

The Woodworker's Journal

Vol. 15, No. 6 \$3.95 (Canada \$4.50)

Make this *Country Pine* Writing Desk

- The Frame and Panel
- Faux-Turned Vessels
- Noise in the Shop

Tool Review:
Biscuit Joiners

Plus! 8 Project Plans: Toy Chest • Hurricane Lamp
Dollhouse • Christmas Carving • Vessel Patterns
Child's Desk & Bench • Jewelry Box • Shop Project

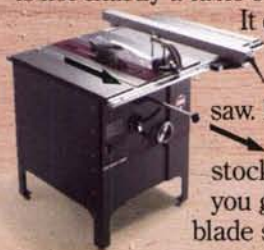
November/December 1991





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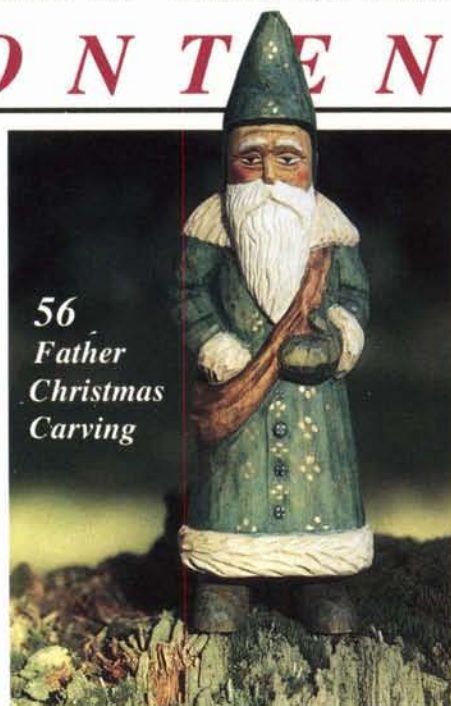
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NOVEMBER/DECEMBER 1991 VOLUME 15, NUMBER 6

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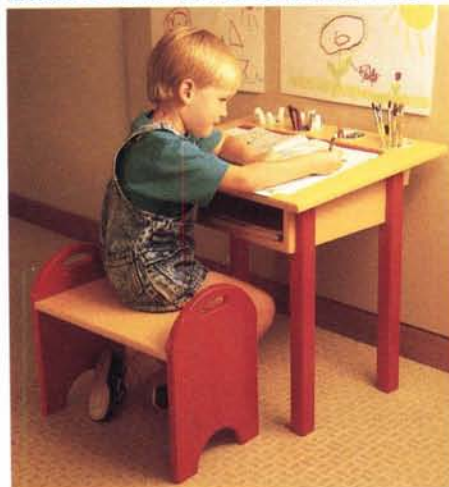
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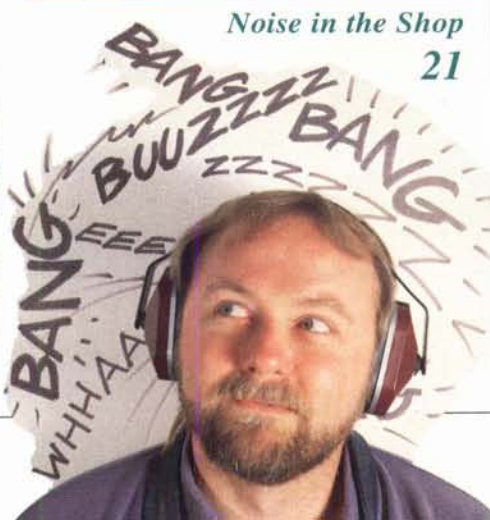


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Shoptalk

Those who claim to have a finger on the pulse of American consumers say that the freewheeling spending of the 1980's is over and we are now returning to a period of conservatism and self-sufficient lifestyles. That seems to be a reasonable assumption considering the fact that we are not yet out from under the effects of a recession that lingers like a case of bronchitis.

Happily for us, woodworking and self-sufficiency go hand-in-hand. There's a very special sense of satisfaction that comes from making useful things for yourself and as gifts for others. There's also that comforting sense of having some measure of control by choosing to make rather than buy.

This issue is loaded with projects that will make fine gifts for the holidays or any time of the year. For someone very special, how about the lovely Country Pine Desk featured on our cover? We made a choice of pine and a painted finish, but you may prefer the more formal elegance of cherry or walnut with a natural finish. Either way, it's a beauty and one of my favorite projects of the entire year.

The toy chest is another fine project that's economical to build and presents no tricky joinery. Dan Thornton came up with the idea of adding the exuberant frogs for a whimsical touch, but you can omit the comical critters and build it as a country-style chest.

Each Christmas season, Adirondack carvers Rick and Ellen Bütz carve a new Santa Claus for the many collectors who prize their work. If you like this year's Father Christmas design, you'll also enjoy carving their St. Nicklaus featured in our November/December 1990 issue.

Having three daughters makes me no stranger to dollhouses, but I must confess that I never did any woodworking on a small scale. The girls played with a kit house that never quite got finished, mainly because dear old Dad was still struggling to finish the house that contained the dollhouse. I wish that twenty years ago I could have built the dollhouse featured in this issue. I'm sure that this fine example will delight your special little girl.

Rounding out this issue are more great gift items including a neat child's desk, the hurricane lamp which is a quick and easy lathe job, the musical jewelry box which is a popular reader request, and for those holiday grab-bags, how about making up a batch of handy plastic bag holders for kitchen recycling?

This issue concludes our fifteenth year of publishing *The Woodworker's Journal* and it's been a pleasure and a privilege to have helped serve the needs of fellow woodworkers during this period of phenomenal growth of the craft. The staff and I thank all our readers and advertisers for their support and extend to all a fine holiday season and a new year of tranquility and good health. Work safely and may all your miters be perfect on the first try.

Jim McQuillan

The Woodworker's Journal

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Letters

We welcome opinions and comments (both pro and con) from our readers. Address correspondence to: Letters Dept., *The Woodworker's Journal*, Box 1629, New Milford, CT 06776.

We applaud your publication for addressing woodworkers' safety practices and your attempt to educate them as to the potential hazards of woodworking. But we are concerned with the inconsistency between your interest for your readers' safety and a "Shop Tip" in your September/October 1991 issue.

You published a reader's "tip" regarding sawdust from a scroll saw by blowing through a straw inserted in the front of a dust mask. This type of misuse of respiratory protection causes a two-fold problem. Not only does inserting the straw into the front of the mask negate any protection offered, but it also creates a false sense of security on the part of the wearer. A user would feel "safe" because they are wearing respiratory protection and there would be a

greater chance for risk taking than if they were wearing no respiratory protection.

An alternative way to clear sawdust from a scrollsaw would be to use a small spray can of compressed air.

Again, we commend *The Woodworker's Journal* for the "ounce of prevention . . . pound of cure" motto, but stress that woodworkers be aware of all potential hazards they are exposed to, and that all personal protective equipment be used only in accordance with the manufacturer's instructions.

Celeste A. Voyer
Marketing Coordinator
North Safety Equipment, Cranston, R.I.

I much enjoyed the Scroll Saw Tool Review in your September/October 1991 issue, especially since it confirmed my suspicion that many saws are made to the same design. But you, and some other reviewers, mislead readers by referring to "constant tension" saws, because there are none.

Most, if not all, scroll saws represent

one of two kinematic types. The first type, called a four-bar linkage (or walking beam) has the blade as one of the bars. There is no straight line motion and either the arms or a separate spring provide the tension. The second type, called a straight line machine, is usually direct driven through a slider-crank mechanism. Either the arms or a separate spring provide the tension.

There is no constant tension because the tension force undergoes a momentary increase at the ends of a stroke due to the inertial force. This "ripple" is an added alternating stress to the initial tension. Studies have shown that fatigue life of metal is increased by keeping the ratio of alternating stress to steady stress as low as possible. A low ratio should be easily achieved for small machines with thick blades, but may be a problem for heavy machines with thin blades.

Since 1930, I have used both types of saws extensively, and express no preference. I find I get the best blade life by using free-pivoting copper-face blade

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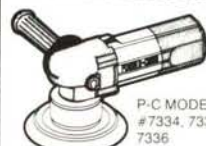
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Carl C. Osgood, Surry, Maine

I enjoy reading articles on different ways to solve woodworking problems, but the article *Low-Tech Picture Frames* in your July/August 1991 issue raises more questions than answers.

Photo 5 and Fig. 5 bear little resemblance. Are they two different versions of the jig? Also, why is the 45 degree stop tapered and dependent on friction? Wouldn't a straight piece secured to the guide board serve the same purpose? And finally, won't the plane blade cut the guide board as you trim the miters? Robert E. Shillington, Baton Rouge, La.

Article author Roger Holmes replies: Sorry for the confusion. The different perspectives of photo and drawing may have tripped you up. My board, shown in the photo, is exactly like the one in the drawing except it has a 90 degree stop above the 45 degree stop. I use this stop to square the ends of drawer sides.

There wasn't enough room to include it in the drawing.

I house the stop in tapered dadoes for several reasons. The dado provides a much more positive fixing than nails or even screws. The 45-degree stop is easily removed when I want to use the 90-degree stop, and both can be easily replaced should they be damaged. And, even though they are narrow, the stops shrink and expand with changes in humidity. The tapered housing allows for that—I just tap a shrunken stop slightly to tighten it in place.

The first few times you use the shooting board, the plane blade will slice a tiny bit off the guide board. But the blade doesn't extend across the sole of the plane. It no longer cuts the guide when the part of the sole adjacent to the end of the cutting edge contacts the guide. From time to time, as the stop moves, its end gets trimmed too. This doesn't matter as it needn't be flush with the edge of the guide board.

I hope this straightens things out. I've

gotten a lot of use out of my jig and hope you do too. It takes a bit of trial and error to learn to use (a sharp plane is half the battle), but it's worth the effort.

Your safety is important to us...

We strive to present our plans and techniques as accurately and safely as possible, and we try to point out specific areas and procedures where extra caution is required. But because of the variability of local conditions, construction materials and personal skills, we can't warn you against all potential hazards. Remember to exercise common sense and use safety measures when operating woodworking power equipment. Don't attempt any procedures you're not comfortable with or properly equipped for. Sometimes, for the sake of clarity, it's necessary for a photo or illustration to show power tools without the blade guard in place. In actual operation, though, you should always use blade guards and other safety devices on power tools that are equipped with them. Remember... an ounce of prevention really is worth a pound of cure.

—The Editors

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Events

We will gladly list as many events of interest to woodworkers as space permits. Listings are free and may include shows, fairs, competitions, workshops and demonstrations. The deadline is eight weeks before publication—July 1 for the September/October 1991 issue. Please address announcements to the Events Department. Readers planning on attending events should call ahead if possible. Scheduled dates and locations sometimes change between publication and the date of the event.

California: The 1991 Palm Springs Wildlife Art Show & Competition, Dec. 6-8, Doubletree Resort Hotel, Palm Springs. For information call (619) 462-0232.

The Southern California Woodworking Show, Nov. 22-24, Building 6, Los Angeles County Fairplex, Pomona. For information call 1-800-826-8257

The Northern California Woodworking Show, Dec. 6-8, Fiesta Hall, San Mateo County Fairgrounds—Fiesta Hall, San Mateo. For information call 1-800-826-8257.

Colorado: The Colorado Woodworking Show, Nov. 8-10, Expo Hall, National Western Complex, Denver. For information call 1-800-826-8257.

Connecticut: The 12th Annual Brookfield Craft Center Holiday Sale,

Nov. 22-Dec. 24, Brookfield Craft Center, Brookfield and South Norwalk. For information on the sale and the Center's woodworking classes, call (203) 775-4526.

Song Bird Carving Workshop, Nov. 7-10, Guilford Handcrafts Center, Guilford; The Center will also be holding its 13th Annual Holiday Festival of Crafts, Nov. 2-Dec. 24. Application deadline is March 1, 1992 for the 35th Annual Guilford Handcrafts Exposition, the national juried show held in July 1992. For more information on the sale, workshop or show, call (203) 453-5947.

Illinois: Woodworking World—The Chicago Area Show, Nov. 22-24, Rosemont O'Hare Exposition Center, Rosemont. For information call 1-800-521-7623.

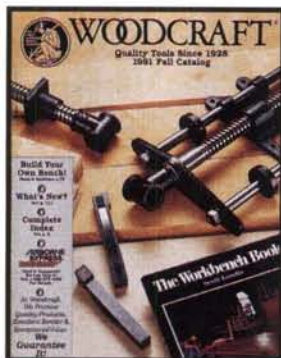
"Artistry in Wood" woodcarving show, Nov. 2-3, Education Center, Chicago Botanic Garden, Glencoe. For information call (708) 835-5440.

Kentucky: Woodturning and joinery workshops. One day to one week. Contact Jim Hall, Adventure in Woods, 415 Center St., Berea, KY 40403; tel. (606) 986-8083.

New Hampshire: The "Hand & I" Craft Center, Route 25, Moultonboro, offers a variety of woodworking and craft classes throughout the year. For information contact the center at P.O. Box 264, Moultonboro, NH 03254; tel. (603) 476-5121.

New York: Constantine's is offering 13 different seminars covering a specific aspect of woodworking basics. For information, contact Constantine's, 2050

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103B	1/4		5/16	13.00	404B	1/4		1-5/8 3/4	15.00
104B	1/4		3/8	14.00	405B	1/4		1-3/4 7/8	16.00
105B	1/4		1/2	16.00	406B	1/4		1-7/8 1 1/2	19.00
107B	1/2		1/4	13.00	601	1/4	Cone Box	1/4 1/4	9.00
109B	1/2		3/8	15.00	602	1/4		3/8 3/8	10.00
110B	1/2		1/2	16.00	603	1/4		1/2 3/8	12.00
112B	1/2		3/4	20.00	604	1/4		5/8 5/8	13.00
113B	1/2		1 32.00	605	1/4		3/4 5/8	14.00	
115B	1/2		1-1/4 41.00	607	1/2		1 3/4	18.00	
116B	1/2		1-1/2 51.00	701	1/4	V Groove	3/8 1/2	14.00	
200B	1/4	Beading	1/8	10.00	702	1/4		1/2 1/2	10.00
201B	1/4		3/16	11.00	703	1/4		5/8 5/8	11.00
202B	1/4		1/4	12.00	704	1/4 1/2		3/4 5/8	12.00
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207B	1/2		1/4	12.00	1502B	1/4		1-1/4 3/16	13.00
210B	1/2		1/2	16.00	1503B	1/4		1-1/4 1/4	13.00
212B	1/2		3/4	20.00	1506B	1/4	Rabbet	1-1/4 1/2	13.00
301B	1/4	Roman	5/32	15.00	1511B	1/2		1-1/4 3/8	12.00
302B	1/4	Ogee	1/4	16.00	1512B	1/2		1-1/4 1/2	13.00
303B	1/2		5/32	15.00	802	1/4	Half Round	3/8 1/2	14.00
304B	1/2		1/4	16.00	803	1/4		1/2 1/2	15.00
901B	1/4	Cove	1/4	11.00	805	1/4 1/2		3/4 1/2	18.00
902B	1/4		3/8	12.00	807	1/2		1 1/2	19.00
903B	1/4		1/2	13.00	808	1/2		1-1/4 1/2	20.00
904B	1/2		1/4	12.00	809	1/2		1-1/2 1/2	20.00
905B	1/2		3/8	13.00	2001B	1/4	Push Trim	3/8 1/2	7.00
906B	1/2		1/2	14.00	2004B	1/4		1/2 1 7.50	
908B	1/2		3/4	27.00	2008B	1/2		1/2 1 8.50	
2501B	1/4	Cove	3/16	16.00	2010B	1/2		1/2 2 16.00	
2502B	1/4	Beading	1/4	17.00	2015B	1/4 3/16		1/2 1 9.50	
2503B	1/4		5/16	18.00	2020B	1/4	Pattern	1/2 1 14.00	
2508B	1/2		3/8	21.00	2021B	1/4		5/8 1 15.00	
2509B	1/2		1/2	23.00	2022B	1/4		3/4 1 16.00	
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TC12B	1/4		3/16	19.00	2207D	1/4	Straight	3/8 1 7.00	
TC12B 1/2	1/2		3/16	19.00	2209D	1/4		1/2 1 7.00	
TC16B	1/4		1/4	19.00	2211D	1/4	(1/2" Shk. Available)	5/8 3/4	7.50
TC16B 1/2	1/2		1/4	19.00	2212D	1/4		3/4 3/4	8.00
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7508B 1/2	1/2		3/16	19.00	GS100 1/2	1/2		1-5/8 1 29.00	
7512B	1/4		1/4	19.00	GW100	1/4		1-5/8 1 29.00	
7512B 1/2	1/2		1/4	19.00	GW100 1/2	1/2		1-5/8 1 29.00	
2601	1/4	Keyhole	3/8	7.50	2101	1/4	Mortise	1/2 13/32	8.00
					2102	1/4		5/8 13/16	9.00
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Metro	1/2" Shk	#63 Joint	\$53
M70	1/2" Shk	#67 1/4" 1/2" Shk	\$28
#66	1/2" Shk	#72 1/4" 1/2" Shk	\$28
#54	\$39	Slot Cutter Assembly	\$53
		1/8, 5/32, 3/16, 1/4 kerf, cut from 1/8" to 23/32"	
Rev. Side & Rail	1/2" Shk	Tongue & Groove	1/2" Shk
1/2" Shk	1/2" Shk	1/2" Shk	\$56 per set
#5101, Panel Raise	5° 15' 1/2" Shk	#5102, 3-1/2" O.D. & Cove	\$39
#3802	1/2" Shk	#5001	Thumbral
Qgee Fil	\$24	2-5/8" O.D.	\$24
3-W Panel Raise Cutter	1/2" Shk	3-W Panel Raise Cutter	1/2" Shk
A B C	1/2" Shk	3-W Panel Raise Cutter	1/2" Shk
D E	1/2" Shk	3-W Panel Raise Cutter	1/2" Shk
5° O.D. - \$55 (3/4" bore, 1/2" bushing)		5° O.D. - \$59 (1" bore, 1/2" bushing)	
DC-250	#26	\$159	
Rev. Side & Rail	1-3/4"	Cabinet Set	1-3/4"
#27	\$169	#28	\$149
Cove & Bead Set	1-3/4"	Bead Side & Rail	1-1/4"
#29	\$149	#30	\$149
Cove Side & Rail	1-1/4"	Cov. Rd. Side & Rail	1-1/4"

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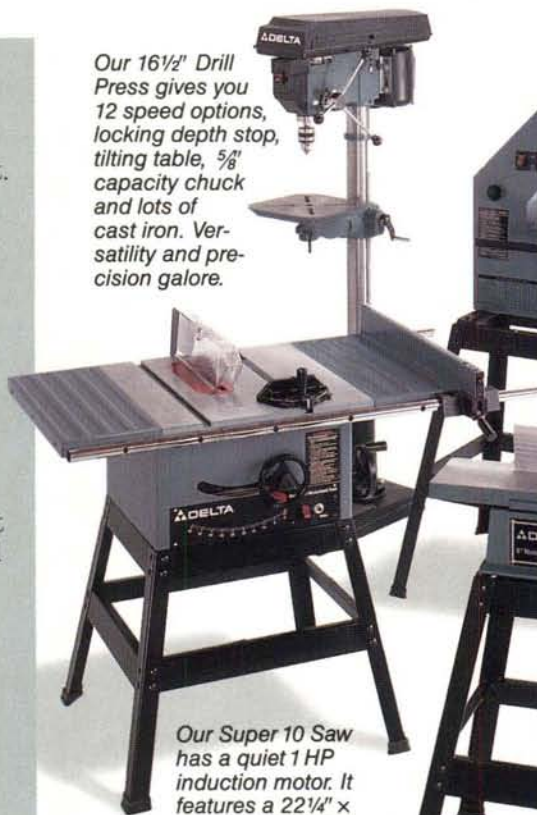
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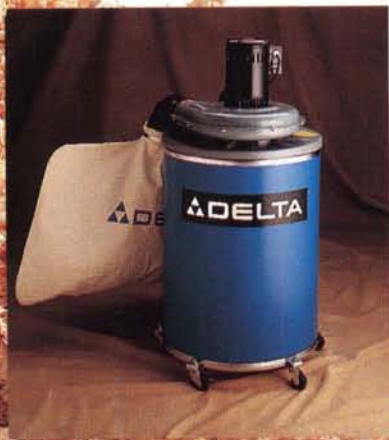
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Ohio: Workshops sponsored by Carriage Hill Farm, an 1880's living history farm operated by the Montgomery County Park District: Oct. 5, planes; Nov. 2, joinery; Dec. 7, tables and chess; Jan. 4, doors, drawers and panels. For more information call (513) 879-0461.

The Hardwood Store woodworking center will be offering several seminars this fall and winter taught by master cabinet-maker Earl Richards. For information call (513) 849-9174.

Oklahoma: The Eastern Oklahoma Woodcarvers Association's 7th Annual "Wonderful World of Wood" Show and Sale, Nov. 8–9, Southroads Mall, Tulsa. For information, call (918) 446-6701.

Oregon: The Oregon Woodworking Show, Nov. 1–3, Memorial Coliseum, Portland. For information call 1-800-826-8257.

Pennsylvania: For information on woodworking classes at the Olde Mill Cabinet Shoppe, contact them at 1660 Camp Betty Washington Rd., York, PA 17402; tel. (717) 755-8884.

The Philadelphia Museum of Art is sponsoring the 15th Annual Philadelphia Craft Show, Nov. 7–10, Philadelphia Civic Center. For information and tickets, call (215) 787-5448.

Woodworking World—The Central Pennsylvania Show, Nov. 15–17, Pennsylvania Farm Show Complex, Harrisburg. For information call 1-800-521-7623.

Vermont: For information on woodworking classes at the Vermont State Craft Center at Frog Hollow, call (802) 388-3177.

Virginia: Woodworking World—The Norfolk Show, Jan. 3–5, Norfolk Scope at St. Paul & Brambleton. For more information, call 1-800-521-7623.

Washington: The Northwest Carvers 11th Annual Woodcarving Show, Nov. 9–11, Western Washington Fairgrounds Expo Hall, 9th & Meridian, Puyallup. For information, call (206) 564-3278.

The Western Washington Woodworking Show, Nov. 15–17, Exhibition Hall, Seattle Center, Seattle. For information call 1-800-826-8257.

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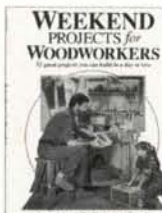
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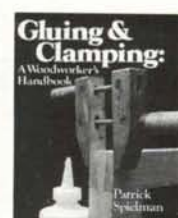
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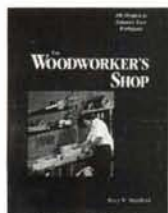
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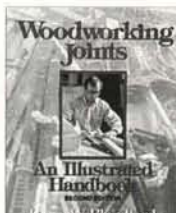
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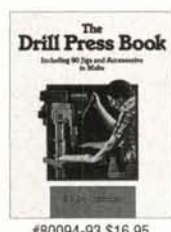
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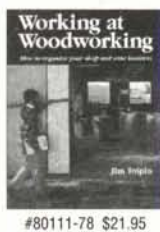
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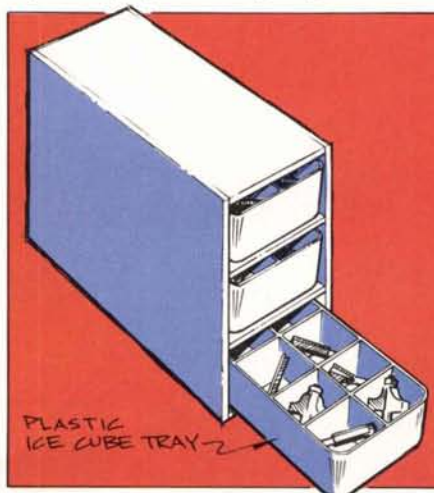
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Shop Tips

Plastic ice cube trays are perfect for storing 1/4 in. shank router bits (most 1/2 in. shank bits will be too big). The tray makes the bits easy to find and remove, and the individual compartments will keep them from banging together, possibly damaging a cutting edge. Readers



with large router bit collections may even want to make a storage box, like the one shown, which will hold several of the trays.

I make my own low-cost foam brush by sandwiching a piece of foam rubber between a couple of pieces of 1/8 in. thick hardboard. The foam rubber, which comes in 1/2 in. thick sheets, is sold by most fabric and upholstery



stores. I cut mine to about 2 in. wide and 3 in. long, but it can be made to just about any size that suits your needs. Use a sharp scissors to cut the foam to size and to cut the bevel on the end. A machine screw and wing nut provide the clamping action to the hardboard. When the finishing job is over, just toss out the used foam (the cost should only be a

couple of pennies) and replace it with a new piece.

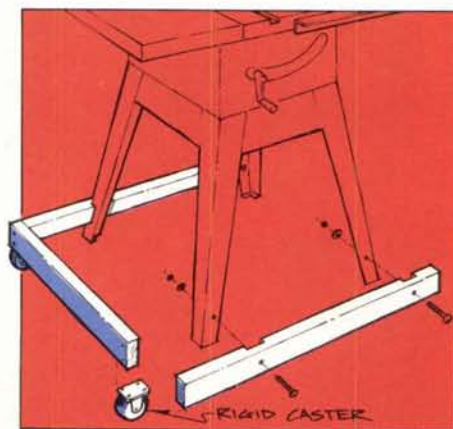
J.D. Perry, Paris, Ontario, Canada

Sanding sleeves are often a real struggle to remove from the rubber sanding drums. Next time, before you assemble the two parts, put some baby powder on the inside of the sleeve and the outside of the rubber drum. When it comes time to remove the sleeve, you'll find it slips off considerably easier.

James S. Dudley, Lake Worth, Fla.

If you use jigs (and who doesn't), try using machine screws and threaded inserts instead of just wood screws, both in the jig assembly and for mounting. For the jig assembly, the threaded inserts enable you to easily retighten loose parts. And when mounting the jig to the miter gauge or auxiliary fence, unlike standard wood screws, the machine screws and inserts won't be prone to stripping out after repeated use.

Woodworkers with small shops often find themselves moving the table saw around in order to make room for one thing or another. Here is a way to make



the job a lot easier. Frame the legs on three sides with 2 by 4 stock, then attach a pair of heavy-duty casters to one side, as shown. Use rigid casters, not the swivel type. Bolt the frame to the legs so that the casters are located about 1/4 in. above the shop floor. Now, by lifting one end of the saw (the end opposite the casters) an inch or so, you'll be able to move the saw much like you would a wheelbarrow.



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 The New Yankee Workshop \$18
 BOTH \$35
 NOTE: "New Yankee Heritage" available Jan. '92

WOODTURNING BOOKS by DALE NISH

Creative Woodturning \$14
 Artistic Woodturning \$17
 Master Woodturners \$19
 ALL 3 ABOVE \$46

BANDSAW BOOKS by DUGINSKE

Bandsaw Pattern Book \$12
 Bandsaw Handbook \$16
 Bandsaw Basics \$9
 ALL 3 FOR \$35

POWERTOOL BOOKS by de CRISTOFORO

The Drill Press Book \$16
 The Router Book \$16
 The Table Saw Book \$16
 The Jigsaw/Scroll Saw Book \$18
 The Bandsaw Book \$16

NEW ANTIQUE TOOL BOOKS

Antique and Collectible Stanley Tools: A Guide To Identify and Value (John Alexander) \$24
 Dictionary of American Hand Tools (Sellens) \$49
 Collecting Antiques Tools (Kean, Pollak) \$25
 Patented Transitional and Metallic Planes in America 1827-1927 (Roger K. Smith) \$55
 The Antique Tool Collector's Guide To Value (Barlow) \$14
 Dictionary of Woodworking Tools (Salamon) \$28
 Restoring, Tuning & Using Classic Woodworking Tools (Dunbar) \$14

NEW BOATBUILDING

Building The New Instant Boats (Payson) \$19
 More Building: Classic Small Craft (Gardner) \$24
 Canoes and Kayaks for the Backyard Builder (Snaith) \$18
 Video Ultralight Boatbuilding With Thomas Hill \$48
 Book Ultralight Boatbuilding (Thomas Hill) \$17
 BOTH VIDEO AND BOOK \$62

CARVING BOOKS by TOM WOLFE

8 Titles \$12 EA; All 8 for \$90
 1. Traditional Santa Carving - 2. Santa and His Friends - 3. Carving The Civil War - 4. Carving Out The Wild West - 5. Dog Carving - 6. The Golfers - 7. Carving Bears and Bunnies - 8. Country Flat Carving \$12 EA; All 8 for \$90

CARVING by RICK BUTZ

Woodcarving with Rick Butz \$16
 Carving Wood \$17
 Video - Woodcarving Tools & Tech. \$32
 BUTZ SET (2 BOOKS 1 VIDEO) \$82

BOOKS by BRUCE HOADLEY

Identifying Wood \$35
 Understanding Wood \$26
 BOTH FOR \$60

WOOD IDENTIFICATION

World Woods in Color (Lincoln) \$46
 Encyclopedia of Wood (Makepeace) \$32
 Know Your Woods (Constantine) \$13
 Woods We Live With (Schiffer) \$26

STICKLEY FURNITURE

The Furniture of Gustav Stickley: History, Techniques, Projects (Bavaro) \$35
 The Early Work of Gustav Stickley (Gray) \$20
 The Mission Furniture of L. & J.G. Stickley (Gray) \$20
 Making Authentic Craftsman Furniture (Stickley) \$9

NEW from TAUNTON PRESS



The Workshop Book (Landis) \$32
 Solid Wood Cabinet Construction (Karg) \$23
 Graphic Guide to Frame Construction (Thailon) \$29
 Fine Homebuilding Great Houses - Craftsman Style \$24
 Working at Woodworking (Tolpin) \$21
 "Best of Fine Woodworking" Series - 8 Titles \$14 EA; All 8 for \$100
 "Fine Woodworking On" Series - 21 Titles \$9 EA; All 21 for \$175
 "Fine Homebuilding On" Series - 6 Titles \$14 EA; All 6 for \$80
 The Workbench Book (Landis) \$32
 Design Book Five \$19

MARQUETRY

The Marquetry Manual (Lincoln) \$19
 Marquetry and Inlay (Bridgewater) \$15

CLOCKMAKING

Clockmaking: 18 Antique Designs (Nelson) \$18
 How To Build 35 Great Clocks (Daniele) \$14
 Build Your Own Grandfather Clock (Nelson) \$12
 Clockmaking for the Woodworker (Kadar) \$14
 101 Wooden Clock Patterns (Novak) \$12

TIPS, TECHNIQUES

200 Original Shop Aids (Capotosto) \$16
 Shop Savvy (Moungovan) \$14
 Workshop Math (Scharff) \$14
 335 Great Shop Tips (Wood Mag.) \$10

WOODWORKING PROJECTS

Weekend Projects for Woodworkers \$14
 Projects for Woodworkers Vol. 1 to IV ea \$12
 101 Projects for Woodworkers \$14
 176 Woodworking Projects (Workbench) \$14
 Making Mechanical Marvels in Wood (Levy) \$14
 Making Pet Houses and Carriers (Self) \$9
 Doll's House Do-It Yourself (Dodge) \$14
 Patterns and Projects for the Scroll Saw (Nelson) \$18

MUSICAL INSTRUMENTS

Guitar-making: Tradition and Technology (Cumpanio) \$58
 Violin Making As It Was and Is (Heron-Allen) \$33
 Making Stringed Instruments (Buchanan) \$19
 Making Wood Folk Instruments (Waring) \$12
 Make Your Own Electric Guitar (Hiscock) \$16

MALOOF; NAKASHIMA FRID; UNDERHILL

Sam Maloof, Woodworker (Soft) \$38
 Video - Sam Maloof, Woodworking Profile \$28
 Maloof Book and Video Set \$54
 Soul of A Tree (Nakashima) \$35
 Tage Frid Teaches Woodworking, Book 1, 2, or 3 \$20 EA; All 3 for \$57
 Roy Underhill - 3 Titles \$12 EA; All 3 for \$35

POWER TOOLS

Router Basics (Spielman) \$9
 Router Book (Geller) \$25
 Router Jigs, Techniques (Spielman) \$16
 Router Handbook (Spielman) \$12
 The Router (Rosendahl) \$14
 Scroll Saw Handbook (Spielman) \$12
 Shaper Handbook (Cliffe) \$16
 Scroll Saw Basics (Spielman) \$9
 Table Saw Basics (Cliffe) \$9
 Table Saw Techniques (Cliffe) \$16
 Radial Arm Saw Techniques (Cliffe) \$16
 Getting The Most Out of Radial Arm Saw (Rockwell) \$10
 Getting The Most Out of Drill Press (Rockwell) \$10
 The Complete Book of Stationary Power Tool Techniques (de Cristoforo) \$17
 The Complete Books of Portable Power Tool Techniques (de Cristoforo) \$18
 Tool Grinding and Sharpening Handbook (Davidson) \$9

JOINERY

Woodjoiner's Handbook (Allen) \$14
 Joinery: Methods of Fastening Wood (Self) \$12
 Woodworking Joints (Blandford) \$17
 Woodwork Joints (Hayward) \$9
 Modern Practical Joinery (Ellis) \$18
 Contract Joinery (Austin) \$15

NEW TOYMAKING

Making Toy Trains in Wood (Lynn) \$10
 Making Classic Cars in Wood (Hicks) \$10
 Making Dinosaur Toys in Wood (Wakefield) \$12
 How To Make Animated Toys (Wakefield) \$12
 Making Vintage Aircraft in Wood (Hicks) \$10
 ToyMaker's Wooden Vehicles (Buckland) \$12
 Blizzard's Dazzling Wooden Toys \$14
 The Ultimate Wood Block Book (Bingham) \$12

FINISHING & REFINISHING

Wood Finishing with George Frank \$14
 Adventures in Wood Finishing (Frank) \$18
 Video George Frank on Woodfinishing \$30
 Woodfinisher's Handbook (Allen) \$12
 Wood Finishing & Refinishing (Gibbia) \$15
 Complete Manual of Wood Finishing (Aughton) \$13

WOODTURNING

Woodturning for Cabinetmakers (Dunbar) \$14
 Practical Woodturner (Pain) \$12
 The Craft of Woodturning (Sainsbury) \$12
 The Practice of Woodturning (Barlow) \$24
 Polychromatic Assembly for Woodturning \$16
 Hand or Simple Turning (Holtzapfel) \$16
 Ornamental or Complex Turning (Holtzapfel) \$16
 The Woodturners Bible (Blandford) \$16

CHIP CARVING by BARTON

Chip Carving \$10; Chip Carving Patterns \$10
 Video Chip Carving \$28; All 3 - \$45

MISC. CARVING

Freshwater Fish Carving (Figer) \$28
 Carving Fish Decoys (Cottle) \$25
 Carving Carousel Animals (Marlow) \$19
 Carousel Horse Carving 1/3 Size (Hughes) \$28
 Sculpting Wood (Lindquist) \$24
 Realistic Decoys (Spielman) \$16
 Decoy Pattern Book (Bridenhagen) \$14
 How To Carve Wild Fowl (Schroeder) \$38

FURNITURE MAKING

Queen Ann Furniture (Vandal) \$32
 Reproducing Antique Furniture (Gottshall) \$38
 Federal Furniture (Dunbar) \$17
 Make A Windsor Chair (Dunbar) \$13
 Measured Shop Drawings for American Furniture (Moser) \$16
 How To Build Shaker Furniture (Moser) \$14
 Antique Country Furniture of North America (Shea) \$18
 Country Projects for Woodworkers (Woodworker's Journal) \$16
 Construction of American Furniture Treasures (Margon) \$9
 Fine Furniture for the Amateur Cabinetmaker (Marlow) \$14
 Classic Furniture Projects (Jones) \$12
 Designing Furniture (Stem) \$23

VIDEOS

VHS
 ONLY



Brad Witt - Router Secrets \$30
 Wilson - Making Oval Boxes \$30
 Todd - Designing Your Kitchen \$34
 Todd - Stair Framing \$30
 Gross - Roof Framing Basics \$75
 Gross - Roof Framing Advanced \$75
 Schuttner - Basic Stairbuilding \$28
 Bollinger - Laying Hardwood Floors \$28
 Bollinger - Sanding, Finishing Floors \$28
 Law - Installing Cabinets, Countertops \$19
 Law - Installing Doors & Windows \$19
 Rosendahl - Series of 8 Videos on Router Techniques \$24 EA; All 8 for \$145
 Roger Cliffe - Faceplate Cabinetmaking \$30 EA; All 5 for \$135
 Roger Cliffe - Table Saw or Radial Saw Techniques \$29 EA; both for \$56
 Krenov - Wooden Planes, Cabinet Scrapers \$38
 Cummins - Making Boxes \$28
 Cummins - Small Shop Tips \$28
 Sundquist - Swedish Carving Techniques \$28
 Mehler - Build a Shaker Table \$37
 Parko - Make a Blanket Chest \$38
 Stubbs - Bowl Turning \$22
 Bush - Carving Techniques and Projects \$22
 Rogers - Molding and Picture Frames \$22
 Rogers - Building Cabinets \$22
 Rogers - Building Bookcases \$22
 Rogers - Building Tables \$22
 Maas - Router Jigs, Techniques \$28 EA; All 3 for \$80
 Byrne - 1 Tiling Countertops; 2 Walls \$38
 Roy Underhill - 1. Shop Planes; 2. Chair-making; 3. Log & Timberframe Bldg. EA \$38
 Klausz - Wood Finishing \$38
 Klausz - Dovetail A Drawer \$28
 Klausz - Mortise & Tennon Joints \$28
 Lowe - Carve A Ball & Claw Foot \$38
 Flexner - 1. Refinishing; 2. Repairing Furniture EA \$28

BOOK & VIDEO SETS

SET CONTAINS 1 BOOK & 1 VIDEO
 Cliffe - Table Saw Tech. \$44
 Cliffe - Radial Saw Tech. \$44
 Savage - Trim Carpentry \$44
 Bollinger - Laying Hardwood Floors \$44
 Schuttner - Basic Stair Building \$44
 Sundquist - Swedish Carving Tech. \$40

CABINETMAKING

Cabinetmaking and Millwork (Feirer) \$45
 Making Kitchen Cabinets (Levine) \$17
 Video-Kitchen Cabinets (Levine) \$28
 BOTH BOOK & VIDEO (LEVINE) \$44
 Building Kitchen Cabinets (Cary) \$14
 Cabinetmaking: The Professional Approach (Peters) \$28
 Cabinetmaking (Calhoun) \$39
 Cabinetmaking from Design to Finish (Maguire) \$21
 Shelves, Closets & Cabinets (Jones) \$16
 The Home Cabinetmaker (Burch) \$18
 European Cabinetry (Christ) \$18

STAIR, DOOR MAKING

Modern Practical Stairbuilding and Handrailing (Ellis) \$22
 Treatise on Stairbuilding (Mowat) \$22
 Basic Stairbuilding (Schuttner) \$14
 Stair Builder's Handbook (Love) \$14
 Doormaking Patterns & Ideas (Birchard) \$18
 Make Your Own Handcrafted Doors & Windows (Birchard) \$16

CARPENTRY; CONSTRUCTION

Carpentry (Lewis) \$19
 Guide to Residential Carpentry (Feirer) \$18
 Trim Carpentry Techniques (Savage) \$17
 The Genius of Japanese Carpentry (Brown) \$23
 Hardwood Floors (Bollinger) \$19
 The Timber Frame House (Benson) \$19
 Timber Frame Construction (Sobon) \$12
 Roof Framing (Gross) \$21
 Wood-Frame House Construction (Anderson) \$12
 Building Small Barns, Sheds, Shelters \$12

Product News

To keep our readers up-to-date, this column features brief descriptions of new tools and supplies on the market. The product descriptions are provided by the manufacturer and are not the result of tests or reviews by the editors of *The Woodworker's Journal*.



Stationary Bench-top Plate Joiner

New from Delta is this stationary bench-top plate joiner, their model no. 32-100. It does everything the portable plate joiners can, with the added convenience of foot pedal control of the blade's plunging action, leaving both hands free to align and hold the stock. Included are an adjustable miter fence, quick-set hold down clamps to secure small pieces of stock, and an auxiliary tilting table for joining beveled stock. List \$422. Contact Delta: 1-800-438-2486.



Pro Smartlevel

Although it looks like a level, Pro Smartlevel is actually an electronic inclinometer—it reads all angles and displays them in clear digital numbers. For woodworkers, this means being able to set saw blade angles to 0.1 degree accuracy or check the exact relationship between a chair seat and back. The heart of Pro Smartlevel is an 8-inch sensor module (under \$90). Used by itself or locked into 24 in., 48 in. or 78 in. rails, the module offers a choice of measurement modes, and can be recalibrated with the touch of a button. Wedge Innovations: 1-800-762-7853.

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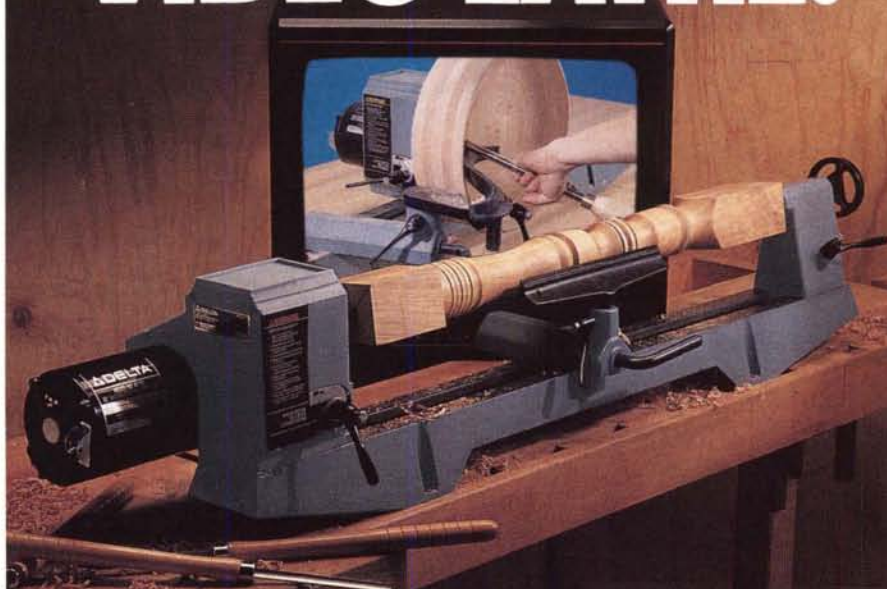
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P.O. Box 29341, Lincoln, NE 68529

VIDEO LATHE.



Actually, it's the new Delta 12" Variable Speed Wood Lathe. Packaged with a free instructional video and plans for making a Colonial Foot Stool.* Priced for a homeshop budget.

Now's your chance to move beyond straight cuts, flat surfaces and shaped edges. Your chance to think *round*. Even if you've never laid your hands on a lathe.

Dial the speed you want, from 500 to 2000 rpm, for everything from initial roughing to final finishing. Work up to 36" between centers, 12" over the bed. Or use the unique pivoting head for outboard turning of stock up to 16" diameter.

If you're ready to round out your repertoire, call toll free for the name of your Delta Dealer: Delta International Machinery Corp., 800/438-2486. In Canada, call: 519-836-2840

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Professional production quality bit makes it quick and easy to produce matching rails and stiles — the panel raising bit with ball bearing guide makes the raised panel perfect every time.

SALE PRICE \$69.95 Regular value over \$150.00!

FOR COMPLETE SET 1/4" Shank set item #554 (includes all bits shown below)

SET ALSO AVAILABLE IN 1/2" SHANK - \$79.95 - Item #852

Shaper Cutters set:

Item #1059

SAVE! only \$99.95

Set: Rail & Stile & Raised Panel Cutters

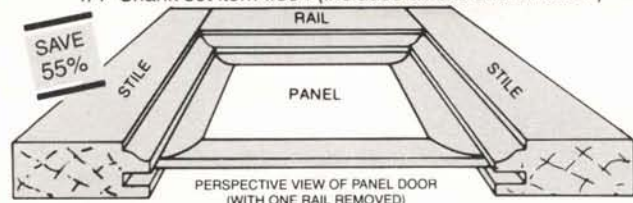


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SUPPLIED WITH
BALL BEARING

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1/4" Shank

REVERSIBLE COMBINATION RAIL and STILE BIT

(For making matching rails and stiles in raised panel doors, etc.) Works with stock from 11/16" to 7/8" thick



PERSPECTIVE VIEW OF PANEL DOOR
(WITH ONE RAIL REMOVED)

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ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#601	Solid Carbide	1/8" Spiral Cutter		1/8"	1/2"	1/4"	\$ 9.00
#603		1/4" Spiral Cutter		1/4"	3/4"	1/4"	\$12.00
#903		1/4" Spiral Cutter		1/4"	3/4"	1/2"	\$12.00
#904		3/8" Spiral Cutter		3/8"	1"	1/2"	\$24.00
#905		1/2" Spiral Cutter		1/2"	1 1/2"	1/2"	\$29.00
#530		3/16" Edge Beading	3/16" Dia. of Circle		1/2"	1/4"	\$15.00
#531		3/16" Edge Beading	3/16" Dia. of Circle		1/2"	1/4"	\$15.50
#350		1/8" Round Over	1/8" R	3/4"	3/8"	1/4"	\$11.00
#351		3/16" Round Over	3/16" R	7/8"	1/2"	1/4"	\$11.00
#230		1/4" Round Over	1/4" R	1"	1/2"	1/4"	\$12.00
#353		3/16" Round Over	3/16" R	1 1/8"	1/2"	1/4"	\$14.00
#209		3/8" Round Over	3/8" R	1 1/4"	3/8"	1/4"	\$15.00
#355		1/2" Round Over	1/2" R	1 1/2"	3/4"	1/4"	\$17.00
#655		1/2" Round Over	1/2" R	1 1/2"	3/4"	1/2"	\$17.00
#656		3/4" Round Over	3/4" R	2"	7/8"	1/2"	\$21.00
#199		Multiform Moulding	Unlimited Patterns	2 1/4"	2"	1/2"	\$40.00
#205		1/4" Cove	1/4" R	1"	1/2"	1/4"	\$12.00
#206		3/8" Cove	3/8" R	1 1/4"	3/8"	1/4"	\$13.00
#207		1/2" Cove	1/2" R	1 1/2"	3/8"	1/4"	\$14.00
#643		3/8" Cove	3/8" R	1 1/2"	3/8"	1/4"	\$15.00
#208		3/4" Cove	3/4" R	1 7/8"	3/4"	1/2"	\$26.00
#231		3/32" Roman Ogee	3/32" R	1 1/4"	1 3/32"	1/4"	\$16.00
#232		1/4" Roman Ogee	1/4" R	1 1/2"	3/4"	1/4"	\$17.00
#506		1/2" Pattern	Flush Trim	1/2"	1"	1/4"	\$15.00
#508		3/4" Pattern	Flush Trim	3/4"	1"	1/4"	\$17.00
#366		1/8" Slot Cutter	3/8" Deep	1 1/4"	1/8"	1/4"	\$14.00
#368		1/4" Slot Cutter	3/8" Deep	1 1/4"	1/4"	1/4"	\$14.00
#204		3/8" Rabbeting	3/8" Deep	1 1/4"	1/2"	1/4"	\$13.00
#670		3/8" Rabbeting	3/8" Deep	1 1/4"	1/2"	1/2"	\$14.00

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#211		3/8" Core Box	round nose	3/8"	3/8"	1/4"	\$10.00
#212		1/2" Core Box	round nose	1/2"	1 1/32"	1/4"	\$13.00
#418		3/4" Core Box	round nose	3/4"	5/8"	1/4"	\$15.00
#213		1" Core Box	round nose	1"	3/4"	1/2"	\$17.00
#548		Lockmitre		2"	7/8"	1/4"	\$32.00
#214		1/4" Straight	plunge cutting	1/4"	3/4"	1/4"	\$ 6.50
#216		3/8" Straight	plunge cutting	3/8"	1"	1/4"	\$ 6.50
#474		1/2" Straight	plunge cutting	1/2"	1"	1/4"	\$ 7.00
#219		3/4" Straight	plunge cutting	3/4"	1"	1/4"	\$ 9.50
#779		3/4" Straight	plunge cutting	3/4"	1 1/2"	1/2"	\$10.00
#462		1/2" Bull Nose	1/2" Dia. of Circle		3/4"	1/4"	\$16.00
#464		3/4" Bull Nose	3/4" Dia. of Circle		1"	1/4"	\$21.00
#764		3/4" Bull Nose	3/4" Dia. of Circle		1"	1/2"	\$21.00
#545		Tongue & Groove	Straight	1 5/8"	1"	1/4"	\$29.00
#845		Tongue & Groove	Straight	1 5/8"	1"	1/2"	\$29.00
#546		Tongue & Groove	Wedge	1 3/16"	1"	1/4"	\$29.00
#846		Tongue & Groove	Wedge	1 5/8"	1"	1/2"	\$29.00
#450		1/8" Beading	1/8" R	3/4"	3/8"	1/4"	\$11.00
#233		1/4" Beading	1/4" R	1"	1/2"	1/4"	\$13.00
#454		3/8" Beading	3/8" R	1 1/4"	3/8"	1/4"	\$15.50
#455		1/2" Beading	1/2" R	1 1/2"	3/4"	1/4"	\$17.00
#500		3/8" Flush	Trimming	3/8"	1/2"	1/4"	\$ 7.00
#501		3/8" Flush	Trimming	3/8"	1"	1/4"	\$ 7.50
#503		1/2" Flush	Trimming	1/2"	1"	1/4"	\$ 8.50
#221		1/2" Flush	Trimming	1/2"	1 3/16"	1/2"	\$ 8.00
#558		Thumb nail		1 3/16"	3/8"	1/4"	\$18.50
#858		Thumb nail		2 1/2"	3/4"	1/2"	\$35.00
#579		Molding Plane		1 1/8"	1 3/4"	1/4"	\$31.95
#879		Molding Plane		1 1/8"	1 3/4"	1/2"	\$31.95

New 32-page catalogue featuring 100's of high-quality router bits, plus other professional woodworking products.



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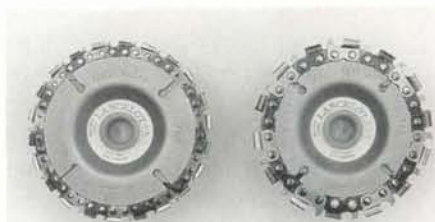
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Product News Continued



New Ryobi Table Saw

The BT3000 Precision Woodcutting System is Ryobi's new lightweight benchtop saw with the precision of a cabinet saw. The heart of the BT3000 is a 13-amp, 2-HP motor driving a 10 in. blade. Incorporating features usually found only in far more expensive saws, the BT3000 comes with a self-aligning rip fence and a sliding miter table with an 18 in. long miter fence and an accurate oversize miter scale. Both the miter and accessory tables mount to an adjustable sliding rail system that provides 30 in. of workspace on either side of the blade. Accessory packages turn the BT3000 into a router/shaper/jigsaw table. Price: about \$550. Contact Ryobi, 1424 Pearman Dairy Rd., Anderson, SC 29625; tel. 1-800-323-4615.



New Woodcarving Tool

New from King Arthur's Tools is Lancelot. Essentially a chain saw blade held between two stainless-steel disks, Lancelot mounts on a standard 4 in. or 4 1/2 in. disk grinder. Handy for sculpting or removing large amounts of wood quickly, Lancelot channels, hollows and cuts curves, both with and against the grain and through knots. The close tooth configuration virtually eliminates kick-back or grabbing. Available in either 5/8 in. or 7/8 in. arbor sizes, and in 14- or 22-tooth configurations. Price: \$38.95 including S & H. Contact FEC International, 3225 Earl Drive, Tallahassee, FL 32308; tel. 1-800-942-1300.

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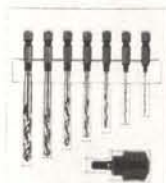


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New Product Review

The Accu-Miter

by Dennis Preston

I was impressed with the Accu-Miter the first time I saw it. Robust, well-finished, adjustable stops—real high tech appeal. After using it in my shop for about two months, I still like it, but with one exception: At times the size and weight of the jig make it awkward to handle.

The Accu-Miter is a miter gauge that can be fitted to virtually any table saw with a miter gauge slot. It has a well made die-cast protractor head with positive stops at the most commonly used angles. Attached to the protractor head is an adjustable fence with a telescoping inner fence and cutoff stop. The extruded aluminum fence has a hefty box cross-section and is available in an 18 in. length which extends to 34 in., or a 24 in. length that extends to 46 in. Two adjustable cutoff stops are provided—one on top of the main fence and one on the end of the telescoping fence. These can be used in conjunction with the built-in scale on the top of the fences. Both stops swing out of the way when not needed.

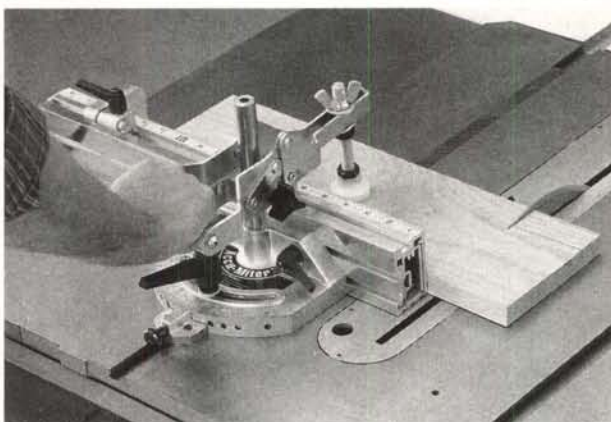
The basic Accu-Miter includes the protractor head, fences, stops and instructions for fitting it to your miter gauge bar. You can also order the Accu-Miter with a bar already mounted to fit your saw. Two clamp options are also available: a manual toggle clamp or a pneumatically powered clamp.

The heart of the Accu-Miter is the excellent protractor head. The protractor scale has well defined raised gradations cast into the head. The setting is locked with a molded adjustable handle. A nice feature is the "shot pin." This is the spring-loaded taper pin that engages a series of holes in the curved edge of the protractor head to hold the common settings of 0, 15, 22 1/2, 30, and 45 degrees. The taper pin eliminates any

slop in the setting and assures repeatability. In use, the shot pin detent is convenient and works well.

The adjustable fence assembly is mounted to the protractor head with two locking handles. Unlocking the handles allows the entire fence to be repositioned so that the work is always well supported close to the saw blade—a nice feature especially on large angle miter cuts where a fixed fence leaves too much unsupported stock.

The Accu-Miter is nicely finished and a lot of thought went into providing a



Model no. 18-34 with optional toggle clamp.

great amount of versatility. However, the price paid for this versatility is the considerable bulk of the whole assembly. Repeatedly lifting it on and off the saw over the course of a day and finding a temporary parking place for it in my crowded shop started to become a chore. With the modular design, though, you can reduce the weight of the assembly by easily removing the inner fence and stops until they're needed.

In summary, the Accu-Miter is an accurate, well made miter gauge. A mild complaint is that it is somewhat large and bulky. If you do a lot of repetitive cuts, the convenience and accuracy will outweigh the bulk.

Accu-Miter model no. 18-34 (18 in. fence)—\$149; model no. 24-46 (46 in. fence)—\$164; optional 3/8 x 3/4 bar—\$14.95; optional manual (toggle) clamp—\$29.95; optional pneumatic clamp—\$159. The Accu-Miter is available from JDS Company, 800 Dutch Square Blvd., Suite 200, Columbia, SC 29210; tel. 1-800-382-2637.



Readers' Information Exchange

Looking for an owner's manual for an old band saw? Need a bearing for a hand-me-down table saw? Can't find a source of supply for an odd piece of hardware? Maybe our readers can help. Send along your request and we'll try to list it here—and perhaps one of our readers will have an answer for you.

I'm looking for an owner's manual and information on a Shop Master wood lathe, head stock serial no. L502, tail stock serial no. L504, 40 in. bed.

James J. Cosgrove
1161 Sylvan Rd.
West Chester, PA 19382

I'm looking for information on a Weston & Anderson portable wood-working machine, model no. 8, serial no. 604; a Walker Turner shaper; and BMC Mfg. Corp. locking pliers.

Kenneth A. Cherry
9966 Lorraine Pl., St. Ann, MO 63074

I need an owner's manual and fence for my Tomlee Tool & Eng. Co. table saw model no. 33.

John Payne
746 Oxford, Houston, TX 77007

I'm looking for block puzzle plans no. 1229, 1230, 1231 and 1232, published by Craft Patterns in 1956.

John Floreno
3848 Pall Dr., Warren, MI 48092

I need an owner's manual for a Craftsman drill press, model no. 113.24511.

Stephen Conlin
Salem Lane, RR 3 Box 222
South Salem, NY 10590

I would appreciate information and an owner's manual for a Porta Shop Model 7, manufactured in Owosso, Michigan. From its design and appearance, it is circa 1950's or 1960's.

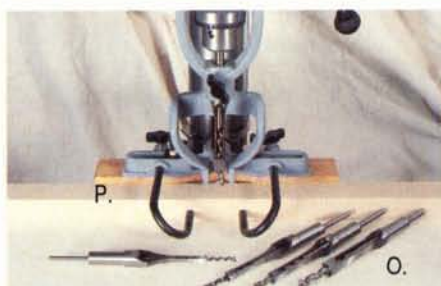
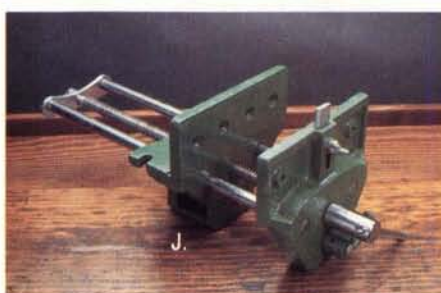
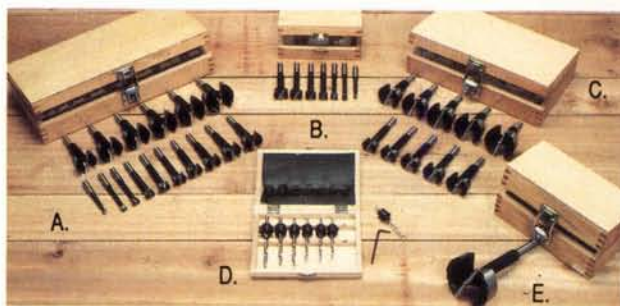
Les Grenz
6263 Depew St., Arvada, CO 80003

I'm looking for a blade guard and info on an 8 in. Craftsman table saw, model no. 103.02041.

David Green
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- Free: 50' of hose, 1 ea 4" to 3" , 2 ea 4" to 2" adaptors.. \$40Value

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Noise In The Shop

The Decibel Dilemma

by Jim Barrett

While many magazine articles have been written on tool safety and the respiratory hazards of sawdust and toxic fumes from finishes, the issue of health hazards associated with noise in the home workshop has largely been ignored. Our home woodworker in the photo below is taking no chances, though, and has included a set of inexpensive earmuffs in his arsenal of safety equipment. Although it might seem like overkill, he probably won't end up wearing a hearing aid later on in life.

Hearing protection is mandatory in occupations where workers are exposed to dangerously high levels of noise on a daily basis (including the lumber, furniture, and cabinet industries). In such work environments, OSHA regulations require employers to implement hearing conservation programs, which include supplying employees with hearing protection devices, giving them periodic hearing tests (audiograms), and taking other measures to reduce overall noise levels when feasible.

While much of the concern in industry has fostered increased public awareness of noise pollution in general, I suspect that not too many home woodworkers use earplugs or earmuffs when operating noisy machinery. Granted, hobbyist woodworkers don't operate their equipment eight hours a day, five days a week, but they're still putting their hearing at risk each time they fire up the table saw, planer, portable belt sander, or other loud tool. Hearing loss is a cumulative process. Besides, loud noise is just plain uncomfortable.

How Loud Is Loud?

Noise is measured in two ways: The intensity or energy of noise is directly related to sound pressure against the eardrum (vibration intensity), and is measured in decibels (dB). The second factor is vibration frequency, or pitch, measured in Hertz (Hz).

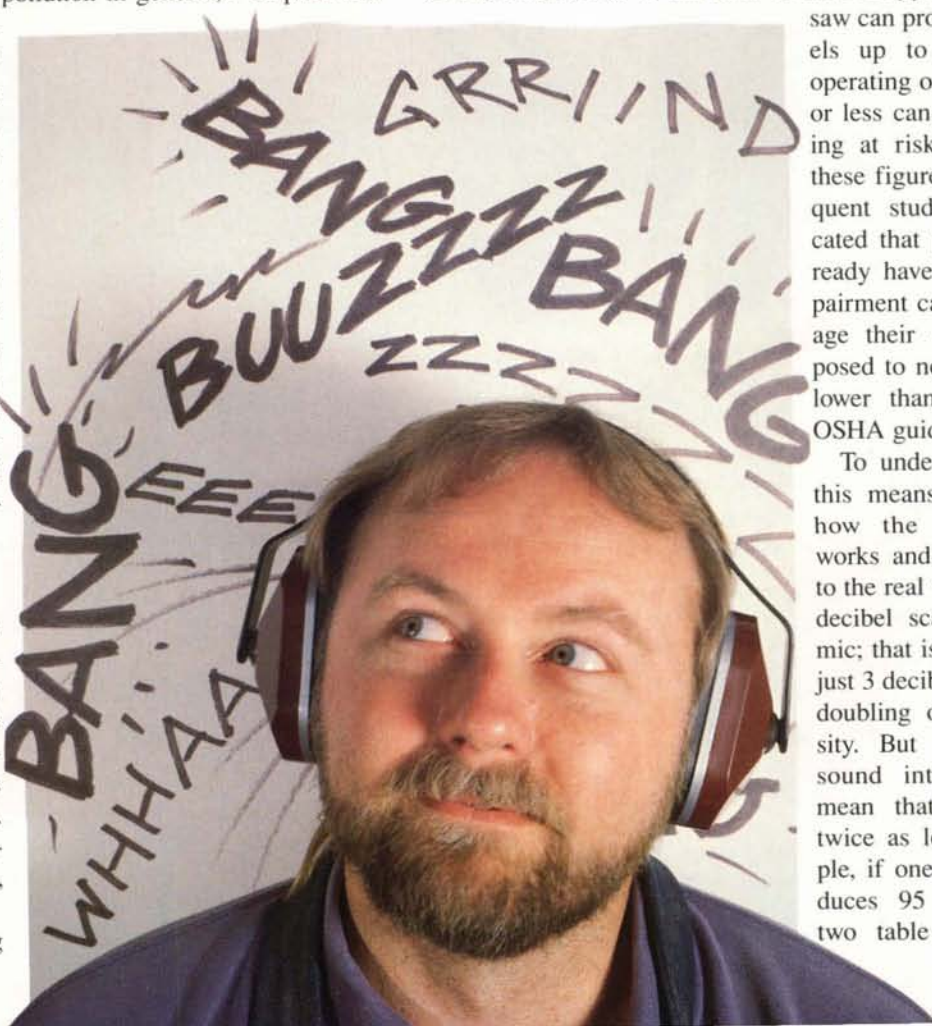
While most hearing

damage is related to sound pressure, higher-pitched noises are more damaging (and irritating) to the ear than lower-pitched noises of the same decibel level—for example, the high whine of a jet airplane motor versus the low rumble of a diesel train. Both factors need to be taken into account when choosing hearing protection devices, as I'll explain later.

OSHA has established regulations to determine when hearing protection is required in the workplace (Noise Standard 29 CFR 1910.95). The regulation is based on studies that indicate the maximum sound levels the ordinary human ear can be exposed to over a given time period without risk of hearing loss. The regulation states, in effect, that when the average sound level over an eight hour period reaches 85 decibels, companies are required to institute hearing conservation programs, which include making hearing protection available to employees. Hearing protection is mandatory when average exposure levels reach 90 decibels over an eight hour period; 92 decibels at six hours, 95 decibels at four hours, 100 decibels at two hours, 105 decibels at one hour, 110 decibels at half hour, or 115 decibels at 15 minutes. Because a typical 10 in. table

saw can produce noise levels up to 110 decibels, operating one for one hour or less can put your hearing at risk, according to these figures. Also, subsequent studies have indicated that people who already have a hearing impairment can further damage their ears when exposed to noise levels even lower than those in the OSHA guidelines.

To understand what all this means, let's look at how the decibel scale works and how it applies to the real world. First, the decibel scale is logarithmic; that is, an increase of just 3 decibels represents a doubling of sound intensity. But a doubling of sound intensity doesn't mean that something is twice as loud. For example, if one table saw produces 95 decibels, then two table saws side-by-



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In The Shop Continued

Decibel Level Chart

Tool ¹	Decibels No Load ²	Decibels Load	Reading Distance (ft) ³
Band Saw (S)	70	90-95	2
Belt Sander (P)	86-98	82-94	2
Belt/Disk Sander (S)	79	84-85	2
Bench Grinder (B)	under 70	varies	2
Circular Saw (P)	92-98	98-105	2
Drill (P)	74-80	72-77	2
Drill Press (S)	74	76-80	2
Dust Collector (P)	76-88	n/a	6
Jigsaw (P)	86	90	2
Joiner (S)	90	94-99	2
Pad Sander (1/4 sheet) (P)	80-83	82-86	2
10" Planer (B)	92	98	3
15" Planer (S)	94	96-100	3
Plate Joiner (P)	90-92	92-96	2
Router (P)	86-92	95-98	2
10" Table Saw (S)	80	90-94	3
10" Table Saw (B)	102	110	3
Shop Vacuum (P)	82	n/a	6

¹B = benchtop; P = portable electric tool; S = stationary tool

²Range of decibel figures indicates more than one tool tested.

³Readings taken from typical operator's position, measured from ear of user to tool motor or cutter.

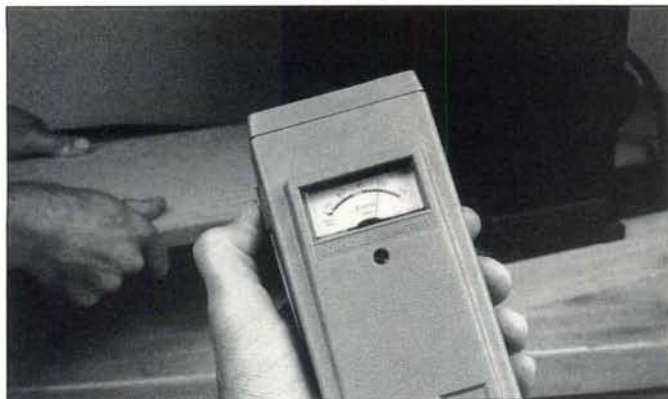
side will produce 98 decibels—the 3 decibel increase. Blindfolded, most people would be unable to distinguish any difference, though. It takes an increase of 10 decibels—or 8 or 9 table saws—before the average healthy ear perceives something as “twice as loud.”

Here are a few examples of typical noise levels we can all relate to. When readings are taken from a typical operator's position, power lawnmowers operate at 90 to 100 decibels; chain saws crank out 100 to 110 decibels; food disposers, 70-85 decibels, washing machines up to 60 decibels, a jackhammer (at 50 feet away) 88 decibels. A typical rock concert can be as high as 120 decibels; a jet airplane taking off, 140 decibels (no wonder airline ground crews wear earmuffs and teenage concert-goers never hear what their parents tell them!).

But how about table saws, belt sanders, planers, and other woodworking machines? Some tool manufacturers list decibel ratings for certain tools (the practice is by no means universal). But the testing methods used are arbitrary, and don't take into account the variations in different shop environments that can affect the readings. For example, a machine will be much louder in a small, confined area, such as a basement or garage

shop than it would if used outdoors or in a 2,000 square-foot factory. You can easily prove this statement by running your belt sander or portable circular saw in your bathroom, then again out in the backyard. Other factors include the distance from the source of the noise (machine motor and/or blade or cutter) at which the reading is taken, the working condition of the machine itself (tools are always quieter when they're new, well oiled and properly adjusted), the physical properties of the wood you're milling, the ability of surrounding surfaces to absorb or reflect sound, and numerous other variables. So, you can't compare the relative noise output of two similar machines by manufacturer's figures alone.

The chart on page 22 shows the approximate decibel levels of various portable and stationary power tools used in the typical woodworking shop. To arrive at these figures, we used the hand-held decibel meter shown below to take readings under load and no-load conditions from a typical operator's position (2-6 ft. away, depending on the tool). I tested some of them in my home shop; others were tested by the editors of *The Woodworker's Journal* in their shop. Because of the variables just mentioned, our figures probably won't coincide exactly with those of the tool manufacturer (if available), nor with figures you might get if the tool were tested in your shop, but they're definitely in the ballpark. You can use the figures to get



Author's handy sound meter: Even a small benchtop planer can kick up enough noise to swing the needle of a sound meter well into the red, as shown.

an idea of the relative noise output of different tools under load and no-load conditions to determine if hearing protection is necessary. This exercise proved one thing to me: Most power tools and machines are noisy enough to warrant protection! Also, I was surprised to find that portable belt sanders and electric drills are actually quieter under load in most cases.

Choosing Hearing Protection

Wearing earmuffs or earplugs when operating noisy tools and equipment is the first and most important line of defense in preventing hearing loss. Plugs and muffs come in a variety of styles, and provide varying degrees of noise protection. Prices range from under \$2 for disposable fiber or soft plastic plugs to over \$30 for a set of industrial-type earmuffs.

Whether you choose ear plugs or muffs is largely a matter of

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personal preference, based on user comfort. Generally, cup-type earmuffs that cover the entire ear are more comfortable and are easier to wear correctly. Styles include over-the-head, behind-the-neck, and under-the-chin, referring to the position of the band connecting the cups. The latter two styles facilitate use with a helmet or hard hat. Helmet-mounted cups are also available.

To be effective, ear plugs must be fitted so that they completely seal off the ear canal; a small percentage of users may find this hard to do, as the plugs are usually sold on a one-size-fits-all basis, and don't take into account the differences in human anatomy. Earmuffs also provide a bit more protection by dampening sound vibration through the skull immediately surrounding the ear. From a comfort and convenience standpoint, I personally prefer over-the-head earmuffs like the ones shown in the photo. Muffs are not easily misplaced and don't get contaminated with ear wax like plugs do. My earmuffs hang in plain sight in my shop along with my dust mask and goggles as a reminder that I should use them.

More important than comfort, though, is the actual amount of protection provided by the various devices. All plugs and muffs are given an Environmental Protection Agency (EPA) noise reduction rating (NRR), which is (or should be) listed on the package. This arbitrary rating is much like the black-and-yellow energy efficiency stickers found on household appliances. That is, the figures are a general average based on laboratory tests and don't really reflect the performance of the device in real-world conditions. In actuality, hearing protectors provide different levels of protection at different sound frequencies. For example, protection devices with an EPA rating of a 23–25 dB reduction may attenuate or “block” 35–40 decibels of high-frequency noise (4,000 to 6,000 Hz), but only 12–14 decibels of low-frequency noise (200–300 Hz). While the EPA ratings don't help much in determining how a particular hearing protector will perform at different frequencies, the figures are helpful in determining the relative protective value between different brands and models. The manufacturers of hearing protectors can provide such additional performance data for the different models in their lines (see Sources).

Fortunately, earmuffs and plugs are more efficient in blocking the high frequency sounds made by woodworking machines such as table saws, planers, and most portable power tools. Unfortunately, you don't know how effectively they block the noise of any one machine, let alone overall noise

levels in your shop, unless you hire a specialized firm to take sophisticated measurements, as industries do. Generally speaking, though, a set of ear muffs or ear plugs with an EPA rating of 20–25 dB will provide adequate hearing protection when operating most woodworking machines found in the home shop (also lawnmowers, chain saws, leaf blowers, and similar outdoor equipment). Earmuffs sold at local hardware stores and tool suppliers generally have EPA NRR ratings from 19 to 25 dB, and range in price from about \$10–25. The ones shown in the photo have a 23 dB rating and cost \$19.95 at the corner hardware store. Theoretically, at least, these muffs tone down my 10 in. table saw from 110 decibels (under load) to around 75 decibels—well within the “safe” range as defined by OSHA.

The only real way to know if your hearing protector is doing its job is to get a periodic hearing test (audiogram): typically once every 6 months for full-time woodworkers, once a year for weekend warriors. Get your first test before you buy your hearing protector, to serve as a baseline. Subsequent tests will reveal if the hearing protection you're using is adequate.

One safety-related question often asked about hearing protectors is if they block sound to a point that you can't hear sounds that might be important, such as a co-worker yelling a warning or sudden odd noises made by a malfunctioning machine. Actually, ear muffs and plugs improve the ear's ability to pick up such noises. Because hearing protection devices reduce overall noise levels, ergo “hearing overload,” they enable you to better distinguish between “normal” and “abnormal” background noises in the shop when running loud equipment.

Other Measures You Can Take

While ear plugs and muffs protect the ears of the machine operator, they don't do anything to reduce the source of the noise. Conversely, by lowering overall noise levels in the shop, you reduce the need for hearing protection in the first place. Following are measures you can take to tone down shop noise.

Choosing Quieter Machines—Tool manufacturers are also becoming aware of industry concerns in reducing noise levels in the workplace, and strive to make their tools quieter. (The most noticeable technological advancements have been made in circular saw blade design.) As mentioned, some manufacturers are now including decibel figures in their spec charts for some equipment, but the figures don't reflect the actual noise output in various shop environments. At the very least, the

Sources

Most lumberyards, hardware stores and tool suppliers carry earplugs and earmuffs. However, the following manufacturers of these devices can provide useful data to help you choose the correct device for your particular requirements.

Bilsom International Inc.

109 Carpenter Drive
Sterling, VA 22170
Tel. 1-800-733-1177

Cabot Safety Corporation

5457 West 79th Street
Indianapolis, IN 46268
Tel. (317) 872-6666

David Clark Company, Inc.

Box 15054
Worcester MA, 01615
Tel. (508) 756-6216

Mine Safety Appliances Co.

P.O. Box 426
Pittsburgh, PA 15230
Tel. 1-800-672-2222

Willson Safety Products

P.O. Box 622
Reading, PA 19603
Tel. (215) 376-6161

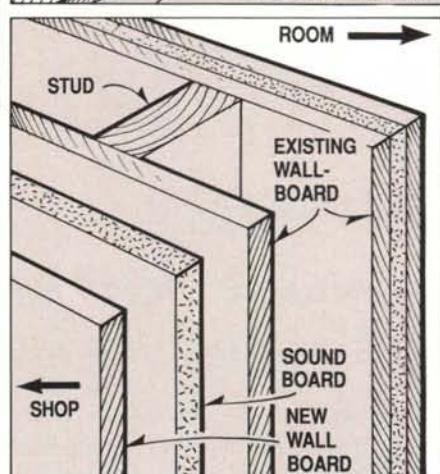
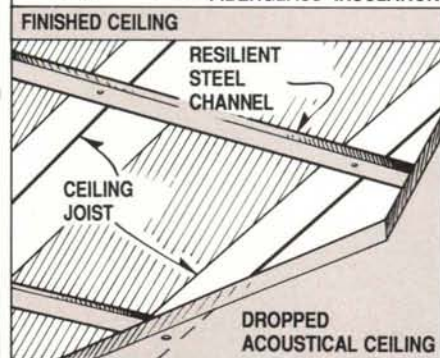
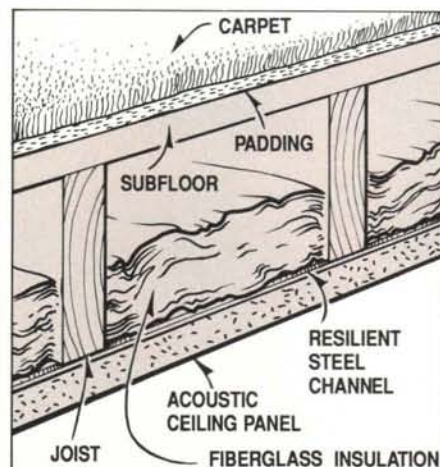
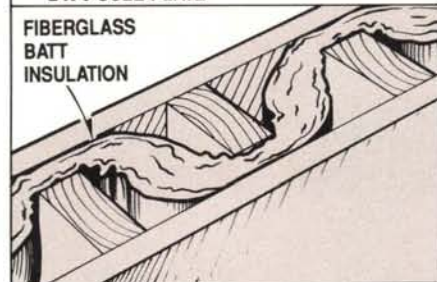
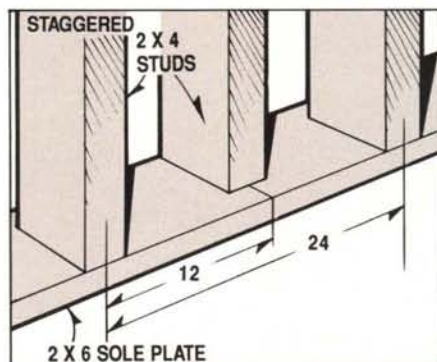
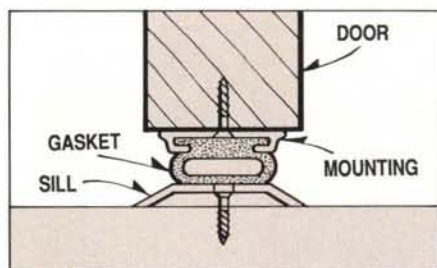
decibel ratings would be more meaningful if the manufacturers also tested their competitor's tools, using the same yardstick, as a means of comparison. Or maybe the EPA or Underwriter's Laboratories (UL) could come up with a standard rating system like that used for hearing protection devices. Then the consumer would be able to factor noise levels into their buying decisions. The only such comparison tests I've seen are informal ones conducted for tool reviews in woodworking magazines. But you can keep noise levels in mind when trying out different tools before you buy, and let your own ear be the judge.

Reducing Machine Vibration—You can make any woodworking tool or machine quieter by keeping it well adjusted and in good repair. Replace worn bearings and other parts, keep all screws, nuts, pulleys, and belts tight, keep moving parts well oiled, adjust blades and cutters to correct specifications and keep them sharp. Loose or poorly aligned components vibrate, and vibration causes noise. Other ways to reduce vibration include isolating or cushioning the machine from the floor or bench. For example, on stationary tools you can place the legs of stands on rubber furniture cups to minimize vibration transmission to the floor. When assembling stands, put a dab of silicone sealer between mating parts where they're bolted together. On benchtop tools or when bolting a stationary tool to its stand, install soft rubber washers, pads, or grommets between the tool base and bench or stand.

Install Sound-Absorbing Surfaces—Smooth, hard surfaces reflect and intensify sound. Have you ever noticed how your voice echoes in bare, empty rooms with no furniture, carpets, draperies, and other sound-absorbing surfaces? While carpeting a shop floor is impractical, rubber mats will help deaden sound while providing a slip-proof walking surface. Adding a dropped acoustical ceiling and covering walls with soundboard (available at building supply stores) is perhaps the most effective structural way to deaden sound within the shop. If your shop is in the garage, simply opening the garage door will make the inside of the shop quieter, although you risk arousing the ire of the neighbors. Conversely, insulating and applying soundboard to the interior walls of an unfinished garage will make it quieter inside and out.

In large shops with two or more workers, you can build partial walls or booths around stationary machines to help isolate the noise.

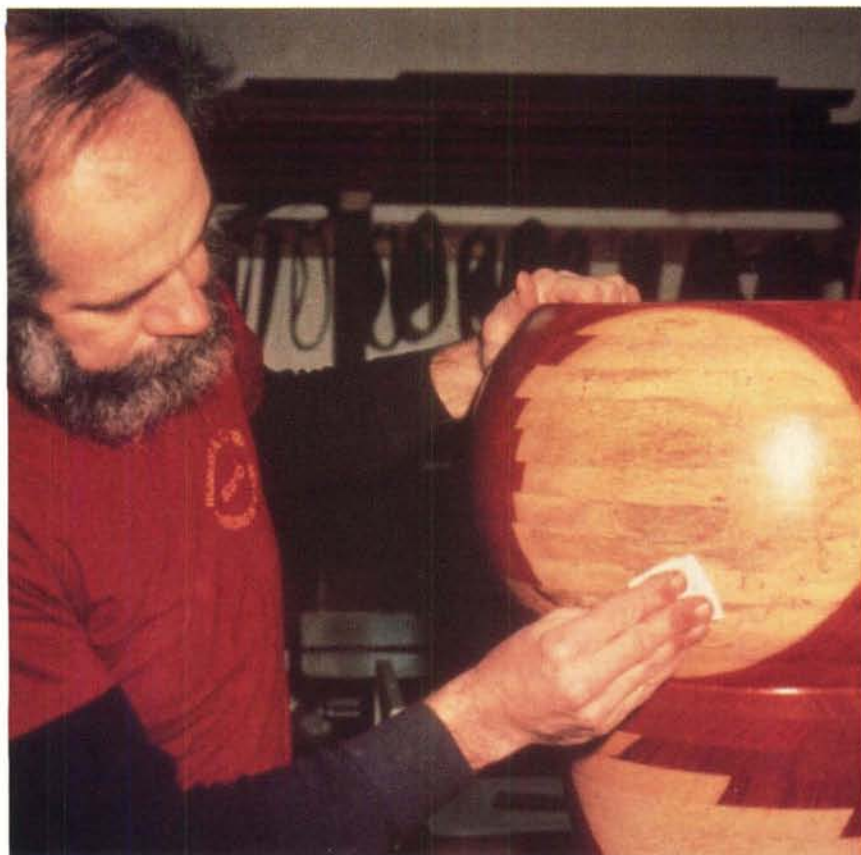
Isolating The Shop—If your shop adjoins the living area in your house, noise transmitted through the wall can disrupt family activities and create disharmony. The least expensive



(and least effective) way to soundproof a wall is to apply soundboard to one or both sides of the wall. Adding insulation in the wall cavities between the studs will further reduce noise transmission. The most effective

way to soundproof a wall is to alter the framing in conjunction with the other methods described. The drawings above show the various options. You can make any wall virtually soundproof if you want to spend the time and bucks to do it.

Sound also transmits through doors and the gaps around them. Hollow core doors are least effective in blocking noise—in fact, they make excellent resonators: A musician friend of mine attached two fretboards to a hollow core door to make a coffee-table dulcimer, or “doorcimer” as he called it. Replace hollow core doors with solid core doors, and seal the cracks around them (including the threshold) with weatherstripping.



Faux-Turned Vessels

Technique yields lathe-turned look without the lathe

Things—and people—aren't always what they seem. Rounding the corner of an aisle at the prestigious 1991 American Crafts Enterprises show in Springfield, Massachusetts, and coming upon Robert St. Pierre's stunning display of wooden vessels, one couldn't help but make two assumptions. First, that the well-balanced forms and innovative work must surely be the result of a classical art education, and second, that they must be produced on a very expensive lathe. Appearances notwithstanding, both assumptions are wrong.

With a host of awards to his credit,

and with clients from private collectors to corporations, St. Pierre certainly looks the part of the high-society artist. But the facts are otherwise. Fully 39 of St. Pierre's 49 years were spent with no relationship whatsoever to arts or crafts. Indeed, after 10 years in the Navy, the last three in Vietnam, St. Pierre was scarcely home three months in 1970 when a devastating auto accident put him in a total body cast for nearly four years. That was followed by a long period of rehabilitation.

Repeating an oft-told story, St. Pierre explains that his first try at creating vessels was the result of a very innocent

request from his wife. "About the time I was learning to walk again without crutches, in 1982, we renovated a bathroom. My wife asked me to make a vase to complement the decor." Although he had worked as a carpenter and cabinet-maker in his youth, St. Pierre had no formal art training, no lathe, and only a very few rudimentary tools. Yet, with only a jigsaw, a homemade drum sander, a belt sander and his inborn stubbornness, St. Pierre set out to make the vase. The result, a scrap pine and plywood lamination, made of ring sections cut with the jigsaw, laminated, and then shaped with the sanders, looked like it could have only been created on a lathe. But it was not, and the combination of this fact and the unique appearance of the built-up ring sections, proved to be the springboard to a career.

An Overnight Success?

Encouraged by a friend to enter a similar vessel in a local art contest in early 1983, St. Pierre took second place. Another award in a second show soon followed. Now over a 100 awards later, St. Pierre's work is in galleries and fine stores the world over, and the order backlog will keep him busy in his Duxbury, Massachusetts, studio for years to come.

If this sounds like an overnight success, St. Pierre insists it was not. Relating how that first award led to his doing local church craft shows and fairs, then on to more local competitions and awards, and finally the national fairs and wider recognition, St. Pierre insists, "I've paid my dues." He continues, "It took time, I kept working hard, and it happened."

How About A Lathe?

Although today some of his vessels take on a nearly sculptural quality, all are crafted with the same basic hands-on procedure that St. Pierre employed with that first vase. The steps are so simple, the equipment required so minimal, and the process so labor intensive, one can easily suggest that far more work could be produced on a lathe. But St. Pierre considers such a thought anathema. "I'm trying to create something from

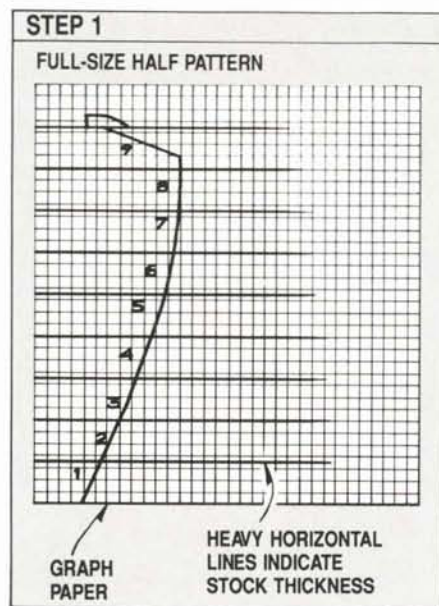
within." He adds, "Wood is alive, you work it with your hands and give it another life." Though some of his best friends are turners, St. Pierre sees the process of lathe-turning as too mechanical. "I feel the vessels have more of a personality, and there's more freedom of design doing it my way" he says with finality.

A Simple Concept

Although he has made some subtle modifications, such as the use of Forstner bits to drill out the interiors of smaller vessels, and the addition of lids on some of his latest work, the basic process remains the same. The following step-by-step instructions are valid for just about any vessel shape you can make. We've included four patterns (see page 65), a vase, an urn, and a pair of vessels—one rimless, the other symmetrical. The urn uses the Forstner bit method to hollow the interior, the rimless vessel uses the jigsaw method for the interior, and the two other forms use a combination of the two interior hollowing methods. Other than this, the only substantial difference between the forms is the order in which the sections are assembled.

Step 1. Create a full-size half-pattern. Draw one-half the vessel's shape on a sheet of graph paper, using the edge of the graph paper as the vessel center line. Then add horizontal lines indicating the stock thickness from which the rings will be cut. St. Pierre prefers using $7/8$ in. thick sections, but $3/4$ in. thick stock is also fine. The four patterns shown (see page 65 for patterns) are all sized for $7/8$ in. thick stock, with thinner sections for the topmost laminations on three of the vessels. If you'd prefer using $3/4$ in. thick stock, then just reduce the pattern slightly till the thickness of the sections on the full-size pattern equals $3/4$ in. Also, number each ring of the pattern in consecutive order. This helps avoid confusion later, when you've got a large number of rings ready to assemble, and you are wondering just what order to assemble them in.

Don't be limited to the four patterns provided. Almost any vessel that you



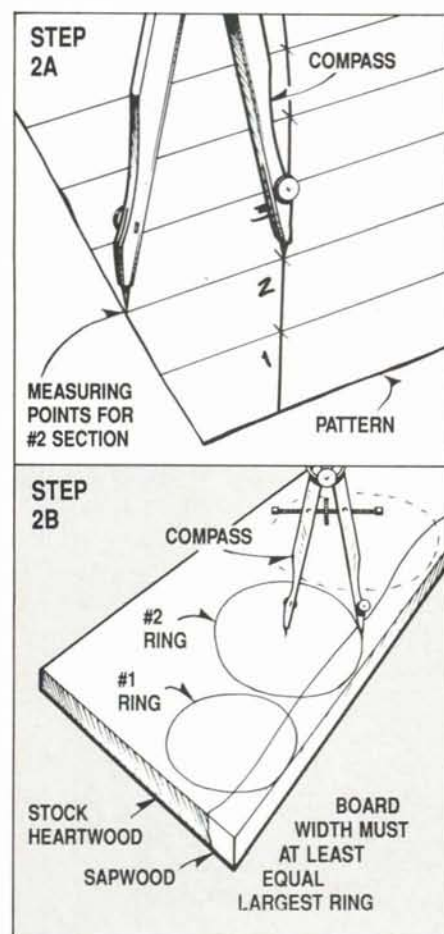
find around the house, from a ceramic vase to a glass jar, can be used for inspiration. If you find a shape you like, just trace it onto some graph paper, add horizontal lines to indicate the stock thickness that you intend to use, and go to work.

Step 2. Use a compass to transfer the radius of each ring from the paper



pattern to your stock. This is simplicity itself. Just set the compass directly from point-to-point on each horizontal line (Step 2A), then use the compass to scribe the ring diameter on the board (Step 2B). Just be sure that your point-to-point setting is always to the farthest outside point of each ring. Number each of the rings scribed on the board to correspond with the ring numbers on the pattern. As described earlier, this helps avoid confusion later.

Laying out the rings side-by-side on the same side of the board is your



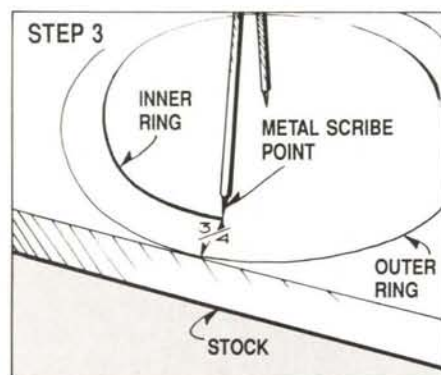
obvious choice for laminations where each consecutive ring is slightly larger than the next, such as for rings 1 through 8 in Step 1. But with round-shape vessels, the rings get larger until about half-way up, while the remaining rings are just the opposite—each is a little smaller than the one before. What should you do here?

Actually, this presents an interesting design opportunity. If you continue to lay out the rings on the same side of the board, when cut, the top half ring sections must be flipped over. With woods that show a distinctive grain pattern, the top and bottom halves of the vessel showing opposing grain creates a bookmatched look, contributing to the round look of the vessel. Or, flip the board over and lay out the top half ring sections on the opposite side. When stacked, this technique will yield one continuous lamination where the grain direction of all the rings agrees. Just remember that your compass points are

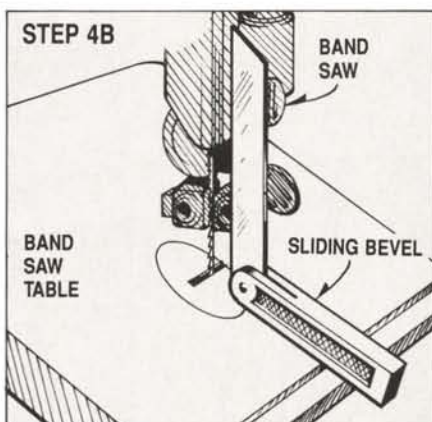
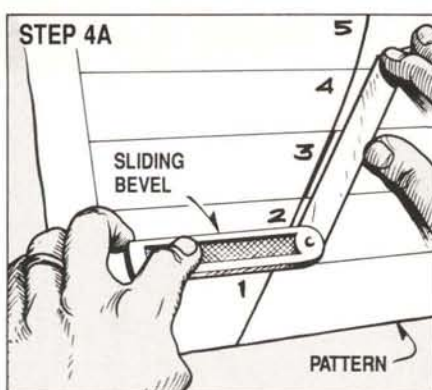
always taken from the widest point of each ring.

Some of St. Pierre's most dramatic pieces are made of rings cut consecutively from a single board, utilizing the contrast of sapwood and heartwood. You'll need long enough boards to yield all the sections (or several boards cut consecutively from the same tree) and you'll need to carefully position each of the rings on the board to take best advantage of the sapwood/heartwood contrast (see photos). Other design options are to use several different types of wood for each alternate ring, or edge-glue several contrasting woods to create a source board. Both of these options yield vessels that have a strong visual appeal.

Step 3. Scribe the interior diameter of each ring. The usual compass setting



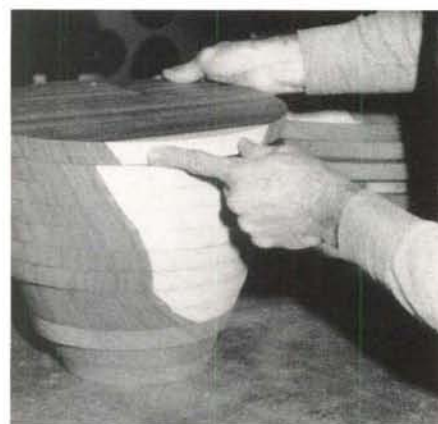
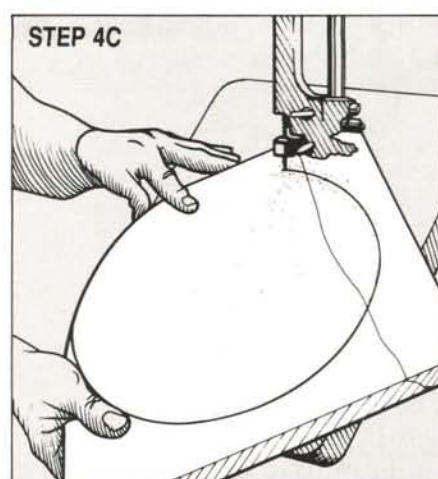
here is the radius to the furthest point of each ring, minus the intended sidewall thickness. As a rule of thumb, make sidewall thickness at least $\frac{3}{4}$ in. for large vessels, slightly less for small vessels. Using the same center point that you used to scribe the outside perimeter, scribe the inside diameter. But replace the compass pencil with a sharp metal scribe point. Use the scribe to deeply score the surface of the inside circle. This is an important step for vessels where the jigsaw is used to cut out the inside of the rings, since without first scoring the surface the jigsaw tends to chip out wood along the cut line, leaving a ragged edge. (On some of the vessels, interior cuts are made with Forstner bits or a combination of Forstner bits and the jigsaw. No deep scoring line is needed for Forstner bit interior cuts.)



After the rings have been laid out, cut the board up into sections (see page 27). You'll need the smaller sections—one section for each ring—in order to easily complete the steps that follow.

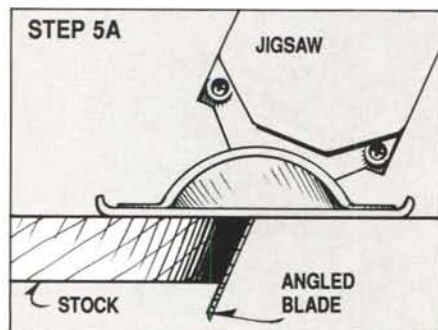
Step 4. Use the jigsaw or band saw to cut the outside diameter of the rings. To minimize sanding work later on, you'll want the outside cut to be as close as possible to the pattern. Using a bevel square, transfer the outside angle directly from the pattern to the band saw table or jigsaw base. This is an easy procedure. Set the bevel angle for each ring right on the full-size pattern (Step 4A). Use the sliding bevel to transfer that angle to the band saw table or jigsaw base (Step 4B), then cut the outside diameter (4C). Reset the band saw table or the jigsaw base for each ring as the bevel angle changes, following the same procedure. As shown in the photo, you'll now have a stack of solid disks, but without a hollow interior.

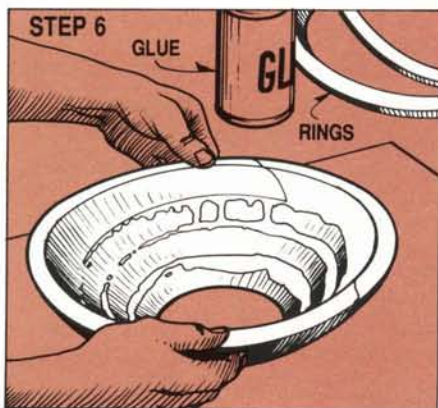
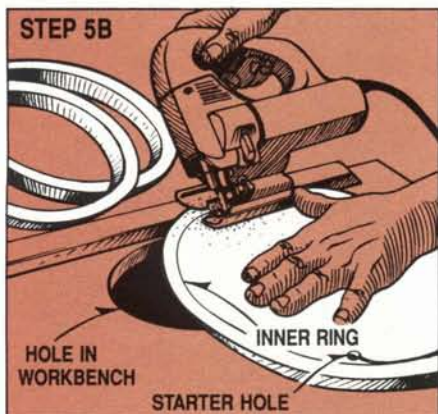
With some vessels, the final shape may include an angle that's beyond the capacity of your jigsaw or band saw. This is the case with the two top sections



and the base sections on both the rimless and the symmetrical vessels, and the rim and top sections on the vase. For these angles, just make the maximum angle cut that your jigsaw or band saw can accommodate, then do the final shaping on the belt or disk sander.

Step 5. Use the jigsaw to cut the inside diameter. Set the jigsaw baseplate angle directly from the outside angle of the ring (Step 5A). Then drill a starter hole for the saw blade and cut the inside diameter (Step 5B). Since you got the inside angle directly from the outside





angle, both should be identical. A hole in the workbench top for the jigsaw blade enables St. Pierre to pivot the workpiece as he cut the rings. The inside cutouts are hardly waste. On his larger vessels, St. Pierre can get two more smaller vessels just by utilizing the waste from the center cutouts. You should now have a stack of numbered rings, as shown in the photo, ready for assembly.

Step 6. Glue and assemble the rings. St. Pierre uses Franklin Titebond wood glue, but any good yellow glue will be fine. St. Pierre doesn't recommend using white glue, since with the types of woods he uses it leaves a noticeable line at each joint.

Although the ring assembly of every vessel is a little different, as a rule St. Pierre glues up about four or five rings at a time. To try to get more in a single assembly often isn't practical, since it just makes sanding the inside of each glue-up more difficult. The best way to go about the glue-up is to limit the number of rings to whatever depth matches the capacity of your drum sander. However, with some vessels, such as a simple smooth curved shape,

without a lipped top, it's possible to laminate more rings. For example, with the vessel on page 68, all the rings except the bottom are done as a single lamination. The main problems when many rings are involved is to work quickly (before the glue starts to set up) and to keep the rings from sliding out of line as clamp pressure is applied.

Where possible, try to divide the assembly procedure for each vessel to best match its shape. Ideally, you'll handle the interior sections of the vessel as a single subassembly, sanding the interior, then adding the top and bottom sections before sanding the outside. But where a lipped rim is used, the top must be sanded separately, and with very large shapes, you may need to use several subassemblies just to complete the body of the vessel. Apply a generous bead of glue to each joint (Step 6), then use bar or pipe clamps with a plywood clamping pad at each end to sock the assembly up tight (see photo). The

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1" x 3/8" Heart	\$ 6.50 / 100	\$ 5.50
1-1/4" x 3/8" Heart	\$ 8.25 / 100	\$ 7.00
3/8" Round Bead	\$ 3.25 / 100	\$ 2.25
1/2" Round Bead	\$ 3.50 / 100	\$ 2.50
1/2" x 5/8" Spool	\$ 5.00 / 100	\$ 4.00



5/8" x 7/8" Wren Egg	\$10.00 / 100	\$ 8.00
1-1/8" x 1-5/8" Pigeon Egg	\$20.00 / 100	\$16.00
1-3/4" x 2-1/2" Hen Egg	\$12.50 / 25	\$10.00
2-3/4" x 4-1/4" Goose Egg	\$ 3.00 / EA	\$ 2.50
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clamps are tightened alternately, much like one tightens lug nuts on a wheel. Don't worry about using too much glue, any excess will just be sanded off later. Also note the use of a hole in the center of at least one of the clamping pads. This is necessary for air circulation inside the clamp-up to facilitate the glue drying. You'll need seven or eight clamps to apply even pressure all around. But don't sock the clamps up overly tight. You want a good secure assembly, but you also want to avoid starving any of the joints, a situation that could lead to failure later on. Also note that both plywood clamp pads are about the same diameter, so the clamps will be parallel. The work should remain in clamps for at least 24 hours, the glue manufacturer's claims to a quicker drying time notwithstanding.

Step 7. Remove the glue-up from the clamping assembly, and use a drum sander to rough-sand the inside of the vessel. St. Pierre uses a 3450 RPM motor and a 4 in. by 1 1/2 in. drum, but any motor and drum size would be acceptable. As shown in the photo, a simple L-shaped dustshield, cobbled together from construction grade plywood, serves both to protect the motor from sawdust, and to limit the dust to within a small area. The extra holes in the plywood are for a 4 in. diameter dust collector hose. St. Pierre tells us that he mounts the hose in the hole closest to

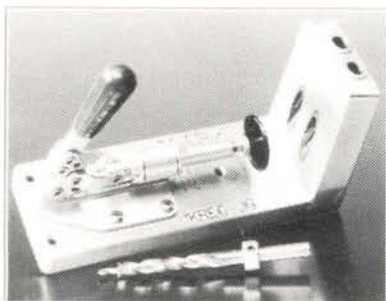


where the flow of dust is greatest. Several holes are needed because the ideal spot varies depending on the size and shape of the vessel being worked.

After the drum sander has been used to bring the rings within range, a flap sander (60-120 grit) is used to final sand the inside. A flexible shaft grinding tool (see photo) is handy for work on very large vessels, and for fairing in and cleaning up interior glue lines after subassemblies have been joined.

Step 8. The outside sanding is done after the various subassemblies (usually the main vessel body and the bottom section) have been joined, so the shape is essentially complete. Use the same clamping procedure as before, again waiting at least 24 hours before removing the clamps. Note that with some vessels, though, where a stepped top lip is employed, the topmost or collar section is added only after the final outside sanding is complete.

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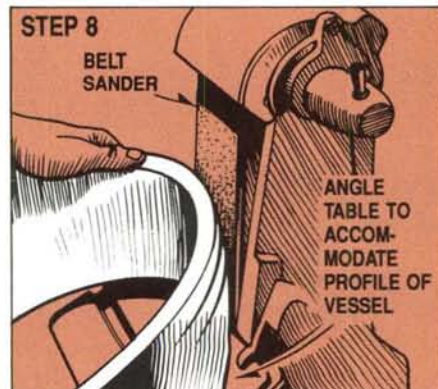
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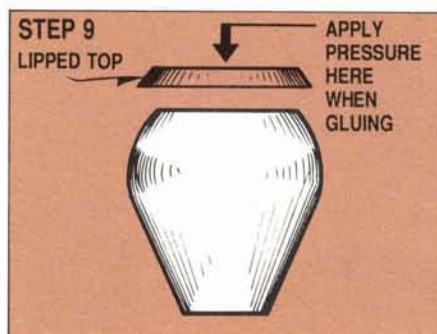




The bulk of the outside sanding is accomplished with a 6 in. by 48 in. belt sander (Step 8). The Sears model is reasonably priced and works well. Start with a 50-grit belt, then switch to an 80-grit belt. Angle the belt sander table a few degrees at a time as you work the vessel from top to bottom. Then use an 8 in. by 10 in. balloon sanding drum (with progressively finer grits up through 220), attached to a 1750 RPM motor to further smooth the outside surface (see photo). Finally, switch to a palm sander, and using progressively finer grits (100, 120, 220), final sand the outside of the vessel to correct any imperfections that you may have missed with the large balloon sander. If you don't have a large balloon sander (a relatively recent addition for St. Pierre), just skip that step and go right to work with the palm sanders. An air-powered palm sander works great (see photo), if your shop is set up with a compressor, but St. Pierre started out using just a standard electric model.

Step 9. (For vessels with lipped tops).

If the vessel has a lipped top, final sand the top ring, glue it in place using weight (clamps are liable to split the thin rings that St. Pierre uses for the lipped tops), then use a small drum sander to sand the inside glue seam smooth. With both the top and bottom, take extra care to use only enough glue to fill the joint. You want to avoid excess squeeze-out, especially at the outside perimeter of the stepped lip, since it can be a problem cleaning the squeeze-out off.



Step 10. Apply the finish. St. Pierre recommends at least four or five coats of an oil base urethane finish, applied with non-sterile gauze pads (see photo on page 26). Sand between each coat, rub the final coat with 0000 steel wool, then add a coat of butcher's wax to provide a little added protection.

More Vessels

Encouraged by his success, St. Pierre is always seeking to expand his horizons. His latest interest is in expanding not only the scope but also the scale of his work. "I'm working on a system to construct massive vessels on location, probably as corporate commissions," St. Pierre says. But don't believe for a moment that money is this craftsman's primary motivation. He admits that the money is nice, but he says he usually just plows it back into the business in the form of new equipment and wood.

St. Pierre's real love involves much more than just his work. "Wood is a wonderful medium," he says "but for me it's not just the work, it's also the people I meet." Recalling the look on people's faces as they run their hands over his vessels, St. Pierre notes, "I'm doing something that gives people a lot of satisfaction."

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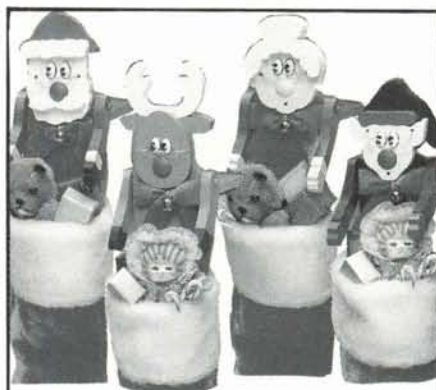
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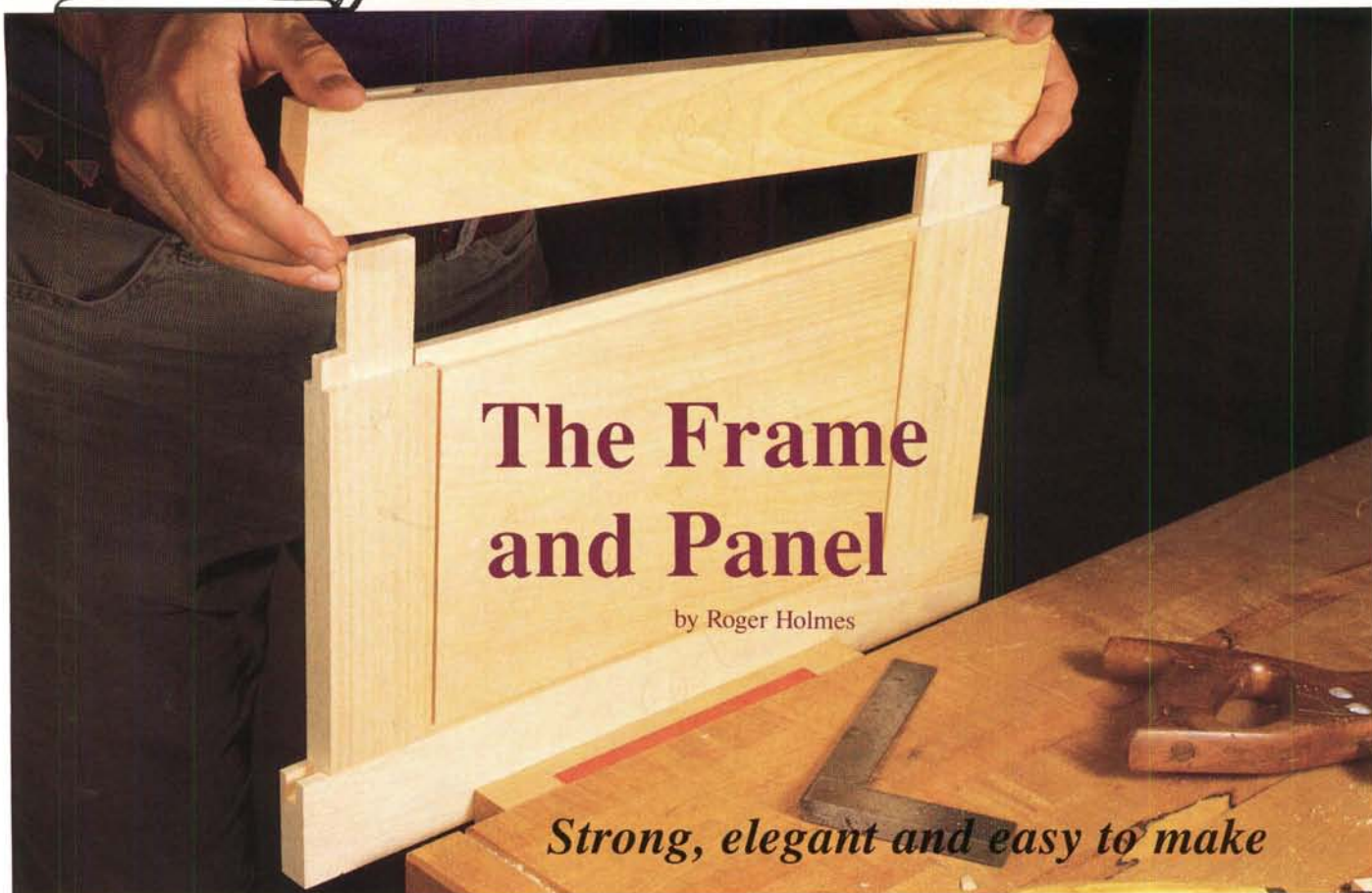
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The Frame and Panel

by Roger Holmes

Strong, elegant and easy to make

Of all the ways of sticking pieces of wood together for some useful purpose, few are as versatile, or permit as much variation, as the frame and panel. It is pervasive in architecture (walls, ceilings, doors, windows—all can be made or covered with frame-and-panel construction) and in furniture. Chests, desks, dressers—any case piece—can be completely or partially assembled of frame-and-panel parts. Cabinet doors are regularly framed and paneled as are drawer fronts.

The appeal of frame-and-panel construction is due in part to a structural advantage. Wood moves, swelling as the surrounding air grows moist, shrinking as it dries. Covering a wall, to take an example, by nailing wide pieces of wood tightly edge to edge invites disaster—a humid spell might swell the assembly a couple of inches, either pushing adjacent walls out, or buckling the swollen boarding. By suspending relatively wide panels in narrow frameworks, the effects of movement are controlled. The panels are free to expand into grooves in the frame, while the total expansion of the

framework is a tiny fraction of the wall's width.

The other attraction of frame-and-panel construction is visual. You could work at it for years and not exhaust the decorative possibilities. A frame and panel can be starkly simple—a rectangular frame surrounding a flat panel—or elaborately embellished. Both the frame and the panel provide a wealth of opportunities for molding and for creating dramatic three-dimensional effects by varying the heights of the surfaces. Some lovely oak wall paneling I once saw in a French chateau had foot-wide frame pieces molded to about half their width. My favorite English Arts and Crafts furniture features panels where three or more levels of geometric shapes rise from the surface like the layers of a wedding cake.

If you've never attempted a frame and panel before, it's best to make your first steps small ones. Get a feel for the basic construction, then experiment with embellishments. Fig. 1 shows two simple types of frame and panel—a grooved frame and panel, and a rabbeted frame

and panel. In both, the frame is assembled traditionally, with through mortise-and-tenon joints. In the grooved frame and panel, the panel is held in grooves—once assembled, the panel cannot be removed. In the rabbeted version, the panel rests in a rabbet, fixed in place by removable moldings or fillets. This construction is best when the panel is breakable (a pane of glass or a mirror), is easily damaged, or needs periodic removal for cleaning (fabric).

In this article, I'll describe how to make the grooved frame and panel. (A rabbeted frame with offset shoulders is only slightly different to make.) As is often true in woodworking, the individual tasks aren't terribly difficult. Success, however, depends on organizing them logically and efficiently and on performing them accurately. I think the best way to learn to do this is to make your first frame and panel largely by hand. In addition to learning the construction from the ground up, you'll improve your hand skills and, I hope, have some fun. If you have the time, I encourage you to do the whole job by

hand, from rough wood on. It's enough, however, to lay out and cut the mortise-and-tenon joints by hand, and that's what I'll do here. Of course, this is far from the only way to make a frame and panel. After you've gained some experience, you can alter the process to suit your projects and your inclinations.

Proportion and Terminology

Frame-and-panel and mortise-and-tenon terminology are identified in Figs. 1 and 2. Usually, the vertical members of the frame, or stiles, are mortised, the horizontal members, the rails, are tenoned. A raised panel is thicker in the middle than at the edges, where it fits into the groove or rabbet. As long as the rails, stiles and panels are sturdy enough for the task, there are no hard-and-fast rules regarding their proportions. I think simple examples like this look best when the top rail and stiles are the same width and the bottom rail is noticeably wider.

In general, I make the mortise about one-third the thickness of the stile

(slightly more for thick frames). Where the panel fits a groove, make the groove equal to or less than the size of the mortise and aligned with it. This allows you to plow the groove along the entire length of the stile (easier than having to stop it short of the ends). The haunch on the tenon fills the groove at the ends of the stile and helps prevent the top part of the joint from twisting out of line.

The edge of the tenon opposite the haunch aligns with the bottom of the groove. The depth of the groove depends on the size of the panel and the type of wood—some expand and contract more than others. I've seldom made grooves less than $\frac{3}{8}$ in. or more than $\frac{5}{8}$ in. deep. Bruce Hoadley's invaluable book, *Understanding Wood*, (Taunton Press), has a useful discussion and chart on the movement of various woods.

Stock Preparation

Mill the frame parts to dimension, taking care to plane their surfaces flat and square. If the rails or stiles are twisted or

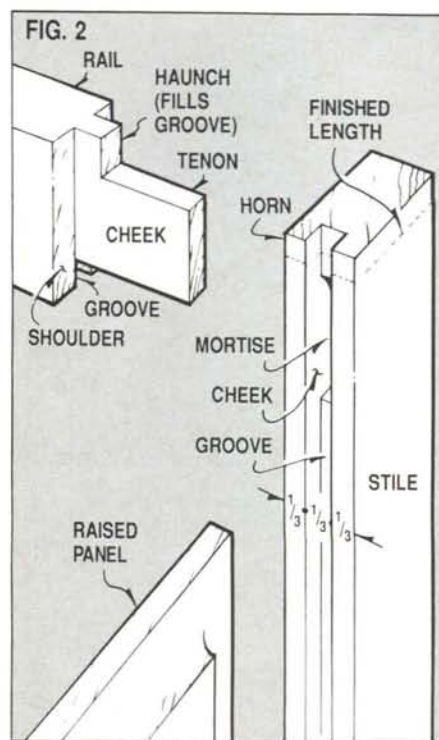
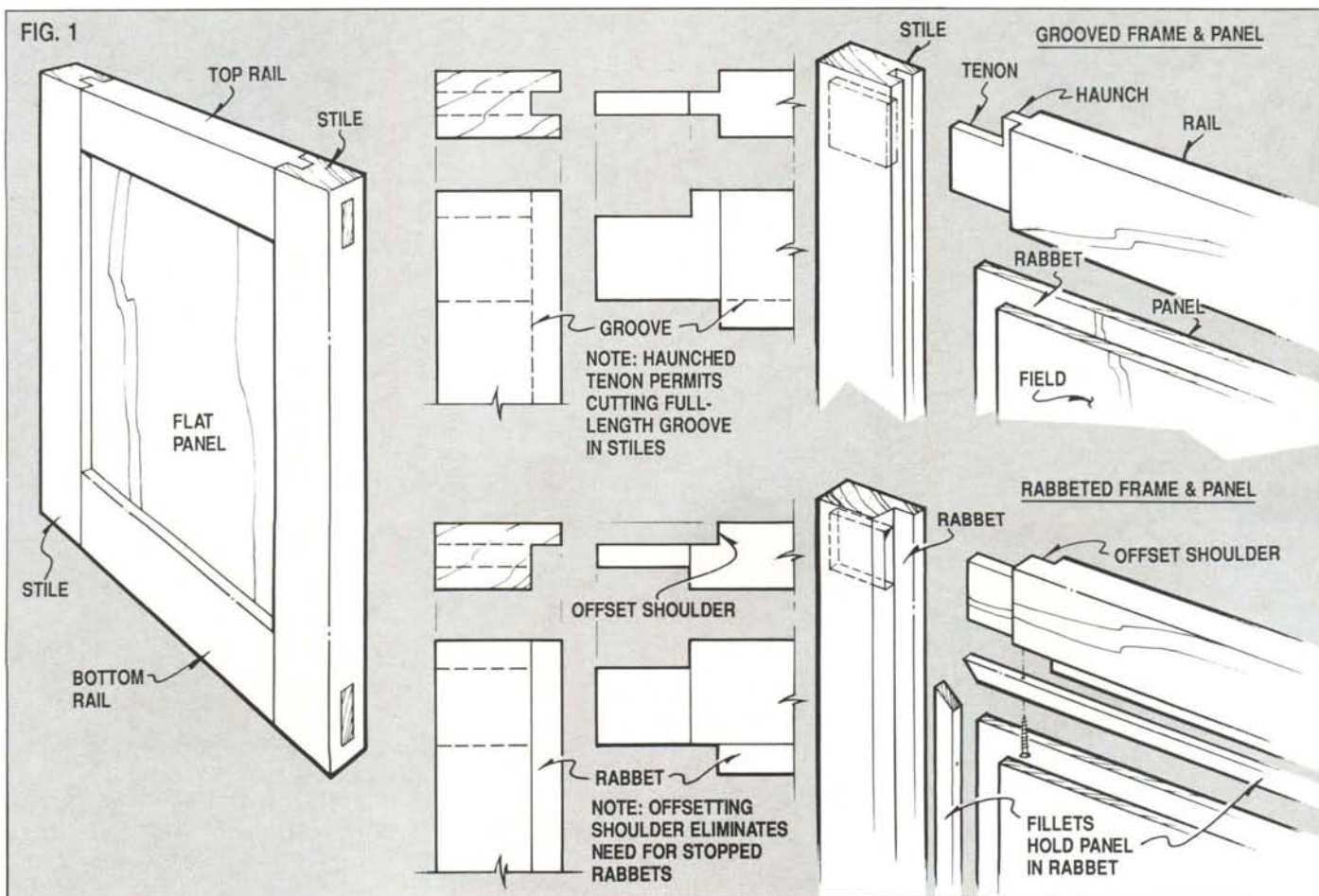
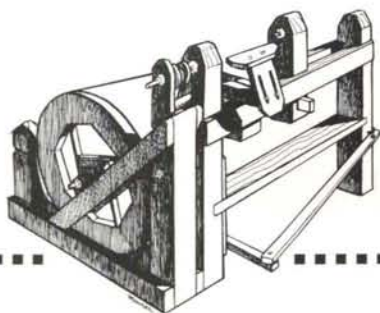


FIG. 1





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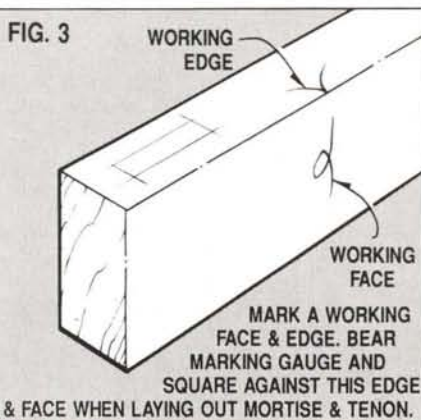
Woodworking Basics Continued

warped, the assembled frame and panel will be, too. I often cut the stiles an inch or two longer than the finished dimensions. The extra length forms "horns," which provide insurance against damage to the thinner end wall of the mortise during cutting and fitting. They're easily cut off after assembly. I glue up and thickness solid-wood panels now, but don't cut them to finish size until the frame joints are cut and fitted.

Laying Out the Joints

I lay out the mortises and tenons with a pencil, thin-bladed knife, mortise gauge and an accurate square. The mortise gauge has two scribing points, which can be adjusted to the thickness of the mortise and tenon. A single-pin gauge works just fine, but requires resetting for each cheek.

FIG. 3



You can save time and avoid errors by organizing your work effectively. Whether you're making one frame and panel or a dozen, lay out identical pieces at the same time. For example, scribe the shoulders of all the tenons, then scribe all the cheeks, and so on. And remember, when laying out always hold the square or gauge against the same face and edge. I mark these "working" surfaces with little squiggles, as shown in Fig. 3, for easy identification.

Tenons—Establish the tenon shoulders first. I position them with ticks of the pencil on the first rail, then scribe around the rail with the knife held against the square (Photo A). Position the tenon shoulders on subsequent rails using the first as a template, (Photo B).

Next, lay out the tenon cheeks. Set the

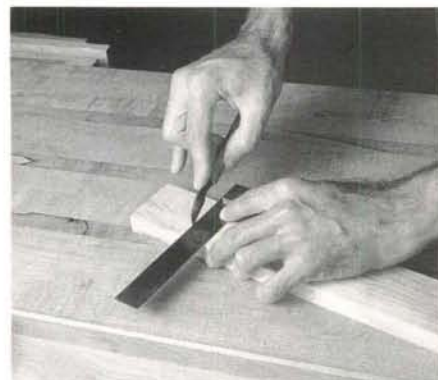


Photo A: Scribe the tenon shoulders by drawing a sharp knife along an accurate square. Be sure to hold the square against the working edge to scribe both faces and the working face for both edges.

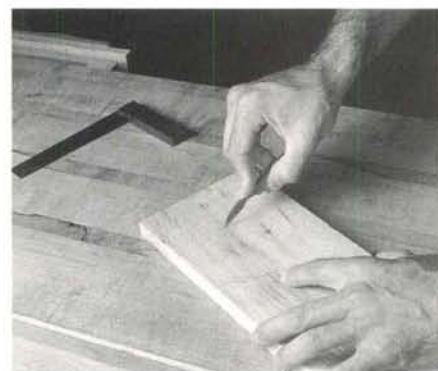


Photo B: Use the first rail as a template to position the tenon shoulders on the second and subsequent rails. A knife mark is more accurate than a pencil line for this.

points of the mortise gauge to the thickness of the tenon and set the fence to position the tenon on the rail (usually centered). With the fence against the working face, scribe up one edge, across the end and down the other edge (Photo C). Now set the rails aside—you won't lay out the haunches and the tenon width until you've cut away the waste from the cheeks.

Mortises—Measure to locate a mortise at each end of the first stile. (Remember that the stile is overlong, so mark the position of the finished ends, too.) The width of the tenon, and therefore that of the mortise, will be the width of the rail less the haunch and depth of the groove. For rails 2 in. or more wide, I usually make the haunch about 1/2 in. wide. Square the lines across the edge with a pencil (Photo D).



Photo C: Scribe the tenon cheeks with a mortise gauge held against the working face.

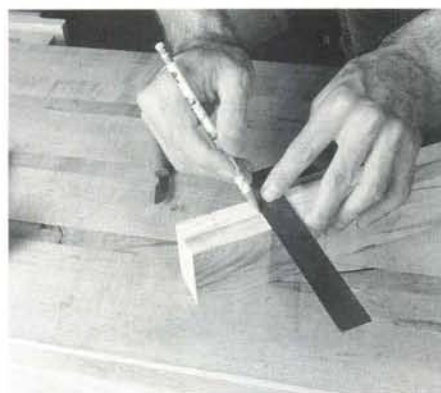


Photo D: Mark the mortises across the edge with a pencil.

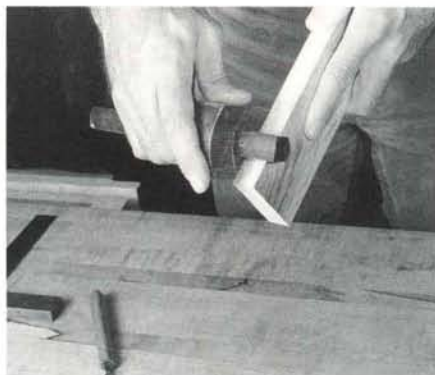


Photo E: With the gauge unaltered from the tenon layout, scribe the mortise cheeks.

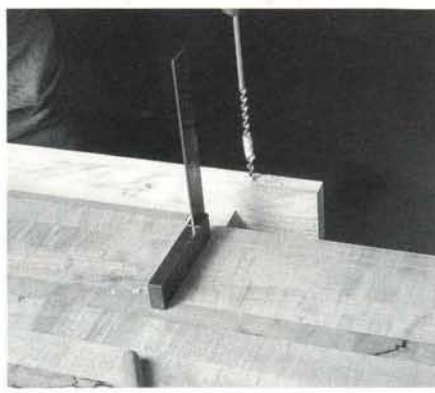


Photo F: Clear the waste in the mortise with a brace and bit. Check with a square if necessary to maintain the bit parallel to the faces of the work.

For through mortises, extend these lines down the face and across the opposite edge. (Although through mortise-and-tenon joints may appear to require more work, I recommend them for beginners. Cutting from both edges tends to reduce the problems that arise when errant chiseling makes the mortise wander off center in the middle of the piece.) The photos and illustrations show the through mortise and tenon.

Once the first stile is laid out, use it to mark the mortise positions on the others. A pencil line is accurate enough for these marks. If you're making several identical frames, you can stack the stiles together and mark across them all at once.

Now scribe the mortise cheeks using the same setting on the mortise gauge as for the tenons (Photo E). If I'm cutting the joints by hand, I also scribe a center line between the cheeks at this time, which I use to position the auger bit for clearing waste. If you've run the gauge

against the working face of all the parts, the faces of the rails and stiles should align at assembly.

Cutting the Joints

To cut mortises by hand, I usually clear the waste with a brace and bit, then trim to the layout lines with chisels. A backsaw cuts the tenons, with some trimming and fitting with chisels and a shoulder plane.

Mortises—I usually cut mortises first. To clear the waste, use a bit slightly smaller than the finished mortise width. The smaller bit allows for a little error, since even with the center line, it's hard to position the holes dead center.

For through mortises, I set a stop so the bit will penetrate a little more than halfway through the stile. Bore the first holes near each end of the mortise, then work on the waste between. The bit will be easier to handle if you leave a little wood between each hole—these

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Woodworking Basics

Continued

"bridges" are no trouble to remove later with a chisel. You can clear waste from the haunches with the bit, too. I usually wait and cut the haunches after trimming the mortises.

It's most important to maintain the bit parallel to the faces of the stile. If you need to, use a square to check your progress (Photo F). When you've bored a row of holes on one edge, flip the piece and repeat the process on the other.

To trim the mortises, I set the stiles on a piece of scrap wood or Masonite, which protects the bench top from a slip of the chisel. Pare the wood from the cheeks with a wide, sharp chisel, taking care to keep the tool straight up and down (Photo G). Clear the bridges and heavier waste in the center first. For the final cuts, position the cutting edge in the scribe line. The end grain at the ends of the mortise will present more resis-

tance—a little persuasion with a mallet may help.

I cut the haunch cheeks with the backsaw, guided by the layout lines and the trimmed mortise cheeks (Photo H), then pare the waste away with a narrow chisel. If you've bored waste from the haunches, pare the cheeks and flatten the bottom with chisels.

Tenons—The key to hand cutting tenons is accurate sawing, which requires a sharp, properly set saw. Don't even attempt it with a dull saw. There's a "saw doctor" in most communities—give your saw a physical; a few dollars will make a world of difference. I prefer to use backsaws, which are usually sharpened as crosscut saws. But most of the cuts for tenons and dovetails are rip cuts (with the grain), so I have the teeth re-cut as rip-saw teeth. The teeth are so fine that they cut cleanly across the grain as well.



Photo G: Pare the mortise cheeks with a wide, sharp chisel. Note how the bottom hand positions and guides the tool, the top hand provides the force.

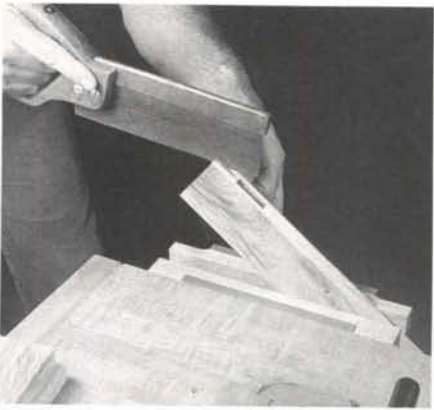
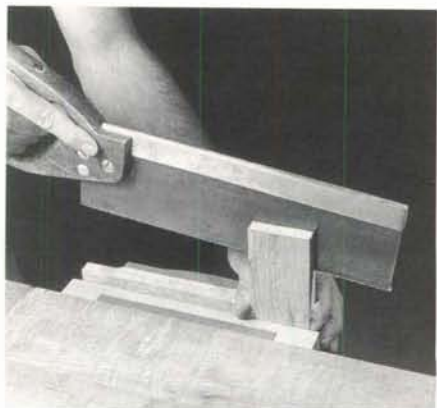
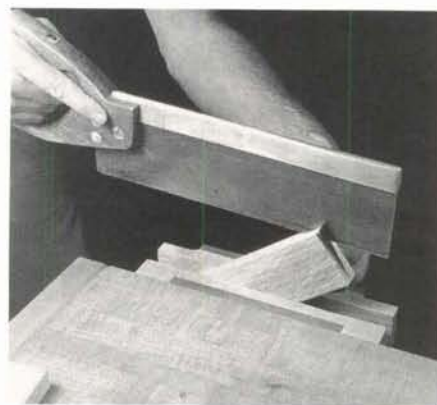


Photo H: You can cut the haunch cheeks with a small backsaw, and chisel out the waste.



Photos I and J: Cut the tenon cheeks from one edge on an angle (Photo I). Then reverse the wood in the vise and cut from the other edge, lowering the saw until it is parallel to the shoulder line (Photo J).

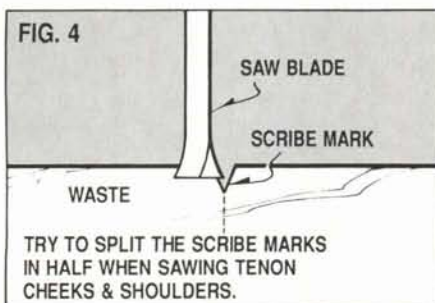
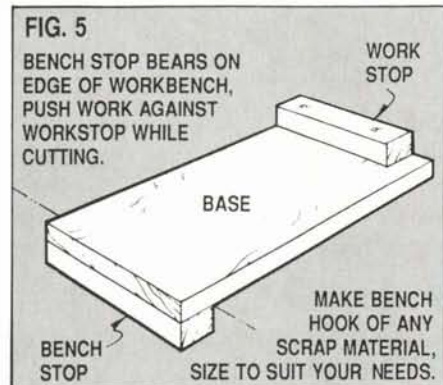


Photo K: Make the shoulder cuts right to the knifed scribe line. A bench hook is quicker to use than a vise for this job.



Photo L: It's easy to mark the tenon width directly from the mortise.



Make the cheek cuts first. Tilting the rail in the vise at an angle, I cut both cheeks from one edge, then flip the rail over and do the same from the other edge, lowering the saw as the cut progresses until it is parallel to the shoulders (Photos I and J). The first angled cut serves as a guide for the second. Try to split the scribe marks in half with the saw cut—the idea is to cut the tenon so it fits the mortise snugly straight from the saw (Fig. 4). I usually have to do a little trimming to fit, but I still keep shooting for the ideal.

Next, make the shoulder cuts. I hold the work with the aid of a simple jig called a bench hook, as shown in Photo K and Fig. 5. Again, try to split the line with the saw. Start the cut on the near or far edge (I prefer the far edge) and lower the saw slowly as you go until you're cutting across the full width of the rail.

A few tips on sawing: Strive for even strokes, as long as possible, and perpendicular to the work. Don't force things, the weight of a sharp saw will do a surprising amount of the work. When you cut the shoulders, a few final, short strokes may be needed to separate the waste.

With the cheek waste removed, layout and cut the haunch and opposite edge of the tenon (which will align with the

bottom of the groove). Hold the tenon to the mortise to tick off the positions (Photo L), then square the lines down with a marking gauge (a marking gauge with a pencil point comes in handy for this). To make fitting and assembly easier, cut the tenon just slightly narrower than its mortise; $1/32$ in. is plenty. (It's the cheek-to-cheek fit that must be snug.)

Fitting the Joints

In a perfect world, the tenons you've just cut would slide into their mortises like pistons into cylinders, the joints at the shoulders drawing together almost seamlessly. In reality, some trimming and coaxing is usually required.

Fitting isn't difficult—you just skim a few shavings off the cheeks or shoulders—but it demands patience, particularly when you're new at it. The job can be done with a few sharp chisels and a block plane, but I find one tool, the shoulder plane, indispensable. A small, narrow plane whose 1 in. or $3/4$ in. wide



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Woodworking Basics

Continued



Photos M and N: A shoulder plane is ideal for trimming the cheeks (Photo M) and shoulders (Photo N) of a tenon to fit.

blade extends all the way across the sole, the shoulder plane can cut right into the intersection of cheek and shoulder. (You may need to grind a new blade slightly to ensure that it is flush with both faces of the plane.)

Cheeks—Work on the cheeks first. Sight through the mortise. If the cheeks bulge into the opening, flatten them with a wide chisel. Trim the cheeks of a thick tenon with the shoulder plane (Photo M). (For large tenons, you can use a block plane for the top part of the tenon.) If the working faces of the rail and stile seem aligned in the same plane, take shavings equally off both cheeks to keep them that way. If they're not, take shavings off the appropriate cheek to move them into alignment. Go slowly, try the tenon to the mortise frequently, resist the temptation to slice a large chunk off a tenon all at once.

Tenons that are too thin are frustrating. Gluing a piece of veneer on one face may correct the fit, but it is likely to throw the parts out of alignment. Gluing

veneer on both faces is likely to add too much. Use your judgement—it may take less time to cut tenons on a new rail than to fiddle around packing and trimming a thin misfit.

Shoulders—Once the tenon fits tolerably well in the mortise, you'll need to trim the shoulders to remove any gaps in the shoulder line and, possibly, to square the rail to the stile. The shoulder plane is ideal for this job. It's easily held in one hand while the other steadies the work in the vise, as shown in Photo N. Remember, you're planing end grain—work in from both edges to avoid breakout. As before, proceed methodically, checking the fit often.

The first few mortises and tenons you cut will very likely require some fussy, frustrating fitting. Don't get discouraged. Once you get the hang of sawing to the line, a few passes of the shoulder plane will be all you'll need to complete a snug, tidy joint.

Plowing the grooves—When you've fitted all the joints, push the frame together dry, without glue. The working faces of the parts should be flush—all in the same plane. If they're not, shave them with a sharp hand plane to correct the misalignment.

Disassemble the frame to cut the grooves. The simplest method is to cut them on the table saw with a dado head or by making several passes over a single blade (Photo O). Keep the working faces against the rip fence and the grooves will align at assembly. Note that

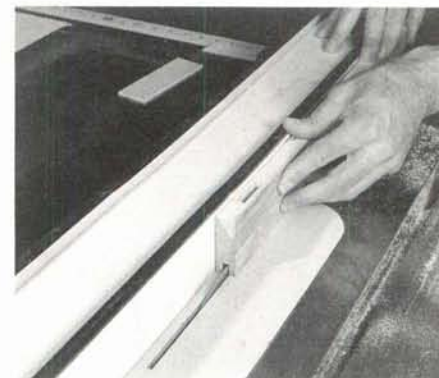


Photo O: Cut the grooves on the table saw, taking care to run the working faces against the rip fence.

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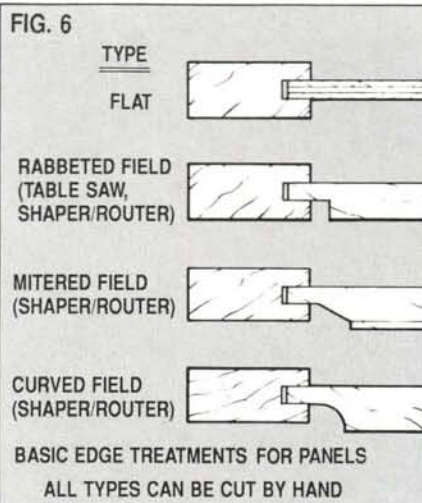
the panel groove should be no wider or deeper than the haunch, lest you create a gap.

Fitting the Panel

Flat plywood panels the same thickness as the groove are easy to fit. They slide right in place and need allow only for the possible expansion of the rails and stiles—make them $\frac{1}{16}$ in. to $\frac{1}{8}$ in. less than the distance between the rails and stiles as measured from the bottoms of the grooves.

Solid-wood panels are usually thicker than the grooves, so their edges must be thinned to fit. A variety of edge treatments are shown in Fig. 6. Probably the simplest is to rabbet the edges on the table saw, as I've done for this example. You can display either face, depending on your taste. The other examples (and many more) can be cut on the table saw, router or shaper or with hand tools. Panels are usually sized so the raised portion or field is flush with the outside face of the frame, although thicker panels, with the field standing slightly proud of the frame, may be preferred in some instances. In all of them, the panel should slide easily, but snugly, into the grooves.

Solid panels must be sized to allow for movement with changes in humidity. As I mentioned earlier, large panels will move more than small, and certain woods more than others. With some experience and common sense you can estimate movement and pick a suitable



width. For example, I'd cut a panel $17\frac{1}{2}$ in. wide for a frame that measured 18 in. between the bottoms of $\frac{1}{2}$ in. deep grooves. The grooves are deep enough to allow for considerable expansion, and the panel is wide enough to prevent it from pulling out of the grooves even if it shrinks a lot. There's almost no movement vertically (with the grain) in a panel, so I cut them about $\frac{1}{16}$ in. to $\frac{1}{8}$ in. shorter than the distance between groove bottoms in the rails.

Assembly

First dry-fit (without glue) the frame and panel (Photo P). If you've checked everything as you've gone along, all should go together nicely. If the project allows it, I recommend finishing the panel and the grooved edges of the frame members before gluing up. This can eliminate some awkward sanding and fussing later. Most finishes also prevent glue that squeezes from the joints from fixing the panel at the corners, thereby restricting its ability to move. If you can't prefinish, take care to avoid excess glue near the grooves.

After the glue has cured, trim the horns with a backsaw and plane the edges flush. You can fix the panel in place with small brads or dowels placed midway along the length of the rails—all movement will occur either side of the fixing.

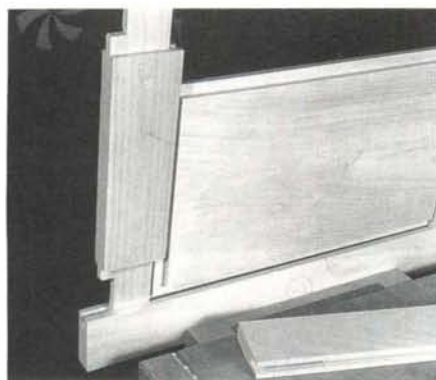


Photo P: Before you glue up, assemble the frame and panel dry to make sure everything fits as it should.



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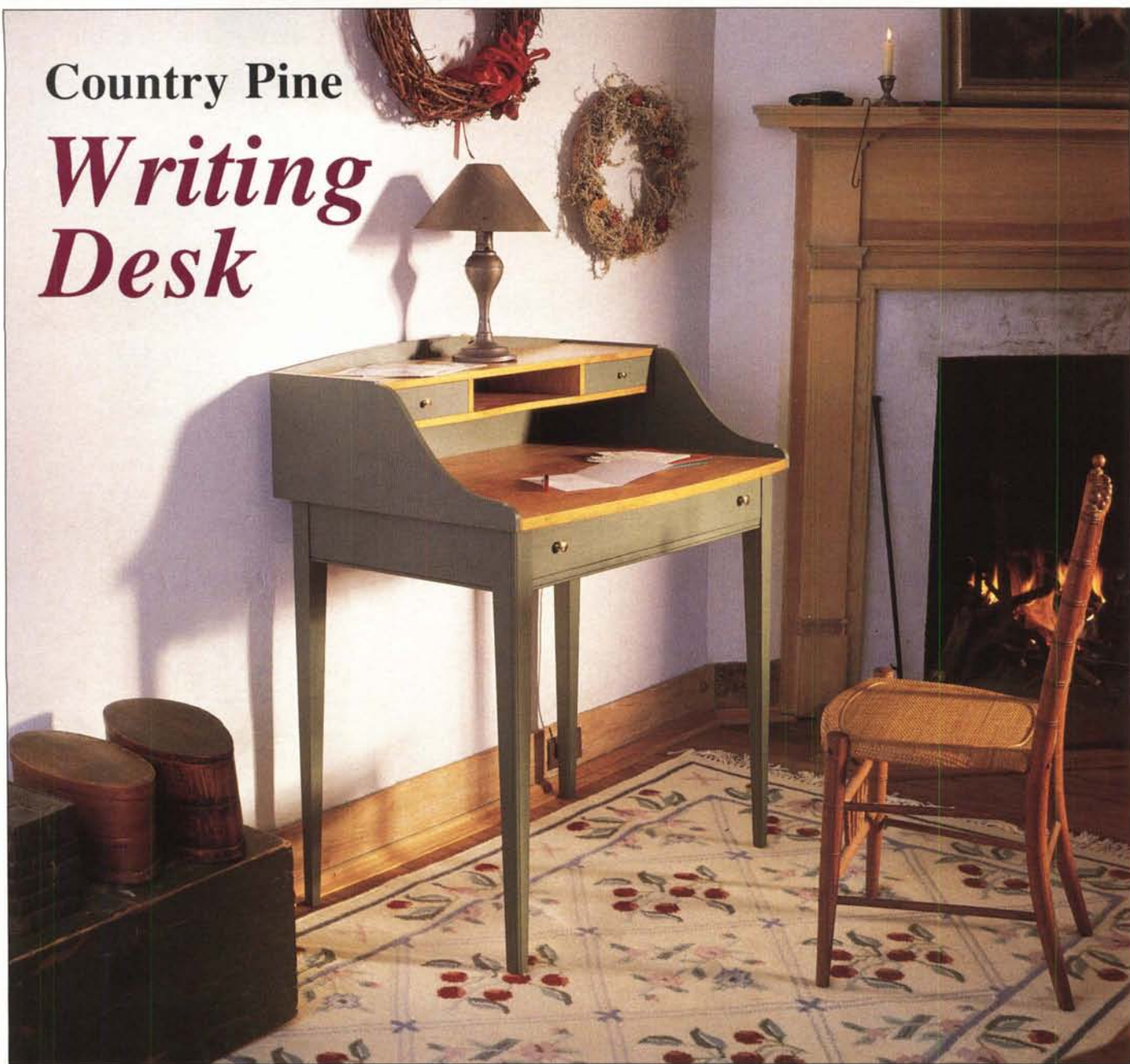
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Ours is made from pine, except for the plywood drawer bottoms. The combination of an antique green paint and natural pine give the piece an especially charming look.

Begin by making the legs (A). You'll

need four pieces of stock, each one measuring $1\frac{3}{4}$ in. square by $29\frac{1}{4}$ in. long. Lay out and mark the location of the various mortises on each leg. Size them to fit the tenon dimensions shown on the drawing, keeping in mind that the aprons and the bottom front stretcher are inset $\frac{1}{8}$ in., while the top front stretcher is inset $\frac{7}{8}$ in. (see top view of leg). However, don't cut the dovetail that's on top of the two front legs just yet. That will be cut later, after the top front stretcher has been made.

Cut the mortises using the drill press and a $\frac{1}{4}$ in. diameter drill bit. Bore a

series of holes, one alongside the other, to remove most of the stock. What remains can be pared away with a chisel.

A bead is now cut along the outside corner of each leg. Use a router and a $\frac{1}{4}$ in. beading bit to make each one.

The legs are tapered on both inside edges. Note, as shown in the front view, that the taper starts $4\frac{1}{2}$ in. from the top of the leg. Lay out and mark the tapers on each leg. Once marked, use the band saw to cut them out. When cutting, stay just outside the marked line, then use your hand plane to smooth the edge exactly to the line.

To further lighten the legs, a chamfer is applied to the inside corner of each one (see chamfer detail). A sharp hand plane will do the job in short order.

Next, cut the two end aprons (B), the back apron (C), the top front stretcher (D) and the bottom front stretcher (E) to the dimensions shown in the Bill of Materials. The tenons are best cut using a tenon jig.

The dovetail on the end of the top front stretcher can be cut with a dovetail saw. Once cut, use the dovetail as a template to mark the location of the dovetail cutout on the top of the front legs. Use a chisel to make the cutout.

A bead is now cut along the bottom edge of the aprons and the bottom front stretcher (see Molding Head Detail). We used a Sears molding head along with a Sears three-bead cutter (p/n 9-2352) to create the beads.

Also, a $\frac{3}{8}$ in. wide by $\frac{1}{4}$ in. deep groove is cut in each apron (see exploded view). Later, the cleats (H) will fit into this groove when the upper part of the desk is mounted. You can use a dado head here, but two or three passes with a regular saw blade will do the job just as well.

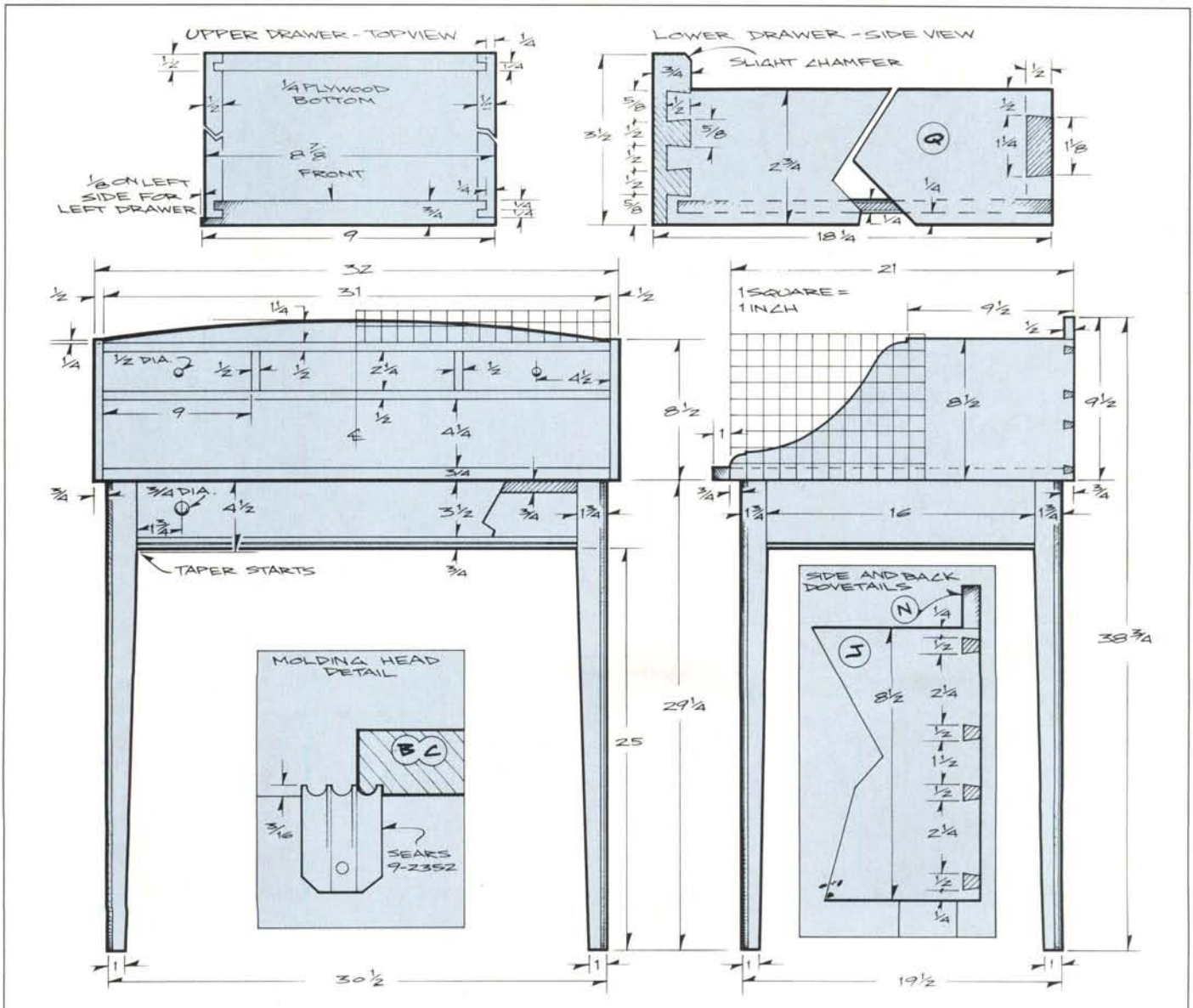
After giving the parts a thorough sanding, the legs, aprons and stretchers can be assembled. The assembly process is best done in two steps. In the first step, the legs are joined to the two end aprons. Add glue to the mortises and tenons, then use bar clamps to apply pressure to the joined parts. Check for squareness before setting aside to dry. In the second step, the leg/apron assemblies are joined to the back apron and the top and bottom front stretchers.

The two filler blocks (F) are made next. Keep in mind that for the drawer to

operate smoothly, you'll want the inside edge of the filler block flush with the inside edge of the legs. It's best to start with stock slightly thicker than $\frac{7}{8}$ in. Rip it to a width of $1\frac{1}{2}$ in., then cut it to a length that results in a snug fit between the legs. Once cut to length, you can plane the thickness down until you get a satisfactory fit. When you are happy with the fit, glue and clamp it in place so that the bottom edge is flush with the bottom edge of the end apron.

The runner (G) fits between the back apron and the bottom front stretcher. Use glue to secure it to the filler block. In order for the drawer to slide smoothly, make sure the top edge of the runner is flush with the top edge of the bottom front stretcher.

You'll need to edge-glue three or four boards to get the $21\frac{1}{2}$ in. width for the writing surface (I). It's best to cut the



boards so that the glued-up stock will be slightly wider and longer than necessary. To edge glue, apply a thin coat of glue to the mating surfaces, then clamp firmly with bar clamps and set aside to dry. There is no need to add dowels or splines here as this joint matches long grain-to-long grain, a joint that is as strong as the wood itself. However, if the edges start to slide out of alignment, clamp a few waxed cleats (made from hardwood stock that measures about 1 1/4 in. square by 22 in. long) across the boards about every 8 to 10 inches. The cleats will keep the boards flush while the wax prevents the cleats from sticking.

The sides (J), top shelf (K), bottom shelf (L), dividers (M) and back (N) are all made from 1/2 in. thick stock. If you don't have a thickness planer, check with your local lumberyard or millwork shop as they will often plane down thicker stock for a nominal charge. Should you need to edge-glue any of the stock, follow the same basic procedure that was used to glue-up the top.

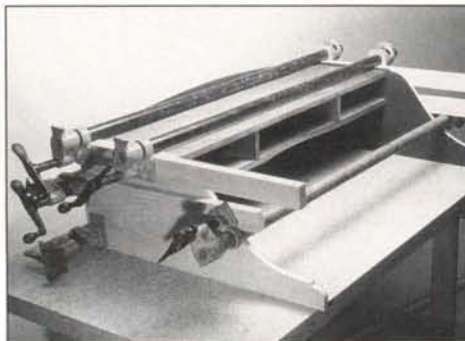
Cut the two sides and the back to length and width, then lay out and cut the dovetails on each end (see Side and Back Dovetails Detail). Also cut the top and bottom shelves to size. A band saw will cut the shallow curve on the front edge of the bottom shelf. Use the router to cut the 1/4 in. wide by 1/4 in. deep stopped dados in the sides and also in the top and bottom shelves.

Next, cut the side curves and also the curve along the top edge of the back. Grid patterns for both these curves are shown on the drawing.

Now, cut tenons on each end of the top and bottom shelves. The tenons should fit snugly in the side grooves. Also cut tenons on each end of the dividers (M) to fit into the shelf dados.

The writing surface, which was glued up earlier, can now be cut to length and width. The front curve is identical to the curve on the top edge of the back, so you can use the back as a template. Cut it out with the band saw and use files and sandpaper to smooth the edge.

For a piece like this, we liked the look of both stained and painted surfaces. The writing surface, top shelf, bottom shelf, and dividers are stained - the rest of the project is painted. Later, when the drawers are made, only the fronts will be painted, while the remaining drawer parts are stained.



The sides and back are joined to the shelf/divider assembly.

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
Desk			
A	Leg	1 3/4 x 1 3/4 x 29 1/4	4
B	End Apron	3/4 x 4 1/4 x 18 *	2
C	Back Apron	3/4 x 4 1/4 x 29 *	1
D	Top Front Stretcher	3/4 x 1 3/4 x 28 **	1
E	Btm. Front Stretcher	3/4 x 1 5/8 x 28 *	1
F	Filler Block	7/8 x 1 1/2 x 16	2
G	Runner	3/4 x 3/4 x 16 7/8	2
H	Cleat	3/4 x 2 1/4 x 2 1/4	6
I	Writing Surface	3/4 x 21 1/2 x 31	1
J	Side	1/2 x 8 1/2 x 21	2
K	Top Shelf	1/2 x 8 3/4 x 31 1/2 *	1
L	Bottom Shelf	1/2 x 8 3/4 x 31 1/2 *	1
M	Divider	1/2 x 8 3/4 x 2 3/4 *	2
N	Back	1/2 x 9 1/2 x 32 **	1
O	Spacer	1/8 x 1 3/8 x 8	2
Lower Drawer (one req'd)			
P	Front	3/4 x 3 1/2 x 27	1
Q	Side	1/2 x 2 3/4 x 18 **	2
R	Back	1/2 x 2 1/4 x 27 **	1
S	Bottom	1/4 x 17 3/4 x 26 1/2	1
T	Knob	3/4 dia.	2
Upper Drawer (two req'd)			
U	Front	3/4 x 2 1/4 x 9	1
V	Side	1/2 x 2 1/4 x 8 1/2	2
W	Back	1/2 x 1 3/4 x 8 1/2 *	1
X	Bottom	1/4 x 8 1/4 x 8 3/8	1
Y	Knob	1/2 dia.	1

* Length includes tenons

** Length includes dovetails

*** Available from Paxton Hardware, 7818 Bradshaw Road, Upper Falls, MD 21156; tel. (301) 592-8505. Knobs are solid brass with a screw back. For the 1/2 dia. knob order p/n 913 (\$1.81 each); for the 3/4 dia. knob order p/n 915 (\$2.13 each). Add \$2.00 shipping and handling for orders under \$10.00.

Because the upper desk has both stained and painted surfaces, the finishing process can be simplified if the parts are assembled in a specific order. Begin by final sanding all the upper desk parts, then join the top shelf to the two dividers. Use glue, clamp firmly and check for squareness before setting aside

to dry. We found it was easier to apply clamp pressure if the bottom shelf was temporarily added.

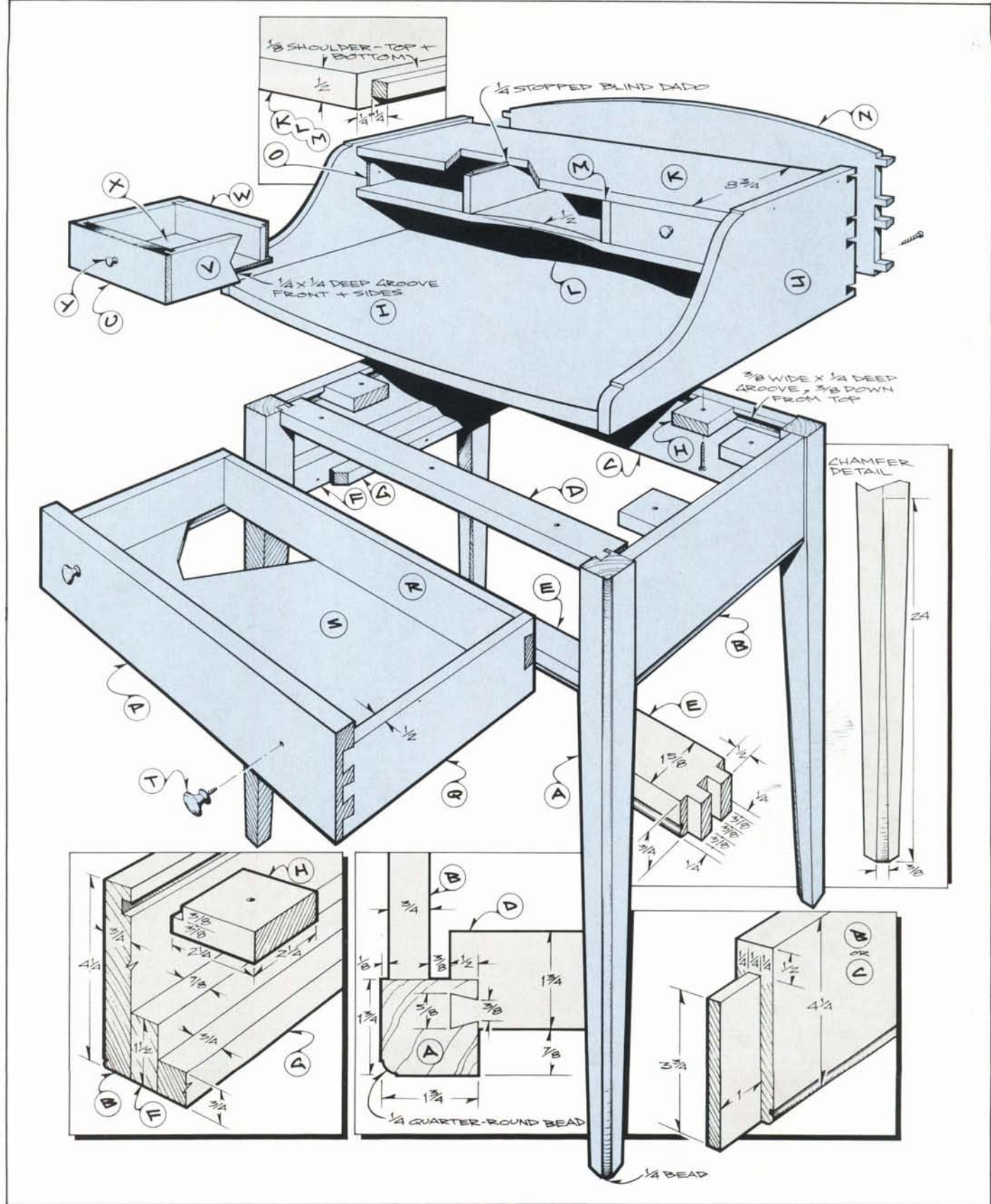
Once dry, remove the clamps and stain the top shelf/divider assembly and the bottom shelf with one coat of Minwax Puritan Pine followed by two coats of orange shellac. Rub out the final coat of shellac with 0000 steel wool, then add a coat of McCloskey's Eggshell varnish. This results in a warm amber patina that we especially like. (Take care to avoid getting any finish in the dado grooves or on the corresponding tenons.) Keep in mind that not all varnishes are compatible with shellac, so check the labels if you use any brands other than those mentioned.

The bottom shelf is now glued to the top shelf/divider assembly. Once again, use glue, clamp firmly and check for squareness.

Next, paint only the inside surfaces of the sides and back. Two coats will be needed for complete coverage. For paint we used Stulb's Wild Bayberry Old Village Paint Color. If not available from your local paint store, it can be ordered from Shaker Workshops, P.O. Box 1028, Concord, MA 01742; tel. (617) 646-8985. Order part number A951. A pint (which should be more than enough for the project) will cost you \$7.15 plus \$2.65 shipping and handling. Don't paint areas around the dovetails or tenon grooves that will be glued later.

Now, add the writing surface, sides, and back to the top and bottom shelf assembly. To do this, first mount one side to the shelf/divider assembly, then add the back, followed by the second side (there is no way to add the shelf/divider assembly once the dovetails have been assembled). Clamp as shown in the photo. Next, the sides are joined to the writing surface with finishing nails, countersunk and filled. Don't use glue here as the writing surface must be free to move with changes in moisture content. The finishing nails will have enough flexibility to allow some movement to occur yet still hold the parts securely together.

The outside surfaces of the sides and back can now be painted. When dry, mount the upper part of the desk to the base. Use 1 1/4 in. long by no. 10 flat head wood screws driven up through the six cleats (H) and the top front stretcher.



Make the lower drawer (parts P, Q, R, S and T) and the two upper drawers (parts U, V, W, X and Y) as shown. The fronts are painted before assembly. A source for the knobs is listed in the Bill of Materials.

Cut the two spacers (O) to fit and tack them in place with several small brads. Note that the upper drawers are constructed with a $\frac{1}{8}$ in. space on the side facing the spacer. Without this space, the drawer would scrape against the side

each time it was opened. Eventually, this would wear the paint away and look rather unsightly.

To complete the project, add a light coat of paste wax to all the drawer runners, cleats, and spacers.

Lathe-Turned Hurricane Lamp

Woodpile project makes a great gift

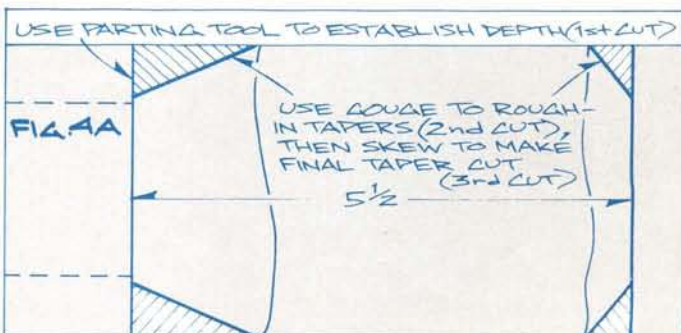
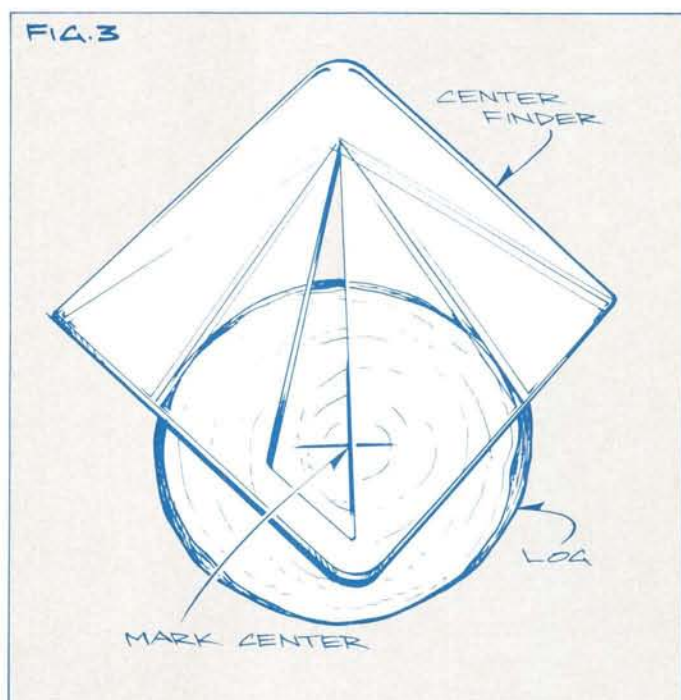
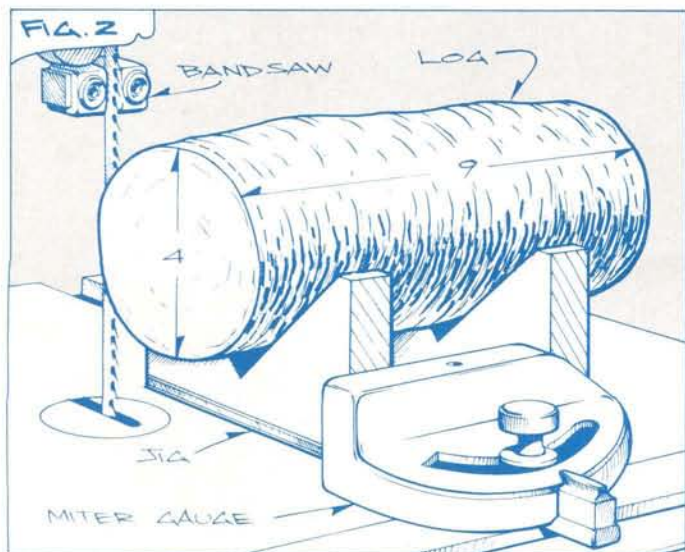
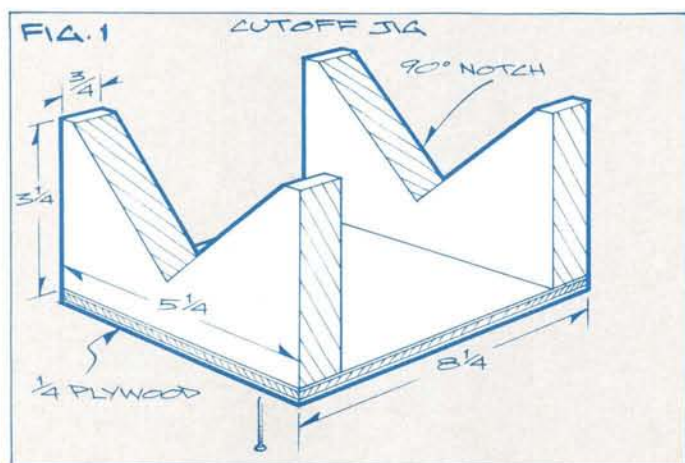
Ringed with a wreath of pine or sprigs of freshly-cut holly, this easy-to-make hurricane lamp makes a great centerpiece for your holiday table. Ours is made from a birch log that we found in a stack of firewood, but if you can't find birch in your area, other woods can be substituted. Just keep in mind that you'll want to use well-dried wood, to minimize any chance of checking (which could crack the chimney glass).

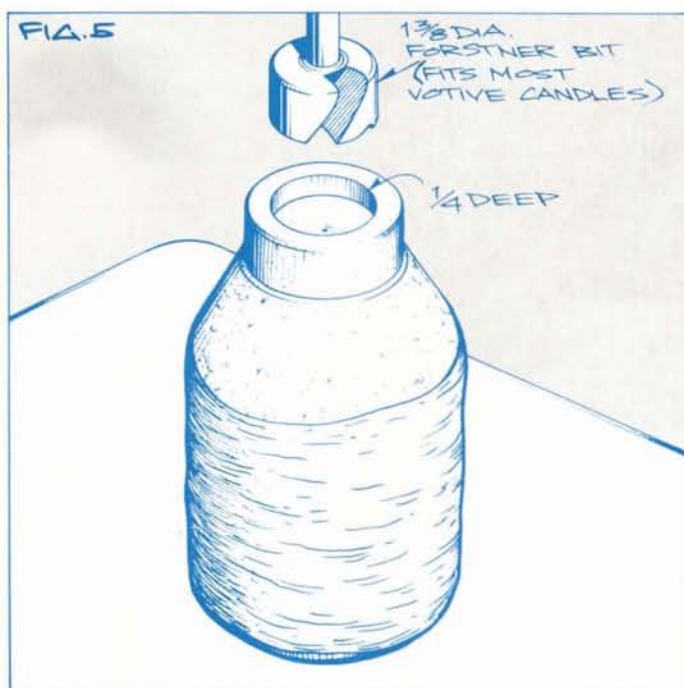
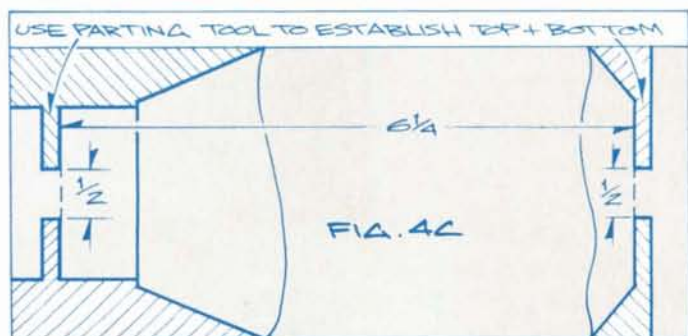
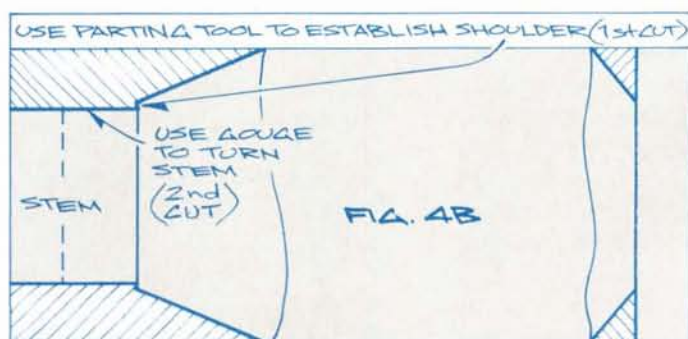
In addition to the log, you'll need a glass chimney and a votive candle (we purchased both items at a local department store). Buy the chimney and candle before you start work, to make certain that the diameters of your turning and candle recess are appropriate.

As shown in Figs. 1 and 2, we made a simple jig for the band

saw to parallel the ends of the log. Making the ends parallel is important if the lamp is to be both upright and stable. You'll need a fairly straight length of log. If you have a band saw with a 6 in. depth-of-cut capacity, with the jig shown, your log diameter can't exceed about 4 in. The starting length of the log should be about 9 in. The jig also holds the log and keeps it from spinning as you make the cut. Use one hand to hold the log firmly in the jig as you advance the miter gauge. Then flip the jig around and cut the opposite end.

Use a center finder to locate the approximate center on each end (Fig. 3), then mount the log in the lathe and turn as shown in Figs. 4A-C. Remove the log from the lathe, use a handsaw to trim the waste, then bore the candle recess with a Forstner bit (Fig. 5). No finish is needed.





Little Folks Desk & Bench

We sized this sturdy desk set for a child about four years old, but the dimensions can be easily changed to adapt it to a larger or smaller child. It features a good-sized "cubby," which is handy for storing books, papers and supplies. And the four plastic cups are ideal for holding pencils, crayons, and paintbrushes. We chose to make it from pine (to reduce cost and weight), but most any wood can be used.

The two front legs (A) and the two back legs (B) can be made first. Start with four pieces of $1\frac{1}{2}$ in. square stock, each one measuring about $21\frac{1}{2}$ in. long. Avoid stock that contains knots or other defects that would affect strength. (If you don't have $1\frac{1}{2}$ in. stock on hand, you can get it by face-gluing $\frac{3}{4}$ in. thick stock.)

Use the miter gauge to trim and square the bottom end of each leg, then set the miter gauge to 5 degrees and cut the front legs to an overall length of $20\frac{1}{8}$ in. and the back legs to an overall length of 21 in.

Next, set up the dado head to cut the $\frac{3}{4}$ in. by $1\frac{1}{2}$ in. notches on each leg. Note that the notches start 16 in. from the bottom.

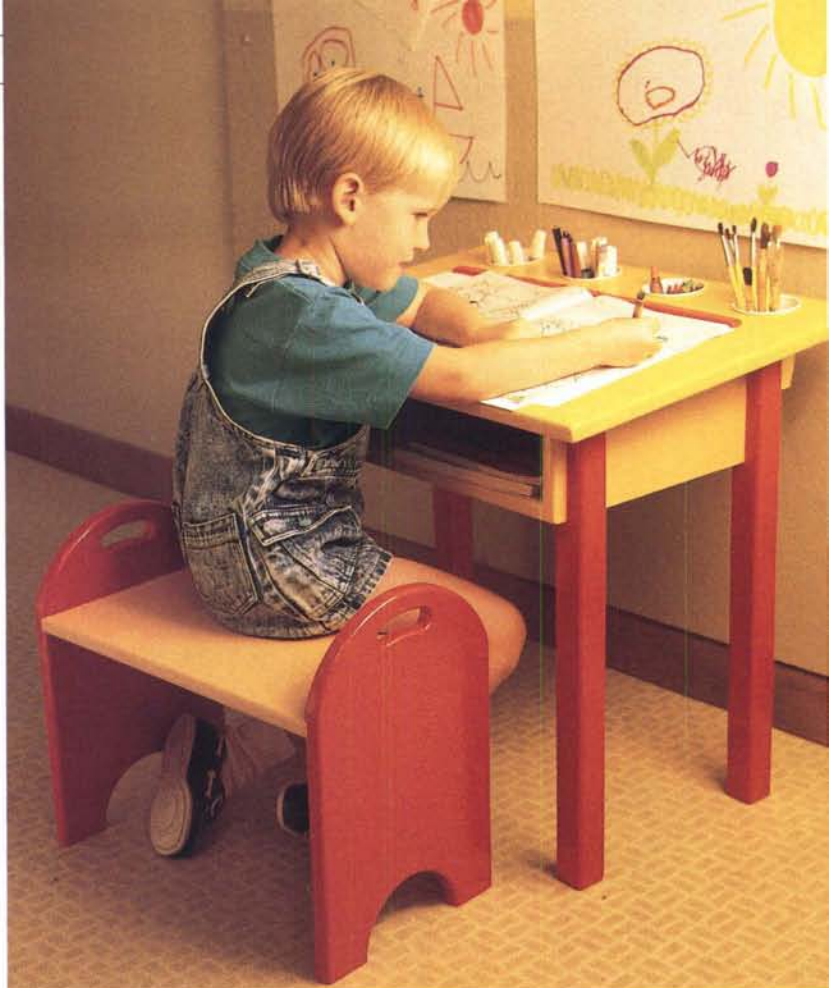
The back (C) can now be made. Start with stock a bit wider and longer than necessary. With the table saw blade set to a 5-degree angle, rip the back to 5 in. wide. Then, set the saw blade to 90 degrees and crosscut the back to final length.

Now, cut the two sides (D) to the dimensions shown in the Bill of Materials. To establish the taper along the top edge, temporarily clamp the sides to the legs (remember to allow for the $\frac{3}{4}$ in. thick back), then lay a straightedge across the tops of the legs and scribe the angle. Use a band saw to cut just outside the marked line. A sharp hand plane will do a nice job trimming the cut exactly to the line.

You'll probably need to edge-glue stock in order to get enough width for the bottom (E). When edge-gluing, it's best to cut the stock a bit longer and wider than necessary. After the clamps are removed, trim to final length and width.

Final sand all the parts, then assemble the two sides to the bottom with $1\frac{3}{4}$ in. long by no. 10 flathead wood screws, countersunk and plugged. Because the bottom is rather wide, it must be able to move freely with changes in humidity, so don't use any glue here. To help allow for that inevitable wood movement, you'll need to bore the two frontmost screw shank holes slightly oversized (we used a $\frac{1}{4}$ in. diameter bit).

The back is next. Apply glue to the mating surfaces, then add several countersunk and plugged wood screws.



Now, assemble the four legs. Use glue and wood screws as shown. Keep in mind that you'll need to use shorter ($1\frac{1}{4}$ in. long) screws as the $1\frac{3}{4}$ in. screws will break through the side if used here. Check for squareness before setting aside to dry.

Edge-glue stock for the top (F) and trim it to final length and width. Lay out and mark the centerline location of the cup holes, then bore them using the drill press with a circle cutter.

Before boring the holes though, it's a good idea to purchase the plastic cups, as you may need to adjust the diameter slightly for a good fit. You'll want cups that have a sturdy rolled lip that can support the cup in the hole. We used a 3 in. diameter (measured across the top), 9 ounce plastic cup made by the Solo Cup Company of Urbana, Illinois (their part no. P-9B). Our local discount department store carried a good supply of them.

Cut the pencil stop (G) to size and apply a slight radius all around the top edge. It will be added later on after painting.

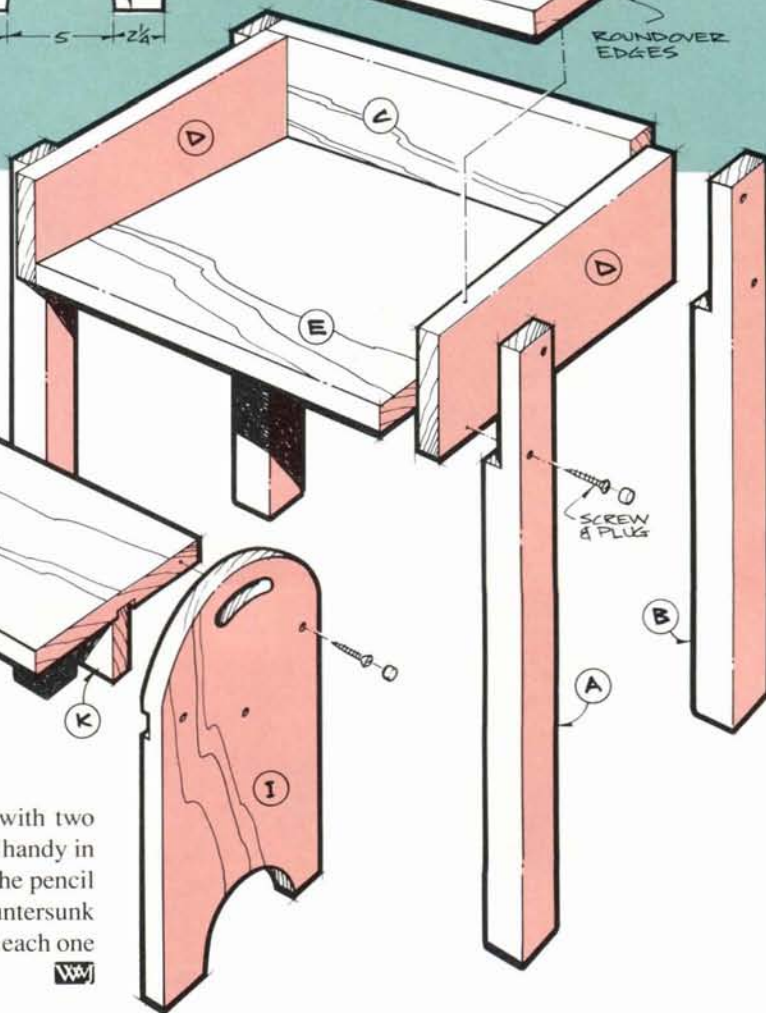
Next, cut the bench sides (I) to final length and width. Use the dado head to cut the $\frac{3}{4}$ in. wide by $\frac{1}{4}$ in. deep dado in each one as shown. Use a compass to scribe the $5\frac{1}{8}$ in. top radius and the $2\frac{1}{2}$ in. bottom radius, then cut them with a band saw. Use a $\frac{3}{4}$ in. diameter drill bit to establish the ends of the handle hole cutout. Once the holes are bored, complete the cutout with a hand held jig saw. The seat (J) and stretcher (K) are now cut to size. With the dado head, cut the $\frac{3}{4}$ in. wide by $\frac{1}{4}$ in. deep groove on the underside of the seat. Final sand, then assemble the parts as shown.

The desk and bench are ready for painting. Note that the top has not yet been assembled in order to make it easier to paint the cubby later on.

Kids shouldn't be exposed to sharp edges so, before going

(all dimensions actual)

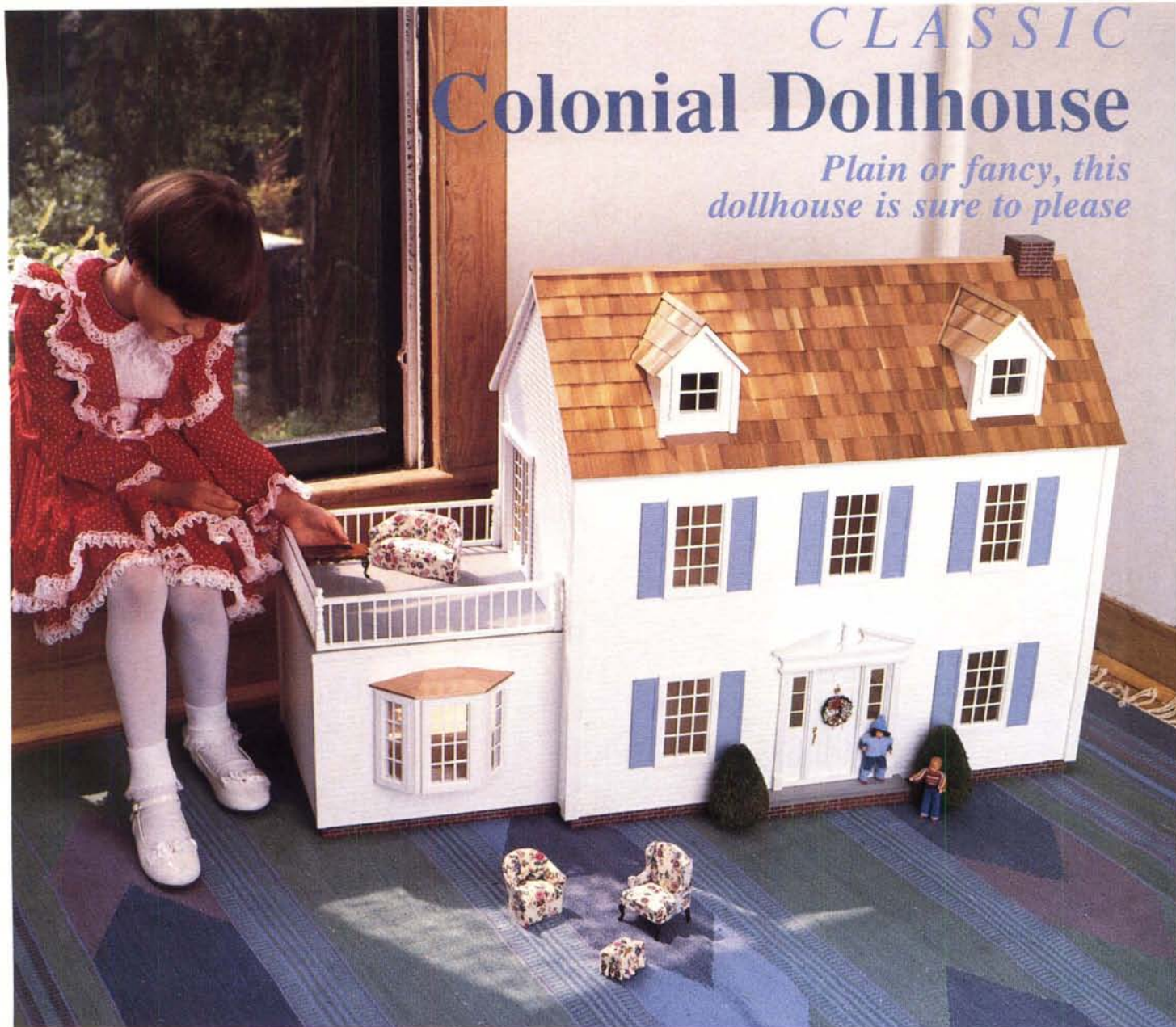
* Extra width allows for later trimming



Next, paint the legs, bench sides, and pencil stop with two coats of orange enamel. An artist's brush will come in handy in the areas where orange meets yellow. When dry, tack the pencil stop in place with a few countersunk brads. Fill the countersunk holes with wood putty, then sand smooth and touch up each one with a bit of orange paint.

CLASSIC Colonial Dollhouse

*Plain or fancy, this
dollhouse is sure to please*



You needn't be a fancier of fine dollhouses to appreciate the classic Colonial style of the dollhouse shown in the photo. But if beauty is in the eye of the beholder, then it's not hard to understand how even simple versions of this same house can equally capture young imaginations.

But don't make the mistake of comparing this dollhouse to the cardboard kits you've probably seen advertised for under \$100. Exactly as shown in the photo, the finished dollhouse commands a price tag of over \$1000. You can build it with all the trimmings, or just use the components to create your own design. Either way you'll end up with an heirloom that will be passed down through the generations.

To make the dollhouse accessible to just about everyone, we've arranged with designer/builders Karen and Tom Russell to offer several trim and component packages. You can build the dollhouse exactly as pictured above by ordering Kit No. 1, or you can purchase just the window and door package, or you can

buy individual components and customize the dollhouse to your own specifications. There's even a package (Kit No. 2) that features genuine working double-hung windows and a wiring kit to electrify the house. The kit and component ordering information and prices are on page 51, but if you'd like more information about what else is available for gussying up the dollhouse, the Russells can help out there too. They sell just about everything, from miniature furnishings and hardware to landscaping.

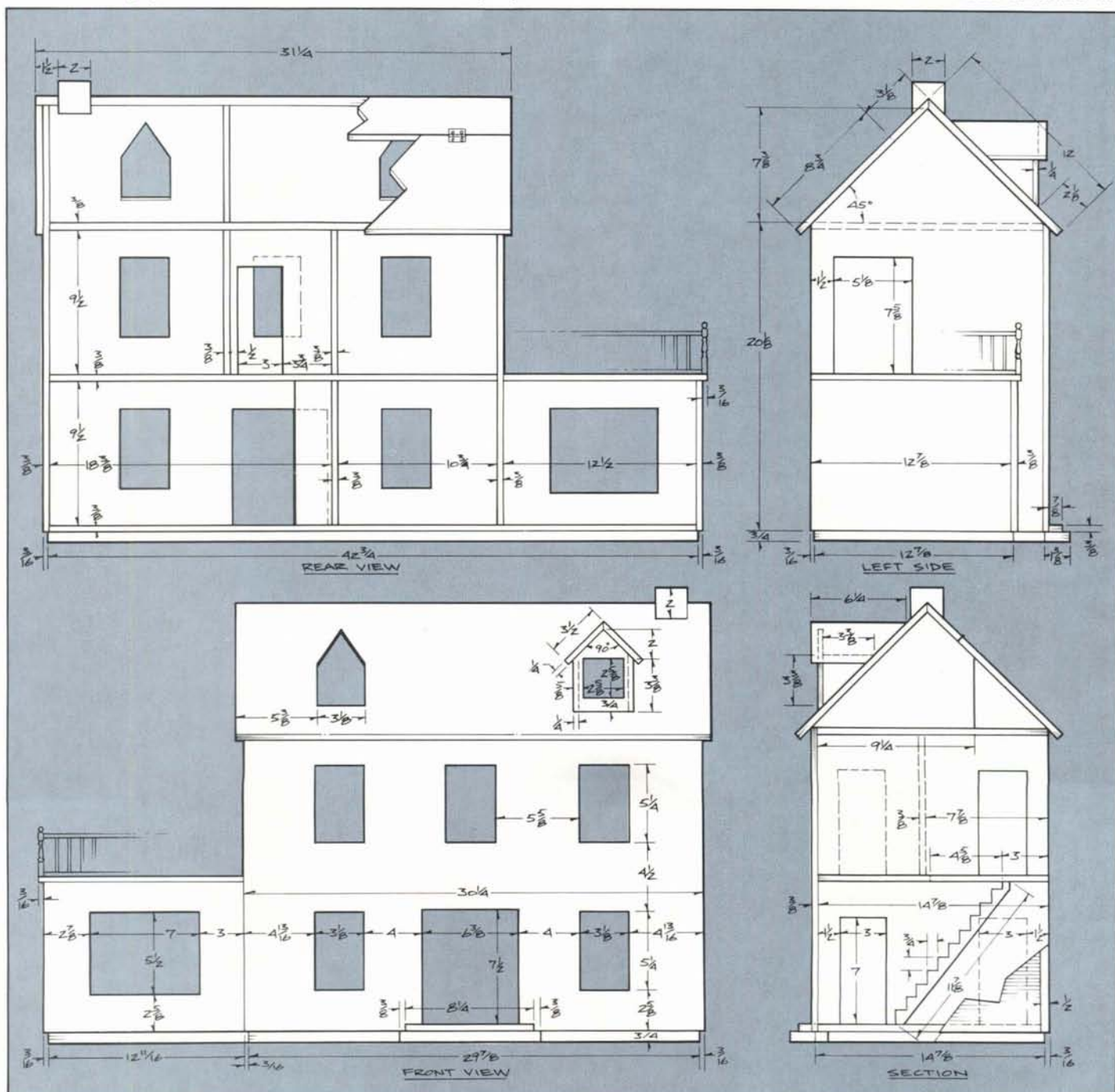
You needn't feel that fancy parts and trim are what make a dollhouse precious. Dollhouses of old, built of sawmill scrap, cobbled together with box nails, and lovingly painted, have endured far longer in memory than the costly plastic and electronic gadgets and toys that children today are inundated with. By taking our basic design and using paint to suggest the details, you'll probably make a child just as happy as she or he would have been with the fully trimmed and dressed version.

And don't limit your creativity to the outside. The real fun in making dollhouses comes with the interior decorating. Leftover wallpaper (or a throwaway wallpaper sample book) is a great source of interior wall treatments, and you can even go so far as to make miniature furniture for the various rooms.

Stripped of all the trimmings, the house is basically just an assembly of plywood parts. All the plywood is $\frac{3}{8}$ in. thick, except for the dormer parts, which are $\frac{1}{4}$ in. thick plywood, and the foundation, which is $\frac{3}{4}$ in. thick plywood. Although it's possible to use construction-grade plywood, we don't recommend it. Cabinet-grade plywood, or Baltic Birch or Apple plywood are better choices. They're more stable than construction plywood, don't have large voids, and aren't prone to chipping and splintering.

The Russells tell us that this version of the classic Colonial is their most popular doll house. The main reason, they say, is

the large kitchen addition with its attractive bay window. Of course, to simplify the construction, you could leave off the kitchen addition and the two dormers. You could also attempt to make the windows and doors yourself, though this is another task we don't recommend you try. A close look at the front door, for example, reveals that it is constructed exactly like a real frame-and-panel door, and even has the same number of parts. Working with such small parts requires specialized equipment that most woodworkers do not have, and trying to make cuts on small pieces with a large table saw just isn't safe. If you do have the proper equipment, though, such as a Dremel miniature table saw, making miniatures can be a lot of fun. We recommend that you have all your purchased component parts on hand before actually starting construction. Although we do provide dimensions for the various window and door cutouts, it's best to have the actual windows and doors available to



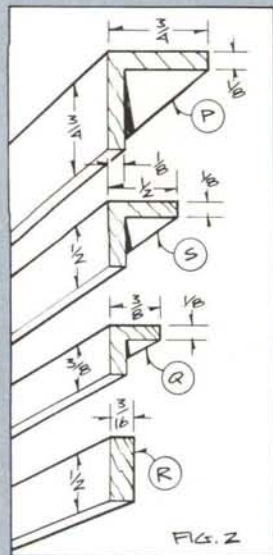


FIG. 2

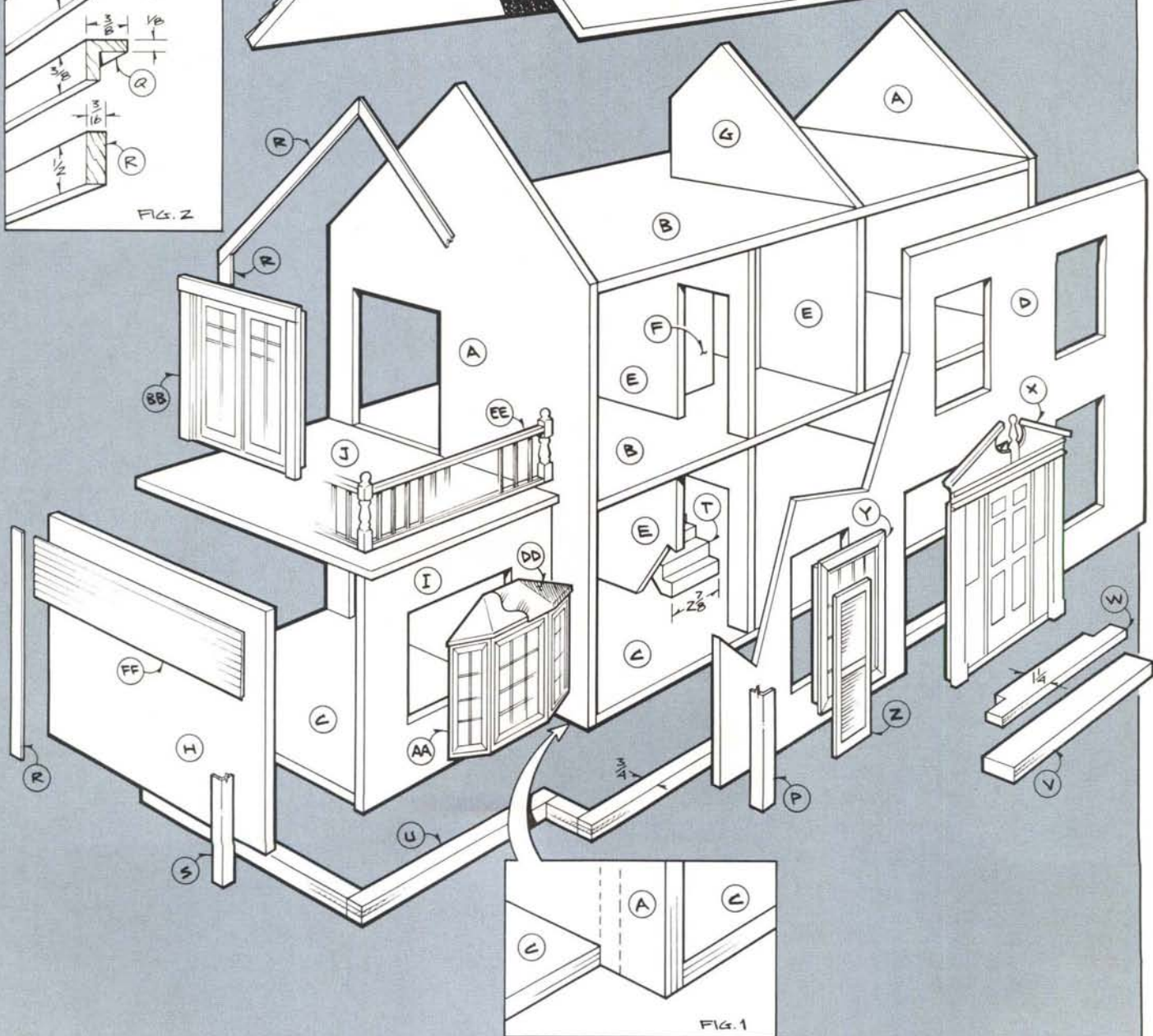
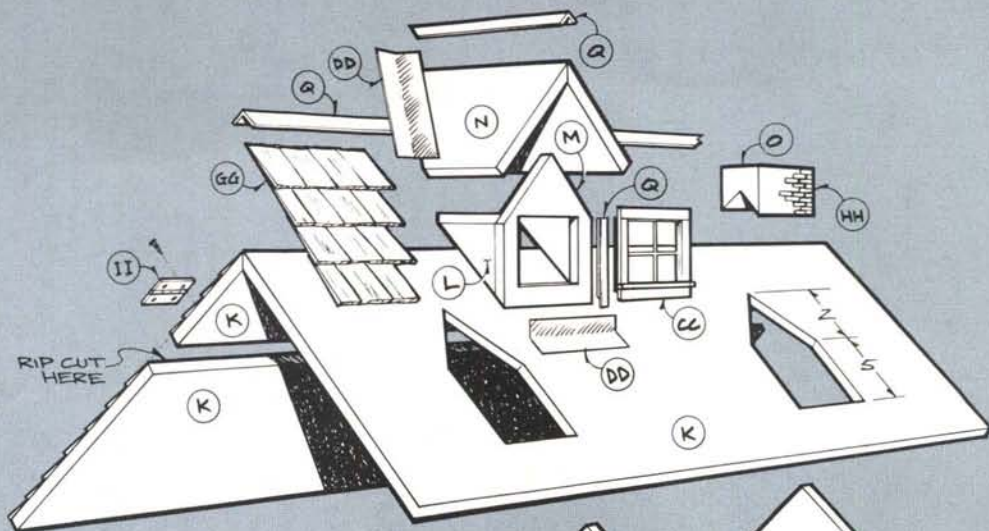


FIG. 1

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd
A	End	$\frac{3}{8} \times 14\frac{7}{8} \times 27\frac{1}{2}$	2
B	Upper Floor	$\frac{3}{8} \times 14\frac{7}{8} \times 29\frac{1}{2}$	2
C	Lower Floor	$\frac{3}{8} \times 14\frac{7}{8} \times 42\frac{3}{8}$	1
D	Front	$\frac{3}{8} \times 20\frac{1}{8} \times 30\frac{1}{4}$	1
E	Wide Partition	$\frac{3}{8} \times 14\frac{7}{8} \times 9\frac{1}{2}$	3
F	Narrow Partition	$\frac{3}{8} \times 7\frac{1}{4} \times 9\frac{1}{2}$	1
G	Attic Partition	$\frac{3}{8} \times 9\frac{1}{4} \times 7\frac{3}{8}$	1
H	Kitchen End	$\frac{3}{8} \times 12\frac{7}{8} \times 9\frac{7}{8}$	1
I	Kitchen Front	$\frac{3}{8} \times 9\frac{7}{8} \times 12\frac{7}{8}$	1
J	Kitchen Roof	$\frac{3}{8} \times 13\frac{7}{16} \times 13\frac{1}{16}$	1
K	House Roof	$\frac{3}{8} \times 12 \times 31\frac{1}{4}$ *	2
L	Dormer Side	$\frac{1}{4} \times 3\frac{3}{8} \times 3\frac{3}{8}$	4
M	Dormer Front	$\frac{1}{4} \times 3\frac{7}{8} \times 5\frac{3}{8}$	2
N	Dormer Roof	$\frac{1}{4} \times 3\frac{1}{2} \times 6\frac{1}{4}$	4
O	Chimney	2 x 2 x 2	1
P	Wide Corner	$\frac{3}{4} \times \frac{3}{4}$	about 4 ft.
Q	Narrow Corner/Cap	$\frac{3}{8} \times \frac{3}{8}$	about 5 ft.
R	Rake/Trim	$\frac{3}{16} \times \frac{1}{2}$	about 8 ft.
S	Medium Corner	$\frac{1}{2} \times \frac{1}{2}$	about 1 ft.
T	Stair	$\frac{7}{8} \times 2\frac{7}{8} \times 11\frac{7}{8}$	1
U	Foundation	$\frac{3}{4} \times \frac{3}{4}$	about 10 ft.
V	Foundation Extension	$\frac{3}{4} \times 1\frac{3}{8} \times 9$	1
W	Front Step	$\frac{3}{8} \times 1\frac{1}{4} \times 8\frac{1}{4}$	1
X	Colonial Door**	as shown	1
Y	Front Window**	as shown	5
Z	Shutter**	as shown	5 pair
AA	Bay Window**	as shown	1
BB	Double French Door**	as shown	1
CC	Dormer Window**	as shown	2
DD	Copper Flashing**	as shown	as req'd
EE	Railing w/Posts**	as shown	as req'd
FF	Siding**	as shown	as req'd
GG	Cedar Shingles w/Flashing**	as shown	as req'd
HH	Bricking Kit**	as shown	as req'd
II	Hinge	$\frac{3}{4} \times 1$ long	2

* One of the two roof sections is ripped to form the hinged section.

** These parts are available either as individual components or in kit form. See Parts Kit & Component Ordering Information for prices and ordering details.

check dimensions before putting the saw to the plywood.

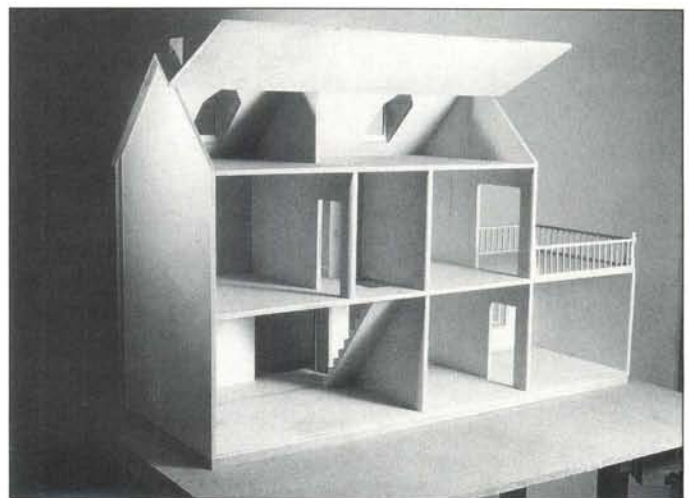
Start the construction by building the basic plywood shell. Lay out the various component parts on your plywood stock, then cut them to size. You'll need a pair of ends (A), a pair of upper floors (B), a lower floor (C), a front (D), three wide partitions (E), one narrow partition (F), an attic partition (G), a kitchen end (H), front (I) and roof (J), and the house roof (K). Note that you'll need to make cutouts in one of the house ends for the double French door and the kitchen entrance, in addition to notching the bottom edge of that same end to clear the lower floor (see Fig. 1). Also, you'll need to rip one of the two house roof sections to create the hinged part, which opens to provide access into the attic. The other roof section has cutouts for the dormers. The two upper floors are identical, except for the stairway cutout in the second floor.

As shown in the illustrations, and as dimensioned in the Bill of Materials, the kitchen roof is sized to overhang the kitchen end and front by $\frac{3}{16}$ in. Although this dimension doesn't sound like much, it's a critical dimension if you plan on building the house as shown, in its fully trimmed version. The $\frac{3}{16}$ in. kitchen roof overhang allows for the addition of the siding and

trim, which when applied, butts up neatly to the bottom side of the flat roof. However, you may also note that our photo of the plywood version does not show this same overhang. That's because, if you decide to just build a plywood house and paint it, without applying siding or trim, then you'll want to leave the overhang off. Whichever way you decide to build it, assemble the plywood shell with glue (either white or yellow is fine), and brads.

With the basic plywood shell cut and assembled, next go to work on the two dormers. Each dormer is just a pair of sides (L) and a front (M) topped with a roof (N). The roof pitch on the dormer—like the house—is 45 degrees, so all the angled cuts will be at 45 degrees.

Once the dormers have been mounted to the house, you can get to work on some details. Make the chimney (O) as shown, then cut the various corner, cap and trim parts (P, Q, R, S). The corners and caps could be made by edge-gluing thin boards at a right angle, but it's easier to just take square stock ($\frac{3}{4}$ in. for the wide corner, $\frac{1}{2}$ in. for the medium corner, $\frac{3}{8}$ in. for the narrow corner), and cut a rabbet into it. With each of the corner pieces, the rabbet should leave $\frac{1}{8}$ in. thickness, as shown in the trim detail (Fig. 2). When rabbeting small parts like this, remember that it's safer to work on the router table, as opposed to using the table saw and dado head. Also, cut the stair (T), foundation (U), foundation extension (V) and front step (W). The foundation and foundation extension are cut from $\frac{3}{4}$ in. thick plywood; the front step is $\frac{3}{8}$ in. thick plywood. But, don't mount any of these parts (T through W) yet. As we'll soon see, getting everything on at the right time will go a long way toward simplifying the building of the dollhouse.



Rear view of the dollhouse as a basic plywood shell.

Next up is the siding. Although the construction of a real house as compared to our dollhouse does share some common ground, when it comes to the assembly order, there are also some important differences. Where most homes have the roof shingled and windows and doors fitted before the siding is applied, with the dollhouse the order is reversed. The siding is first. Actually, the reason for this is simple. Applying the corners, windows and doors over the siding eliminates any fussiness with fitting siding up to these parts. Just run the siding wild, then trim it flush with the window and door cutouts and the front corners of the dollhouse. Also apply the siding to the

Parts Kit & Component Ordering Information

WINDOW & DOOR PACKAGE \$85.00

- 5 Non-working windows
- 1 Bay window w/ copper flashing
- 1 Colonial door w/ hardware
- 1 French door w/ hardware

Price includes shipping & handling.

KIT NO. 1 \$231.50 KIT NO. 2 \$274.00

- | | |
|-----------------------------------|-----------------------------------|
| 17 pc. clapboard siding and glue | 17 pc. clapboard siding and glue |
| 2 dormer windows | 2 dormer windows |
| Square cedar shingles w/ flashing | Square cedar shingles w/ flashing |
| 5 non-working windows | 5 working windows |
| Colonial front door w/ hardware | Colonial front door w/ hardware |
| Double French door w/ hardware | Double French door w/ hardware |
| Railing kit w/ newel posts | Railing kit w/ newel posts |
| Bay window w/ flashing | Bay window w/ flashing |
| Shutters (5 pair) | Shutters (5 pair) |
| Bricking kit | Bricking kit |
| | Wiring kit |

Price includes shipping & handling.

INDIVIDUAL COMPONENTS

- | | |
|---|---------|
| 5 pair shutters | \$15.00 |
| 2 dormer windows | 7.00 |
| Railing kit w/ newel posts | 15.00 |
| Square cedar roofing shingles w/ flashing | 12.00 |
| 17 piece clapboard siding | 72.00 |
| 2 tubes of glue for the siding | 8.00 |
| Bricking kit for the foundation and chimney | 12.00 |
| 5 working windows | 32.50 |
| 1 Colonial door w/ hardware | 28.50 |
| 1 double French door w/ hardware | 16.95 |
| 1 bay window w/ flashing | 20.50 |

Add \$7.50 for shipping & handling

Please Note: Kits only include items listed. You must provide plywood, steps, chimney, corners, rake, and cap boards.

Conn. state residents add 6% sales tax after shipping cost is added in. Checks, Visa, MC and AmEx accepted. To order, call or write: Russell Crafts, 481 Danbury Rd., New Milford, CT 06776; tel. (203) 354-5287.

dormers. Note, though, that before you start on the siding, you'll need to first apply the rake and trim molding. This molding, which is just lengths of $\frac{3}{16}$ in. thick by $\frac{1}{2}$ in. wide stock, runs up the back corners and along the roof pitch. The siding is butted up to it.

Don't use a white or yellow glue for the siding. Builder Tom Russell cautions that most common woodworking adhesives tend to buckle the siding. The purchased siding isn't individual strips of clapboard, but instead is actually wide, thin boards with about eight levels of siding milled into it. A rabbet along the bottom edge of each length of siding enables each section to fit perfectly over the previous length, with just the right overlap. Russell recommends a special quick-grab adhesive for the siding application. The adhesive is supplied with kits no. 1 and 2, or it may be purchased separately.

To use the adhesive—which is similar to contact cement—first apply the adhesive to the back of a length of siding. Next,

temporarily position the siding on the house, exactly where it will finally go. Then, immediately lift the section of siding away. A thin layer of the quick-grab adhesive should remain on the dollhouse where the siding had been. Wait a few moments, then replace the siding into its original position. The key with this siding application technique is to use enough adhesive so that when you first position the section of siding, a thin layer of the adhesive will transfer to the side of the dollhouse. Russell also tells us that a wallpaper roller—if you happen to have one—works well for flattening the siding. When applying the siding to the front of the dormers, leave the bottom most edge free of adhesive. You'll need to slide a slip of copper flashing (DD) up under the bottom edge of the siding here, after the roof has been shingled.

Next, go to work shingling the roof. Unlike the siding, with its timesaving wide multiple clapboards, the job of shingling the roof is rather time-consuming. It's basically just a case of applying one row of the cedar shingles (GG) over the next. Note the use of copper flashing (the flashing is included with the roof shingles) in the valleys where the dormers meet the main roof. Trim back the shingles along the valleys to leave a neat, clean edge, as shown in the photo. The chimney is applied over the roof shingles, but not until you've used the bricking kit (HH) to apply the appearance of bricks.

The bricking, which is applied to the chimney and the foundation perimeter, is not a real brick, but an imitation brick that comes in a kit. Instructions are included in the bricking kit.

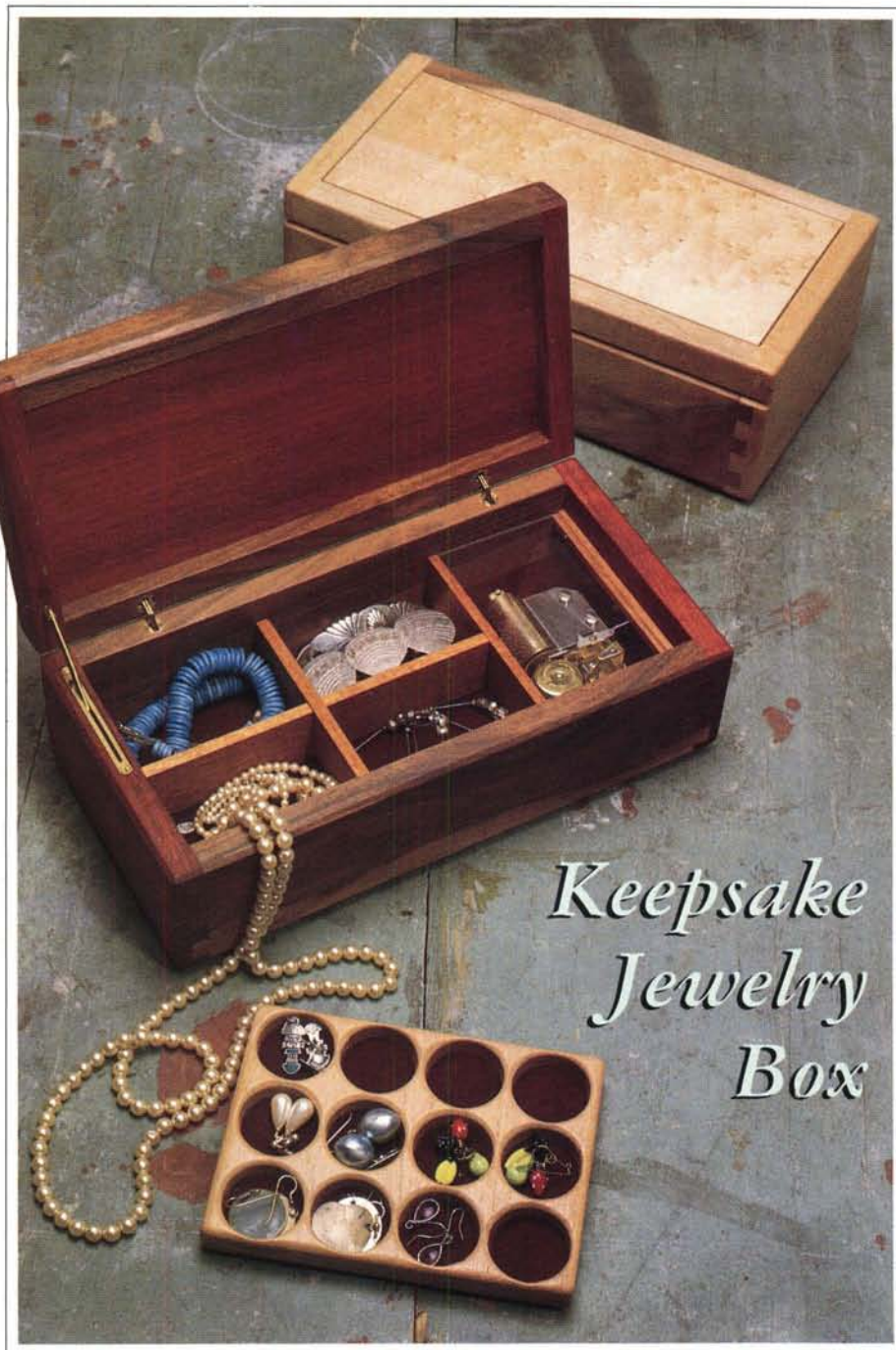
Next, mount the various doors (X, BB) and windows (Y, AA, CC). Tom Russell suggests that you use a silicone adhesive—instead of a conventional glue—for this job. Should replacement ever be necessary, with the ever-flexible silicone adhesive, taking out a broken old window or door is easy. All that's needed are a few dabs of the adhesive—one at each corner. Don't forget the copper flashing on the bay window. It's a very attractive detail, imitating the copper roof found on better-quality bay windows. Now is also a good time to mount the various corners and caps. The wide corner molding is applied to the two front corners of the house, while the medium corner covers the front corner of the kitchen. The narrow corner/cap serves several purposes. It serves as the ridge cap for both the main roof and dormers, and it serves as the corner trim for the dormers. The shutters (Z) and railing (EE) can also be mounted now, again using just a few dabs of the silicone adhesive.

As for painting, the traditional colonial white trimmed with blue shutters is just one option. You may find it easier to paint windows and doors separately, before they are mounted. Of course, painting things before they are mounted is a must for anything that's to be painted a different color—like the shutters. Note that the window grills pop out, making painting easy.

You could glue the stairway in place, but if you plan on doing any interior finishing, keep in mind that it's easier to apply carpeting to the stairs, and perhaps add a railing, with the stairs on your workbench as opposed to in the dollhouse. All that's left is to mount the lift-up roof section with the $\frac{3}{4}$ in. wide by 1 in. long brass hinges (II), which are available at any hardware store.

Once your dollhouse is complete, wrap a big red ribbon around it, tie a red bow on top, and sneak it down by the Christmas tree a little after midnight. Come dawn, add to this one wide-eyed little girl, and we'll guarantee a Christmas that won't be soon forgotten.





Keepsake Jewelry Box

Music box movement adds a special touch

When we first saw these little jewelry boxes, by Portland, Oregon, woodworker Gary Damaskos, we liked the simple, clever design. Damaskos had taken the traditional half-blind dovetail joint used in drawer-making, and employed it to make a small jewelry box. If the ability to make a box is the foundation of most every carcase construction in wood-working, then this jewelry box carries

the concept even further. If you can make a drawer, then you can make this box, and conversely, if you can make this box, then you can make not only drawers but chests, cases and cabinets.

As illustrated, the half-blind dovetail joinery can be made with any standard $\frac{1}{2}$ in. dovetail fixture (Sears, Black & Decker, etc.) or with any adjustable dovetail fixture, such as the Leigh jig. You'll also need a router and a $\frac{1}{2}$ in.

dovetail bit. If you've always wanted a dovetail fixture, but could never find a good enough excuse to buy one, then consider this. Make one of these keepsake jewelry boxes for that special person in your life, and there won't be any complaining that you spent Junior's lunch money for the dovetail fixture.

Although Damaskos' original jewelry box design looked fine, we opted for several changes that are noteworthy. First, we added a music box movement. There's something magical about music boxes, and we've long had one on our project wish list. But most of the music boxes we looked at were just boxes for housing a movement. We wanted our music box to also serve a practical purpose, as this jewelry box does.

The changes to the box also included our employing some unique and interesting hardware. With the addition of the music box movement, we found it necessary to replace the swing-arm lid stay that the box originally came with. The solid brass lid stay we selected is a simple and elegant device that has the added benefit of not interfering with the ring tray inside the box. The lid stay is new from Larry and Faye Brusso, a small midwestern hardware company that specializes in top-quality jewelry box hardware. It's the perfect solution to those situations where a lid stay is needed, but you can't afford to use a stay with a chain or swing arm that hangs down inside the box. The lid stay also nicely complements the solid brass barrel hinges that Damaskos uses to mount the lid. If you have never tried these unique little hinges, they're an efficient, easy-to-mount alternative to standard mortise-type hinges. You just drill a pair of matching holes for the two halves of the hinge. The barrel hinges (which are also available in larger sizes for larger boxes) have the added bonus of being totally concealed when the box is closed.

As with all projects, we recommend that you have all the specified hardware—and the music box movement—on hand before starting construction. Ordering information for the movement and hardware is listed in the Bill of Materials.

The box sides (A) and ends (B) are cut from $\frac{5}{8}$ in. thick by $3\frac{1}{2}$ in. wide stock.

The boxes in the photo are bird's-eye maple or padauk with walnut, but almost any combination of attractive hardwoods can be used. Note that the 3 1/2 in. width dimension includes an allowance of 1/16 in. for waste when the lid is cut from the box and the parts are sanded, but you may want to also allow a little extra for sanding on the top and bottom edges. Cut the sides and ends to length, then follow the instructions for cutting half-blind dovetails that come with your jig.

Next up is cutting the grooves for the top panel (C) and the bottom (D). The dado head (set for a 1/4 in. wide by 1/4 in. deep cut) and table saw, or the router table (equipped with a 1/4 in. diameter straight cutter) can be used for this operation. Note that the location of the grooves with respect to the dovetails enables you to make the cuts along the entire length of the sides and ends, without the grooves showing once the box is assembled.

Before assembling the box, you'll want to cut the slot and recess in the right end for the actuator shaft and button. Establish the button recess first. Measure 1 1/4 in. up from the bottom edge, and 2 7/8 in. from either the front or back, then use the drill press and a 5/8 in. diameter Forstner bit to establish one end of the 3/16 in. deep recess. Make a second cut 1/4 in. from the first, then clean up the little remaining stock with a sharp chisel. To cut the shaft slot, use the same center point measurements to drill a pair of 1/4 in. diameter holes, and again clean up the remaining stock to produce a straight-sided slot.

Cut the top panel and the bottom to the dimensions listed in the Bill of Materials. Note that the 1/4 in. wide by 1/4 in. deep rabbet around the top panel is sized to leave a 1/16 in. reveal all around the panel once assembled. Now assemble the sides and ends around the top and bottom. Use glue at the dovetails and on the bottom, but not on the top panel. Later, after the box is out of clamps and the lid has been separated, you'll anchor the top panel with a pair of pins.

As shown in the elevation, we've allowed about 1/16 in. for the band saw blade kerf and sanding when the lid is separated from the box. If you use the table saw instead of the band saw to separate the lid, use a thin kerf blade, and be sure to employ shims and tape to

hold the box together and the kerf open for the final cut. Depending on the method of sawing, and the kerf width of the blade used to separate the lid from the box, your actual final lid depth will vary from about 3/4 in. to 7/8 in. Once the lid is separated, you can apply the 1/8 in. chamfer where the lid and box meet, and at the top and bottom edges.

Next, cut the long and short partitions (E, F), the cleat (G) and the tray (H). The partitions are a simple half-lap construc-

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	5/8 x 3 1/2 x 11 1/4*	2
B	End	5/8 x 3 1/2 x 6*	2
C	Top Panel	1/2 x 5 1/8 x 11	1
D	Bottom	1/4 x 5 1/8 x 11	1
E	Long Partition	1/4 x 1 5/16 x 7 3/4	1
F	Short Partition	1/4 x 1 5/16 x 4 3/4	2
G	Cleat	1/4 x 3/8 x 4 3/4	1
H	Tray	3/4 x 4 3/4 x 6 3/8	1
I	Felt	10 x 16	1
J	Plexiglas	1/8 x 2 7/8 x 4 3/4	1
K	Movement**	36 note	1
L	Barrel Hinge***	10 mm diameter	2
M	Lid Stay****	1/4 x 1 1/2 x 2 7/8	1
N	Foot	As shown	4

* Width dimension of sides and ends are before lid is separated from box.

** Music box movements are available from Mason & Sullivan, 586 Higgins Crowell Road, West Yarmouth, MA 02673; tel. 1-800-933-3010. Movement shown is part no. 3673X, cost is \$75 plus shipping. For alternate 18-note movement, order part no. 3650X, cost is \$12.95 plus shipping.

*** Barrel hinge and 10 mm drill bit are available from Woodcraft, 210 Wood County Industrial Park, Parkersburg, WV 26102; tel. 1-800-225-1153. Hinge is part no. 27C11, cost is \$2.95 each (2 required); 10 mm brad-point bit is part no. 11Y88, cost is \$3.85.

**** Lid stay can be ordered from Larry & Faye Brusso, 3812 Cass Elizabeth, Pontiac, Michigan 48054; tel. (313) 682-4320. Order part no. 250, cost is \$10 postpaid.

tion. If you add a felt liner (I) to the box, you'll need to shave just a hair off the partition width to allow for the liner thickness. A 1/8 in. by 1/8 in. rabbet in the cleat and one of the short partitions serves to support the Plexiglas movement cover (J). The 1/8 in. thick Plexiglas is available at hobby centers or at any glass shop. It's important since it adds to the sound quality by creating a resonant chamber, while keeping dust away from the delicate movement.

The tray (which is perfect for holding rings or earrings) is just a board with a series of 1 3/8 in. diameter by 3/8 in. deep holes drilled with a Forstner bit. Space the holes about 1/8 in. apart. The size listed for the felt in the Bill of Materials includes enough extra felt to also yield 1 3/8 in. diameter disks to line the ring tray holes.

Next up is mounting the barrel hinges (L) and lid stay (M). You'll need a 10 mm diameter drill bit to drill for the hinges, but if you don't own a set of metric bits, a single 10 mm bit is available from the hinge supplier. The hinge barrels aren't glued in place. Instead, a small screw is tightened to lock each hinge barrel securely in its hole. This makes removal easy, should that ever be necessary.

For the lid stay, cut a 1/4 in. wide by 1/2 in. deep slot into the box end. The slot is 2 7/8 in. long and starts 1/2 in. from the back of the box. The 1/4 in. diameter hole for the sliding arm pin is located 1 in. on center from the back edge of the lid. The body of the stay is screwed in place and a dab of epoxy is used to secure the pin in the hole. While you are drilling the pin hole, also drill for the pair of brass pins that anchor the top panel. The key here is to make certain that an even 1/16 in. reveal is maintained all around the top panel.

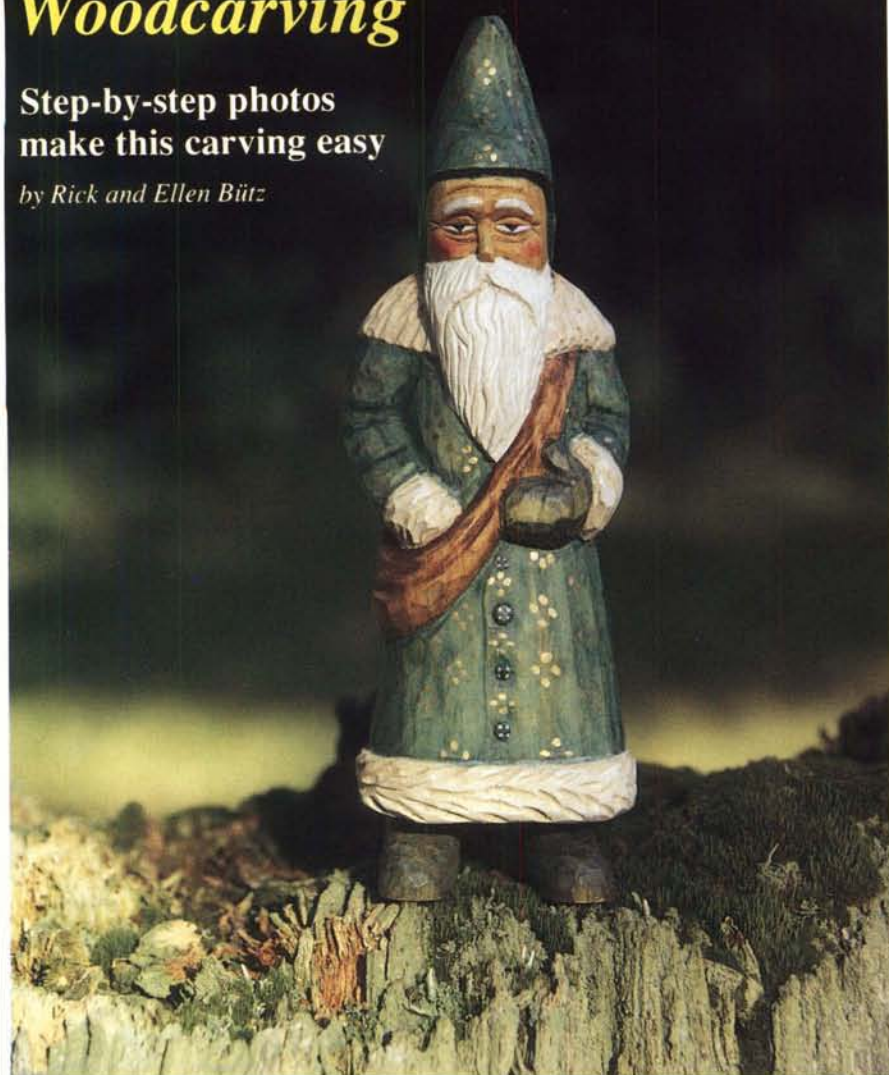
All that's left is to apply a finish, add the feet (N) and mount the movement (K). For a finish, we recommend either a tung oil finish topped with beeswax, or lacquer. When mounting the movement, take care to locate it properly so the actuator button and the slide arm to which it is attached effectively turn the movement on and off. The button, slide arm and all necessary linkage hardware are included with the movement. The winding knob for the movement screws in place through the box bottom.

The movement that we show is a 36-note Swiss Reuge, that plays both Edelweiss and Lara's Theme from Doctor Zhivago. Other tunes are also available, including The Blue Danube Waltz and Tales from The Vienna Woods, and Music Box Dancer. The 36-note movements play about eight minutes on a single winding. Less costly 18-note movements, that play about three minutes per winding, are also available (see Bill of Materials for price and ordering information).

Father Christmas Woodcarving

Step-by-step photos
make this carving easy

by Rick and Ellen Bütz



Today, most Americans picture Santa Claus as a jolly well-rounded person dressed in red. But this has not always been true.

Our modern image became accepted around 1875 and was strongly influenced by the cartoons of Thomas Nast which appeared in *Harper's Weekly* from 1863 until 1886. These in turn had been derived from Dr. Clement Moore's poem "The Night Before Christmas," first published in 1822.

However, the tradition of Father Christmas dates back many centuries and his image often varied with local European customs. Even the name Santa Claus is a variation on Dutch children's pronunciation of Sinterklaas.

This particular woodcarving is similar to the style found in 18th century

Germany. Historically, very few of the old wooden figures have survived over the centuries because of the fragile nature of the wood. Fortunately, this style was also molded in chocolate candy and papier mache Christmas tree ornaments. The molds from which these candies and ornaments were cast proved more durable and can still be found in museums and private collections.

This Father Christmas is dressed in a rich green traveler's robe trimmed in fur. He wears the oddly shaped winter hat that was fashionable in post-medieval times. Over his shoulder he carries a pouch containing handmade wooden dolls and toy animals as well as the fruits, nuts, and sweets so welcome during the long winter months.

This figure lacks the jolly smile of

modern Santas. Instead he has a somber expression typical of many older St. Nicholas figures. His thoughtful look reflects the Saint's role as judge of the deeds of children and adults over the past year.

Before starting, keep in mind that the tool sizes listed are suggestions. You can substitute other tools in similar sizes.

The carving is made from a block of 1 3/4 in. thick by 3 in. wide by 7 in. long air-dried white pine or basswood. Begin by drawing the front view of the pattern on the wood, then draw the side view (feet only). Use a band saw to cut out the side view first, so you have a flat surface to rest the carving on while you cut out the front view (Photo 1).

Next, fasten the blank down in a bench vise and use a large flat gouge like a 30 to 35 mm no. 1 or 2 to remove some of the excess wood and round off the sharp edges of the blank (Photo 2). If you prefer you can do this with a knife, but it will take a little longer.

Draw a pencil line to indicate the



PHOTO 1



PHOTO 2

shoulder cape and then round off the back of the hood and the cape area with a knife (Photo 3).

Use a 10 mm no. 12 V-gouge to outline around the beard. Hold the gouge in a pencil grip and make sure your fingers are out of the way in case the tool slips. Make your cut around the beard



PHOTO 3

about $\frac{1}{4}$ in. deep. It may take more than one pass with the tool to reach the proper depth (Photo 4).

I have wrapped the shaft of this particular V-gouge with heavy thread. I learned this technique when I was studying figure carving in Switzerland. It makes the tool easier to hold when you are working on a small project, but standard tools will work just fine.

Pare away the wood around the beard with a knife, leaving the beard raised (Photo 5).



PHOTO 4



PHOTO 5

Next, use the V-gouge to outline the shoulder cape. Bevel the excess wood below the cape with the whittling knife just as you did with the beard (Photo 6).

After the cape is shaped, draw in both arms and the toy sack with a pencil. Using the V-gouge, outline the left arm and mitten first (Photo 7). Then, using

the knife, bevel down the excess wood around the arm.

Smooth the arm and shape the mitten and fur ruff on the sleeve using the same technique of outlining with the V-gouge and paring away the excess.

Outline the toy sack next (Photo 8).

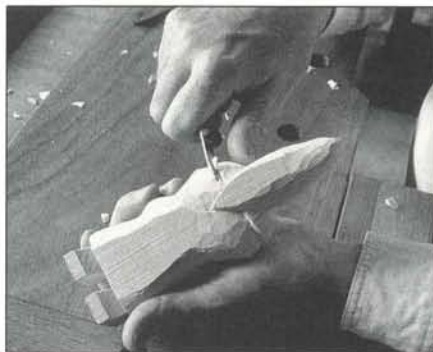


PHOTO 6

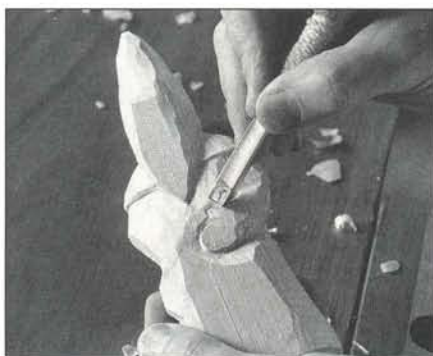


PHOTO 7

Use the knife to remove the excess wood above and below the sack. Then, round the sack.

Finally, outline the right arm with the V-gouge (Photo 9). Pare away the excess wood and round the arm. If you haven't done this kind of carving before, positioning and shaping the arms can be a little tricky. Just take your time and work through this step slowly.

After you have the arms shaped, the next step is to make the fur ruff on the hem of Santa's cloak. Use the same technique and outline the ruff with the V-gouge, then cut away the wood above the ruff leaving it raised. Round the ruff slightly with your knife.

The final step before carving the face is to round the feet and shape the boots (Photo 10).

Face carving is something many carvers find challenging. However, follow the directions carefully and make the cuts in the order I recommend, and you will be rewarded with a nice little face. Don't worry if your Santa's face doesn't look exactly like mine. The individuality



PHOTO 8

of expression is what gives this carving its character. You may want to practice detailing faces a few times on scrap wood to get a feeling for the technique.

Before you begin the face, take a few minutes and make sure your knife is razor sharp right up to the tip. I always touch my edge up on a strop before I tackle the face. The clean, crisp cuts a truly sharp knife makes will give your carvings a finished, professional look.

The first step in carving the face is to shape the hood, rounding it to a gentle



PHOTO 9



PHOTO 10

peak. Then draw a line indicating the edge of the hood around the face. Outline the edge of the hood with the V-gouge, then pare away the excess wood below it (Photo 11). This step will leave the face area slightly rounded.

Draw a pencil line across the face about $\frac{3}{8}$ in. below the level of the hood,



PHOTO 11

and draw another line about $\frac{1}{4}$ in. below the first. The first line is a guide line for the position of the eyes, and the second marks the bottom of the nose.



PHOTO 12



PHOTO 13

Next, with the knife, cut two notches about $\frac{1}{8}$ in. deep on the lines you have drawn. The lines indicate the deepest part of the notch (Photo 12).

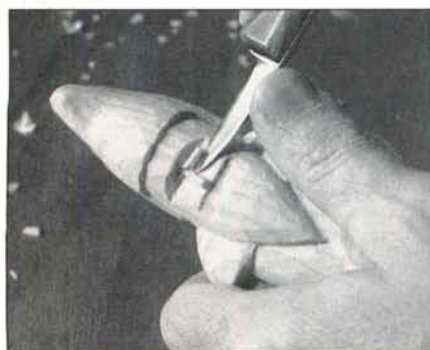


PHOTO 14



FULL-SIZE PATTERN

To form the nose, hold the knife in the pencil grip and carefully incise two cuts about $\frac{1}{8}$ in. apart to create the two sides of the nose (Photo 13). Then pare away the excess wood over the cheeks leaving the nose raised (Photo 14).

To define the cheek, remove a tiny triangular chip of wood from the bottom of the cheek next to the nose. Cut down vertically between the cheek and the nose. Then make a small horizontal cut to remove the chip (Photo 15).

Round off the sharp angles on the cheeks and forehead, and bevel the angles on the nose very slightly.

Next is shaping the eyes. The method I use suggests the shape of a human eye rather than attempting to reproduce it in realistic detail. This style is actually more effective in creating a lifelike expression on a small scale carving.

A perfectly sharp knife is especially important for this step as the chips you will be removing are paper thin. Hold the knife in the pencil grip and incise a very shallow cut, $\frac{1}{32}$ in. deep, around the outline of the eye (Photo 16). Next, pare away an extremely thin shaving of wood above and below the eye, leaving the eye area slightly raised (Photo 17).

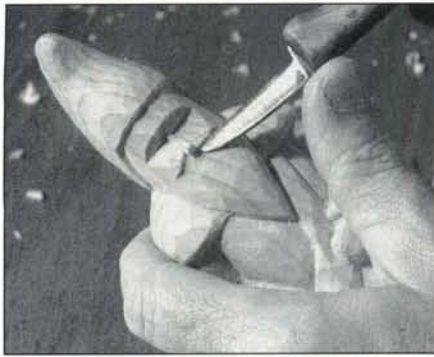


PHOTO 15



PHOTO 16

To create the pupil of Santa's eye, use the very point of your knife to remove a tiny three-sided chip from the lower eyelid. Make three small cuts angled in so they meet at the bottom and remove a clean chip (Photo 18).

Now, take the V-gouge and incise a line from under the cheek to the edge of the hood. This line forms the top of the beard. Smooth off the sharp edges with the whittling knife (Photo 19). This will give the face rounded cheeks.

Holding the knife in a pencil grip, incise a line to make the bottom edge of



PHOTO 17

Santa's long drooping mustache. Then slice away a thin shaving below the incised cut to form the mustache (Photo 20). You can also add wrinkles under his eyes using this same method.

To detail the carving use a small V-gouge like a 3 mm no. 12 to carve

wrinkles on the forehead and texture the beard and mustache (Photo 21).

Then use the larger 10 mm V-gouge to texture the fur trim on the sleeves, the cape, and the hem of the cloak (Photo 22). Use the same tool to put some



PHOTO 18

horizontal folds of cloth in Santa's toy sack. The larger V-gouge leaves a slightly more rounded texturing cut and creates a softer, fluffier feeling in the fur.

Now your Santa Claus is ready to paint. Begin by using artist's titanium white acrylic paint and a no. 3 pointed



PHOTO 19

synthetic sable brush to paint his beard, eyebrows, fur trim and cape. I use acrylic paint for the white areas because it is more opaque than oil paint. Artist's brushes, acrylic paints, and oil paints are available at any art supply store.

Then paint the cloak with viridian green oil paint thinned with turpentine to



PHOTO 20

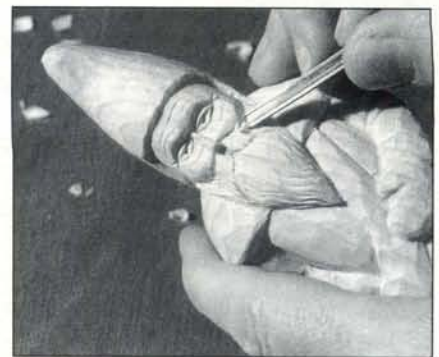


PHOTO 21



PHOTO 22

a transparent stain. Paint the mitten and boots a darker green made by adding a small amount of burnt umber oil paint to the cloak color. For broad areas like the cloak, use a no. 4 flat synthetic sable brush.

Use the same brush to paint the toy sack with burnt umber oil paint also thinned to a transparent stain.

You can leave the face the natural wood color or you can color it with a very tiny amount of burnt umber and burnt sienna oil paints thinned to a very dilute stain. The stain for the face should



PHOTO 23

be extremely subtle for the most natural effect. Use a small brush like a no. 2 flat synthetic sable for this step.

Use gold enamel to paint the dots on Santa's cloak with a 000 pointed sable brush (Photo 23). Use the same brush if you wish to paint on buttons.





Heirloom Toy Chest

It has a big appetite for little playthings

If there's one project that should be at the top of your woodworking list for Christmas, this toy chest is it. It couldn't be much easier. No complicated joinery, no expensive exotic woods to buy, and only a few dollars worth of hardware. And best of all, after just a few afternoons or evenings in the shop, you'll have a chest that's cavernous enough to swallow just about all the toys that are sure to be scattered about come Christmas morning.

Actually, our chest can be for more than toys. Although the Calaveras County jumping frogs cavorting around its sides surely lend it a whimsical air, leave the frogs off and you've got a handsome chest that fits just about

anywhere, from the foot of the bed to the family room. With this in mind, if you do make the chest for toys, consider mounting the frogs with doublestick tape. That way, when the kids are grown, they'll have a sturdy chest that they won't be embarrassed to take with them for use in a college dorm room.

If the thought of a toy chest surviving to see hallowed halls of ivy seems improbable, then consider this. The body of the chest is all $\frac{3}{4}$ in. thick pine, with joinery both glued and screwed. The lid slats are also a full $\frac{3}{4}$ in. thick—sturdy enough so the chest can see double duty as an occasional seat, and the full $\frac{1}{2}$ in. thick plywood bottom can hold just about anything that can be

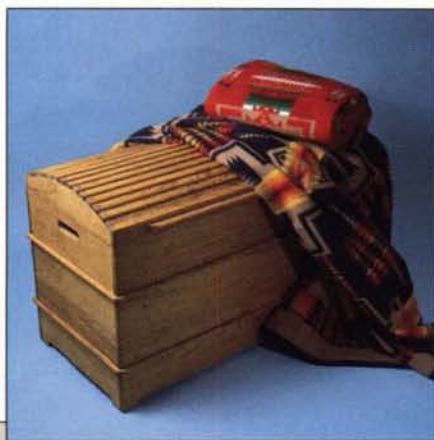
fit within. Even the parallel bullnose moldings around the outside of the chest are more than just window dressing, channeling the frogs on their merry way. Cut from oak, the bullnose strips serve as protective bumpers, fending off objects that may dent the softer pine.

You'll want to start this project by edge-gluing stock for the front/back (A) and ends (B). You can make this edge-gluing procedure a single assembly by purchasing 9 ft. lengths of pine, in sufficient widths to add up to a little over 20 in. Although you could achieve the needed width with just a pair of 1 by 12's, it's wiser to use three or four narrow boards to achieve a width like this. That way you'll avoid the cupping

As with any edge-gluing procedure, joint the edges of the boards first. Also, be sure to alternate the direction of the growth rings (see Fig. 1). Apply a coat of glue to the mating edges, then use pipe or bar clamps to snug the assembly up. Waxed clamp blocks, spaced about 18 in. apart and secured with C-clamps, will keep the joints from sliding out of register as the bar or pipe clamps are tightened. As with any woodworking assembly, use only moderate clamp pressure. Remember, you don't want to apply so much pressure that all the glue is squeezed out of the joint (a condition that's known as a starved joint), since that joint will almost surely come apart.

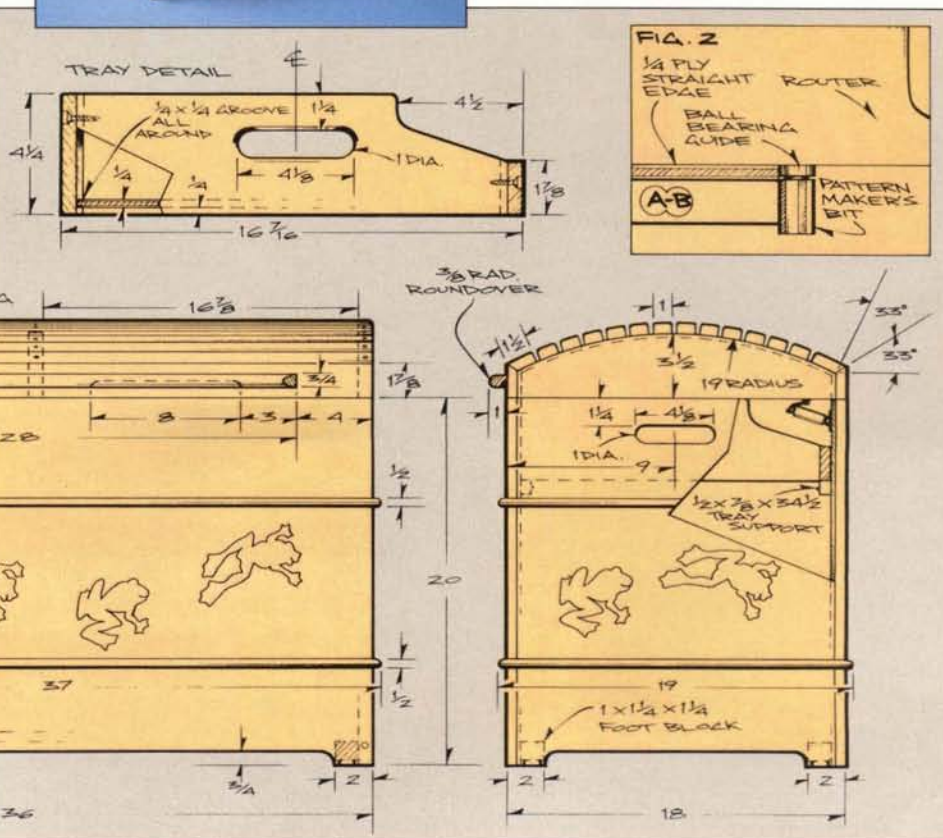
Once your stock is out of clamps, crosscut the front, back and ends to the lengths listed in the Bill of Materials. Then make the ripping cuts to establish the final 20 in. width. You could make the rip cut on the 9 ft. long glue-up first, but most small shop saws aren't set up to accurately handle boards that long. Next, establish the 1/4 in. deep by 3/4 in. wide

The hand-hold cutouts in the ends and the gentle reveal at the bottom edge of the front, back and ends can be made next. If you have a set of large Forstner bits, use the 1 in. diameter bit to establish the ends of the handholds and the 1½ in. diameter bit to get the ¾ in. radius at the ends of the reveal. Next use a hand-held jigsaw to cut along the straights connecting the radii. Stay just



off the line. You could use files and sandpaper to clean and smooth the jigsaw cuts, but that could easily take an hour or more. Here's a handy shortcut. Clamp a straight edge along the marked line, then use a ball bearing guided flush-trimming bit in the router to get a perfectly true and smooth edge. As an alternate to the flush trimming bit, you may want to try a pattern making bit. The pattern making bit has the ball bearing guide on the top end of the bit instead of the bottom, so you can see the straight edge and the cut as you work (Fig. 2). Use the factory edge of a length of 1/4 in. plywood as a straight edge.

After cutting the 1/2 in. thick plywood bottom to size, glue and assemble the chest. Use several screws at each joint, counterbored and plugged, to reinforce the assembly. Then cut the tray supports (D), bullnose molding (E) and foot blocks (F). An easy way to get the bullnose molding is to start with stock that's 1/2 in. thick by 1 in. wide plus the width of the kerf that your saw blade cuts. Use the router table and a 1/4 in. radius roundover (or a bullnose) bit to apply the bullnose to both edges, then move to the table saw and rip your stock in half to yield two lengths of bullnose molding. Or just apply the bullnose to a wider piece of stock and rip the molding



from it. The tray supports are glued and screwed in place, while glue and finishing nails anchor the bullnose molding. Glue holds the foot blocks in place.

The frogs (G) are cut from 1/4 in. thick plywood with a scroll saw. Just use our full-size patterns to transfer the profiles of the two frogs (one sitting, one jumping) to your stock, then cut out as many of each pattern as needed to produce an arrangement that pleases you. We continued the pattern around the sides and back of the chest, making it one continuous repetition of jumping and sitting frogs. The plastic eyes (U) on the frogs are a common craft store item. If you can't find them locally, they can be purchased by mail-order (see Bill of Materials for ordering information). Paint the frogs with acrylics to make them more attractive. If this is a family project, this is a good opportunity to get everyone—even the kids—involved. Assign a frog to everyone and you are sure to end up with a colorful menagerie.

The Lid

The lid is of similar construction to the chest, with rabbets on the front/back (H) for the ends (I). The center brace (also I), which is identical to the ends, fits within a dado in the front and back. The 19 in. radius on the top edge of the ends and center brace can be cut with a band saw or a jigsaw. Note that a 33-degree angle is ripped along the top edges of the front and back, and on one edge of the front/back slats (J). The 33-degree angles form a perfect miter joint where these parts meet. The front/back slats and the remaining slats (K) are all 3/4 in. thick. They have the appearance of being lighter, however, thanks to the rabbets for the ends and the dado for the center brace. To space out the slats, locate the center of the 19 in. lid radius, then arrange the slats, six on each side of the center point. The lift (L), like the bullnose molding, is oak. Use a 1/2 in. radius cove cutter to cut the finger lift recesses, then apply the bullnose round-over to the front edge (use either a bullnose bit or a 3/8 in. radius roundover bit) and establish the 45-degree chamfer on each end. Glue and screws are used to mount the lift to the lid.

The Tray

The sliding tray provides a handy spot for smaller items that are used often. The

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
The Chest			
A	Front/Back	3/4 x 20 x 36	2
B	End	3/4 x 20 x 17	2
C	Bottom	1/2 x 17 x 35	1
D	Tray Support	1/2 x 7/8 x 34 1/2	2
E	Bullnose Molding	1/2 x 1/2	about 19 ft.
F	Foot Block	1 x 1 1/4 x 1 1/4	4
G	Frogs	See Full-size Patterns	as req'd
The Lid			
H	Front/Back	3/4 x 17 1/8 x 36	2
I	End/Center Brace	3/4 x 3 1/2 x 17	3
J	Front/Back Slat	3/4 x 1 1/2 x 36	2
K	Slat	3/4 x 1 x 36	12
L	Lift	3/4 x 1 x 28	1
The Tray			
M	Front	3/4 x 4 1/4 x 12	1
N	Back	3/4 x 17 1/8 x 12	1
O	End	3/4 x 4 1/4 x 15 7/16*	2
P	Bottom	1/4 x 11 x 15 7/16	1
The Hardware			
Q	Hinge	2 1/2 long x 1 3/4 wide	2
R	Lid Support**	Center Mount, for 95–125 lbs. torque	1
S	Cushion Glide	1 1/16 dia., nylon base	4
T	Slat Screw***	No. 8 x 1 1/2 long, oval head brass	48
U	Eye****	10 mm	as req'd

* Length is sized to allow 1/16 in. for clearance within chest.

** Use only an approved toy chest lid support. Our support is sized to handle the weight and size of our lid. It's available from Woodcraft, 210 Wood County Industrial Park, P.O. Box 1686, Parkersburg, WV 26102. Order their part no. 04Y31; cost is \$4.95 plus \$4 shipping and handling.

*** If not available at your local hardware store, the heavy-duty oval head, solid brass screws we used can be ordered from Bruss, P.O. Box 88307, Grand Rapids, MI 49518; tel. (616) 698-8314. Order part no. WWJ3 for a box of 100 screws (enough for two chests). Also included is a Phillips insert bit for your powerscrewdriver or drill. Price is \$7.75 postpaid or \$12 postpaid for 200 screws.

**** Plastic eyes are available from Van Dyke's, Woonsocket, SD 57385; tel. 1-800-843-3320. Order part no. RVC5, 10mm, green, slot pupil, wire mount frog eye. Cost is \$2.85 per pair plus \$2.50 shipping and handling per order.

narrow back (N) and the taper on the ends (O) are needed to provide clearance for the childsafe lid support (R). Cut the front (M), back, ends, and bottom (P) to size, establish the rabbets, grooves and the handhold cutouts, then assemble the

front, back and ends around the bottom, anchoring the rabbet joints with screws, counterbored and plugged.

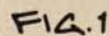
The Hardware

The hardware required for this project can be found at most hardware stores. Mount the lid to the chest with the butt hinges (Q), then add the lid support. The lid support, which holds the lid open at any angle, is an absolute must if you intend this chest for toys. The U.S. Consumer Product Safety Commission mandates the use of an approved lid support on all commercially made toy chests, and we think it's just as—if not more important—for a chest that's made for a loved one. Before lid supports were required by law, fatalities from neck compression were an infrequent but tragic consequence of unsupported lids. Mounted as shown, the lid support worked perfectly on our chest, but depending on the wood you use—and the weight of the lid—some adjustment up or down may be required to get the proper action on your chest. The cushion glides (S) will keep the chest from scratching your floors, and the solid brass oval-head slat screws (T) are a nice detail that add a little something extra to the appearance. The plastic eyes on the frogs are another special touch that isn't a must, but that go a long way toward making the hoppers more realistic.

Finishing Touches

After sanding, we wiped a coat of Minwax Puritan Pine stain over all surfaces, except for the frogs. The frogs should be painted green, but just about any combination of frog-like colors is acceptable. The eyes are mounted to the frogs by drilling a hole for the mounting wire, and then using a dab of epoxy to anchor the wire and eye. A handy way to mount the frogs—or any other intricate cutout—is with spray adhesive. The spray is a quick and convenient way to get adhesive on the entire back surface of the frogs without a lot of fuss. Another trick to mounting items like this is to apply doublestick tape before cutting the profiles out. The protective paper backing is removed after the profile is cut. The advantage of this method is that it permits easy removal at a later date, if you'd like to convert the chest to some more sedate purpose.





For the Shop

Plastic Bag Recycler

designed by Jim Ballow

A number of grocery stores now offer plastic grocery bags. But once home, most of us toss them into the trash container as soon as the groceries are emptied. Here is a project that provides a second use for them—not a bad idea when you consider that landfill space is becoming harder to find these days.

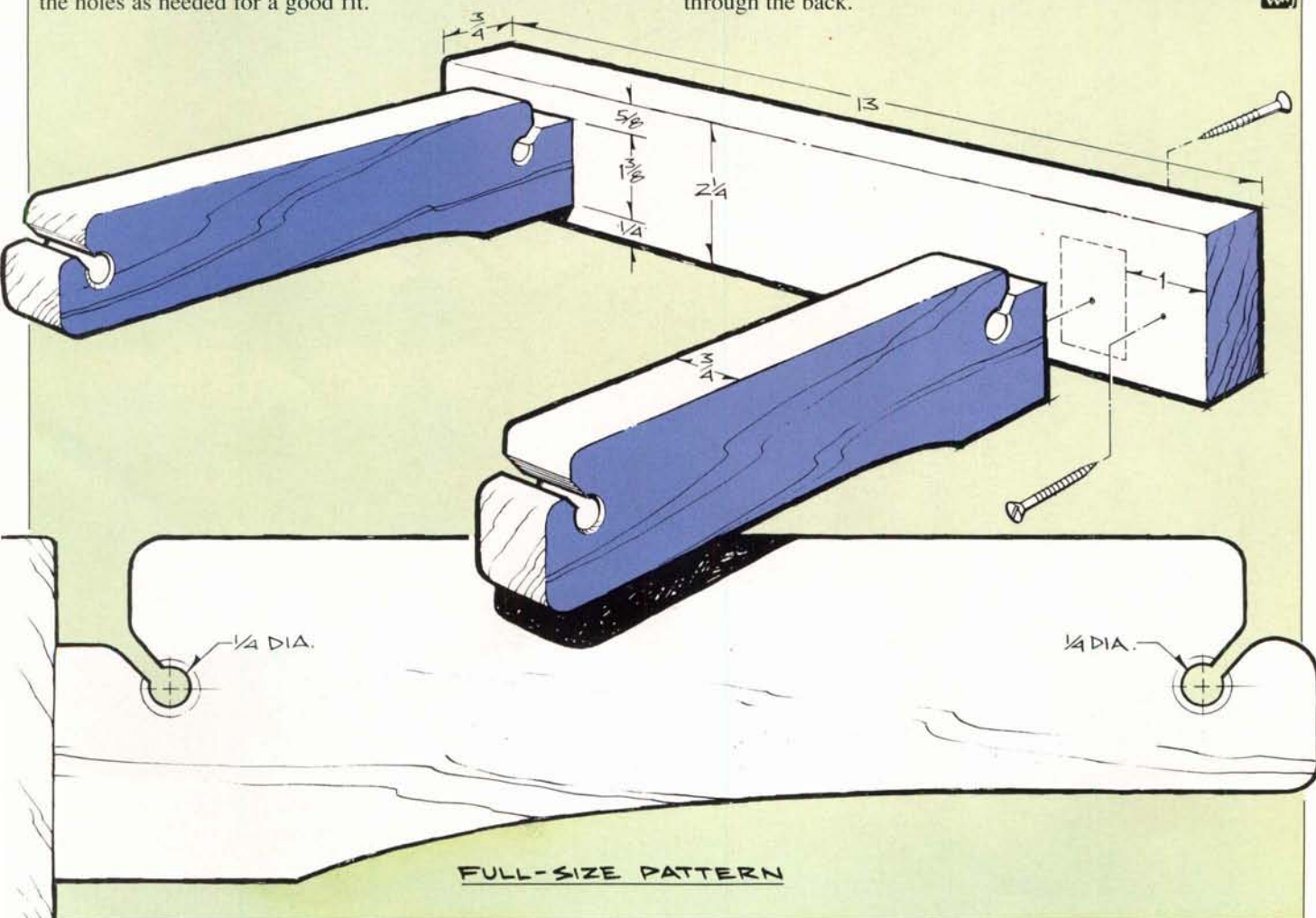
To mount the bag, simply stretch the bag handles into the notches in the arms. Use it anywhere there is a need for a small trash bag—in the shop, garage, basement, or laundry room. Jim Ballow, who provided us with the idea, mounted one on the inside of the cabinet door under his kitchen sink. Ours is made from pine, but any wood can be used.

The arms are made from $\frac{3}{4}$ in. thick stock cut 2 in. wide and $7\frac{1}{4}$ in. long. Transfer the full-size pattern to the stock and cut out the profile with a band saw, scroll saw or jigsaw. Smooth the edges with a file and sandpaper. Now, locate and bore the $\frac{1}{4}$ in. diameter holes, then use a countersink bit to apply a slight chamfer to each one. We used plastic grocery bags collected from a number of area stores, and they all had the same handle size and spacing. However, before boring the holes, it would be a good idea to check to make sure that the spacing we show works okay with bags from your area. If it doesn't, just relocate the holes as needed for a good fit.



Next, cut the back to size and attach each arm with a single $1\frac{3}{4}$ in. long by no. 8 flathead wood screw. The screw should be located $\frac{11}{16}$ in. from the bottom edge in order to avoid the $\frac{1}{4}$ in. diameter hole cut earlier.

Mount the assembled holder with a pair of screws driven through the back.





Faux-Turned Vessels:

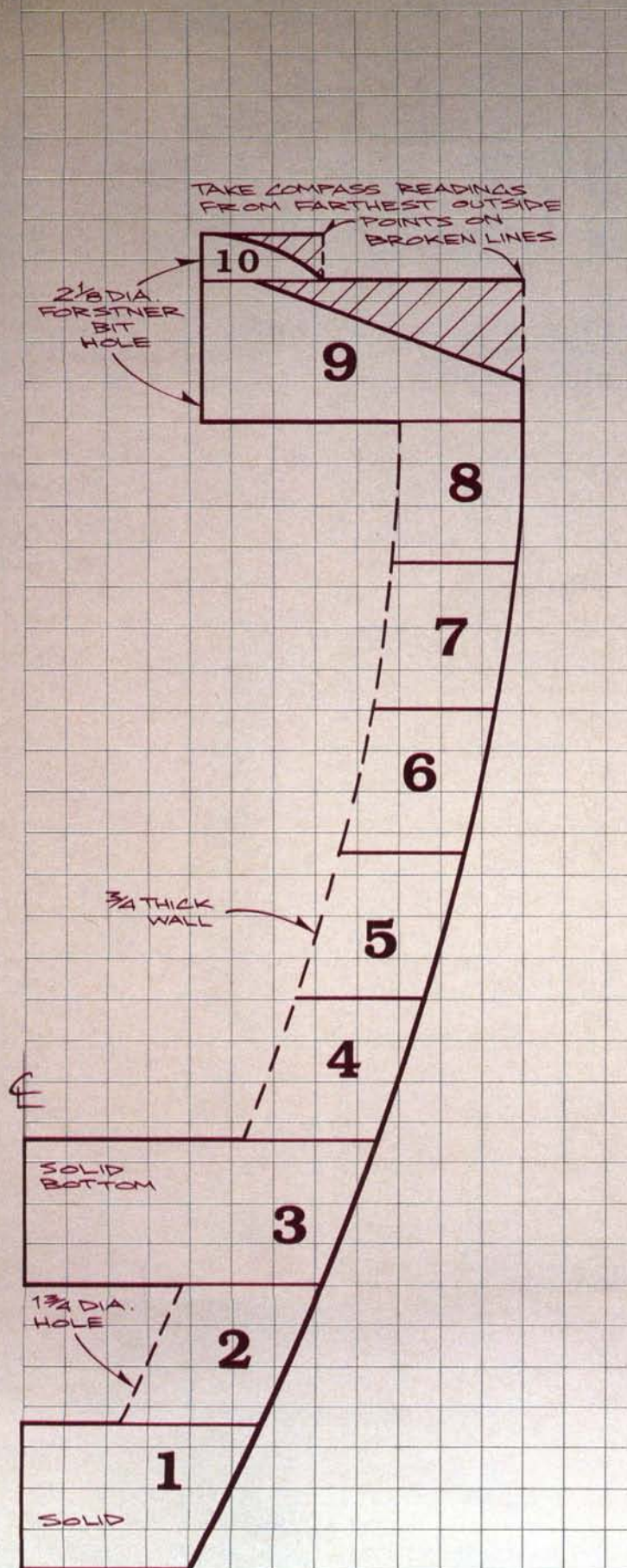
4 Full-Size Patterns

These four full-size patterns, by Robert St. Pierre, are easy forms that you may want to make to try out St. Pierre's unique and simple method of creating vessels that resemble, but aren't, lathe turnings. The special technique (page 26) details the general procedure, but we've included a few details that pertain to each pattern specifically. Remember, choice of stock has much to do with the beauty of these vessels. St. Pierre uses spalted maple from West Virginia for the urn, purpleheart from Brazil for the vase, padauk from Africa for the

rimless vessel, and Wenge (with sapwood) from Zaire for the symmetrical vessel.

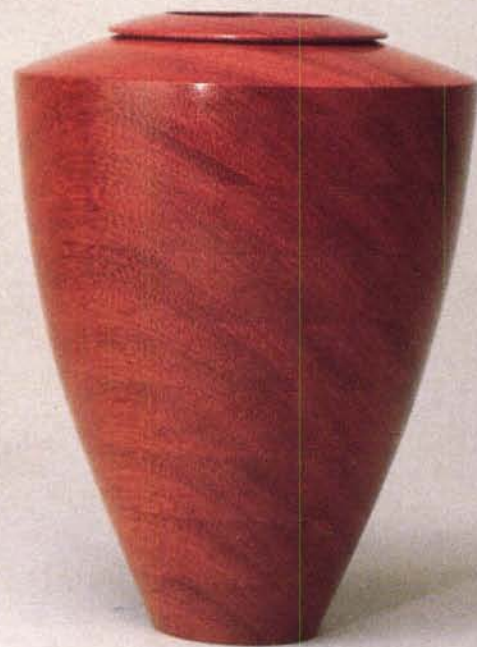
This technique is one where experience will be your best ally. On the large vessels St. Pierre specifies a $\frac{3}{4}$ in. thick vessel wall, but as you gain confidence, you'll probably want to reduce the wall thickness to lighten the form. We recommend that you start with the $\frac{3}{4}$ in. dimension, and then use the sanders to thin the wall. On the patterns, the dotted lines indicate the interior walls.

Vase



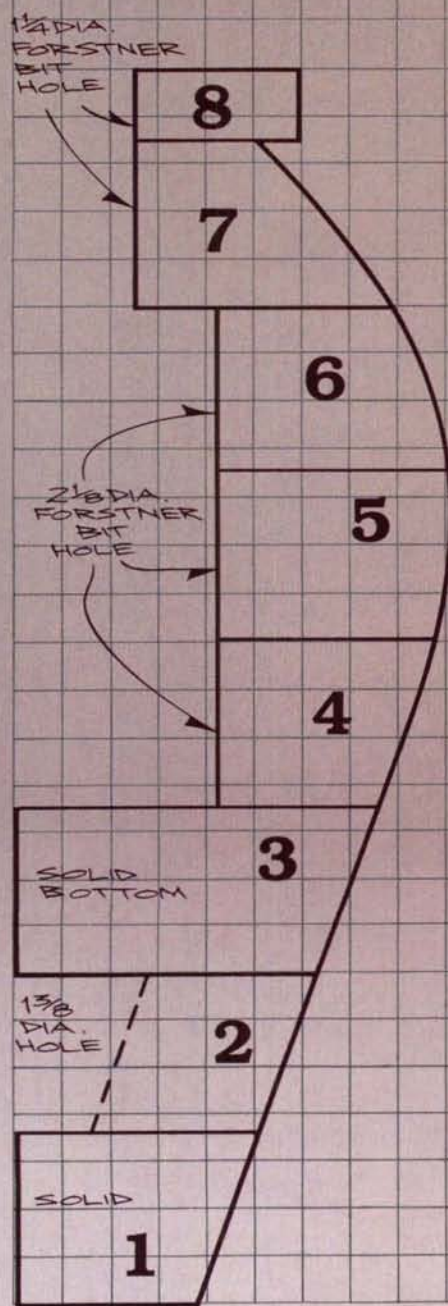
With many of his smaller forms—particularly those with narrow mouths—St. Pierre says that he soon discovered no one ever closely inspected the insides. “People at the shows were buying the vessels without ever looking inside, so I realized that with certain forms the inside needn’t be entirely hollow.” With these smaller pieces, St. Pierre employs a false bottom construction, where the actual bottom of the interior space is the third section up. The second ring up is hollow only because that prevents the three lower sections from sliding out of register during the glue-up.

For the vase, start by cutting and gluing up sections 4, 5, 6, 7 and 8. Smooth the interior with the drum and flap sanders, add sections 3, 2, 1 and 9, then shape the exterior. The 2 1/8 in. diameter holes in sections 9 and 10 are made with Forstner bits. The bevel on section 9 can be shaped on the belt sander. The lipped top (section 10) is shaped first, then glued in place with a weight. Remember, don’t use clamps on the top section, since you’ll risk breaking the thin (only about 1/4 in. thick) ring apart.



Urn

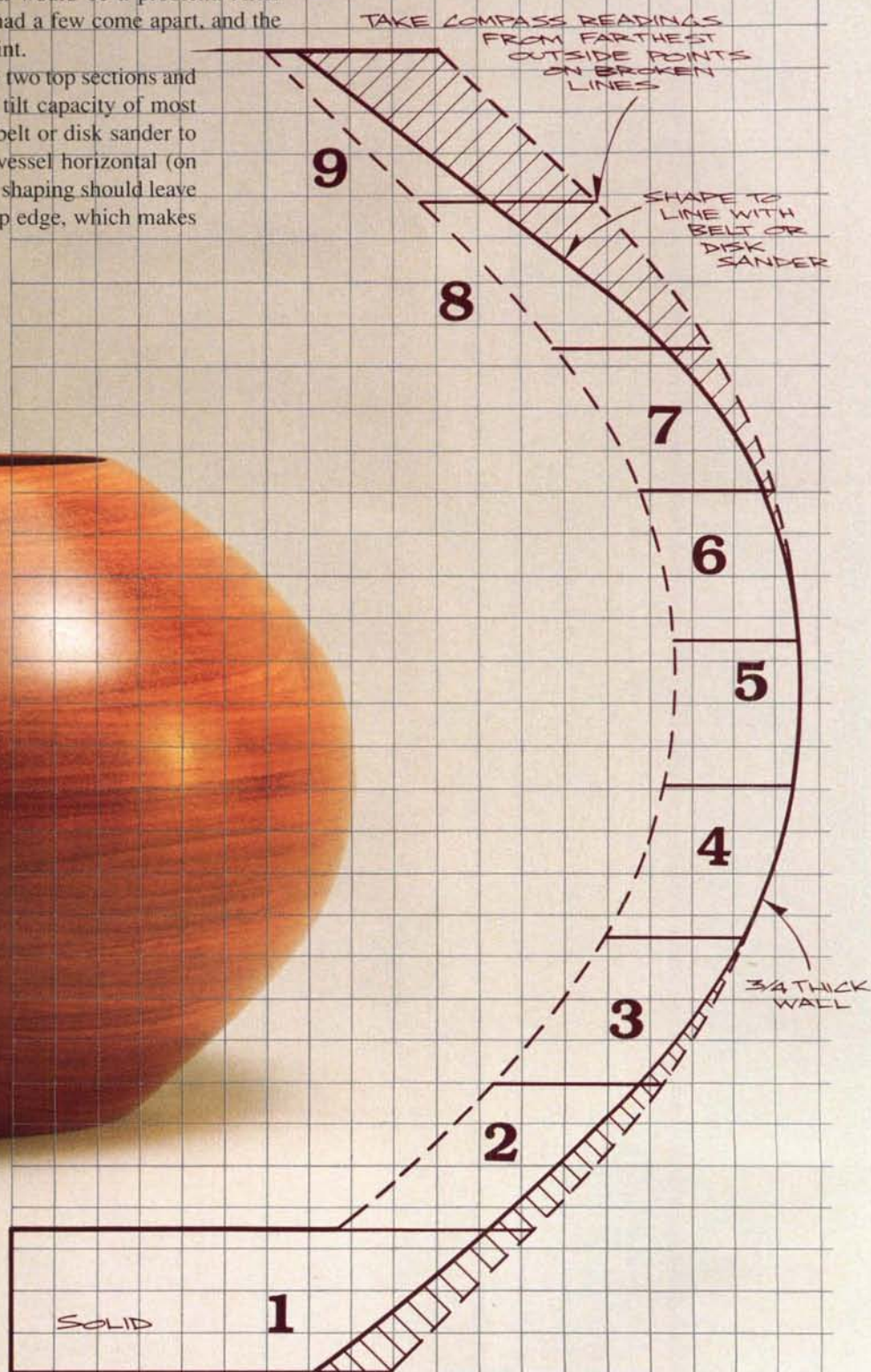
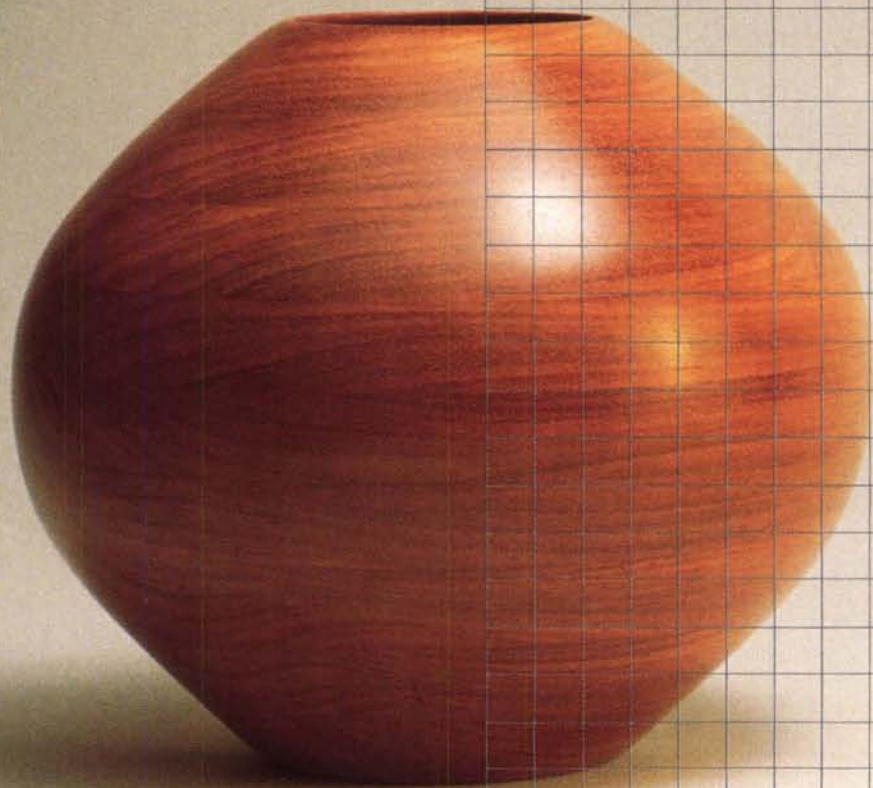
This simple urn-shaped vessel is a handsome form, and quite easy to make. St. Pierre uses Forstner bits for most of the interior cuts. A jigsaw is used for all the outside cuts, and to rough out the $1\frac{3}{8}$ in. inside diameter of the second lamination. If you don't have Forstner bits, you can use the jigsaw for all the cuts, although as with all small radius cuts with the jigsaw, you'll need to pay close attention to the blade to keep it from getting off-line. Once the rings are cut, glue and clamp ring numbers 4, 5 and 6 together. When out of clamps, and after sanding the interior smooth with a drum sander, add sections 3, 2 and 1 at the bottom and section 7 at the top of the 4-5-6 sub-assembly. Don't be too generous with the glue where section 3 meets section 4; you don't want to see a lot of glue squeeze-out at the inside seam. Lastly, shape the lipped top and glue it in place, using weight and not clamps, to prevent breaking the thin ring. Try to keep any glue squeeze-out on the inside, where it can be cleaned up easily with a small drum sander.



This is a graceful form, with a $\frac{3}{4}$ in. thick wall and no lip or rim. The exterior cuts are all made with the band saw, the interior cuts with a jigsaw. The wide opening at the top invites inspection inside, so you'll want to take extra care with the interior work. The rings—with the exception of the bottom—are glued up in a single assembly. With this many pieces, the assembly can get a little tricky, but by careful alternate tightening of the clamps, you should be able to snug the assembly up without any sections sliding out of register. As with all these vessels, don't apply too much clamp pressure. A little glue at the joint line won't make a difference in the appearance, but a glue-starved joint could lead to delamination, and that would be a problem. After thousands of vessels, St. Pierre has only had a few come apart, and the likely cause was usually a glue-starved joint.

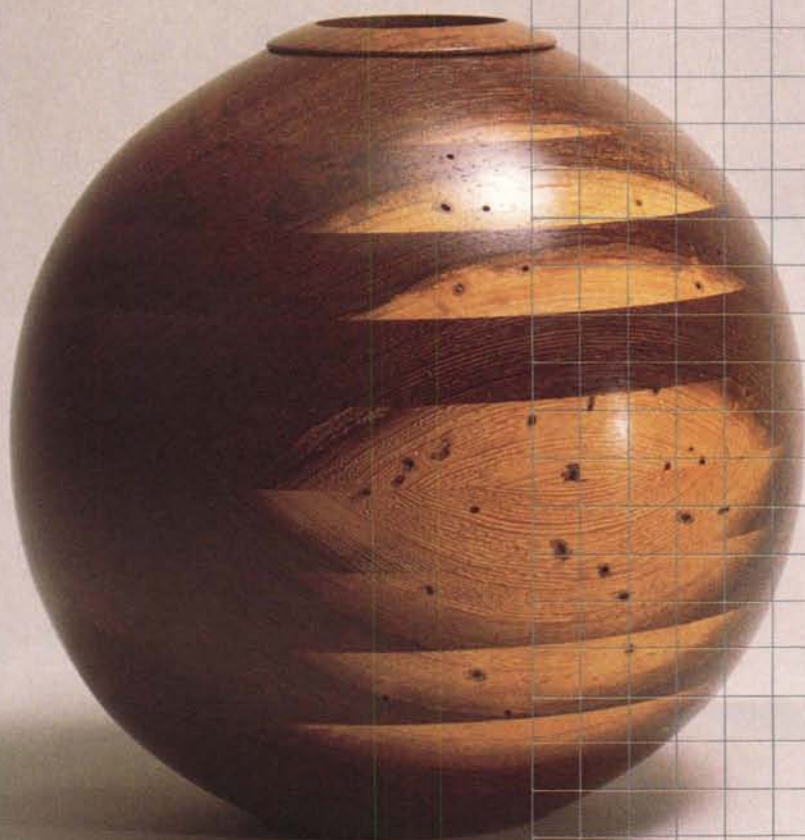
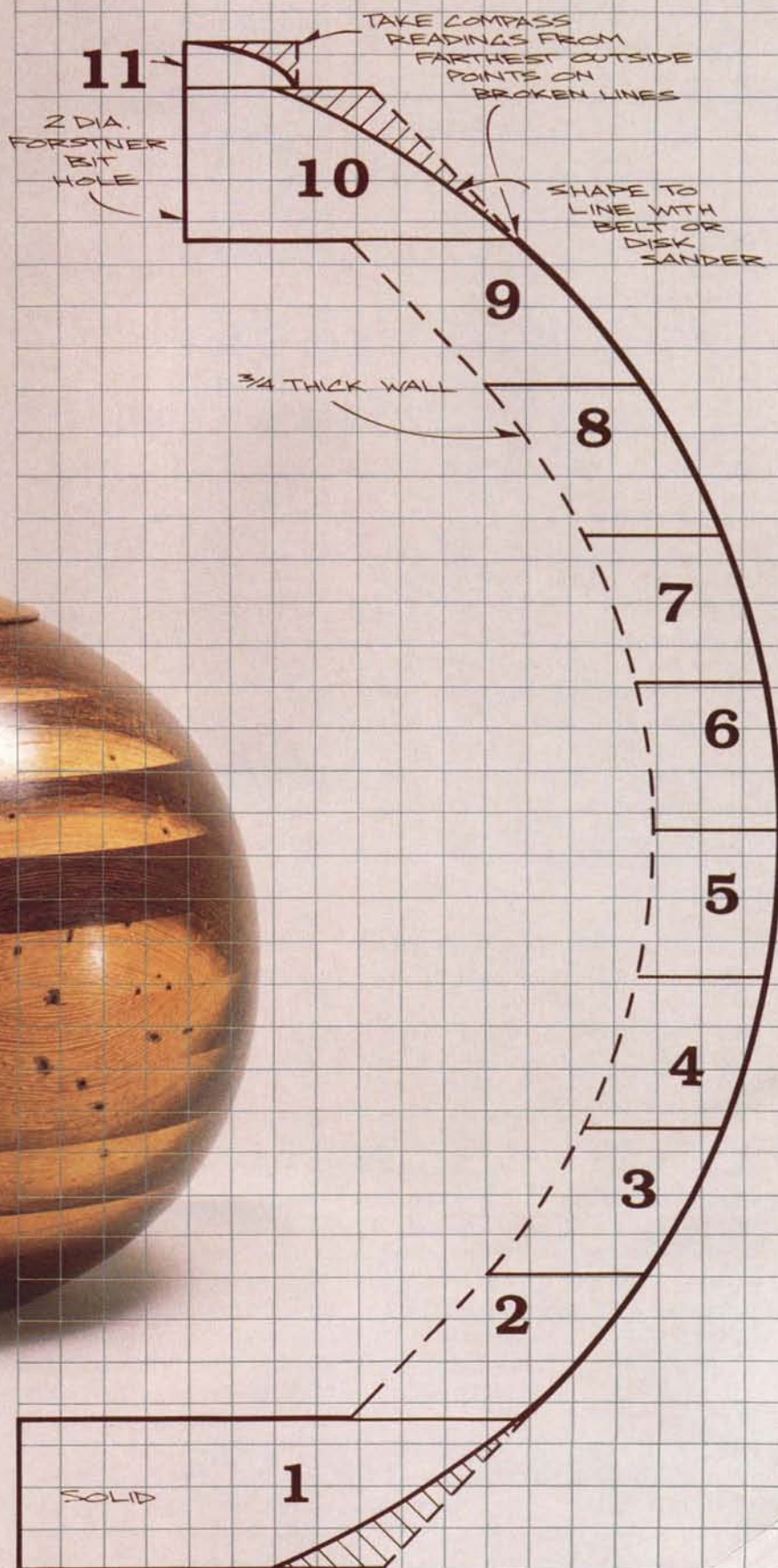
The final shape of this vessel at both the two top sections and the bottom section is a bit more than the tilt capacity of most band saw tables or jigsaw bases. Use the belt or disk sander to achieve the indicated shape, holding the vessel horizontal (on its side) to the sander. As shown, this final shaping should leave the vessel with a very thin and delicate top edge, which makes a nice detail.

Rimless Vessel



Symmetrical Vessel

With the exception of the lipped top ring, and the fact that section 1 is solid, while section 10 has a 2 in. diameter hole through it, this vessel is perfectly symmetrical. Cut all the sections. Glue up sections 2 through 9, and when dry, sand the inside surface of this assembly. Add sections 10 and 1, and sand the outside smooth. Note that you'll need to use the belt or disk sander to increase the bevel angle on sections 1 and 10 before smoothing to the line. Finally, shape and add the lipped top ring (section 11). Be sure to sand the inside joint between sections 10 and 11, to clean up any glue squeeze-out and fair-in any irregularities.



Tool Review

Although Colonial Saw first imported the Swiss-made Lamello plate joiners (also called biscuit joiners) back in 1962, these tools didn't really catch on with American woodworkers until about six years ago, when importers introduced the Swiss-made Elu and Spanish-made Virutex machines. It didn't take long for many production cabinetmakers to discover the clear advantages of this system over conventional dowel and spline joinery. About four years ago, the Freud and Porter Cable joiners appeared on the market, giving writers such as myself enough meat to do tool comparison articles on them in woodworking magazines.

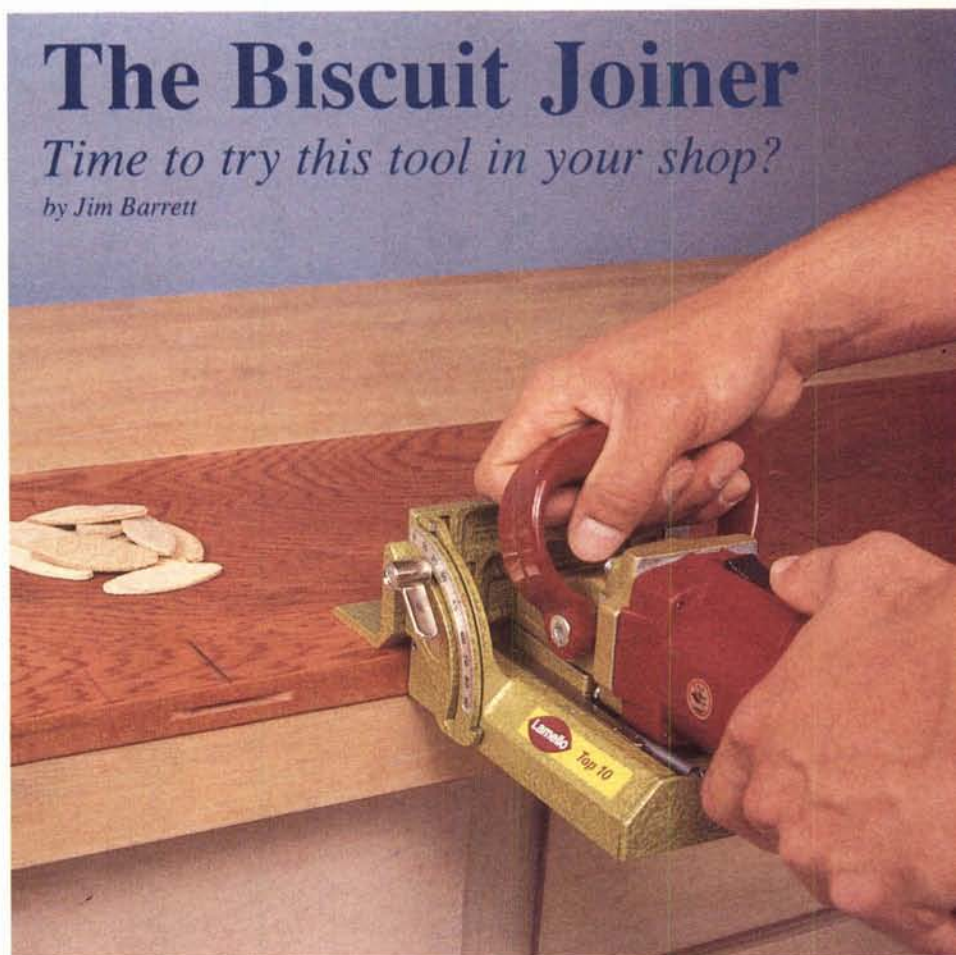
So, some of you may already know what plate joiners do, how they work, and how to use them, but I suspect that many woodworkers still haven't had a formal introduction to these handy joining machines. Thus, I feel obligated to first provide the uninitiated with a brief overview of plate joinery before launching into my comparative analysis of the various brands. You veteran plate joiner users can skip over the "Plate Joinery 101" section, if you want, and take a look at what's on today's market, starting on page 72.

Plate Joinery 101: A Basic Primer

Although plate joinery requires the initial purchase of the tool and a good supply of wooden joining plates or "biscuits," it can pay for itself in the time and frustration it will save you. Plate joinery is much faster and less complicated than other methods, such as dowels, splines, mortise-and-tenon, tongue-and-groove, and dado joints. In most applications, the plates also make a stronger joint than conventional joining methods. As far as I know, it's the only system that will make strong butt joints and miter joints in particleboard without using screws or other metal fasteners.

The Tool

A plate joiner (Photo 1) is nothing more than a plunge-cutting machine that cuts a semicircular groove or kerf into which you fit a flat, football-shaped compressed wood joining plate. The tool



The Biscuit Joiner

Time to try this tool in your shop?

by Jim Barrett

itself consists of a 4 in. carbide-tipped saw blade attached to an angle-grinder type motor. A variety of blade designs are available. Several are shown in Photo 2 (including a new 3 1/8 in. diameter blade for smaller-sized biscuits). The blade is enclosed in a spring-loaded housing beneath the motor assembly. The housing, or base, has a slot at the front through which the blade projects when you press the joiner against the workpiece. Small metal spurs or rubber knobs on the front of the faceplate grip the wood surface to prevent the spinning blade from slipping and cutting a longer groove than necessary. An adjustable fence attached to the blade housing enables you to control the height or vertical location of the blade slot on the board surface.

On machines with fixed-angle fences, such as the Skil 1605 shown (Photo 3), the fence can be inverted on the faceplate to make 45-degree miter joints.

Several models (Photo 4) also have faceplates that adjust to any angle from 0–90 degrees; this feature comes in handy if you want to join pieces at angles other than 0, 45, or 90 degrees, such as when making hexagonal or octagonal assemblies. Marks on the faceplate are aligned to corresponding marks penciled across the joint to align the cuts horizontally.

The joiners also have a stop knob that controls the depth of cut. This is needed to accommodate various size plates; on most machines, the knob has fixed positions marked 0, 10 and 20, which correspond to the three standard plate sizes, as explained in "The Joining Plates" below.

The Joining Plates

The joining plates or biscuits (Photo 5) serve much the same purpose as dowels or splines, but with several advantages. The plates are cut from compressed,

kiln-dried beechwood. When you buy them, the plates are slightly smaller than the width, length, and depth of the kerf cut by the joiner, to allow for minor adjustments in alignment after inserting them in their respective slots. So, alignment of the slots needn't be as critical as with dowels or splines. When you glue the plate into the slot with water-based woodworker's glue, moisture in the glue expands the plate, making a strong, tight mechanical joint, even before the glue dries.

Other than providing a strong joint, the plate's ability to swell inside the joint has another advantage; because the joint locks up before the glue dries (usually in 10 minutes or less), clamping time is reduced. On the other side of the coin, you don't have much time to adjust the pieces during assembly (the oversize slots allow for minor adjustments, but only until the plates swell up, locking the joint). For this reason you might be restricted to joining only two or three boards at a time when making large

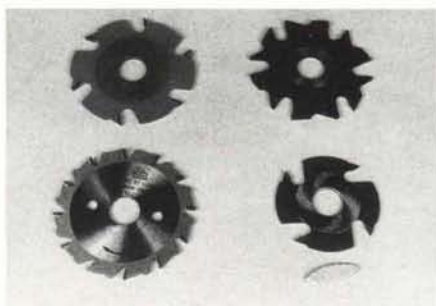


Photo 2: Top left: Conventional 4 in. carbide-tipped blade. Top right: chip-limiting blade. Bottom left: 12-tooth Elu blade. Bottom right: Lamello H-9 blade for small biscuits. All blades shown fit all machines.

glued-up panel assemblies such as tabletops. Even so, plate joiners take much of the headache out of measuring, marking, and alignment problems common to other types of joinery. In a matter of seconds, you can mark the plate location on the joint, cut the mating slots in the adjoining boards and glue in a plate.

The plates come in three standard sizes: no. 0 (about $\frac{5}{8}$ in. x $1\frac{3}{4}$ in.), no.

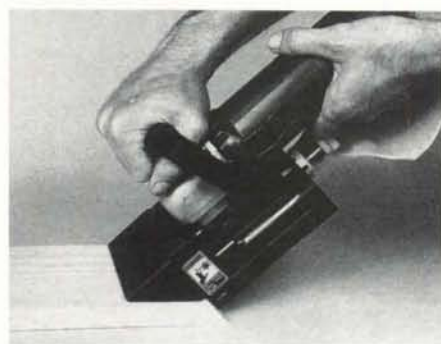


Photo 3: The Elu, Freud, Skil (shown), and Virutex have fixed fences, which you can invert to make cuts in mitered stock. The Lamello Standard 10 fence has a notch that indexes to the outside corner of the 45-degree miter.

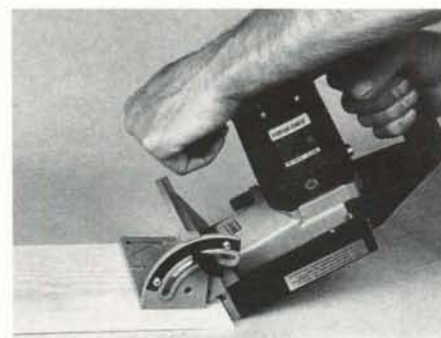


Photo 4: The Lamello Top 10, Porter-Cable, and Ryobi joiners have adjustable fences for joining boards cut at any angle. The fence on the Porter-Cable is an optional accessory.



Photo 5: Depth-stop knob controls depth of cut for no. 0, no. 10, and no. 20 biscuits shown. Joiners also have micro-adjustment capability for fine-tuning the blade depth.

10 ($\frac{3}{4}$ in. x $2\frac{1}{8}$ in.) and no. 20 (1 in. x $2\frac{3}{8}$ in.). No matter who makes the plates, all brands are uniform in thickness, and work with all machines (the blades are also interchangeable).

Lamello has recently introduced a new plate size ($\frac{1}{2}$ in. x $1\frac{1}{2}$ in.). This plate is smaller than a standard no. 0 plate, and requires a special $3\frac{1}{8}$ in. diameter blade (available from Lamello) to cut the slot for it (shown in Photo 2). The blade fits all brands of plate joiners.

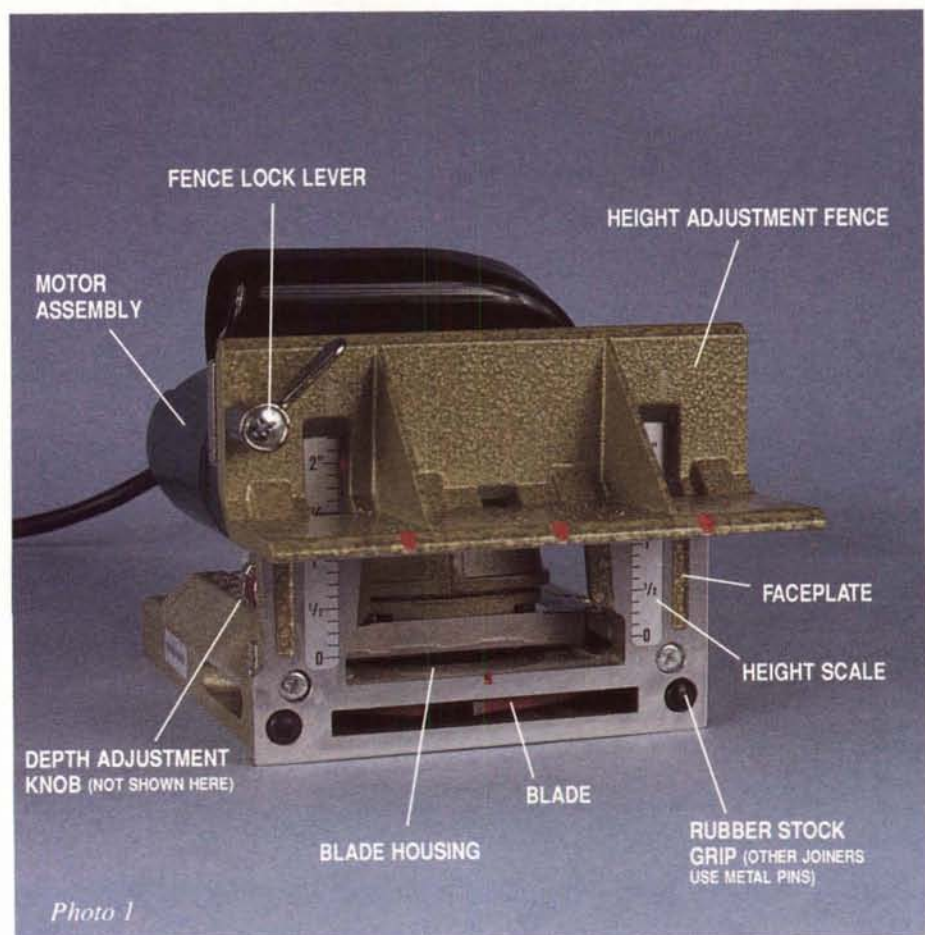
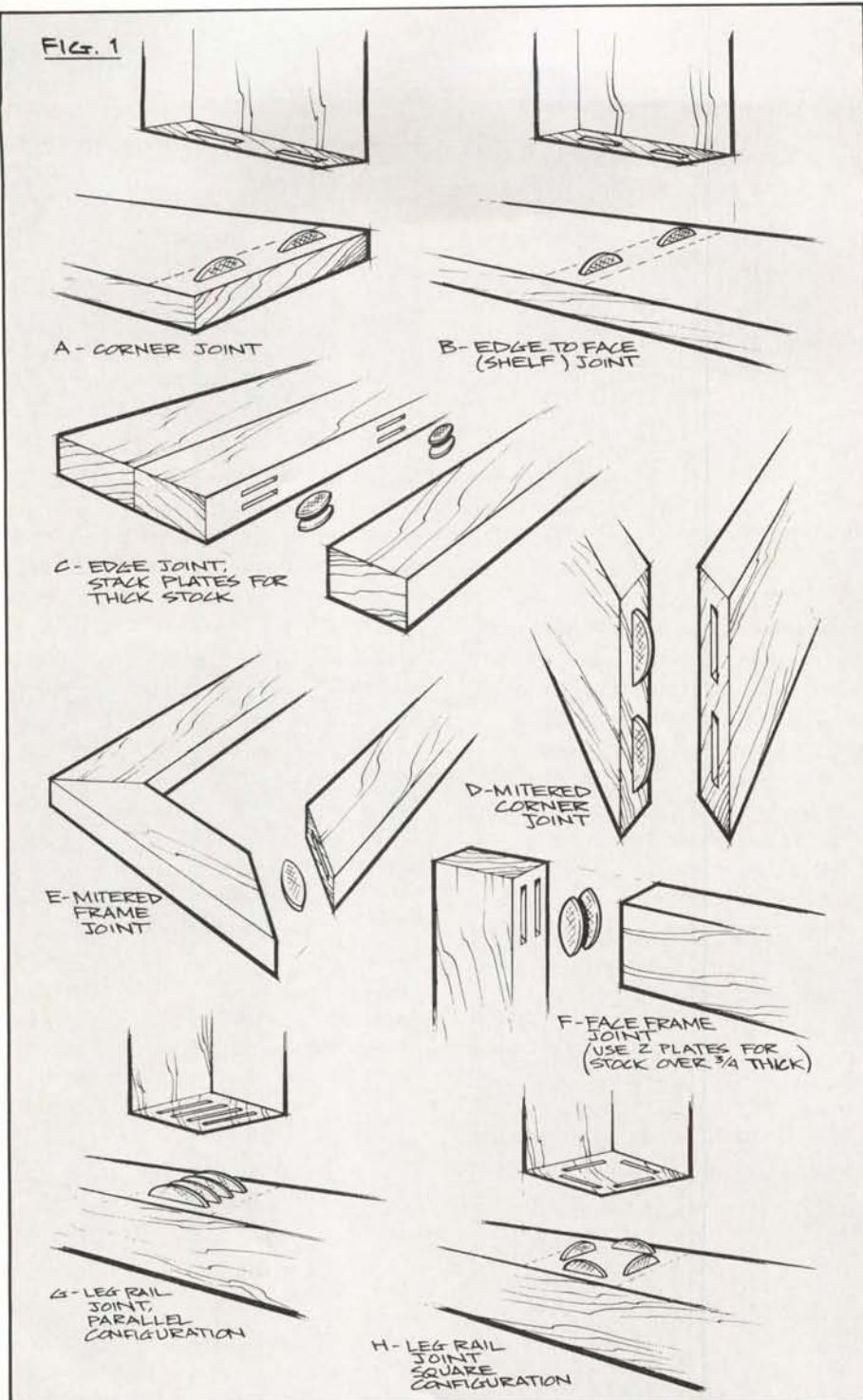


Photo 1

FIG. 1



This size plate was made especially for assembling cabinet face frames that use pieces down to 1³/₄ in. wide, without the ends of the plates showing when the pieces are assembled. They're also useful for assembling small picture frames because they allow you to miter-join narrower stock than a no. 0 plate would.

Joints You Can Make

Photos 6 through 9 show the basic steps for joining two pieces of wood with joining plates. Fig. 1 shows a sampling

of the basic joints you can make. The owner's manuals that come with most of the tools show the steps involved in making the basic joints. If you're interested in learning about other applications, Skil has an informative booklet, *Getting the Most From Your Skil Plate Joiner* (\$4.95), which applies not only to the Skil, but includes joint-making techniques and several simple projects applicable to all plate joiners.

Here are a few basic pointers: When butt-joining stock much thicker than 1

in., it's best to install two or even three plates, one above the other, as shown on Figs. 1C and 1F. This parallel stacking of plates is also suitable for leg/rail joints (Fig. 1G) that will be subjected to light stresses. Arranging the plates in a square, as shown in Fig. 1H, makes a stronger installation—nearly as strong as a mortise and tenon joint.

When cutting slots in the ends of narrow boards, the spurs or gripping surface on the faceplate might not grip the wood sufficiently to keep the tool from side-slipping. In such cases, clamp the joiner fence to the stock to steady it.

If your joiner has a fixed fence that cuts 45-degree angles only, you can join pieces cut at nonstandard angles, such as 22¹/₂ or 30 degrees, by cutting a wood shim or wedge to the appropriate angle and attaching it to the bottom of the fence with duct tape.

When making an edge-to-face joint (for shelves or dividers), you'll need to remove the fence attachment on all machines except the Ryobi, so the faceplate will make full contact with the wood surface.

What's Available

At the time of this writing, eight machines were available for testing (Photos 10 and 11). As mentioned, The Skil and Ryobi joiners are the most recent additions.

Colonial Saw, the sole importer of Lamello joiners, no longer carries their low-end machine, the Lamello Junior, but does maintain a large inventory of replacement parts for this model. Lamello plans to introduce a new "low-end" machine, the Lamello Cobra, at a competitive price of \$299. The Cobra should be available by the time you read this article. Also, significant improvements have been made to the Lamello Top and Standard models, and they're now being sold as the Top 10 and Standard 10. Finally, Virutex will soon be adding a second model, the AB-11. It's essentially the same as the 0-81N with a few improvements, including the addition of an adjustable faceplate.

If you look at the Specifications Chart on page 73, you'll notice a wide range of prices for these tools. In my tests, I found that all of them had sufficient power to do the work they're intended for. They're all fairly expensive as portable power tools go, but all seemed

to be well-made, durable machines. Some are easier to use than others, though, and you'll find noticeable differences in features and construction quality between them. So, I suggest you try some hands-on testing of your own before you buy.

Elu 3380 Jointer/Spliner

While the motor assembly on the Elu is much like that found on other joiners, it has a radically different baseplate assembly. The blade pivots into the work, rather than plunging straight in as on other joiners. If you're used to operating one of the others, this one will take some getting used to. The primary advantage of the Elu is that it can also be used to cut continuous grooves for splines, and as a trim saw (the blade can be set to project much farther from the housing than other joiners—up to 20mm). To use the Elu as a grooving machine, you need to remove the metal spurs or pins from the faceplate (using a special key provided with the tool) so it will glide smoothly along the stock. You'll also need to attach an adjustable side fence to locate the blade (you remove the fence when cutting grooves for joining plates). To adjust the blade height on the stock, you turn a knob that moves the blade itself up or down inside the blade slot. For centering slots in wood much thicker than 1 in., you need to insert a spacer between the base and workbench to raise the entire tool up to the desired level. Because two hands are required to operate this tool, you'll need to clamp the stock securely to your bench. (I noticed that the Elu is a

bit harder to control than the other joiners, so a firm grip is imperative). The Elu also comes with a miter fence for cutting slots or continuous grooves in mitered surfaces.

One feature I like: You don't need tools to remove the base in order to change blades—you simply detach the blade guard cover by removing four knurled nuts. While the Elu doesn't have dust collection, the dust port is placed so it doesn't spew dust on left-handed users, as some of the others do.

The tool comes with a 12-tooth blade, rather than the conventional 6-tooth blades found on most other joiners. This makes for smoother cuts. The importer (Black & Decker) also offers optional 30-tooth blades for fine trimwork. Overall, the Elu is a sturdy, well-machined tool, and the one to buy if you want more than just a plate joiner.

Freud JS100

Freud offers a good basic machine at a good price. True, it lacks the sophistication and precision machining of the Lamello, Elu, and Virutex joiners, but it won't make nearly as big a dent in your pocketbook, either. (You can usually buy it for about half the suggested list price of \$334.) I'm not saying that the Freud is crude or poorly built—it's really quite accurate and sturdy. In fact, I found the locking knobs on the fence easier to operate than those on the Virutex, and far superior to the Allen screw method used by Porter-Cable and Skil tools. The height scale on the faceplate reads in inches and millimeters; the fixed-angle

Plate Joiner Safety

Other than the basic safety rules that apply to any portable electric tool there are two cardinal safety rules specific to plate joiners: 1) Always clamp down the workpiece; 2) Never position your hands or fingers in front of the tool. While plate joiners are among the safest cutting machines (the blade remains retracted in the housing until you plunge it into the wood), they can still cause injury. Although it may seem tempting to hold or secure the stock with one hand and operate the joiner with the other, this method puts one hand in front of the blade, and also provides less control over both the stock and the machine. Take a few extra seconds to clamp the work to your bench, and keep a proper two-handed grip on the tool at all times.

Another potential hazard arises when you overfeed the blade (plunge it into hard stock too quickly). This may cause the tool to kick back, damaging the work and possibly causing injury. The Lamello joiners have slip-clutch protected motors to help prevent kickback and keep the motor from bogging down. Also, several companies offer special chip-limiting blades to prevent overfeeding. These special blades are designed with nubs or shoulders between the teeth to limit the cutting action and reduce kickback. Photo 2 shows one that's available from Lee Valley Tools, and will fit all brands.

Specifications Chart

Make ¹	Model	Amps @ 120 V	RPM	Fence Type ²	Dust Pickup ³	Cord Length	Cord Type ⁴	Net Wt. (lbs.)	List Price ⁵
Elu	3380	5	8,500	F	VO	10 ft.	SJ	6.2	516.00
Freud	JS100	5	10,000	F	N	7 ft. 8 in.	SJ	6.2	333.90
Lamello	Top 10	6.4	10,000	A	VS	8 ft. 6 in.	SJ	6.8	699.00
Lamello	Standard 10	5.2	10,000	F	VO	8 ft. 6 in.	SJ	6.6	499.00
Porter-Cable	555	5.0	8,000	F/A*	N	10 ft.	SJ	6.0	315.00
Ryobi	JM-100	5.3	9,000	A	B	6 ft.	SJT	7.3	431.00
Skil	1605	6.0	12,000	F	B	6 ft.	SJT	6.6	210.00
Virutex	0-81N	5.0	10,000	F	VO	7 ft. 6 in.	SJ	7.0	379.00

¹See Sources for importer.

²F = fixed angle fence (0/45 degrees only); A = adjustable; *adjustable fence for Porter-Cable 555 is optional (\$59 suggested list).

³B = dust bag; VS = vacuum attachment standard; VO = vacuum attachment optional; N = no vacuum attachment

⁴SJ = rubber cord; SJT = thermoplastic cord

⁵Manufacturer's suggested list price; prices on most machines discounted 10–50 percent.

Edge Joining: 4 Easy Steps



Photo 6: Align boards, then mark slot locations across the joint with a square (typically every 6–12 in. when edge-joining long boards).

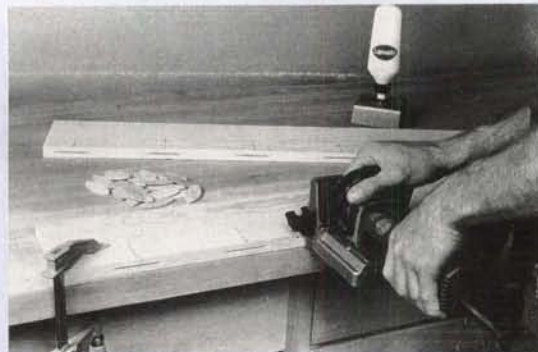


Photo 7: Adjust the fence height on joiner to center the blade between the top and bottom edges of the stock. Then adjust the depth stop for plate size you're using. Align the mark on the faceplate with the mark on the board, and slowly push the blade into the stock until it bottoms out.

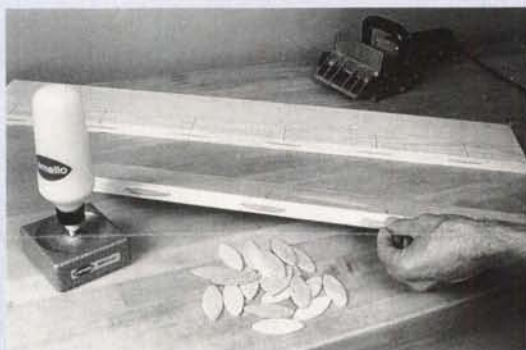


Photo 8: Apply glue to the sidewalls of the slots in both boards (not to the joining plates). Insert the plates.

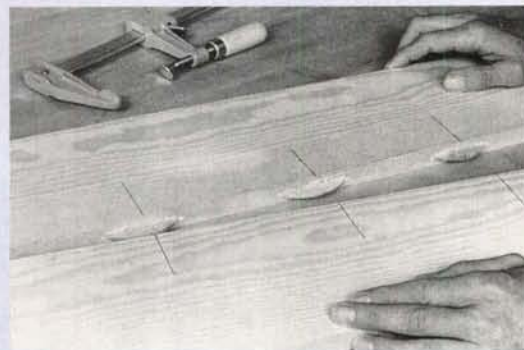


Photo 9: Join pieces as shown, tap together with a mallet, and clamp.

45/90-degree fence works the same way as those on the other machines that have them.

Unfortunately Freud doesn't offer any dust collection accessories for the tool. Like the Porter-Cable, the dust port on the right side of the machine showers left-handed users with chips. The Freud has one of the better owner's manuals, with easy-to-follow instructions, clear photographs, and directions for making various types of joints. While reading them, I found out that the tool should have red alignment marks on the aluminum fence and faceplate. Mine didn't, and I found the marks stamped into these components hard to see when using the tool. A bit of judiciously applied red nail polish took care of the problem.

Lamello Top 10

The Top 10 is the flagship of the Lamello plate joiners and, in the minds of many experienced users, the best joiner you can buy (with a \$699 price tag to match). In my tests, it was certainly the fastest, smoothest, most powerful

(6.4 amps), and best-machined tool of the lot—the epitome of fine Swiss craftsmanship. For those of you who own a Lamello Top, the Top 10 is an improved version. According to the manufacturer, the 10 stands for 10 internal and external improvements made to the original Top—ditto, the Standard 10.

The swiveling faceplate adjusts from 0 to 90 degrees; it operates flawlessly. The addition of a large protractor scale makes accurate settings a snap (the original Top didn't have the scale). With the fence attachment removed, the faceplate automatically centers the blade on $\frac{3}{4}$ in. stock, and with the addition of a clip-on plastic shim, $\frac{1}{2}$ in. stock. The fence attachment rides smoothly on milled sliding dovetails and is much easier to slip on and off than those on the other brands I tried. Slots in the fence enable you to read the clearly printed height scales inset into the faceplate. The fence is also designed to index cuts from the outside corner of mitered pieces, which enables you to miter-join boards

of unequal thicknesses with flush outside corners (The Porter Cable and Ryobi are the only other joiners with this capability).

The motor is protected by a slip clutch to prevent kickback and extend motor life; a spindle lock button and quick-release base facilitate blade changing. Beyond settings for standard size biscuits (0, 10, 20), the depth adjustment knob has three additional settings for Lamello accessory plates: "S" for Simplex knock-down fittings, "D" for Duplex hinges, and "Max" for conversion to the smaller-diameter H9 blades (see Photo 2). The Top 10 comes standard with two different dust chutes, one of which attaches to an optional vacuum hose attachment. The hose includes a conical adaptor that fits standard vacuum hoses from $1\frac{1}{4}$ in. to 2 in. in diameter. A roomy wooden case provides plenty of extra space to store joining plates and other accessories.

The only drawback to the tool is the sketchy, poorly written instruction manual—the one thing that mars an other-

wise superior tool. The price will be another drawback for many, but bear in mind that this is a heavy-duty industrial machine designed for continuous operation in production shops. But, if you simply appreciate the feel of fine machinery, and money is no object, you'll find the Top 10 a joy to use.

Lamello Standard 10

The Standard 10 has most of the features of the Top 10, but with a smaller, 5.2 amp motor. Other goodies on the Top 10 that you won't find on the Standard 10 are a quick release base, swiveling faceplate, automatic indexing to $\frac{3}{4}$ in. and $\frac{1}{2}$ in. thick stock, and a built-in dust collection attachment. However, you can fit the Standard 10 with an optional bolt-on vacuum attachment and hose. In my tests, I found that the Standard 10 operated every bit as smoothly as its big brother, and had ample power, despite the smaller motor. Like the Top 10, it's an industrial-duty machine, but without the conveniences mentioned. At \$499 the Standard 10 is still a bit pricey for occasional users.

Porter-Cable 555

This joiner is radically different than the others in several respects. As you can see in the photo, the motor is mounted vertically. If you took it apart, you'd find the blade is belt-driven, rather than gear-driven like the others, which makes it a bit quieter than most of the others during operation (comparable in noise output to the Lamello tools tested). I found the D-handle design put my hands in a more natural position, making it more comfortable to use than the conventional designs. The depth adjustment knob is located conveniently at the rear of the tool next to the D handle.

The standard fixed fence on the Porter-Cable enables you to index cuts in mitered pieces from the outside corners, which enables you to join boards of unequal thickness (the fence on the Lamello Standard 10 will also do this, but not quite as efficiently, I found). While the faceplate on the Porter Cable is stationary, an optional tilting fence/faceplate assembly is available for joining pieces at any angle from 0 to 90 degrees. Photo 11 shows the unit with the optional fence attached. On both the fixed fence and optional tilt fence, the height is adjusted by loosening and

tightening two Allen screws, a bit more of a hassle than on joiners with knobs or levers for this purpose. No matter which fence you use, it must be detached from the faceplate (by removing the Allen screws) for making edge-to-face joints. The one feature I would like to see on this tool is some provision for dust collection. The dust port is on the right side of the tool, which tends to spray sawdust on left-handed users.

Skil 1605

Despite its relatively low price, the Skil has one of the most powerful motors available—6.0 amps. While the motors on the 5-amp machines slowed down

Allen screws instead of knobs for fence height adjustment and removal. Also, there's some sideways slop in the fence, so it's possible to misalign it horizontally unless you're careful. Another drawback is that you can't see the alignment marks on the fence and faceplate from the normal operator's position—you need to bend over the tool to align the marks with those on the stock (the other joiners have windows or peepholes in the fence or faceplate for this purpose).

The tool does come standard with a dust bag (the way the tool is designed, it wouldn't be hard for Skil to come up with an optional vacuum hose attach-

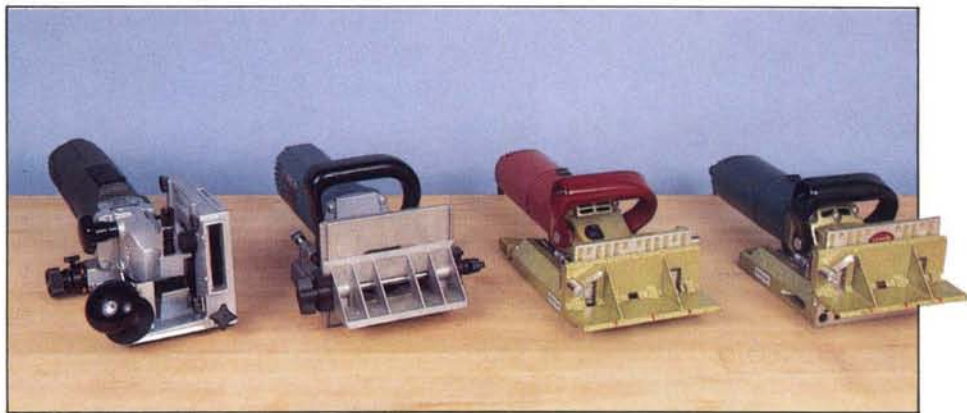


Photo 10: Left to right: Elu 3380, Freud JS100, Lamello Top 10, Lamello Standard 10.



Photo 11: Left to right: Porter-Cable 555, Skil 1605, Ryobi JM-100, Virutex O-81N.

audibly in my tests (but not enough to affect performance), I was hard put to bog down this one.

The Skil was the only joiner with a plastic base, faceplate and fence (on the others, these components are steel or aluminum). But it is by no means cheap plastic. Instead, it's fiberglass reinforced polyester, and probably as durable as aluminum of the same gauge—certainly adequate for the occasional user.

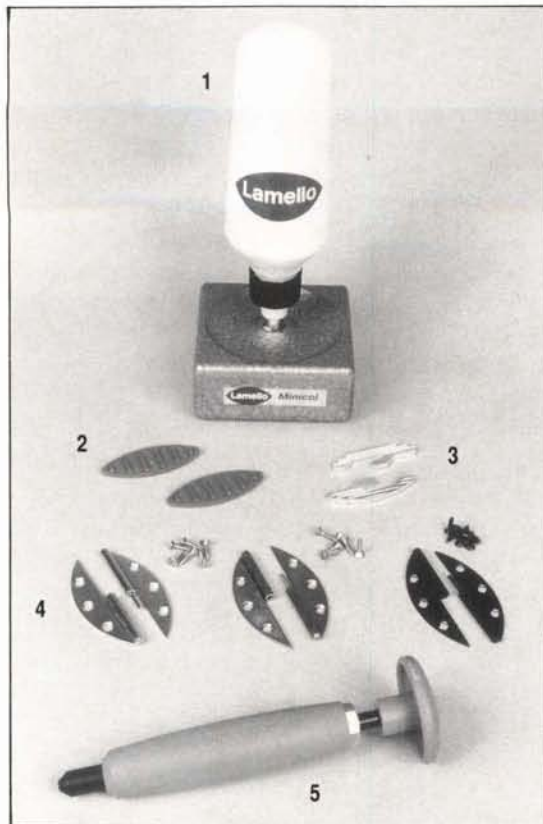
Like the Porter Cable, the Skil uses

ment). The instruction manual is perfectly adequate, but for first-time users, the supplementary pamphlet "Getting The Most From Your Skil Plate Joiner" mentioned earlier is well worth the extra \$4.95 you might have to pay for it. (At the time of this writing, the pamphlet was included with the tool as a promotional offer).

Ryobi JM-100

While the Ryobi has a conventional

Photo 12: Lamello Minicol glue applicator (1), K-20 clamping plates (2), Simplex knock-down fittings (3) Duplex hinges (4), and Centro centering awl (5, for hinges) can be used with all plate joiners. Instructions included with the Simplex fittings and Duplex hinges describe how to set your biscuit joiner for the appropriate depth of cut.



design, the adjustable fence is unique in that it swings an additional 45 degrees below the 90-degree mark. The scale on the fence is reversed compared to other joiners with tilt fences, but it's not hard to figure out. This fence has several advantages: One is that you can index cuts from both the outside and inside corners of mitered pieces. Also, you don't need to remove the swiveling fence to make edge-to-face joints. Finally, the fence can be adjusted to a height of 2½ in. above the blade—a full inch higher than the fences on most other joiners. Two knobs on either side of the fence control both the fence height and tilt. Although it's a neat concept, I found the adjustable fence didn't operate quite as smoothly or accurately as the adjustable fences on the other joiners that have them (the fence components aren't as precisely machined).

Other features include a dust bag attachment, and a full rubber facing on the front of the base to prevent side-slip. Overall, the Ryobi was easy to operate, well balanced and had some nice features not found on the other lower-priced tools.

Virutex 0-81N

The Virutex holds the middle ground between the Lamello and Elu machines and the inexpensive ones (Freud, Skil,

Porter-Cable and Ryobi). While the Virutex can be considered a well-made industrial-duty tool, it lacks some of the refinements found in the Lamello joiners, and the 5-amp motor gives it less power than the Top 10 and Skil. The "pull-out-and-crank" height-adjustment levers on the fence are less convenient to operate than the straightforward knobs or levers on the others, although the levers can be folded neatly behind the faceplate if side clearance becomes a problem. By contrast, I found the depth adjustment knob convenient and easy to operate (similar to that on the Porter-Cable).

The three-language owner's manual includes directions for making basic joints; optional equipment includes a vacuum hose attachment.

Accessories

Lamello offers the widest range of plate joiner accessories by far (Photo 12). Some, such as a stationary bench mount device and vacuum hose attachments fit Lamello machines only. Others, such as the Minicol glue applicator, Simplex knock-down fittings, Duplex hinges, K-20 plastic clamping plates, Centro centering awl, and the small H9 biscuits and blade, can be used with any joiner. The K-20 clamping plates are especially useful when gluing up large panels,

Sources

Black & Decker

U.S. Power Tools Group (Elu)
10 North Park Drive
P.O. Box 798
Hunt Valley, MD 21030-0748
Tel. (301) 527-7000

Colonial Saw Company (Lamello)

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Suite F
Ontario, CA 91761
Tel. (714) 986-1168

Freud USA, Inc.

P.O. Box 7187
218 Feld Ave.
High Point, NC 27264
Tel. 1-800-334-4107

Lee Valley Tools

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Tel. (613) 596-6030

Porter Cable

Young's Crossing at Hwy. 45
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Jackson, TN 38302-2468
Tel. (901) 668-8600

Practical Products Co. (Virutex)

3925 Virginia Ave.
Cincinnati, OH 45227
Tel. (513) 561-6560

Ryobi America Corp.

1424 Pearman Dairy Rd.
Anderson, SC 29625
Tel. 1-800-323-4615

Skil Corporation

4300 West Peterson Ave
Chicago, IL 60646
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eliminating the need for clamps (which most of us never seem to have enough of). You install the plastic plates every third slot, with ordinary wood plates in the remaining slots. When you tap the joints together, the teeth in the plastic plates grip the joint tight until the glue dries.

All of the joiners come with cases and blade-changing tools. Most also sell joining plates and replacement blades. Those that have a provision for dust collection are indicated in the Specifications Chart.



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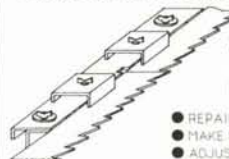
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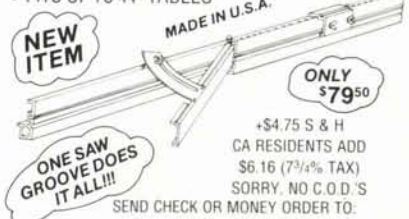


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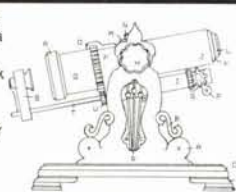
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52 great projects you can build in a day or two

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Complete Plans and Instructions for a Variety of Distinctive Furniture Designs, Toys, and Accessories

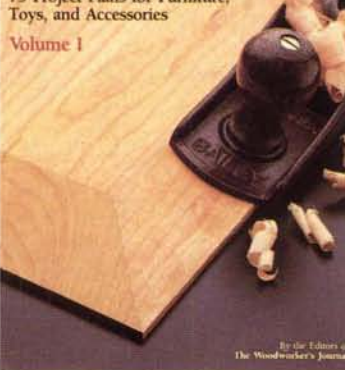
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75 Project Plans for Furniture, Toys, and Accessories

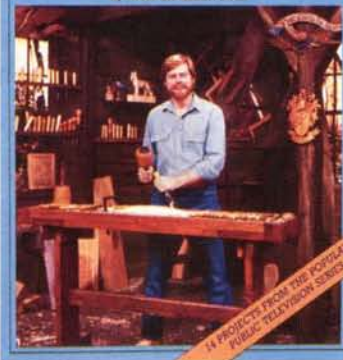
Volume 1

By the Editors of
*The Woodworker's Journal***Projects For Woodworkers,
Volume 1**

Beginning and advanced woodworkers alike will appreciate the full range of styles in furniture, accessories, lamps, clocks, toys and gifts. Of the 75 projects selected from the 1980-81 issues of *The Woodworker's Journal* magazine, plans include a Cabinetmaker's Workbench, Pine Shaker Cupboard, Old-time Icebox, a Cobbler's Bench Coffee Table and a Child's Victorian Sled. Fully detailed instructions, illustrations, and photos.

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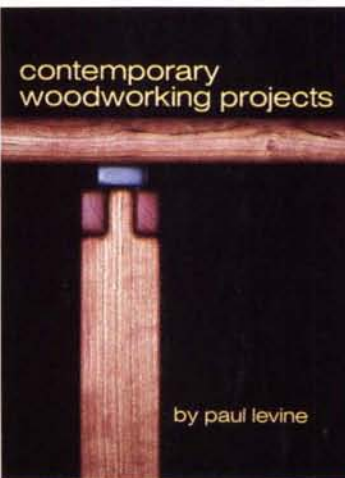
**Projects for
Woodworkers**

60 Project Plans for Furniture, Toys, and Accessories

Volume 2

By the Editors of
*The Woodworker's Journal***Projects For Woodworkers,
Volume 2**

Originally published in the 1982 issues of *The Woodworker's Journal* magazine, all 60 projects were chosen with a variety of styles and skill levels in mind. Each project has complete instructions and illustrations. You'll find household accessories like the Desk Caddy, Casserole Dish Holder, and Breakfast Tray easy to build. And you're sure to enjoy completing more involved projects like the Tambour Desk, Old Danish Chest of Drawers and Swinging Cradle.

contemporary
woodworking projects

by paul levine

**Contemporary Woodworking
Projects**

Paul Levine guides woodworkers of all skill levels through room-by-room chapters of coordinated furniture and accessories. The clean angles and sturdy joinery are made easy with step-by-step instructions and illustrations. Among the 40 handsome projects are a Love Seat, Chair and Ottoman set, an Oak Credenza, a Platform Bed, and a Japanese Shoji Lamp. Children will enjoy their own table and chair, puzzles and a great box of dominoes.

**Projects for
Woodworkers**

60 Project Plans for Furniture, Toys, and Accessories

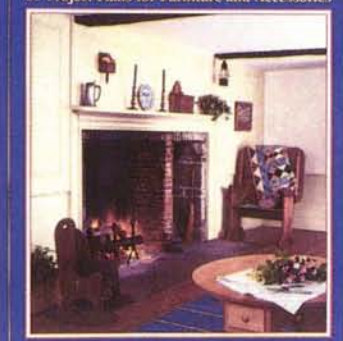
Volume 3

By the Editors of
*The Woodworker's Journal***Projects For Woodworkers,
Volume 3**

The best projects from the 1983 issues of *The Woodworker's Journal* magazine—toys, lamps, cupboards, chests, cabinets, tables, planters, mirrors, and much more. Clear illustrations and thorough written instructions make each project easy-to-understand and fun to build. A book you'll want to keep within easy reach of your workbench.

**COUNTRY
PROJECTS for
WOODWORKERS**

85 Project Plans for Furniture and Accessories

By the Editors of *The Woodworker's Journal***Country Projects For
Woodworkers**

If building the simple, sturdy furniture of the old cabinetmakers appeals to you, then you'll want this collection of country projects from the 1980-84 issues of *The Woodworker's Journal*. 85 complete plans range from projects like Colonial Candlesticks and Fireplace Bellows to more challenging projects such as a Shaker Chest, a Stepped-Back Hutch, and an 18th Century Trestle Table. Some plans are also in *Projects for Woodworkers*, Volumes 1 and 2.

Back Issues

Turned Shop Mallets S/O '87



Vol. 9 No. 3 May-June '85

Wall Cabinet with Recessed Finger Pulls, Shaker Desk, Kitchen Cart, Contemporary Wall Clock, Colonial Wall Sconce, Card Box, Towel Bar with Glass Shelf, Marble Race Toy, Cradle, Vanity Mirror, Miter Clamping Jig, Jacobean Joint Stool; *Articles*: Product Liability: Part I; Restoring an Antique Frame; Coping with Wood Movement; Making Recessed Finger Pulls.

Vol. 9 No. 6 Nov-Dec '85

Dulcimer, Dining Table, Shaker Washstand, Marking Gauge, Veneered Wall Clock, 4 x 4 Off-Roader, Teddy Bear Puzzle, Duck Pull-Toy, Landscape Cutting Boards, Early American Tall Clock, Desk Organizer, Moravian Chair; *Articles*: Weaving a Rush Seat, Part I; Table Saw Ripping Problems and Their Solutions; 4-Piece Book Match Veneering; Running a Profitable Business.

Vol. 10 No. 1 Jan-Feb '86

Chippendale Bachelor's Chest, Oriental Serving Tray, Country Bench, Antique Knife Tray, Tape Dispenser, Valentine Box, Toy Tow Truck & Car, Shaker Drop-Leaf Table, Shop-Made Bow Saw, Child's Settle Bench, Plate Shelves,



Tinsel Art Cabinet J/A '89

Freestanding Shelf System; *Articles*: On Getting Paid for Your Work; Weaving a Fiber Rush Seat, Part II; Table Saw Crosscutting; Router-Lathe Fluting: A Shop-Made Approach.

Vol. 10 No. 3 May-June '86

Contemporary Lamp, Early American Bench, Steam-Bent Clock, Pine Hutch, Goose Basket, Toy Crane, Condiment Holder, Shop Workstation, Parsons Table, Shaker Lap Desk, Victorian Whatnot Shelf; *Articles*: Toy-maker Clare Maginley; How to Flatten a Warped Board; Choosing Your First Router; Supported Steam Bending.

Vol. 10 No. 4 July-Aug '86

Wall-Hung Display Cabinet, Lattice-work Planter, Country Bucket Bench, Adirondack Chair, Coffee

Mill, Clamdigger's Basket, Box of Shapes Toy, Disk Clock, Tenon Jig, Dictionary Stand, Shaker Slat-Back Side Chair; *Articles*: Selecting the Right Project for Production; More About Warped Boards; All About Router Bits; The Sliding Dovetail Joint.

Vol. 10 No. 5 Sept-Oct '86

Vanity Case, Stool, Coffee Table, Blanket Chest, Mortar and Pestle, Whale Folk Art Silhouette, Toy Wagon, Cranberry Rake, Router Bit Box, Shaker Drop-Leaf Table, Desk with Tambour Top; *Articles*: Are Your Prices Competitive?; Restoring a Rosewood Chair; Basic Router Operations; Making Tambour Doors.

Vol. 10 No. 6 Nov-Dec '86

Cube Table, Rabbit Pull Toy, Old-Time Sled Wall Shelf, Cassette Holder, Dog/Cat Bed, Vanity Mirror, Early American Washstand, Router Table, Victorian Sleigh, Early American Hamper; *Articles*: Wholesale and Discount Sources of Supply; Sandpaper Abrasives; Using the Router Table; The Mitered Bead Frame and Panel.

Vol. 11 No. 1 Jan-Feb '87

Glass-Top Dining Table, Dovetailed Stool, Jewelry Box, Door Harp, Toy Firetruck, Canada Goose Mobile, Balancing Sawyer Folk Toy, Early American End Table, Jointer Push Board, Shaker Blanket Chest; *Articles*: Defining the Market for Your Work; Old Wood; The Mortise and Tenon, Part I; Combination Hand/Router Dovetailing.

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Garden Bench and Table, Mirrored Wall Shelf, Rhombohedron Puzzle, Wood Sawyer Whirligig, Folk Art Door Stop, Kangaroo Pull Toy, Colonial Wall Shelf, Contemporary Hall Table, Shaker Sewing Desk; *Articles*: How to Create a Direct Mail Promotion; Types of Finish; The Mortise and Tenon, Part II; Bevel-Edged Drawer Bottoms.

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Merganser Decoy J/F '89

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Magazine Rack, Occasional Table, Mitered-Corner Box, Heart Stool, Decorative Cutting Boards, Piggy Bank, Turned Bowl, Country Cupboard, Four-Drawer Lamp; *Articles*: Faceplate Turning; Workshop Layout; Cutting Dovetails on the Table Saw; Staining Basics.

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Miter Cutting Jig, Captain's Clock, Country Coffee Table, Rooster Folk-Art Silhouette, Harvest Basket, Bird Push Toy, 18th-Century Pencil Post Bed and Nightstand, Bookcase Desk; *Articles*: Wood Movement; Joining Ring Segments; Drill Bits and Boring; Filling Open-Grained Woods.

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Vol. 13 No. 3 May-June '89

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Vol. 13 No. 4 July-Aug '89

Shaker Long Bench, Folk-Art Sign, Toy Farm Tractor and Wagon, Miniature Flower Cart, Kitchen Tongs, Wall Cabinet with Tinsel Art, Stacking Bookshelves, Country Pie Safe; *Articles:* Dealing with Uneven Wood; Tinsel Art; Coping with Your Radial-Arm Saw; Brushing Lacquer; A Visit to a Woodworking Show.

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Mission Style Trestle Table, Jewelry Box, Kids' Bobsled, St. Nicklaus Carving, Carousel Toy, Box Drum, Dancing Man Folk Toy, Towel Rack, Secretary Desk, Bed Tray; *Articles:* Mortising Butt Hinges; Dado Heads; Marquetry: The Empty Window Method; Aniline Dyes; Lynes Unlimited: Making Toys in a Kansas Chicken Coop.

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Mortise & Tenon Mirror, Weaver's Chest of Drawers, Tissue Box Cover, Band-Sawn Napkin Holder, Grasshopper Pull Toy, Compact Disc Holder, Shop-Built Spindle Sander, Wall-Hung Ironing Board, Tavern Table; *Articles:* Clamps: One Shop Tool You Can't Do Without; How to Hang Wall Cabinets; Marquetry: The Direct Method; A Guide to Waxes and Polishes; Special Section: Back Issue Index.

Vol. 14 No. 2 Mar-Apr '90

Small Early American Mirror, Shop-Built Sanding Blocks, Cookie Jar Holder, Hourglass, Candle Holder, Toddler Cart, Folk Fiddle, Plant Stand, Santa Fe Bench; *Articles:* Making Drawers; Using Router Bits in the Drill Press; Finishing Outdoor Projects; Making Curved Instrument Sides; A Conversation with Allene and Harold Westover.

Vol. 14 No. 3 May-June '90

Garden Table, Garden Chair, Planter Box, Stackable Shoe Rack, Victorian Wall Shelf, Child's Stepped-Back Cupboard, Cat Push Toy, Tabletop Armoire, Shaker Tall Clock; *Articles:* Japanese Saws; Gluing Oily Woods; Tung Oil; Making a Tombstone Frame-and-Panel Door; Are Woodworkers Killing Our Rain Forests?

Vol. 14 No. 4 July-Aug '90

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TV/VCR Cabinet w/Pocket Doors, Shaker Woodbox, Cabinet with Punched Tin Doors, Sushi Set, Carved Pineapple, English Cutlery Tray, Toy Train Set, Workbench, Portable Tool Chest; *Articles:* Files and How to Use Them; Compound Angle Dovetails; Water-Based Finishes; Making the Slip Joint; Shop Test: 6 Dovetail Jigs.

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Provincial 4-Poster Bed, Jewelry Box, Christmas Angel Folk Carving, Rocking Dolphin, Walnut Hand Mirror, Perpetual Calendar, Hanging Bird Feeders, Country Pine Table, Shaker Chest of Drawers; *Articles:* The Shaper; Finishing Problem Woods; 20 Ways to Hang a Shelf; Inlaying Mother-of-Pearl.

Vol. 15 No. 1 Jan-Feb '91

Santa Fe Chair, Santa Fe Table, Clamp Rack, Provincial Bench, Step Stool, Box with Marquetry Top, Ash Wall Desk, Fork Lift Toy, Connecticut River Valley Highboy, Part 1; *Articles:* Tempering Steel Tools; Three Easy Finishes for Oak; Making a Cabriole Leg; Hand-Cut Dovetails; Special Section: Back Issue Index.

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Vol. 15 No. 3 May-June '91

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Vol. 15 No. 4 July-August '91

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Child's Table & Chairs J/F '89



Hutch Cupboard M/J '86

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NEXT ISSUE . . .



We've got a list of projects that's guaranteed to start the new year off right. If your Christmas stocking included a band saw or scroll saw, then our stunning **Toucan-On-A-Branch** intarsia project will soon put that new saw to good use. And you don't need to play chess to marvel at the clever Dutch Turning special technique that we use to craft our handsome walnut and ash **Chess Set**. But that's just for starters.

With Valentine's Day just around the corner, what better gift idea is there than our easy-to-make bandsawed **Heart Box**? Classic furniture lovers will appreciate our elegant **Dining Table**, and for the workshop we've got a great combination **Miter Saw/Outfeed/Assembly Table**. But there's more.

Nine projects, four feature articles (including a plunge router face-off you won't want to miss), and a wealth of useful woodworking information make our next issue a must-see.

