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January 1999 #106

Popular Woodworking

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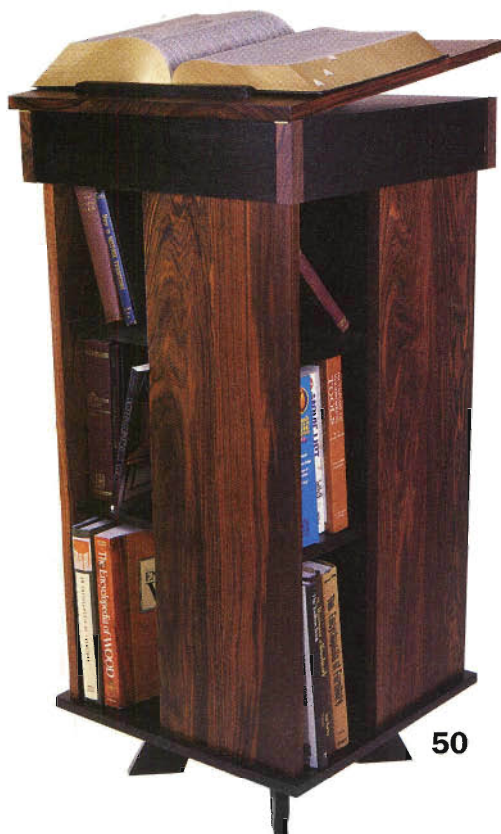
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FEATURES & PROJECTS

BEST NEW TOOLS of 1998

No hedging in these tools reviews. The *PW* staff picks its 16 favorite new tools of 1998. We tell you why we chose them and where there's room for improvement!

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Twig Furniture

34

If you're a scrounger, making rustic willow furniture is as simple as it gets. And a great thing about these projects is there's no finishing required.

Great Danish Modern Table

39

A PopWood Project File

Rediscover the gentle curves and dramatic lines of Danish furniture with our maple and walnut coffee table.

World's Most Comfortable Foot Stool

40

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Rest your dogs on a project guaranteed to make any chair a recliner. Scrap lumber and a few hours turn out this simple project.

Tag-Along Duck

49

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Delightful for youngsters of all ages, this classic toy wags his head and flaps his wings as he's towed across the floor.

Revolving Bookshelf

50

A PopWood Project File

We took a classic revolving bookcase and added a modern twist: a hidden drawer, solid panels for sides and a tilting book rest on top. It's the ultimate revolving bookcase.



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Silver Maple Leaf Box

52

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Military Writing Desk

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Don't go exploring brave new worlds without a way to write home about your journey. This portable desk goes with you anywhere.

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58

Most furniture is essentially a box, but this article tells you how to turn two box sizes into furniture for every room of your home.

Plantation Desk

63

A piece of furniture that served as the business office of the old South, this traditional pine desk works great in your home for organizing paperwork, bills, stationery and phone books.

Queen Anne Side Tables

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"The Greenest of the Green"



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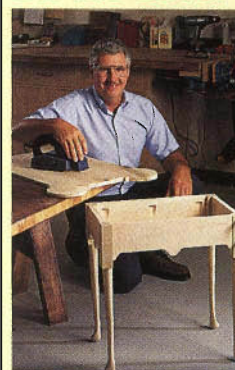
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On the Cover



Cover photo: Pam Monfort Braun, Bronze Photography

This month's cover features a porringer table built by Associate Editor Jim Stuard. The bottom edge of the top is beveled using a tool usually reserved for carpenters: the power planer.

One of these tables was sold recently at a charity auction for \$425 to benefit Wheelchairs for Kids, a charity started by Porter-Cable that benefits a children's hospital.

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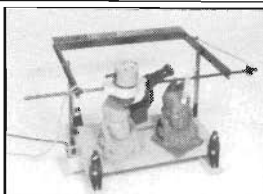
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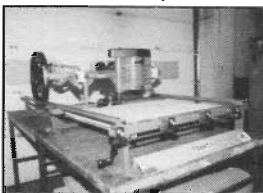
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Popular Woodworking (ISSN 0884-8823, USPS 752-250) is published six times a year in January, March, May, July, September and November by F&W Publications, Inc. Editorial and advertising offices are located at 1507 Dana Ave., Cincinnati, OH 45207; tel.: (513) 531-2222. Unsolicited manuscripts, photographs and artwork should include ample postage on a self-addressed, stamped envelope (SASE); otherwise they will not be returned. Subscription rates: A year's subscription (6 issues) is \$19.97; outside of U.S.A. add \$7/year.

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Produced and printed in the U.S.A.

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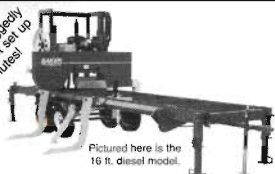
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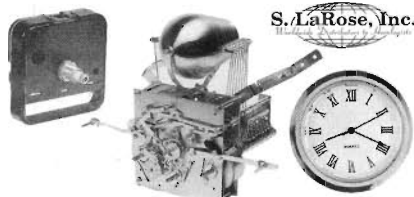
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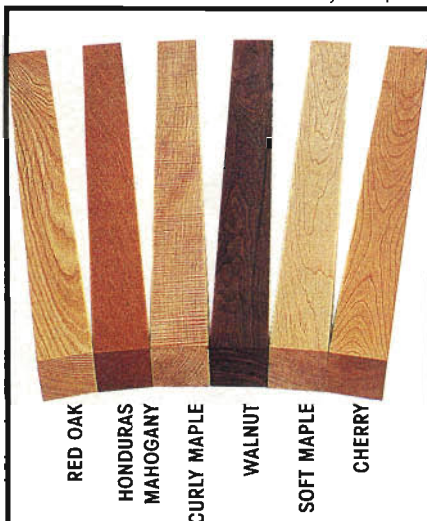
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OUT ON A LIMB

Gotta Have It. Never Used It.



THE PAST FEW MONTHS I've heard a couple tool manufacturers grouse about features they must build into their products to stay competitive — yet these features are almost never used. They're the vestigial organs of the tool world. Those conversations got me thinking about what "must-have" features are on my tools that are rarely, if ever, used. The following is an inventory of near-worthless tools or near-worthless features on essential tools that we would never consider buying unless they were part of the package.

- The rabbeting ledge on a jointer.
- The tilting base on a jigsaw.
- The bubble level and scribe tool on a combination square.
- The bubble level on a drill.
- Most of the clutch settings on a drill.
- The ripping function on a radial arm saw.
- The second sleeve on a two-sleeve keyless chuck for a drill.
- Most of the functions on any Swiss Army knife I own.
- The last 3" of depth capacity cut on a planer.
- The last 1/4" of depth capacity cut on a jointer.
- High-speed steel router bits.
- Positive stops on a slot miter gauge.
- A big old crosscut hand saw. Even worse: a hand rip saw.
- A "drywall"-type T-square that's never ever reliably square.
- Coarse part of Four-in-Hand file.
- The metal corners that come with every band clamp.
- The itty-bitty wrench that comes with every band clamp.
- Sur-Form type rasps.
- A "Yankee"-type screwdriver.
- A brace.
- The bits that go with that brace.
- An adjustable wrench.
- The shape-finding gadget with all the little pins that you use every time you have to duplicate a moulding profile that's not a standard shape.
- All the elaborate cases that power hand tools come in that are too nice to throw away but take up too much precious shop space.
- The high-speed steel saw blade that comes with most table saws.
- The last 13' in a 25' tape measure.
- Half the pockets on my shop apron.
- The often low-quality flashlight "bundled" with most cordless drills.
- The hand strap on cordless drills.
- The thickness gauge on a planer.
- The cheap abrasive wheels that come on most new bench grinders.

While inventorying my tools and their "must-have" features, I realized I was also discovering the closely related category: The "must keep" but "never use" junk that makes up the flotsam and jetsam in the bottom of every drawer in the shop. These are the items that roll around in drawers for years, items I know will someday save me a trip to the hardware store and at least a dollar. These are also items that don't match up to anything else or have so outlived their usefulness that their value might best be measured in pounds, as scrap metal.

- Broken drill bits.
- Phillips screwdrivers with bockety tips.
- More straight screwdrivers than I'll ever need.
- One magnetic catch.
- At least 20 pounds of miscellaneous fasteners, but never the one I'm looking for.
- A "live" shaper collar (1/2" spindle) that I've had for 20 years and never used (I haven't even owned the machine it came on for 13 years).
- A half dozen really worn out toothbrushes. **PW**

Steve Shanley

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with your 1/4" or 1/2" Router, or your 1/2" or 3/4" Shaper.

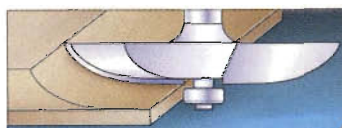
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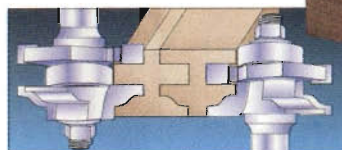
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#1302	1/2" Shank Router	*3-1/2"	\$79.95
#1303	1/2" & 3/4" Shaper	4-5/8"	\$99.95

Raised Panel Door Instructional Video

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*Raised Panel Router Bit



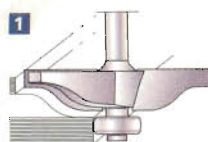
*Reversible Combination Rail & Stile Bit

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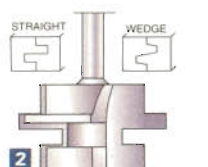
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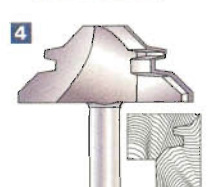
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#1330 1/2" Dia. of Circle\$16.00

#1331 3/4" Dia. of Circle\$21.00



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5 RABBETING KIT

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Rout into tight spaces and sharp corners.
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#1429 1/4" R Round Over\$17.00

#1430 3/8" R Round Over\$19.00

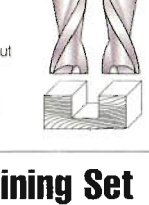
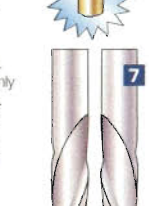


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LETTERS

We welcome your comments about *PW* or anything related to woodworking. We'd also like to see color pictures of what

you're building. Send your input to: Letters, *Popular Woodworking*, 1507 Dana Ave., Cincinnati, OH 45207. Our e-mail address is: PopWood@FWPubs.com

Letters may be edited for publication.

—Steve Shanesy, editor, *PW*



One Cradle. Price: 71 Cents

Thanks for a magazine that is informative with a good selection of projects — from fun to challenging — all mixed with a chuckle or two. Keep up the good work!

I would like to send a special thanks to Bruce Stoker and his father. Their Arts & Crafts Cradle (May 1998, #102) was exactly what I was looking for.

Oh yeah, I didn't have to chop down a cherry tree to build it. All the wood for my cradle came from construction scrap. The wood for the cradle's body was oak scrap from some window stools in a high school that I helped build. I made the frame from pallet wood off another job. The only thing that was store-bought was a 71-cent walnut dowel. Thanks again.

Michael D. Meade
Currituck, North Carolina

Thanks From a 'Dullard'

I don't subscribe to your magazine, but I buy one every once in a while. I really appreciated your article "Sharpening for Dullards" (September 1998, #104). I'm glad someone recognizes that we're all not professional woodworkers who just "know" how to do things. Articles of this nature are extremely helpful to me. The how-tos and descriptions walk you through the process and do a good job of explaining. Thank you for sticking to the basics.

Rafa Middleton
Park City, Montana

Gel Stain Really Stops Pine From Blotching

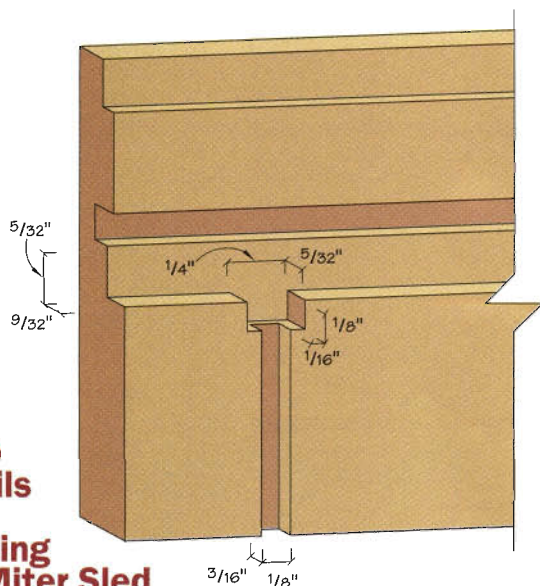
Recently a friend asked me to build an entertainment center. I've built some things, but this project seemed to be a real challenge and at the same time a real temptation. So I built it.

Your article "Blotching & Splotching: Finishing's Evil Twins" (May 1998, #102) helped me decide on the appropriate stain. Because the entertainment center was 100 percent pine, I used gel stain and got good results.

Michael S. Scarpaci
Orland Park, Illinois

CORRECTION: In the Lathe Cabinet article (Sept. 1998 #104) there are a couple wrong dimensions. The two tool dividers are $\frac{1}{2}$ " x 2" x 23". The drawer sides dimensions should be $\frac{1}{2}$ " x 5" x 8 $\frac{1}{2}$ ".

More Details on Building the Miter Sled




Editor's note: An amazing number of readers have told us they're building the miter sled from the September 1998 issue (#104). Several have told us they're enhancing their sleds with different features, and we plan to share a lot of those ideas with you in future issues.

Some readers have been unclear about where to cut the elongated notches in the fixed fence to allow for perfect right-angle adjustment to the blade. Above is a diagram that should explain that process a little better. Chisel or band saw a $\frac{3}{16}$ " x $\frac{1}{8}$ " dado a few inches in from the left end on each half of the fence. Then chisel a $\frac{9}{32}$ " x $\frac{1}{8}$ " notch at the top of each dado to allow room for the screw head to recess and slide. If you have questions, please call us at (513) 531-2690 ext. 255.

Safety Note

Safety is your responsibility. Manufacturers place safety devices on their equipment for a reason. In many photos you see in *Popular Woodworking*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand. Think ahead. **Safety First!**

Continued on page 10



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Circle #138 on Resource Directory Coupon

Continued from page 8

Smokers Strike Back!

This letter is in response to C.A. Brown's letter printed in your September 1998 issue (#104). I was shocked and stunned to see this letter referring to an ad for cigarettes in your magazine. I have read your magazine with great pleasure for some time and I find it excellent. The letter from C.A. Brown was a perfect example of a health Nazi at work cleaning up the supposed ills of the world.

In answer to his letter, I assure you that some woodworkers would consider "using" cigarettes in their shops. In fact, I smoke cigarettes in my shop and have happily for many years. I am sure many of my projects have been badly affected by the second-hand smoke, but I still enjoy woodworking despite the evil of my habit. Please be assured that *Popular Woodworking* did not insult its readers with the ad in question.

Joseph P. Harris
Brookfield, Illinois

Cancel Cigarette Ad — Or I'm Gone

I just received the September issue of *Popular Woodworking*, and after reading "Infeed/Outfeed" I must agree with C.A. Brown. As a professional magazine that promotes health and safety among woodworkers, it is contradictory for you to advertise cigarettes. On page 3 of your magazine you have a "Safety Note" that warns to take extra precautions for one's health. The conclusion of this note is to think before you act. It might be wise for *Popular Woodworking* to do the same... think before you publish advertising. Surely many of your readers are becoming more health-conscious. With all the current tobacco lawsuits, it would be folly if you lost readers and dollars simply because you advertised a product that has nothing to do with your magazine.

I do enjoy your magazine, but I am more obligated to what is right. If the cigarette ad is not removed, I will not re-

instate my subscription. I hope you gentlemen are fully customer-oriented and will do what is right.

Frank Check
Burton, South Carolina

Editor's Note: Letters on this controversial subject were about equally divided and passionate. And yes, we gave the subject of tobacco advertising considerable thought before accepting the ad. We concluded that because the vast majority of our readers are mature adults who have already formed an opinion on tobacco use (as opposed to adolescents who might be influenced), we wouldn't be "contributing to the delinquency" of youngsters. The acceptance of any ad is not an endorsement of the product. It's the responsibility of adults to be informed consumers and make their own judgments and to be responsible parents in raising their children.

— Steve Shanesy, editor
Continued on page 12



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purchase of these tools is advised to follow the stampede to your local JET dealer to round up the tools you've always wanted. JET is offering rewards of up to \$100 for the purchase of these notorious tools.

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LETTERS

Continued from page 10

What You Can Build With Just a Few Tools

I recently finished building this oak gun cabinet in my one-car garage in my spare time. Because I work in limited space, all of my tools are of the bench-top variety with the exception of my table saw. I just wanted to send a picture and share the fact that fine furniture can be created using bench-top tools that cost less and take up less space.

I love your magazine. Keep up the good work and let's keep the sawdust flying!

James Simpson
San Diego, California



I Didn't Like You — But Now I Do

I'm not a letter-writer. However, I wanted to let you know how impressed I was with your latest issue. I never cared for your magazine before. I picked it up a couple of times at the newsstand, took a quick look and put it back on the shelf. But the September issue really hit home. It had a great finger-joint jig, projects for all skill levels, a how-to on door installation and even a look back at a past project!

I found a couple of tips and new product information. A wide variety for everyone. I look forward to purchasing the next issue and have high expectations.

One area that always interests me is other woodworkers' shops. Is it in a basement, garage, or are they lucky enough to have a "New Yankee Workshop?" How does the enthusiast get started? What does he make? What kind of tools does he have? Every magazine shows the professional/commercial shop. It would be nice to see someone the average guy can relate to. **PW**

Scott Reese
via the Internet

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Regarding our patent-pending cutterhead snipe control lock that stabilizes the cutterhead during operation: "Compared to the other machines in the test, the Delta produced the cleanest surface and the least amount of snipe. The other planers in the test also gave us excellent surface finishing, but the Delta stood out as just a bit better."

Woodworker's Journal, January/February 1998



Regarding our quick-change 2-knife system with two high-speed steel, double-edged, reversible knives: "... quick-change knives that we found easy and accurate to install. We found that with the quick-change systems we aligned the knives within .001." And, we could install both knives in about five minutes." "Editors' Choice Top Tool™"

Better Homes & Gardens® Wood,® November 1996



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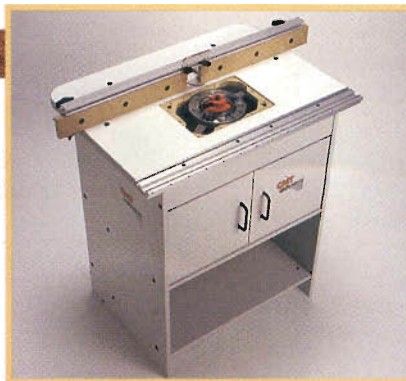
TOOL TEST

We test a lot of tools at *Popular Woodworking*, and while we don't often test tools to failure, we do give them an honest workout. In this column we share our results and offer insights to help with your shopping decisions.

Here's a quick reference on our rating system. **PERFORMANCE:** A rating of "five" indicates we think this tool is a leader in its category — for now. (You won't likely see ratings of "one" or "two" because we wouldn't publicize an inferior tool.) **VALUE:** "Five" is a great tool for the money; "one" isn't.

Got a question about a specific tool? Contact me at (513) 531-2690, ext. 255, or by e-mail at DavidT@FWPubs.com.

— David Thiel, senior editor



CMT Offers a Router Table — or Kit

Known for their quality router bits, CMT has

just introduced new bench-top and floor-model router tables. You can purchase either of these as a complete unit, or you can pick and choose parts from the floor model to design your own.

The bench-top model includes a fence, a table with an insert and a melamine base for \$199. The floor model sells as a complete package for \$429. The fence (\$150 separately), which is similar on both models, is our favorite. Made from a heavy anodized aluminum extrusion, it uses easily adjustable MDF sub-fences for quick zero-clearance settings and can just as easily be set for jointing work. In addition, t-slots are provided on the front and back of the fence to mount accessories.

The floor-model's table top (\$140 separately) is 1" MDF with laminate on both sides. The router opening is near the front edge for better ergonomics and more usable table space. At the front of the top is an aluminum miter track t-slotted for standard $\frac{3}{8}$ " x $\frac{3}{4}$ " miter gauge bars and can be used to mount featherboards and hold-downs. Standard on both units is a clear, undrilled acrylic table insert with a 2" opening, supported by 12 leveling screws. Pre-drilled inserts for specific router mod-

els are also available. These units are well thought out and though we're not sure we'd spend the extra money for the cabinet on the floor model, the fence and top are worth the money. And the bench-top model is a great deal.

For more information, circle #160 on the Resource Directory Coupon.

333VS RO Sander — New and Improved

Porter-Cable has taken its respected random-orbit sander and made it even better. The new 333VS offers a 2.4-amp motor, variable speed and has a redesigned pad to accept both five- or eight-hole sanding discs.

By boosting the sander to 2.4 amps (which ties it with the most powerful palm-grip random orbit sanders on the market), the unit now removes material considerably faster than the older 1.7-amp version. And the variable-speed feature (5,000 to 12,000 orbits per minute), lets you drop the power down for delicate operations.

The new sanding pad now has five dust-collection holes that have been connected with a circular groove in the pad so you can also use eight-hole paper. The sander's pad-control feature doesn't require that the pad be placed on your work before starting the motor. Priced around \$80, it isn't the least expensive sander, but it's got some very nice features and the Porter-Cable tradition for quality.

For more information, circle #161 on the Resource Directory Coupon.



Performance: ●●●●○
Value: ●●●●○

Tool Scoop

On the 'Record'

American Tool Companies Inc., the parent company for products such as Vise-Grip®, Quick-Grip® and Irwin® tools, has purchased Polyhedron Holdings PLC, which carries tool brands including Record®, Marples® and Nooitgedagt®.

In addition to the hand tool line, Polyhedron Holdings also markets Record Power® tools in Great Britain, offering lathes, drilling and mortising machines and band saws. The acquisition will help expand American Tool brands into the international market and increase the presence of British woodworking tools in the United States. Though there is some overlap in the product lines, in general this acquisition should be good for American woodworkers. PW

How Does This One Grab You?

My shop is better than some, and worse than others, but I still have a 10' section of wall that's exposed studs. I've drilled screws into the studs to hold some specific tools and jigs, but mostly it's wasted space. Granted, a sheet of peg board would go a long way here, but Stanley came up with another idea. Called the StudGrabber®, this simple hanger grabs onto a 2x — whether ceiling, wall or rafter. Operating on the same principle as the jaws of a trouble-light clamp, the pre-galvanized wire holder ends in two sharpened spikes rather than a padded jaw. Each StudGrabber will support up to 25 pounds, and when used in multiples, the weight ratio improves.

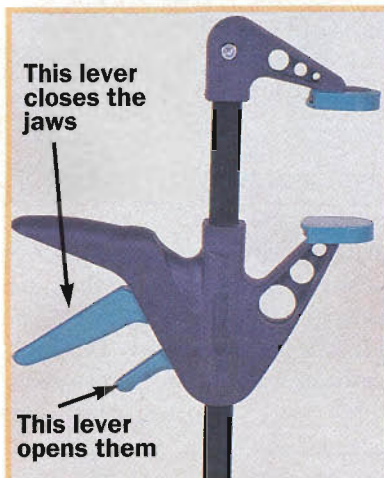
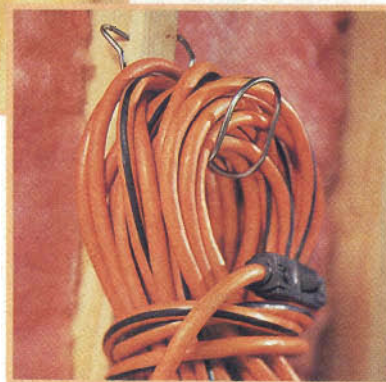
Available in two models: a stud or joist-mounted Utility Hook (right), and a stud-mounted Tool Storage Hook. Each sells in a pack of six with a suggested retail price of \$8, or in a contractor pack of 20 with a suggested retail price of \$18.

We love the name, and we can think of dozens of reasons to own at least a pack of each. Clever and reasonably priced, we wished we owned the patent.

For more information, circle #162 on the Resource Directory Coupon.



Performance: ●●●○○
Value: ●●●○○



Wolfcraft's Quick-Jaw® One-Handed Bar Clamps

We're always happy to see a new clamp on the market, and the price and performance of the new Quick-Jaw® clamp has earned it a place in our shop. Available only in a 12" model at this time, the Quick-Jaw® clamps are similar to the Quick-Grip® clamps (made by American Tool) but with a couple twists.

The Quick-Jaw closes faster when squeezing the handle, it exerts greater clamping force and the fixed jaw can be removed and placed on the opposite end of the bar so the clamp can be used as a spreader. Also, the lever that releases the clamp does double duty. When repeatedly pushed it opens the clamp with each squeeze. The handle takes some getting used to, and it is designed to be used from either end of the clamp. While billed as ergonomic, the handle seemed less friendly to the hand than the American Tool product. Construction of this Wolfcraft clamp also appears less durable, but it doesn't seem flawed in any way.

We'd buy six, no problem. The improved clamping pressure, the snazzy release lever and the price (it's comparable to a Quick-Grip at \$16 to \$22) make it a good deal.

For more information, circle #163 on the Resource Directory Coupon.

Performance: ●●●○○
Value: ●●●○○

A Sliding Bevel for Both Sides Now

When it comes to layout tools, Veritas continues to offer high-quality improved versions of proven designs. Case in point is their new 10" sliding bevel. Inspired by a turn-of-the-century design, this tool uses a cam-locking mechanism that recesses flush into the handle when closed, allowing it to be used on either side without interference. The design also allows you to use it in restricted areas because you can lock the bevel with the flick of a finger. Accuracy is improved as well because the cam operates on compression. Traditional bevels use a wing nut to lock the blade, which allows the blade to move some. Veritas' bronze cam mechanism is cast using the lost-wax process and mates up with a stainless steel blade. The wood body is resin impregnated, making the entire tool waterproof (if you need that).

Priced at \$19.95 through Lee Valley Tools (800) 871-8158, item #05N44.01, it's a great addition to your shop apron or tool cabinet. **PW**

For more information, circle #164 on the Resource Directory Coupon.



Performance: ●●●●●
Value: ●●●○○

It's All in the Box

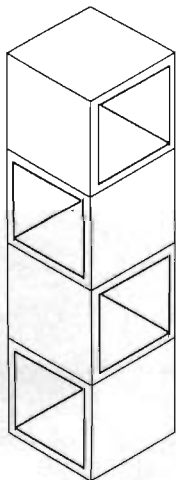
Learn the tricks to modular furniture, then build this attractive storage unit.

A HOUSE IS A BOX containing boxes called "rooms," and boxes within those boxes called "furniture." In each area the box is transformed to something useful, beautiful or both. The house-shaped box is architecturally designed to suit a period or personal notions. A furniture-shaped box has legs and drawers and a shaped top to become, for example, a dresser.

In its simplest form, a box is a spartan concept. But to Plato, who used a simple table as a way to discuss truth and the issues of arts and crafts, the idea of a box, like a table, is a "divine truth."

R.J. DeCristoforo has written more than 30 how-to books and is a member of Popular Woodworking's advisory board. His latest book, "The Master Jig Book," will be published in spring 1999 by Popular Woodworking Books.

Stack and alternate these boxes to create interesting pedestal storage



Complete plans for this unit are on page 58

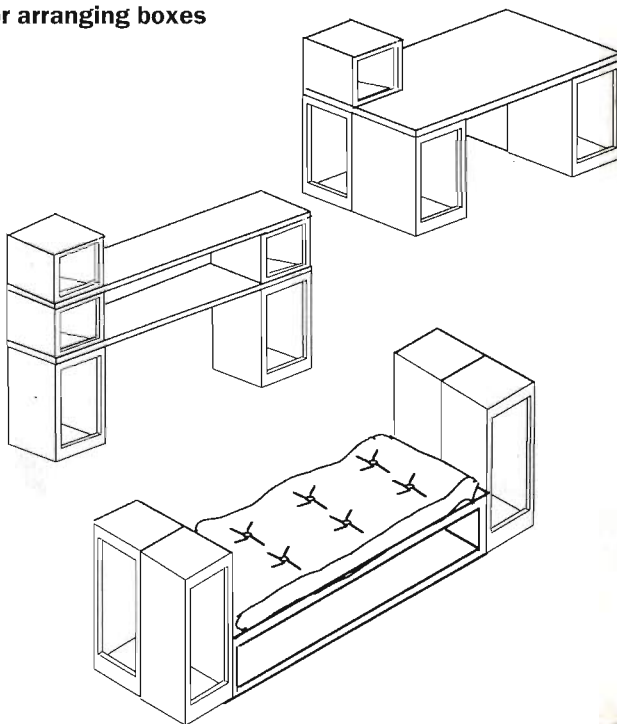
There is the idea of the box, there is the builder, and beyond that there might be an artist who doesn't know screws from nails but who can produce an acceptable painting of the project.

But, enough of Plato. Here, the point

is that if you accept a box as a piece of furniture, then it is a piece of furniture. I read some time ago about a couple who carried the idea to extreme. Their spacious home was furnished with nothing

Continued on page 20

Ideas for arranging boxes



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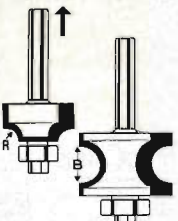
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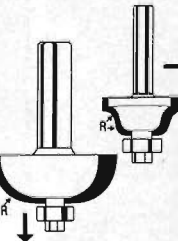
1/4" Shank	Radius	
WL-1040	1/16"	\$9.
WL-1041	1/8"	\$9.
WL-1042	3/16"	\$9.
WL-1043	1/4"	\$9.
WL-1044	5/16"	\$10.
WL-1045	3/8"	\$11.
WL-1046	1/2"	\$13.

1/2" Shank		
WL-1049	1/8"	\$9.
WL-1042-5	3/16"	\$9.
WL-1050	1/4"	\$9.
WL-1044-5	5/16"	\$10.
WL-1051	3/8"	\$12.
WL-1052	1/2"	\$13.
WL-1053	5/8"	\$16.
WL-1054	3/4"	\$18.
WL-1055	7/8"	\$25.
WL-1056	1"	\$27.
WL-1057	1-1/8"	\$30.
WL-1058	1-1/4"	\$30.



Bullnose Bits

1/4" Shank • Bead	
Opening	
WL-1100	1/4" \$12.
WL-1101	3/8" \$14.
WL-1102	1/2" \$16.
WL-1103	5/8" \$18.
WL-1104	3/4" \$19.
1/2" Shank	
WL-1110	1/4" \$12.
WL-1111	3/8" \$14.
WL-1112	1/2" \$16.
WL-1113	5/8" \$18.
WL-1114	3/4" \$19.
WL-1115	1" \$22.
WL-1116	1-1/8" \$25.
WL-1117	1-1/4" \$28.
WL-1118	1-1/2" \$32.



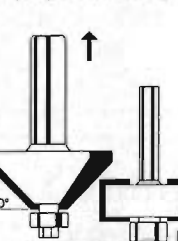
1/4" Shank • Radius	
WL-1159	1/8" \$10.
WL-1160	3/16" \$10.
WL-1161	1/4" \$11.
WL-1162	3/8" \$13.
WL-1163	1/2" \$14.

Cove Bits (continued)

1/2" Shank		
WL-1169	1/8"	\$10.
WL-1170	1/4"	\$11.
WL-1171	3/8"	\$13.
WL-1172	1/2"	\$14.
WL-1173	5/8"	\$18.
WL-1174	3/4"	\$20.

Chamfer Bits

1/4" Shank • Degree		
WL-1180	15°	\$10.
WL-1181	25°	\$10.
WL-1182	45°	\$12.
WL-1183	45°	\$14.
(for up to 3/4" material)		
1/2" Shank		
WL-1184	45°	\$10.
WL-1185	11-1/2°	\$12.
WL-1186	15°	\$12.
WL-1187	22-1/2°	\$12.
WL-1188	30°	\$14.
WL-1189	45°	\$15.
WL-1190	45°	\$22.
(for up to 1-1/4" material)		



Rabbeting Bits

1/4" Shank • Kerf		
WL-1220	1/2"	\$11.
WL-1220-2	1/16"	\$10.
WL-1220-3	1/8"	\$10.
WL-1220-4	1/4"	\$10.
WL-1220-5	3/8"	\$10.
1/2" Shank		
WL-1225	1/2"	\$11.
WL-1225-2	1/16"	\$10.
WL-1225-3	1/8"	\$10.
WL-1225-4	1/4"	\$10.
WL-1225-5	3/8"	\$10.
WL-1225-6	3/4"	\$12.

Roman Ogee Bits

1/4" Shank • Radius		
WL-1230	5/32"	\$13.
WL-1231	1/4"	\$15.
1/2" Shank		
WL-1235	5/32"	\$13.
WL-1236	1/4"	\$15.

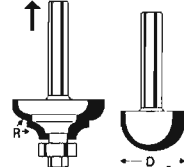
Double Roman Ogee

1/4" Shank • Radius		
WL-1240	5/32"	\$18.
WL-1241	1/4"	\$20.
1/2" Shank		
WL-1245	5/32"	\$18.
WL-1246	1/4"	\$20.

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Classical Ogee Bits

1/4" Shank • Radius		
WL-1250	5/32"	\$18.
WL-1251	1/4"	\$20.
1/2" Shank		
WL-1252	5/32"	\$18.
WL-1253	1/4"	\$20.

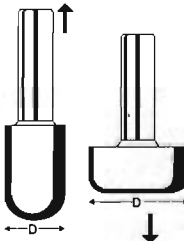


Core Box Bits

1/4" Shank • Diameter		
WL-1370	1/8"	\$10.
WL-1371	1/4"	\$8.
WL-1371-1	3/8"	\$9.
WL-1372	1/2"	\$10.
WL-1373	3/4"	\$12.

Roundnose/Core Box

1/2" Shank • Diameter		
WL-1375	1/4"	\$8.
WL-1375-1	3/8"	\$11.
WL-1376	1/2"	\$12.
WL-1377	3/4"	\$14.
WL-1378	1"	\$16.

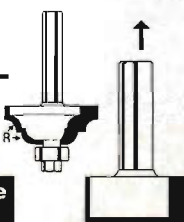


Bowl & Tray Cutter

1/4" Shank • Diameter		
WL-1380	7/16"	\$13.
WL-1381	3/4"	\$15.
1/2" Shank		
WL-1385	3/4"	\$15.
WL-1386	1-1/4"	\$18.

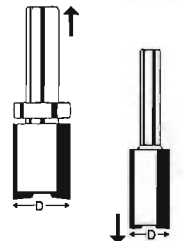
Dado & Planer Bit

1/4" Shank • Diameter		
WL-1390	3/4"	\$12.
1/2" Shank		
WL-1391	3/4"	\$12.
WL-1392	1"	\$14.
WL-1393	1-1/4"	\$15.
WL-1394	1-1/2"	\$16.
WL-1394-1	2"	\$28.



Pattern Cutting Bit

1/4" Shank • Diameter		
WL-1400	1/2"	\$12.
WL-1401	5/8"	\$12.
WL-1402	3/4"	\$12.
1/2" Shank		
WL-1405	3/4"	\$15.
WL-1406	1-1/8"	\$16.



Straight Bits

1/4" Shank • Diameter		
WL-1001	1/8"	\$10.
WL-1002	3/16"	\$5.
WL-1002-5.5	5.5mm	\$5.
(for undersized 1/4" plywood)		
WL-1003	1/4"	\$5.
WL-1004	5/16"	\$5.
WL-1005	3/8"	\$5.
WL-1006	15/32"	\$5.
(for undersized 1/2" plywood)		
WL-1007	1/2"	\$6.
WL-1008	9/16"	\$6.
WL-1009	5/8"	\$7.
WL-1010	23/32"	\$8.
(for undersized 3/4" plywood)		
WL-1011	3/4"	\$9.
WL-1012	1"	\$10.
1/2" Shank		
WL-1020	15/64"	\$5.
(for undersized 1/4" plywood)		
WL-1021	1/4"	\$5.
WL-1019	5/16"	\$5.
WL-1022	3/8"	\$5.
WL-1023	7/16"	\$5.
WL-1024	15/32"	\$5.
(for undersized 1/2" plywood)		
WL-1025	1/2"	\$6.
WL-1027	5/8"	\$8.
WL-1028	23/32"	\$8.
(for undersized 3/4" plywood)		
WL-1029	3/4"	\$9.

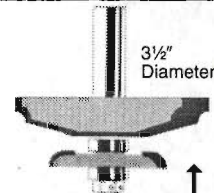


Corner Lock Mitres

For up to 5/8" material	
WL-1420-2 1/4" shank	\$25.
For 1/2" to 3/4" material	
WL-1420-1 1/2" shank	\$30.
For material 3/4" to 1-1/4"	
WL-1420 1/2" shank	\$38.

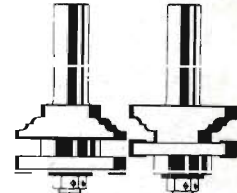
For the Shaper

Lock Mitre	WL-1581 \$40.
------------	---------------



Horizontal Panel Raiser

1/2" Shank		
WL-1346	Ogee	\$49.
WL-1347	Traditional	\$49.
WL-1348	Convex (Cove)	\$49.
WL-1359	12° Facecut with Quarter Round	\$49.
WL-1363	Wave	\$49.

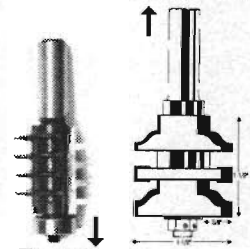


2-piece Rail & Stile Cutter Sets

1/2" Shank	Set	
WL-1360	Ogee Profile	\$59.
WL-1361	Roundover	\$59.
WL-1362	Cove & Bead	\$59.

1-piece Rail & Stile Cutter Sets

Just raise the cutter to make the matching cut. No changing or reversing.		
1/2" Shank		
WL-1365	Ogee Profile	\$49.
WL-1366	Roundover	\$49.
WL-1367	Cove & Bead	\$49.
WL-1368	Wedge	\$49.
WL-1374	Dbt Roundover	\$49.

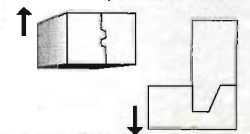


Finger Joiner

Router Bit	WL-1429 \$39.
For the Shaper	WL-1580 \$89.

Reversible Glue Joint

WL-1430	1-3/4" Diam	\$35.
For the Shaper WL-1706 \$35.		



Drawer Corner Lock

Makes drawer side separation virtually impossible		
1/2" Shank		
WL-1435	For 1/2" material	\$30.

SHAPER CUTTERS

3/4" BORE		
Corner Round		
WL-1509	1/8"	\$22.
WL-1510	1/4"	\$24.
WL-1511	3/8"	\$26.
WL-1512	1/2"	\$26.
WL-1513	3/4"	\$30.
WL-1514	1"	\$32.
WL-1515	1-1/4"	\$38.



Bead

WL-1520	1/4"	\$24.
WL-1521	3/8"	\$26.
WL-1522	1/2"	\$26.
WL-1523	3/4"	\$28.
WL-1524	1"	\$30.

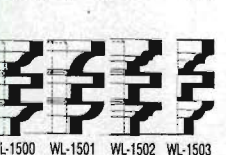
Flute

WL-1530	1/4"	\$24.
WL-1531	3/8"	\$26.
WL-1532	1/2"	\$26.
WL-1533	3/4"	\$28.
WL-1534	1"	\$30.



Rabbeting/Straight

WL-1540	1/4"	\$24.
WL-1541	3/8"	\$26.
WL-1542	1/2"	\$26.
WL-1543	3/4"	\$28.
WL-1544	1"	\$30.
WL-1545	1-1/2"	\$32.
WL-1546	2"	\$48.



SHAPER CUTTERS 3/4" BORE

1-piece Rail & Stile

Just raise the cutter to make the matching cut. No changing or reversing.		
WL-1500	Roman Ogee	\$89.
WL-1501	Roundover	\$89.
WL-1502	Cove & Bead	\$89.
WL-1503	Dbt Roundover	\$89.

WL-1600	
WL-1601	
WL-1602	
WL-1603	
WL-1604	
WL-1605	

Panel Raisers (Shaper Cutter)

3/4" Bore		
WL-1600	Ogee	\$59.
WL-1601	15° Facecut	\$59.
WL-1602	18° Traditional	\$59.
WL-1603	Convex (Cove)	\$59.
WL-1604	12° Facecut with Quarter Round	\$59.
WL-1605	Wave	\$59.

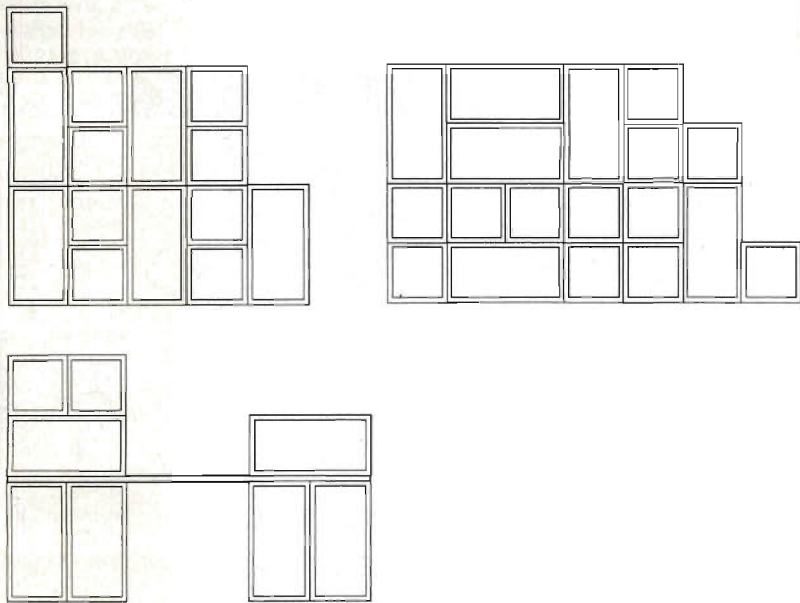
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CRIS CUTS

Continued from page 18

Ideas for covering a whole wall

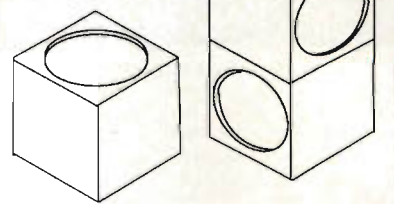


but boxes, boxes to sit on, platforms to lounge on, others to display artifacts or plants or as storage units. If you visited, you sat on a box and ate off one,

and you walked from room to room around modules that served as dividers.

All the boxes were plywood and painted white; color was provided with cush-

Make them storage boxes or pet houses



ions and pads, wall hangings and rugs. The effect was spectacular, but what I found interesting was that the boxes were "architecturally designed" and put together by commercial cabinetmakers. The professional design fees must have far outweighed material costs. This made me think that a box, or boxes, while simple in construction, can evolve as interesting contributions to a home's decor.

Making a Box

Plywood is a logical material choice. (Use softwood types of plywood for a

Continued on page 22

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Flush Cut Saw Blade

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Rigid Scraper

Easily removes old putty, caulking and flooring adhesives. Great for scraping paint and varnish or lifting linoleum.



Oscillation

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and oscillating saw all in one tool.

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Grout-Cutting Saw

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Segment Knife

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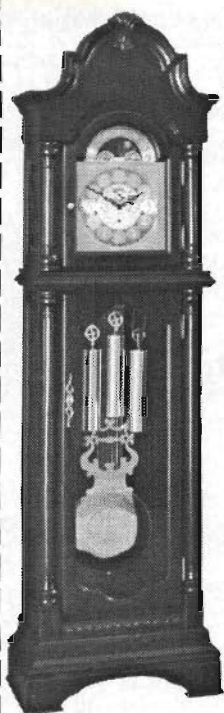
*Finishing
is just
the
beginning.*



Kitchen designs: Lee Wanasela, CKD. Kitchens by Design. Photo: Gary Baker

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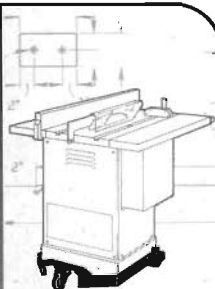
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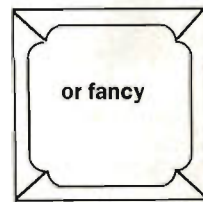
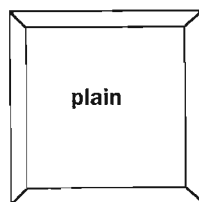
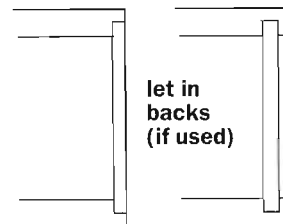
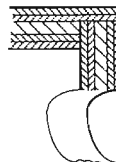
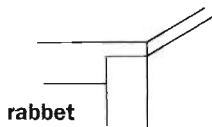
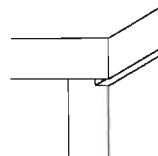
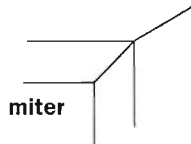
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22 Popular Woodworking

CRIS CUTS

Continued from page 20

The basic joints for basic boxes



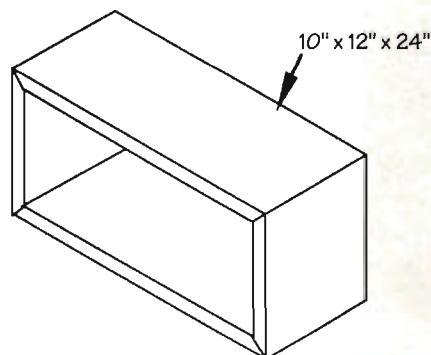
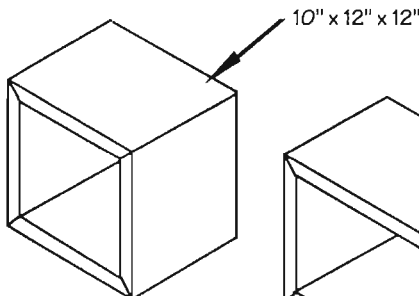
painting finish. hardwood varieties for a natural look.) Other man-made sheet material is also suitable. Medium Density Fiberboard (MDF) is a good choice for painting because even sawed and sanded edges are easily covered. However, the weight of the material may be a deterrent. Plain old solid lumber might be desirable in some cases, but it's best to use it when project components are narrow enough to avoid having to construct wide panels by edge-gluing separate boards.

You can be persnickety with joint selection or opt for faster production. The lowly butt joint, with nail or screw re-

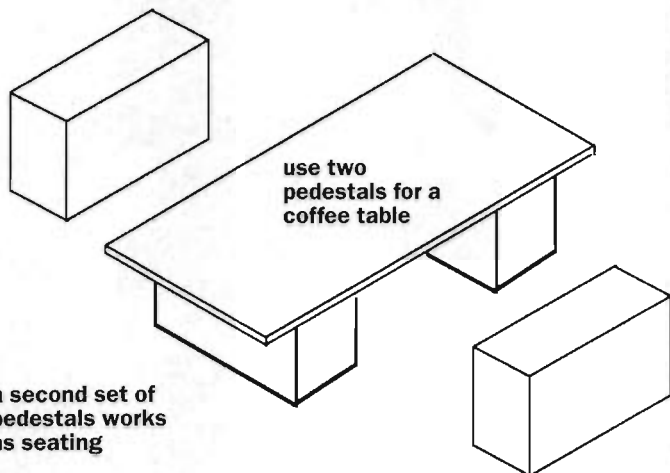
inforcement, is usable on lumber or plywood. The problem of exposed plywood edges is solved with self-adhesive banding or by careful filling and sealing. They can also be prepared so they are easy to cover with paint. Miter joints are suitable for any material and can be reinforced with splines or biscuits.

Large boxes, like a platform for a mattress or lounge pad, can be strengthened with interior glue blocks. Use plywood for shelves or the slabs needed for desk or table tops. Cover the edges with slim strips of lumber, glued and nailed. Set the nails and conceal them with wood dough before painting.

Common dimensions for boxes



Four boxes and a sheet of plywood make flexible seating



Modular Units

Modular units can be assembled to suit a particular purpose, space or decor. A major advantage of the concept is that you are free at any time to rearrange the units to accommodate changes in storage or display items or merely to provide a change of scene.

Two units, made in quantity, make up a modular project. The units can be sized to sit so long as one of them is half the length of the other. Don't be fazed by the work or time involved; an easy approach is the way to go. The first phase is to cut all the parts to size. Do assembly in stages, producing several at a time. "Suddenly," you'll have enough to cover a wall or to use as a partition.

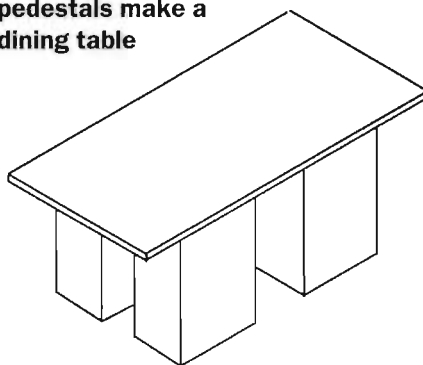
Be Imaginative

One project, made by a fellow woodworker, is the combo table shown in the drawing. The pedestals (boxes) are sized so, when set vertically, they provide a suitable height for a dining table. Two of them are used when the project becomes a coffee table. Guests can be seated on floor-level cushions or on the remaining two boxes.

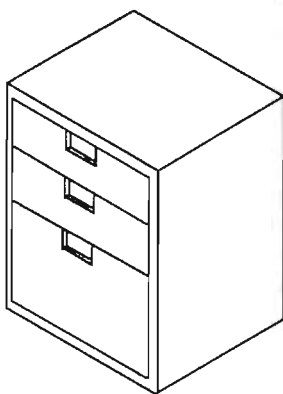
My friend also has large cubes with one circular opening. Pets enjoy the projects for sleeping or as a hideaway since the interior is lined with carpeting.

Try painting the inside of units with a contrasting color. Install crossing di-

Two or four pedestals make a dining table



Add drawers for even more storage



viders in some units so they are usable to hold bottles of wine.

Combine creativity and practicality when previewing how the final project will appear. So when you hear management gurus tell you to think "outside the box," remember instead to simply think "about the box." **PW**

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Drying GREEN Wood

Simple techniques to keep your lumber out of the firewood pile.

Getting a load of freshly cut lumber can bring out several emotions. First, the excitement from getting your hands on the rawest of raw materials. Then the anticipation of fine, quality boards for your projects. Finally, panic sets in as you try to figure out what to do before it checks, bows and twists its way into the firewood pile.

Fortunately, air drying your lumber outdoors is the easiest, least expensive way to dry lumber with minimal waste. By following a few basic techniques, your green lumber will eventually find its way to your workshop.

The Basic Air-Drying Stack

Simply put, you need to build a stack that allows air to circulate around each board, keep the stack off the ground to avoid moisture from ruining the wood and keep the sun and rain off the lumber.

While the ideal place for air drying lumber is in a shelter such as an open shed, you can stack it anywhere it is protected from direct sun.

Starting from the ground up, lay a solid base with cement blocks and 4" beams on top, spaced about 16" apart so they will be perpendicular to your boards and accommodate the full length of your boards without overhang.

On top of the beams, which must be level with each other, lay your first course of stickers. Stickers are used to separate the boards from each other and allow for air circulation. They should be made from dry wood and must all be the same thickness, around $\frac{3}{4}$ ". Avoid sappy woods or woods that may leach color when in contact with moisture, such as cedar and oak.

Next, lay your first layer of boards. It is easiest to stack your lumber if the boards are all the same length and thickness. Otherwise, stacking will take care-

ful planning, because the entire stack should be rectangular, with spacing between the boards as consistent as possible to promote even air circulation.

On each layer, the boards must all be the same thickness, and they must line up at the ends without overhanging. Leave 1" or so between the boards, with shorter boards on the interior of the pile and full-length boards at the sides. The shorter boards should be staggered so the ends on the interior of the stack don't line up. This reduces large open spaces and promotes slow, even drying.

Each successive layer of stickers must line up vertically with the previous layer of stickers, otherwise you will end up with bowed or cupped boards.

Continue this process until your pile is complete. Then add a final course of stickers and add a cover of old boards, plywood, etc. to protect the pile from sun and rain. This cover should extend over the edges of the stack if your stack isn't already sheltered. Weigh the stack down with bricks or other heavy items to reduce the possibility of warping. To slow down the rate of moisture loss and minimize end checking, coat the exposed ends of each board with latex paint or paint specially designed for this.

Once your stack is finished, simply wait for it to dry. While the general rule of thumb is one year of drying for every

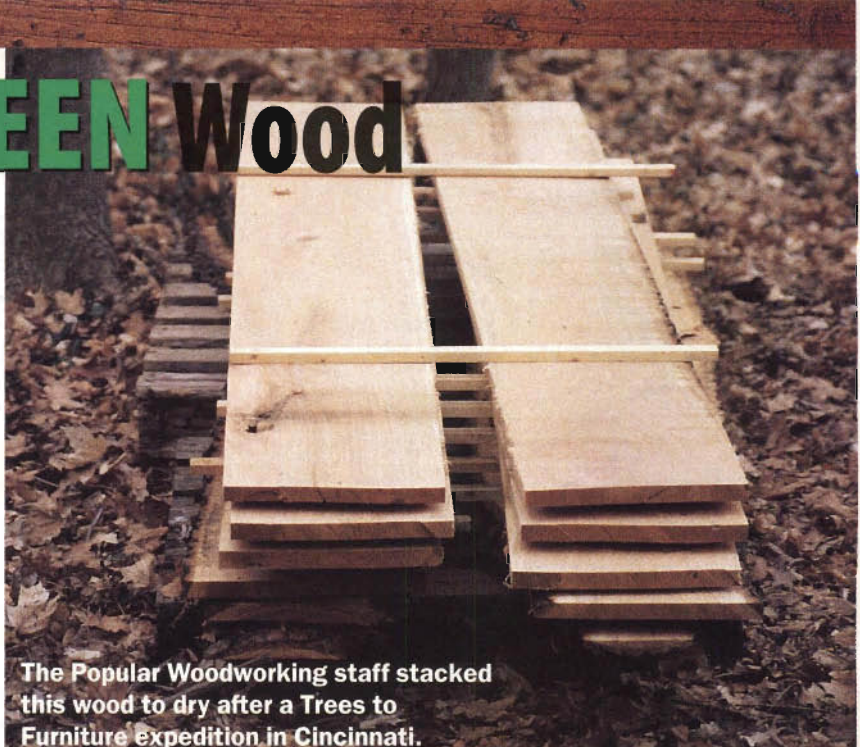
inch of thickness, the species you are drying, weather conditions and the time of year you begin drying can influence this significantly. No published times can adequately compensate for the huge variations in drying rates, so unless you are in a rush, plan your lumber drying carefully to allow adequate time. Ideal moisture content for interior wood in dry, arid areas will be considerably lower than in humid areas. Consult with professional cabinet shops in your area for relevant ranges.

One thing to remember is that once your lumber has dried, it can't get any drier, so lumber that has air dried for many years isn't any drier than lumber that has dried for just the right amount of time. Once your lumber is as dry as it can get, you can re-stack the lumber somewhere else without stickers for easier storage.

Taking it Further

Air drying your lumber outdoors won't get you down to the ideal moisture content to successfully use your lumber indoors. Wood used in the home should range around 6 to 8 percent moisture content. Air drying outdoors only allows the lumber to reach its equilibrium moisture content (EMC) with the surrounding air, which is typically 12 to 18 percent. While air-dried lumber can be used as-is with adequate consideration for

Continued on page 26



The Popular Woodworking staff stacked this wood to dry after a Trees to Furniture Expedition in Cincinnati.

Michel Theriault lives in Ottawa, Ontario, and is the author of "Woodworking Projects with a few Basic Tools" (Sterling). His articles about woodworking have appeared in four countries.



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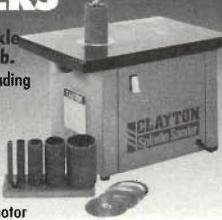
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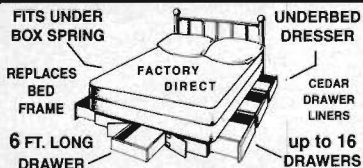
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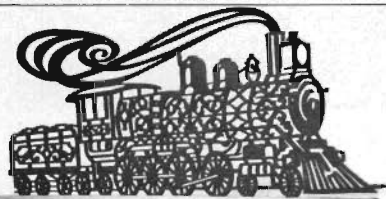


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26 Popular Woodworking

TREES TO FURNITURE

Continued from page 24

Measuring Moisture

You can measure the moisture content of your lumber in three ways:

1 MOISTURE METERS • They are available at various prices and various moisture ranges. Traditional meters use pins that are pressed into the wood for a reading, while pinless meters allow you to check moisture without damaging the wood.

2 CONSISTENT WEIGHT METHOD • To determine if boards being dried indoors are dry enough to use, weigh one board at the start of the process and then once every week. Plot your results. When the weight starts to remain constant, the lumber is sufficiently dry.

3 OVEN METHOD • Accurately measure the weight of a small sample (no more than a 1"-thick cross section) of your lumber and dry it in a 212-degree oven until it is dry (up to 24 hours). Weigh the dried sample and subtract its current weight from its original weight to find the weight of the water that dried off. Divide this by the dried weight of the wood and multiply by 100 for the moisture content.

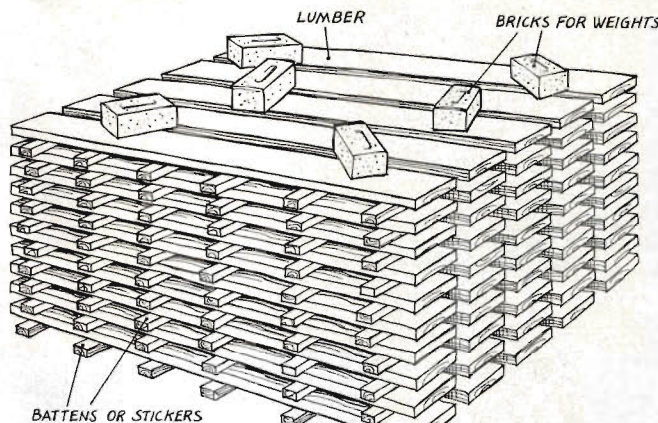


Illustration by Stephen Hutchings

shrinkage, you will be better off drying it indoors before using it.

To dry your lumber indoors, use essentially the same stacking technique, without the special considerations for moist ground, sun and rain. It is important to stack the lumber in a dry area where there is air circulation. While it is tempting to do this in the basement, it may be too moist to do this effectively. If in doubt, use a dehumidifier to control the humidity.

Finishing the drying process indoors will take from several weeks to a couple of months, depending on conditions in your home and the moisture content you are starting with. You don't need to dry all your lumber indoors at once. If you plan your projects properly, you can dry enough in small batches to satisfy your project-making goals. To be certain the lumber is dry enough, check the moisture content before using it. **PW**

What is 'Trees to Furniture'?

Trees to Furniture is an effort started by two professors/woodworkers in Cincinnati who wanted to turn fallen urban trees into lumber for projects in their home shops. In the last two years, they've figured out the best ways to find the trees and have them cut into usable lumber by other people who own portable sawmills. And they do this for less than 50 cents a board foot.

If you'd like more information about the program, send a self-addressed, stamped envelope (with two first-class stamps) to Trees to Furniture • 1507 Dana Ave. • Cincinnati, OH 45207. Or you can contact the founders directly:

• Sam Sherrill •
samuel.sherrill@uc.edu

• Michael Romanos •
michael.romanos@uc.edu

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Rechargeable Battery Recycling Corporation (RBRC) is a non-profit, public service organization whose mission is to be the international leader in the environmentally-safe collection, transportation and recycling of rechargeable batteries. Nickel-Cadmium (Ni-Cd) rechargeable batteries can be found in power tools, cordless and cellular phones, camcorders and remote control toys. Any of the following stores also recycle Ni-Cd rechargeable batteries: in the US—Ameritech, Batteries Plus, BellSouth Cellular, Car Phone Store, Circuit City and RadioShack; in Canada—Astral Photo Images, Battery Plus, Black's Photography, Authorized Motorola Dealers and RadioShack Canada.

Circle #135 on Resource Directory Coupon

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from your power tools

After all the sanding, drilling, and sawing is done, it's time to check your batteries — because sooner or later your Ni-Cd rechargeable batteries will no longer hold their charge. But please, don't throw them away. Recycle them! Just like plastic, glass, aluminum or old newspapers.

Just look for the recycling seal on your battery packs. If the seal is on it, we recycle it! Take your spent Ni-Cd rechargeables to any of the stores listed or call 1-800-8-BATTERY for the location of a store near you. You will make a huge difference in preserving our environment. Thank you.

International RBRC
Spokesperson Richard
Kam, "Al" on TV's
Home Improvement

Popular Woodworking

BEST NEW TOOLS

of 1998

Popular Woodworking's staff scoured the world to bring you the best tools of the year.

Throughout the year we have the opportunity to inspect and test the newest woodworking tools here at the magazine. Recognizing that not every tool is for every woodworker, we try to keep our personal feelings about a tool under our hats and simply provide enough unbiased information to help you recognize the benefit of the tool and make an informed purchase.

But not this time.

Fresh from the woodworking shows in Chicago, Atlanta and Cologne, Germany, our staff has picked up, played with

and inspected just about every new woodworking tool that hit the market in 1998. We then took the best of those tools and ran them through the paces in our shop here at *Popular Woodworking*. The result is this list of what we think are the best (and sometimes coolest) new tools. They aren't ranked, because they're each "the best" for a different reason. We've also mentioned if we have concerns with a tool (such as it's very expensive) and, in a couple cases, we've suggested some improvements. We hope you enjoy our choices.

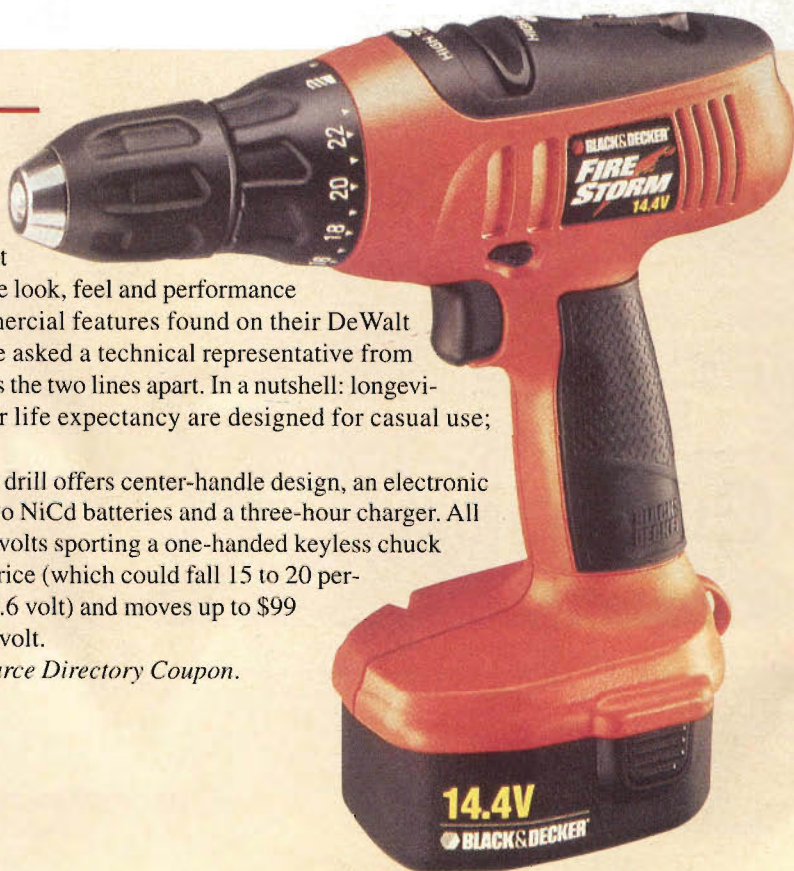
— Popular Woodworking's editors

All the Bells and Whistles — Not a Lot of Money

These orange drills belong on this list because they're a great deal for the home woodworker on a tight budget. We used the 18- and 12-volt drills around the shop and were pleased with the look, feel and performance of the tools. Most important, they sport commercial features found on their DeWalt cousins — but for one-third less money. So we asked a technical representative from Black & Decker (which owns DeWalt) what sets the two lines apart. In a nutshell: longevity. The Firestorm's battery, gearing and motor life expectancy are designed for casual use; DeWalts are designed for daily use.

Available in 9.6, 12, 14.4 and 18 volts, each drill offers center-handle design, an electronic brake, two gear ranges, a 24-position clutch, two NiCd batteries and a three-hour charger. All four have keyless chucks, with the 14.4 and 18 volts sporting a one-handed keyless chuck with automatic spindle lock. Suggested retail price (which could fall 15 to 20 percent due to market competition) starts at \$79 (9.6 volt) and moves up to \$99 (12 volt), \$129 (14.4 volt), and \$149 for the 18 volt.

For more information, circle #165 on the Resource Directory Coupon.



Powermatic Performance for the Masses!

Powermatic's legendary Model 66 table saw has earned its reputation in custom woodshops for decades, and Powermatic quality has been the dream of many home-shop woodworkers. With the introduction of

Powermatic's new Artisan contractor's table saw, a good quality Powermatic saw is now available to DIY woodworkers for about \$750. The 64A features two solid cast iron wings, a high-quality rip fence, a well-positioned switch, a well-made blade guard that's not inconvenient to use, a ribbed belt-drive system, and a 1½ hp single-phase motor. Oh yeah, and the blade tilts to the left for increased safety and ease of use — a rarity in this category of machine. The saw comes standard with a 30" cast-iron fence extension. A 50" extension is also available, as is a cast and pre-drilled router table mount in the right wing.

All that said, this is not a Model 66. The assembly was as tricky as expected, with some of the instructions being inaccurate. The table inserts are disposable, and a better blade would be nice. But we'd still buy one in a heartbeat.

For more information, circle #166 on the Resource Directory Coupon.

Sanding Small Parts Made Easy

This tool is designed for the woodworker who has removed his fingerprints while using a random orbit sander on a small woodworking piece. With Delta's new Bench Random Orbital Sander, you hold the small part, not the tool, which gives you more control over the finish of your project.

Featuring a 16" x 22" table, an oversized 9" sanding pad (hook and loop and pressure sensitive adhesive compatible), integral dust collection and a router table-type 3" x 22" fence to help guide the workpiece, this simple but effective tool will take over the work usually reserved for a disc sander or that random orbit clamped into a vise.

The ½ hp motor powers the sanding pad as well as a fan to pull dust away from the work area and into the attached collection bag. At \$199 it might seem a little expensive, but you'll find yourself using it a lot.

For more information, circle #167 on the Resource Directory Coupon.



Throw Away the Router Wrenches!

We first let you know about the coming revolution in changing router bits in our July 1998 issue when we announced that Jacobs' wrenchless router chuck would first appear on the Skil ¼"-collet 1845.02 plunge router. The router chuck has been a long time coming, and quite honestly there still may be one or two details to be ironed out before every router will have this Jacobs chuck as standard equipment. We've learned that some manufacturers are planning routers using a ½" collet version, and Jacobs has announced plans to offer the ½" model as an after-market accessory for a number of router models.

We'll wait — but not for long. We want those router chucks! Router wrenches have been taking the fun out of routers for too many years, and leave it to the people who made the drill's chuck key extinct to do away with router wrenches. With a simple snap and pull (or push) the bit is locked in place with no over- or under-tightening of collets. We had a couple of concerns about the ¼" collet version, and when we had the chance to ask the Jacobs folks about them we were pleased to find that our questions were already being addressed. Give Jacobs a couple of months and then get out of the way, 'cause these babies are gonna be hot!

For more information, circle #168 on the Resource Directory Coupon.



A Random-Orbit Sander That Won't Give You the Shakes

Palm-grip random-orbit sanders are getting better and costing less every year, and 1998 was no exception. This year, Makita's BO5010 stood out as the best of 1998's crop. Though it's not the most powerful palm-grip sander (three other manufacturers have 2.4-amp sanders), Makita's machine removes material very quickly and is comfortable to use for long periods of time because it's lightweight (just under 3 pounds) and vibrates little for a sander.

After using a lot of other machines, Makita's 5" sander (\$69.95) stood out for another two reasons. First, the dust collection works very well, removing dust from the wood and putting it in the bag — which is no small affair. Second, the switch is easy to operate, especially when you compare it to other comparable models.

At first we wished that Makita's sander had two speeds, like the nice Bosch 1295DH, but after a few weeks of use we decided that one speed was perfect. The BO5010 is powered by a 2-amp motor, spins at 12,000 orbits per minute and uses hook-and-loop sandpaper.

For more information, circle #169 on the Resource Directory Coupon.



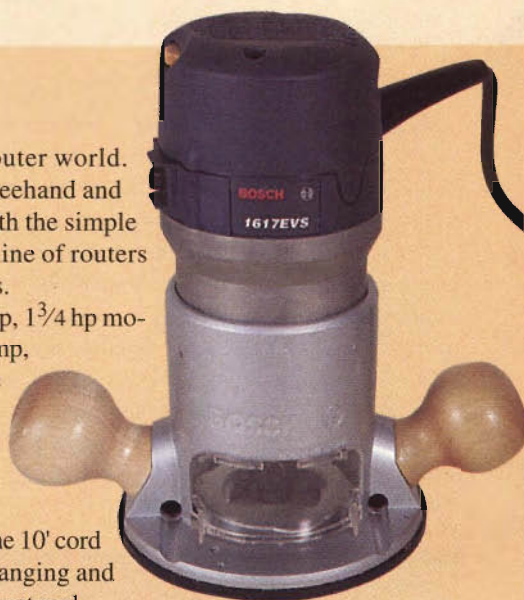
Bosch's New Fixed-Base Routers Offer Function and Form

This new line of fixed-base routers from Bosch has raised the bar in the router world. Simply put, these routers are easy to use, accurate and perform very well in freehand and router-table applications. Adjustment is simple: Lock the base to the motor with the simple close of a buckle and then turn a small dial to get the perfect bit height. This line of routers also offers a precision centering feature for bit positioning during repetitive cuts.

The model 1617 and its D-handle variant, model 1618, (\$179) sport 11-amp, 1 $\frac{3}{4}$ hp motors delivering 25,000 rpm. The 1617 EVS (\$209 as shown) is powered by a 12-amp, 2 hp motor with a variable speed range of 8,000 to 25,000 rpm. The Electronic Variable Speed is a great addition to this tool beyond the variable speed capability. It gives you soft-start and allows the motor to maintain the selected speed under load — no bogging down in harder material. All three models offer $\frac{1}{4}$ " and $\frac{1}{2}$ " collets standard.

Bosch's extra attention to the cord makes the package even more friendly. The 10' cord protrudes from the side of the router to allow the tool to sit on its head for bit changing and adjustment. These routers feel good, perform well and as an added touch they've got real wood handles that bring the mind and hand back to the focus of all your hard work.

For more information, circle #170 on the Resource Directory Coupon.



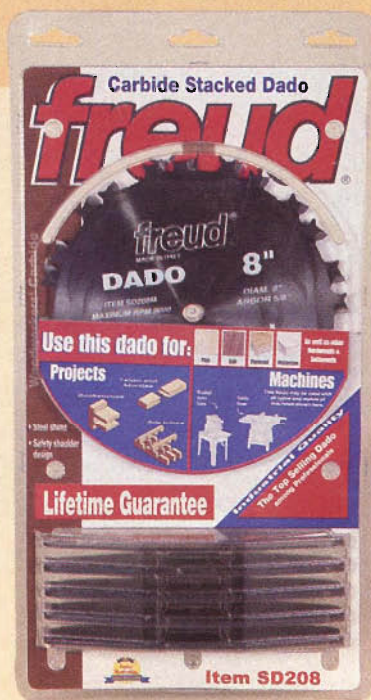
Cut Clean, Flat Dados for Less Than \$100

Sometimes a dado (or groove) is the only joint that will work for a project. To make this cut you could make repeated passes with an $\frac{1}{8}$ "-thick blade, you could use a router and a straight bit or you could use a dado set on your table saw. We prefer a dado set. Problem is, carbide-stack dado sets have always been expensive, and many "affordable" dados don't cut a flat-bottomed groove and will tear out the wood, especially after the steel tips start to dull. Freud has always made good carbide-tipped dado sets, but they were pricey (\$125 to \$175). Thankfully, they've now added an 8" carbide-tipped stack dado that provides a good cut for just \$90.

The Italian-made set includes two 12-tooth outer blades, one $\frac{1}{16}$ " two-wing chipper and four $\frac{1}{8}$ " two-wing chippers that produce dados from $\frac{1}{4}$ " to $\frac{13}{16}$ " wide. Also included in the set are eight steel shims to adjust for that always-unpredictable plywood dimension. While the dado cut by these blades is square and flat, it isn't going to be used to cut decorative reveals in casework.

If you need an affordable dado that produces reliable results, this tool fits the bill.

For more information, circle #171 on the Resource Directory Coupon.



Bosch Jigsaw Blades Look Like a Nightmare, Cut Like a Dream

Woodworkers don't always pay a lot of attention to the type of jigsaw blade they're using — until it stops performing. Then we cuss and put in a new one. When our staff had the opportunity to try Bosch's new Progressor wood-cutting blade, our first reaction was, "What a wicked-looking blade." When we put the metal to the wood we couldn't believe the ease of cut, and even more amazing was the almost mirror finish on the inside of the cut. Then we tested the hook-tooth design by making a stab-cut into a piece of $\frac{3}{4}$ " poplar without any hesitation or kickback. What a blade! Our only disappointment

came when we were told they weren't available for sale yet. That's been fixed, and you too can own one amazing jigsaw blade.

The blade boasts a progressive tooth pitch, with the smaller teeth nearest the shank and the larger teeth at the business end of the blade, which produces a faster cut and a longer life. They're available in packs of three (for \$7), five (for \$10) or 25. Their advertising makes a boast we tend to believe — even their competitor's tools perform better with these blades.

For more information, circle #172 on the Resource Directory Coupon.

One-Handed Clamps With Extraordinary Power

Don't get us wrong — we love our black and yellow Quick-Grip clamps from American Tool Co. They're great for holding work to the bench and for many clamping jobs. But when we need that extra "oomph," we reach for the new Bessey PowerGrip clamp. It's a German-made one-handed clamp that can be tightened to give up to 1,000 pounds of pressure.

In all fairness, the PowerGrip is a little fussier to use than the Quick-Grips. If you don't have the threaded clamp properly positioned when you tighten it, you could have real troubles when you try to release the clamp. We haven't encountered a situation where we couldn't remove a clamp, but we've come close a few times. However, once you get the hang of it, you'll adjust them without thinking when you pick them up. As you would expect from Bessey, the PowerGrips are ruggedly made from bright-drawn, heat-treated and tempered steel and have no-mar plastic covers on both pads. Available in 12" (\$43.50) or 24" (\$47.50) jaw openings. Leave it to Bessey to

make a one-handed clamp that's built like a tank and squeezes your work like an anaconda.

For more information, circle #173 on the Resource Directory Coupon.

NiMH Power Tool Batteries: More Power, More Flower

Thanks to new battery technology, your cordless tools will soon get a 15-percent boost in juice and be a lot better for the environment. Nickel-Metal Hydride batteries are now available in Makita cordless tools and will soon be found on cordless tools from Bosch, Black & Decker, DeWalt, Hitachi and others. Nickel-Metal Hydride (NiMH for short) batteries outlast traditional Nickel-Cadmium (NiCd) batteries by an average of 15 percent, when compared to the highest-powered NiCd batteries available (2.0 Ah).

And the really good news is that future Nickel-Metal Hydride batteries will be even more powerful. Energizer Power Systems, one of three battery companies in the NiMH market, estimates in a few years that its batteries will have 40 percent more capacity than today's.

For the tree-hugger, NiMH is a dream come true. The batteries don't use the environmentally unfriendly lead found in Nickel Cadmium. The only downside at this point is the price. Because NiMH is a little more expensive, tool manufacturers are putting the new batteries on their higher-end tools. That's going to change as NiMH becomes more widely accepted.

R B R C



Ni - Cd

The Fate of Your NiCds

You probably know you're not supposed to just throw away your old Nickel-Cadmium batteries in the garbage. But what should you do with them? Thanks to a great new program started by the nonprofit Rechargeable Battery Recycling Corp. (also known as RBRC), you should be able to drop off those old

batteries at your hardware store where they'll be recycled. (Call 800-8-Battery to find a store near you.) The only hitch is that your old NiCd battery has to have a RBRC sticker on it to be recycled. Currently 75 percent of battery makers put it on their products. The cadmium from the batteries is used to make new batteries and the recovered nickel and iron is used to make stainless steel.

For more info., circle #174 on the Resource Directory Coupon.



Package Deals From Senco and Hitachi

As pneumatic nail guns come down in price (\$100 - \$150), more home woodworkers are discovering the benefits of these industrial tools. But if they don't own a compressor, the \$350 to \$400 price makes it tough to become air powered.

Clever marketers that they are, two pneumatic manufacturers have recognized this stumbling block to increased sales and are offering "bundled" products for the holiday season. Both will offer similar package deals that include a pneumatic tool, a small compressor and the necessary hoses and couplers to let you plug in and start fastening for between \$250 to \$350.

Hitachi will offer two packages with either the NT32AE 18-gauge nailer that drives up to a 1 1/4"-long fastener, or the NT50AE 18-gauge nailer that drives a 2" fastener. Both kits will feature a 1.5-hp compressor with a 5.8-gallon tank, hose, fittings and fasteners and will be available for \$299 and \$349 respectively.

Senco will offer a starter kit including their new Accuset A125BN 1 1/4" brad nailer, a 1-hp compressor with a 2.5-gallon tank, a 25' hose and all the necessary fasteners and couplers for about \$250.

For information from Senco, circle #175 on the Resource Directory Coupon. For information on the Hitachi, circle #176.



Makita's Super Sliding Compound Saw

We've seen a lot of miter saws in our shop — sliding and otherwise — and this is the best we've tested. The dual-rail design and single-piece table provide the smoothest operation we've ever seen (even after months of use in the shop). This 10", 13-amp saw is capable of bevel cutting from zero to 45 degrees to left and right, and resets back to zero at a positive detent.

The fence system provides good support for the work piece in any saw configuration and requires no tools to adjust for miter cuts. Another positive feature is the easily accessible slide release and table adjustment controls mounted right up front on the saw — where they belong.

We had only one suggested modification: It might be nice to have the handle oriented on the horizontal, but that's a personal preference. At around \$535 it's not a purchase to be taken lightly, but if you need a sliding compound saw, this one's a winner.

For more information, circle #177 on the Resource Directory Coupon.

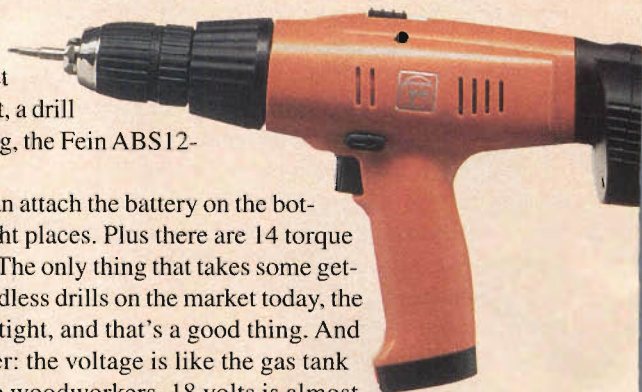


Nothing Could be Fein-er

At \$250, this is probably the most expensive 12-volt drill on the market today. But if you want a drill that will always be there when you need it, a drill that has enough guts and German engineering to tackle almost anything, the Fein ABS12-2EUQ is the cordless drill for you.

Perhaps the most shocking feature of the drill is the fact that you can attach the battery on the bottom of the handle or the rear of the drill. This feature gets you into tight places. Plus there are 14 torque settings with two speeds, a 1/2" keyless chuck and a one-hour charger. The only thing that takes some getting used to is the way the battery attaches to the drill. Unlike most cordless drills on the market today, the Fein's battery slides in on two tracks and clicks into place. The fit is tight, and that's a good thing. And one more thing: Don't be afraid that 12 volts isn't enough (remember: the voltage is like the gas tank on a car; it has little to do with the raw torque of the drill). For home woodworkers, 18 volts is almost always overkill. For \$249.95, the ABS12-2EUQ includes the drill, metal case, two batteries, charger and screwdriver bit.

For more information, circle #178 on the Resource Directory Coupon.



The Next Generation of Biscuit Joiners

Porter-Cable has packed a boatload of features into their new Model 557 biscuit joiner and still managed to keep it priced within \$10 of their yellow-colored competition (\$199.95, including case, dust bag and two cutters). The best part of this machine is that you finally get a biscuit joiner that doesn't feel like you're using an angle grinder. You also get a much-improved $3\frac{3}{8}$ " x $5\frac{1}{4}$ " fence that will adjust to about every angle you could ever need, a micro-adjust feature to raise and lower the fence in small increments, and a rear handle that you can actually get your hand around.

But perhaps the biggest step forward Porter-Cable has made is with the machine's front handle. It's mounted to the fence instead of the body, allowing you to hold the fence steady with one hand as you push the cutter forward with the other. Another great feature is that you can insert a second (provided) smaller cutter so that in addition to the standard #0, #10 and #20 biscuits, you can use smaller face-frame biscuits. However, changing the blade isn't as easy on the Porter-Cable as it is on some competitors' biscuit joiners. Two small improvements could be made to this otherwise fine machine: The fence's angle settings should be marked in at least 5-degree increments, instead of 10-degree increments, and we wish the motor's fan didn't blow in your face during every cut.

For more information, circle #179 on the Resource Directory Coupon.



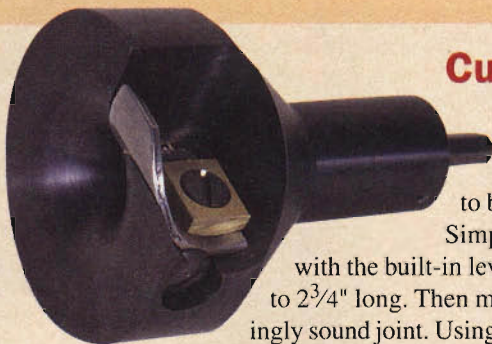
Cut Perfect Round Tenons Without a Lathe

Once in a long while, a new tool comes along that does things that were once a huge pain with almost no effort. This is such a tool. The new Power Tenon Cutters from Canada's Veritas Tools Inc. make rustic furniture incredibly sturdy and easy to build and can also be used to cut round tenons on dowels or square stock.

Simply chuck the tenon cutter in your drill, clamp a branch to your bench, line up the cut with the built-in level and pull the trigger. The three smaller cutters makes perfectly smooth tenons up to $2\frac{3}{4}$ " long. Then make the mortise for the tenon with a regular drill bit and you have created an amazingly sound joint. Using the $\frac{3}{4}$ " Power Tenon Cutter, we built a pretty complex willow chair in an afternoon, and the chair is rock solid. Say goodbye to merely nailing stretchers into your legs. As an added bonus, you can use the tenon cutter to make round tenons on your regular round stock, such as dowels or something you've turned on a lathe.

The cutter body is made from aluminum, and the cutter blade is adjustable so you can fine-tune the size of your tenon for a perfect fit in your mortise. Veritas makes five sizes of cutters, $\frac{5}{8}$ ", $\frac{3}{4}$ ", 1", $1\frac{1}{2}$ " and 2", which range in price from \$52.75 to \$61.75. Once you buy one of these cutters, you'll be looking around your yard for branches you can instantly transform into furniture.

For more information, circle #180 on the Resource Directory Coupon.



Powerful Sanding for Less Than \$40: Ryobi RS240

In the world of woodworking there are few bargains as good as a palm-grip random-orbit sander. For less than \$100, you can buy a professional-quality tool that will speed the sanding process (always a good thing) and improve the final finish of your project. If you're not a professional, we recommend Ryobi's RS240 sander because it gives great results for less than \$40.

This 2.4-amp sander feels good in the hand and removes material quickly. One nice feature — particularly for the new woodworker — is the fact that the sander can accept both hook-and-loop sandpaper and the stick-on sanding disks. While we tell our readers that hook-and-loop is the best way to go (the stick-on sandpaper can be used only once), we recognize that a lot of beginning woodworkers might want to make up their own mind, or they might want to try the less-expensive sticky stuff. All-in-all, the RS240 is perfect for the week-end woodworker who needs good results but doesn't want to pay for a professional-level machine. **PW**

For more information, circle #181 on the Resource Directory Coupon.



EFFORTLESS TWIG FURNITURE

You'll be shocked how easy and fast it is to build stylish and durable willow furniture.



BUILDING RUSTIC FURNITURE is so unbelievably easy and quick that it's almost unfair to call it woodworking. With just a few tools you can build a bent willow chair in a long afternoon. Smaller projects, such as our magazine rack, can be finished before lunch. And, as if it weren't easy enough already, a remarkably simple new tool has come to market that makes these gypsy chairs sturdier and even faster to build.

In fact, the greatest obstacle in building these chairs is finding the right materials. Luckily, willow trees grow in every state in the continental United States. They thrive near water and are easy to spot along the roadsides in ditches.

In fact, they thrive almost too well. Many arborists consider them nuisance trees. Their roots clog sewer and water lines, and their offspring sprout easily and spread like kudzu. As a result, most people we asked were more than happy to have us lop off a few branches. We got weeping willow branch-

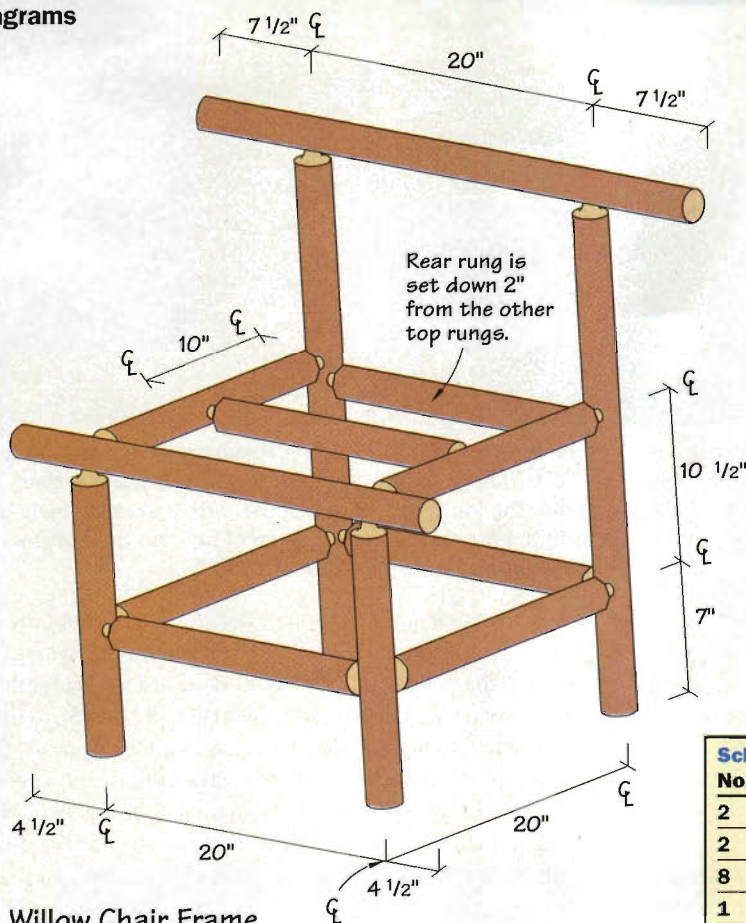
es (*Salix babylonica*), which are great for the bent arms and back, from a willow on a university campus. We got black willow (*Salix nigra*) from a local park after talking to the park board. (If you can't find willow, poplar branches also work.)

With a little effort, you'll soon have more sources for willow than you need. By the way, winter is the perfect time to harvest willow because most of the underbrush around the trees will be dormant and the sap is at rest, meaning the bark won't peel off the branches as they dry.

STEP 1 An Easy Harvest • Luckily you don't need a chainsaw to harvest willow for chairs or small projects. We used a folding pruning saw and a ratcheting hand pruner to cut our branches. Basically you are looking for three different kinds of thicknesses. Branches that are 2" in diameter are great for the frame of the chair. Branches that are $\frac{3}{4}$ " in diameter are perfect for the bent sections of your chair. And small branches, those $\frac{3}{8}$ " and smaller, are good for decorative trim.

By Christopher Schwarz, managing editor, and Michelle Taute, editorial assistant, Popular Woodworking.

Diagrams

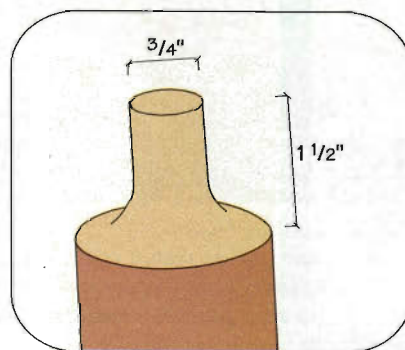


Willow Chair Frame



Are we on target?

To see more projects like this in future issues, circle "P6" on the postage-paid card in the Resource Directory.



Detail of tenon stub

Schedule of Materials: Willow Chair Frame

No.	Item	Dimensions D L	Material
2	Back legs	2" x 30"	Willow
2	Front legs	2" x 17"	Willow
8	Rungs	2" x 20"	Willow
1	Front rung	2" x 29"	Willow
1	Top rung	2" x 35"	Willow



1 TIMBER! • It isn't often that a woodworker gets to play lumberjack. When you're clear-cutting the trees, cut near the base of the tree, as soon as the trunk starts to straighten out. The smaller branches can be cut with the saw or removed with a ratchet pruner.

You can find pruning saws and hand pruners at any home improvement store, but you'll get better quality at a lower price through gardening catalogs.

STEP 2 Store Your Harvest • Once you've gathered your branches, you need to separate them into two piles. The thicker branches need to dry in the sun for a week or so, while you need to keep the bendable limbs — we call them "limbers" — in a bucket of water so they remain flexible.



2 A BUCKET OF BENDERS •

We kept our "limbers" in a five-gallon bucket filled with water. You can make your bendable limbs even more limber by first standing on the thick end and pulling the rest of the limb up toward you. Then take a step forward on the limb and pull it up again. Repeat the process most of the way up the limb. Don't pull too hard, or the limb will snap.

We used the driest branches for the chair's rungs, and we used branches that were a little wetter for the four legs. There's a good reason for this. All of the rungs will have tenons cut on the ends (this is where the new tool will come in handy), while your legs will house the mortises. As wood dries it

WILLOW FURNITURE



3 REALLY QUICK TENONS • To cut the tenons with the Power Tenon Cutter, clamp your rung to a table or your workbench, keeping it as level as possible. Start the cut slowly to make sure your drill is centered on the rung. Then fire away.

shrinks, so if your four legs are a little wetter, they will tighten more around the drier rungs, making a very stiff, and natural, joint.

Keep in mind that this isn't rocket science, so don't get too haired over if your moisture content isn't perfect. After a couple weeks, most of our branches had a moisture content of about 15 percent, which is dry enough.

STEP 3 Cut Your Tenons • First cut all your pieces to size and square the ends the best you can. Now cut the tenons on both ends of the eight chair rungs. You could whittle the tenons using a knife, but there's a new tool on the market that makes this process child's play. The Veritas Power Tenon Cutter chucks into your hand drill and cuts perfect tenons



4 MAKE THE MORTISES • Handscrews are the best way to hold your legs level while you drill the mortises. Mark the location of the mortise with a scratch awl. Then drill the mortise. I used a piece of tape on the Forstner bit to gauge how deeply I should drill.

on wet branches. The tenon cutters are pricey, but they are worth every penny. (They are available in three sizes, but we used the $\frac{3}{4}$ " cutter [item #05J41.02 at \$54.75] for the entire project. Call Lee Valley Tools at 800-871-8158 to order.)

The tenons are $\frac{3}{4}$ " long (plus the shoulder) and $\frac{3}{4}$ " thick. It's tempting to use your cordless drill with the power tenon cutter to make the tenons, but I recommend using an old-fashioned corded drill. Even our professional-quality cordless drills had some trouble making the cuts, and the process drained their batteries quickly.

STEP 4 Even Faster Mortises • Because your tenons are perfectly round and perfectly sized, cutting the mortises is a snap. We used a $\frac{3}{4}$ " Forstner bit in our drill press. If

Willow Rack

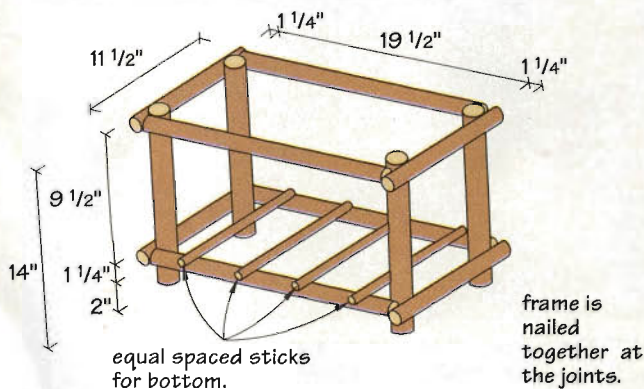
This planter box/magazine rack will look perfect sitting on your front porch next to your other rustic furniture. It's big enough to hold two or three potted plants and easy to make out of the scraps left from building your willow chair.

1 BUILD THE FRAME • Cut the pieces to length as specified in the Schedule of Materials. These sizes may be altered to take advantage of the scraps left from your chair. Just be sure to keep the inside of the frame at least 6" wide, the standard size for many pots. Fasten the frame together with nails.

2 CHECK FOR STABILITY • Because tree branches have their own character, it might be necessary to saw off the bottom of one or more legs to make the planter sit flat. Next, add the four floor pieces that will support the pots.

3 GET CREATIVE • Now comes the fun part. Use limbers – the small, flexible pieces of willow – to make a design on each side of the frame. Simply bend each branch to the desired shape and nail in place. Green branches work best for this part of the planter, but they must be nailed carefully or they will split. PW

Diagrams



Willow Rack Frame

Schedule of Materials: Planter Box

No.	Item	Dimensions D L	Material
4	Legs	1 3/4" x 14"	Willow
4	Sides	1 1/4" x 19 1/2"	Willow
4	Ends	1 1/4" x 11 1/2"	Willow
4	Floor pieces	1 1/4" x 11 1/2"	Willow
20-30	Limbers	various	Willow

—Michelle Taute, PW staff

Rustic Reading

Here are a few good books on rustic furniture to give you ideas about what else you can build:

- **Making Bent Willow Furniture**, by Brenda and Brian Cameron, 140 pages, Storey Books, ISBN # 1-58017-048-X, \$19.95
- **Making Rustic Furniture**, by Daniel Mack, 160 pages, available from Lee Valley Tools #31L16.98, \$18.95
- **Rustic Carpentry**, edited by Paul N. Hasluck, also available from Lee Valley Tools #49L80.03, \$4.95

you don't have a drill press, you also could use your hand drill. Just try to make the hole as straight as possible. The wood will bend to some degree to help you, but there are limits. Once you have cut the mortises, you can begin to assemble your chair's frame. We used polyurethane glue in the mortises because it works with wood that has a moisture content up to 20 percent — perfect for this application. Once you insert the tenon into the mortise, secure the joint with a galvanized 1½" brad. Once this frame is assembled, allow it to dry overnight. When dry, clean the glue squeeze-out with a chisel.

STEP 5 Nail the Limbers • Once you've limbered up your limbers, it's time to nail them in place. The arms are about 53" long. You might want to leave them even longer and cut them to size after attaching them to the seat's frame. I cut a small notch with a chisel in each of the eight arm pieces at the point where the arm meets the top rung. This makes the joint stronger. Nail or screw the first arm piece to the area under the overhang of the top rung. Put the first arm piece next to the leg. Then bend the piece around the frame and nail it to the bottom front rung. Add as many arm pieces as will fit.

STEP 6 The Back • Save your best and longest pieces for the back. I recommend making a plywood template for this (an idea I borrowed from the book "Making Bent Willow Furniture" from Storey Books). The template requires a piece of ¾" plywood measuring 27" x 19". The idea is to make one end of the plywood into a half-circle shape with a radius of 13½". You could mark this radius using trammel points or a piece of string 13½" long. Cut the shape with a jigsaw or band saw. Notch the ends so the template fits over the arms as shown in the photo.

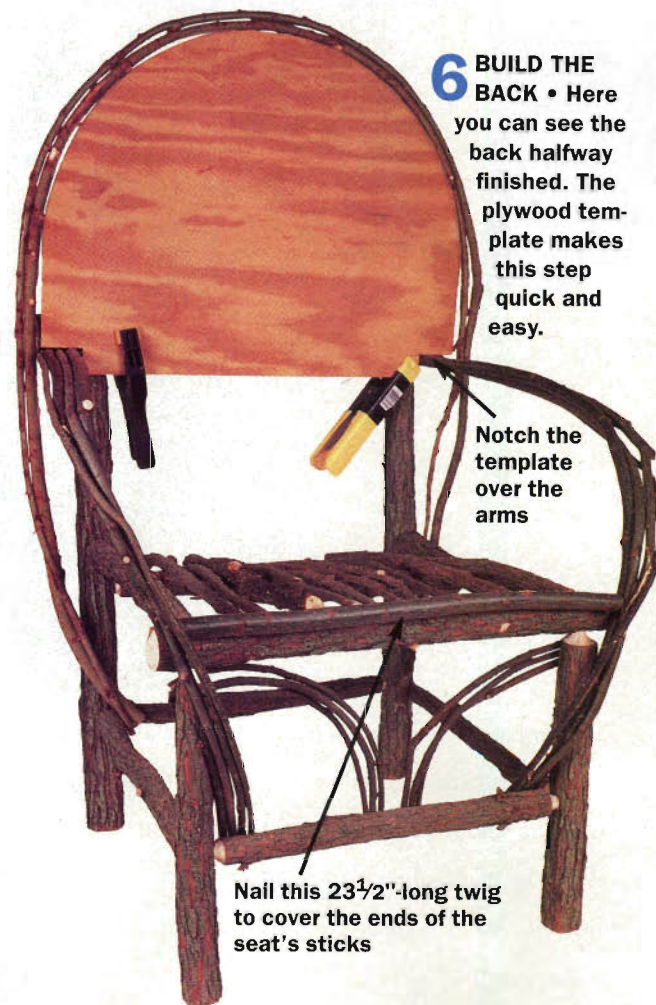
Now nail in your first back piece. Nail one end to the stretcher on the frame's side, then bend it outside the arm pieces and over the template to the other side of the frame. Nail it in place. You might have to splice two shorter pieces together to reach the optimum 112" length. Repeat this process with four more limbs.

You can build the seat several ways. You can nail really long flexible limbers to the seat rungs and bend them up to also serve as the back. Or you can use 22" lengths spaced 1" apart for the seat, and then nail longer lengths between the seat pieces for the back. Finally, nail a 23½"-long stick to the front of all the ends of the seat's sticks to protect the undersides of your knees. We also add little trim pieces made from willow scraps. The little design on the front of our chair was made from six sticks that were each 20" long.



Cut a notch in the arm pieces here

5 BENDING WOOD WITHOUT STEAM • The trick to getting these limbers to bend together is to cut off the little knots and imperfections with a pocket knife. Then put as many nails as possible into the sticks to hold them in place.



6 BUILD THE BACK • Here you can see the back halfway finished. The plywood template makes this step quick and easy.

Notch the template over the arms

Nail this 23½"-long twig to cover the ends of the seat's sticks

Here's the best part — you're done. No sanding, no staining, no finishing. The best way to finish one of these chairs is to buy a seat cushion, set the chair outside and let Mother Nature do her job. **PW**

To understand something completely,
you have to know how to read between the lines.

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*Subtle touch
ensures accurate
fastener placement.*

*Palm lifts
4,000 lbs. of
lumber a day.*

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PROFESSIONAL FASTENING SYSTEMS

Great Danish Modern Table



Don't hate me because I found some 20"-wide curly maple. It was a lucky accident, and while it wasn't cheap (\$50), it was a good deal. The only way to show off this 20" x 60" piece was as a table top, and I'd been itching to try something Danish.

STEP ONE: First mill all your material to $\frac{3}{4}$ " thickness. The schedule includes four blanks for the legs that will yield one leg per piece. If you're being thrifty, the pieces will interlock and save material, but orient the grain so it follows the path of the lower part of the leg. Use the pattern in the PullOut™ Plans to lay out the legs.

STEP TWO: Use a band saw or jig-saw to cut the legs to shape. Use double-sided tape to hold the four legs to-

gether and sand the edges of all four at the same time.

STEP THREE: Soften all the edges (except the ends of the end stretchers and the tops and bottoms of the legs) using a $\frac{1}{4}$ " roundover bit. Then mark the dowel locations as shown in the diagrams and drill the holes.

STEP FOUR: Sand the entire base through 220 grit, then glue the legs to the side stretchers, seating the dowels in the holes to leave $\frac{3}{4}$ " of the dowel exposed. Then glue the end stretchers between the two side pieces.

STEP FIVE: Now lay out the top. Bend a strip of $\frac{1}{4}$ " material along the edges of the top to mark the gentle curve, then

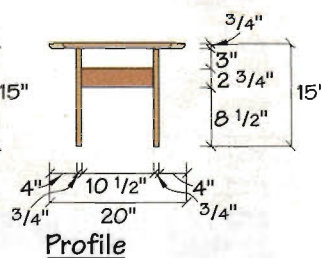
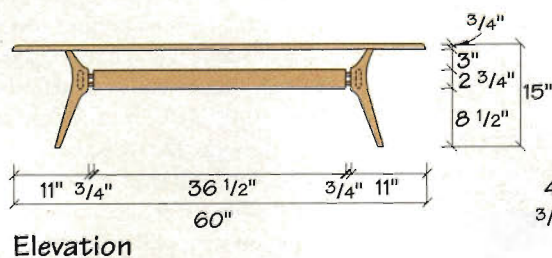
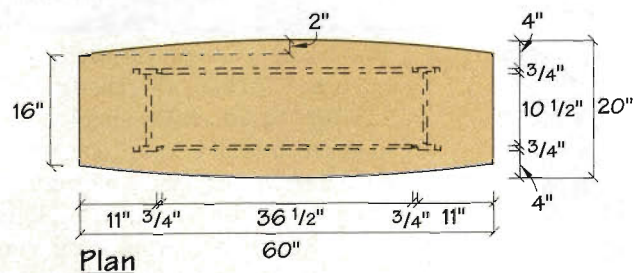
cut the top to shape. For an interesting effect, I routed the edges of the top with a $\frac{1}{2}$ " roundover. I cut this detail on the bottom of

the sides and the top of the ends. I then marked a line 1" in from the edges and used a random-orbit sander to further roll the edge details toward the 1" line.

STEP SIX: I finished the table with natural Danish oil, then fastened the top to the legs using figure-eight table fasteners placed parallel to the side stretchers. This way the fasteners will move if the top piece moves. **PW**

— David Thiel, PW staff

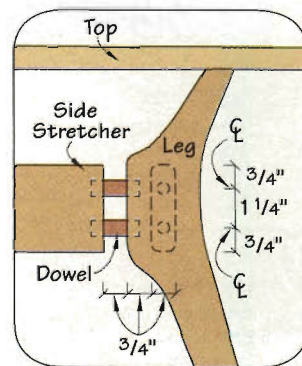
Diagrams



Schedule of Materials: Danish Coffee Table

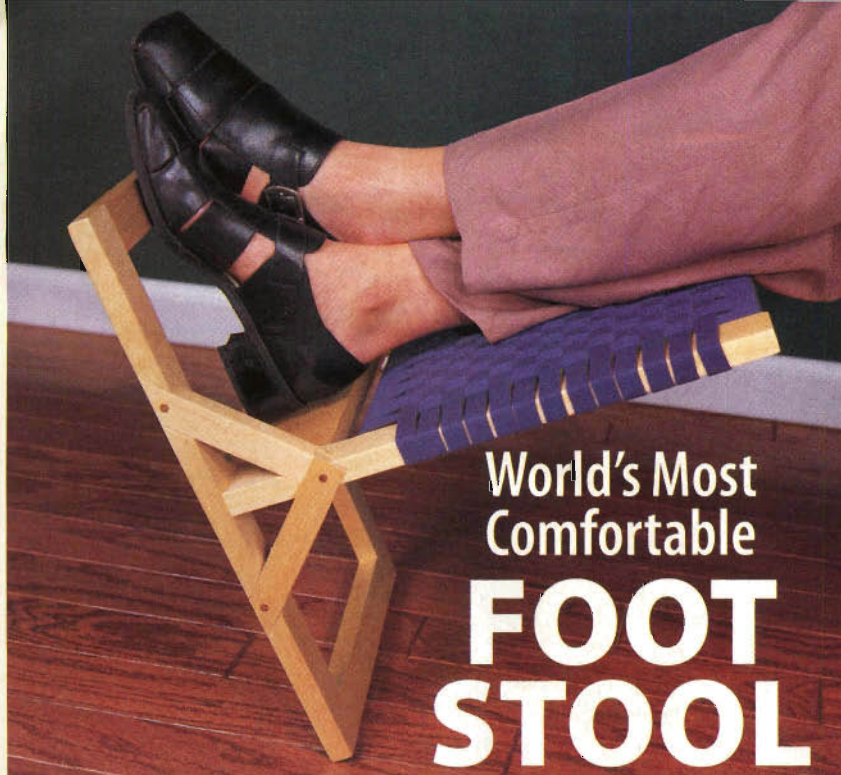
No.	Item	Dimensions T W L	Material
4	Legs	$\frac{3}{4}$ " x 5" x $14\frac{1}{4}$ "	Walnut
2	Side stretchers	$\frac{3}{4}$ " x $2\frac{3}{4}$ " x $36\frac{1}{2}$ "	Walnut
2	End stretchers	$\frac{3}{4}$ " x $2\frac{3}{4}$ " x $10\frac{1}{2}$ "	Walnut
16	Dowels	$\frac{3}{8}$ " x $1\frac{1}{2}$ "	Maple
1	Top	$\frac{3}{4}$ " x 20" x 60"	Maple

Top fasteners-Woodcraft #130216 (\$3.50/10) 800-225-1153



Are we on target?

To see more projects like this in future issues, circle "P11" on the postage-paid card in the Resource Directory.



World's Most Comfortable FOOT STOOL

SHERWOOD DOUGHMAN, a loyal reader from Dauphin, Penn., sent us a photo of a crazy-looking foot stool he'd found in an old barbershop. We laughed when we first saw the thing,

but a hush came over the office when Sherwood told us that this was the "most comfortable foot rest ever."

Those are strong words for a bunch of professional loafers like ourselves.

So we built a prototype from four pieces of plywood using Sherwood's dimensions. The result? Amazing comfort to the lower extremities.

Using the same dimensions, we dressed up the foot stool and produced this "high-class" version so your spouse won't complain about your unnatural attachment to four pieces of plywood.

STEP ONE: Begin by cutting out all the pieces according to the sizes in the Schedule of Materials. Assemble the two frames separately using biscuits or dowels. Glue, clamp and allow to dry.

STEP TWO: Now attach the smaller frame to the center rail of the larger frame using biscuits or dowels. Clamp and allow to dry.

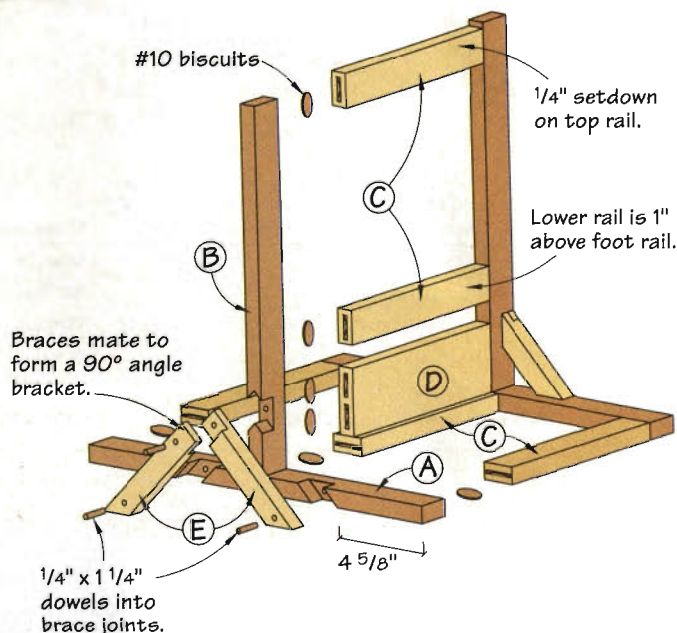
STEP THREE: The braces are the only difficult part of the project. Join the ends of two of the braces at a 90-degree angle using a half-lap joint. Glue and clamp. Repeat for the other two braces. Now put a completed brace on one of the sides of your joined frames using the diagram as a guide. Mark the location of the brace and repeat the same procedure on the other side of the frames. Now cut notches into the frames deep enough so the braces sit flush to the edges of the frames. Dowel each joint using a $\frac{1}{4}$ " dowel for additional strength. Round over all of the edges that your legs could come in contact with. Sand the entire project and apply three coats of clear finish.

STEP FOUR: Weave the seat on the smaller frame using blue Shaker tape available from Constantine's (a 25-yard roll is \$24.75, item #SKT4, call 800-223-8087 to order). The simplest way to weave the seat is to use a one-over, one-under design. Begin by cutting a piece of $\frac{3}{4}$ "-thick foam to fit inside the hole in the frame you'll be weaving around. Now loop a length of tape over one of the rails and either sew it to the tape or staple it to the frame. Next wrap the tape around and around the two rails. When complete, cut the tape and tack it to the side. Do the same thing going back and forth across the stiles, weaving the tape over and under the rows of tape you wrapped around the rails.

Now take your new buddy inside for some serious sitting. **PW**

—Christopher Schwarz, PW staff

Diagram



Schedule of Materials: Foot Stool

No.	Let.	Item	Dimensions T W L	Material
2	A	Long stiles	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x 18"	Maple
2	B	Short stiles	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x 16"	Maple
5	C	Rails	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x 9"	Maple
1	D	Foot rail	$\frac{3}{4}$ " x 3" x 9"	Maple
4	E	Braces*	$\frac{3}{4}$ " x 1" x 7"	Maple

* Dimension is a little long — cut to fit.



Are we on target?

To see more projects like this in future issues, circle "P9" on the postage-paid card in the Resource Directory.

Popular Woodworking

Carefully open staples to remove plans, then bend staples closed again.

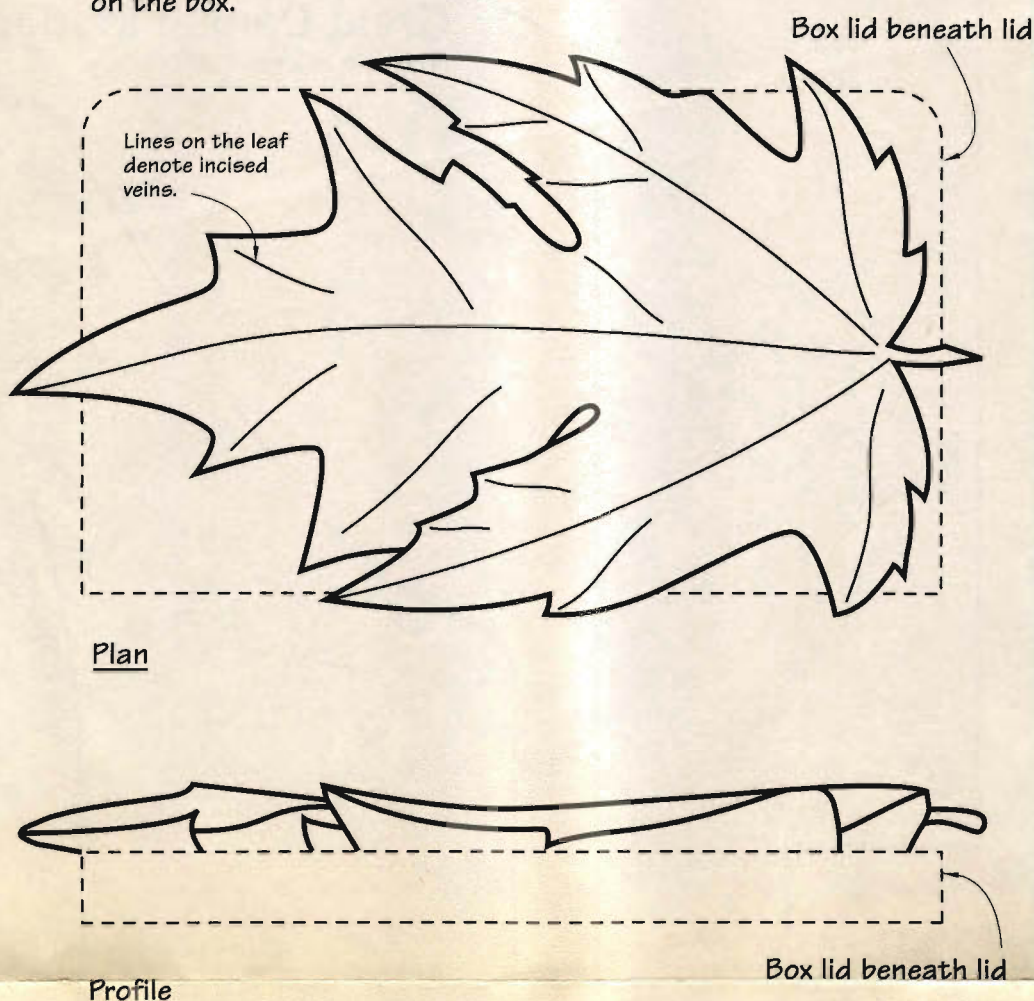
Supplemental drawings for projects in this issue

Project name	From page
Great Danish Modern Table	39
Tag Along Duck	49
Revolving Bookcase	50
Silver Maple Leaf Box	52
Queen Anne Side Tables	68

These plans incorporate pages 41 to 48 of this magazine

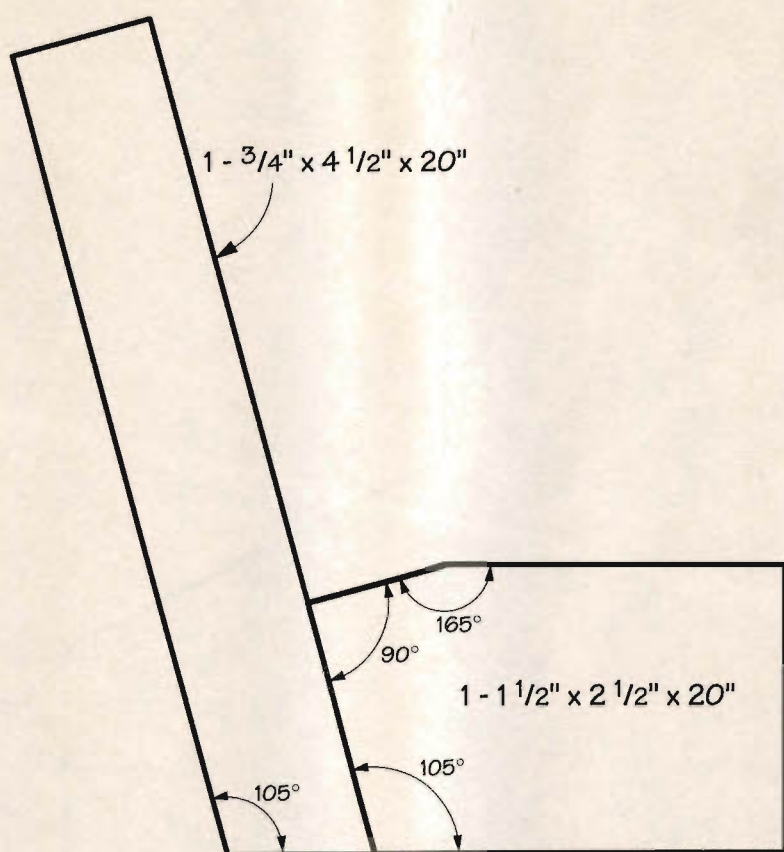
Silver Maple Leaf Box

Full-size diagram of the leaf and its location on the box.



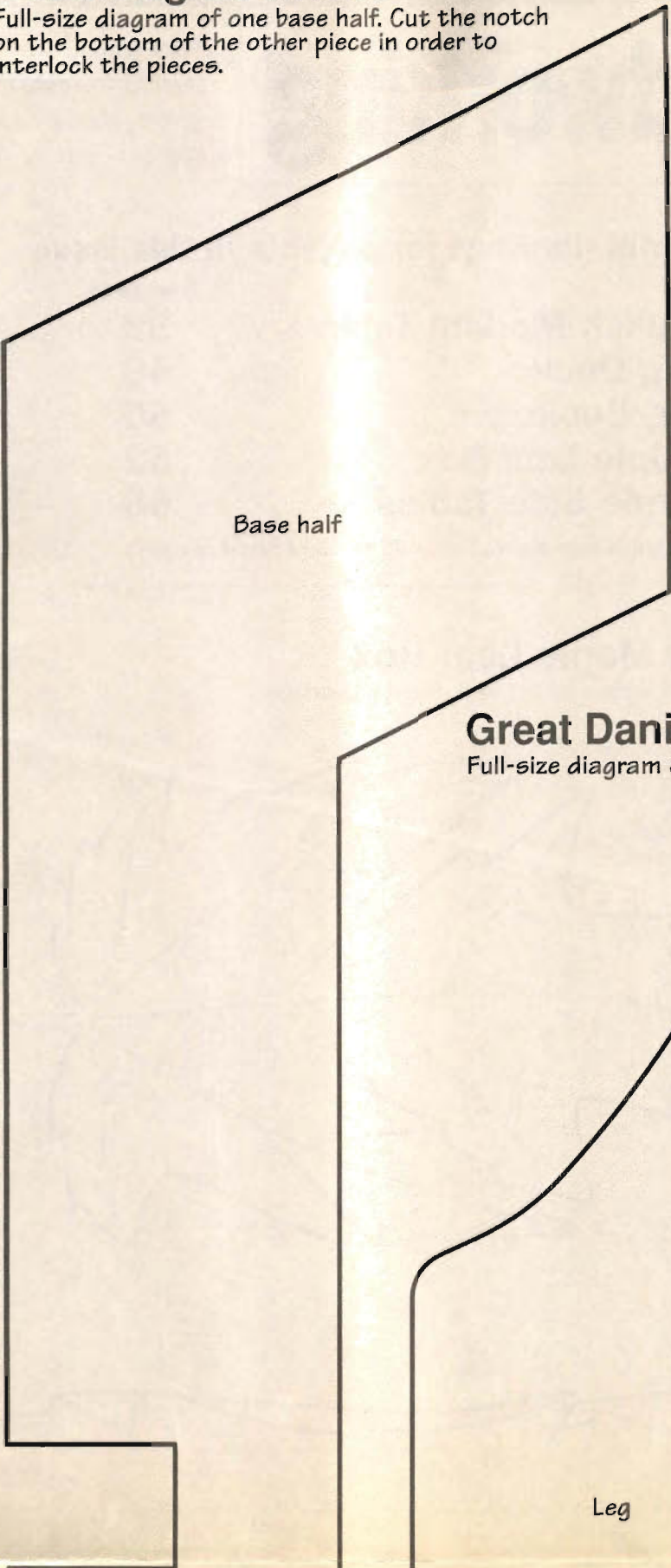
Queen Anne Side Tables

Full-size profile diagram of drilling jig for aprons.



Revolving Bookcase

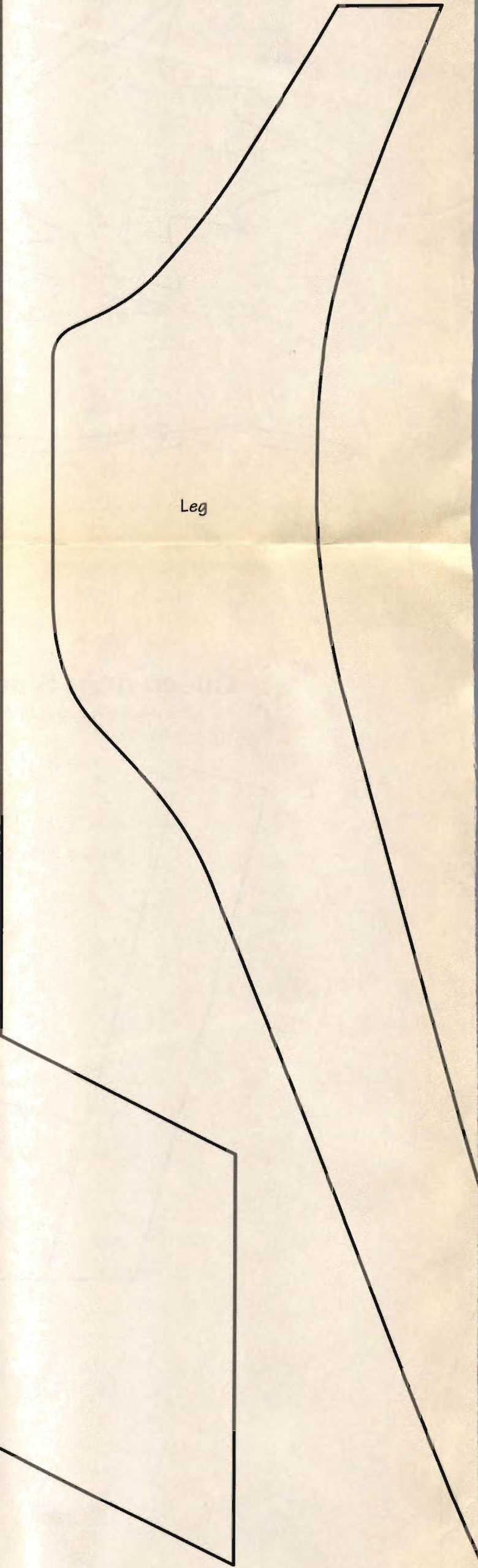
Full-size diagram of one base half. Cut the notch on the bottom of the other piece in order to interlock the pieces.



Base half

Great Danish Modern Table

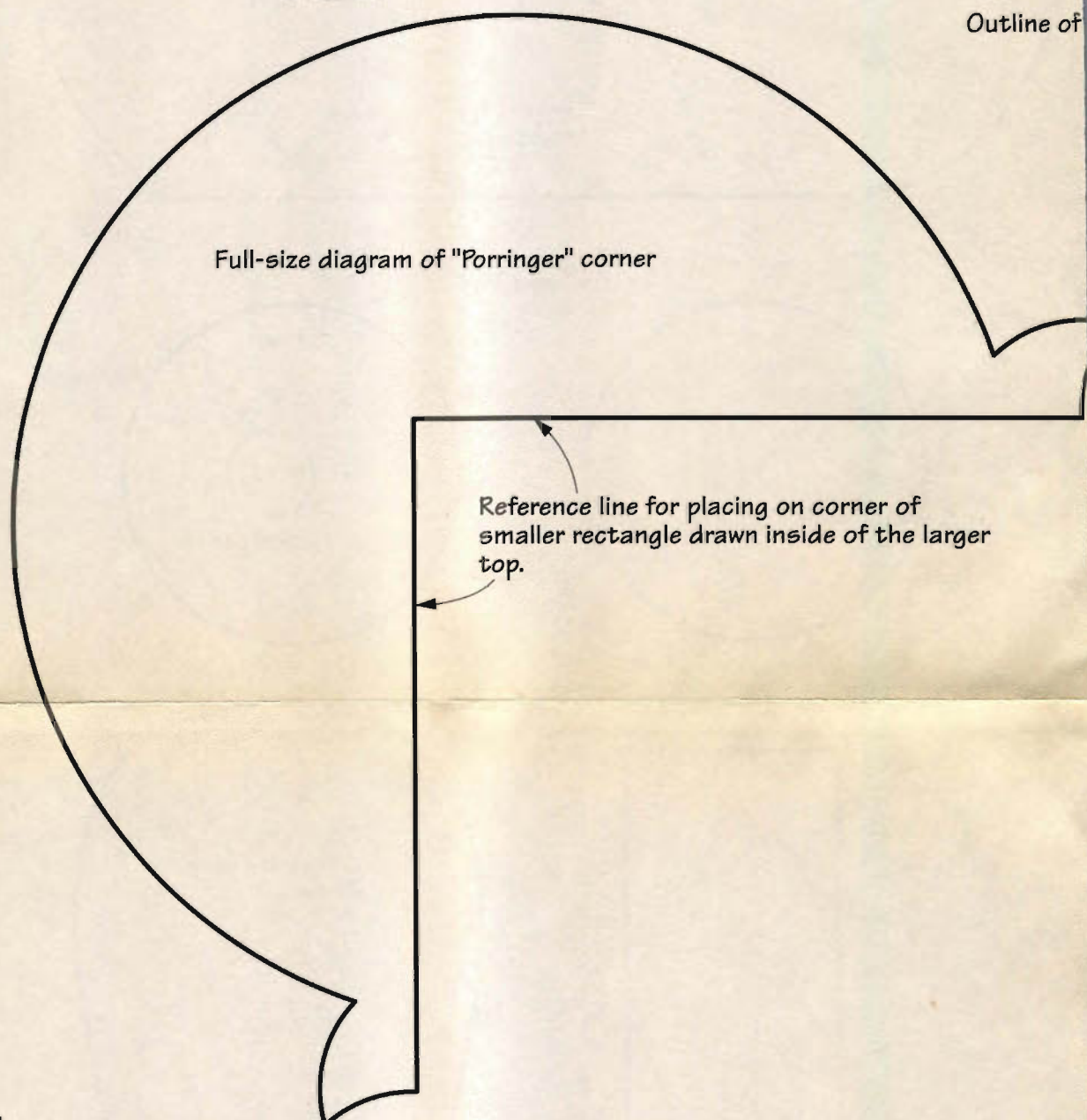
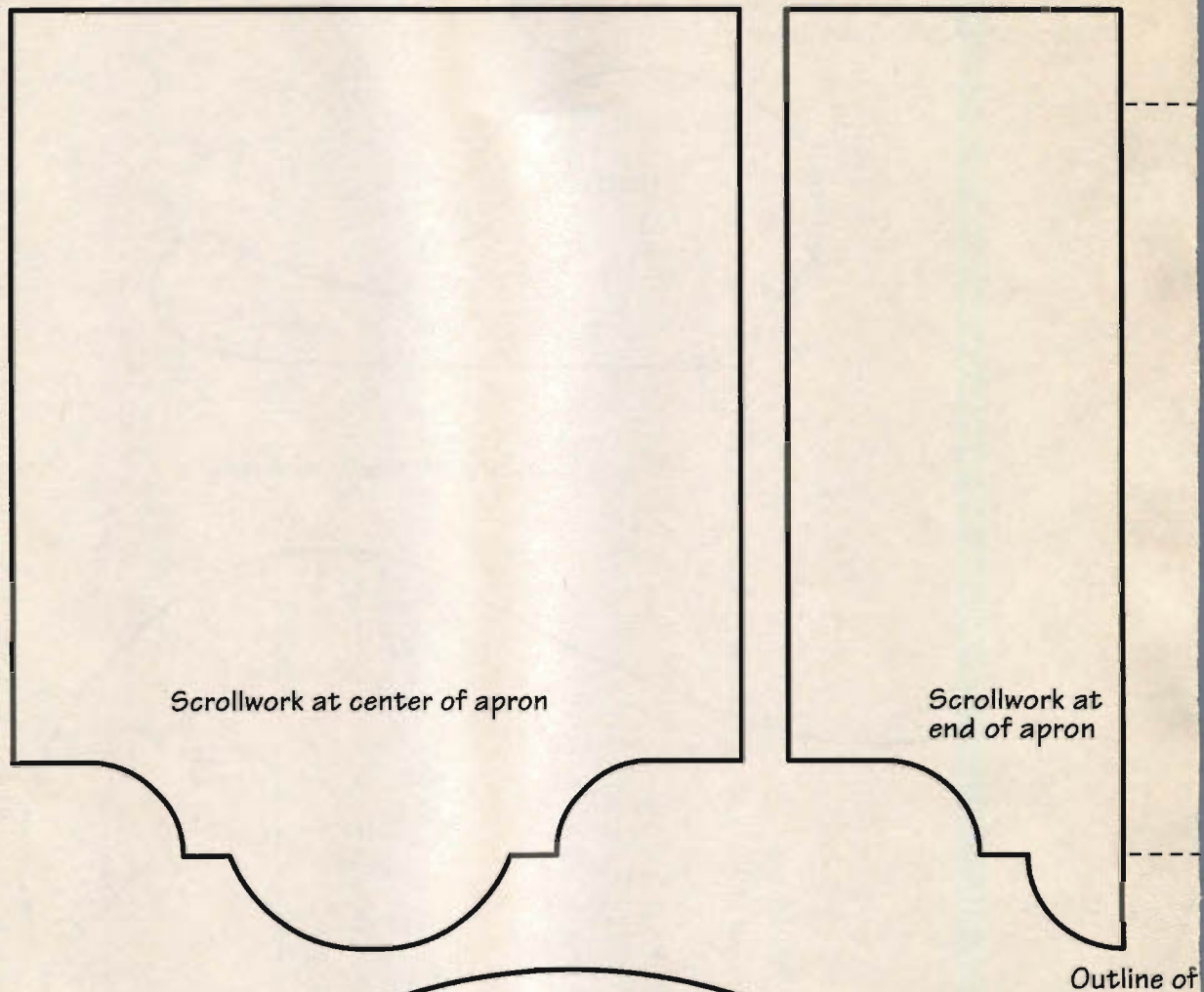
Full-size diagram of the leg.



Leg

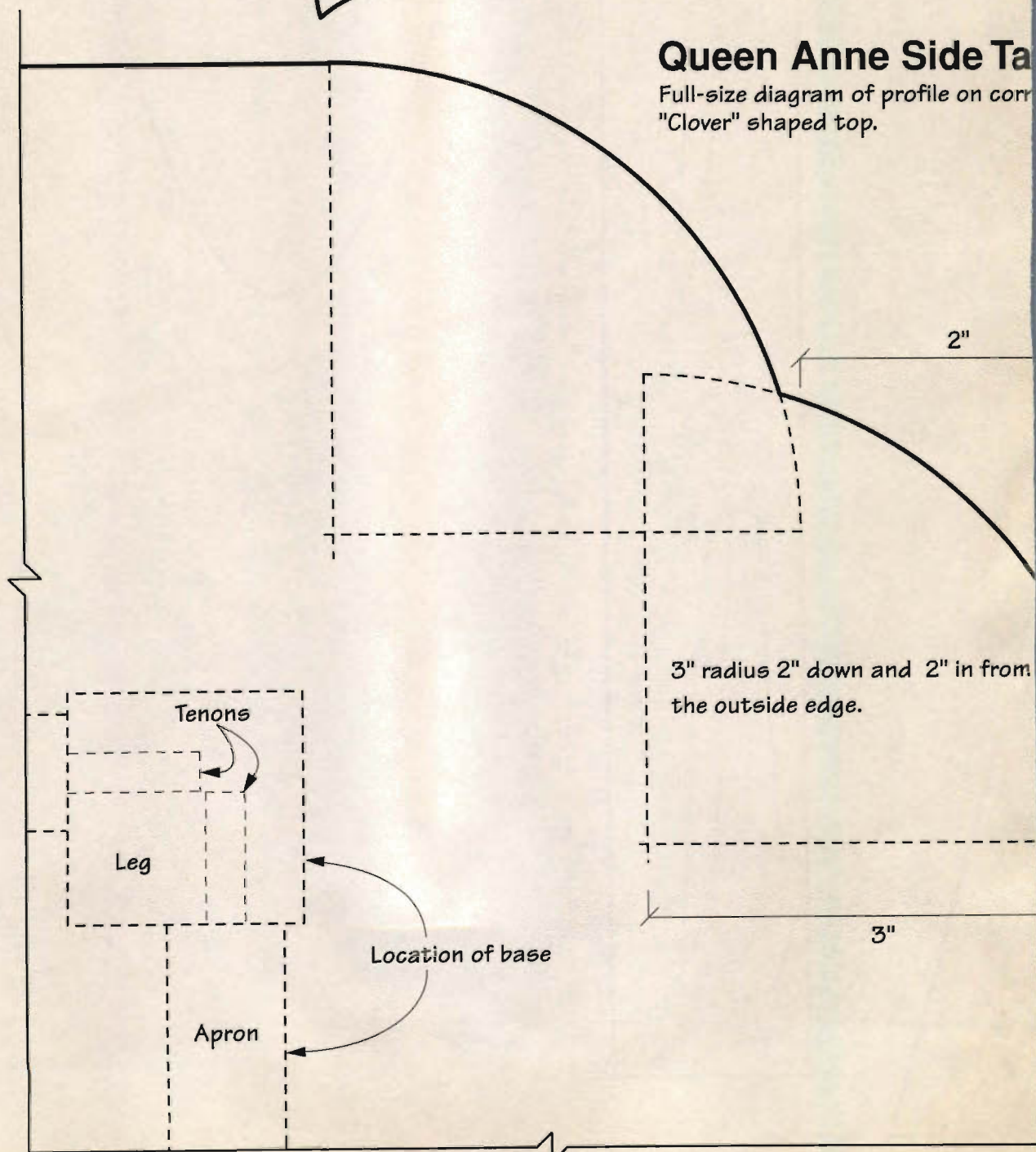
Queen Anne Side Tables

Full-size diagram of scrollwork for aprons.



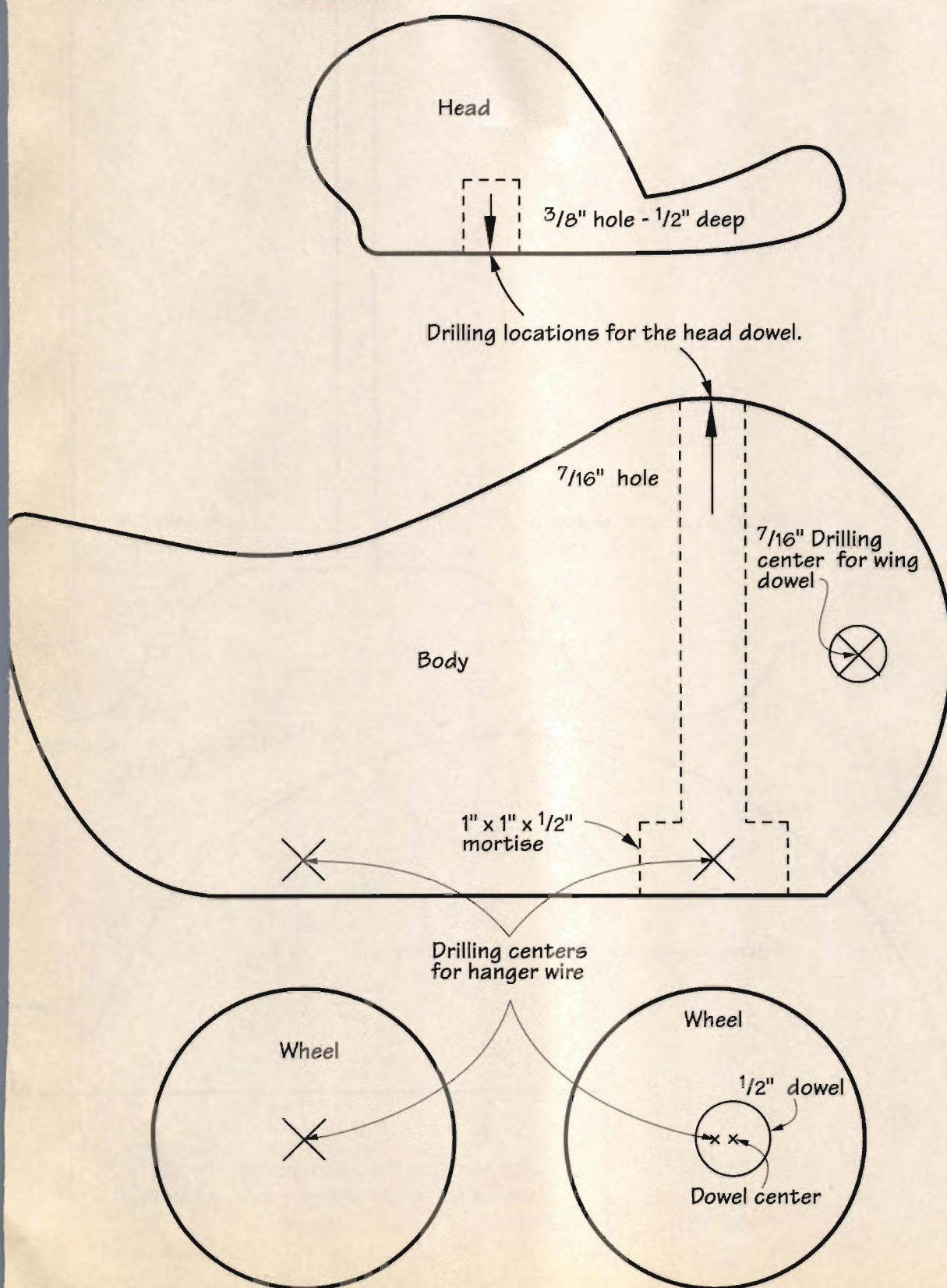
Queen Anne Side Table

Full-size diagram of profile on corner "Clover" shaped top.

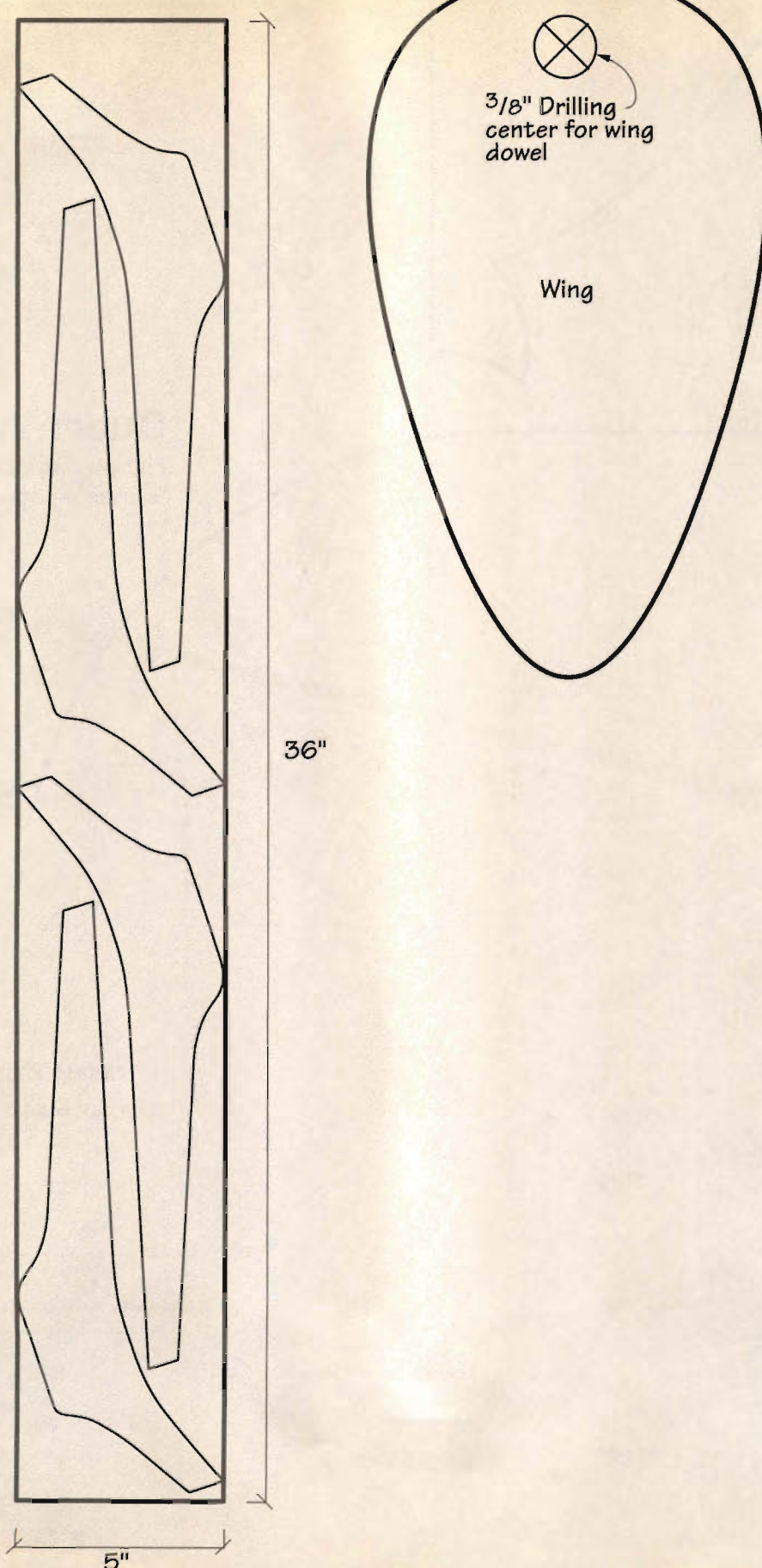


Tag Along Duck

Full-size diagram of all the body pieces with drilling locations for axles and dowels.



Optimization for table legs.



TAG-ALONG DUCK

As a little boy I had a wooden toy bus filled with dog-chewed, slobber-polished wooden passengers. I loved that bus and its unlucky crew, and unlike my plastic toys, it survives to this day. One day I was looking at the old wreck and decided my daughter needed a toy like that.

This duck is that toy. As the wheels turn, the head turns back and forth and the wings go up and down. If you've got a band saw, you can make this duck from a small but thick chunk of wood.

STEP ONE: Cut the pieces according to the Schedule of Materials and smooth the edges with sandpaper. You'll find full-size drawings of the major components in the PullOut™ Plans. I used a fly-cutter on my drill press to cut out the wheels and band sawed the rest.

STEP TWO: Cut a 1/2" deep by 1" x 1" mortise in the duck's body in the location shown in the PullOut Plans. Now

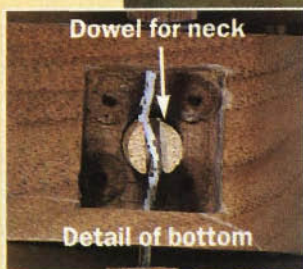
drill 7/16"-wide holes in the body for the dowels that connect the wings and support the head. Drill 3/8"-wide holes in the wings and head for the 3/8" dowels. Finally, drill 1/8" holes in the body for the axles, which I made from wire coat hangers.

STEP THREE: The front wheels are tricky. The 1/2" dowel spacers aren't centered on the wheels because their eccentricity is what makes the wings

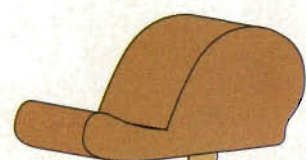
move up and down. So for the front axle, drill a 5/64" hole off-center through the ends of the spacers. Glue the spacer to the wheel with the hole in the spacer lined up with the center point of the wheel. Now make the mechanics for the head movement. Put the front axle in place in the body and bend the center about 1/8" with needlenose pliers. Cut a 5/8"-long by 3/16"-wide notch in the end of the dowel for the head. Glue the head to the dowel and put the dowel in place in the body. When you turn the axle, the head should move back and forth slightly. A small wedge locks the dowel to the front axle.

STEP FOUR: Finish all the parts with shellac — the only finish material declared edible by the FDA. Attach the wheels to the axles using epoxy. Glue the wings in place. Attach a screw eye to the front of the duck, add a string and you're ducky. **PW**

—Christopher Schwarz, PW staff

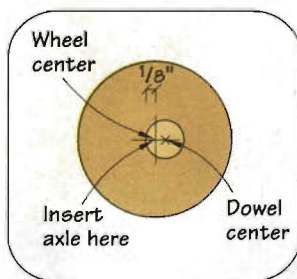


Diagrams

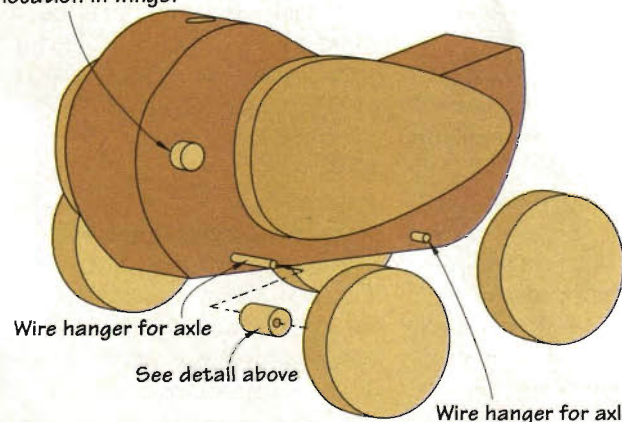


See Pull Out™ Plans for dowel location in wings.

3/16" x 5/8" notch in dowel



Detail of wheel attachment



Wire hanger for axle



Are we on target?

To see more projects like this in future issues, circle "P8" on the postage-paid card in the Resource Directory.

Schedule of Materials: Tag-Along Duck

No.	Item	Dimensions T W L	Material
1	Body	1 1/2" x 3 1/2" x 6 1/2"	Walnut
1	Head	1 1/2" x 1 5/8" x 3 3/4"	Walnut
2	Wings	3/8" x 2 1/2" x 4 1/4"	Walnut
1	Dowel for wings	3/8" x 2"	Dowel
1	Dowel for head	3/8" x 3 3/4"	Dowel
2	Spacer for wheels	1/2" diameter x 5/8"	Walnut
4	Wheels	1/2" x 2"	Walnut
1	Front axle	3"	Wire hanger
1	Rear axle	2 1/8"	Wire hanger

Revolving Bookshelf

About 1800 the reading world got a little lazy and decided it was too much trouble to walk across a room to grab a book from a built-in bookshelf. Along came a revolving bookshelf that sat next to the chair or desk. Since then the space-saving benefits of the design have been employed for storing compact discs and video tapes, as well as books.

I took the idea a little further and added a drawer and book stand, and went with a dramatic modern design. If the wood is too much for you, it works well in red oak.

Much of the piece is plywood, which is a good and affordable material for the black finish. The wood for the sides is sold as "moradillo" (or "morado") at our lumber supplier, but we've had a hard time locating it anywhere else. I think a few well-selected boards of walnut would have almost the same effect.

STEP ONE: Begin by cutting all the pieces to the sizes in the Schedule of Materials. Construction is a little more complex than a simple box. The four "centers" are arranged into a plus sign (see the diagram). This plus sign is attached to the base at the bottom and to a box with a drawer at the top. The shelves are biscuited into the four centers and the outside panels are biscuited to the centers and the shelves. Most of the joinery for the project uses biscuits, but dowels or carefully placed, set and plugged nails would work, too. To prepare the centers for assembly, first cut $\frac{3}{4}$ " x $\frac{3}{8}$ " deep grooves $\frac{3}{4}$ " in from the back edge of each center piece on one face.

STEP TWO: Now prepare the shelves and base piece. Cut about 12' of poplar edging $\frac{1}{4}$ " x $\frac{13}{16}$ " and cross cut the pieces to fit the front edge of each of the shelves and the four edges of the bot-

tom. Glue the edges on and allow them to hang over on all four sides to allow for trimming.

STEP THREE: Before any assembly, lay out the location for all the shelves and mark and cut biscuit pockets. Each shelf has pockets on two long and one short edge. The lower shelf is 12" up from the bottom. The upper shelf is 10" up from that. Wait to cut the pockets in the sides until the inner section is assembled to check the locations.

STEP FOUR: With all the biscuit pockets cut, glue and clamp the centers together to form the plus sign.

STEP FIVE: Next glue the shelves in place. When complete, center the as-

sembly on the bottom and mark the location. Then remove the assembly and drill two clearance holes per center panel in the bottom. Attach the bottom using #8 x $1\frac{1}{2}$ " flat-head screws.

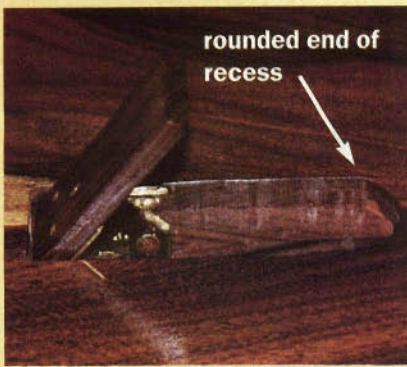
STEP SIX: Now make the box that goes on top of the bookshelf. Locate and attach one of the inside tops to the top of the assembly as with the bottom. Use biscuits to assemble the drawer box atop the center assembly. The sides of the box should extend below the inside top by $\frac{1}{8}$ ". This will be important as the extra $\frac{1}{8}$ " will serve as the finger pull for the drawer, so locate the biscuits accordingly. First biscuit and glue two corner blocks to the back piece, and one block each to the front end of each side piece. Then glue the two sides to the upper and lower inside top panels. Now glue the back in place.

STEP SEVEN: Next build the drawer. I simply butt-nailed the ends between the sides. The bottom is captured in a $\frac{1}{4}$ " groove cut $\frac{1}{8}$ " up from the bottom of the sides and ends. Next, cut and fit the drawer front and screw it to the drawer. Check the fit between the two end blocks.

STEP EIGHT: Next make the base. Cut the two base pieces to the shape shown in the PullOut™ Plans. Sand the pieces of the base and assemble with a $1\frac{1}{2}$ " flathead screw through the half-lap joint. Cut the book stop for the top and round over the two ends.

STEP NINE: The top becomes a book rest. It is hinged on one side, and a hinged top support recessed into the underside of the top props the top up. First mark a $1\frac{1}{8}$ " x $3\frac{1}{2}$ " recess on the underside of the top 2" in from the top edge and centered side-to-side. Remove enough material to form the $\frac{5}{8}$ "-deep recess, (see detail photo). Then mount the support in the recess with a jewelry box hinge.





rounded end of recess



Detail of support bracket and recess cut into the underside of the top (left), and hinge recess at the front near the drawer shown fully opened (right).

When the lid is laid flat, the support will fold up invisibly under the top. The top itself is attached at the front two corner blocks by $\frac{1}{2}$ " jewelry box hinges mortised into the top of the blocks.

STEP TEN: If you choose to use the black lacquer finish, now is the time to paint or spray. Tape off the corner blocks

and the edges of the center panels and shelves where the side panels will attach. If these edges aren't taped off, the glue will not adhere properly when the sides are attached. Paint the case, the base and the book stop. I went ahead and painted the entire drawer, then added a couple of coats of clear lacquer to pro-

tect the black finish.

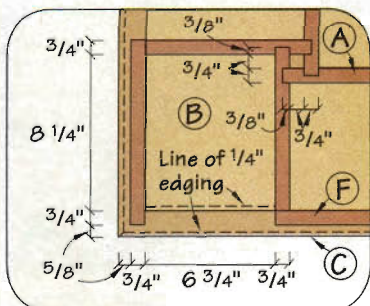
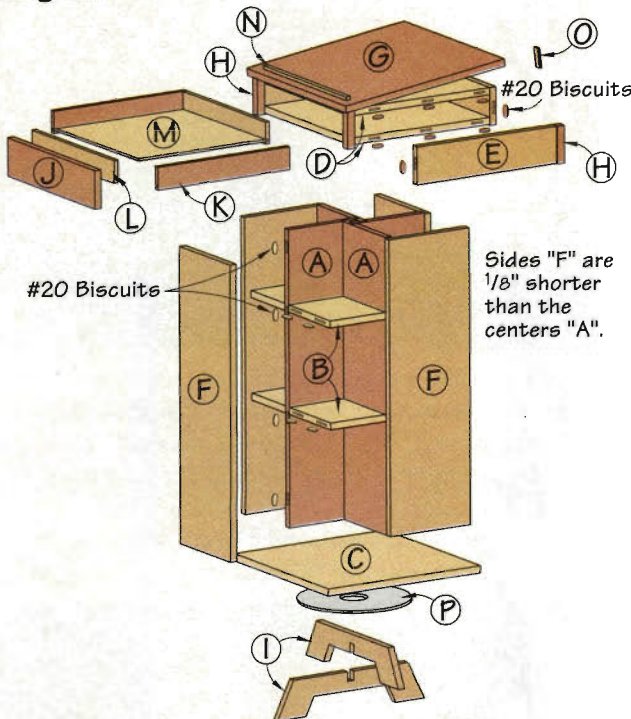
STEP ELEVEN: Next fit and cut the biscuit locations on the inside of the moradillo panels. Then tape over the glue locations on the panels and put a couple coats of clear finish on the loose side panels and the top.

STEP TWELVE: Assemble the bookcase by first attaching the swivel plate to the base. Turn the bookcase upside down and attach the base and swivel. Now remove the tape from the glue surfaces and glue the side panels to the case.

STEP THIRTEEN: Depending on your finish, you might want to add another coat of clear finish to the assembled case at this time. The last step is to drill clearance holes through the top to attach the book stop, then attach the hinges and mount the top in place. **PW**

— David Thiel, PW staff

Diagrams



Detail of center assembly

Schedule of Materials: Revolving Bookshelf

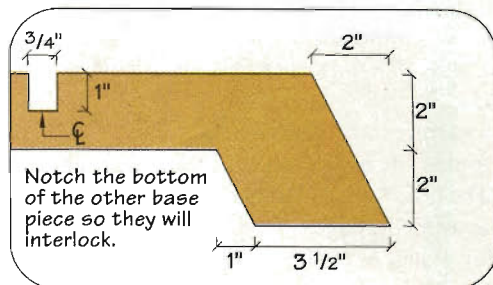
No.	Ltr.	Item	Dimensions T W L	Material
4	A	Centers	$\frac{3}{4}$ " x $8\frac{5}{8}$ " x $31\frac{1}{2}$ "	Plywood
8	B	Shelves	$\frac{3}{4}$ " x $6\frac{3}{4}$ " x 8"*	Plywood
1	C	Bottom	$\frac{3}{4}$ " x 18" x 18"*	Plywood
2	D	Inside tops	$\frac{3}{4}$ " x 17" x 17"	Plywood
3	E	Upper sides	$\frac{3}{4}$ " x 4" x 17"	Plywood
4	F	Sides	$\frac{3}{4}$ " x $9\frac{3}{4}$ " x $31\frac{3}{8}$ "	Moradillo
1	G	Top	$\frac{3}{4}$ " x $19\frac{1}{2}$ " x $19\frac{1}{2}$ "	Moradillo
4	H	Corner blocks	$\frac{7}{8}$ " x $\frac{7}{8}$ " x 4"	Moradillo
2	I	Base halves	$\frac{3}{4}$ " x 4" x 18"	Poplar
1	J	Drawer front	$\frac{3}{4}$ " x 4" x $16\frac{7}{8}$ "	Poplar
2	K	Drawer sides	$\frac{1}{2}$ " x $2\frac{3}{8}$ " x 16"	Baltic ply
2	L	Drawer ends	$\frac{1}{2}$ " x $2\frac{3}{8}$ " x $15\frac{15}{16}$ "	Baltic ply
1	M	Drawer bottom	$\frac{1}{4}$ " x $15\frac{1}{2}$ " x $16\frac{1}{2}$ "	Plywood
1	N	Book stop	$\frac{1}{2}$ " x $\frac{1}{2}$ " x 12"	Poplar
1	O	Top support	$\frac{3}{8}$ " x 1" x $2\frac{1}{2}$ "	Moradillo
1	P	12" swivel platform		

*Size of the bottom and shelves before gluing on $\frac{1}{4}$ "-thick solid poplar edging. The $6\frac{3}{4}$ " edge on the shelves and the bottom has edging glued to all four edges.



Are we on target?

To see more projects like this in future issues, circle "P10" on the postage-paid card in the Resource Directory.



Detail of base cutout

Silver Maple Leaf Box



A great project for the beginning carver or someone who loves trees.

I'VE ALWAYS HAD an affinity for trees, and I've never grown tired of picking up a leaf simply to get a better look at its natural beauty. To me, leaves are among the finest examples of perfection in nature. Their shape, color, texture and vein structure have given me an infinite number of ideas for wood carvings.

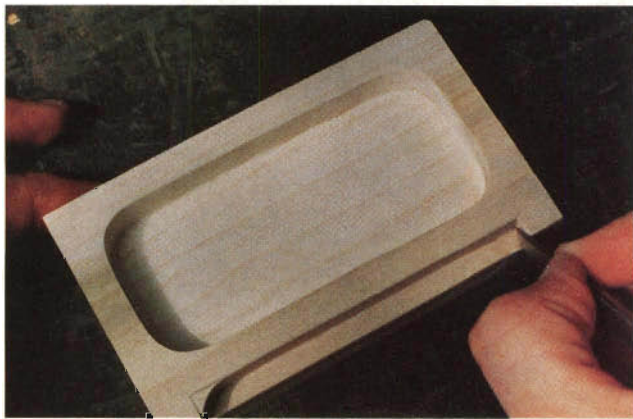
The project shown is a tiny box with a silver maple leaf carved on the lid. I designed it specifically to hold a few precious objects such as earrings, wedding bands or coins.

Please note that this box uses small, precision shop-made hinges. I found out early on that it takes my full concentration (not to mention patience) to complete one of these boxes. So take periodic breaks. But I think you'll find your labor was well spent when you see the finished product: a flawlessly operating hinge, a glass-like finish and a humble tribute to the wonders of nature.

Begin construction by cutting a $\frac{3}{4}$ " x $2\frac{5}{8}$ " x $4\frac{1}{2}$ " blank for the bottom of the box. Then cut a $\frac{3}{4}$ " x 3" x $5\frac{1}{4}$ " blank for the lid. The lid is initially larger because the leaf will eventually "hang over" the edges of the lid. Place the lid blank on top of the lower half of the box and note the end grain. Both top and bottom pieces should be oriented so the heartwood is

facing down. Make a pencil mark on both pieces to remember the correct orientation. Next, hand sand or plane the mating faces of the blanks flat. Test-fit the pieces; there should be only the slightest gap (if any) between the lid and bottom.

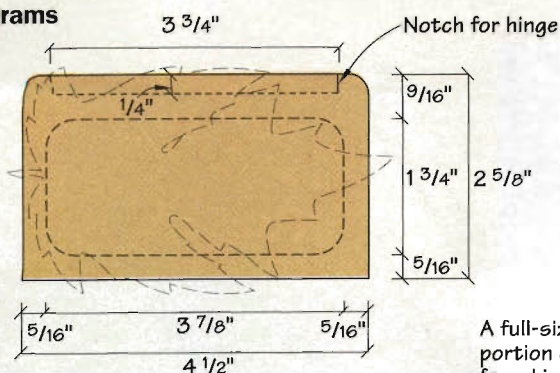
STEP 1 Prepare the Box Bottom • Draw the opening for the $\frac{9}{16}$ " deep x $1\frac{3}{4}$ " x $3\frac{7}{8}$ " cavity in the box bottom as



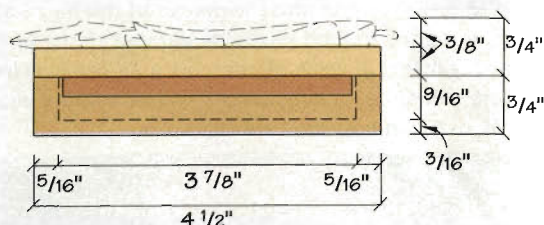
1 SQUARE THE EDGES • Carefully remove any remaining waste material from the hinge recess on the box bottom with a chisel or knife. The edges should be square after removing the waste the router couldn't reach.

Mark E. Elfman retired from the military in 1994 and now works with wood full time.

Diagrams

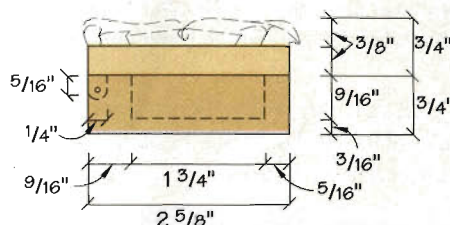


Plan



Elevation (rear)

A full-size diagram of the carved portion of the box can be found in the PullOut™ Plans.



Profile

Schedule of Materials: Leaf Box

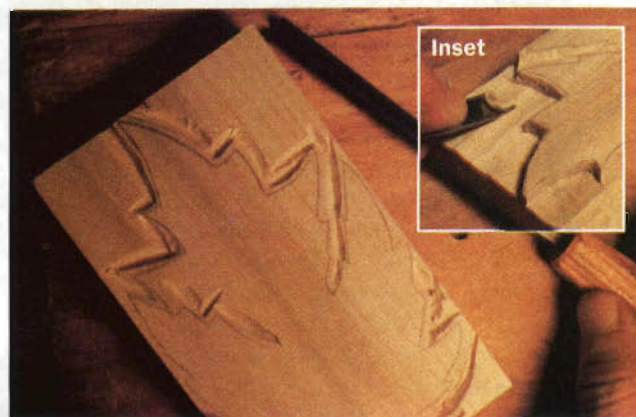
No.	Item	Dimensions T W L	Material
1	Bottom	3/4" x 2 5/8" x 4 1/2"	Soft maple
1	Lid	3/4" x 3" x 5 1/4"	Soft maple
2	Brass pins	3/64" x 5/8"	Brass
1	Hinge strip	1/4" x 5/16" x 3 11/16"	Soft maple



To see more projects like this in future issues, circle "P5" on the postage-paid card in the Resource Directory.

shown in the drawing. Remove all the waste material with a router. Next, mark the $\frac{1}{4}$ " x $\frac{5}{16}$ " x $3\frac{3}{4}$ " hinge recess on the box's bottom. Using a router and a $\frac{1}{4}$ " straight router bit, carefully remove the waste material. Any remaining waste should be removed by hand as shown in the photo.

STEP 2 Shape the Lid • Trace the leaf shape in the PullOut™ Plans on the lid and relieve the leaf by removing the background. A rotary tool with a small bit helps in the tight places. Now use a No. 7 or No. 8 gouge to begin modeling the contours of the leaf. Keep in mind that you can substitute other carving gouges if you don't have the exact ones specified here in the text. A good way to start is by gouging a deep line along the center of the leaf from stem to tip. This way, you are allowing the sides of the leaf to "curl up" slightly. Don't be afraid to carve some points facing down, straight or curved.



2 BEGIN CARVING • Use a V-tool and outline the leaf, leaving about $\frac{1}{8}$ " between the tool's edge and leaf. Cut away the background to a depth of no more than $\frac{1}{2}$ " using a chisel and gouges (a router with a $\frac{1}{4}$ " straight bit will also help).

Use the photos as a guide to carving.

After a rough modeling of the leaf, use a No. 3 fishtail gouge or No. 5 gouge to flatten the sharp recesses left by the previous gouges. Using a V-tool, incise the veins on the leaf. Next, sand the background of the lid as flat as possible using home-made sanding sticks to reach into the nooks and crannies. Sanding sticks are easily constructed by cutting a piece of $\frac{1}{4}$ " dowel to the desired length and attaching a small piece of sandpaper to the end with glue. An arrow-shaped piece of sandpaper makes reaching under the edges of the leaf considerably easier.

STEP 3 Trim the Lid • This will allow the leaf to "hang over" the sides of the box. Turn the lid upside down and put the box bottom on the lid, centering it. Trace the outline of the bottom on the lid. See photo for details on cutting the lid



3 CREATING HANG-OVER • To trim the lid, adjust the depth of the table saw to the thickness of the lid's background. Remove the edges of the background, leaving the extremities of the leaf to hang over the edges. The blade should touch only the underside of the leaf.

LEAF BOX



4 MAKE THE HINGE STRIP • The hinge strip is marked for rounding-over by sanding. Go slowly! When done right, there will be absolutely no play in the movement of the lid.

with the table saw. After cutting, lay the lid on top of the box bottom; the flat sides of the lid should now be almost flush with the sides of the lower half of the box.

STEP 4 Attach the Hinge • Cut the small strip for the hinge. Round over the edges on one narrow side of the strip using sandpaper. See photo for desired shape. Next, carefully sand one end of the hinge strip until it fits perfectly in the hinge recess of the box bottom. Place the hinge strip in the recess on the box bottom, with the flat edge of the hinge strip toward the lid. Place the lid on top, align and draw a pencil mark across any point where the hinge strip meets the lid (you'll later use these marks to align the hinge strip and lid). Remove the lid and hinge strip. Attach the flat edge of the hinge to the bottom of the lid using glue and two small brass pins for added strength, being extremely careful to align the pencil marks you made previously. Allow the glue to dry.

STEP 5 Assemble the Box • Place the lid on the lower half of the box and clamp both halves together with just enough pressure to keep the halves from moving. Sand all four sides of the box.

Round over the rear vertical corners of the box to about a $\frac{1}{4}$ " radius. Draw crosshairs on both ends of the lower half of the box where you will drill holes for the hinge pins. Using a miniature 2mm gouge (or veiner), remove a tiny chip from the center of the marks you made. Save these chips, because they will be used later to cover the ends of the hinge pins. If you don't have a miniature gouge or veiner, simply drill the holes that you can plug later with tiny homemade tapered dowels. Next, use a wire-gauge $\frac{3}{64}$ " drill bit in a pin vise and carefully drill holes in the center of the crosshairs you drew (where the chips were removed). Drill all the way into the wooden hinge strip, for a total depth of about $\frac{5}{8}$ ". Insert the brass hinge pins for a test fit.

STEP 6 Test Hinge and Finish • Test the movement of the lid as shown in the picture and caption. Next, remove the hinge pins. Do a final sanding on the inside surfaces of box and lid. Trim the hinge pins so when they're inserted, the ends are recessed about $\frac{1}{32}$ " from the outer edge of the hole. Assemble the box, using a slender scratch awl to seat the hinge pins. Glue in



5 DRILL CAREFULLY • When drilling, keep in mind that you're trying to drill into the center of the hinge strip, so try to keep the drill bit perfectly parallel to the hinge. Temporarily insert lengths of brass wire all the way into each hole you drilled, being careful to leave some wire exposed so it can be pulled out later.

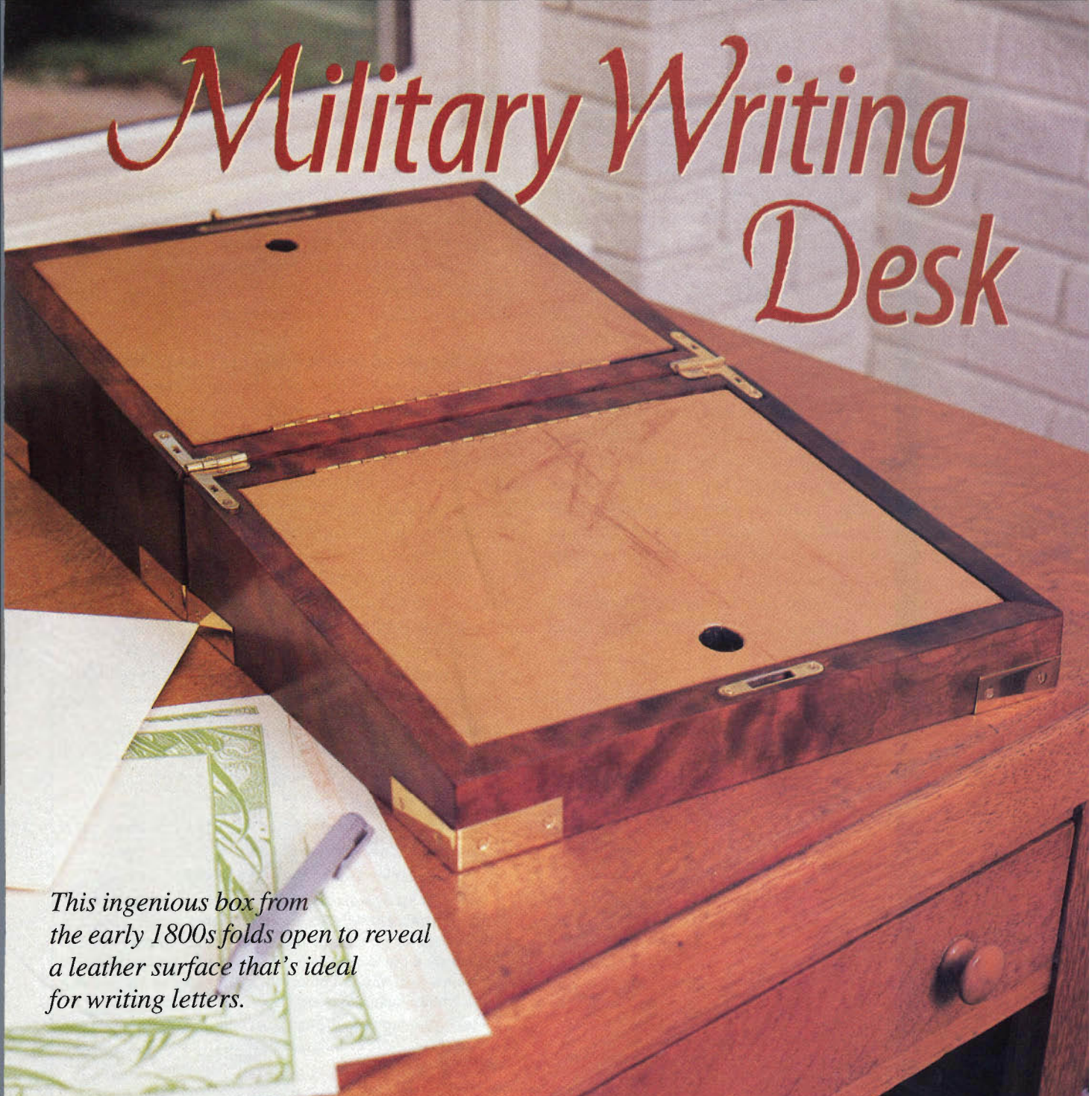


6 CHECK THE LID • The lid should open freely, with no dragging or binding, to approximately 90 degrees. If the movement is rough, try to determine where the pinching is occurring. The problem is usually the rounded edge of the hinge rubbing against the inside of the hinge recess. In this case, use a small chisel to remove minute shavings from the inside of the hinge recess until the movement of the lid is flawless.

the chips you removed from the hinge holes, carefully aligning the grain. When the glue has dried, sand the chips flush.

Coat the entire box with boiled linseed oil or tung oil. Allow it to dry overnight. If needed, give the box a light sanding with 400 grit paper before coating with a spray or brushing lacquer. Alternatively, use a good polyurethane finish. I normally brush on three coats. Do not put a finish coat on the inside of the box, as this will impede the proper closing of the lid. For the truly meticulous craftsman, the final finish can be rubbed out to a glass-like sheen: First, lightly sand the thoroughly dried finish with 600-grit wet/dry paper. Next, use fine pumice powder on a piece of felt moistened with water or oil to rub out the marks left by the sandpaper. Go slowly, and keep checking to make sure you're not abrading through the finish to bare wood. Finally, use the finest grit auto rubbing compound available, such as a "clear coat" rubbing compound, to apply the final gloss. **PW**

Military Writing Desk



This ingenious box from the early 1800s folds open to reveal a leather surface that's ideal for writing letters.

LIKE A LOT OF AMERICANS, I've recently been stricken with Lewis & Clark fever. I devoured the book "Undaunted Courage," watched the PBS special and am now wondering if my wife will let me hike the Lolo Trail. As you probably learned in history class, the primary record of Lewis and Clark's amazing trek to the mouth of the Columbia River is Meriwether Lewis' journal, which was a meticulous account of the flora and fauna they encountered on their trip.

How, I wondered, did explorers write their journals while blazing through the West? I haven't been able to find the answer to that question, but this desk is an educated guess. Traveling

writing desks were common among British and American military officers of the day. They wrote their orders and journals on their portable desks, and when it was time to move the ranks, the desk was packed up and moved with the men.

This desk is an adaptation of a British military officer's desk from the early 19th century. And while you might not be writing orders to your left flank on this desk, it is quite handy for keeping up with all your correspondence. Personal or monarch-sized stationery stores in the area below the top; and pens, paper clips and envelopes fit nicely in the bottom section. Best of all, this project requires very little material. I made this one out of a 5'-long board of figured cherry. The originals were commonly built using mahogany.

By Christopher Schwarz, managing editor, Popular Woodworking.

STEP 1 Building the Box • The writing desk is essentially a box that has been cut on a diagonal line so that when it opens up, it forms a slanted writing surface. Now, a lot of box makers prefer gluing up a box and then cutting the thing apart on the table saw to separate the lid from the base. That won't work here. Because the cut is on the diagonal, you either have to build the two parts separately (as I did) or glue up the box and cut the two pieces apart on a band saw that has a generous resawing capacity.

The box itself is simple. The four sides are mitered and then glued together using biscuit joints and polyurethane glue. The top and bottom are merely raised panels captured in a groove in the sides.

Begin by cutting your pieces to the sizes shown in the Schedule of Materials. Next cut the miters on the ends of the four pieces as shown in the photo. Now, cut the $\frac{3}{8}$ "-deep x $\frac{1}{4}$ "-wide groove along the top and bottom edges of all four sides with a dado stack in your table saw. The groove should begin $\frac{5}{16}$ " from each edge. This will recess your $\frac{1}{2}$ "-thick panels $\frac{1}{16}$ " in from the edges and will keep the panels from rubbing against table tops.

Now cut the panels to finished size and raise them using either a table saw or router in a router table. You want the edges to finish out at about $\frac{3}{16}$ " thick.

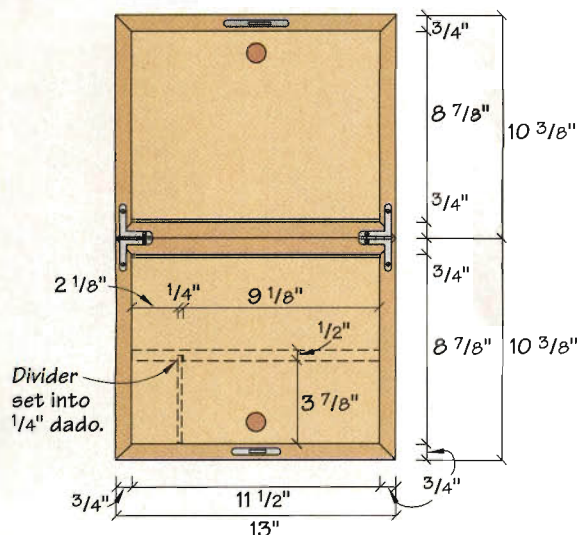
STEP 2 Cutting the Angles • The trick to cutting the two short sides at an angle is to make sure that the cut begins in the dead center of the back of the board. That's because you want your desk to lay flat when you open it. Set your table saw's tapering jig to 9 degrees and try your setup with some scrap first. When satisfied, cut the short sides.

Now set your table saw's blade to 9 degrees and rip the long sides. This will allow the long sides to mate with the angled short sides. You absolutely must test your setup with scrap pieces before you make these cuts.

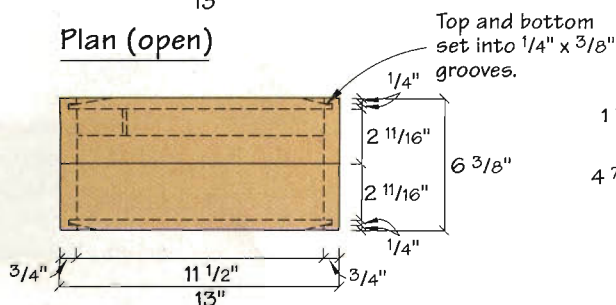
STEP 3 Biscuits All Around • Except for two of the corners, a #10 biscuit will fit on all of the miters. I used a mini-biscuit cutter for the two narrow sides. You could use dowels instead. Cut all the slots for the biscuits, then dry-assemble the two boxes. When satisfied with the fit, sand everything, especially the two panels and the parts that face inside the box. I started with 120 grit sandpaper and finished with 220.

Here are some tips for gluing up the top and bottom: First, polyurethane glue is an excellent choice for this short-grain joint. Just make sure you dip each biscuit in water before putting it in its slot and be sure to add a little water to each joint to speed up the curing. Polyurethane glue has a long open time, so you have plenty of time to get your clamps just right. When all of your miters are tight, measure each box corner to corner to make

Diagrams



Plan (open)



Elevation (closed)

Schedule of Materials: Writing Desk

No.	Item	Dimensions T W L	Material
2	Front & back	$\frac{3}{4}$ " x $6\frac{1}{2}$ "* x 13"	Cherry
2	Sides	$\frac{3}{4}$ " x $6\frac{1}{2}$ "* x $10\frac{3}{8}$ "	Cherry
2	Top & bottom	$\frac{1}{2}$ " x $9\frac{1}{2}$ " x $12\frac{1}{8}$ "	Cherry
2	Interior panels	$\frac{3}{8}$ " x $8\frac{3}{4}$ " x $11\frac{3}{8}$ "	Baltic birch
1	Envelope divider	$\frac{1}{2}$ " x $1\frac{3}{8}$ " x $11\frac{1}{2}$ "	Cherry
1	Paper clip divider	$\frac{1}{4}$ " x $1\frac{3}{8}$ " x $4\frac{1}{8}$ "	Cherry

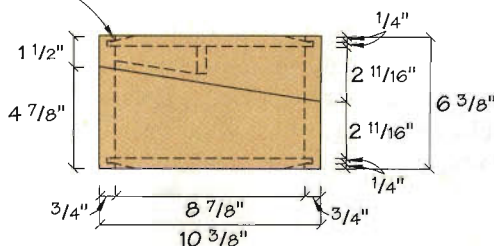
Hardware kit available from Woodcraft Supply: 800-225-1153. Kit# 129253, \$59.99 plus shipping and handling. Hardware kit includes all the hinges you need, the chest straps and the lock. Woodcraft also carries adjustable ball catches (#27H39, \$2.50 each), which work well for holding the interior panels in place.

*Measurement includes $\frac{1}{8}$ " kerf to separate lid and bottom.

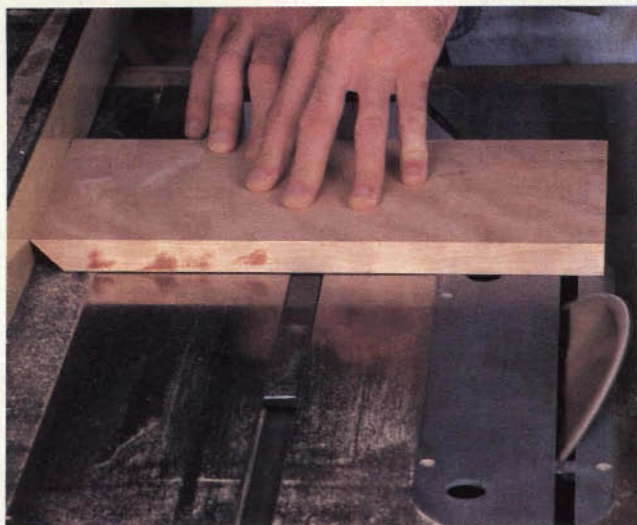


Are we on target?

To see more projects like this in future issues, circle "P2" on the postage-paid card in the Resource Directory.



Profile (closed)



1 MITERS • I cut my miters on the table saw, though you can use a chop saw if you please. Normally you're not supposed to use your rip fence and miter gauge simultaneously, but this is an exception. Set your saw's blade to a 45-degree angle and set your rip fence a little longer than the finished length of the board you're cutting. Now mark on your board the finished length of the piece. Make the cut with your saw, then move the rip fence in a little bit until the blade cuts right to the mark. Now turn the piece of wood around and cut the opposite side. Repeat this process for the smaller sides.

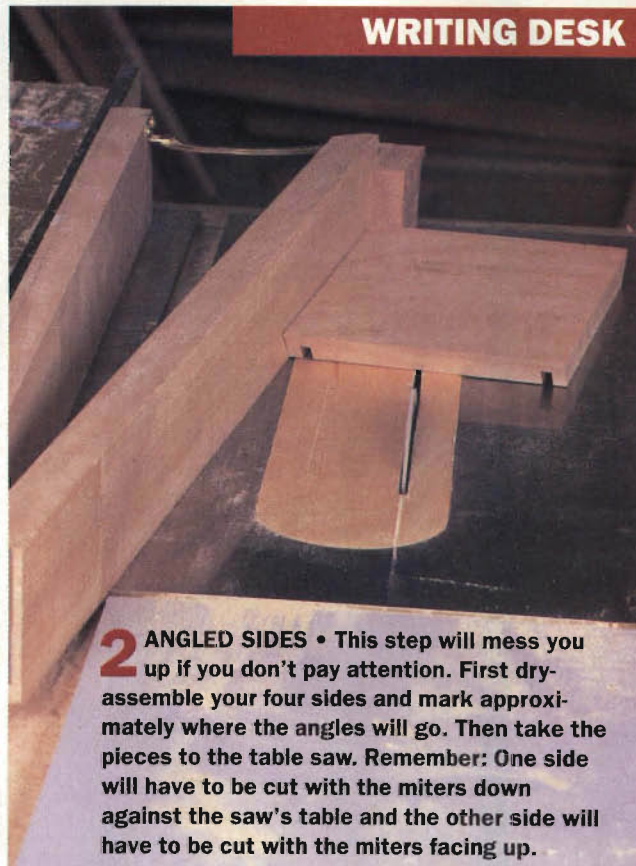
sure everything is square. Allow the glue to cure overnight.

Now glue some pieces of smooth leather or felt to the two interior panels. Yellow glue works fine. I attached the leather using the same method many woodworkers use to glue up veneer, sandwiching the leather between two panels. Attach small piano hinges to one of the long edges of each panel and attach them to the inside of the box. Add small stops inside the box to support each panel. I cut a $\frac{7}{8}$ " hole in each panel so I can easily open the two compartments in the box. To hold the panels in place when you close the box, I highly recommend buying a couple adjustable ball catches (available in most woodworking catalogs for about \$2.50 each). Really, though, you also could use almost any other cabinet catch.

Now it's time to join the two boxes using quadrant hinges. Most quadrant hinges have a metal bar that runs between the two leaves to prevent people from opening a box's lid too far. Remove or cut these small bars off; you want your hinges to open all the way. Now attach the chest straps to the outside corners of the box so that when you attach your hinges you've taken into account the space the straps will add. Trust me, it's important. Mortise the quadrant hinges into the top and bottom. Close the box and sand your joints flush.

Shape and then glue the envelope divider and paper clip divider in place in the shallow side. Mortise a chest lock into the top and bottom. Remove all the hardware and begin finishing. I used a water-based aniline dye (J.E. Moser's Light Sheraton Mahogany, available from Woodworker's Supply, 800-645-9292, #W1330) and followed that with two coats of clear finish. Then I wiped on a thin coat of warm brown glaze to remove some of the orange color of the red finish. Finally, I added another two coats of clear finish, sanding between

WRITING DESK



2 ANGLED SIDES • This step will mess you up if you don't pay attention. First dry-assemble your four sides and mark approximately where the angles will go. Then take the pieces to the table saw. Remember: One side will have to be cut with the miters down against the saw's table and the other side will have to be cut with the miters facing up.



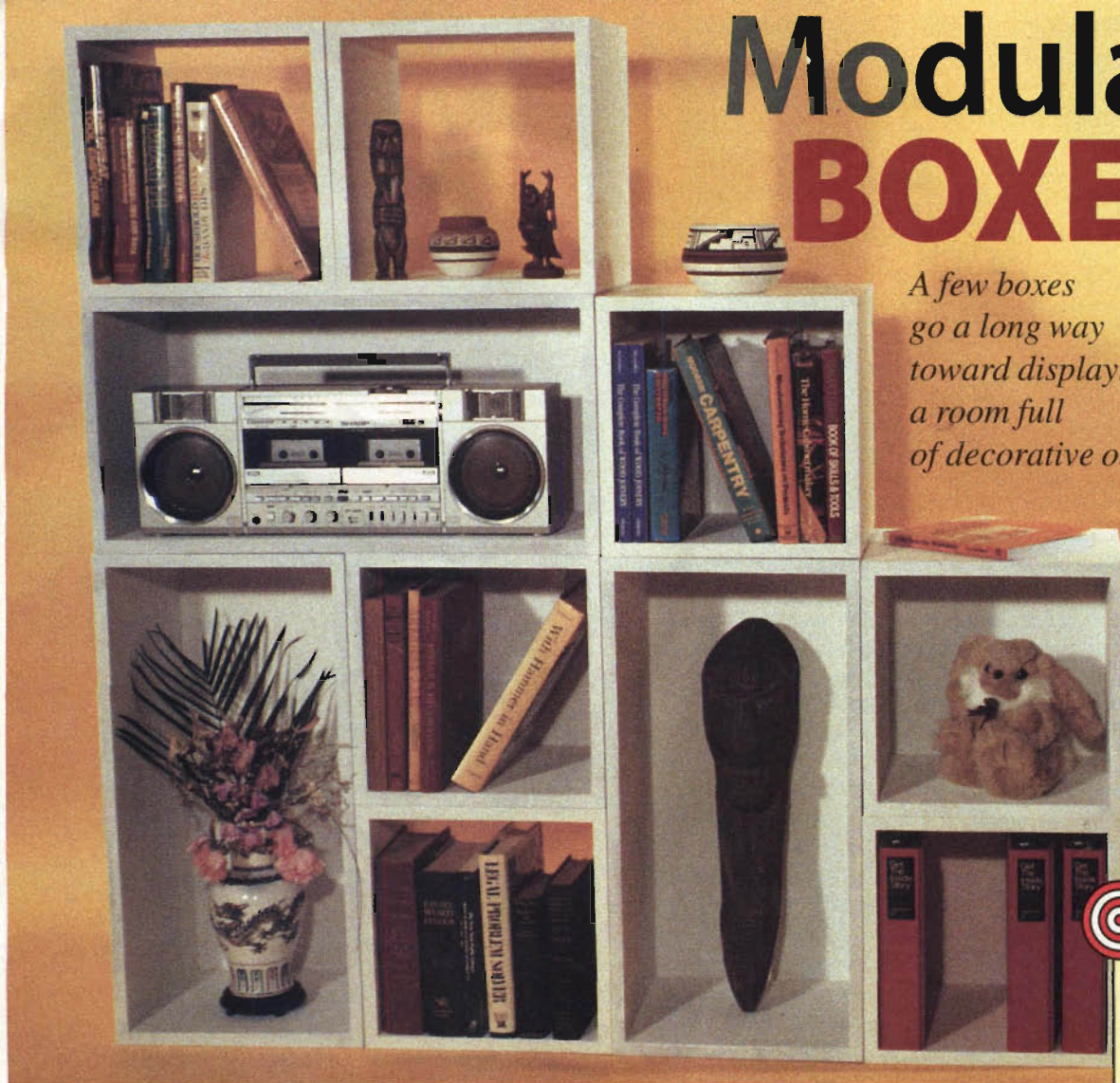
3 ANGLED SLOTS • Most biscuit joiners have a fence that allows you to cut this joint as shown in the photo. If not, try this trick. Clamp one mitered piece to the piece it will be joined to so that the two miters form a perfect "V" between them. Then put your biscuit joiner in the "V" and cut the slot on one side. Turn the tool to the other miter and make the same cut.

coats. This finish, which takes a little patience, gives the cherry a warmth that is worth more than the extra effort.

Now I just have to talk my wife into letting me hike the Lolo Trail. I could bring the desk along and write to her about my journey, my bug bites, my aching feet — all from the same remote and lonely campsites used by Lewis & Clark. Or maybe I'll just stick to trailblazing my back yard. **PW**

Modular BOXES

*A few boxes
go a long way
toward displaying
a room full
of decorative objects.*



**Are
we on
target?**

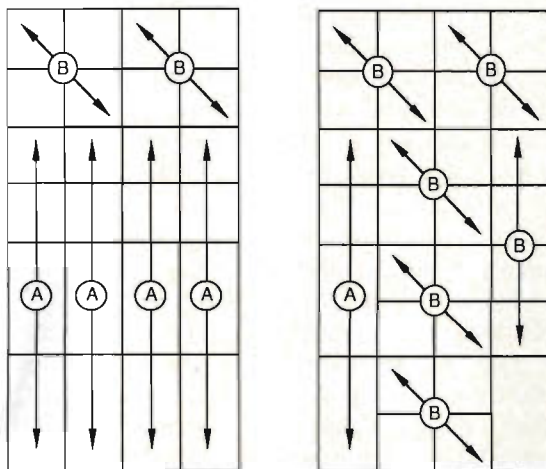
To see more
projects like
this in future
issues, circle
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AS CHILDREN we could build almost anything we imagined with blocks. And we still can. In fact, by using different sizes of really large blocks, you can build almost anything for your home. In this case, we have a modular project designed with standardized units for convenient assembly and flexible arrangement. All the units can have the same dimensions, but that limits setup possibilities and doesn't provide a variety of "cubicles" that are convenient for displaying items of different size and nature. Plus the project would be visually monotonous if all the units were clones.

Because plywood or other man-made panel material is a logical choice for this type of project, the size of units is the first consideration in terms of making the most of a 4' x 8' sheet. There are options, but when designing, consider that while the width and depth of all units is similar, one set of units must be half the length of the others. I settled on "large" units that are approximately 12" x 12" x 24" and companion 12" cubes. The result is visually pleasing and the cubicles pro-

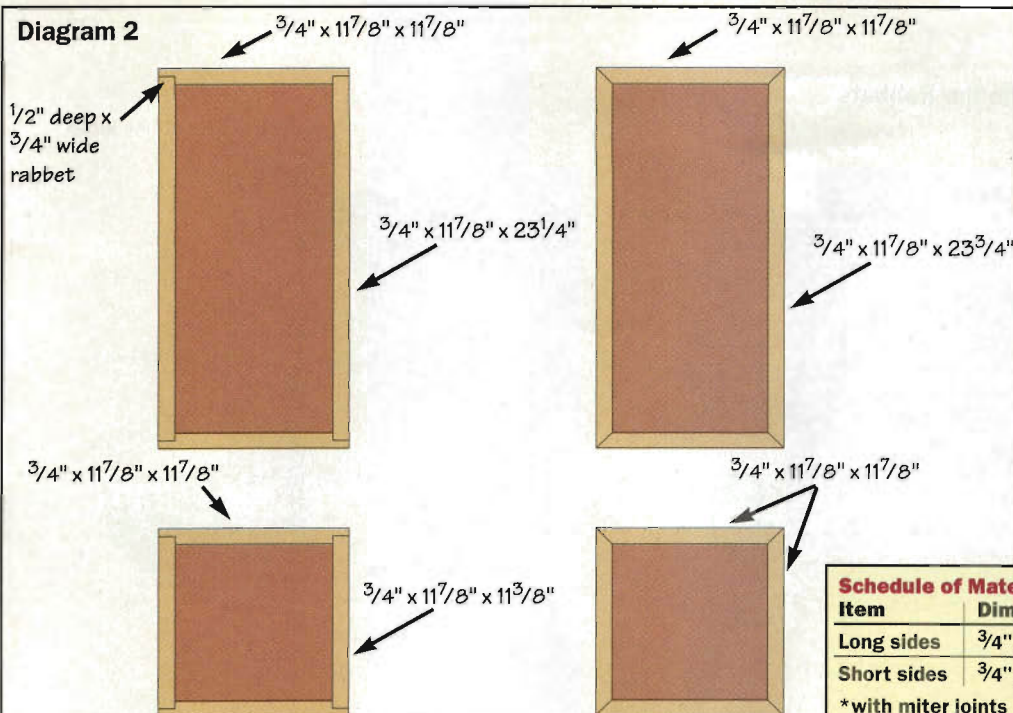
R.J. DeCristoforo has written more than 30 how-to books and is a member of Popular Woodworking's advisory board. His latest book, "The Master Jig Book," will be published in spring 1999 by Popular Woodworking Books.

Diagram 1 • Material Optimization



A • Parts for a large unit
B • Parts for a small unit

Diagram 2

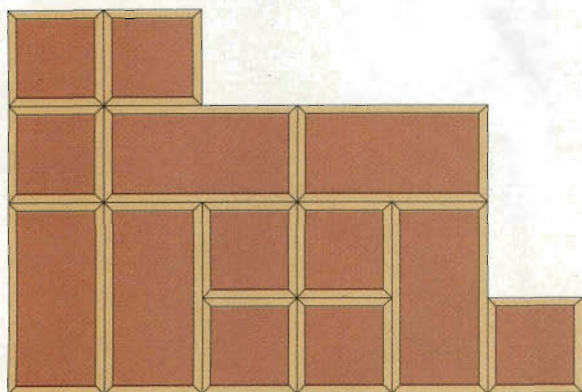


Schedule of Materials: Large Modular Unit*

Item	Dimensions T W L	Material
Long sides	3/4" x 11 7/8" x 23 3/4"	Ply
Short sides	3/4" x 11 7/8" x 11 7/8"	Ply

*with miter joints

Diagram 3 • One Possible Arrangement



vide good storage for books and display items. If you use the suggested dimensions you can make five full units and eight small units from two sheets of plywood (**diagram 1**). It's a good idea to work with a draftsman's template or computer to draw the project to scale to preview your ideas.

Incidentally, I said "approximately" when I stated the sides of the units. There is some slight variation, as you will see, since allowance must be made for "kerf waste."

STEP 1 Getting Started • Choosing a joint depends primarily on how the units will be finished. My units are painted so I used rabbet joints. You may want to use miter joints if you opt for a natural finish. The true sizes of the components, whether you use rabbet or miter joints, are shown in diagram 2. Note that while the length of parts differs, all are the same width regardless of the joint used.

Begin the project by sawing pieces to width as shown in



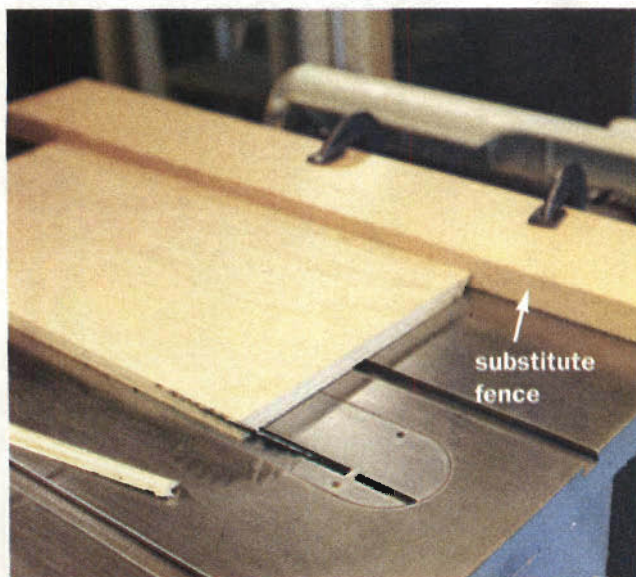
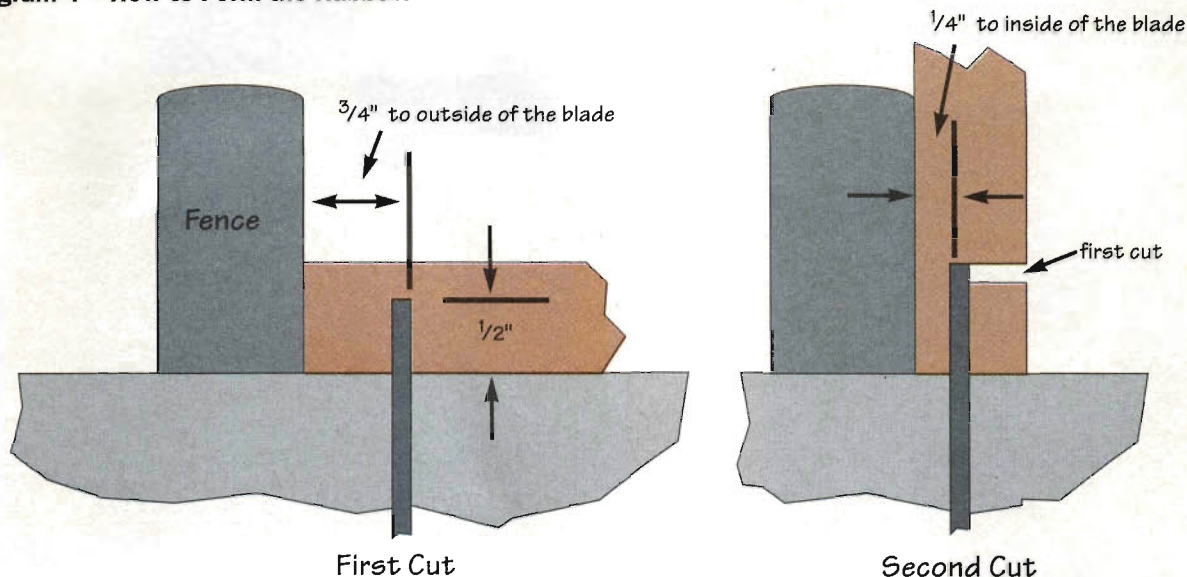
1 CUT TO WIDTH • The first step is to saw the panels into strips of correct width. For this project, the correct width is 11 7/8". Clamp a spring stick to the fence to help keep the work flat on the table. Be sure the fence and saw blade are parallel.

photo 1. Sawing large sheets requires special consideration, primarily providing adequate support for the workpiece. Use outboard supports or a helper to maintain the sheet on a horizontal plane as you move it past the blade. If you use a helper, explain the procedure and the help required of the person before you start sawing. For example, the helper's chore is to provide support only, not to guide the work or pull it.

You can make this part of the project a lot easier if your lumber-supply depot offers, as mine does, half or even quarter sheets of plywood. In any event, check to be sure the angle between the side of the blade and the table is 90 degrees and that the blade and rip fence are parallel before you start sawing.

MODULAR BOXES

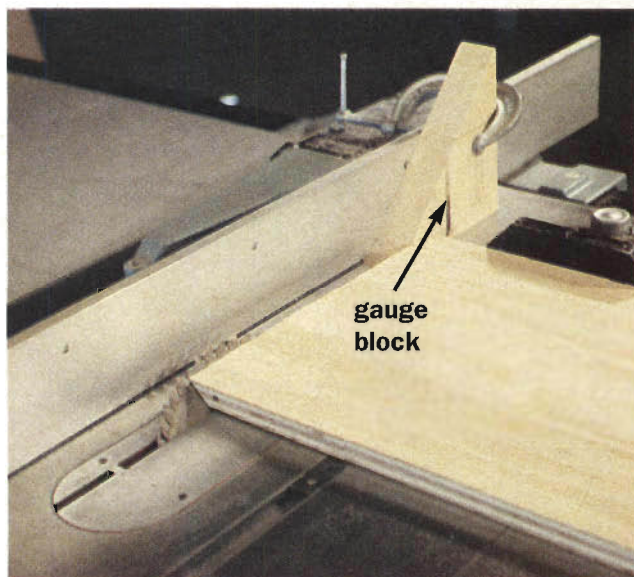
Diagram 4 • How to Form the Rabbets



2 AUXILIARY FENCE • If you're using miters to join your parts, form the miter on a whole row of end parts before sawing them to length. The blade on my saw tilts to the right, but I'm not partial to having the work captured between blade and fence. Because using the fence on the left side of the blade doesn't give me enough room, I use a straight piece of wood as a substitute fence.

STEP 2 Forming Rabbets • Make the shoulder cut first. This is done with the work flat on the table and held firmly against the fence as the pass is made. The second cut is accomplished with the stock on edge. On cuts of this type, always position the work so the waste falls free of the saw blade.

STEP 3 Cutting Miters • The miters on the ends of the long components can be formed as shown in the photo. Clamp a thick block of wood to the fence to act as a gauge for the cut. The setup also allows room for the cutoff to fall free

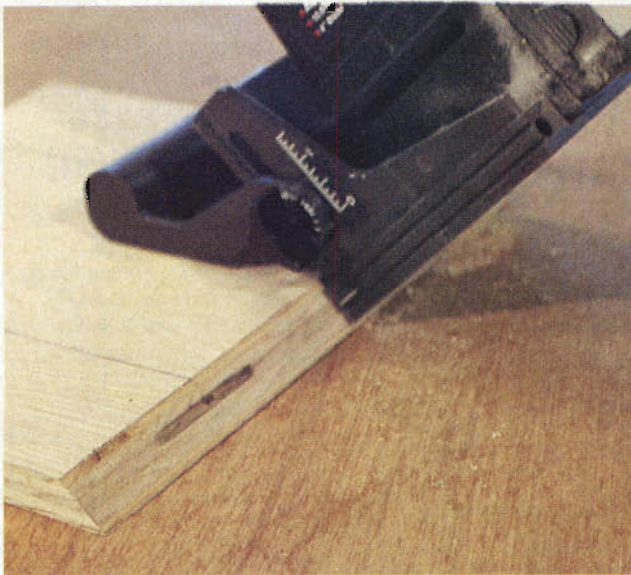
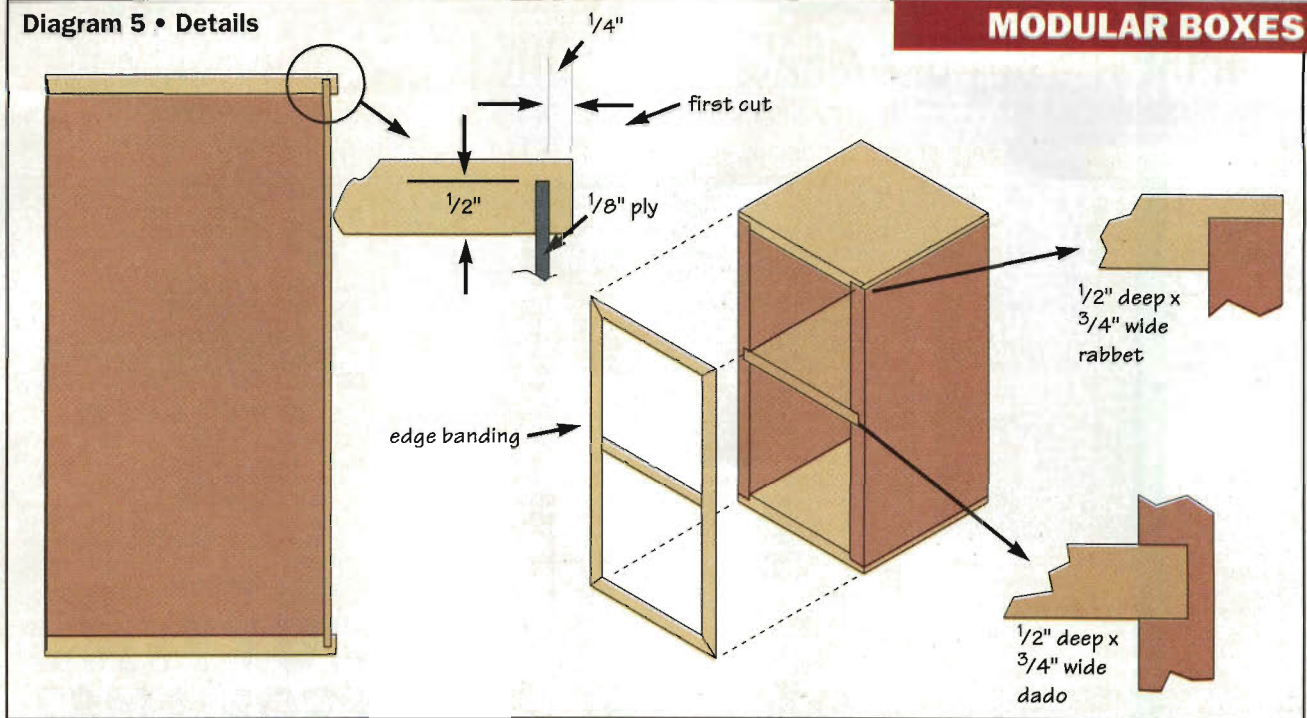


3 USE A GAUGE BLOCK • Use this setup for sawing the miters on the long components. The gauge block positions the work. Keep the work snug against the miter gauge throughout the pass.

of the blade. Hold the work firmly against the miter gauge throughout the pass. You can attach an extension to the miter gauge to provide additional support if you wish.

STEP 4 Reinforcing Joints • Miter joints can be reinforced with splines, but I've become partial to biscuit joinery. If you work this way be sure to make accurate alignment marks on all the components before forming the #10 biscuit slots.

STEP 5 Assembly • You can assemble rabbeted units, as I did, by coating the mating edges with glue and then reinforcing the joint with 4d finishing nails. Set the nails slightly below the surface of the wood and then conceal them with



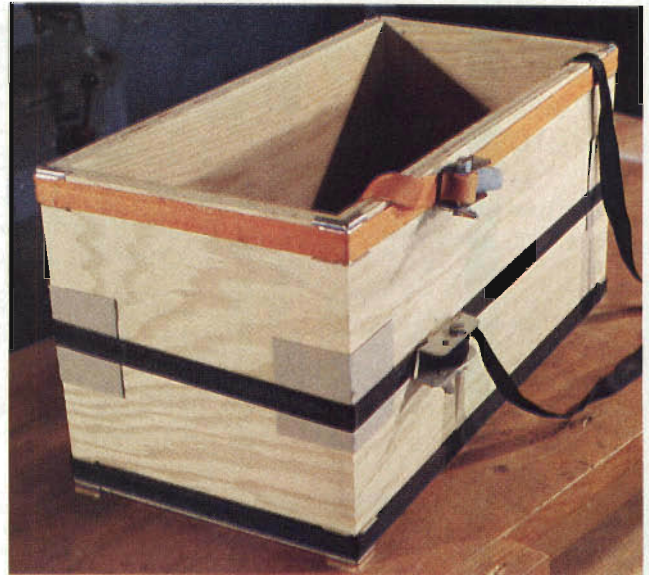
4 MAKE IT STRONGER • Use a #10 biscuit (#20s need too deep a cut) to reinforce the miter joints. Mark all components accurately for placement of the tool. A spline joint is another way to go.

wood dough.

I used band clamps to assemble a sample mitered unit. Choose a white glue (polyvinyl acetate) or a yellow glue (aliphatic resin). Both these adhesives have enough “open” time — 10 to 15 minutes — so there is enough time to put parts together before applying clamp pressure.

Options

Units can be left open or you can install a back. Form the grooves in all parts before making joint cuts. If you find that the kerf-width doesn’t allow easy insertion of the 1/8” plywood, make a second pass to widen the groove just a bit. The groove dimensions shown in the drawing apply whether parts



5 PUT IT TOGETHER • Band clamps work fine for assembly. Use corner brackets or pieces of cardboard to protect the wood. Use a white or yellow glue; keep the clamps tight for about 60 minutes.

are assembled with rabbet or miter joints. Don’t use glue when installing back members.

You can save material and time if you make all units the same size but “halve” some of them by installing a mid-point shelf. This gives the effect of full and half units but limits flexibility of arrangements to some extent.

Edges

You can conceal plywood edges by gluing on thin strips of wood or by applying ready-made wood banding. The banding is available from wood supply stores in pressure-sensitive form — you just press it on — or with an integral adhesive that is activated with a household iron. **PW**

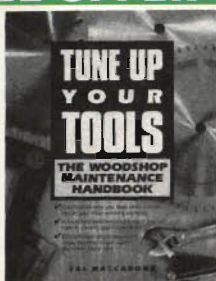
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10"X40TX1/8" or 3/32"	\$156	\$119	\$107	\$95
30T 1/8" or 3/32"	\$135	\$99	\$89	\$79
9"X40T	\$146	\$109	\$98	\$87
30T	\$125	\$99	\$89	\$79
*8-1/4"X40TX 3/32"	\$136	\$99	\$89	\$79
8"X40T 3/32"	\$136	\$99	\$89	\$79
30T	\$115	\$89	\$80	\$71
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DeWalt 8-1/2" & Ryobi 8-1/2"X60TX5/8"	\$179	\$109
Delta 9"X80TX5/8"	\$204	\$119
Ryobi-Makita & all 10"X80TX5/8"	\$207	\$129
DeWalt, Makita, B&D, Hitachi 12"X80TX1"	\$229	\$139
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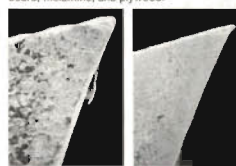
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8" x 80T x 1/8" & 3/32" K	\$202	\$169	12" x 100T x 1-1/8"K	\$253	\$215
220mm x 80T x 1/8" x 30mm	---	\$167	14" x 80T x 1"	\$232	\$197
9" x 80T x 1/8" & 3/32" K	\$207	\$179	14" x 100T x 1"	\$266	\$226
10" x 80T x 1/8" & 3/32" K	\$207	\$159	16" x 80T x 1"	\$262	\$223
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Plantation Desk

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THIS TYPE OF DESK first appeared about 1800. While the masters were turning out elaborate drop- or fall-front secretaries, country furniture builders developed this much simpler style called a plantation or cupboard desk. Some were made from hardwood — cherry, maple or walnut — but most were made of pine. Some had glass doors, some had panel doors, some had no doors at all. A few had a drawer below the writing section, as does mine. Shaker versions sometimes had fall-fronts that revealed several small drawers and a couple of pigeon holes — essentially a simple form of the traditional secretary. Most had a lift-top and were basically a cupboard on a frame. This version here is based on a circa 1810 plantation desk.

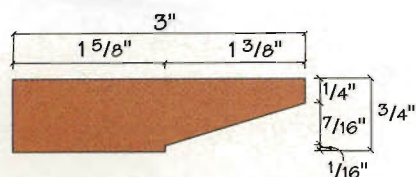
Construction of this desk, while somewhat challenging, should be well within the capabilities of most experienced hobbyists. There are, however, one or two tricky areas you should be aware of. The top section has three small drawers set back from the shelves, which allows room for the small pulls when the doors are closed.

The lift top of the lower section slants forward at a 10-degree angle, which means there are lots of angles to cut. The front legs are shorter than those at the rear, and the tops of the front legs are cut at a 10-degree angle. The sides are also angled at 10 degrees, as is the top edge

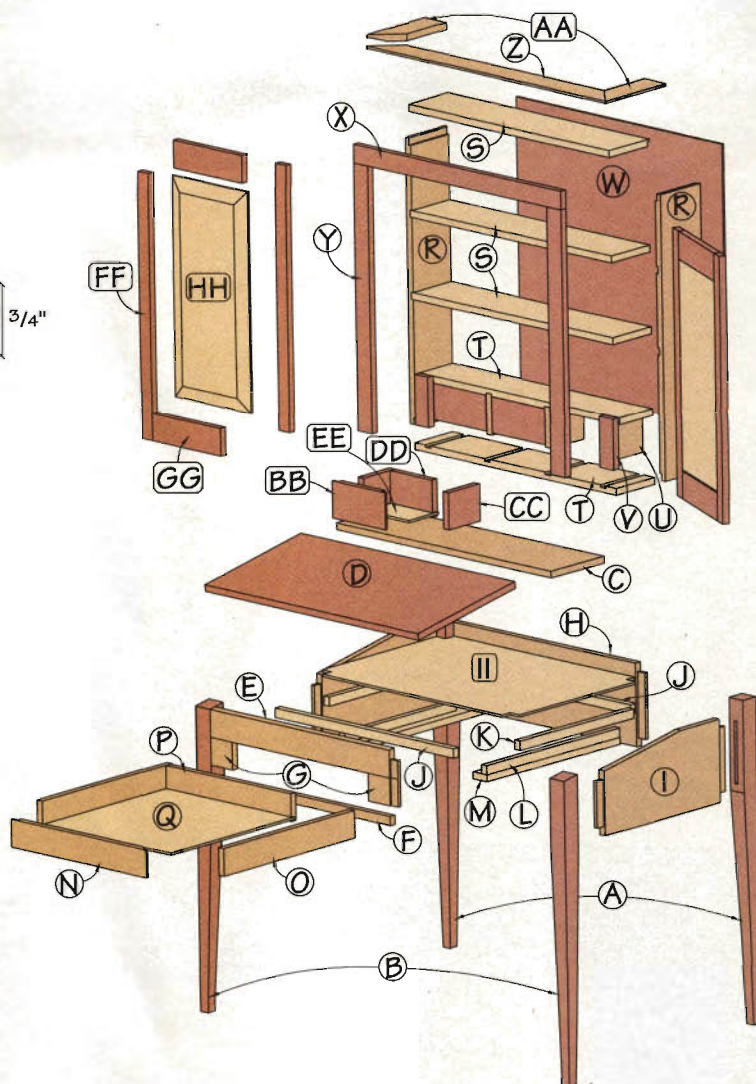
Blair Howard is a professional writer and woodworker. He is the author of Making Money Making Furniture, due out this year, and Building Classic Antique Furniture with Pine, available now. Both are Popular Woodworking Books.

PLANTATION DESK

Diagrams



Profile of Crown Moulding



Are we on target?

To see more projects like this in future issues, circle "P3" on the postage-paid card in the Resource Directory.

Schedule of Materials: Plantation Desk

No.	Letter	Item	Dimensions T W L	Material
2	A	Rear legs	2" x 2" x 35"	Pine
2	B	Front legs	2" x 2" x 33"	Pine
1	C	Lid	1" x 8" x 30 1/2"	Pine
1	D	Lid	1" x 15" x 30 1/2"	Pine
1	E	Front*	3/4" x 3" x 27 5/8"	Pine
1	F	Front	3/4" x 1" x 25 5/8"	Pine
2	G	Front*	3/4" x 3" x 4"	Pine
1	H	Back*	3/4" x 9" x 27 5/8"	Pine
2	I	Sides*	3/4" x 9" x 19 1/2"	Pine
2	J	Cleats	3/4" x 1" x 25 5/8"	Pine
2	K	Cleats	3/4" x 1" x 17 1/2"	Pine
2	L	Drw Guides	3/4" x 3/4" x 19 1/2"	Pine
2	M	Drw Guides	3/4" x 2" x 19 1/2"	Pine
1	N	Drw front	3/4" x 3" x 19 5/8"	Pine
2	O	Drw sides	3/4" x 3" x 19"	Pine
1	P	Drw back	3/4" x 3" x 18 1/8"	Pine
1	Q	Drw bottom	1/4" x 18 7/8" x 18 3/8"	Plywood
2	R	Upper sides	3/4" x 6" x 30 3/4"	Pine
3	S	Shelves	3/4" x 5 3/4" x 28 3/4"	Pine

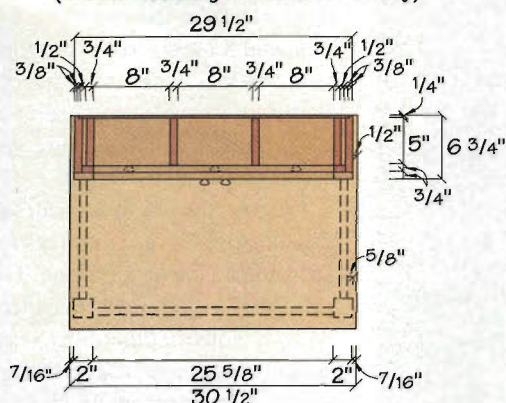
No.	Letter	Item	Dimensions T W L	Material
2	T	Drw section	3/4" x 5" x 28 3/4"	Pine
4	U	Dividers	3/4" x 4 1/2" x 4 3/4"	Pine
2	V	Spacers	3/4" x 1 1/4" x 5 1/2"	Pine
1	W	Back	1/4" x 29" x 30 3/4"	Plywood
1	X	Trim	3/4" x 2" x 29 1/2"	Pine
2	Y	Trim	3/4" x 2" x 28 3/4"	Pine
1	Z	Crown	3/4" x 3" x 34"	Pine
2	AA	Crown	3/4" x 3" x 9"	Pine

Upper Drawers & Interior Panel

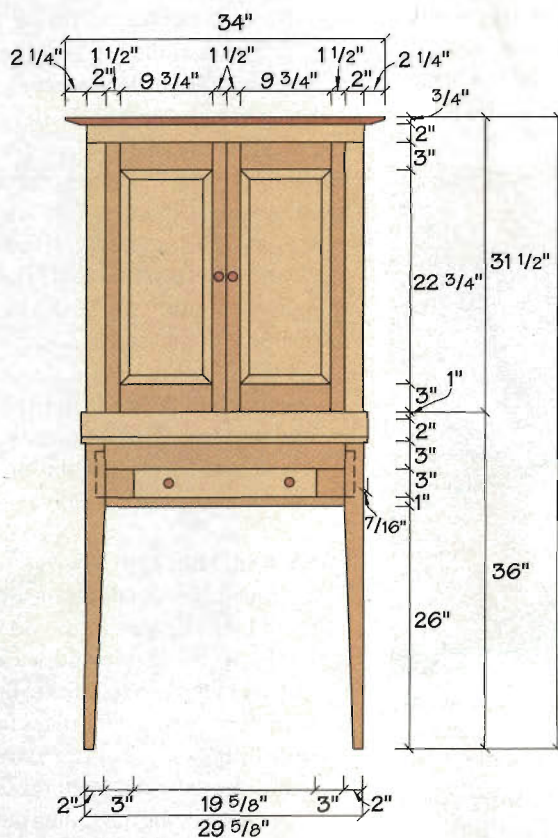
3	BB	Drw fronts	3/4" x 4" x 8"	Pine
6	CC	Drw sides	3/4" x 4" x 4 5/8"	Pine
3	DD	Drw backs	3/4" x 4" x 6 1/2"	Pine
3	EE	Drw bttns	1/4" x 4 1/4" x 7 1/4"	Plywood
2	FF	Door stiles	3/4" x 1 1/2" x 28 3/4"	Pine
2	GG	Door rails	3/4" x 3" x 9 3/4"	Pine
2	HH	Door panels	3/4" x 8 5/8" x 21 5/8"	Pine
2	II	Inset bottom	1/4" x 19 1/2" x 26 7/8"	Plywood

*Measurement includes tenons

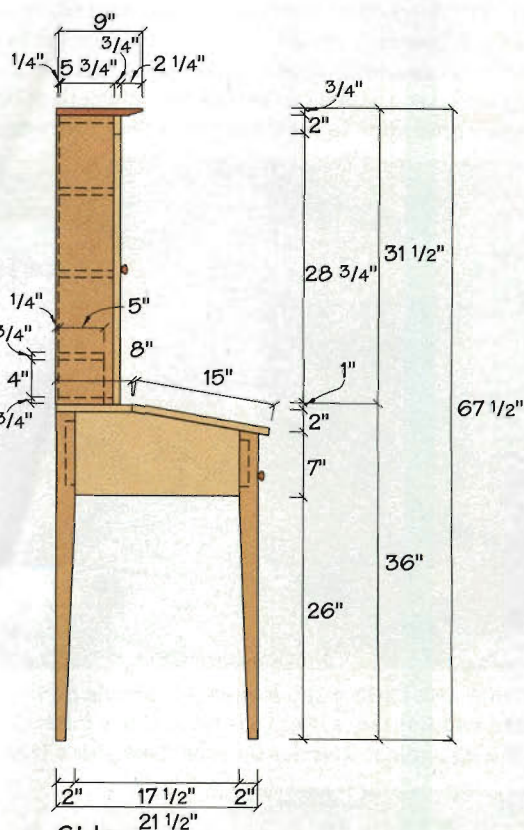
Upper case drawer
opening dimensions
(Crown moulding removed for clarity)



Plan



Elevation



Side

WOOD WORDS (wood'wurds) n.

Crown: Much like the capital on a column, the crown is the decorative top moulding of a case.

Cleat: A small triangular or rectangular block that secures two perpendicular pieces of wood, such as a table top to an apron.

Cut nails: A pre-industrial square-sided nail formed by cutting up a long bar of metal into tapered fasteners.

Furniture-grade lumber: High-quality wood that has a low moisture content (8 to 10 percent in the Midwest), is free of structural defects, is shipped under a tarp and is stored indoors. Generally the wood is dried more slowly than construction-grade lumber.

of the front, and the rear edge of the top.

The bottom of the desk compartment is made from 1/4" plywood that is screwed to four cleats, and the drawer guides are secured to two more cleats. These are all fairly simple to install. As the plantation desk was basically a simple, homemade piece, the drawers are constructed using rabbets, glue and cut nails.

The legs are cut from 1 1/4" stock and are tapered on two adjacent sides 2 degrees. Be sure you make two left and two right, with the tapers all facing in-

ward and toward each other. The sides, front and back are secured to the legs using mortise and tenon joints.

The top and lid of the lower section, one lift section and one fixed, is made from furniture-grade pine. You could, of course, use the same good old shelving board that the rest of the piece is made from. The front of the lower section is made from four pieces of stock. The crown is made from 3/4" stock, laid flat and cut like a raised panel using your table saw.

STEP 1 Prepare Your Panels • Begin the project by cutting all the pieces to size. Cut the 1/4"-thick ply bottom roughly to shape, however. You can make final adjustments later. Then glue up the board for the lid, and using four pieces of stock, build the front of the lower section as shown in the drawing. Use your jointer to cut a 10-degree bevel on the top of the front.

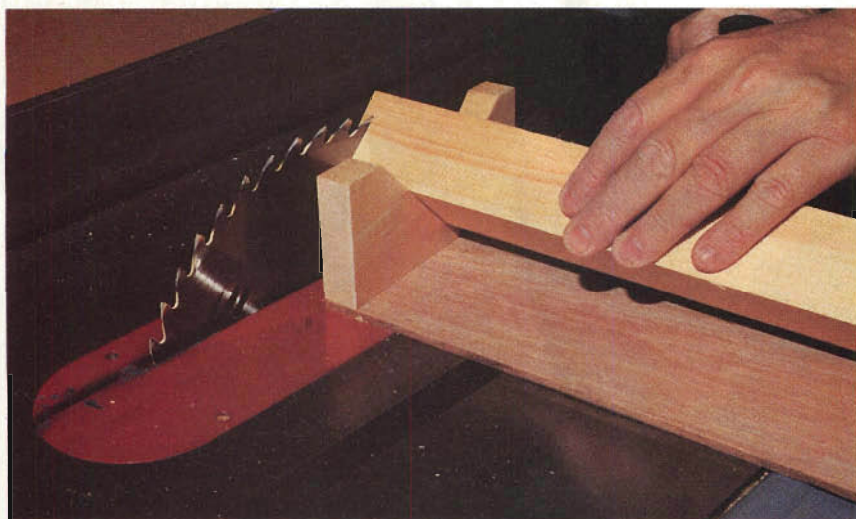
STEP 2 Build the Bottom • First cut the tops of the two front legs at a 10-degree angle as shown in the photo.

PLANTATION DESK

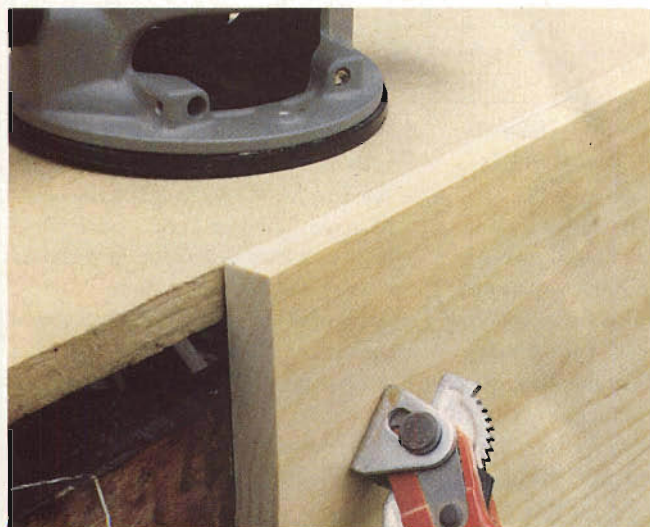


Inset

1 BEVEL THE FRONT • To make the lid close tightly on your desk, you need to bevel the top of the front piece to 10 degrees. You can do this on your table saw or your jointer. If you do it on the jointer, set the fence to 10 degrees using a sliding bevel square as shown in the photo. Then run the stock against the fence, taking light passes until you've achieved the perfect bevel (inset). You can use this same procedure to cut the bevel on the inside edge of the hinged lid.



2 TRIM THE LEGS • You'll need this simple jig to cut the angle on the top of the two front legs. Set your table saw's miter gauge to 10 degrees and rest the jig against it. Raise up your table saw's blade and cut the angle.



3 ROUT THE ROUNDOVER

• Clamp the lid pieces to your bench and rout a $\frac{1}{4}$ " roundover on all the outside edges. Don't roundover the joint where the slanted lid meets the fixed lid.

Now cut the two sides of the lower section to shape as shown in the drawing; the slope on the top is 10 degrees. Starting 10 inches from the top of the two rear legs, and 8 inches from the top of the two front legs, taper two adjacent sides of all four legs. You can use your table saw or jointer, but make sure you have two left legs and two right.

Next cut the mortises on all four legs. The mortises on the front legs measure $\frac{3}{8}$ " wide x 1" deep x 5" long. The mortises on the back legs measure $\frac{3}{8}$ " x 1" x 7". Note that the mortises for the side pieces are centered on the legs. The mortises for the front and back are set back $\frac{7}{16}$ " from the outside edges of the legs. Now cut the tenons on the front, sides and back of the lower section.

Dry assemble the lower section to ensure you have a good fit. If all is well, disassemble the piece. Then glue, assemble and clamp. Check to make sure the structure is square before setting it aside to dry. When it is dry, glue and screw the four cleats (**parts J & K**) that will support the bottom of the desk cavity to the inside of the lower section as laid out in the drawing. Build the drawer guides (**parts L & M**), then fit them to the two supports. Cut the notches on the inset bottom and screw it to the top of the four cleats above the drawer cavity.

STEP 3 Add the Lid • First rout a roundover detail on the outside edges of both sections of the lid. Then cut the 10-degree angle on the back edge of the larger lid piece so it fits to the top. Then mark out and cut mortises for two 1" butt hinges to join the two lids. Carefully set the assembled lid section in place on top of the desk, then glue and screw the rear section of the lid in place on the flat area at the rear.

STEP 4 Build the Top • Make $\frac{3}{8}$ "-deep dados in both the sides of the top section (**part R**) and the $\frac{1}{4}$ "-deep dados in the drawer sections (**part T**) as shown in the drawing. Using a dado stack in your table saw, cut a $\frac{1}{4}$ " deep x $\frac{3}{8}$ " wide rabbet on the sides for the back. Then glue, assemble and toenail the shelves and drawer sections to the sides of the upper section case. Then set it aside to dry.

Now it's time to finish building the

top section. First glue and clamp the two small spacers (**part V**) in place between the trim and drawer section. Now glue and clamp the three face frame pieces to the front of the top case. Attach the back with nails or screws.

Take the three pieces that will make up the crown to the table saw. Set the blade's angle to 17 degrees. Then, placing the stock on edge, mill the crown just as you would if you were making a raised panel door. Cut the three sections of the crown to their final dimensions, then miter the ends to 45 degrees. Glue and screw the crown in place to the top of the cupboard section — be sure to glue the miters together.

STEP 5 Construct the Doors • To build the doors, first cut a $\frac{1}{2}$ "-deep by $\frac{5}{16}$ "-wide groove down the inside edge of the rails and stiles (the stiles require a stopped cut). Raise the interior panels using your table saw or a router (see "Building a Raised Panel Door" for more on this). Assemble the rails and stiles using biscuits and glue — just make sure you don't glue the interior panel in place, it needs to float in the groove.

Set the top section in place on the rear flat section of the desk and screw them together using #8 x 1" screws.

All the drawers for this project are constructed in the same manner: The drawer sides are nailed into a $\frac{3}{8}$ "-deep by $\frac{3}{4}$ "-wide rabbet on each end of the drawer fronts. The bottom sits in a $\frac{3}{8}$ "-deep groove on all four sides. Then the back is nailed between the sides. Build the three small drawers for the cupboard

Building a Raised Panel Door

Most people use a router table and an expensive set of bits to mill the pieces for a raised panel door. But to me, the expense is not worth the result. I prefer the old-fashioned look: square door frames and flat, beveled panels. I can make a set of four doors in only a couple of hours. Begin by cutting your rails and stiles exactly to length.

1 Use either your router with a $\frac{5}{16}$ " straight-cutting bit or your table saw to mill $\frac{1}{2}$ "-deep grooves to the inner edges of the rails. The cut runs the entire length of the rails, and stops $2\frac{3}{4}$ " short from both ends of the stiles. I use my router table with the stops marked on a piece of masking tape that shows just above the stock.

2 Lay out the rails and stiles and mark for biscuit slots. Mill the biscuit slots. Then dry fit the rails and stiles and measure the width and height between the grooves to get the true size of the panels. Sand the rails and stiles smooth and stain the inner edges. It's much easier to stain them before assembly. Glue and clamp the rails and stiles, one side only, dry fit the other, ensure all is square, then set them aside until the glue is dry.

3 Set your table saw's blade to cut at 17 degrees and the rip fence at $\frac{1}{4}$ " and mill the bevels of the edges of the panels. The tip of the blade should just break through the surface of the stock, leaving a small step and nice clean lines. Sand the panels smooth, paying close attention to the bevels, and then apply the stain.

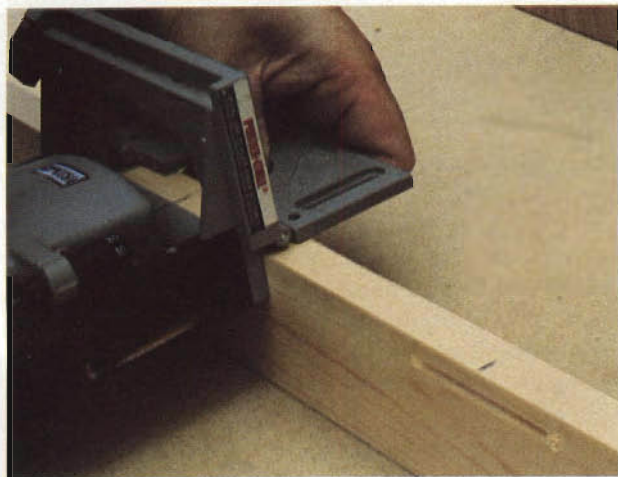
4 When the glue is dry, remove the clamps from the frames, and remove the dry-fitted stiles. Slide the panels into place in the now-open frames, glue and clamp the remaining stiles in place, and set the completed doors aside to allow the glue to dry. Either roundover or break the outer edges. Do any necessary sanding to the joints, then the finish sanding and, finally, complete the staining.

section as shown in the drawing. Build the drawer for the desk section. Add all of your pulls. Now cut mortises for the four door hinges and hang your doors. Disassemble the doors and drop lid for finishing.

Finishing

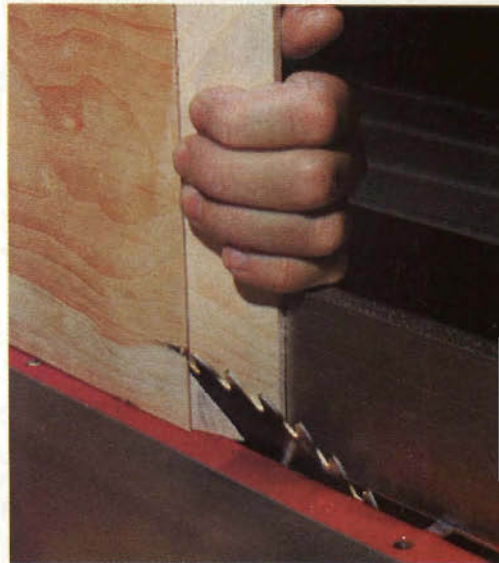
Finish sand all the completed sections and drawers. To help avoid blotching, you might want to first coat your project with shellac that has been diluted

with alcohol. Apply your stain to all sections of the desk and drawers. After finishing is complete, attach the knobs to the doors and drawers and fit the doors to the cupboard section. I kept things very simple for this piece. After doing a little light distressing, and applying a medium stain, I applied eight coats of seedlac mixed to a three-pound cut. This gave the piece a deep, almost dark gold-shine. The final step was to apply a couple of coats of beeswax. **PW**



4 BISCUIT SLOTS • I used biscuits to attach the face frame pieces to the top case. You could use cut nails for an authentic look.

5 RAISED PANELS • To build the interior panels, set the table saw's blade to 17 degrees. The blade should just break through the surface as shown in the photo. Be sure to set the bevel so it corresponds to the $\frac{5}{16}$ " groove. **CAUTION:** Make sure you use a zero-clearance insert in your table saw when you make this cut.



Queen Anne

SIDE TABLES

Build these traditional tables with help from a tool usually reserved for carpenters: the power planer.

AS I GET A LITTLE OLDER, I get more sedentary. My wife says I'm just looking for more places to set a drink down. In that spirit, I decided to draw on my experience making period furniture to come up with a set of end tables for the living room — one with a poplar clover-shaped top, the other with a curly maple porringer top. These tables come from designs that are roughly 250 years old. This places them squarely in the country interpretation of the Queen Anne style.

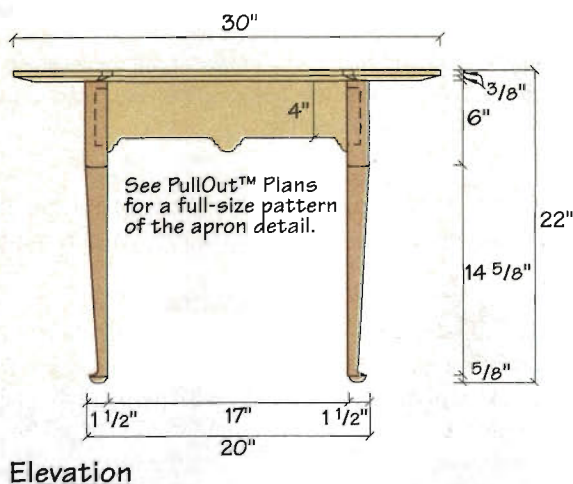
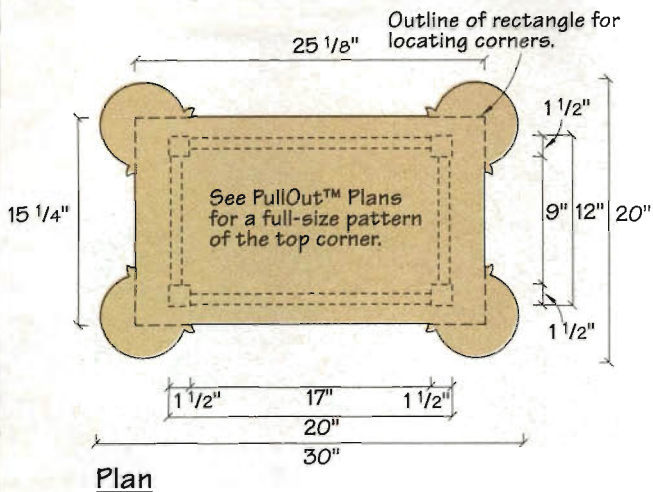
According to Leigh Keno, a noted New York antiques dealer and a regular on PBS's popular "Antiques Roadshow," the term "porringer" is merely a convenient way for antique dealers to classify this type of table and probably has nothing to do with the way

By Jim Stuard, Associate Editor, Popular Woodworking.

the table was used originally. Using the English word "porridge" (oatmeal) as the root word, the term is likely no more than 150 years old. "Porringer" is used today to describe a small soup or cereal bowl with a handle. Antique dealers most likely tried to use the name to pass off the round oversized corners — which were no more than a decorative element — as the accessories of a small breakfast table. That said, porringers in good condition will fetch thousands of dollars these days due to their rarity.

STEP 1 Making Aprons • These tables were made with simple mortise-and-tenon construction. Start by cutting the apron parts according to the Schedule of Materials. Next cut the $\frac{3}{8}$ " x 4"-wide x $\frac{7}{8}$ "-long tenons on the ends of the aprons.

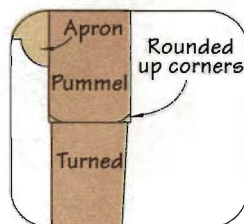
Diagrams



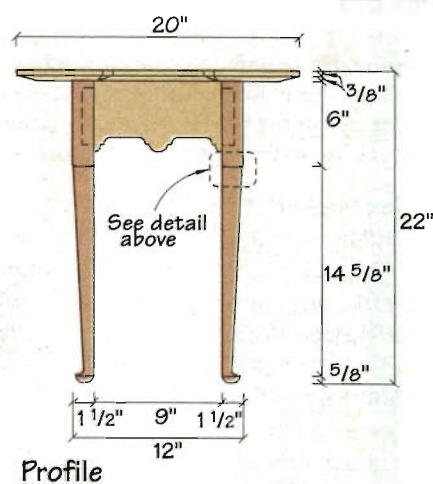
Schedule of Materials: Queen Anno Side Tables

No.	Item	Dimensions T W L	Material
1	Top	3/4" x 20" x 30"	Maple
4	Legs	1 1/2" x 1 1/2" x 21 1/4"	Maple
2	Long aprons	3/4" x 5" x 18 3/4"	Maple
2	Short aprons	3/4" x 5" x 10 3/4"	Maple

Source for curly maple: Groff and Groff Lumber 800-342-0001. H. Behlen Button-Lac Shellac and Lee Valley shellac solvent: Lee Valley 800-871-8158. J.E. Mosers Golden Amber Maple Aniline Dye: Woodworkers Supply 800-645-9292.

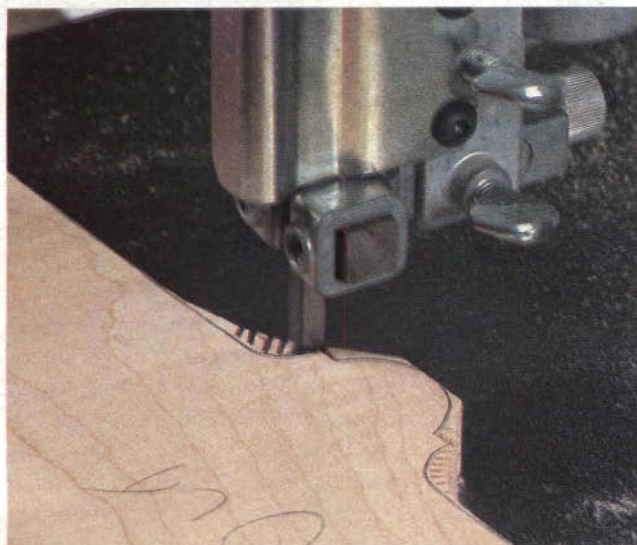


Detail of leg transition at top of turning

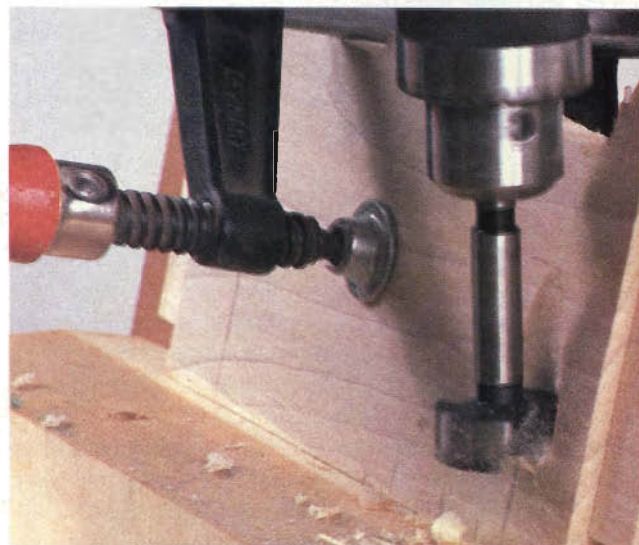


Are we on target?

To see more projects like this in future issues, circle "P4" on the postage-paid card in the Resource Directory.



1 SCROLLING THE APRONS • Lay out the scrollwork on the bottom of the aprons using the patterns supplied in the PullOut Plans. Glue the patterns to 1/4" plywood, cut them out, trace the pattern on your aprons and cut them out on a band saw. Make relief cuts on the inside radii so you can scroll them out easier.



2 DRILL POCKET HOLES • Make sure that the bottom of the pocket is at least 7/8" from the top edge of the apron to prevent the screws from poking through.

PORRINGER TABLE



3 CUTTING CORNERS • First mount a blank between centers with the top towards the drive center. Then use a saw to cut a small kerf on each corner at the line 6" from the top. Don't cut too far or you won't be able to remove the kerf. With a roughing gouge and skew chisel, turn a cylindrical blank from the saw kerf to the foot. At this point use a skew chisel to cut a small rounding up on the square corners of the top (see diagram). Repeat on all the legs and you're ready to do the offset turning.

STEP 2 Making Pockets • The last thing to do on the aprons is to drill the pocket holes for attaching the base to the top. Do this on a drill press with a 1/4" Forstner bit. Use a shop-built jig (the diagram and materials list for this jig are in the PullOut™ Plans) to hold the aprons in place for drilling.

STEP 3 Leg Blanks • Although the legs look complicated, they are not. The secret is an offset turning technique. First cut the blanks 1/8" longer than in the schedule. This gives you some room to work with when turning the pad on the end of the foot.

Use a straight edge to make an "X" from corner to corner on both ends of the blank. This will aid in finding the center as well as marking the offset. Now, on the bottom of the legs, determine which corner will face out. On the bottom of each leg, measure 1/2" from the center to the corner opposite the outside corner. This is the offset for the leg. Remember, the farther away from the center you go, the thinner the ankle (the area just above the pad) will be. Going any farther than 1/2" is dangerously close to having a leg pop off your lathe.

Mark a line completely around the blank 6" down from the top of the blank. To save time roughing the blank, lay out a 1 1/2" diameter circle on the bottom of the blank. Set your jointer to 45 degrees. Using the circle as a guide, lower the infeed table to the point where you can take the corner off, leaving about 1/32" to the circle. Go slow and joint to within 1/8" of the line where the turning starts. Now mount the blank in the lathe.

After mounting a blank between centers with the top towards the drive center, cut a small kerf at the line where the turning stops. Don't cut too far or you won't be able to remove the kerf. With a roughing gouge and skew chisel, turn a cylindrical blank from the saw kerf to the foot. At this point use a skew chisel round the corners of the pummel, the square



4 A WELL-TURNED ANKLE • When you turn the lathe on, the leg's spinning creates a ghost image of what the finished leg will look like. Remove that "ghost" material with a roughing gouge. Stop at the second line that you drew earlier. Lay the gouge on its left side at the second line and slowly rotate the gouge clockwise as you go to the left. Go very slowly until you get the hang of how the wood reacts to the gouge.

part of the leg, where it meets the turned portion. Repeat on all the legs and you're ready to do the offset turning.

STEP 4&5 Turning the Offset • Before resetting the legs, measure up from the bottom 1/8" and from that mark another 5/8". Turn the lathe on and follow the marks around with a pencil. Take a parting tool and set it on its side. Cut a small incision at the 5/8" mark. This creates a shadow line from which to begin the offset turning. Set the lathe for its lowest speed and reset the tailstock so the leg center is mounted in the offset mark. This might look like an awkward setup but as you remove material the leg will turn with more stability. Finish the straight part of the leg with a skew chisel and the ankle with a roughing gouge. Finally, turn the pad foot as shown in photo 5. Now is the time to sand the legs. Start with 120 grit sandpaper and finish with 150 grit.

Now cut the 3/8" x 7/8" x 4" mortises in the legs, 5/16" in from the edge and 1/2" down from the top. Be careful when marking the locations of your mortises to make sure the turned feet face out. You'll notice that the mortises meet slightly at their bottoms. Simply plane away a little of the tenon where they meet. Now glue the base together. Start by gluing the short ends together and then attaching them to the long aprons.

After the glue is dry, finish sand the entire base, then lay out the holes for the cherry pegs. Any dark hardwood will do for the pegs, but cherry sands smooth and the end grain stains a dark color. Drill a 1/4" hole 1" deep. Follow suit with 3/16" and 1/8" bits, creating a tapered hole. After shaping 16 square pegs (tapered on four sides to a point), tap one in until you feel and hear it seat. The sound of the hammer hitting the peg makes a distinctly different sound when it seats. No glue is required for this as you are running a peg completely through the leg. It won't be coming out anytime soon. Cut the pegs,



5 TURNING THE PAD • The last thing to do on the legs is turning the pad on the foot. You do this last, as removing the foot material also removes the offset center. Reset the bottom of the leg into the original center and using a parting tool, turn away this “extra” length until it’s about $\frac{3}{8}$ ” diameter. This gives you some extra distance from the live center. Then using a small spindle gouge, turn the pad of the foot till it meets the $\frac{3}{8}$ ” diameter. Sand the pad the same as the leg and you’re done turning.

leaving $\frac{1}{32}$ ” showing and sand until it is a rounded-over bump. Drill $\frac{1}{4}$ ” holes into the pockets from the top of the base for attaching the top.

STEP 6 Make and Attach the Top • The top is the easiest part, but it can make or break the whole project. Wood selection is key. One hundred years ago, you could get extremely wide, highly figured curly maple at a low price. Amazingly most old porringers were one- or two-board tops. That’s clear-figured wood 10- to 20-inches wide! Regrettably, those days are gone, and you will have to make do with the painfully high-priced, narrow lumber you get today.

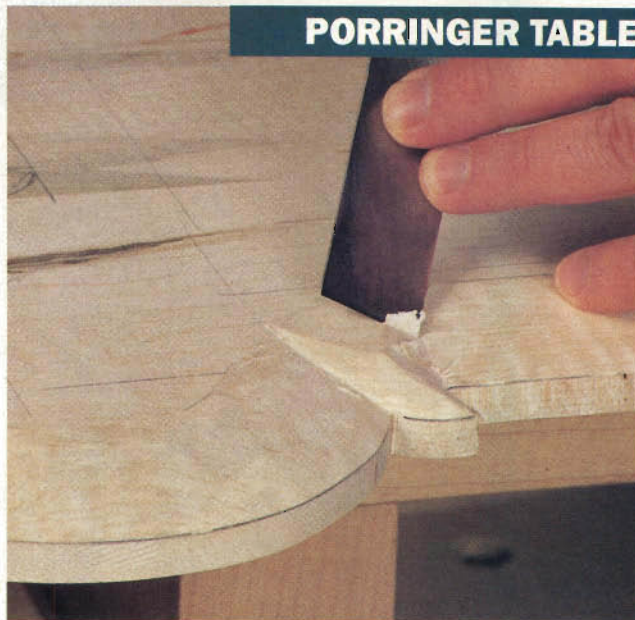
Poplar is easy to get in a decent width and length, but I had to try the Amish sawmills in eastern Pennsylvania to find a retail source for decent curly maple (see the Schedule of Materials for one such mill). I managed to find decent $\frac{4}{4}$ that’s about 7” wide and a nice piece of $\frac{8}{4}$ for the legs (I wasn’t sure how thick the legs would be when I started so you could probably get away with $\frac{6}{4}$ for leg stock).

The tops for both types of tables are the same size. They just require a different edge pattern. For the porringer top, lay out a $15\frac{1}{4}$ ” x $25\frac{1}{8}$ ” rectangle in the center of the top. Make a pattern for the top with $\frac{1}{4}$ ” plywood as you did with the aprons. See the PullOut Plans for the shape of each top. When you lay the inside corner of the pattern over the outside corner of the drawn rectangle, the outside of the radius should just touch the edge of the top. Trace the pattern on all four corners and jigsaw the top out.

For the “clover” shaped top, things are easier. Make a pattern from the diagram supplied in the PullOut Plans and trace the double radius on all four corners. When you are done cutting the shape of the top out, chamfer the edges.

Chamfering the edges lightens the overall look of the table, and the chisel work underneath has a very sculptural feel.

PORRINGER TABLE



6 SCULPTING UNDERNEATH • When you’ve done all you can with a power plane, use chisels and planes to remove material down to the marked line.

How thick is it anyway?

When lumber yards count up the board footage that you buy, it’s referred to as a tally. The “tallyman” carries a special notebook and a strange floppy stick called a “tallystick” (go figure!) with odd measurements on it. The lumber you buy is sorted by how many quarters of an inch thick it is. This system starts at $\frac{4}{4}$ for 1” thickness on up to $\frac{16}{4}$ for 4” lumber.

Before chamfering, use a marking gauge to mark a line that is half the thickness of the top on the entire outside edge of the top. Next, use an adjustable square to mark a line around the underside of the top. For the porringer the measurement is $1\frac{1}{2}$ ” and for the clover use a $2\frac{1}{4}$ ” line.

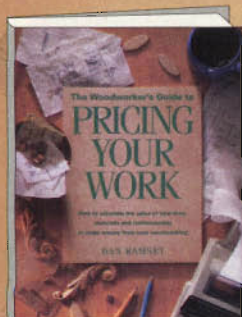
I chamfered the edges with a power planer. It’s a tool used mostly by carpenters to remove material from doors when fitting and installing them. And in that role, this tool is unequalled. Finish sand the top to 150 grit.

The last assembly chore is to screw the top to the base. Begin by laying the top upside down on a blanket. Center the base on the top and screw it down with #10 x $1\frac{1}{2}$ ” wood screws.

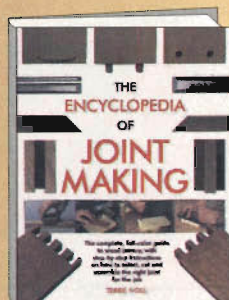
In finishing the clover table, I sprayed on a custom-mixed aniline dye followed by three coats of clear finish. This turned the poplar to a mahogany-like color.

The porringer was a different story. To begin with, I hand scraped the top with a Stanley #80 cabinet scraper. With the lack of abrasive sandpaper 250 years ago, this is how the old tables were made ready to finish. Scraping with a properly prepared scraper blade will show up as rows of slight depressions ($\frac{1}{32}$ ” deep) with ridges about $2\frac{1}{2}$ ” apart. I stained the wood with aniline dye and then applied one coat of boiled linseed oil and finished the table with four coats of dark shellac. This imparts a nice honey brown color to the curly maple and is easy to repair. Now where did I put that drink? **PW**

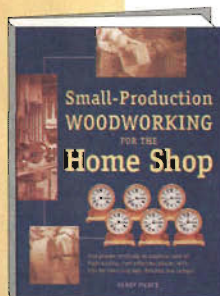
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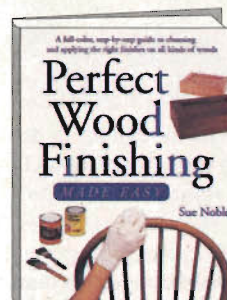
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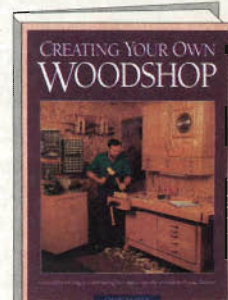
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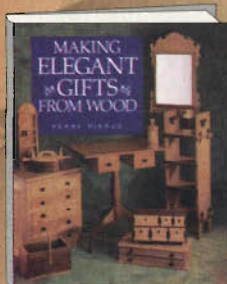
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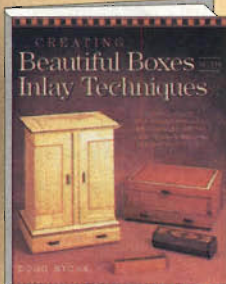
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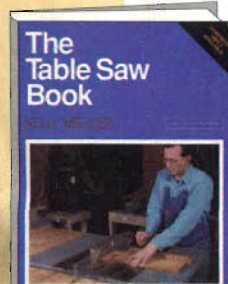
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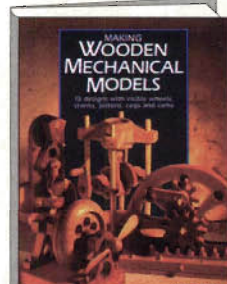
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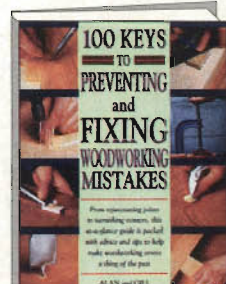
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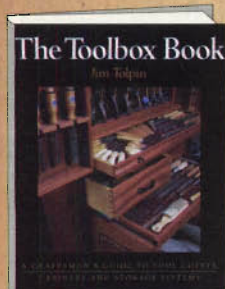
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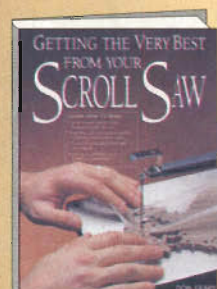
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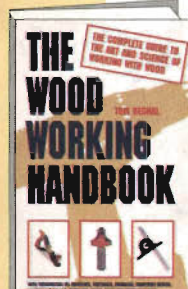
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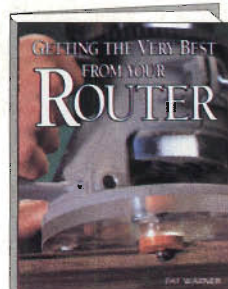
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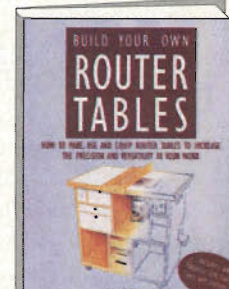
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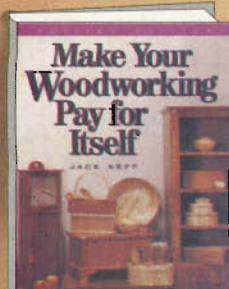
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1/2 Price is \$10.99



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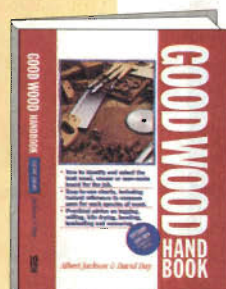
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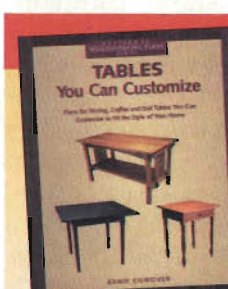
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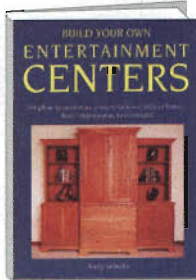
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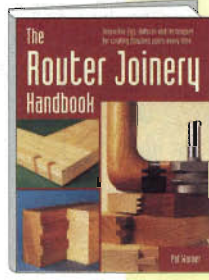
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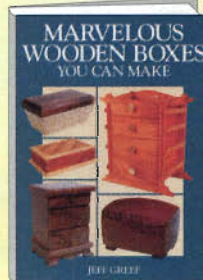
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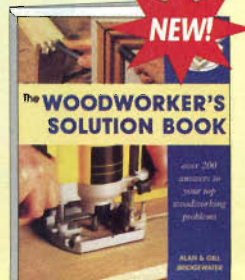
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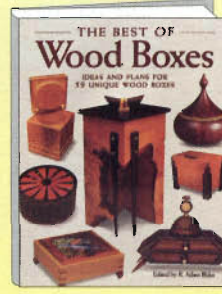
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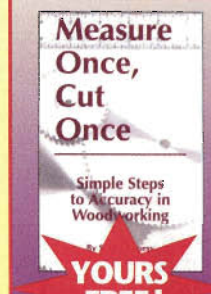
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PROJECTS FROM THE PAST

Early American BABY CRADLE



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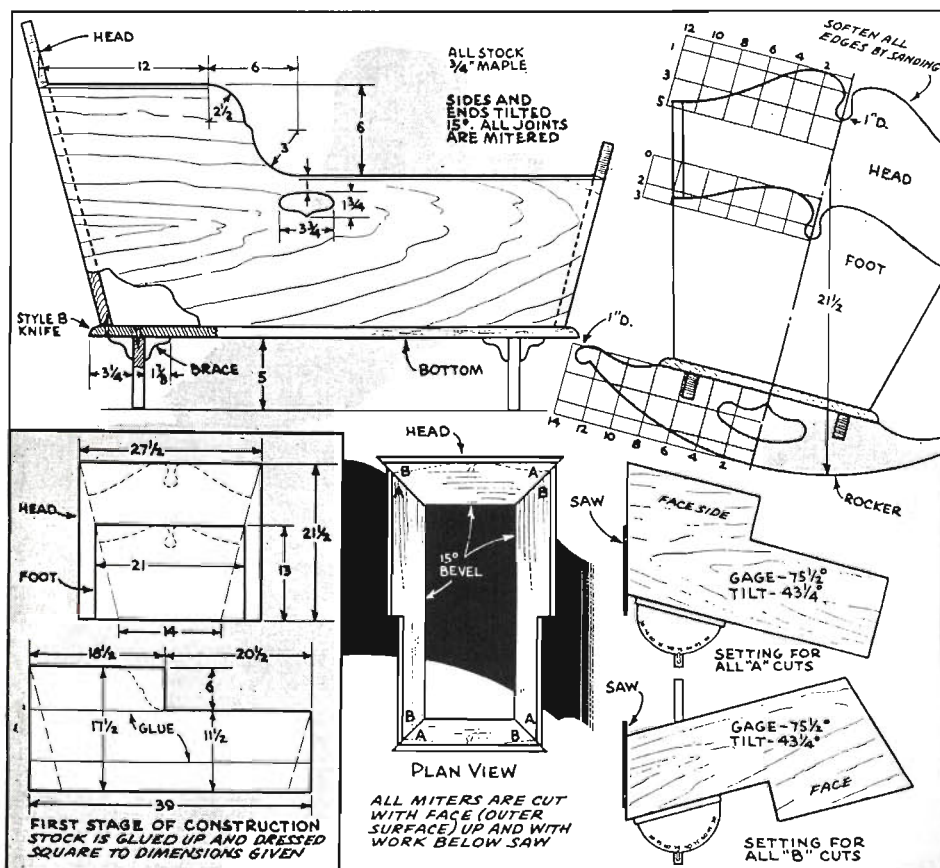
The Delta

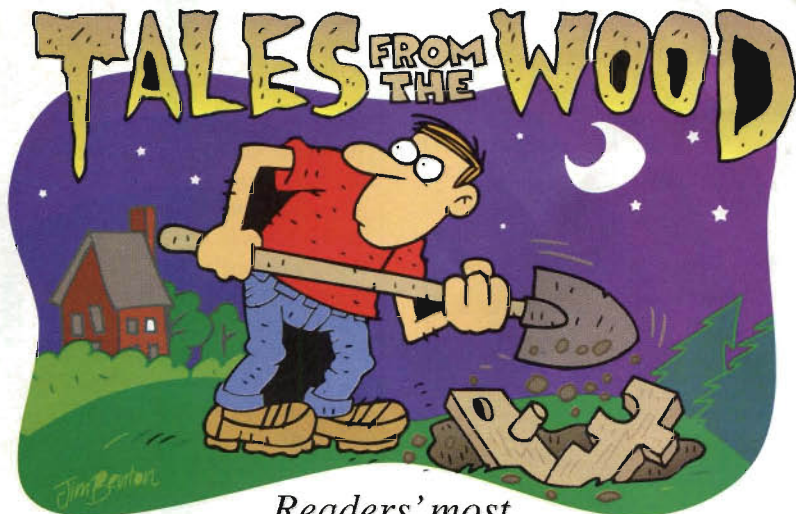
Vol. 16,
Issue 2
1946-1947

Earlier this century, Delta Machinery published a magazine filled with woodworking plans. These magazines are more than nostalgia — the plans are darn good! In the interest of history, we're happy to offer this project from yesteryear.

Built to the dimensions given, this makes an attractive and somewhat different baby cradle. Cut the dimensions in half and you have an equally pleasing doll cradle. Start the construction by gluing-up the lumber to the sizes shown at lower left. Next, cut the compound miters, setting the miter gauge at $75\frac{1}{2}$ degrees and tilting the saw's blade $43\frac{1}{4}$ degrees. These are the proper angles for a side tilt of 15 degrees. Bevel all bottom edges 15 degrees, and then band and scroll saw all curved edges. Assemble the sides and ends with screws under wood plugs. The size of the bottom is taken from the work, and it overhangs 1" all around. Cut a $\frac{1}{4}$ " roundover on all four edges. The rockers are a straight job of band sawing, and are mounted with screws and wood brackets. **PW**

Diagrams





Readers' most
amazing stories from their workshops.

WINNER!

Skinniest Outhouse in Missouri

When I was a boy of 12 in north Missouri, my grandmother's outhouse blew away one night. There was no question I would have to build another. I had a saw, a hammer, some old rusty nails and scrap lumber. I didn't know that you needed a set of plans. In fact, there were several things I didn't know. But I knew one thing: Grandma needed an outhouse.

A hole in the ground seemed to be the first step. In the night it rained. The next morning I found three drowned skunks in the hole. Drowned skunks don't stink, I learned. After a decent burial, my progress continued.

Four posts seemed important. Four walls and a door would be essential. I knew she would want a roof. Then the day came.

"Grandma, I did it," I said.

"Did what?" she asked.

"Your outhouse is finished."

I took her by the hand and led her to the first big project I ever made. I sat down on the seat and told her to close the door. The door would not close. My knees caused the door to stay ajar about 8". But she never complained about my under-sized outhouse. Grandma is gone now, and so is the skinniest outhouse in Missouri. I have built several buildings and homes since that time. I have always thought that building plans were a marvelous idea.

George Cowgill
Lamar, Colorado

Why Tape Measures Have Springs

When I first started to date my wife, my future father-in-law was building a sun deck. Naturally I wanted to make a good impression, so I offered to help him with his project. He said he was all set, but if I could cut a 2 x 6 board to 59 1/2" long it would be a big help. He gave me his brand new 25' tape from his tool box and told me to be careful with it because I was the first person to ever use it.

"Yes sir," I said.

I put the 2 x 6 on the table of the radial arm saw, hooked the tape on one end and gently pulled the tape across the board until I got to 59 1/2". I wanted it to be perfect. I then grabbed the handle of the saw and "zing" I cut a perfect 59 1/2" board — and a perfect 59 1/2" tape. I had forgotten to retract the tape. As I heard the tape spinning around inside its case, all I heard was a hammer hitting the deck. Next day, guess who showed up at the house with a new 25' tape measure?

Donald P. Viera
Fairhaven, Massachusetts

Continued on page 76

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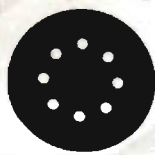
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WOOD TALES

Continued from page 75

Share Your Story & Win!

Turn your favorite tale from the woodshop into a \$150 gift certificate from Lee Valley Tools in Popular Woodworking's "Tales from the Wood" contest. We're looking for your funniest, most embarrassing or incredible story. And if we can learn something from your yarn — even better.

Each issue, our editors choose the best tale and print it here. Runners-up receive a Veritas Marking Gauge (shown at left) from Lee Valley Tools, the catalog company that features an impressive array of quality woodworking tools, supplies and accessories. One final rule: Please, no stories about people getting hurt.

That's not funny.

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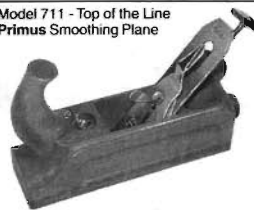
We live in the Capay Valley, about 50 miles northwest of Sacramento, Calif., and we have rattlesnakes — the only negative aspect of this beautiful place. One day I was working in my shop, got frustrated with what I was doing and decided to go water the garden. Not paying attention to my surroundings, I walked through the bushes and turned on the hose. Fifteen minutes later I walked back to shut off the water and was shocked out of my wood thoughts by a coiled and buzzing rattlesnake not 10" from my hand. Not just any rattlesnake, but the biggest, fattest one I have ever seen in the valley. I jumped back and yelled for my husband, Mike, to come help me get the snake. We don't enjoy killing God's creatures, but any rattlesnake that gets up against my house near my two children is fair game.

I found a hoe and shovel while Mike

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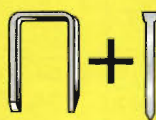
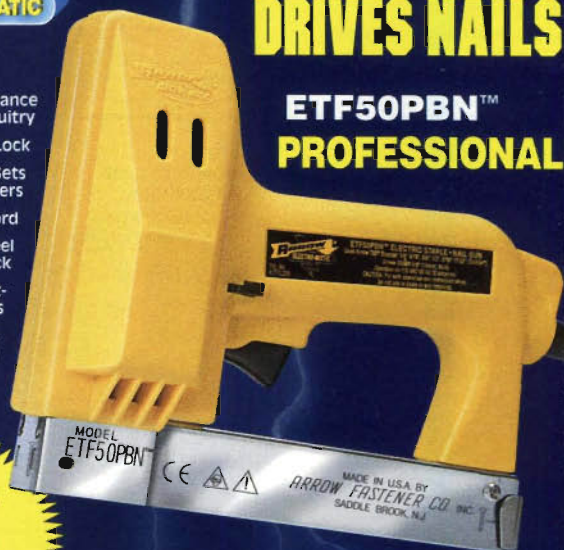
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watched the snake. The snake hid behind some large rocks so we couldn't get to him with the hoe. So we tried strapping a steak knife to a pole to spear him and hold him down. This of course didn't work. Mike asked me if I had anything with a longer handle that could be better fixed to the pole. I went to the shop. I have some old lathe tools that belonged to my grandfather. I don't use them, I just keep them because they were his. I taped a parting tool to the pole and returned to the battle.

Using the lathe tool, Mike pinned the snake to the wooden siding of the house, so the tool wasn't damaged. I pulled the rocks away and took off the snake's head with a hoe.

The lesson here is to never underestimate the usefulness of tools. With a little imagination, just about anything can be accomplished. **PW**

*Teresa Warde
Capay, California*

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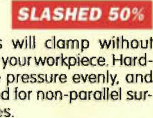
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- 1/8 HP, .83 amps @ 110V, 60 Hz, single phase
- Throat: 16"
- Uses pin end blades, 5" long
- Stroke: 5/8"
- Precision milled cast aluminum table: 14-3/8" x 7-7/8" tilts 0° to 45° left
- 1750 SPM blade speed

ITEM 37908-2EBA

5 PC. 5-1/2" SAW BLADES

• Pin end type

ITEM 35024-0EBA



\$69.99
\$49.99

\$4.99

CHICAGO Electric Power Tools

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HEAVY DUTY 4-1/2" DISC GRINDER

- 5/8"-11 spindle with 7/8" arbor adapter
- Motor: 3/4 HP, 115V, 5.8 amps
- High power to weight ratio
- High powered 10,000 RPM
- 11-7/8" long • Spindle lock

ITEM 31135-6EBA

4-1/2" x 1/4" GRINDING WHEELS (PK. OF 10)

24 grit, 7/8" arbor, 1/4" thick

FOR METAL

ITEM 06674-0EBA

FOR MASONRY

ITEM 07422-0EBA

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\$8.99

\$9.99

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CENTRAL MACHINERY

12" DIRECT DRIVE, BENCH TOP DISC SANDER

Get sharp, accurate finishes without burning or marring. Direct drive disc won't slip. Table tilts to 45°. Includes 60 grit, 12" sanding pad.

- 1 HP, 120V, 10.0 amps • Base: 13" x 10"
- No load speed: 1793 RPM
- Wheel diameter: 12"
- Shipping wt.: 92 lbs.

ITEM **\$89⁹⁹**
37297-3EBA

12" SANDING DISCS

GRIT	ITEM	PK. QF 2
60	37958-1EBA	\$6⁹⁹
120	37959-1EBA	\$6⁹⁹

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LIMITED
QUANTITIES

1-1/2 HP PLUNGE ROUTER AND FIXED BASE

Dual purpose router gives you the advantage of both a plunge router and a standard router with a fixed base. Includes edge guide for making precision cuts.

- 0 to 2-1/2" micrometer depth of cut control • 115VAC
- High torque 10 amp motor
- Includes: 1/4" and 1/2" collets
- No load speed: 23,000 RPM
- Net weight: 9-3/4 lbs.

ITEM **\$199⁹⁹**
53249-0EBA

Pittsburgh

Pittsburgh
LIFETIME
WARRANTY

2 PC. 3/4" HEAVY DUTY PIPE CLAMP

Constructed from heat-treated cast iron, these durable clamps keep your work rock steady. Just screw the handle side onto a 3/4" threaded pipe and slide the spring loaded end on. You're ready to go! Pipe not included.

- Handle screw operating range: 2-1/8"
- 1-1/2" throat depth
- Weight: 2-7/16 lbs.

ITEM **\$399**
31255-1EBA

1/2" PIPE CLAMP

- 1-1/2" throat depth
- Weight: 1-4/16 lbs.

ITEM **\$299**
37056-2EBA

CENTRAL MACHINERY

NO MORE LOST
CHUCK KEYS!

5 SPEED BENCH DRILL PRESS WITH KEYLESS CHUCK

- 8-1/4" maximum distance spindle to table
- 1/3 HP motor • 2" stroke, 8-1/4" swing
- 620 to 3100 RPM • 1/2" chuck
- 22-1/2" high, 47 lbs.

ITEM **\$49⁹⁹**
34231-6EBA

DRILL PRESS WITH KEYS CHUCK

ITEM **\$48⁹⁹**
05901-0EBA

CENTRAL MACHINERY

DRILL 1/4", 3/8", &
1/2" SQUARE HOLES

MORTISING MACHINE

Easier layout for professional mortise and tenon joints in furniture, cabinets, and restoration projects. Fence with hold down clamp keep workpieces from lifting off the table. Large capacity - up to 5" maximum height. Includes fence, workpiece clamp, and 1/4", 3/8", and 1/2" mortising chisels and bits.

- 10-7/8" x 7-3/4" base
- 13-3/8" x 6" table • 60 lbs. shipping wt.
- 3580 RPM spindle speed • 5" throat
- 5" maximum workpiece height
- Accepts .745" chisel shanks
- 1/2 HP, 110V, 2.3 amps

ITEM **\$149⁹⁹**
35570-5EBA

CENTRAL MACHINERY

BENCH TOP SHAPER/ROUTER

Expand your workspace with this handy wood shaper. Big machine features and compact enough to store under your bench. Very advanced - accepts both shaper cutters and router bits for the exact finish you want.

- Uses 2" diameter shaper cutters and router bits with 1/4" shank
- Individually adjustable fence halves
- 115V, 4.3 amps, 7/8 HP
- 10,200 RPM motor speed
- Cast iron work table and base
- Rear chip discharge

\$109⁹⁹ **\$89⁹⁹**
ITEM 32650-0EBA



FINEST
HARDWOOD

SOLID HARDWOOD WORKBENCH

Includes large flush mounted vises. Twin rows of 10 bench dog holes hold just about any project. Tools shown sold separately.

- 2 vises: 13"W x 1-1/4"D x 7-1/2"L max.
- Trough: 47-3/8"L x 5-1/2"W x 2-3/4"D
- Overall: 55"L x 25"W x 32-3/4"H
- Work area: 49-1/4" x 13-1/2"
- 20 bench dog holes
- Weight: 64 lbs.

\$129⁹⁹ **\$99⁹⁹**
ITEM 01635-0EBA

CHICAGO Electric Power Tools

3/8", 14.4 VOLT CORDLESS DRILL KIT WITH KEYLESS CHUCK

High voltage, heavy duty battery gives long run times between charges. T-Handle design makes this drill easy to use.

- Variable speed, reversible; 0 to 600 RPM
- 6 torque settings
- Includes 6 pc. drill bit set, 6 pc. screwdriver bit set, magnetic extension bit, charger, battery, Jacobs® keyless chuck, and carrying case

ITEM **\$39⁹⁹**
34793-2EBA

14.4 VOLT BATTERY

ITEM **\$29⁹⁹**
34794-0EBA

CENTRAL MACHINERY

13 GALLON INDUSTRIAL PORTABLE DUST COLLECTOR

Develops over ten times the suction of most shop vacuums. Works with 4" hose to pick up large chips from jointers, saws, shapers and planers. Unit includes heavy duty ball bearing castors, and dust bag. Hose is sold separately.

Bag capacity: 13 gallon; Motor: 110V, 7 amp, 1 HP; CFM: 660; Shipping weight: 56 lbs.

\$139⁹⁹ **\$109⁹⁹**
ITEM 31810-2EBA

DELTA LIMITED QUANTITIES

12" PORTABLE PLANER

- 24 FPM feed rate
- Capacities: 12" width, 6" thick, 3/16" depth of cut • Motor: 15 amp, 120V
- Table size with extensions: 12-1/8" x 26"
- Four precision ground columns to effortlessly raise and lower cutter head
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- Precise thickness scale conveniently located for easy reference
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- 27-1/4" x 20-1/2" x 15" overall dimensions
- Factory reconditioned, factory perfect

\$299⁹⁹ **\$259⁹⁹**
ITEM 06177-7EBA

PLANER BLADES **\$29⁹⁹**
ITEM 33075-3EBA

CENTRAL MACHINERY

DOVETAIL MACHINE

Just place stock and pull the cam handles to positively lock material in place. Allows cutting tails, pins, half blind, and standard dovetails. Accepts stock up to 12" wide and 1-1/4" thick. Includes 1/2" template.

\$59⁹⁹ **\$39⁹⁹**
ITEM 34102-8EBA

CENTRAL MACHINERY

LIMITED
QUANTITIES

10", 2 HP BENCH TABLE SAW

Die cast aluminum table 25-3/4" x 16", has adjustable 17-7/8" x 2" rip fence and inch/metric scale for precise cutting.

- Max. depth of cut at 90°: 3-1/8"; at 45°: 2-1/2"
- Blade sold separately, below
- Motor: 2 HP, 115V, 60 Hz, 10 amp, 4500 RPM
- Shipping weight: 36 lbs.
- Miter gauge adjusts 0° - 60° left and right
- Blade capacity: 10" with 5/8" arbor

ITEM **\$79⁹⁹**
31755-2EBA

10" CARBIDE TIP SAW BLADE

• 5/8" arbor • 40 tooth **\$9⁹⁹**
ITEM 00529-4EBA

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TRICKS OF THE TRADE

PLYWOOD CARRIER



Each issue of *Popular Woodworking* offers tips and tricks for the woodworker that we've accumulated from readers, contributors and from our own workshop and woodworking experiences. We want to encourage the free exchange of these time-saving and safety ideas for all woodworkers. If you have a good trick, we'd love to hear about it. Send your trick, whether it's one your father taught you or one you came up with on your own, to *Popular Woodworking*, Tricks of the Trade, 1507 Dana Ave., Cincinnati, OH 45207.

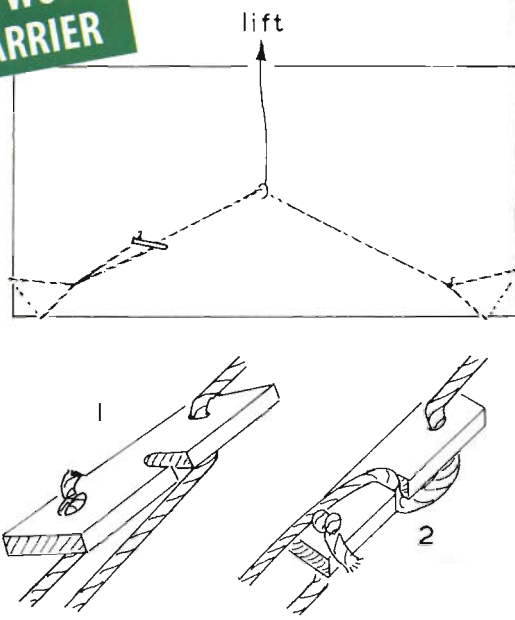
Carrying Sheet Goods — Alone

Sheet material is difficult to lift and carry by yourself. The safest place to have the sheet is under one arm, but you're limited by the reach of your arm. A full 4' x 8' sheet of plywood is easier to lift alone by using a rope and arranging loops around the lower corners, with another piece of rope between them as a handle. But there is a problem of getting the rope exactly tensioned to suit your reach, and then it's only suitable for that size sheet.

Shown here is a way to make one of these sling assemblies adjustable so it is adaptable to sheets of many sizes and adjustable to get your grip at exactly the right height without altering knots.

Make two rope corner loops with a sufficient length of long rope attached to one of them. Make a wood slide with two holes and a notch, all making an easy fit on the rope. For $\frac{1}{4}$ " rope my slide is $\frac{1}{4}$ " x $\frac{3}{4}$ " x 4". Take the long rope through the slide, through one loop and back to the slide. Move this to get the tension you want (1), then lock the rope by turning it back through the slot (2). An assembly to suit a full sheet should adjust down to any smaller size you wish to carry.

Percy Blandford
Warwickshire, England



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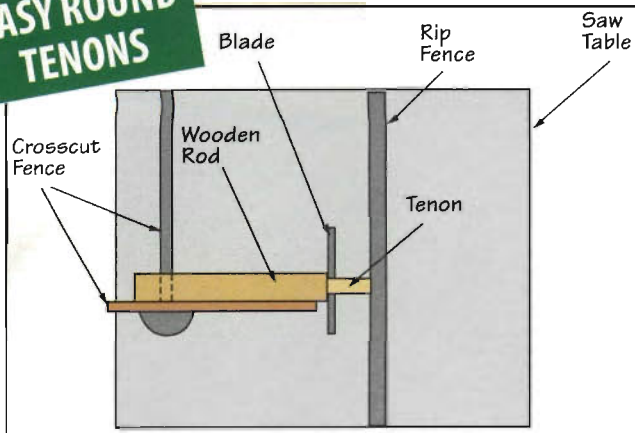
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David Koenigsberg
Roslyn, Pennsylvania

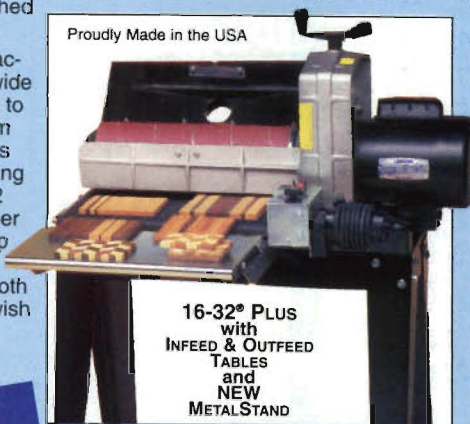
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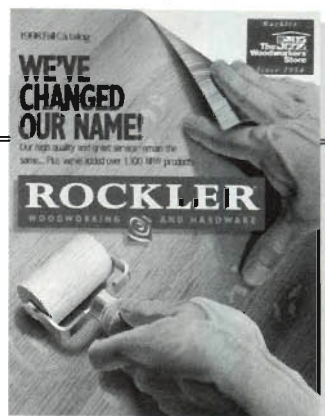
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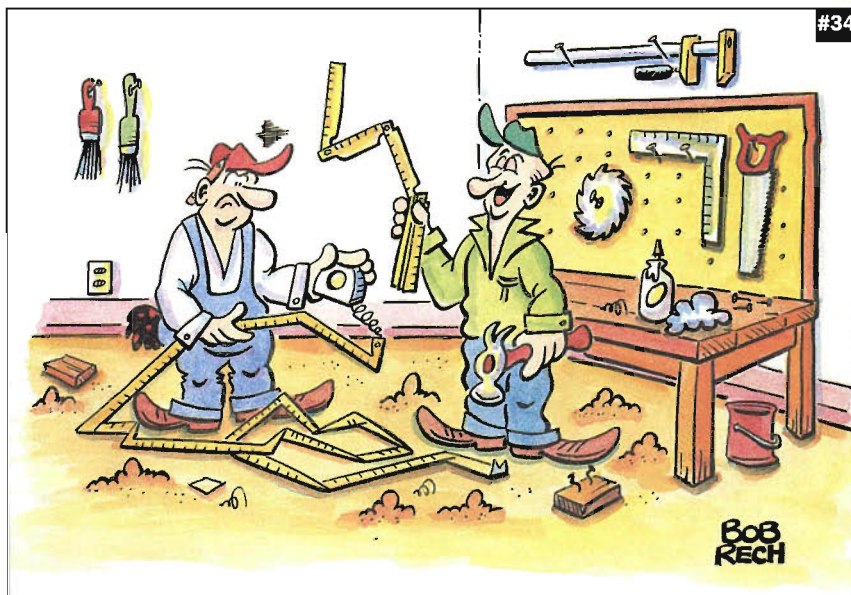
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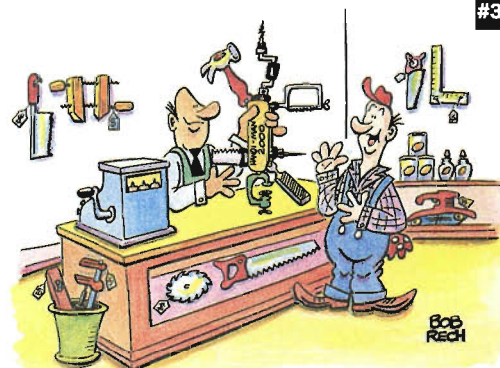
#34

Bob Rech

SHAWN BUDINE

from Faucett, Missouri, is the winner of our "Caption the Cartoon Contest #32" from the September issue and recipient of the Ryobi miter saw. Congratulations Shawn!

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#32

Bob Rech

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Peter Daucet, on board the USS Saipan

illustrated by Bob Rech



WIN Me!

Submit your caption(s) for this issue's cartoon on a postcard to **Popular Woodworking, Cartoon Caption #34, 1507 Dana Ave., Cincinnati, OH 45207** by December 24, 1998. Winners will be chosen by the editorial staff.

The winner will receive Makita's new B05010 random-orbit sander. This sander, chosen as a "Tool of the Year" by *Popular Woodworking*, features a powerful 2.0-amp motor, excellent dust collection and low vibrations.

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WOOD TYPES

Willow

(*Salix nigra*)

Other Common Names: Black willow, Dudley willow, Goodding willow, Sauce, Western black willow, Weide.

Growing Regions: Willow grows in Canada and nearly every state in the United States. It is often found among cotton trees, in flood plains and along the banks of rivers and lakes.

Characteristics of Tree: Size varies depending on where the trees are growing, but they average 60 to 100 feet tall and 18 to 30 inches across.

Characteristics of Wood: Willow has interlocking grain and uniform texture. It has no odor or taste. The sapwood is a creamy white color and the heartwood is gray or brown with streaks. It is resistant to decay but susceptible to many wood-destroying insects. Willow dries quickly but may retain moisture pockets. Defects such as splits,



water pockets and collapse can occur. Seasoned willow is stable.

Finishing Characteristics:

Willow stains and polishes easily.

Workability: The wood works fairly well with machine tools, but sharp cutting edges are necessary to avoid fuzzy surfaces. It glues, screws and sands well.

Common Uses: Baskets, decorative veneer, chests, furniture, hat racks, herbal medicine, packing cases and paper products. Charred willow was used in gun powder.

Availability: Common if harvesting branches for rustic furniture.

Special Features: Willow trees are used extensively along the banks of the Ohio, Mississippi and Missouri rivers to reinforce levees. For this reason, Black Willow is often referred to as the most important New World willow.

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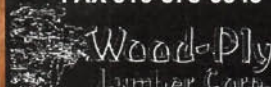
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The Greenest of the Green



A shop teacher grows and learns with his students.

THAT SUMMER after my graduation but before I started teaching shop, I was the finest teacher since Socrates; I envisioned myself with 20 sets of rapt eyes hanging on my every word and my shop students deeply aware of the larger world, starving for knowledge that only I could impart. Well, this delusion was not to be. My students were hungry, but not for much of what I could provide, and the only rapt attention I commanded was from my stumbles and pratfalls. By the end of the school year I was pretty hangdog.

I survived that first year, as most first-year teachers do, humbled by the challenge of teaching and bowed by the sheer weight of managing hordes of death-defying adolescents amid a shop full of deadly machine tools. One veteran teacher pulled me aside at the end of the school year and said, "Wait 'til you get a crop of students who've been with you for four years—you'll see your handiwork then."

Andrew Schultz is a woodworking author in Lincoln, Nebraska. His book, "Building Mission-Style Furniture" (Popular Woodworking Books), will be published in spring 1999.

This simple sentence proved prophetic. I spent the summer drawing, thinking, reading and writing the many kinds of materials I'd need to teach the kids. This was before the microcomputer, of course, so all my plans were typed or drawn by hand and then duplicated by the clumsy school equipment. Central to the revised woodworking program was the idea of the circle of life, of how wood is more than mere material.

The next year, the freshmen planted five walnut trees after four nine-week quarters of drafting, small engine repair, elementary metalworking and hand woodworking. The sophomores learned to use machine tools and their hand woodworking skills to build tool chests for the tools they crafted. They built bowsaws, forged chisels and punches, and made their own hand planes. Their big project was a fancy tool chest with a couple dovetailed drawers. The juniors learned framing by building a solar kiln. And the seniors, who'd worked the whole year building furniture of their own design, felled a huge black walnut tree and spent a week milling it into long planks.

Four years later I looked out on the graduating class and saw a bunch of kids with skills. They could fell a tree

and mill it into boards. They knew how to dry the wood so that it was usable. They could frame a building, be it kiln or cabin. They could make cabinets; they could build furniture. What's more, they had their own tools and a neat chest to carry them in.

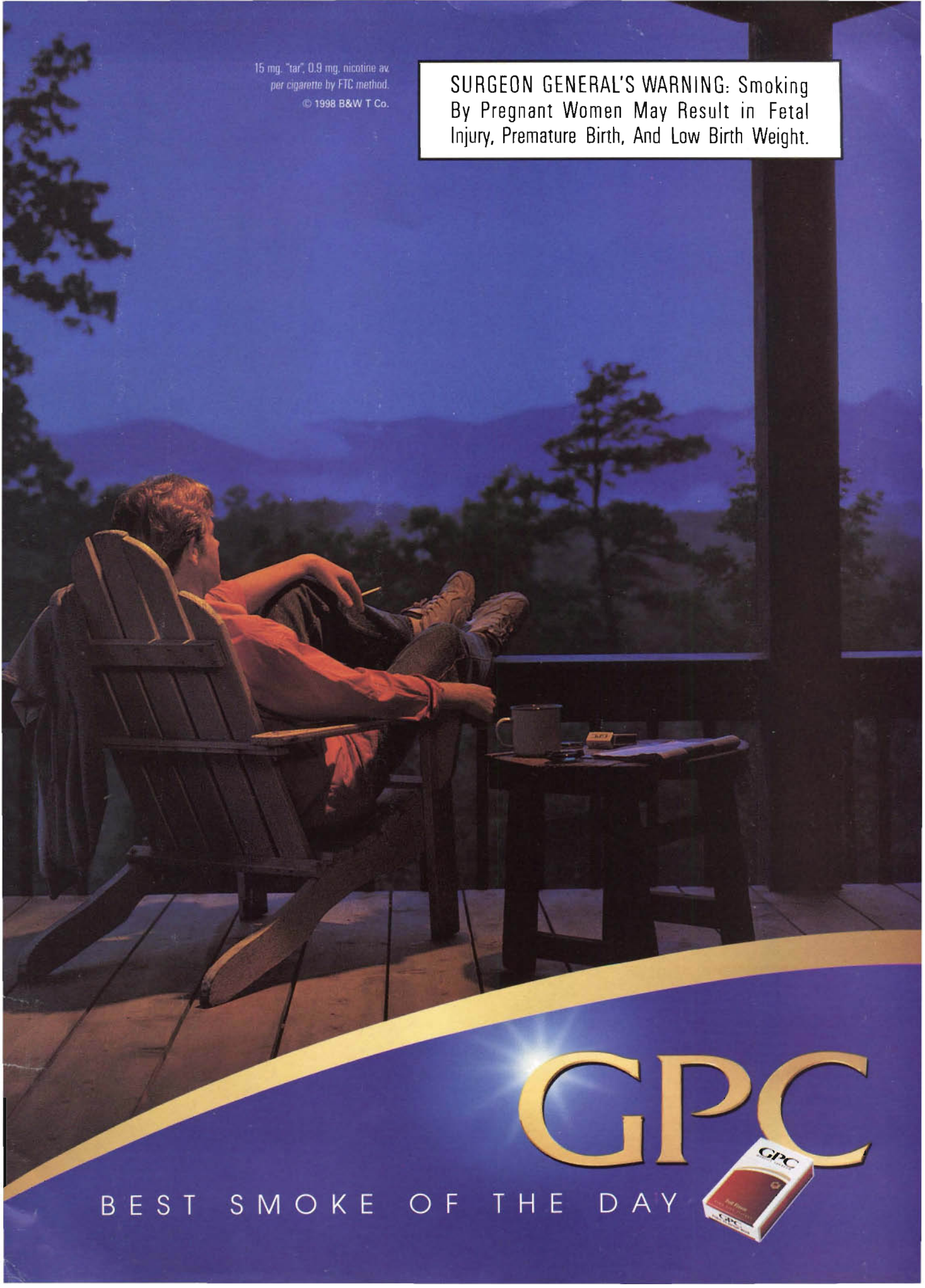
They'd left a legacy, too. The next year, the sophomores would inherit a board for their tool chests that those seniors had milled. And, most significant, I think, those trees they'd planted as freshmen and carried water to during the last three years had survived and flourished. Their long, leggy, leafy bows, just visible from the graduation stand at the football field, were blowing every which way in the wind just like the gawky, unpromising crop of freshmen who were acting up in the audience. The contrast, for me, was remarkable, and I think the seniors saw it too.

During the last four years, the students had learned just how much could be accomplished through their own perseverance and hard work. And I, too, had learned that knowledge is imparted in the same way, by lugging one heavy bucket of water to the tree at a time and waiting patiently for it to take root. **PW**

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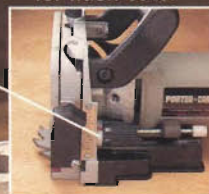
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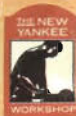
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