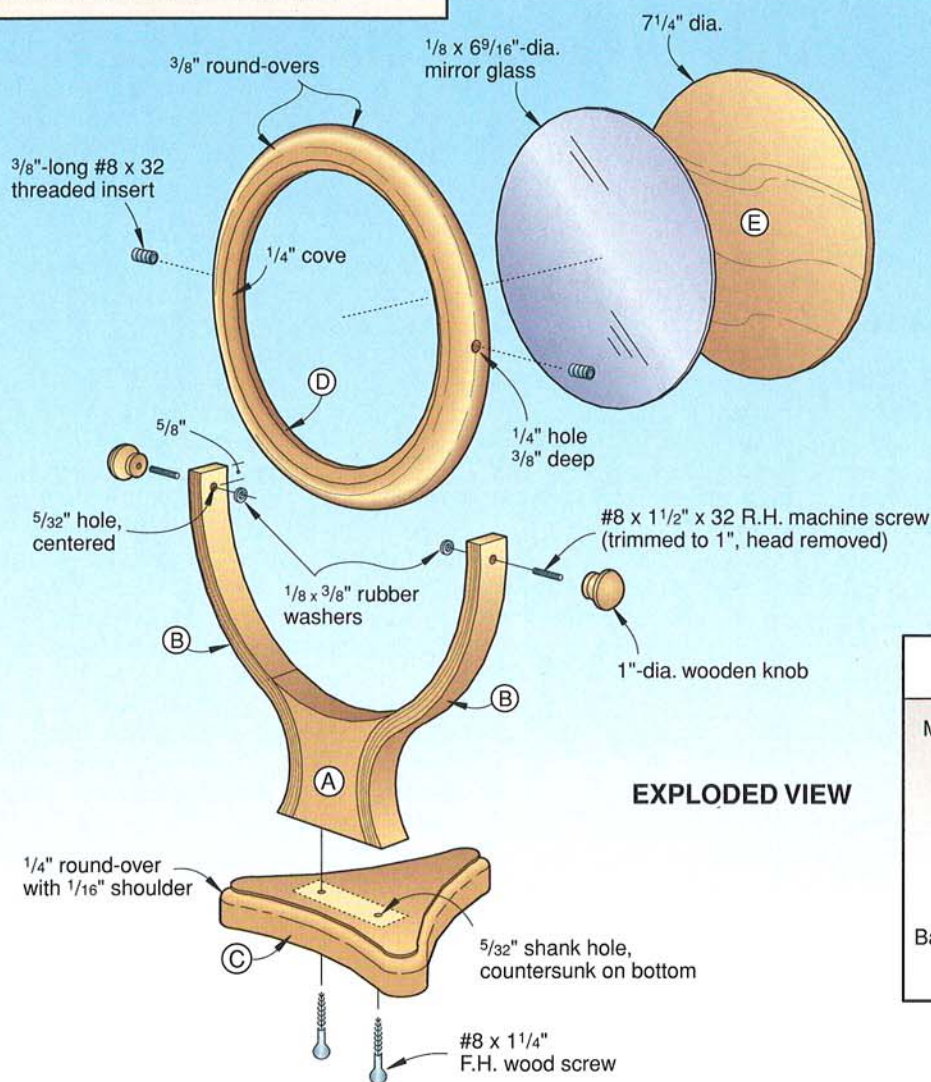
Materials Key: O—oak; OL—oak lamination; EO—edge-joined oak; OP—oak plywood.

Supplies: #8x1 1/4" flathead wood screws; #8x32 threaded brass inserts; #8x1 1/2"x32 roundhead machine screws; 1/8x3/8" rubber washers; quick-set epoxy; 1"-dia. pre-drilled oak knobs; 1/8"-thick mirror glass (cut to size).



GLUING FORM

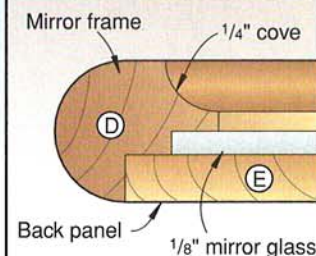
TIP no. 1—To lay out the gluing form, first draw a vertical centerline and a horizontal line where shown. Next, lay out centerpoints for the base radii. Using a compass, draw the two concentric circles and the two pairs of concentric base radii as dimensioned on the drawing. Finally, use your combination square to draw the vertical cutlines, starting at the top edge of the form and continuing until the lines intersect with the concentric circles.



EXPLODED VIEW

TIP no. 2—Before gluing up the mirror frame in the gluing form, we recommend dry-assembling and clamping your frame centerpiece and two groups of laminating strips in the form. This will give you a chance to smooth any kinks caused by the gluing form and also will familiarize you with the assembly process, so you can work quickly before the glue sets.

MIRROR FRAME SECTIONAL VIEW



Stellar Stand-Up Mirror

Stock required: $\frac{3}{4} \times 7 \frac{1}{4} \times 48"$ oak, $\frac{1}{4} \times 12 \times 12"$ oak plywood.

TIP no. 3—To miter-cut the six mirror frame pieces to a uniform length, first miter-cut one end of the $2 \times 36"$ stock, then flip it edge-for-edge. Position it to cut the first piece to exact length, and then set your rip fence against the mitered end to serve as a stopblock. Next, miter-cut this first piece, and again flip the stock edge-for-edge. Now, position the new end against the fence, and miter-cut the second piece. Repeat this procedure to cut a total of six pieces.

Project design: Bob Colpetzer, Clinton, Tenn.

Illustrations: Roxanne LeMoine, Troy Doolittle

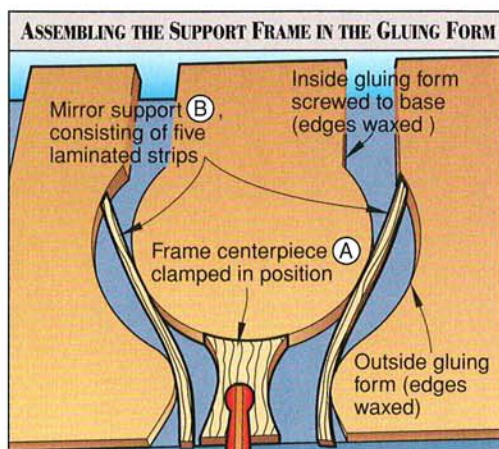
Project builder: Don Wipperman

Photograph: King Au

Laminate the Support Frame

1 To make laminating strips for the mirror supports (B), first cut a piece of $\frac{3}{4}"$ -thick stock to $4 \times 24"$. With the stock in ripping position, set your rip fence to cut a $\frac{1}{16}"$ -wide strip from the edge of this piece. Then, make a reference mark along this edge on your saw table. Rip a $\frac{1}{16} \times 24"$ strip, then move your fence over to realign the edge of the stock with the reference mark. Repeat this procedure to rip a total of five strips, then crosscut these into ten 11"-long strips.

2 Center the inside gluing form on a $12 \times 15"$ plywood base as shown below, aligning the bottom end of the attached centerpiece (A) with the



bottom edge of the base. Screw the inside form to the base, then separate the centerpiece from the form and remove the carpet tape. Now, use paraffin to wax the edges of the gluing form parts and base that will make contact with the stock during glue-up. (See Tip no. 2 on page 21.)

3 Center and clamp the frame centerpiece in its former position where shown in the illustration. Next, apply white woodworker's glue to both faces of six laminating strips, to one face of the

remaining strips, and to both centerpiece edges (not the ends). Then, laminate two sets of five strips, keeping the two dry faces on the outside of each lamination. Position the two laminations as shown, then use pipe clamps to pull the two outside forms toward the inside form. (We laid a piece of scrap temporarily over the form and pressed down as we clamped to keep the parts flush with the form.)

4 Once you've pulled the forms up snug against the laminations, screw the two outside forms to the base, and remove the clamps. Allow the glue to dry, then use your tablesaw and rip fence to trim the bottom ends of the laminated parts flush with the edge of the form.

5 Belt-sand the support frame flush with the face of the form. Next, flip the frame over, fit it back into the form, and sand the other face. Mark the ends of the mirror supports where shown on the Gluing Form drawing, then bandsaw the supports to length. Now, finish-sand the support frame (A and B), sanding a slight round-over on all edges except for the bottom end.

Machine the Base, Then Attach It To the Frame

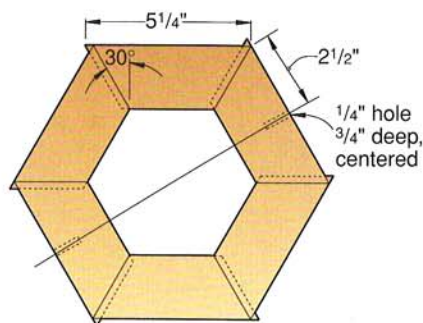
1 Enlarge the gridded Base pattern shown on page 24 to full size, and adhere it to a $6"$ square of $\frac{3}{4}"$ -thick stock. Next, bandsaw and drum-sand the base to shape.

2 Drill $\frac{5}{32}"$ shank holes where shown on the pattern, and countersink them on the base bottom. Next, position and clamp the support frame where shown. Using the shank holes as guides, drill $\frac{7}{64}"$ pilot holes $\frac{1}{2}"$ deep in the frame. Now, unclamp the parts, and remove the pattern.

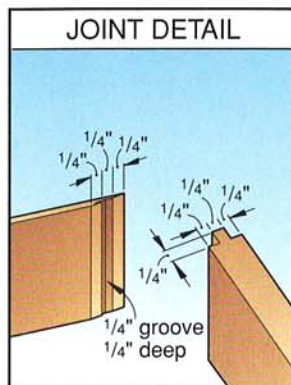
3 Adhere the base to a $24"$ square of $\frac{3}{4}"$ -thick plywood using double-faced carpet tape. Fit your router with a $\frac{1}{4}"$ round-over bit elevated to cut a $\frac{1}{16}"$ shoulder, and rout the top edge of the base. Next, separate the base from the plywood, and then finish-sand it. Now, glue and screw the base to the support frame using $\#8 \times 1 \frac{1}{4}"$ flathead wood screws.

Now, Build the Mirror Frame

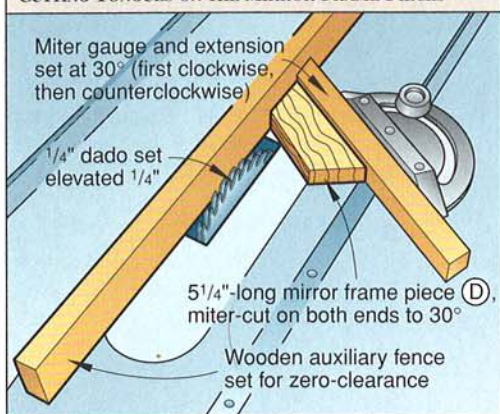
1 To build the tongue-and-groove mirror frame (D), first cut a $2 \times 36"$ piece of $\frac{3}{4}"$ -thick stock. Set your miter gauge and extension at 30° , and miter-cut both ends of six pieces to $5 \frac{1}{4}"$ long. (See the Mirror Frame Assembly drawing at left. Also, see Tip no. 3 above left.)



MIRROR FRAME ASSEMBLY



CUTTING TONGUES ON THE MIRROR FRAME PIECES



2 Fit your tablesaw with a $\frac{1}{4}$ " dado set elevated to $\frac{1}{4}$ ", and attach a wooden auxiliary fence to your rip fence. With your miter gauge and extension still set at 30° , rabbet one end of each mirror-frame piece as shown above. Then, reset your miter gauge to 30° in the other direction, and rabbet the other face on the same end to form a $\frac{1}{4}$ "-thick tongue. (See the Joint detail shown with the Mirror Frame Assembly drawing.)

3 Using the same dado setup, stand each piece on its opposite end, and cut a mating $\frac{1}{4}$ " groove in that end. To do this, first set your rip fence to center the groove in the end of the stock. (We adhered all six pieces to a 2×6 carrier board using double-faced carpet tape. We then stood the carrier board on edge against our rip fence and grooved the pieces in one operation.)

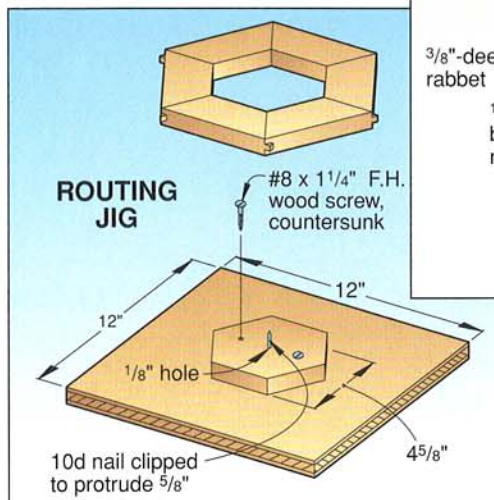
4 Dry-assemble the six pieces to check for fit. Adjust as necessary, then glue and clamp. (We used three bar clamps, first attaching all three and then tightening each one successively.)

5 After the glue has dried, unclamp the frame. Find and mark a centerline across two opposite edges where shown on the Mirror Frame Assembly drawing. Then, transfer this line to the outside edges. Now, drill a centered hole on each edge for a threaded insert. (We used our dowel jig and attached a depth stop to our portable drill. Our $\#8 \times 32$ inserts called for a $\frac{1}{4}$ " hole $\frac{3}{8}$ " deep, so we allowed $\frac{3}{8}$ " extra for the waste and drilled ours $\frac{3}{4}$ " deep.)

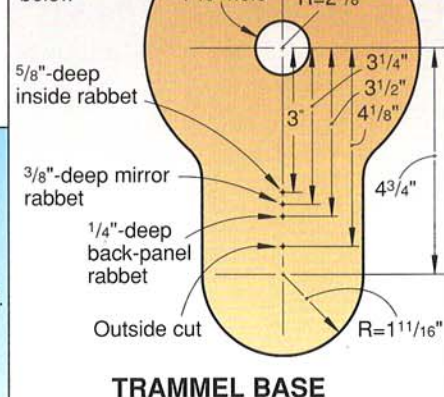
Make an Easy Jig and Trammel Base To Build the Mirror Frame

1 To make a routing jig, trace the interior outline of the hexagonal mirror frame onto a piece of $\frac{3}{4}$ "-thick scrap plywood. Bandsaw this hexagon to shape, and check its fit inside the frame. (It should fit snugly.) Use this piece to build the jig shown on the Routing Jig drawing above.

2 Lay out the trammel base on $\frac{1}{4}$ "-thick hardboard as shown and dimensioned on the Trammel Base drawing at right. Then, bandsaw the base to shape, and drill holes where



Note: Drill four $\frac{1}{8}$ " pivot holes where shown below



TRAMMEL BASE

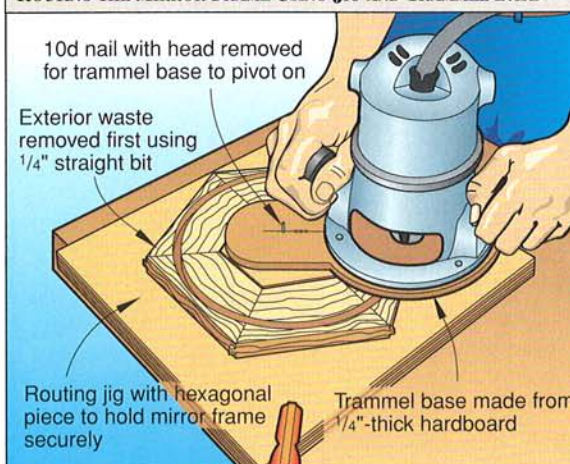
TIP no. 4—To make the trammel base, first lay out a vertical centerline and a pair of centerpoints for circles where shown. Using your compass, draw the $2\frac{7}{8}$ "-radius and the $10\frac{1}{16}$ "-radius circles. Then, connect these circles with vertical lines. Next, lay out the center hole and the four pivot holes where dimensioned. Bandsaw the base to shape, then bore the $1\frac{1}{8}$ " center hole using a Forstner or multi-spur bit. Now, drill and countersink the screw holes to fit your router base, then drill the four $\frac{1}{8}$ " pivot holes.

indicated and dimensioned. (Note: Check the base of your router to make sure these dimensions will work. Also, lay out screw-hole centerpoints to match those on your router. See Tip no. 4 at right.)

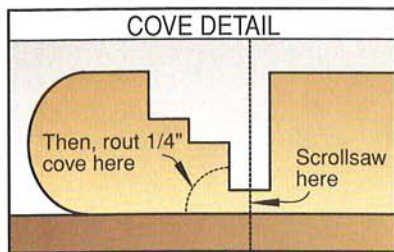
3 Sand both faces of the mirror frame smooth, then place it over the hexagonal jig piece as shown below. Attach the trammel base to your router, and fit the router with a $\frac{1}{4}$ " straight bit set to cut $\frac{1}{2}$ " deep. Insert the jig pin through the outermost pivot hole on the trammel base. Then, start the router, lower the bit into the mirror frame, and rout around the perimeter in a counterclockwise direction. Now, flip the frame over on

Continued

ROUTING THE MIRROR FRAME USING JIG AND TRAMMEL BASE

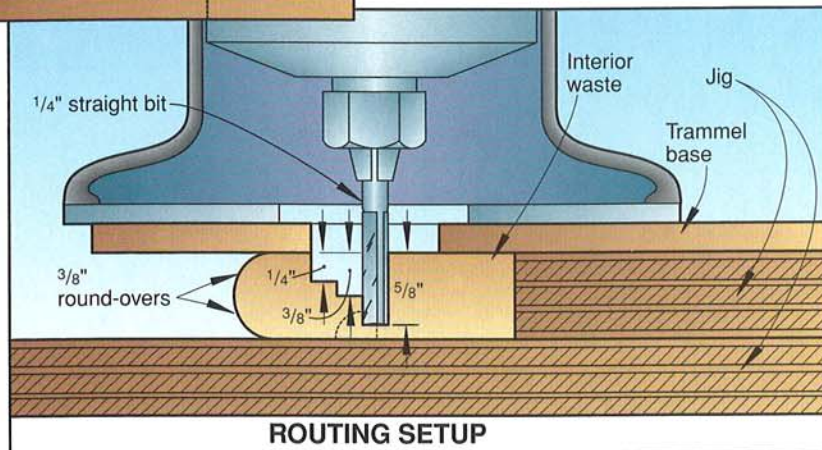


Stellar Stand-Up Mirror



the jig, and repeat this operation to separate the exterior waste from the frame.

3 Cut several 1/4"-thick scrap spacers, and insert them under the frame to elevate it above the jig base. Next, change to a 3/8" round-over bit, and again rout the front and back outside edges of the frame.



TIP no. 5—Before setting the mirror and assembling the frame, apply your finish to the mirror rabbet on the inside face of the mirror frame. Since the mirror will reflect this surface, it will be quite visible once you've assembled the frame. (For our finishing approach, see Step 5 in the final how-to section opposite.

4 Remove the spacers, and change back to a 1/4" straight bit. Next, designate "front" and "back" faces on your frame, then seat the frame on the jig with the back face up. Now, using the three remaining pivot holes on your trammel base, rout the three rabbets where shown and dimensioned on the Router Setup drawing above.

5 Remove the frame from the jig, and scrollsaw a full circle to separate the interior waste from the frame. To do this, first drill a 1/8" start

hole in the 5/8"-deep rabbet you routed in the previous step, then keep your blade roughly centered in this recess as you saw. (See the Cove detail shown at left with the Router Setup drawing.)

6 Next, fit your table-mounted router with a 1/4" cove bit elevated to cut 1/4" deep. Then, rout the inside edge of the front face where shown on the Cove detail.

Assemble the Mirror and Frame

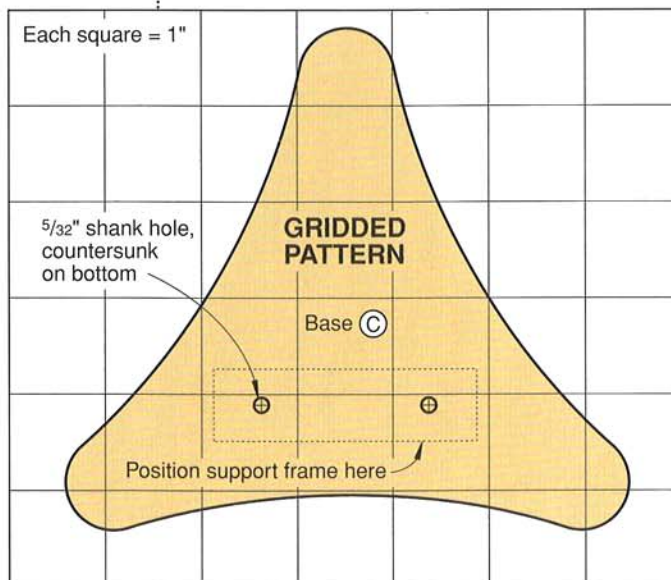
1 Measure the diameter of the outer rabbet on your mirror frame. (Ours measured 7 1/4".) Using your compass, lay out the back panel (E) on 1/4"-thick oak plywood, and bandsaw it to shape, keeping your blade outside the line. Sand to the line, then dry-assemble it to the frame to check for fit. Now, temporarily adhere it in place using small strips of carpet tape. Finish-sand all exposed surfaces of the frame and back panel.

2 Lay out and drill 5/32" holes in the mirror supports (B) where shown on the Exploded View drawing. Next, screw the #8x32 brass inserts into the two 1/4" holes on the mirror frame to check for fit. If necessary, redrill the holes to proper depth. Now, saw the heads off two #8x1 1/2"x32 machine screws to a length of 1", taking care not to mutilate the threads. Dip one end of each in quick-set epoxy, then screw them into two pre-drilled 1"-diameter oak knobs. (We found the inserts, screws, and knobs at a local hardware store.)

3 Assemble the mirror frame to the supports to check for fit, using the knobs and two 1/8"x3/8"-diameter rubber washers. Adjust as necessary, then disassemble the parts.

4 Remove the back panel and carpet tape. (**Note:** At this point, see Tip no. 5 above left.) Next, measure the diameter of the mirror rabbet, and have your local hardware store or glass dealer cut a 1/8"-thick circle of mirror glass to this diameter minus 1/16". (Ours measured 6 5/8", so we had ours cut to 6 1/16".) Set the mirror, then glue and clamp the back panel in place. Remove any glue squeeze-out, and allow the glue to dry.

5 Apply your choice of finish to the assembled mirror frame, the support-frame assembly, and the knobs. (We applied two coats of Watco Medium Walnut Danish Oil Finish according to the manufacturer's instructions.) After the finish has dried overnight, assemble the mirror frame to the supports. ■





Lathed Letter Opener

Ever find yourself shredding an envelope to get at the contents? This elegant project offers a more civilized approach—and also gives you a chance to try offset turning. Once you get warmed up, you can fashion a fine gift in less than an hour.

For Starters, Prepare the Blank

1 Select a $1\frac{1}{2} \times 1\frac{1}{2} \times 12$ " blank. (We tried both walnut and curly maple.) Then, draw diagonal lines at each end to locate the center. On the end of the stock that will be the blade, draw a line through the centerpoint perpendicular to the grain. (For reference, see the Blank Preparation drawing on page 26.) Now, use a bevel gauge to transfer this line to the other end of the blank. (**Note:** Aligning the offset centers perpendicular to the grain ensures that the face grain will be aligned with the faces of the blade. It also allows you to follow the fibers of the wood and avoid chipping the edges of the blade as you turn.)

2 Mark two offset centerpoints on this perpendicular line, $\frac{3}{8}$ " on either side of the true center, on both ends of the blank. Next, drill a $\frac{1}{8}$ " hole $\frac{1}{8}$ " deep at each of the three centerpoints on the handle end of the blank. Then, punch the three points on the blade end using a center punch.

3 Cut $\frac{1}{32}$ "-deep kerfs in the handle end where shown on the Blank Preparation drawing to seat the centerpoints in the spur center. To do this, clamp the blank in your vise, and use a thin-kerf backsaw. Now, mount the blank on your lathe using a spur center at the headstock and a live (revolving) tail center. (**Note:** Mount the blank at all three sets of centerpoints before you start turning to make sure that the centers will seat properly. If you try to seat the offset centers after turning the taper, you'll stress the workpiece.)

Next, Turn the Opener to Shape

1 Mount the blank at the true center, and turn it to a 1"-diameter cylinder, leaving the ends of the stock square. (See Step One of the four-step drawing shown on page 26.) To do this, set your speed at 500 rpm, and use a roughing gouge or large ($\frac{3}{4}$ ") spindle gouge. After you've rounded the blank, increase the speed to 1,500 rpm and true the cylinder using a spindle gouge.

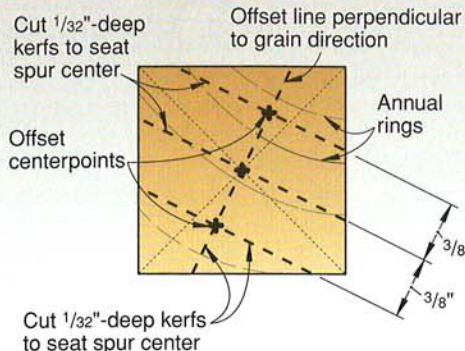
2 Using the full-sized Template shown on page 27 for reference, cut in at each point shown in Step Two of the four-step drawing to establish the appropriate diameter. (We used our parting tool, checking each diameter with our calipers as we worked.)

3 With the lathe still set at 1,500 rpm, turn the handle of the opener to its finished shape using a $\frac{1}{2}$ " gouge. Then, turn the blade to form its taper, as shown in Step Three of the four-step drawing. (**Note:** For now, leave at least a $\frac{1}{4}$ " diameter.)

Continued

Lathed Letter Opener

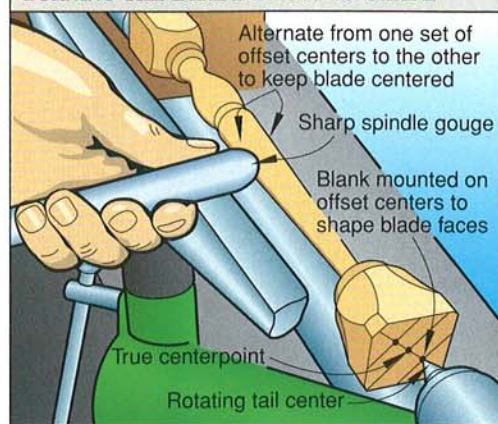
BLANK PREPARATION



ter at the end of the handle. Also, you'll want to stop the taper 1/4" from the true end of the blade. We'll hand-shape this part later.)

4 Remount the blank at one of the two sets of offset centers. Then, set your speed at 1,000 rpm, and begin turning one face of the blade to shape as shown at right. (We found that a sharp spindle gouge, used in a light cutting—not scraping—action, works best for this. For reference, see the sectional views shown on the Front

TURNING THE BLADE FACES TO SHAPE



View drawing.) Then, switch to the other pair of offset centers, and start turning the other face. To keep the blade centered, alternate between the two offsets until you've established the blade edges. Remember to keep a 1/4" diameter at the tip where shown in Step Four of the drawing.

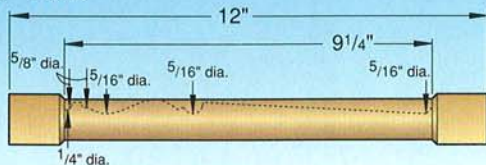
TURNING THE LETTER OPENER

STEP ONE



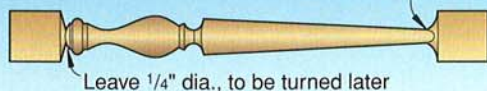
Mount the blank on the true centers, and turn it to a 1" diameter, leaving the ends square

STEP TWO



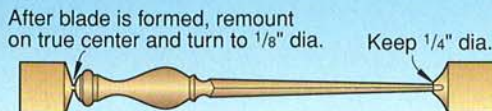
Using a parting tool, cut in at each point shown to establish diameters

STEP THREE



Turn the handle to shape using the diameters and contours shown on the template. Then, turn the blade taper.

STEP FOUR



Remount on one set of offset centers, and start turning one blade face to shape. Switch to the other offset, and start the other face. Alternate back and forth to keep the blade centered.

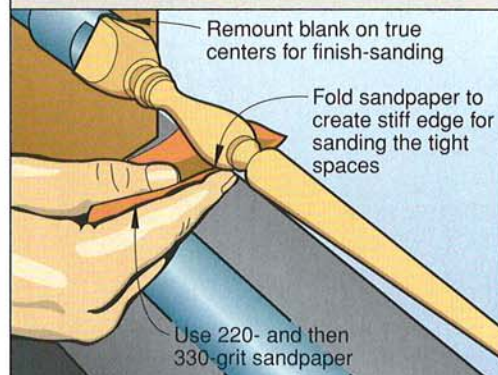
Now, For the Finishing Touches

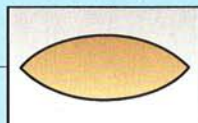
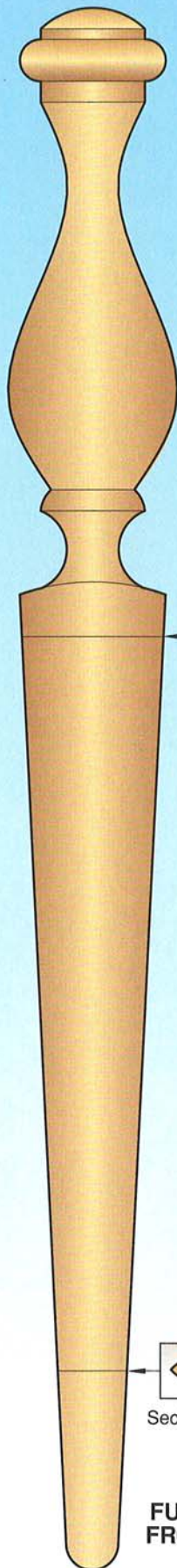
1 Once you've formed the blade, remount the stock on the true centers, and finish-sand the handle as shown below. (We used 220- and then 320-grit sandpaper, folding the paper to form a stiff edge for sanding the tight spaces.) Next, turn the excess waste at the handle end, working this diameter down to 1/8". Then, remove the turning from the lathe, and bandsaw the turning at both ends to separate it from the blank ends.

2 File and finish-sand the 1/8" waste from the handle end. Next, sand the waste from the blade tip, forming it to shape as you go. Now, finish-sand the entire blade, being careful to maintain its turned form.

3 Apply your choice of finish. (We sprayed on two coats of Minwax Semigloss Fast-Drying Polyurethane, leveling the finish between coats with 0000 synthetic steel wool.) ■

FINISH-SANDING THE HANDLE





Sectional view

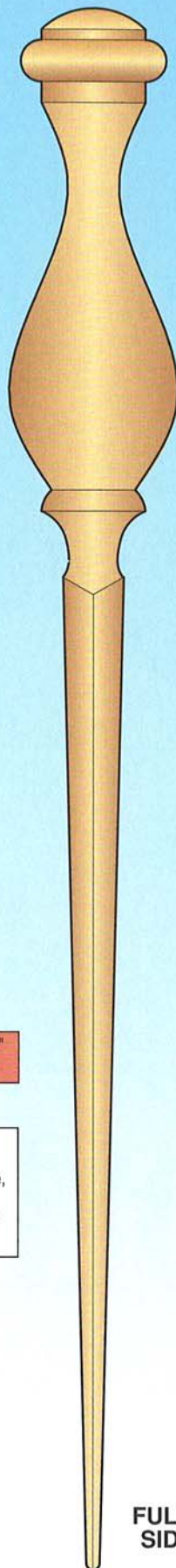
Stock required: 1½x1½x12"
turning blank

Project design: Bob Colpetzer,
Clinton, Tenn.
Illustrations: Roxanne LeMoine,
Troy Doolittle
Project builder: Larry Johnston
Photograph: King Au

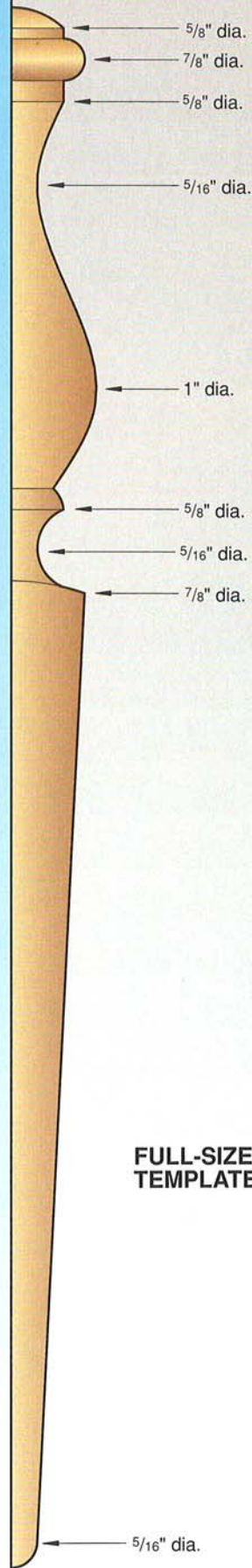


Sectional view

**FULL-SIZED
FRONT VIEW**



**FULL-SIZED
SIDE VIEW**



**FULL-SIZED
TEMPLATE**



Flip-Top Cottontail

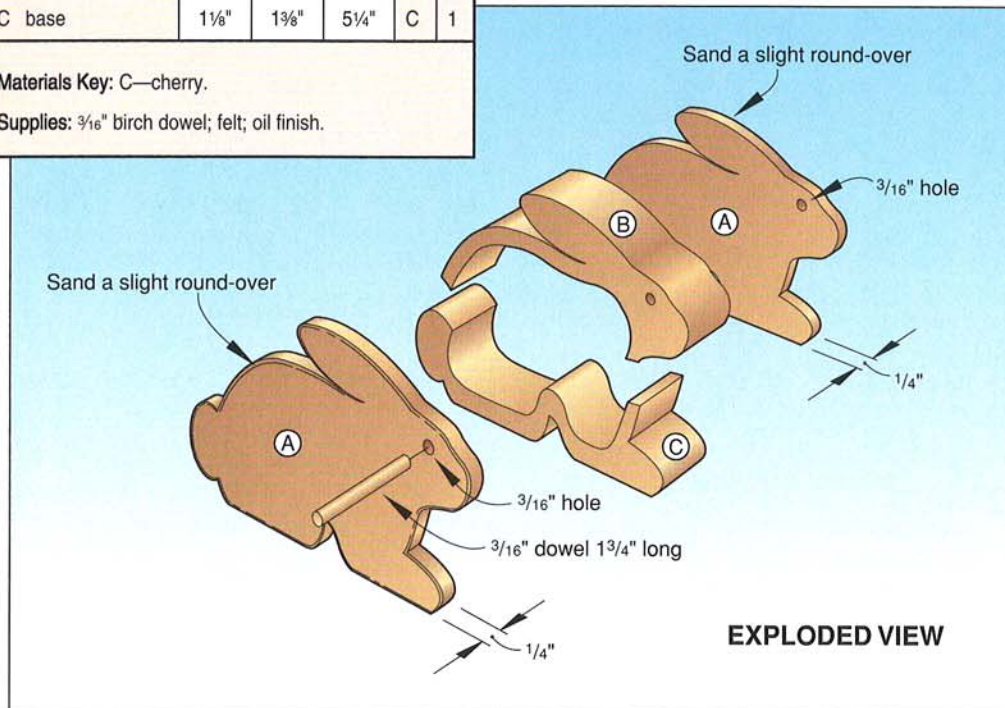
No rabbeting required to make this loveable longears. Our bandsawed bunny box makes a nice one-afternoon project, not to mention a charming gift with definite hareloom possibilities.

BILL OF MATERIALS

Part	Finished Size			Mtl.	Qty.
	T	W	L		
A sides	1/4"	3 3/8"	5 3/4"	C	2
B lid	1 1/8"	2 1/4"	5 3/16"	C	1
C base	1 1/8"	1 3/8"	5 1/4"	C	1

Materials Key: C—cherry.

Supplies: 3/16" birch dowel; felt; oil finish.



TIP no. 1—Since actual dowel diameters vary these days, we recommend that you measure your hinge-pin dowel stock first and adjust the size of the hole accordingly to achieve a snug fit.

For Starters, Rough Out Your Bunny On the Bandsaw

1 To make a blank, rip and crosscut a 4×6" piece of 1 3/4"-thick stock. (We selected cherry. If you have trouble finding stock this thick, you can laminate thinner stock.) Next, make two copies of the full-sized pattern shown on page 30, and adhere one of these to one face of the blank. (We used 3M Spray Mount, a spray adhesive you can buy at art-supply and crafts stores.) Using your bandsaw and a sharp 1/8" blade, follow along the outside pattern line to cut the rabbit to shape, keeping your blade just outside this line.

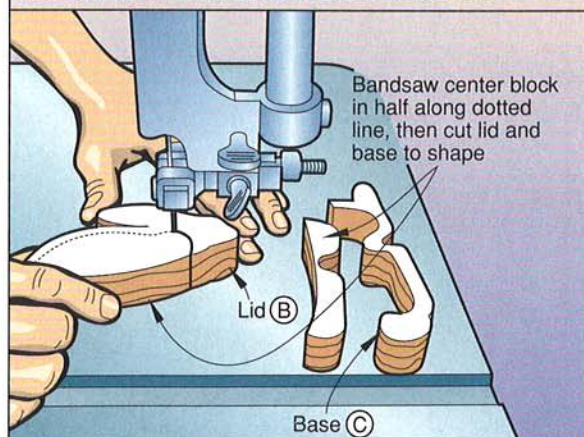
2 Drill a 3/16" hinge-pin (eye) hole where shown on the pattern. To do this, use a brad-point bit in your drill press, and place a backup board under your stock to prevent tear-out. (**Note:** For your backup board, be sure to select scrap stock of a hardness similar to that of your workpiece. Also, see Tip no. 1 at right.)

3 Rip a 1/4"-thick side (A) from each face of the rabbit cutout using your bandsaw and rip fence. Then, adhere the second copy of the pattern to one face of the center block. Starting at

one of the entry-exit kerf lines, bandsaw through the middle of the center cavity where marked on the pattern, and exit at the other kerf line. (**Note:** It's critical that you make the entry-exit kerfs where shown on the pattern so that the box will open properly.) Now, bandsaw along the inside pattern line on both pieces as shown below to form the lid (B) and base (C).

Continued

BANDSAWING THE LID AND BASE TO SHAPE



Flip-Top Cottontail

TIP no. 2—It may be necessary to sand the bottom of the box flush before you finish-sand, since you've glued the base up snug against the lid edges to take up the space left by the entry-exit kerf. To do this, carefully sand the sides to the dotted line shown near the bottom edge of the pattern. On the top of the tail and front paw, you'll need to sand the base flush with the sides. A 1" belt sander works best for this.

TIP no. 3—For an extra-smooth surface, we suggest a final once-over with a fine-grit flap (contour) sander.

Project design: Alan Bradstreet,
North Pownal, Maine
Illustrations: Roxanne LeMoine,
Troy Doolittle
Project builder: James E. Boelling
Photograph: King Au

Machine the Parts, Then Assemble Your Rabbit

1 Sand the inside faces of all four parts smooth. (For the contoured surfaces, we used a $\frac{3}{4}$ "-diameter drum sander in our drill press.) Next, sand the entry-exit kerfs smooth. (We used our 1" belt sander.) Remove the patterns from parts B and C (but not from A), then sand the edges of the lid (B) slightly so that it will open freely. (We laid a sheet of sandpaper on our bench and hand-sanded, checking frequently for fit.)

2 To make a hinge pin, cut a $2\frac{1}{2}$ " length of $\frac{3}{16}$ " hardwood dowel. (We used birch for contrast.) Place the lid between the two sides (A) with the eye holes aligned, and insert the pin through all three pieces to hold them together. (The pin should be a bit too long.) Now, stand this assembly upside down on your bench, making sure that the lid edges are aligned with the top edges of the sides (with the lid in its closed position).

3 Apply glue to the edges of the base (B) and mating surfaces of the sides. Next, position the base between the sides, and slide it up snug against the edges of the lid. Clamp the assembly, then open the lid a little so that glue squeeze-out won't lock it in. Wipe away all squeeze-out, then allow the glue to dry. (**Note:** This will put the base out of alignment with the bottom edges of the sides. See Tip no. 2 above left.)

Fine-Tune the Bunny, Then Finish It with Style

1 To glue in the hinge pin, first back it out on one side until it's recessed about $\frac{1}{8}$ " on the other side. Using a straightened paper clip, apply a drop or two of glue to the inside of this "eye socket," then push the pin back through until it protrudes just slightly. After the glue has dried, trim the pin ends, and sand them flush.

2 With the pattern still in place on one side, sand all edges of the box smooth. (We used our 1" belt sander. For the tight spaces, we wrapped a piece of stiff cardboard with sandpaper.) Next, finish-sand the sides using your palm sander. Now, hand-sand a slight round-over on all exterior edges. (See Tip no. 3 at left.)

3 Apply your choice of finish to all surfaces of the box. (We brushed on a generous coat of Watco Natural Danish Oil Finish, allowing it to penetrate for 30 minutes. We applied a second coat, then rubbed the box with 0000 synthetic steel wool before wiping off the excess with a clean cotton cloth.)

4 Allow the finish to dry overnight. Now, line the base interior with felt. (We cut our felt to width before trial-fitting it along the base contours. We then cut the felt to length and adhered it using double-faced carpet tape.) ■

