

Better Homes and Gardens®

Weekend Woodworking Projects™

January 1994

Please display until Jan. 2

*Weave this
Best-of-Show
Basket*

*Scrollsawed
Coach and Four*

*CD/Cassette
Carousel*

*Federal-Style
Wall Mirror*

*Toy
Mobile Crane*

*Splined
Jewelry Box*



From the editors of WOOD® Magazine

HOW TO FIND YOUR WAY THROUGH THE WOODS.

In woodworking, every project is an adventure. You explore the wood, studying its grain, searching for something hidden within.

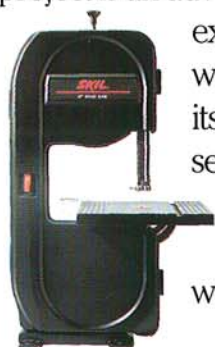
Your goal is to emerge, weeks later, with a proud souvenir. A planter. A Shaker chair. Or perhaps a rustic chest of drawers.

Ironically, the ease of any woodland journey depends largely on a decision you make *before* embarking. Your choice of tools.

To this end, a move in the right direction is Skil Woodshop Tools.™

Skil Woodshop Tools are a full line of woodworking tools designed to make any project a pleasure.

Every step



saw. Its powerful induction motor makes small work of resawing stock up to 7 inches wide. And afterward, navigate intricate curves on the large, tilting table that adjusts from -6° to 50°.

Whatever your plans call for next, the HD 1875 plunge router is sure to be part of them. Its 2¼ hp motor can carve signs, cut joints and trim decorative edges with power to spare.



For accurate, repetitive drilling, the new HD 3580 13" benchtop drill press is exactly what you need. Its exclusive fence can be set a precise distance from the drill bit, to ensure consistency from first hole to last. This unique fence also offers plenty of room to clamp



of the way.

Confidently enter the thickest woods with the new HD 3640 10" benchtop band

down your workpiece for added support.

When it's time for assembly, try the innovative HD 1605 plate joiner.



Simply cut matching slots, pop in a wooden biscuit, glue and you have yourself a quick, durable joint.

Once it's all together, give your project a once over with the HD 7575 palm grip sander. The 7575 performs an exacting 1/16" orbit 13,000 times a minute for a fast finish.

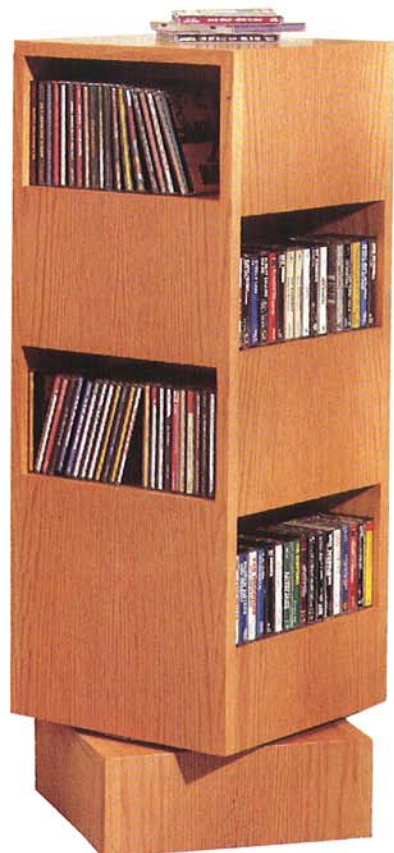
Next time you explore the woods, bring along the perfect traveling companions—Skil Woodshop Tools. You'll find those shown here and other Woodshop tools in stores everywhere. Just look for this label.

It's a sure sign you're on the road to woodworking success.



SKIL®

Weekend Woodworking Projects



CD/Cassette Carousel, Page 14



Splined-So-Fine Box, Page 24

5 BEST-OF-SHOW BASKET

Here's a woven wonderwork that makes a gift fit for weddings and golden anniversaries. If you don't own a steamer, no problem—we've devised a simple, inexpensive soaking tube you can build in 15 minutes.

10 FEDERAL-STYLE WALL MIRROR

Our founding fathers would have felt right at home with this design. They developed what was later called the Federal style to express their enlightened ways of thinking. You'll appreciate our enlightened, time-saving approach to this project.

14 CD/CASSETTE CAROUSEL

Going around in circles looking for a classy way to organize your compact discs and cassettes? This revolving tower can house 240 CDs or 136 tapes. Use our simple adapter to convert each cavity from CD to tape storage, then convert cavities back to CDs as the need arises.

18 MOBILE CRANE

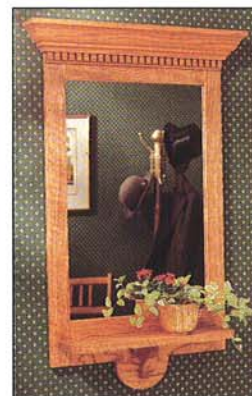
When our kids field-tested this design, they gave it a unanimous "thumbs up" for interest-holding power. In fact, we suggest you build at least two of these, so you won't have to wait for the youngsters to give you a turn.

24 SPLINED-SO-FINE BOX

With this little project, you'll achieve dazzling results without spending long hours in the shop. A fancy face and matching splines make this box a great gift for man, woman, or child.

27 CLASSIC COACH AND FOUR

Whip up your scrollsaw to make our version of the famous "Tally-ho" coach, which offered bone-rattling transportation across the English countryside back in Victorian times. Add excitement to a mantel or bookcase with this handsome curio.



Federal-Style Wall Mirror, Page 10



Mobile Crane, Page 18

Cover photograph : King Au



A WOODWORKING WOMAN WRITES



When Vickie Bornholdt of Blaine, Minnesota, built our Pint-Sized Model T Pickup (Issue 34, July 1993), she was pleased enough with the results to send us photos. "Just goes to show you," writes Vickie, "that it's not just dads and their sons who are interested in woodworking, as I'm a mom and made this for my 16-month-old daughter. She loves it!"

Vickie has a vested interest in Ford pickups. She and her husband Dennis have lovingly restored a 1955 Ford F-100, which they show at regional and national meets. At the recent F-100 Midwest

Nationals in Iowa, Vickie displayed her pint-sized Model T alongside the '55, to the delight of many spectators.

Vickie's point is well taken. Our latest survey tells us that women make up between 10 and 20% of our readership. A contingent this large deserves some recognition. According to Jim Boelling, *WOOD*® magazine staffer and adult-education instructor, women account for a third to a half of his woodworking course enrollments these days. A higher percentage of women than men, he adds, tend to stick it out for the duration of the course.

So, here's to our women readers. If Vickie Bornholdt is at all representative, you're a talented and enthusiastic presence out there. We'd like to hear from more of you.

Doug Cantwell

Photograph : Susan Gilmore

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!

Weekend Woodworking Projects editorial mailing address:

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

For a change of address, it is best for you to contact your local Postmaster, who then will notify us. For any other subscription service, please write :

Weekend Woodworking Projects

Customer Service, P.O. Box 55364

Boulder, CO 80322-5364.

Enclose a recent label from your magazine for better service.

Or, you may phone toll-free 800/374-3669.

If you want us to remove your name from our lists for other product promotions, please write to *Weekend Woodworking Projects*, P.O. Box 10263, Des Moines, IA 50336-0623.

PRINTED IN U.S.A.

WEEKEND WOODWORKING PROJECTS (ISSN 1042-6094; Canadian GST Reg. #R123482887) is published bimonthly in January, March, May, July, September, and November by Meredith Corporation, 1716 Locust Street, Des Moines, IA 50309-3023. Second-class postage paid at Des Moines, Iowa, and additional offices. **SUBSCRIPTION PRICES:** One year \$27.97 in the United States and its possessions. Canada and other countries add \$6 per year. **POSTMASTER:** Send address changes to: **WEEKEND WOODWORKING PROJECTS**, P.O. Box 55364, Boulder, CO 80322-5364. **COPYRIGHT** MEREDITH CORPORATION, 1994. ALL RIGHTS RESERVED.

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Statement of Ownership, Management and Circulation (Required by 39 U.S.C. 3685) 1A. Title of Publication: Weekend Woodworking Projects. 1B. Publication No. 10426094. 2. Date of Filing: September 28, 1993. 3. Frequency of Issue: Bimonthly. 3A. No. of Issues Published Annually: 6. 3B. Annual Subscription Price: \$27.97. 4. Complete Mailing Address of Known Office of Publication: 1716 Locust Street, Des Moines, Polk County, IA 50309-3023. 5. Complete Mailing Address of the Headquarters of General Business Offices of the Publisher: 1716 Locust Street, Des Moines, Polk County, IA 50309-3023. 6. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor: Publisher: William R. Reed, 1912 Grand Avenue, Des Moines, IA 50309-3379; Editor in Chief: Larry Clayton, 1912 Grand Avenue, Des Moines, IA 50309-3379; Managing Editor: Not Applicable. 7. Owner: Meredith Corporation, 1716 Locust Street, Des Moines, IA 50309-3023. The Names and Addresses of Stockholders Owning or Holding 1 Percent or More of the Total Amount of Stock: The Bank of New York, 925 Patterson Plank Rd., Secaucus, NJ 07094; Bankers Trust, Corporate Securities Services, 16 Wall St., New York, NY 10005; Boston Safe Deposit & Trust Co., c/o ADP Proxy Services, 51 Mercedes Way, Edgewood, NY 11717; Brown Bros. Harriman & Co., 63 Wall Street, New York, NY 10005; The Chase Manhattan Bank, N.A., 1 Chase Manhattan Plz., New York, NY 10081; Chemical Bank, 270 Park Ave., New York, NY 10017; Mellon Bank, N.A. c/o ADP Proxy Services, 51 Mercedes Way, Edgewood, NY 11717; Norwest Bank Minnesota National Assn., 733 Marquette Ave., 5th Floor, Minneapolis, MN 55479-0056; The Northern Trust Company, c/o ADP Proxy Services, 51 Mercedes Way, Edgewood, NY 11717; Prudential Securities, Inc., 315 Hudson St., New York, NY 10013; State Street Bank & Trust Co. Fiduciary, c/o ADP Proxy Services, 51 Mercedes Way, Edgewood, NY 11717; U. S. Trust Co. of New York, 770 Broadway, New York, NY 10003; Wells Fargo Institutional Trust Co., 45 Fremont St., 16th Floor, San Francisco, CA 94105. Through some of the nominees listed above, the E. T. Meredith and Bohen families and family foundations own directly or beneficially, approximately 30% of the issued and outstanding stock of the corporation. Each nominee listed above holds stock for one or more stockholders. 10. Extent and Nature of Circulation—A. Total No. Copies (Net Press run): Average No. Copies Each Issue During Preceding 12 Months, 283,990; Actual No. Copies of Single Issue Published Nearest to Filing Date, 314,021. B. Paid and/or Requested Circulation: 1. Sales Through Dealers and Carriers, Street Vendors, and Counter Sales: Average No. Copies Each Issue During Preceding 12 Months, 7,283; Actual No. Copies of Single Issue Published Nearest to Filing Date, 8,300. 2. Mail Subscriptions (Paid and/or requested): Average No. Copies Each Issue During Preceding 12 Months, 197,792; Actual No. Copies of Single Issue Published Nearest to Filing Date, 218,000. C. Total Paid and/or Requested Circulation (Sum of 10B1 and 10B2): Average No. Copies Each Issue During Preceding 12 Months, 205,075; Actual No. Copies of Single Issue Published Nearest to Filing Date, 226,300. D. Free Distribution by Mail, Carrier, or Other Means: Samples, Complimentary, and Other Free Copies: Average No. Copies Each Issue During Preceding 12 Months, 18,358; Actual No. Copies of Single Issue Published Nearest to Filing Date, 26,000. E. Total Distribution (Sum of C and D): Average No. Copies Each Issue During Preceding 12 Months, 223,433; Actual No. Copies of Single Issue Published Nearest to Filing Date, 252,300. F. Copies Not Distributed: 1. Office Use, Left Over, Unaccounted, Spoiled After Printing: Average No. Copies Each Issue During Preceding 12 Months, 5,601; Actual No. Copies of Single Issue Published Nearest to Filing Date, 3,291. 2. Return from News Agents: Average No. Copies Each Issue During Preceding 12 Months, 54,956; Actual No. Copies of Single Issue Published Nearest to Filing Date, 58,430. G. Total (Sum of E, F1, and 2—should equal net press run shown in A): Average No. Copies Each Issue During Preceding 12 Months, 283,990; Actual No. Copies of Single Issue Published Nearest to Filing Date, 314,021. 11. I certify that the statements made by me above are correct and complete. (Signed) Larry Clayton, Editor in Chief.



Best-of-Show Basket

If all those ordinary projects seem run-of-the-mill to you, sink your sawteeth into this woodworking adventure. You'll emerge from your shop with a gift fit for weddings and golden anniversaries—although our guess is that you'll want to keep one for yourself, too. Don't worry if you don't own a steamer—we've devised a simple, inexpensive soaking tube you can build in 15 minutes.

First, Build a Bending Form And Soaking Tube

1 To build the form you'll need for bending the handle, hoop, and bands, first cut and laminate two 10½×24" pieces of ¾"-thick plywood. Lay out the form starting at one end of this piece, including the two radii, four 2" clamp holes, and starting notch where shown and dimensioned on the Bending Form drawing shown on page 6.

2 Bandsaw the form to shape, cut the notch, and bore the holes. Save the large waste piece for use in bending the handle. Next, lay out the locations for the uprights and handle ends where shown on the drawing.

3 To make a soaking tube, cut a 60" length of ¾"-diameter PVC plumbing pipe. Glue a cap on one end and a threaded fitting with a plug on the other. (**Note:** If you own a wood steamer, use it instead. We devised the soaking tube because a standard bathroom tub is not long enough to accommodate the 55"-long band pieces. You can purchase the PVC parts and cement at your local home center for about \$10.)

Prepare The Stock Next, Then Soak and Bend It

Note: For this project, you'll need clear, straight-grained stock. Quartersawn stock bends more evenly than flatsawn. Species that bend reasonably well include ash, beech, birch, elm, gum, hickory, maple, oak, and walnut.

1 Cut the hoop (A), bottom band (B), top bands (C), weavers (D and E), handle (F), and uprights (G) to the dimensions listed in the Bill of Materials. (We selected ash for the hoop and bands, red elm for the wide weavers, red oak and red elm for the narrow weavers, and red oak for the handle and uprights. See our tip on page 7 about making extra blanks to allow for breakage.) To do this, sand both faces of ¾"-thick stock, then plane one edge on your jointer. Rip the pieces to width using a fine-tooth tablesaw blade. Now, resaw the strips to thickness using a pushstick for safety.

2 Sand each strip smooth. (We used our stationary belt sander, pressing the stock against the belt with a 2×4 scrap and pulling it toward us.) At both ends of parts A, B, and C, feather the last 2½" to ¼" thick. Then, bandsaw a taper on one end of parts B and C. (For dimensions, see the Tapering detail that accompanies the Assembled View drawing.)

Continued

BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A hoop	1/4"	3/4"	55"	A	1
B bottom band	3/16"	1"	55"	A	1
C top bands	3/16"	1 1/4"	55"	A	2
D wide weavers	3/32"	7/8"	55"	E	4
E1 narrow weavers	3/32"	3/8"	55"	O	6
E2 narrow weavers	3/32"	3/8"	55"	E	5
F handle	5/16"	1 1/4"	48"	O	1
G uprights	3/32"	1 1/4"	10"	O	14
H* bottom panel	1/4"	11"	16 3/4"	OP	1

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

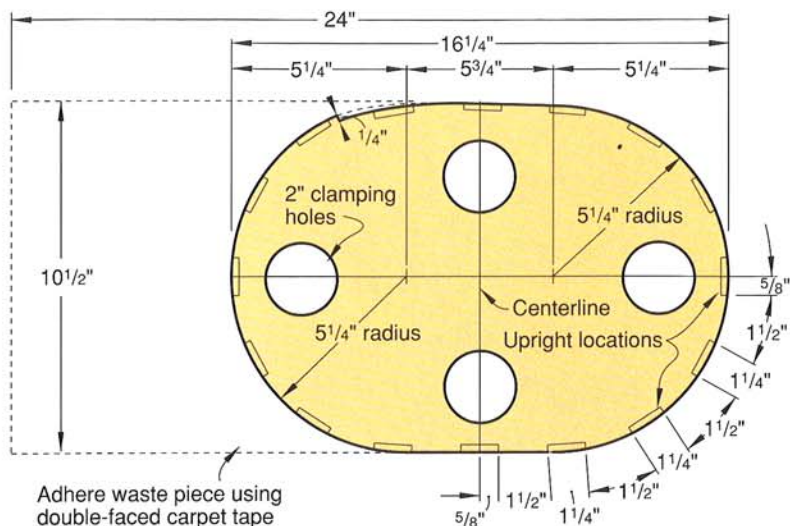
Materials Key: A—ash; E—elm; O—oak; P—plywood.

Supplies: 4"-dia. PVC pipe, cap, and threaded fitting with plug (for soaking tube); PVC cement; oil finish.

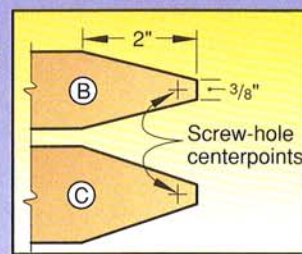
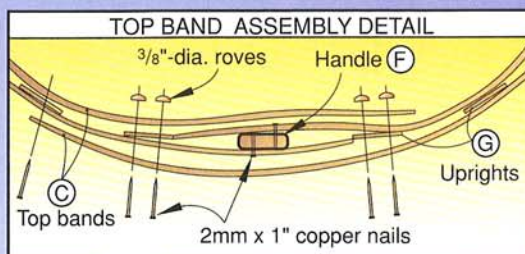
Buying Guide

Flush-Cutting Bit. Carbide-tipped, 1/2"-dia. x 1" cutting length, 1/4" shank, includes pilot bearing. Catalog no. 24A71. \$13.95 plus \$4.50 shipping and handling. Woodcraft, 210 Wood County Industrial Park, P.O. Box 1686, Parkersburg, WV 26102-1686. Phone 800/225-1153.

Copper Nails and Roves. Includes 100—2mm×1" nails with rose-type head and 20—3/8" roves. \$12.00 ppd. Faering Design, Inc., P.O. Box 805, Shelburne, VT 05482. No phone or credit-card orders, please.

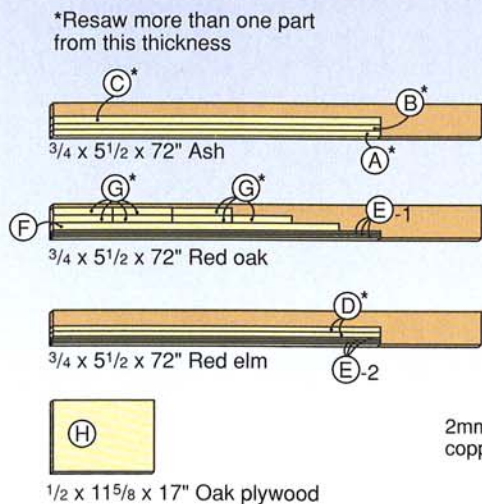


BENDING FORM

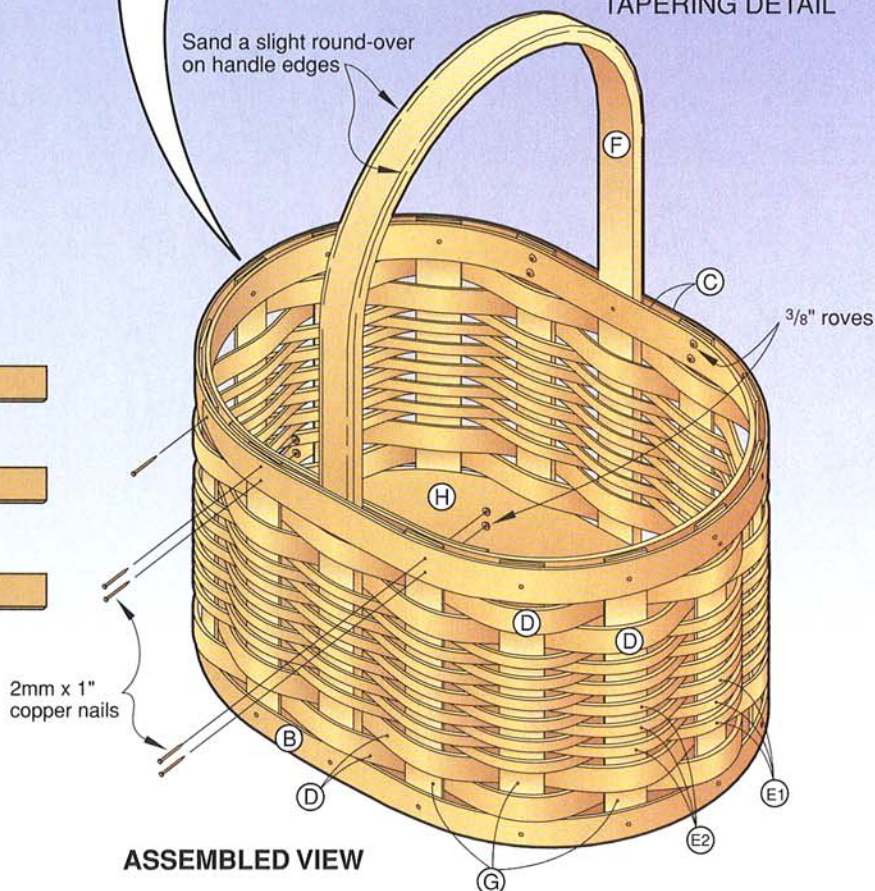


TAPERING DETAIL

Sand a slight round-over on handle edges



CUTTING DIAGRAM

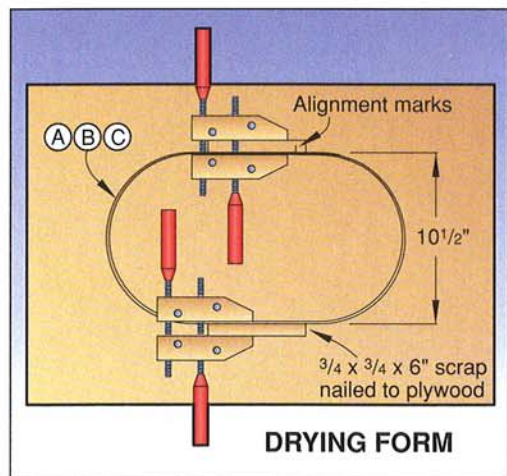


ASSEMBLED VIEW

3 Now, fill the soaking tube with your hottest available tap water, and soak the band and handle stock overnight. Replace the water a couple of times to keep it hot, and then replace it about an hour before you bend the parts.

4 Bend the three bands first, then the hoop, and then the handle. (This will allow the thicker stock to soak longer.) To do this, position the untapered end of each piece in the starting notch, and clamp it using the hole on that side of the form. Gently bend the stock around the form, clamping it as you go. Release the first clamp enough to fit the tapered end into position, then reclamp it. Now, draw a reference mark across the edge of both ends roughly in the middle of the overlapping section.

5 Let each part cool on the form for 15 minutes. During this time, rip and crosscut eight 6" lengths of 3/4 x 3/4" scrap stock to make drying forms as shown below on the Drying Form drawing. Next, nail four pairs of these pieces 10 1/2" apart to a large, flat piece of scrap plywood, spacing them far enough from one another to clamp a band between each pair. As you remove each part from the bending form, position it in one of the drying forms. Then, align the two reference marks, and clamp each side of the band to the form where shown in the drawing.



6 To bend the handle, first reattach the large waste piece to the end of the bending form using double-faced carpet tape. (**Note:** Make sure that the handle stock has been soaking in very hot water for at least an hour before bending. As you remove the handle blank from the tube, insert the wide and narrow weaver strips, and let them soak for at least four hours.) Mark a centerline 24" from one end of the handle

blank, align it with the centerline at the other end of the form, and clamp it there. Gently bend the two ends around the form, clamping as you go. Allow the handle to dry overnight on the form. Then, remove it from the form, and mark the inside face 10" from each end. Feather each of these 10" lengths on the inside, reducing the thickness to 1/8" at each end. (We used our stationary belt sander.)

Now, Assemble the Bottom Panel, Hoop, Band, and Uprights

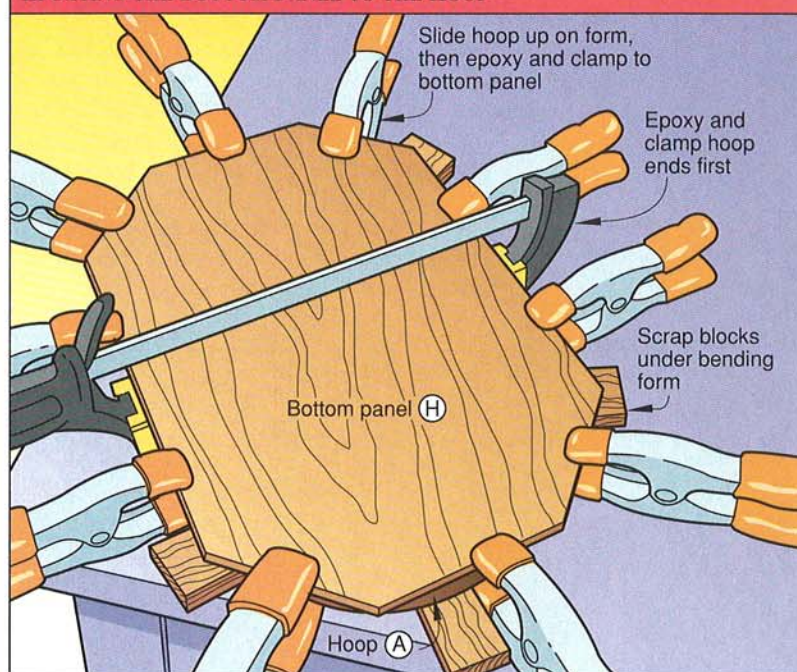
1 For the bottom panel (H), cut an 11 1/2 x 17 1/2" piece of 1/4"-thick plywood. (We chose oak.) To facilitate clamping in the following step, cut off the corners, starting 3" from each corner.

TIP To allow for breakage during bending, we suggest you make the following quantities of each part:

Part	Quantity
A	2
B	2
C	4
D	6
E1*	9
E2*	8

*Note: E1 and E2 refer to the two contrasting species we used for the narrow weavers. If you start with E1 and alternate with E2, you'll need six E1s and five E2s.

EPOXYING THE BOTTOM PANEL TO THE HOOP



2 Fit the hoop back onto the bending form, then epoxy and clamp the ends together. (We used quick-set epoxy.) While the epoxy is curing, transfer the upright and handle locations to the outside face of the hoop using your combination square. Unclamp the hoop, slide it halfway up the edges of the form, and reclamp it. Next, place 3/4"-thick scrap blocks under the form to elevate it off your bench. Apply a liberal bead of epoxy around the top edge of the hoop, then center and clamp the bottom panel to it with the good side facing up, as shown above. Wipe away any squeeze-out, and allow the epoxy to cure.

Continued

3 Now, remove the clamps, and fit your router with a piloted $\frac{1}{2}$ " flush-cutting bit. (See our Buying Guide for a mail-order source.) Check the actual thickness of your bottom panel, and set the depth of cut accordingly. Then, rout the bottom panel edge flush with the outside face of the hoop.

4 Fit the bottom band (B) around the outside of the hoop. (The top edge of the band should be flush with the top face of the bottom panel.) Now, insert one of the handle ends between the band and hoop where marked on the hoop. Position and clamp the handle end and bottom band to the hoop. Then, drill a $\frac{3}{32}$ " pilot hole through the three parts $\frac{9}{16}$ " from the bottom edge and slightly off-center. (See the Base and Uprights drawing below.) Insert a 2mm x 1" rosehead copper nail through the hole. Then, clinch the tip of the nail on the inside using a ballpeen hammer with an anvil or vise to back up the head. (We found it easier to insert each nail as we went and then clinch all the nails afterwards in one operation. See our Buying Guide for a nail source.)

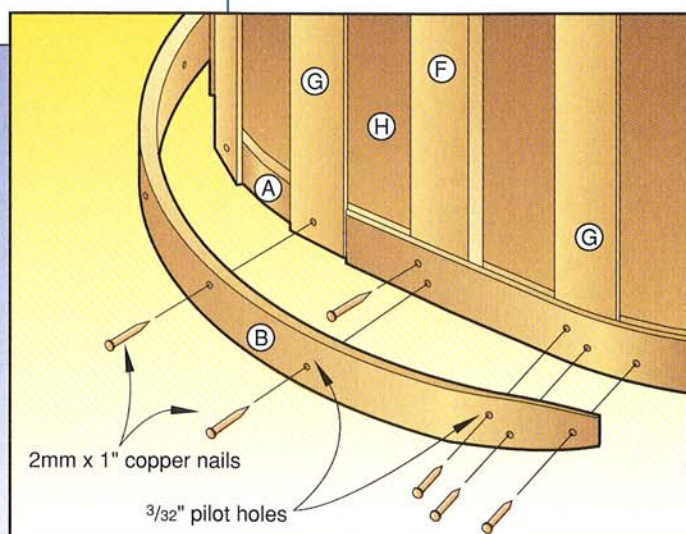
5 Now, work your way around the basket as shown on the drawing, repeating the previous step for each of the uprights as well as the

other handle end. Clamp each upright assembly, then drill. (**Note:** Skip the first upright for now. Drill and nail it after you've done all the others, since you'll need to fasten the other band end to this upright.) For decorative effect, locate your first hole (in the second upright) $\frac{9}{16}$ " from the bottom edge (as you did the handle hole), then drill every alternate hole $\frac{1}{4}$ " from the bottom. This will also ensure that the second hole you drill in the first handle end (to attach the other end of the band) won't crowd the nail you installed in Step 4 to start the assembly.

6 When you come to the other, tapered end of the bottom band, insert the upright you skipped, and drill a hole at both the $\frac{1}{4}$ " and $\frac{9}{16}$ " positions, offsetting the two holes slightly to avoid weakening the stock. Then, drill a final hole near the tapered end of the band. (This nail won't coincide with an upright.)

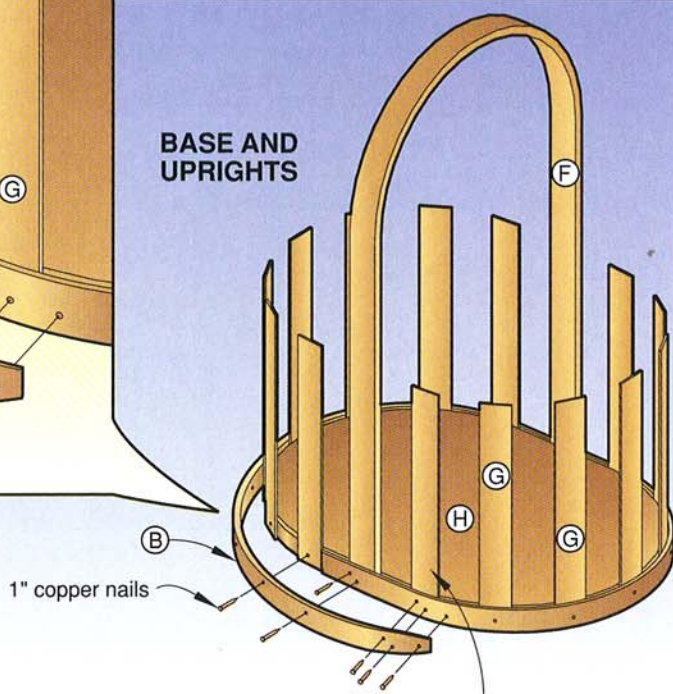
Now, Do Some Weaving, Then Attach Your Top Bands

1 An hour before you plan to weave, freshen the hot water in your soaking tube. Remove two of the wide weavers (D), and weave the first one in and out among the uprights, starting *inside* an upright that's next to a handle end (so that it will go outside of both handle ends). Start the second wide weaver *outside* the diagonally



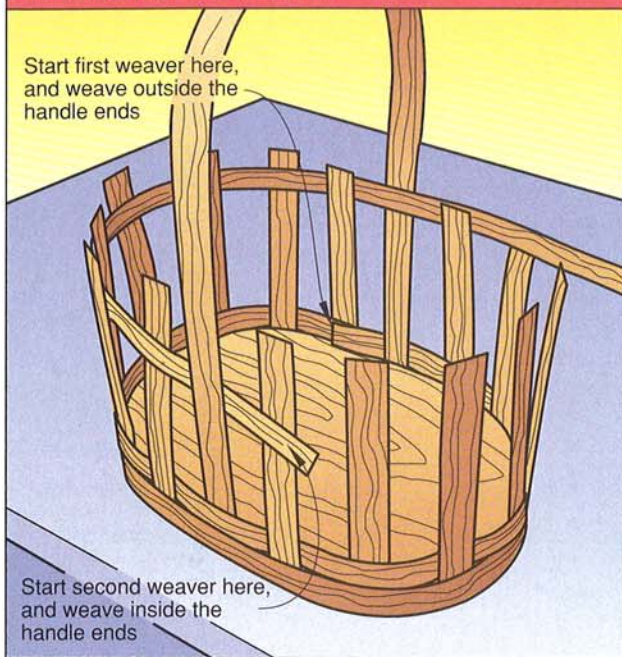
BOTTOM BAND ASSEMBLY DETAIL

BASE AND UPRIGHTS



Note: Skip this upright until you've worked your way around the basket.

WEAVING THE WIDE WEAVERS



carefully swell the nail ends, again using a ballpeen hammer and an anvil or vise. On the two uprights that enclose each handle end, drill offset holes at both nailing positions, and add a rove to the nail end where shown on the Top Band Assembly detail. (To order roves, which resemble washers, see our Buying Guide.)

Add the Final Touches, Then Apply your Finish

1 Trim and sand the uprights flush with the top band edges. (We used our dovetail saw.) Next, score both ends of the weavers several times using a utility knife, then carefully break them off. (**Note:** Score the outside ends along the edge of an upright or handle end so they won't show once you've broken them off.) Finally, finish-sand the bands and handle.

TIP Since the weavers will shrink as they dry, be sure to tap each one down firmly before adding the top bands. We used a small hammer and a flat piece of scrap, working our way around and up the basket sides.

opposite upright as shown above, so that both the weave and the end locations will alternate with respect to the first level.

2 Remove your narrow weavers from the soaking tube one at a time. Follow the same procedure you used for the wide weavers, alternating the species, the weave, and the starting position at each level.

3 When you've finished the 11 narrow weavers, add the two wide weavers on top. Start in the same positions you used for the previous levels. (**Note:** Before proceeding to Step 4, allow the weavers to dry thoroughly, then tap them down. See our tip about shrinkage at right.)

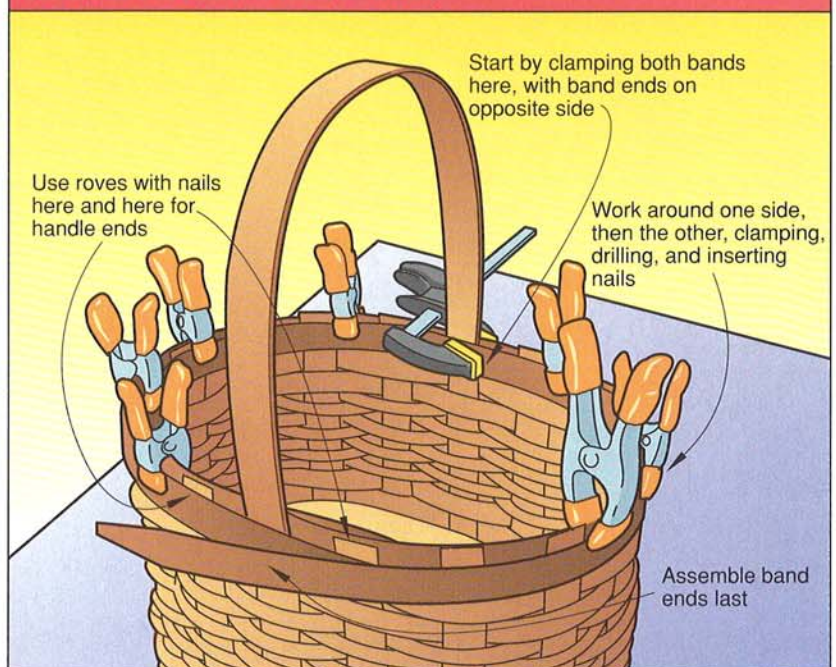
4 Position the two top bands on top of the wide weavers with their ends on the same side of the basket but pointing in opposite directions. (See the Top Band Assembly detail that accompanies the Assembled View drawing.) Clamp both to the handle on the opposite side as shown at right. (**Note:** Orient the outside band so that its end and the bottom band end point in opposite directions.) Work your way around the basket, first in one direction, then the other. Clamp and drill each upright assembly, this time locating the holes $\frac{3}{8}$ " from the top edge and, alternately, $\frac{3}{8}$ " from the bottom. Leave the assembly of the band ends until last. Then, drill and nail them where shown on the detail.

5 Instead of clinching the nails in the top bands, clip off the tips, leaving $\frac{1}{16}$ " protruding on the inside. (We used a pair of side cutters.) Now,

2 Apply your choice of finish. (We used a disposable spray bottle to apply a coat of Watco Natural Danish Oil Finish to all surfaces. After five minutes, we wiped off the excess.) ■

Project design: Keith Raivo, Brook Park, Minn.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Chuck Hedlund
Photograph: King Au

CLAMPING AND NAILING THE TOP BANDS



W Federal-Style Wall Mirror



Here's a design our founding fathers would have felt right at home with. They developed what came to be known as the Federal style by updating certain Greek and Roman styles to suit their enlightened ways of thinking. In turn, we've come up with an enlightened approach to this project that will spare you frustration as well as save you some time.

Start with the Basic Frame

1 Rip and crosscut two stiles (A), one top rail (B), and one bottom rail (C) to the dimensions listed in the Bill of Materials. (We chose red oak. We purchased our crown molding first and then matched the remaining lumber to it.) Next, use your compass to lay out a 3" radius on the bottom rail where shown on the Shelf Placement drawing *opposite*. Bandsaw the radius to shape, then use your rip fence to bandsaw the straight cuts. Keep your blade outside the line, then sand to the line.

2 Dry-clamp the frame members, and lay out a pair of dowel marks at each joint using the Frame drawing shown on *page 12* for reference. Use a dowel jig to drill a $\frac{3}{8}$ " hole $\frac{13}{16}$ " deep at each mark. Then, glue, dowel, and clamp the frame using $\frac{3}{8} \times 1\frac{1}{2}$ " dowel pins. Check for square, and allow the glue to dry.

3 Scrape off any glue squeeze-out, and sand both frame faces smooth. Fit your router with a piloted rabbeting bit, and rout a $\frac{1}{4}$ " rabbet $\frac{1}{2}$ " deep along the inside back edge of the frame. Now, use a chisel to square each corner.

Next, Add the Shelf and Bracket

1 Rip and crosscut the shelf (D) and bracket (E) as dimensioned in the Bill of Materials. (*Note: Cut the bracket so that the grain runs diagonally across it.*)

2 Lay out a 1" radius at each front corner of the shelf. Then, position your compass point on the bracket where shown on the Bracket drawing on *page 12*, and draw a $2\frac{3}{8}$ " radius. (We

Continued

BILL OF MATERIALS

Part	Finished Size			Mati.	Qty.
	T	W	L		
A stiles	3/4"	2"	33 5/8"	O	2
B top rail	3/4"	5 1/2"	15 3/8"	O	1
C bottom rail	3/4"	7 1/2"	15 3/8"	O	1
D shelf	3/4"	4"	18"	O	1
E bracket	3/4"	3 1/4"	3 7/8"	O	1
F spacer	1/2"	27/8"	19 3/8"	P	1
G* side moldings	3/4"	3 1/2"	3 1/4"	O	2
H* front molding	3/4"	3 1/2"	23 3/8"	O	1
I* dentil molding	1/2"	1"	19 3/8"	O	1
J back panel	1/4"	15 3/4"	23 3/4"	P	1

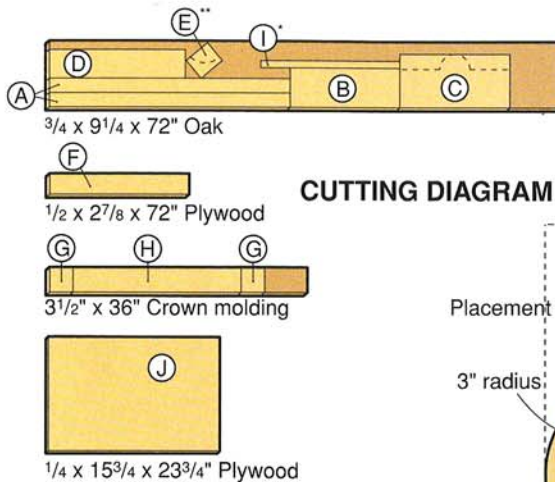
*Initially cut part oversized. Please read all instructions before cutting.

Materials Key: O—Oak; P—plywood.

Supplies: #8x1 1/2" flathead wood screws; #10x2" pan-head wood screws; 3/8x1 1/2" dowel pins; #17x1" brads; 1/8"-thick mirror glass; paper for mirror backing; finish.

Buying Guide

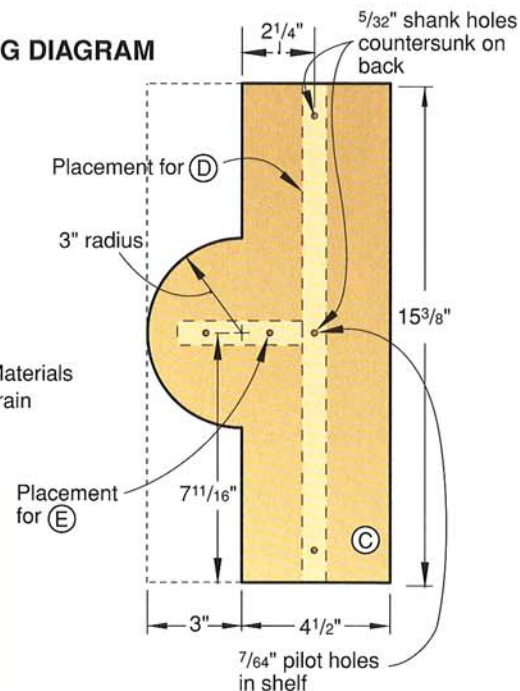
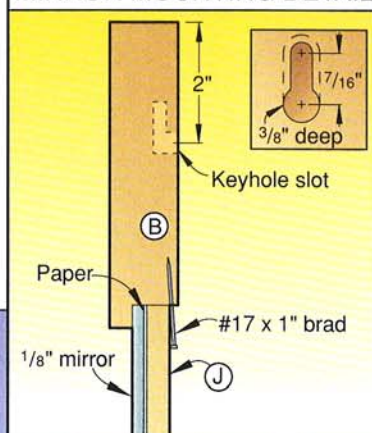
Keyhole Slot Bit. Carbide steel. Cuts 1/4" slot, 3/8" cavity. Catalog no. 08142. \$14.95 plus \$4.50 shipping and handling. Woodcraft, 210 Wood County Industrial Park, P.O. Box 1686, Parkersburg, WV 26102-1686. Phone 800/225-1153.



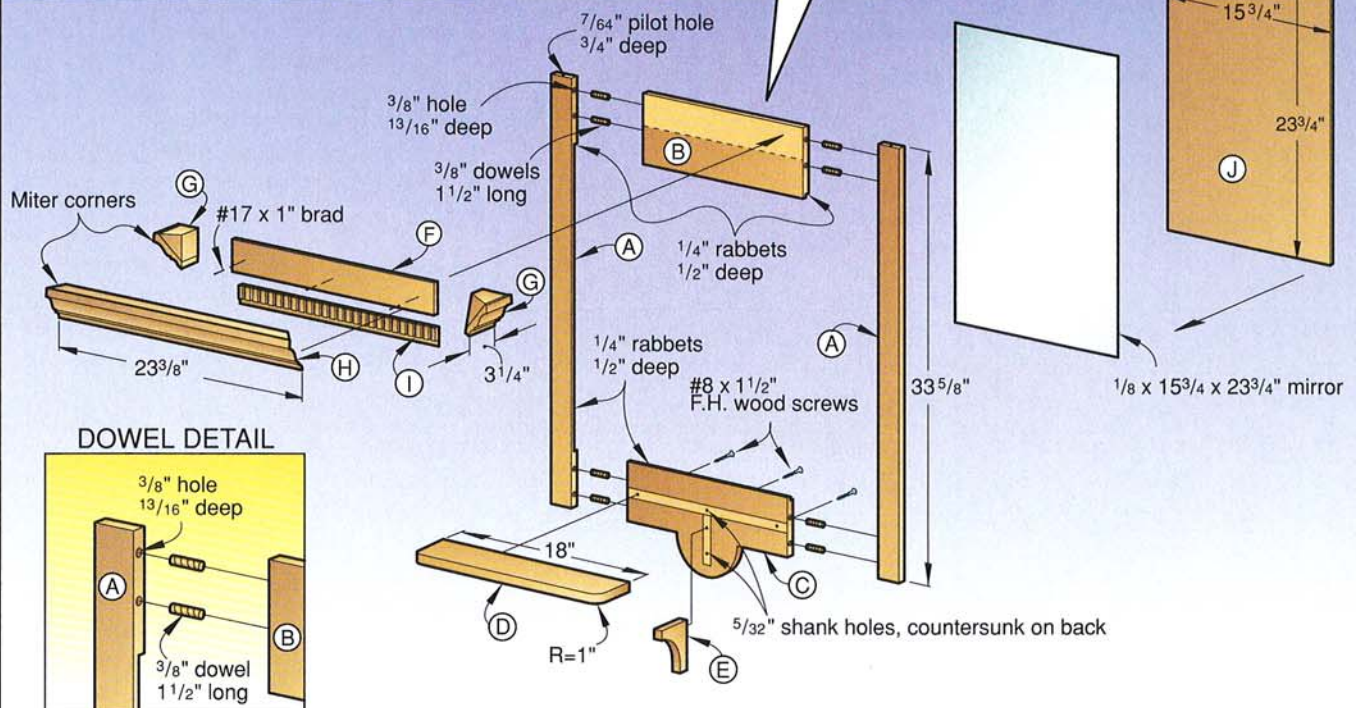
CUTTING DIAGRAM

*Resaw to thickness listed in Bill Of Materials
**Cut diagonally with respect to the grain

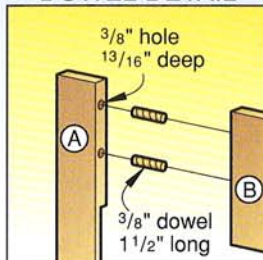
MIRROR MOUNTING DETAIL

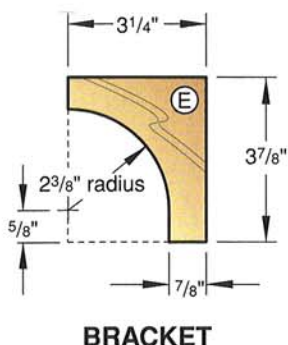
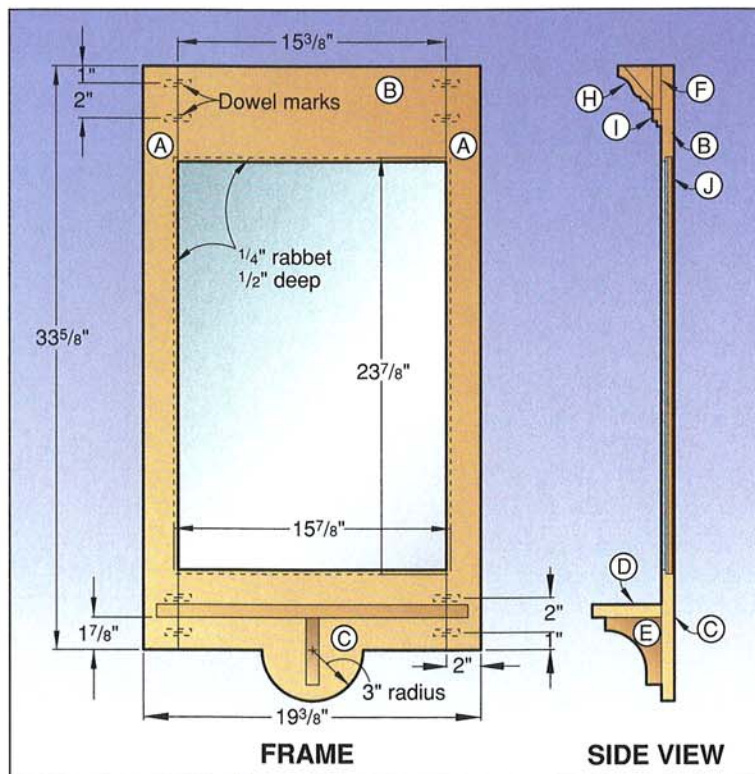


SHELF PLACEMENT



DOWEL DETAIL





adhered a piece of 3/4"-thick scrap to the front edge of the bracket blank and positioned the compass point in the crack between the two pieces.) Use your bandsaw to cut the radii on the shelf and bracket, keeping your blade outside the line. Sand to the line, then finish-sand the shelf and bracket.

3 Dry-clamp the shelf to the frame where shown on the Shelf Placement drawing. Then, clamp the bracket to the shelf and bottom rail. On the back side of the frame, lay out and drill 5/32" countersunk shank holes and 7/64" pilot holes to a total depth of 1 1/2" where shown

on the drawing. Now, unclamp both parts, and reassemble them using glue and #8x1 1/2" flat-head wood screws. Remove any glue squeeze-out with a damp cloth, and allow the glue to dry.

Move on to the Moldings

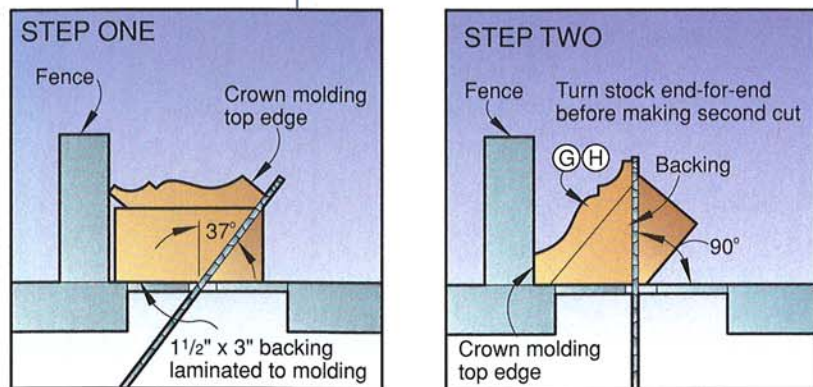
1 Crosscut a 36" length of 3 1/2"-wide crown molding. (We found ours at a hardwood lumber store, although home centers and building-supply stores also stock crown molding.) Next, crosscut a 36" length of 2x4 for backing, and rip it to 3" wide. Then, glue and clamp it to the back face of your molding. (**Note:** Since you'll be bevel-ripping the backing in the following step, don't use nails for this operation.)

2 When the glue has dried, bevel-rip the backing to form a right-angled cross section as shown in the two-step Bevel-Ripping Setup drawing below left. To do this, move your rip fence to the side of the blade opposite its direction of tilt. Tilt the blade until it's parallel to the top edge of the molding, as shown in Step One of the drawing. (For our molding, we tilted the blade to 37° from square.) Set your fence so that the blade will bevel-cut the backing flush with this top edge. Rest the bottom edge of the molding against the fence, and make the cut.

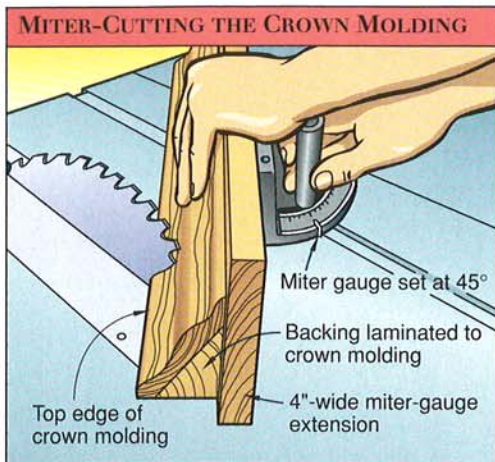
3 Now, reset your blade to perpendicular as shown in Step Two of the drawing. Turn the molding assembly end-for-end, and roll it over so that it rests on the bevel-cut surface. Reset your fence to bevel-rip the other backing surface flush with the bottom edge of the molding. This time, rest the top edge of the molding against the fence, and bevel-rip the backing to a right-angled corner.

4 Rip and crosscut a spacer (F) to 27/8x19 3/8" from 1/2"-thick plywood or pine stock. Attach it to the front face of the frame flush with the top end using glue and #17x1" brads.

5 Set your miter gauge to 45° from square, and attach an extension to it. Verify the angle with respect to the blade using your combination square. Orient the molding assembly as shown opposite top, and miter-cut one side molding (G) to a rough length of 4 1/2". Next, reset your miter gauge to 45° in the opposite direction. Miter-cut a waste piece to reverse the miter, then position and dry-clamp the molding assembly to the frame. (See the Crown Molding Layout drawing opposite.) Reset your miter gauge to the first 45° setting. Now, lay out and miter-cut the front



TWO-STEP BEVEL-RIPPING SETUP



molding (H) to length. Change your 45° setting again to miter-cut a second side molding. Now, dry-assemble the three pieces to the frame. Trim the two side moldings to length, and adjust the fit as necessary. Glue and clamp the moldings to the frame, then allow the glue to dry.

6 To make the dentil molding (I), first build an indexing extension for your miter gauge as shown *below right*. To do this, fit your table-saw with a 1/4" dado set, and elevate it to 1/4". Cut a notch in one edge of a 1×2×24" piece of scrap stock using your miter gauge. Now, bandsaw a 1/4×1/4×2" indexing peg, and glue it into the notch so it protrudes out in front of the extension. Position the extension so that the peg is 1/2" to the right of the dado set, then attach it to your miter gauge.

7 Next, cut the dentils by first ripping and cross-cutting a piece of 3/4"-thick stock to 1×22". Rest this piece against the extension and against the peg. Keep the same dado setup, and cut the first notch in your stock, using the peg as a stop-block. Then, fit this notch over the indexing peg as shown to cut the second notch. Repeat this procedure until you've cut dentils along the entire piece of stock.

8 Next, rabbet the bottom front edge of your dentil molding. To do this, keep your dado setup as before, but position your rip fence 1/2" from the right side of the dado set. Rest the back face of the molding against the fence, and use a pushstick to cut the 1/4" rabbet.

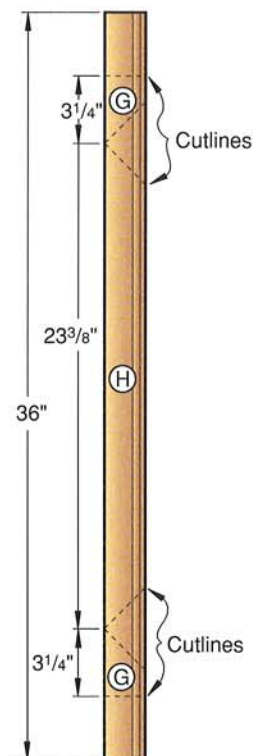
9 Resaw the dentil molding to a 1/2" thickness. To do this, set your rip fence 1/2" from the blade, rest the front face of the molding against the fence, and remove 1/4" of stock from the back face. Now, crosscut the part to 19 3/8", centering each end in a notch. Next, finish-sand the dentil molding, then glue and clamp it to the frame directly beneath the crown molding.

Now, for the Final Assembly

1 To wall-mount your mirror, fit your router with a 1/4" keyhole slot cutter. (See our Buying Guide for a mail-order source.) Then, lay out and rout two keyhole slots 16" apart where shown on the Mirror Mounting detail on the Exploded View drawing. Locate two studs in your chosen wall location, then mount a #10×2" panhead wood screw in each. (*Note: The standard distance between stud centers is 16". If your studs vary from this, adjust your layout accordingly.*)

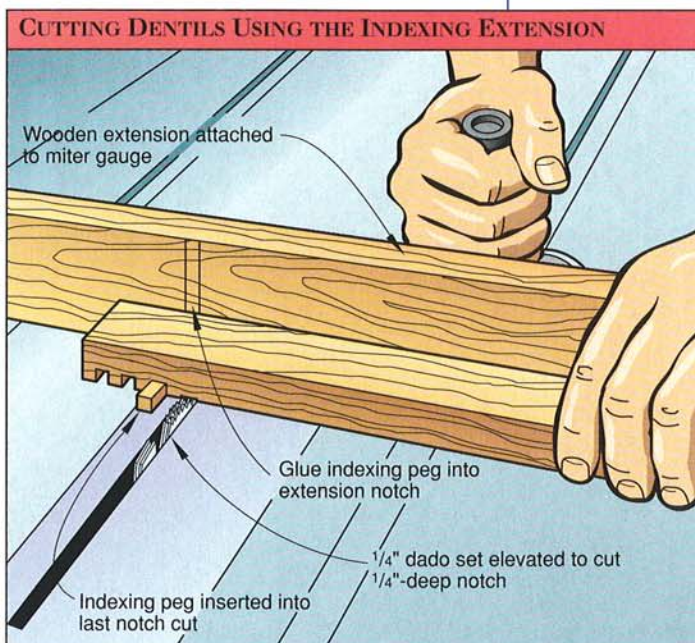
2 Finish-sand any parts of your frame that still need it, then apply the finish of your choice. (We brushed on a liberal coat of Watco Dark Walnut Danish Oil Finish, rubbing it down after 30 minutes with 0000 synthetic steel wool and then wiping off the excess. Next, we applied two coats of Watco Natural Danish Oil, again leveling the finish before wiping off the excess. After the second coat had dried overnight, we rubbed out the finish with a clean cotton cloth.)

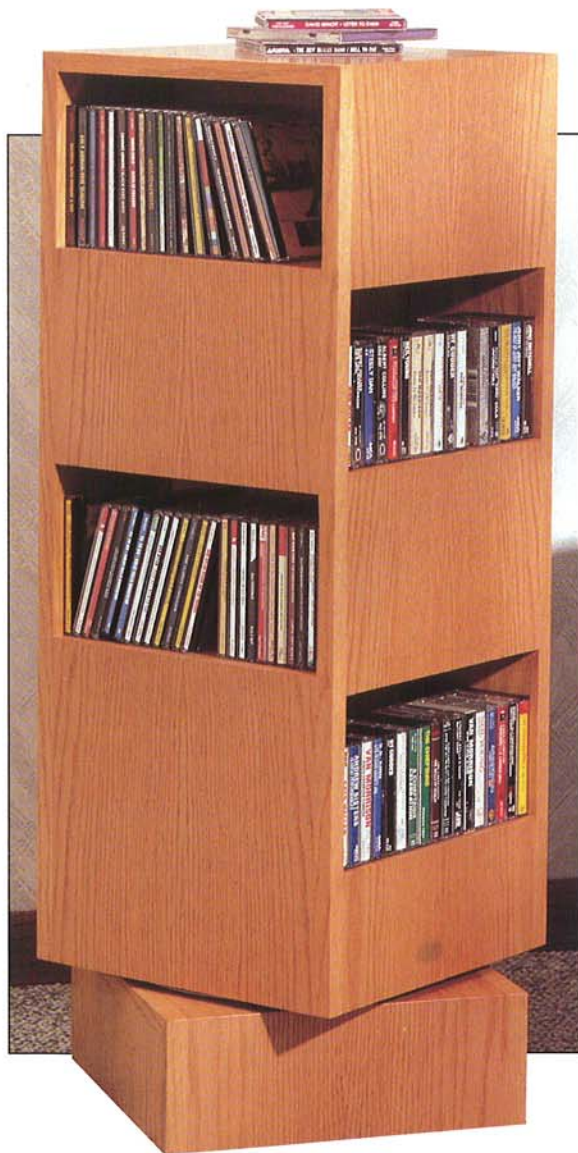
3 Install a piece of 1/8"-thick mirror glass in the frame recess. (We measured the exact dimensions of our recess, which were 15 7/8×23 7/8", and had a hardware store cut the mirror slightly smaller to fit.) Next, cut a piece of paper to size, and lay it over the silvered mirror backing to protect it. Then, cut the back panel (J) to size from 1/4"-thick plywood, and nail it into the recess using #17×1" brads. (See the Mirror Mounting detail on the Exploded View drawing.) ■



CROWN MOLDING LAYOUT

Project design: Chris Christensen, Port Townsend, Wash.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: James E. Boelling
Photograph: King Au





CD/Cassette Carousel

If you've been going around in circles looking for a classy way to organize your growing heap of compact discs and cassette tapes, check out these numbers. This 3-foot revolving tower can house 240 CDs or 136 tapes or any combination of the two. It can also hold its own for styling next to your ultra-tech stereo components.

Start by Cutting Your Plywood Parts to Size

1 First, rip a 4x8 sheet of 3/4"-thick plywood into four 11 1/2"-wide pieces. (We selected plain-sliced red oak.) Next, lay out the parts where shown on the Cutting Diagram, oversizing the lengths of the mitered pieces (A, B, C, and D) by 1". (We arranged our Cutting Diagram to maintain grain continuity from panel to panel. See the Bill of Materials for finished lengths.)

2 To eliminate confusion later, use masking tape to label each plywood piece as marked on the Cutting Diagram. Also, label the ends to be mitered—both ends of A and the mating end of each B, C, and D. Be sure to label the good face of your plywood as well.

3 Crosscut all plywood parts (A through F and J through L). (We attached a miter-gauge extension and stopblock to our tablesaw miter gauge.) Tilt your blade to 45°, and double-check the angle using a combination square. Miter-cut both ends of the top panels (A) and only the mating end of each top front panel (B), middle front panel (C), and lower front panel (D) to finished length, using your stopblock to ensure accuracy.

4 To cut grooves for spline joints as shown on page 16, first move your miter gauge to the slot on the opposite side of the blade. Keep your blade tilted to 45°. Reposition the extension as necessary, and lower the blade to cut a 5/16"-deep groove. (We tested our depth of cut using scrap pieces.) Now, reset your stopblock as shown to limit the depth of cut, and cut a 1/8"-wide groove in each mitered end of parts A, B, C, and D.

5 Next, cut spline grooves for the dividers on the inside faces of the front panels (B, C, and D) where shown on the Spline Grooves drawing on page 16. To do this, reset your tablesaw blade to vertical, and lower it to cut a 5/16"-deep groove. Set your rip fence 5 11/16" from the blade to cut a centered, lengthwise groove on the inside face of each piece. Next, cut a centered groove in both edges (the 6"-long sides) of each divider. (We clamped each divider edge-down to a 12" length of 2x6 stock, which we then used as a sliding carrier board along with our rip fence.)

6 To make splines, first rip 14' of 1/8"-thick stock to 1/2" wide. (We used hardboard, first checking its thickness to make sure that it would fit snugly into a 1/8"-wide groove.) Then, cut twelve 11 1/2" lengths (to join the top and front panels) and eight 6" lengths (for the four dividers).

Continued

BILL OF MATERIALS

Part	Finished Size			Mati.	Qty.
	T	W	L		
A* top panels	3/4"	11 1/2"	13"	OP	6
B* top fr. panels	3/4"	11 1/2"	7 1/2"	OP	6
C* middle fr. panels	3/4"	11 1/2"	11 1/2"	OP	2
D* lower fr. panels	3/4"	11 1/2"	4 3/4"	OP	4
E* dividers	3/4"	11 1/2"	6"	OP	4
F bottom panels	3/4"	11 1/2"	11 1/2"	P	2
G edge pieces	3/4"	3/4"	31 3/4"	O	4
H edge pieces	3/4"	3/4"	13"	O	4
I edge pieces	3/4"	3/4"	4 3/4"	O	4
J interior frame	3/4"	11 1/2"	3 1/4"	P	4
K interior frame	3/4"	10"	3 1/4"	P	4
L base end panels	3/4"	11 1/2"	4"	OP	2

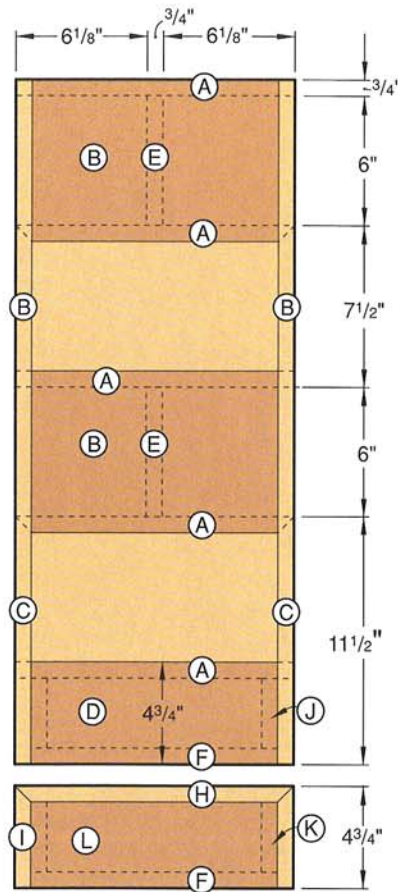
*Initially cut part oversized. Please read all instructions before cutting.

Materials Key: OP—Oak plywood; O—Oak; P—plywood.

Supplies: #8 x 2" flathead wood screws; #10 x 3/4" round-head wood screws (for turntable bearing); #17 x 1" brads; stain; finish.

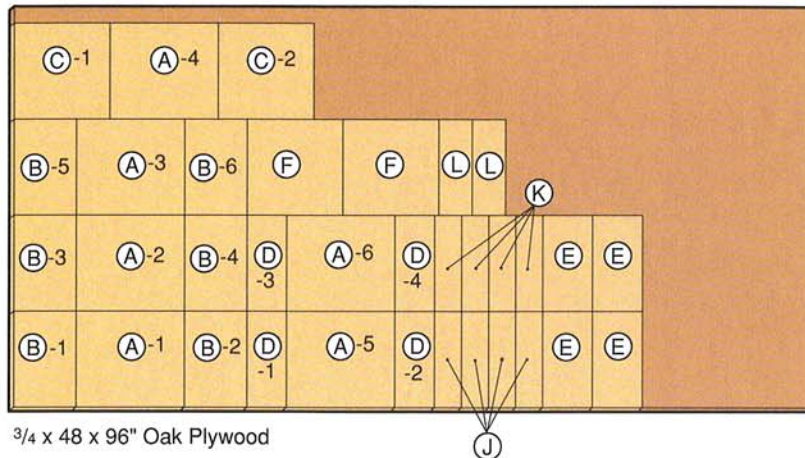
Buying Guide

12"-dia. Turntable Bearing. 1,000-lb. nominal capacity. Screws not included. Catalog no. 02Z51. \$8.95 plus \$4.50 shipping and handling. Woodcraft, 210 Wood County Industrial Park, P.O. Box 1686, Parkersburg, WV, 26102-1686. Phone 800/225-1153.

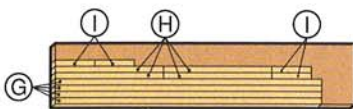


NOTE: Cabinet is shown rotated 90° with respect to base.

SIDE VIEW

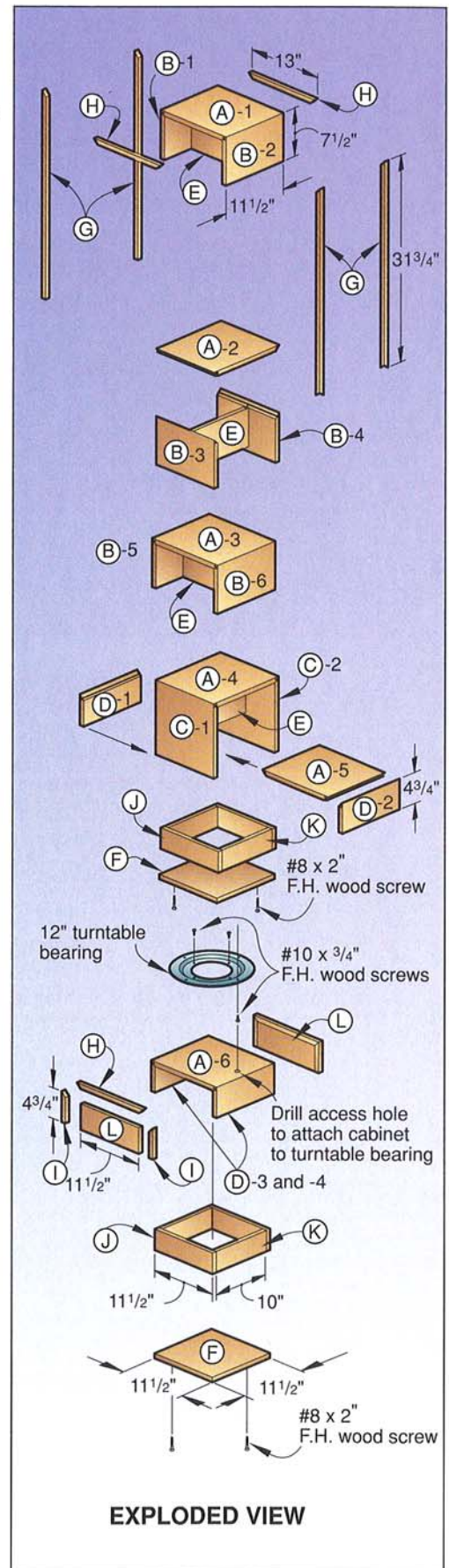


3/4 x 48 x 96" Oak Plywood



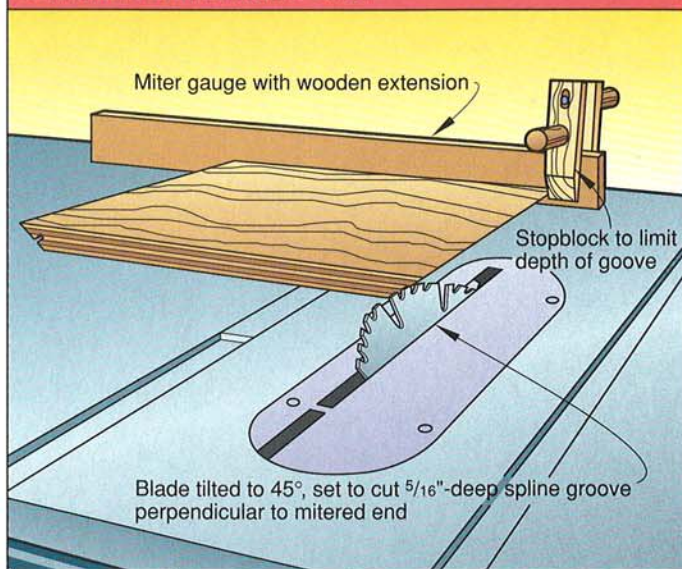
3/4 x 7 1/4 x 48" Oak

CUTTING DIAGRAM



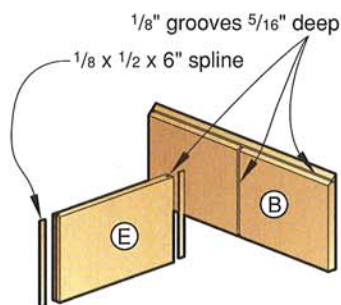
EXPLODED VIEW

GROOVING THE MITERED ENDS

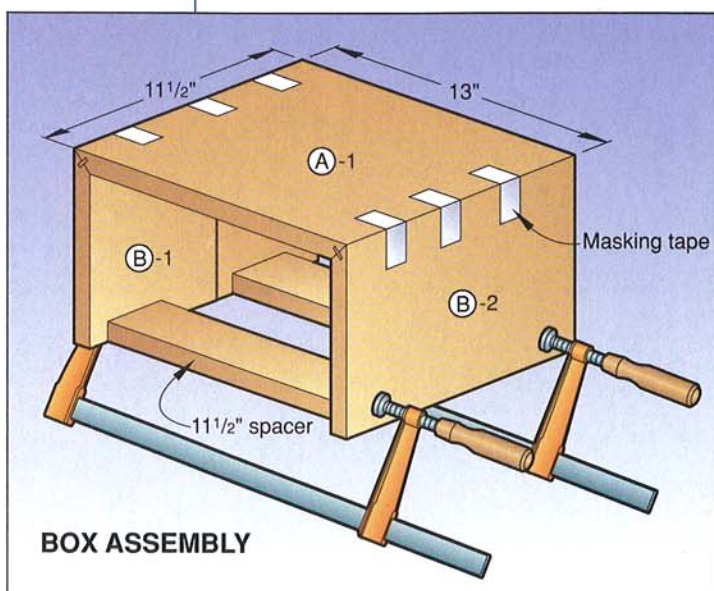


Now, Assemble the Cabinet Level by Level

First, glue up a three-sided box for each level as shown on the Box Assembly drawing below, starting with the top level. To do this, dry-assemble the top panel (labeled A-1) and the top front panels (B-1 and B-2) using two 11½"-long splines. Check for fit and for square, then glue up and spline the top level. (We taped the mitered joints with masking tape to hold them snugly together. To keep the box square, we cut 11½"-wide spacers from our plywood scrap and clamped them between the sides.) Wipe away any glue squeeze-out with a damp cloth.



SPLINE GROOVES



BOX ASSEMBLY

2 When the glue has dried, repeat the previous step for each of the four remaining levels plus the base. To make the second level, use top panel A-2 and top front panels B-3 and B-4. For the third level, use top panel A-3 and top front panels B-5 and B-6. Then, make the fourth level using A-4 and the two middle front panels, C-1 and C-2. Use A-5 and bottom front panels D-1 and D-2 for the fifth level and A-6, D-3, and D-4 for the base. (For part number reference, see the Exploded View drawing.)

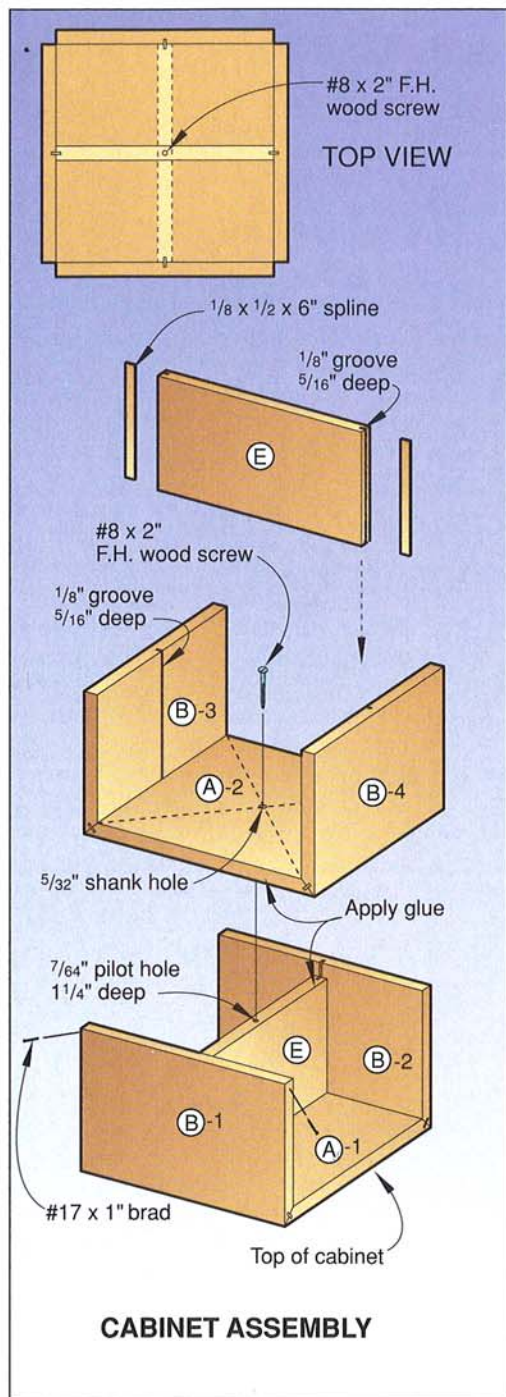
3 Assemble the five levels and the base upside down as shown in the Cabinet Assembly drawing opposite, beginning with the two top levels. To do this, first dry-fit a divider into position in the top level using two 6"-long splines. Measure the divider for length to make sure that it will leave exactly enough clearance for the top panel of the second level where shown in the drawing. Then, trim the divider and splines as necessary. Glue, spline, and clamp the divider, then wipe away any glue squeeze-out.

4 When the glue has dried, dry-assemble the second-level box to the top level, and check for fit. Then, draw diagonal lines to find the center on the bottom face of the second-level top panel. Drill shank and pilot holes on this point as dimensioned on the Cabinet Assembly drawing. Now, glue, screw, and clamp the second level to the top level, also driving brads diagonally where shown. (We drilled 1/16" pilot holes for the brads to avoid splitting our stock.)

5 Next, dry-fit a divider and two splines into position in the second-level box as you did in Step 3 above. (See our tip opposite about matching grain in the dividers.) Again, trim these parts to length to allow the proper clearance for the next top panel. Then, glue, spline, and clamp the divider.

6 Repeat steps 4 and 5 to assemble the three remaining cabinet levels. In the bottom level, glue and clamp the interior frame pieces (J and K) into position instead of a divider. (See the Exploded View drawing. Also, see our tip opposite on French-rolling the mitered corners.)

7 When the glue has dried, measure the actual outside dimensions of the cabinet. Then, rip and miter-cut the edge pieces (G, H, and I) to size from 3/4"-thick solid oak stock. (Ours measured 31¾", 13", and 4¾" long respectively.) Now, glue and clamp the edge pieces to one side of the cabinet at a time.



8 To finish assembling the base, glue and clamp edge pieces (H and I) to the base end panels (L). After the glue has dried, glue and clamp the end panels to the base. Then, glue and clamp the interior frame (J and K) into the base.

Finish Your Carousel, Then Put a Spin on It

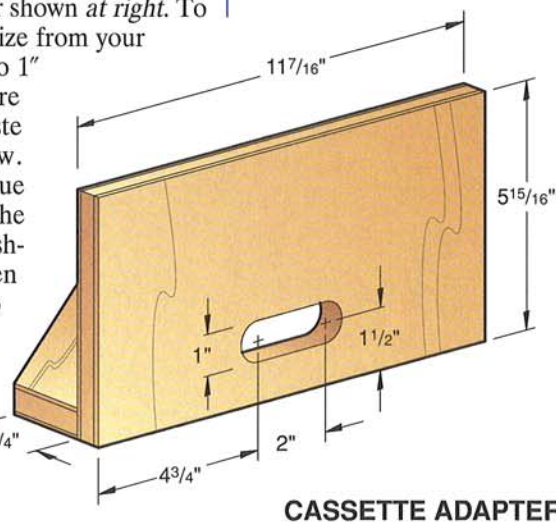
1 Apply filler to any spots that need it. Then, finish-sand all surfaces. (We used a random-orbit sander with 80-, 120-, and then 180- grit

sanding discs.) Next, apply your choice of finish. (We brushed on Minwax Colonial Maple stain, allowed it to penetrate for 10 minutes, then wiped off the excess. After the stain had dried overnight, we sprayed on three coats of Minwax Fast-Drying Satin Polyurethane, leveling the finish between coats with 0000 synthetic steel wool.)

2 After the finish has dried thoroughly, turn the cabinet and the base upside down, and attach a bottom panel (F) to the interior frame of each assembly using #8x2" flathead wood screws. Next, draw diagonal lines on the cabinet bottom and the top of the base to find the center of each. Use the diagonals to center a 12"-diameter turntable bearing ("lazy Susan") on the base top. (See our Buying Guide for a mail-order source.) Drill 5/32" pilot holes 5/8" deep, then attach the turntable using four #10x3/4" round-head wood screws.

3 Trace the turntable access hole onto the base top. Then, remove the turntable from the base, and bore the hole. (Ours was 3/4" in diameter. We used a Forstner bit in our drill press as well as a backup board.) Now, reattach the turntable, flip the base over, and center it on the cabinet bottom using the diagonal lines. Rotate the base 90° to make sure that it's centered on all sides. Then, use the access hole to trace the turntable screw-hole locations onto the cabinet bottom. Remove the base, and drill pilot holes as in the previous step. Screw the turntable to the cabinet bottom, then reattach the bottom panel to the base. (We found a magnetic screwdriver helpful.) Turn your carousel rightside up, and check to see that it spins freely.

4 To convert the cavities to hold cassette tapes, build the adapter shown at right. To do this, cut the pieces to size from your leftover plywood. Bore two 1" holes for the handhold where shown, then cut out the waste using a portable jigsaw. Assemble the parts using glue and finish nails, then set the nails and fill the holes. Finish-sand the adapter, and then finish the front face to match the carousel. (**Note:** The adapter offers flexibility—you're not stuck with cavities that will hold either CDs or cassettes but not both.) ■



TIP Plywood is almost always manufactured with a good surface and a not-so-good surface. (The not-so-good surface on our plain-sliced plywood, for example, is rotary-sliced.) Since both divider surfaces will be visible on the assembled cabinet, we recommend that you match the divider grain on alternate levels. In other words, make sure that the good divider surface faces the same direction on the first and third levels and on the second and fourth levels.

TIP If your mitered joints don't come together perfectly, we recommend the "French roll." Simply run the rounded shaft of a screwdriver along the mitered corner, applying a fair amount of pressure. This will usually close up any small gaps. If the French roll doesn't do the trick, we recommend FIX Wood Patch in the appropriate color.

Mobile Crane

A full-action toy for your favorite little operator



When our kids field-tested this design, they gave it a unanimous “thumbs up” for interest-holding power. They spent hours out in the sandbox, rotating the crane on its turntable, raising and lowering the boom, and hoisting heavy payloads. In fact, we suggest you build at least two of these. We got mighty impatient waiting for them to give the grownups a turn.

Start by Building the Truck

Note: This project requires thin stock. You can plane or resaw thicker stock to the thicknesses needed.

1 From a $\frac{3}{4} \times 5\frac{1}{4} \times 12$ " piece of stock, cut the truck chassis (A), axle housings (B and C), and bumper brace (D) to the dimensions listed in the Bill of Materials. (We selected cherry.)

2 Lay out and drill the $\frac{7}{16}$ " holes on one edge of the axle housings where shown on the Side View drawing *opposite*. (We used a brad-point bit and clamped a fence to our drill-press table. We clamped the parts to it before drilling.) Next, counterbore a centered $\frac{5}{8}$ " hole $\frac{1}{2}$ " deep on one face of the rear housing. (See the Chassis Bottom View drawing on page 20.) Switch to a $\frac{1}{4}$ " bit, center it in your $\frac{5}{8}$ " hole, and drill through the part. Now, finish-sand the chassis parts.

3 From a 36" length of $\frac{3}{4} \times 5\frac{1}{4}$ " stock, cut the two cab floor sections (E) to size. (We used maple.) Now, resaw a $3 \times 9\frac{1}{2}$ " piece of this same stock to $\frac{3}{8}$ " thick, and cut three 3×3 " blanks for the truck cab walls (F) and boom rest wall (G). Using double-faced tape, stack the three blanks face-to-face, aligning the edges.

4 Make copies of the full-sized Cab Wall, Crane Left Wall and Right Wall, and Boom patterns shown on pages 20, 21, and 23, and cut them out. Adhere the Cab Wall pattern to the top piece on the stack, aligning the edges.

5 Drill the start hole through the window on the pattern, and scrollsaw it to shape. Then, angle-cut the front edge using your bandsaw. Separate the three pieces, leaving the pattern in place on the top piece. Bandsaw the top piece where shown to make the boom rest wall.

6 Rip and crosscut a piece of $\frac{3}{4}$ "-thick maple stock to $7\frac{1}{8} \times 12$ ", then resaw it to $\frac{3}{8}$ " thick. From this piece, crosscut the cab back wall (H) and the rear boom rest (I). Next, tilt your blade to 30° from square, and bevel-cut the front boom rest (J) and the front cab wall (K). Now, bore a $\frac{5}{8}$ " hole through the back cab wall. (See the Exploded View drawing and Bill of Materials.)

7 To make the grille (L), first prepare a $\frac{3}{4} \times 5\frac{1}{4} \times 36$ " piece of contrasting stock. (We chose walnut.) To do this, rip and crosscut a

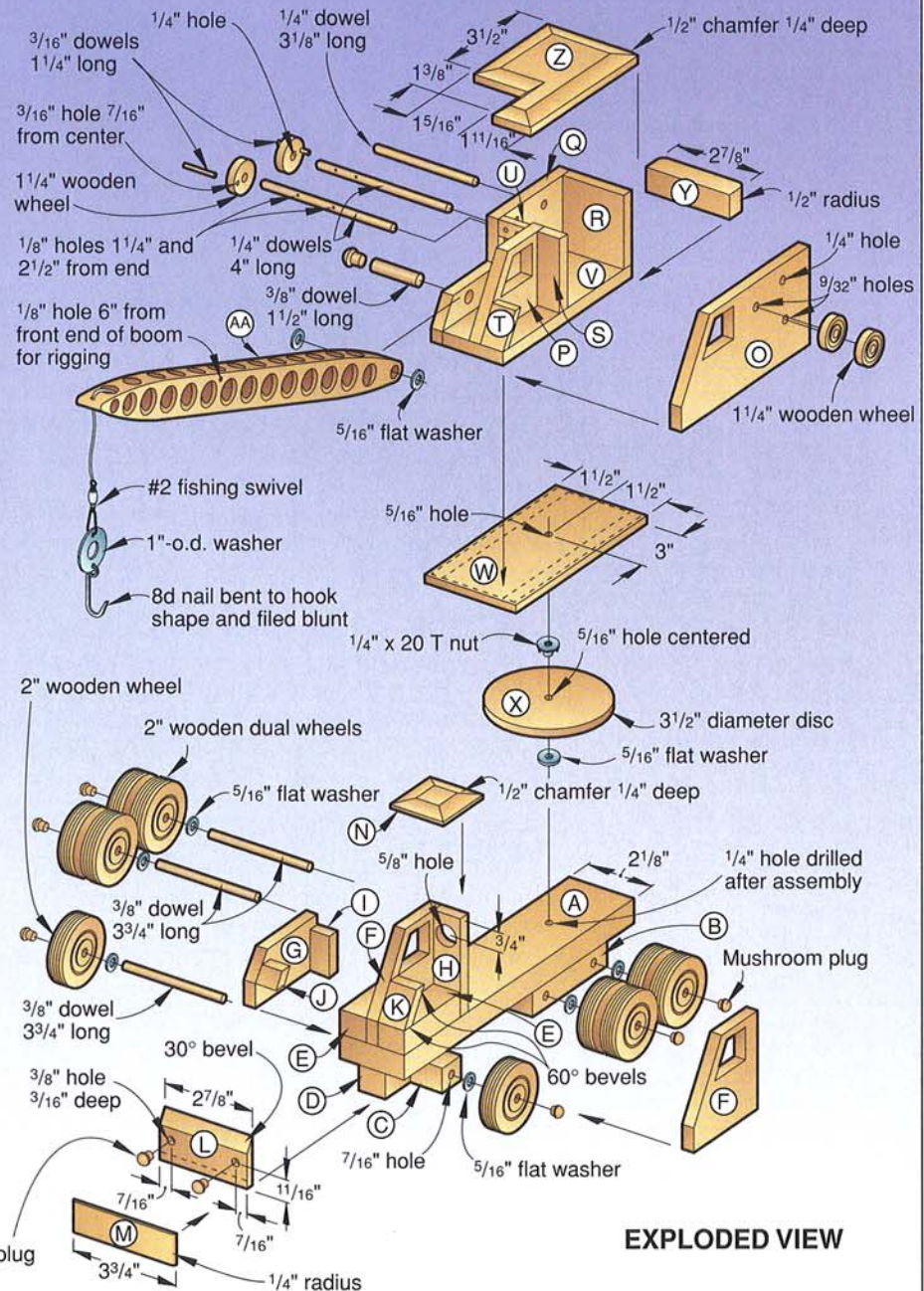
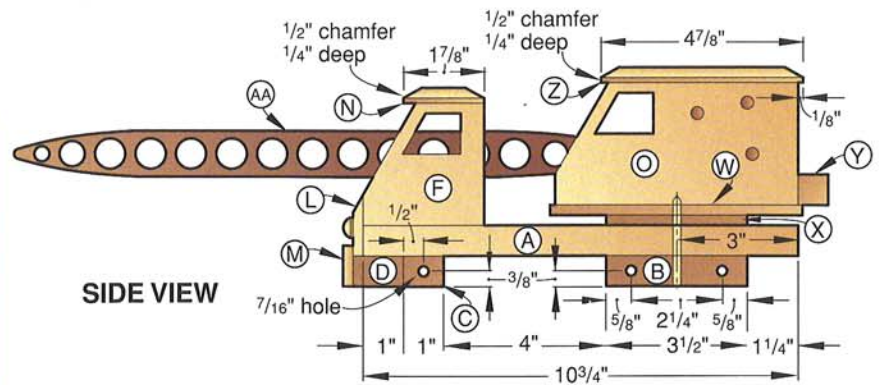
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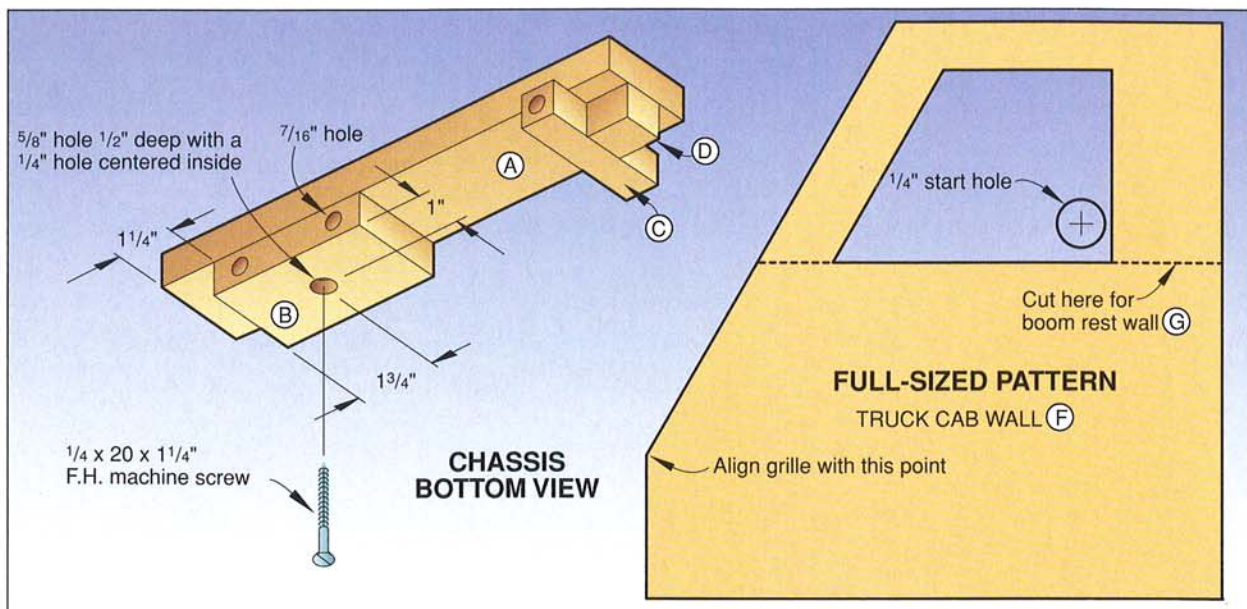
BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A chassis	3/4"	2 1/8"	10 3/4"	C	1
B axle housing	3/4"	2 1/8"	3 1/2"	C	1
C fr. axle housing	3/4"	1"	3"	C	1
D bumper brace	3/4"	1"	1 1/4"	C	1
E truck cab floors	3/4"	7/8"	25 1/8"	M	2
F truck cab walls	3/8"	3"	3"	M	2
G boom rest wall	3/8"	1 3/4"	3"	M	1
H* cab back wall	3/8"	7/8"	3"	M	1
I* rear boom rest	3/8"	7/8"	1 1/4"	M	1
J* front boom rest	3/8"	7/8"	7/8"	M	1
K* cab front wall	3/8"	7/8"	1 1/4"	M	1
L* grille	1/4"	1 1/2"	27 1/8"	W	1
M* bumper	1/4"	1"	3 3/4"	M	1
N truck cab roof	3/8"	1 3/4"	17 1/8"	W	1
O crane left wall	3/8"	2 3/4"	6"	M	1
P* crane middle wall	3/8"	2 1/4"	3"	M	1
Q crane right wall	3/8"	2 3/4"	6"	M	1
R crane back wall	3/8"	2 1/8"	2 1/4"	M	1
S* cab back wall	3/8"	7/8"	2 1/4"	M	1
T* cab front wall	3/8"	7/8"	1 1/4"	M	1
U cable guide	3/8"	1/2"	7/8"	M	1
V crane floor	1/2"	2 1/8"	6"	M	1
W crane base	3/8"	3"	6 1/8"	W	1
X turntable bearing	3/8"	3 1/2" dia.		W	1
Y* counterweight	3/4"	3/4"	27 1/8"	W	1
Z crane roof	3/8"	3"	4 7/8"	W	1
AA boom	3/4"	1 1/8"	15"	W	1

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

Materials Key: C—cherry; M—maple; W—walnut.





Stock Required: 3/4x5 1/4x12" cherry; 3/4x5 1/4x36" maple; 3/4x5 1/4x36" walnut.

Supplies: 3/16" and 3/8" hardwood dowel stock; 1/4" walnut dowel stock; 1/4x20 T-nut; 1/4x20x1 1/4" F.H. machine screw; 1/16"-thick nylon line; 5/16" and 1"-o.d. flat washers; #2 fishing swivel; 8d nail; sanding sealer; finish.

Buying Guide

Crane Kit. Includes 2—2"-dia. wooden wheels with tread; 4—2"-dia. dual wooden wheels with tread; 4—1 1/4"-dia. wooden wheels with tread; 7—3/8" walnut mushroom plugs; 2—3/8" birch mushroom plugs. Part no. 1386. \$5.95 plus \$3.50 shipping and handling. (Minn. residents add 6.5% sales tax.) Meisel Hardware Specialties, P.O. Box 70WEW, Mound, MN 55364-0070.

30° Chamfering Bit. Carbide-tipped, 1/4" shank, 5/8" cutting surface. Catalog no. CT1185. \$18.95 plus \$4.95 shipping and handling. Trendlines, 375 Beacham St., Chelsea, MA 02150. Phone 800/767-9999.

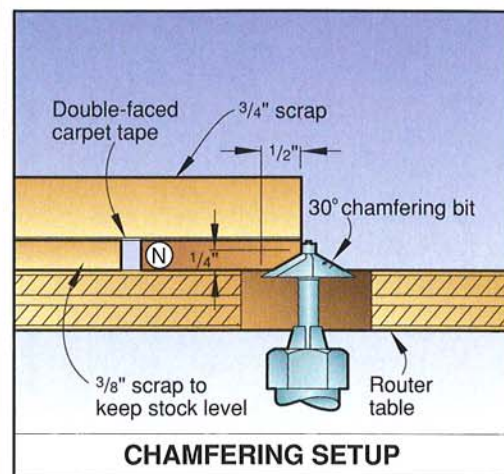
1 1/8x18" piece, and set it aside for the boom and counterweight. Then, plane or resaw the remainder to 3/8" thick. From this stock, rip and cross-cut the grille to 1 1/2x27 1/8", then use your bandsaw and fence to resaw it to 1/4" thick. (For safety's sake, we adhered the grille to a sliding carrier board.) Now, lay out and drill headlight holes where shown and dimensioned on the Exploded View drawing. (**Note:** Bevel the grille after gluing it to the cab.)

8 From 3/4"-thick maple stock, bandsaw the bumper (M) to size. Then, resaw it to 1/4" thick using your bandsaw and the sliding carrier board from the previous step. Now, sand a 1/4" radius at each end where shown on the Exploded View drawing.

9 For the truck cab roof (N), cut a piece of 3/8"-thick walnut to the dimensions listed on the Bill of Materials. Then, rout a 1/2" chamfer 1/4" deep along the edges where shown on the Exploded View drawing. (See the Chamfering Setup drawing at right. To order a 30° chamfering bit, see our Buying Guide.)

Now, Assemble The Truck Cab and Chassis

1 Dry-assemble and clamp the cab parts (E, F, G, H, I, J, and K) where shown on the Exploded View drawing to check for fit. Sand the parts as necessary. When everything fits, glue, assemble, and clamp the cab. Wipe off any glue squeeze-out with a damp cloth.



2 After the glue has dried, sand the front end of the cab assembly smooth. Next, glue and clamp the grille to this surface. After the glue has dried, sand all parts of the angular front cab wall flush, including the top edge of the grille. (We used our stationary belt sander.)

3 Glue and clamp the axle housings and bumper brace to the underside of the chassis where shown on the Side View drawing. Then, turn the chassis facedown. Using the existing hole in the rear axle housing as a guide, drill a 1/4" hole through the chassis.

4 Center, glue, and clamp the cab to the chassis. Next, glue and clamp the bumper to the grille and bumper brace where shown. Then, center, glue, and clamp the roof to the cab. Glue

a $\frac{3}{8}$ " walnut mushroom plug into each wheel for a hub and birch plugs into the two grille holes for headlights. (See our Buying Guide for a mail-order source for the wheels and plugs.)

5 Apply the finish of your choice to the assembled truck and to the wheels. (We sprayed on a coat of sanding sealer and two coats of Minwax Fast-Drying Satin Polyurethane, sanding between coats with 320-grit sandpaper.)

6 Cut three $3\frac{3}{4}$ " lengths of $\frac{3}{8}$ " dowel stock for the wheel axles. Insert the axles through the three chassis holes, then add the $\frac{5}{16}$ " flat washers where shown on the Exploded View drawing. Now, glue the wheels to the dowel ends.

Let's Cut the Crane Parts Next

1 To make the crane walls (O, P, and Q), cut three 3×6 " blanks from $\frac{3}{8}$ "-thick maple. Stack them face-to-face using double-faced carpet tape. Adhere the full-sized Crane Left Wall pattern to the top piece, aligning the edges. Next, lay out and drill one $\frac{1}{4}$ " and two $\frac{9}{32}$ " holes. Drill the start hole in the window, then scrollsaw it to shape. Now, remove the left crane wall (O) from the stack, and set it aside.

2 Adhere the Crane Right Wall pattern to the top piece of the two-piece stack (P and Q). Then, drill the $\frac{3}{8}$ " hole through both. Next, separate these walls, and set the bottom piece (Q) aside. Following the pattern, cut the rectangular notch in the crane right wall (Q). (**Note:** Don't drill the $\frac{7}{32}$ " holes yet—we'll do that later.)

3 Use a pushstick to rip and crosscut the crane middle wall (P) to $2\frac{1}{4}\times 3$ " where shown on the pattern. From $\frac{3}{8}$ "-thick maple, cut the crane back wall (R) and the crane cab back wall (S) to size. Bandsaw the crane cab front wall (T) to width, then tilt your bandsaw table to 30° from square to bevel-cut both ends to length.

4 For the cable guide (U), rip a 4" rough length of this same stock to $\frac{1}{2}$ " wide. Drill two $\frac{1}{8}$ " holes where shown on the full-sized Cable Guide pattern on page 23, then bandsaw the guide to length. Next, cut the crane floor (V) to size from $\frac{3}{4}$ "-thick maple, and bandsaw it to $\frac{1}{2}$ " thick. Now, finish-sand all crane parts.

5 From $\frac{3}{8}$ "-thick walnut, cut the crane base (W) to size. Draw diagonal lines on one face to lay out the centered $\frac{5}{16}$ " hole. Then, drill the hole through the base. To make the turntable bear-

ing (X), cut a $3\frac{1}{2}$ "-diameter disc from the same stock. (We used a wing-type circle cutter on our drill press.) Enlarge the center hole to $\frac{5}{16}$ ", then drive a $\frac{1}{4}\times 20$ T-nut into the hole. Now, finish-sand all crane parts that still need it.

Now, Assemble the Crane

1 Dry-assemble and clamp the maple crane parts (O, P, Q, R, S, T, U, and V). Sand any parts that need adjustment. Then, glue, assemble, and clamp the cab. Wipe off any squeeze-out with a damp cloth, and allow the glue to dry.

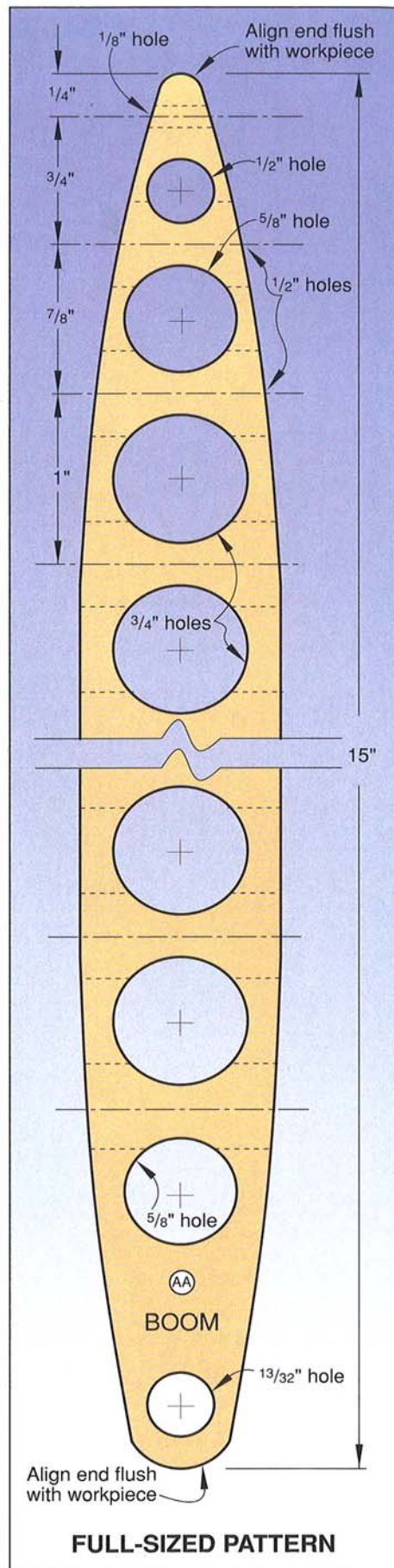
2 Glue and nail the turntable bearing to the cab base. (We used $\#16\times\frac{3}{4}$ " brads. To align the holes in these parts, we screwed a $\frac{1}{4}\times 20\times 1\frac{1}{4}$ " flathead machine screw up through the T-nut in the turntable bearing, allowing the screw tip to protrude into the hole in the base.)

3 Measure the actual width of the crane cab, then bandsaw the counterweight (Y) to size from the 18" length of $\frac{3}{4}$ "-thick walnut stock you set aside. Lay out and bandsaw a $\frac{1}{2}$ " radius at each end where shown on the Exploded View drawing. Finish-sand the part, then glue and clamp it along the bottom of the cab rear wall.

4 From $\frac{3}{8}$ "-thick walnut, bandsaw the crane roof (Z) to shape. (See the Exploded View drawing.) Chamfer the outside edges using the router-table setup shown in the Chamfering Setup drawing. Then, use your 1" belt sander to chamfer the notch edges and a fine-tooth file to square the inside corner.

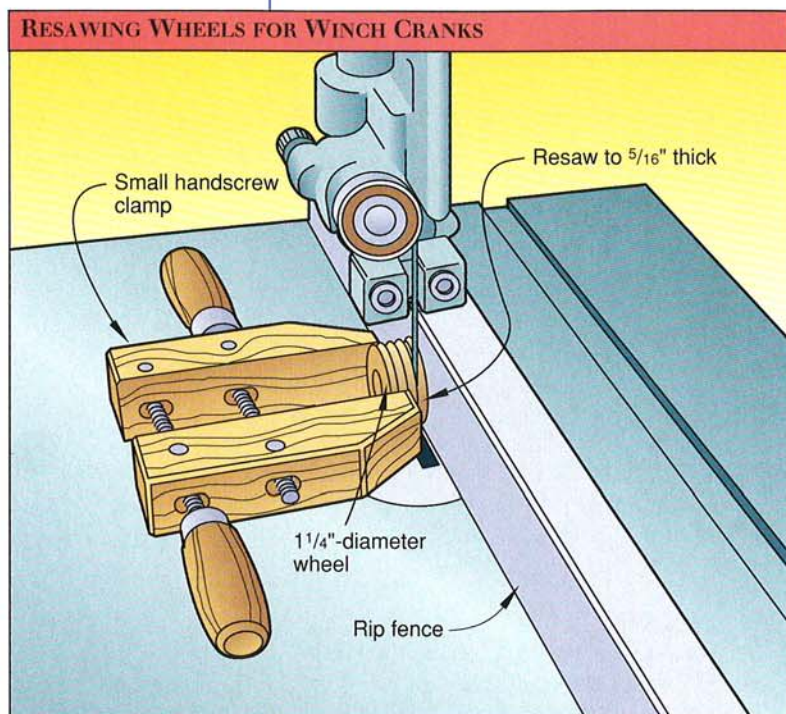
5 Center, glue, and clamp the crane assembly to the top of the base. (**Note:** The base should protrude $\frac{1}{16}$ " on all sides.) After the glue has dried, apply finish using the same procedure you followed for the truck.

6 To make two winch axles and a secondary axle, crosscut two 4" lengths and one $3\frac{1}{8}$ " length of $\frac{1}{4}$ " walnut dowel. Drill two $\frac{1}{8}$ " holes $\frac{1}{2}$ " apart through one of the 4" lengths starting 1" from one end. In the second 4" length, drill $\frac{1}{8}$ " holes $1\frac{1}{4}$ " and $2\frac{1}{2}$ " from one end. Now, sand a round-over on the ends of all three axles.



7 Make the winch cranks by resawing four 1 1/4"-diameter wooden wheels to 5/16" thick as shown *below*. Sand the wheels smooth, then lay out and drill a 3/16" hole 7/16" from the center on two of them. Now, temporarily assemble both winches as shown on the Exploded View drawing, positioning the drilled wheels on the right side of the crane.

8 Using the 3/16" hole you drilled in the two wheels, mark centerpoints for four holes one-quarter turn apart on the crane right wall. (We



TIP Before you assemble and glue the winches, check the Exploded View drawing to make sure you've oriented the boom winch axle and the hoist winch axle in the right direction and that you've inserted them into the correct holes. Before gluing the crank wheels onto each axle, be sure you space them far enough apart to allow the axle 3/8" of lateral play. This will permit the winch to turn freely when you disengage the handle/stop from the stop hole.

used an awl. For reference, see the Crane Right Wall pattern.) Now, disassemble the winches, and drill 7/32" holes through the wall.

9 Cut two 1 1/4" lengths of 3/16" dowel. Insert and glue them into the two 3/16" crank holes so that 5/16" of each dowel protrudes beyond the inside crank faces. (See our tip about winch assembly *at left*.) Next, apply finish to the four winch wheels, and allow it to dry. Reassemble the two winches in their respective holes in the cab walls, this time using glue. Now, glue the secondary axle into the 1/4" holes.

Build and Install the Boom Next

1 For the boom (AA), trim the remainder of your 3/4x1 1/8x18" piece of walnut stock to 15" long. Adhere the two pieces of the Boom pat-

tern to the ends of one face. Then, lay out the holes not shown on the pattern using your combination square. (Starting from the front end, we transferred the four edge-hole centerlines onto one edge. We marked 10 more centerlines at 1" intervals and then drew a lengthwise centerline along this 3/4"-wide edge.)

2 Place the boom on edge on your drill-press table. Drill the 1/8" tip hole where marked. Then, drill a 1/2" hole at each intersection of centerlines. To do this, position and clamp a fence to the drill-press table, and brace the boom against it. (For this and the following step, we used Forstner bits for the larger holes, brad-point bits for the smaller ones, and a backup board to prevent tear-out.)

3 Turn the boom faceup. Using the pattern centerpoints as guides, mark centerpoints for seven additional 3/4" holes at 1" intervals between the pattern halves. Now, bore the 15 holes as dimensioned on the pattern. To rig the boom later, lay out and drill a 1/8" hole through the boom 1/8" from the edge where shown on the Exploded View drawing.

4 Following the pattern lines, bandsaw and sand the boom to shape. Then, finish-sand the part, and apply finish as before.

5 Crosscut a 1 1/2" length of 3/8" dowel. Use it to attach the boom to the crane cab, inserting 5/16" flat washers where shown. Drive the dowel into the hole to a depth of 3/16", then glue a 3/8" walnut mushroom plug in the hole.

Now, for the Rigging And Final Assembly

1 To rig the boom winch, first cut an 18" length of 1/16" nylon line. Knot one end of the line, and thread it through one of the holes in the rear winch axle, then up over the secondary axle above, through one of the holes in the cable guide, through the 1/8" hole in the boom face, and then back through the opposite set of matching holes. Lay the boom flat in the boom rest. Remove most of the slack from the line, knot it at the axle, and cut off the excess line. Apply a drop of instant glue to weld the knots.

2 For the hoist line, cut a 36" length of line, knot one end, and thread the line through the axle hole 2 1/2" from the crank end. Run the line laterally along the axle, thread it through the other hole, and then bring the loose end forward

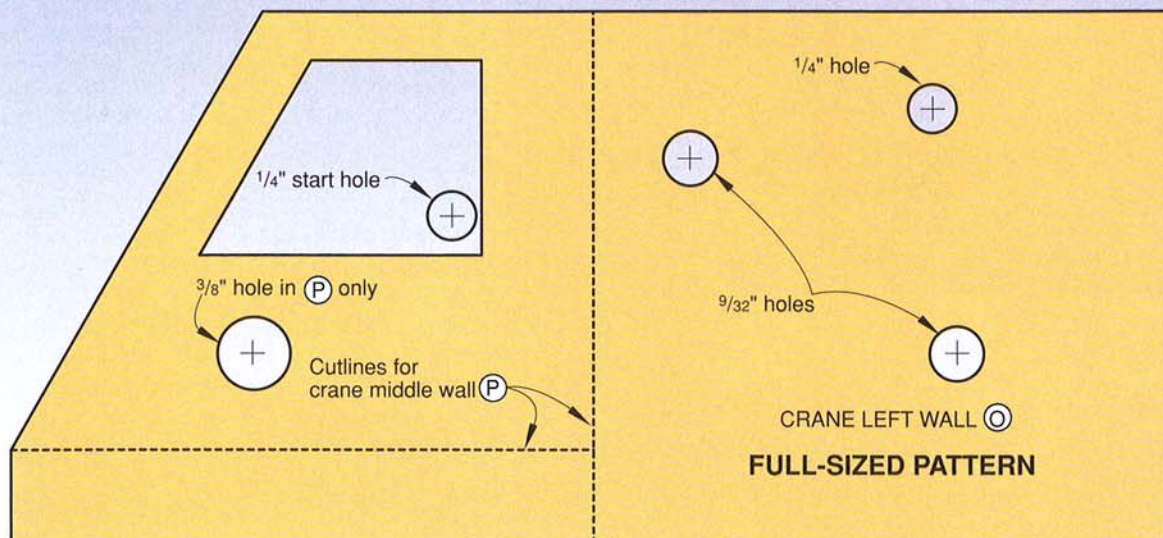
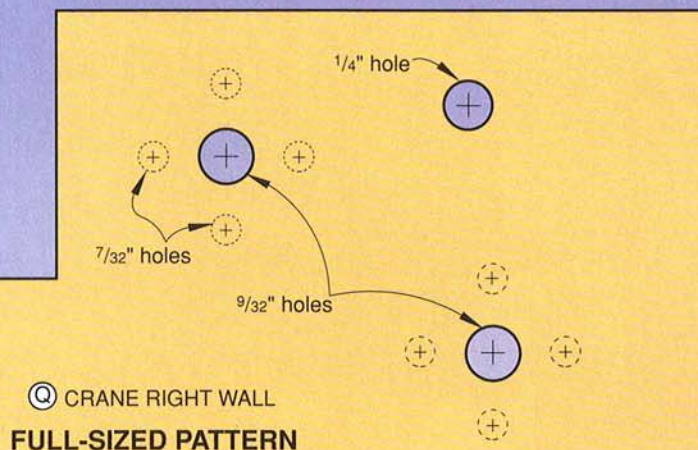
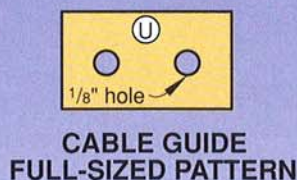
through the first boom hole and out at the tip where shown on the Exploded View drawing.

3 To make a hook, clip the head off an 8d nail, and file the tip to a blunt end. Using needle-nosed pliers, bend the tip double, then bend a small loop at the other end. Next, drill two $\frac{1}{8}$ " holes on opposite sides of a heavy 1"-o.d. flat washer. Attach the hook to one hole, soldering the loop to close it. Now, clip a #2 fishing swivel to the other hole, and tie it to the hoist line.

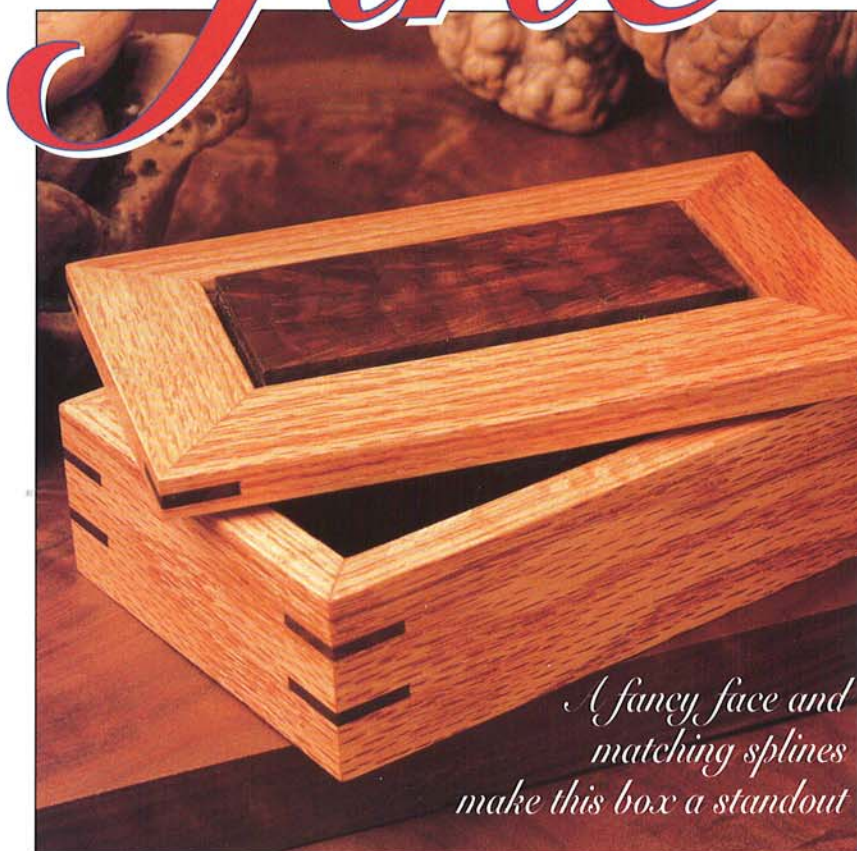
4 Apply finish to the top face of the crane roof. After the finish has dried, center, glue, and clamp the roof to the crane. Wipe away any squeeze-out, and allow the glue to dry.

5 Fit a $\frac{5}{16}$ " flat washer over the machine screw protruding from the chassis. Center the crane on the chassis, align the holes, and drive the screw into the T-nut in the turntable bearing. Tighten the screw enough to stabilize the parts but not enough to prevent rotation. ■

Project design: Thomas Stutzman, Melbourne, Fla.
Illustrations: Roxanne LeMoine, Carson Ode
Project builder: Chuck Hedlund
Photograph: King Au



Splined so *fine*



*A fancy face and
matching splines
make this box a standout*

A pretty fair number of ornamental box designs cross our desks, so we have to be picky about which ones we present to you. We think you'll be impressed with the dazzling results you achieve with this project, especially for the amount of work it requires. You'll also appreciate the versatility of this box—it makes a terrific gift for man, woman, or child.

Let's Start with the Basic Box

1 Plane one edge of a $3\frac{1}{2} \times 24$ " piece of $\frac{3}{4}$ "-thick stock on your jointer. (We selected red oak.) Rip a $1\frac{3}{4}$ "-wide strip from this edge, then plane or resaw it to $\frac{1}{2}$ " thick.

2 To cut a groove for the bottom panel, first check the actual thickness of your $\frac{1}{4}$ "-thick plywood stock. If the stock measures exactly or slightly less than $\frac{1}{4}$ " thick, fit your tablesaw with a $\frac{1}{4}$ " dado set elevated to $\frac{3}{16}$ ". If the stock measures closer to $\frac{3}{16}$ ", use your regular $\frac{1}{8}$ "-thick blade, and adjust your fence slightly before making a second pass. Cut a full-length groove $\frac{1}{4}$ " from the edge of one face.

3 Crosscut the box ends (A) and sides (B) to $\frac{1}{8}$ " longer than the lengths listed in the Bill of Materials. (We cut our parts in A-B-A-B order so the grain would run continuously around the box.) Next, tilt the blade to 45° . Check the angle using your combination square, then miter-cut both ends of each part to finished length. (We attached an extension to our miter gauge and clamped a stopblock to it to ensure accurate cuts.)

4 From $\frac{1}{4}$ "-thick oak plywood, cut the bottom panel (C) to the dimensions listed on the Bill of Materials. Now, dry-assemble the ends, sides, and bottom panel, and sand as necessary until everything fits. Then, glue the two sides to one end. Apply glue to the edges of the bottom panel, and slide it into its groove. Glue the other end in position, then clamp the box. Check for square, and allow the glue to dry.

Machine the Lid And Face Panel Next

1 To make the lid ends (D) and sides (E), first rip a $1\frac{1}{8} \times 24$ " strip from the same stock you used for A and B. Next, cut a full-length groove on one edge to receive the face panel. To do this, elevate your tablesaw blade to $\frac{1}{4}$ ", set your rip fence $\frac{3}{16}$ " from the blade, and use a pushstick.

2 To bevel-cut the lid stock to thickness, first move your rip fence to the side of the blade opposite its direction of tilt, then tilt the blade to 6° from square. (See Step One of the Lid-Cutting Sequence drawing *opposite*.) Now, bevel-cut the stock using a pushstick.

Continued

BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A* box ends	1/2"	1 3/4"	4 1/2"	O	2
B* box sides	1/2"	1 3/4"	7"	O	2
C bottom panel	1/4"	3 7/8"	6 3/8"	OP	1
D* lid ends	5/8"	1 1/8"	4 1/2"	O	2
E* lid sides	5/8"	1 1/8"	7"	O	2
F face panel	1/2"	2 3/4"	5 1/4"	W	1
G liner panel	1/8"	3 3/8"	5 7/8"	H	1

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

Materials Key: O—oak; OP—oak plywood; W—walnut; H—hardboard.

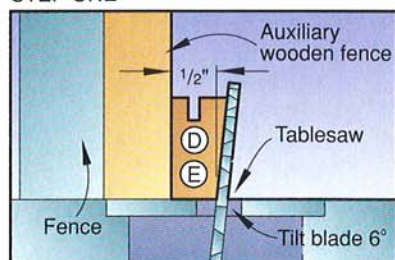
Supplies: Oil finish, velvet, quick-set epoxy.

Buying Guide

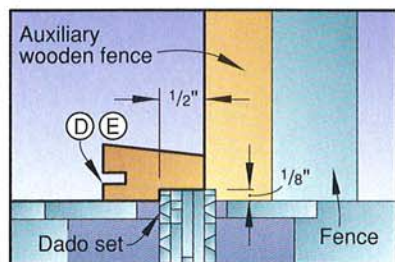
Face Panel and Spline Stock. Includes 1/2 x 3 x 5 1/2" fancy walnut-crotch face panel and 1 1/2 x 1 1/2 x 6" spline stock. Stock no. WWP1. \$12.00 ppd. Johnson Wood Products, RR #1, Strawberry Point, IA, 52076. Phone 319-933-6504.

LID-CUTTING SEQUENCE

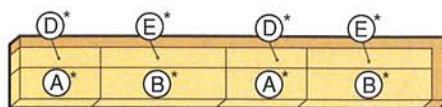
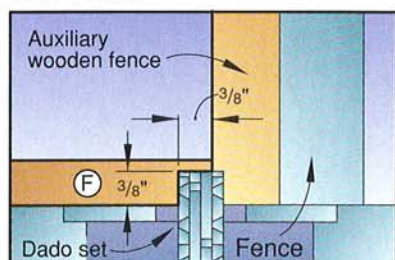
STEP ONE



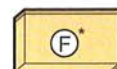
STEP TWO



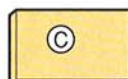
STEP THREE



3/4 x 3 1/2 x 24" Oak



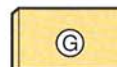
1/2 x 2 3/4 x 5 1/4" Walnut



1/4 x 3 7/8 x 6 3/8" Oak plywood

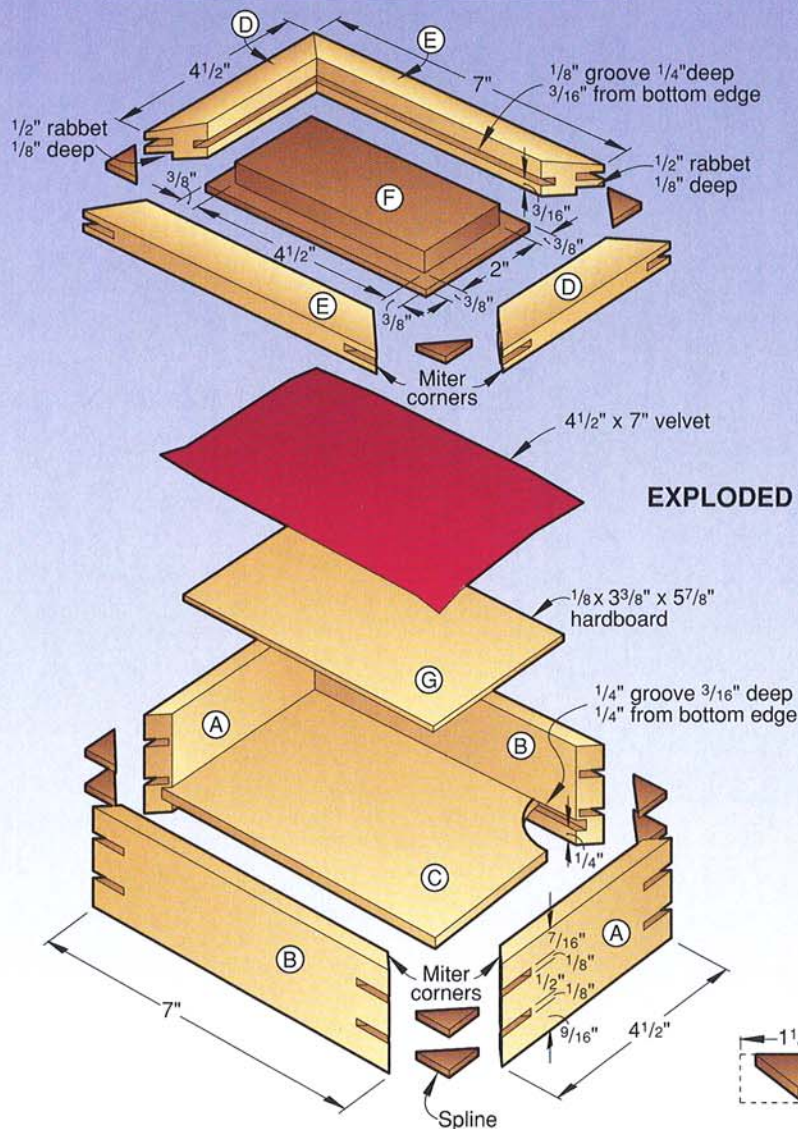
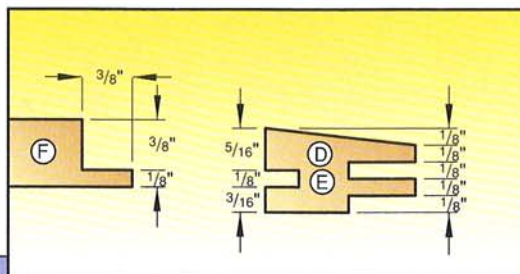


1 1/2 x 1 1/2 x 6" Walnut (for splines)



1/4 x 3 3/8 x 5 7/8" Hardboard

CUTTING DIAGRAM



EXPLODED VIEW

Project design: Todd Anderson, Shakopee, Minn.

Illustrations: Roxanne LeMoine, Carson Ode

Project builder: Chuck Hedlund

Photograph: King Au

3 Next, cut a rabbet on the bottom face of your lid stock where shown in Step Two of the Lid-Cutting Sequence. To do this, fit your tablesaw with a $\frac{5}{8}$ " dado set elevated to $\frac{1}{8}$ ". Set your rip fence $\frac{1}{2}$ " from the blade, and attach a notched, $\frac{3}{4}$ "-thick wooden auxiliary fence at least 24" long. Set the fence where shown in the drawing, and rabbet the bottom face of your lid stock along the outside edge.

4 You did the corresponding box parts, cutting them in D-E-D-E order to finished length plus $\frac{1}{8}$ ". Then, elevate your tablesaw blade to $1\frac{3}{4}$ ", and tilt it to 45° , again checking the angle. Using your miter gauge, extension, and stopblock, stand the ends and sides on edge, and miter-cut them to finished length.

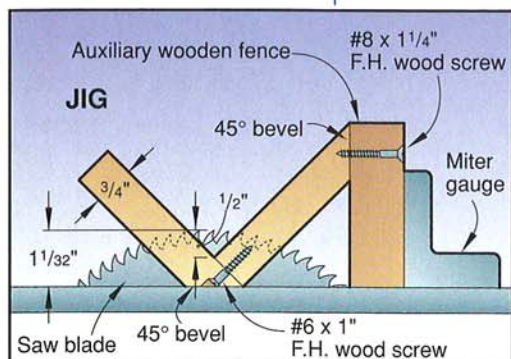
5 Next, rip and crosscut the face panel (F) to size from $\frac{1}{2}$ "-thick stock. (We chose an ornately grained piece of walnut crotch. See our Buying Guide for a mail-order source.) To rabbet the sides, fit your tablesaw with a $\frac{1}{2}$ " dado set elevated to cut $\frac{3}{8}$ " deep as shown in Step Three of the Lid-Cutting Sequence. Then, adjust the notch depth on your wooden auxiliary fence, and cut the rabbet. Now, sand the face panel smooth.

6 Dry-assemble the lid ends and sides around the face panel, and adjust the fit as necessary. Next, glue and clamp the lid at the corners, allowing the face panel to float without glue.

Build Our Simple Jig, Then Add the Corner Splines

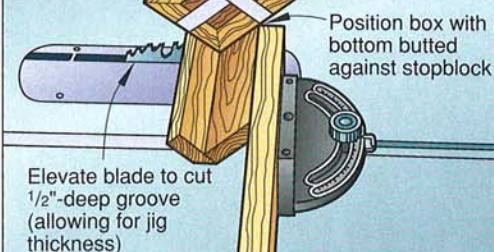
1 To cut the spline grooves, first build the jig shown below in the Jig drawing. To do this, cut two $3\frac{1}{2} \times 12$ " pieces of $\frac{3}{4}$ "-thick scrap stock. Tilt your tablesaw blade to 45° , and bevel-rip one edge of each piece. Glue and screw the two pieces where shown in the drawing, then remove the screws after the glue has dried. Position and screw the jig to your miter-gauge extension so that it extends 4" beyond the blade path.

2 Sand the top edges of the box until they're smooth and level. Then, place the lid on the box, and sand the lid flush with the box sides. (We used our stationary belt sander for both operations.)



CUTTING SPLINE GROOVES

Clamp stopblock at $\frac{9}{16}$ ", $\frac{13}{16}$ ", and $1\frac{7}{8}$ " beyond blade to cut grooves



3 Elevate your blade enough to cut $\frac{1}{2}$ " above the inside corner of the jig. (We tested our depth of cut using scrap stock.) Next, measure $\frac{9}{16}$ " beyond the kerf in the jig, and clamp on a stopblock at this point. Secure the lid to the box using masking tape, and place the box in the jig as shown above. Cut a groove in the box corner, then rotate the box to groove all four corners.

4 Reclamp the stopblock $1\frac{3}{16}$ " beyond the kerf, and again groove all four corners. To groove the lid, reset the stopblock at $1\frac{7}{8}$ " beyond the kerf. (This should center the cut on the lid edge).

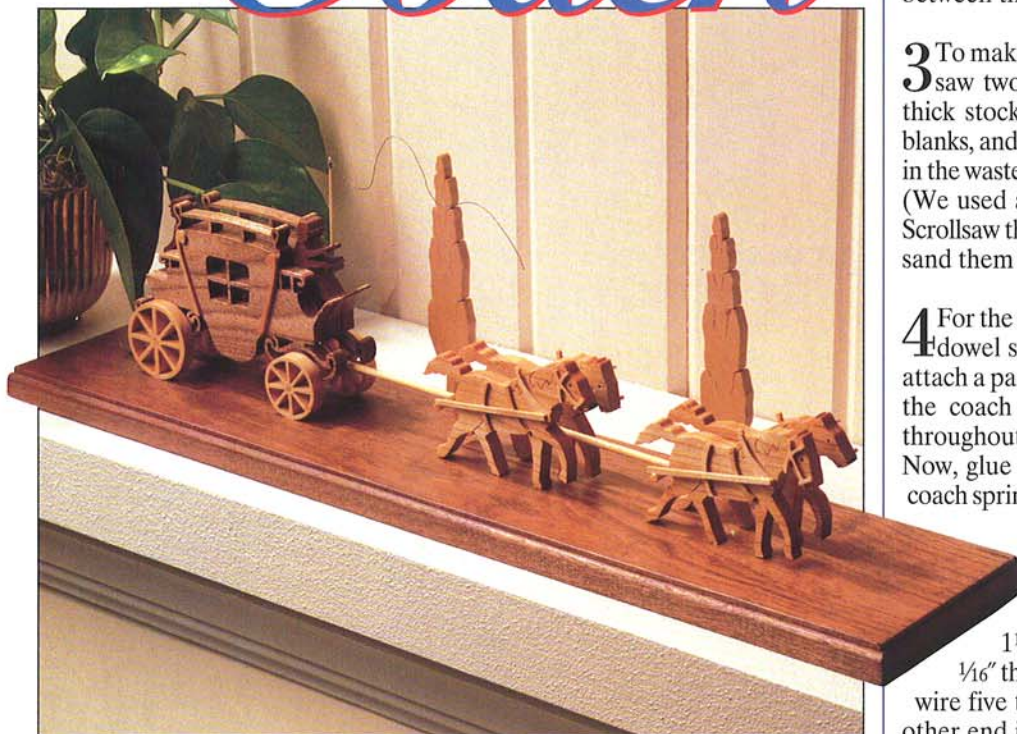
5 Resaw your walnut spline stock to a rough thickness of $\frac{3}{4}$ ". (We used a pushstick.) Then, rip several $\frac{1}{8}$ "-thick strips from the edge, and crosscut twelve 2"-long splines. Glue the splines into the grooves, and allow the glue to dry. Then, sand the splines flush with the lid and box sides. (We used our stationary belt sander.)

Finish Your Box, Then Spruce Up the Interior

1 Finish-sand the box and lid (including the interior) using 120- and then 180-grit sandpaper. Next, apply your choice of finish. (We brushed on two coats of Watco Natural Danish Oil Finish. After allowing each coat to penetrate for 30 minutes, we rubbed it with 0000 synthetic steel wool before wiping off the excess. We let the finish dry overnight, then rubbed it out with a clean cotton cloth to achieve a luster.)

2 Finally, cut and upholster the liner panel (G). To do this, measure the interior dimensions of the box, and cut a piece of $\frac{1}{8}$ "-thick hardboard that is $\frac{1}{16}$ " smaller in both width and length. (Ours measured $3\frac{3}{8} \times 5\frac{7}{8}$ ".) Cover one face with a $4\frac{1}{2} \times 7$ " piece of burgundy velvet, then epoxy and clamp the edges to the back face. (We used quick-set epoxy.) When the epoxy has cured, epoxy and clamp the liner into the bottom of the box. ■

Classic Four-in-Hand Coach



If you wanted to get from London to Birmingham in 1830, your best bet would be a bone-rattling ride aboard the "Tally-ho." Our version catches the horses in midstride and the coachman's whip in midair as the coach rumbles along the post road. This bully bit of scrollsawing will look "tip-top" on your mantel or bookcase.

Let's Build the Coach First

1 From $\frac{1}{4}$ "-thick stock, scrollsaw the two coach sides (A). (We selected walnut.) To do this, bandsaw two 3×5 " blanks, and stack them using double-faced carpet tape. Next, copy the full-sized patterns shown on page 29, and adhere the appropriate pattern to the top face. Drill a $\frac{1}{16}$ " entry hole in each waste section, and scrollsaw each to shape. (We used a #2 blade.) Saw around the outside, then sand both faces smooth. Now, separate the pieces, and sand the edges.

2 From $\frac{3}{8}$ "-thick walnut stock, cut a 3×5 " blank for the coach interior (B). Drill entry holes, and scrollsaw as before. Sand the faces smooth, then glue and clamp the interior piece between the two sides. Allow the glue to dry.

3 To make the coach wheels (C and D), bandsaw two 2×4 " blanks from contrasting $\frac{1}{4}$ "-thick stock. (We chose birch.) Stack the two blanks, and adhere the patterns. Drill entry holes in the waste sections, then drill the $\frac{1}{8}$ " axle holes. (We used a brad-point bit on our drill press.) Scrollsaw the wheels to shape, then separate and sand them smooth.

4 For the axles, cut two $1\frac{5}{8}$ " lengths of $\frac{1}{8}$ " birch dowel stock. Next, use an "instant" glue to attach a pair of wheels to each axle. (Except for the coach lamination, we used instant glue throughout. See our tip about glue on page 28.) Now, glue an axle to the center of each set of coach springs (with the smaller wheels in front).

5 Drill a $\frac{1}{16}$ " hole in the coachman's upper hand to hold the whip. To make the whip, sand a $1\frac{1}{2}$ " length of toothpick to a uniform $\frac{1}{16}$ " thickness. Twist a 6" length of 40-gauge wire five times around one end, and glue the other end into the coachman's hand. Bend an S-curve in the wire, then remove it until later.

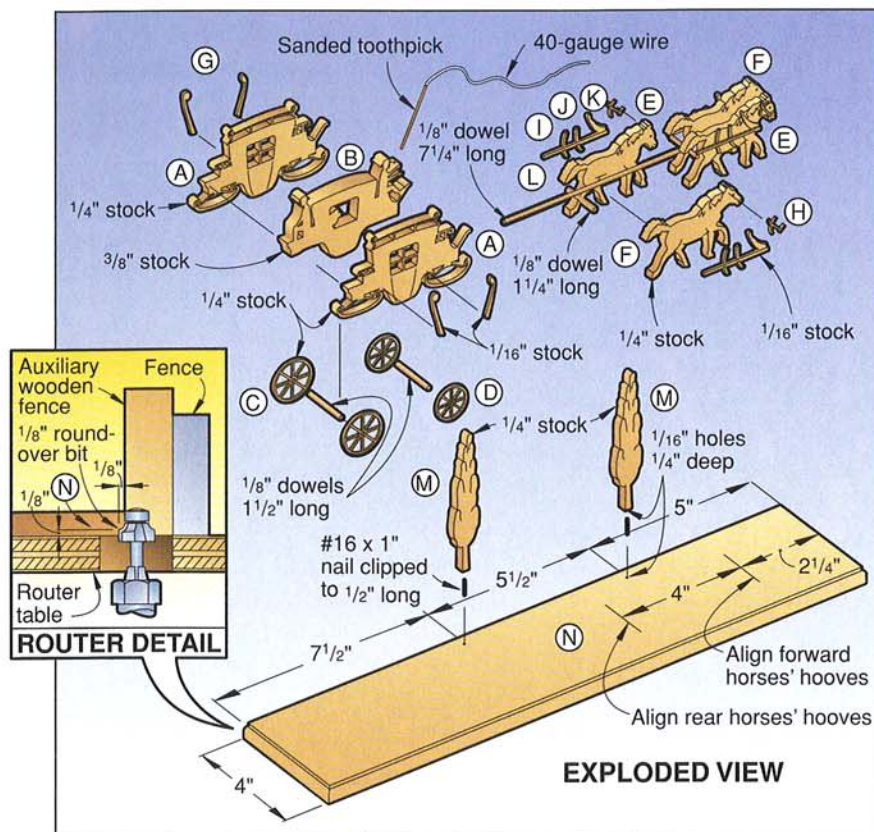
Now, Machine Your Horses And Other Parts

1 To make the horses (E and F), first bandsaw two $2\frac{1}{2} \times 8$ " blanks from $\frac{1}{4}$ "-thick contrasting stock. (We used cherry.) Stack the blanks, and adhere the two horse patterns. Drill $\frac{3}{64}$ " holes for the eyes, then scrollsaw the horses to shape. Separate the pieces, and sand them smooth.

2 Scrollsaw the coach trim pieces (G), bridles (H), and harness parts (I, J, K, and L). To do this, sand four 2×5 " pieces of $\frac{1}{16}$ "-thick birch

Continued

Four-in-Hand Coach



TIP For all gluing operations other than the coach lamination, we used Pacer's Zap-A-Gap, a gap-filling cyanoacrylate product, and Zip Kicker, an accelerator that speeds up the curing process. You can buy these products at your local hobby shop.

Project design: Bill Zahn
Illustrations: Roxanne LeMoine
Project builder: Rick Hutcheson
Photograph: King Au

stock smooth, then stack them and adhere the patterns. After you saw, separate the pieces with a splash of acetone or lacquer thinner.

3 Glue a bridle and harness to each horse where shown on the pattern. (**Note:** Attach these pieces to opposite sides of your two parts E and two parts F. Then, when you assemble your team, position the two horse types diagonally opposite to one another.) Now, glue the four trim pieces to the coach sides where shown on the Exploded View drawing. From 1/8" birch dowel, cut two short traces and one long trace to the lengths shown.

4 To make the trees (M), stack two 2x5" pieces of 1/4"-thick birch stock. Adhere the pattern, and scrollsaw to shape. Separate the pieces, then sand the faces and edges smooth.

5 For the base (N), rip and crosscut a piece of 3/4"-thick stock to 4x18". (We selected walnut.) Plane or resaw it to 5/8" thick, then sand the faces smooth. Next, fit your table-mounted router with a 1/8" round-over bit, and elevate it to cut a 1/8" shoulder. (See the Router detail shown on the Exploded View drawing.) Rout the top edges, then finish-sand the base.

BILL OF MATERIALS

Part	Finished Size			Matl.	Qty.
	T	W	L		
A coach sides	1/4"	2 1/2"	4 3/4"	W	2
B coach interior	3/8"	2 1/2"	4 3/8"	W	1
C back wheels	1/4"	1 3/8" dia.		B	2
D front wheels	1/4"	1 1/8" dia.		B	2
E horses	1/4"	2"	3 1/4"	C	2
F horses	1/4"	2 3/16"	3 3/8"	C	2
G coach trim pieces	1/16"	1/4"	1 9/16"	B	4
H bridles	1/16"	1/2"	3/4"	B	4
I harness pieces	1/16"	1/8"	1 3/16"	B	4
J harness pieces	1/16"	1/8"	1 3/16"	B	4
K harness pieces	1/16"	3/16"	1"	B	4
L harness pieces	1/16"	1/8"	2 1/4"	B	4
M trees	1/4"	7/8"	4 5/8"	B	2
N base	5/8"	4"	18"	W	1

Materials Key: W—walnut; C—cherry; B—birch.

Supplies: 1/8" birch dowel stock; 40-gauge wire; toothpicks; #16x1" brads; instant (cyanoacrylate) glue; finish.

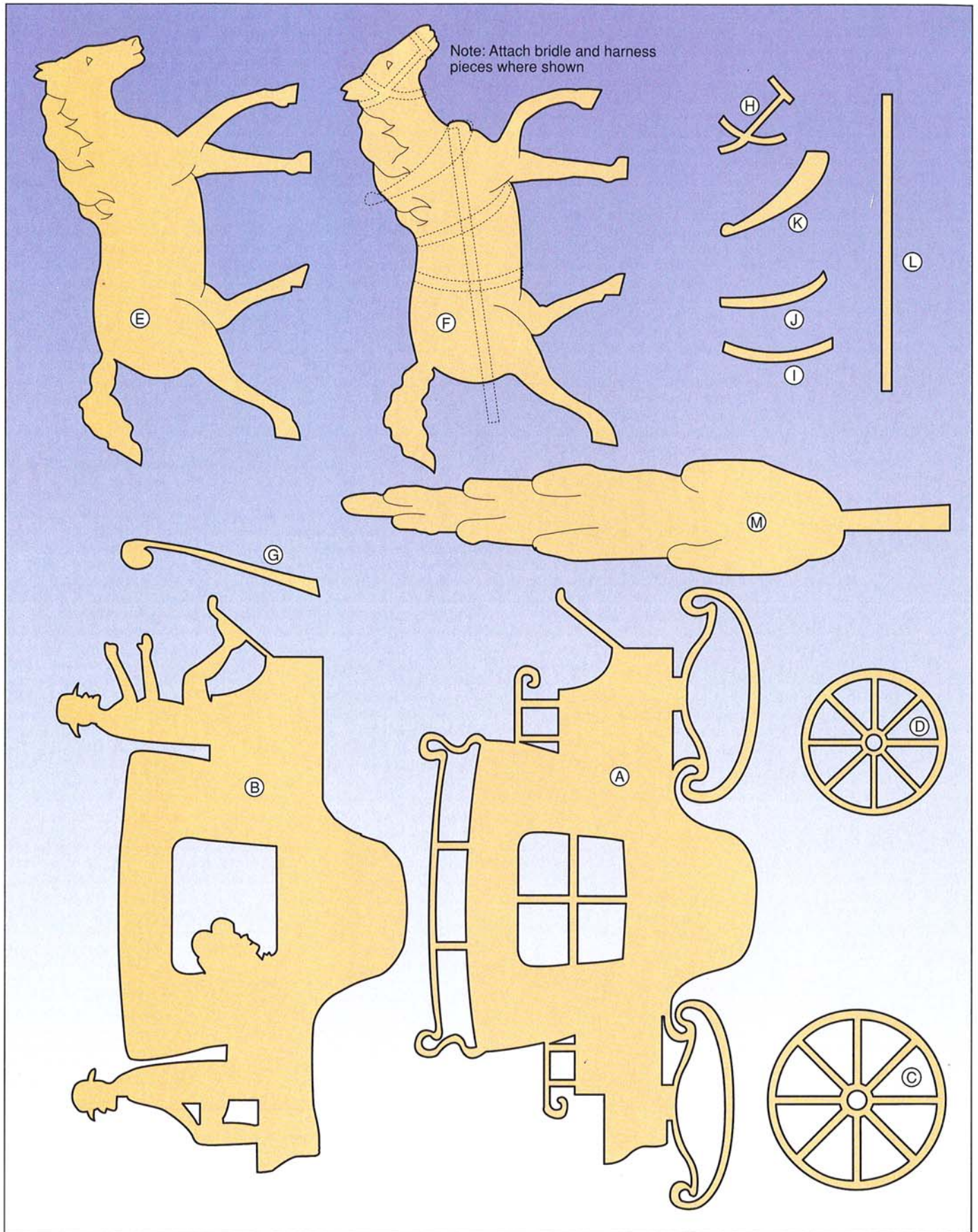
Assemble the Coach and Team, Then Add Finish

1 Lay out and drill 1/16" holes 1/4" deep in the base and tree trunks where shown on the Exploded View drawing. (We used a handscrew clamp to hold the trees vertical.) Clip two 1/2" lengths from #16x1" brads, and glue them into the tree trunks. Then, glue the trees to the base.

2 Glue the forward pair of horses (one E and one F) to the base. (For layout, see the Exploded View drawing.) To do this, place them with their outside faces 1" apart, then apply glue to the two inner hooves of each. Next, glue a short trace between the two long harness pieces (L). Glue the rear horses where shown, then glue the other short trace between their harnesses. Next, glue the long trace to both short traces.

3 Position the coach behind the rear horses (without glue) so that the long trace fits between the front springs and extends to the front axle. Mark the wheel positions lightly with a pencil, then glue the coach to the base.

4 Apply your choice of finish. (We sprayed on two coats of Deft semigloss aerosol lacquer.) Finally, reattach the whip wire. ■



Weekend Woodworking Projects

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